FACTORS ASSOCIATED WITH UNDERREPORTING IN THE COMPASSION CONNECT HEALTH MANAGEMENT INFORMATION SYSTEM AMONG FRONTLINE CHURCH PARTNERS OF COMPASSION INTERNATIONAL UGANDA IN THE CENTRAL REGION

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A DISSERTATION SUBMITTED TO THE FACULTY OF PUBLIC HEALTH, NURSING, AND MIDWIFERY IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF A DEGREE OF MASTER OF PUBLIC HEALTH DEGREE OF UGANDA CHRISTIAN UNIVERSITY

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Acknowledgment

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Dedication

I dedicate this dissertation to my family, friends, and tutors, who have encouraged and supported me to complete the project and dissertation. Thank you, and may the Almighty reward you abundantly.

Declaration

I, **Shellina Rwabyoma Abaho**, hereby declare that this research dissertation is solely mine and has never been presented to any university for the award of any academic qualification. In case there are works of other authors in this proposal, they have been duly recognized (Acknowledged) through appropriate citations.

Sign: 

SHELLINA RWABYOMA ABAHO

REG. NO. RJ16M21/058

Date: 12/09/2024

Approval

This dissertation entitled "*Factors associated with underreporting in the Compassion Connect HMIS among Frontline Church Partners of Compassion International Uganda – Central Region*" by Shellina Rwabyoma Abaho has been done under my supervision.

Sign: 

Rev. Canon Evatt Mugarura

Date: 12/09/2024

Abstract

Introduction: Health information reporting is fundamental in various organizations to ensure the smooth running of programs. Compassion International, a charity organization, employs a Health Management Information System to evaluate information such as medical incidence reporting and medical funds reimbursement requests. However, there has been a mismatch in reporting for the last eight years since the HMIS integration. The study aimed to explore the factors associated with underreporting medical incidents in Compassion Connect HMIS.

Methods: A mixed methods study design with quantitative descriptive and qualitative methodologies was used to collect data among Central Region FCPS and key staff at Compassion's National and Global levels. Key informant interviews were done with four key informants: two health specialists, one global health specialist, and one global health advisory team senior manager. The interviews were analyzed thematically using Atlas ti. Software. Descriptive statistics were used on categorical variables, while non-parametric tests were used to evaluate the Likert scale responses among 70 study participants. Likert Scale analysis and decisions of association were made based on the weighted mean of 2.78.

Results: Considering a sample of 70 respondents, 46 were male (65.7%) while 24 (34.3%) were female. 58 (82.9%) participants were CDO-health professionals, while 9 (12.9%) were project directors and 3 (4.2%) occupied other roles. Most study participants 38 (54.3%) spent 1-5 years working at the FCP. 36 (51.4%) of the study participants never had a medical background, and over half of the study participants, 57 (51.4%), were ignorant about the FCP organizational policies, culture, and practices. HMIS complexity, Frontline Church Partner Procedures, National Procedures, Communication and feedback, and individual attitude were significantly associated with under-reporting with a mean value of 2.81, 3.84, 2.93, 3.26, and 3.23, respectively. Also, standardized indicators and training about Compassion Connect were significantly associated with underreporting.

Conclusion: Developing the HMIS to capture the different information within Compassion International is vital in promoting evidence-based decision-making. Also, addressing the different factors leading to underreporting is vital in improving the data quality within the system, leading to better decision-making practices in the organization.

Key Words: Health Management Information System, Compassion Connect, Data Quality, Underreporting.

OPERATIONAL DEFINITIONS

Compassion Connect – an e-filing system that houses FCP and selected critical National Office information. The FCPs and National office staff have varied rights to the different functions in the system and can only use the system as per accorded rights. The system provides a platform for accessing documents, official files, and searchable registries, facilitating document management and retrieval. The information ranges from individual beneficiary information to plans and budgets for various interventions for FCPs and the National Office, including health interventions.

Individual factors are personal attributes and attitudes that can affect the utilization of the HMIS.

Organizational factors are issues concerned with the organization's structure, support services, procedures, resources, and culture, which are used to manage, develop, and improve the HMIS's performance and processes.

Technical factors are issues concerning special knowledge, skills, and expertise needed to improve, run, manage, and increase the performance and processes of HMIS.

Medical incident a record of medical information in Compassion Connect derived from a medical document from a health facility after a Compassion beneficiary has received treatment.

Entry/ recording of medical incidents: the avenue of transferring the relevant medical information from a written medical record to the beneficiary's account in Compassion Connect under the medical incidents section.

Frontline Church Partners: These professional church leaders partner with Compassion International to implement the organization's activities.

Health Management System: Refers to a comprehensive and integrated system designed to support managing and delivering healthcare services. It combines technology, processes, and resources to efficiently and effectively manage various aspects of healthcare, including patient care, administration, financial management, and decision-making.

List of Abbreviations

FCP	Frontline Church Partners
IT	Information Technology
MIN	Medical Incident Number
HIES	Health Information Exchange Systems
WHO	World Health Organization
DHIS	District Health Information System
CDO-H	Child Development officer in charge of Health.
CC- HMIS	Compassion Connect Health Management Information System
NGO	Non-Governmental Organization
HMIS	Health Management Information System
HIS	Health Information System

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1.0 CHAPTER 1: INTRODUCTION

The chapter offers information about the background of the study and why the study was conducted. The chapter highlights the factors associated with underreporting among various Health Management Information Systems on a global, regional, and national aspect. It also reveals the existing gaps, such as the literature and information gaps that prompted the research to be done. Moreover, the chapter elaborates on the different objectives that were considered to answer the research questions for the project.

1.1 Background of the Study

Information reporting within different organizations and entities is a critical concept that ensures project propagation and results production. Within the health sector, the information reporting process involves different systems, individuals, and activities. The World Health Organization defines the health system as a collection of different institutions, departments, and professional individuals who work independently and collectively to ensure the promotion of a given goal (World Health Organization, 2023). The interaction between these individuals is affected by sharing information amongst themselves, which information can be used during different aspects such as decision-making, follow-ups of investments, and resource allocation.

Additionally, the World Health Organization offers a comprehensive framework describing the systems responsible for producing different outcomes within the health sector, as illustrated in Figure 1. Majorly six pillars are described within these blocks, including service delivery, health workforce, and Access to essential medicines. Other pillars illustrated include Health information management systems, financing, and leadership. These pillars are vital in ensuring access coverage and quality safety, which enhance health outcomes and responsiveness in the different facilities. Additionally, they enhance the pillars and promote enhanced efficiency and social and financial risk protection. The augmentation of these concepts enhances the productivity of the different implementing organizations and promotes better service delivery.

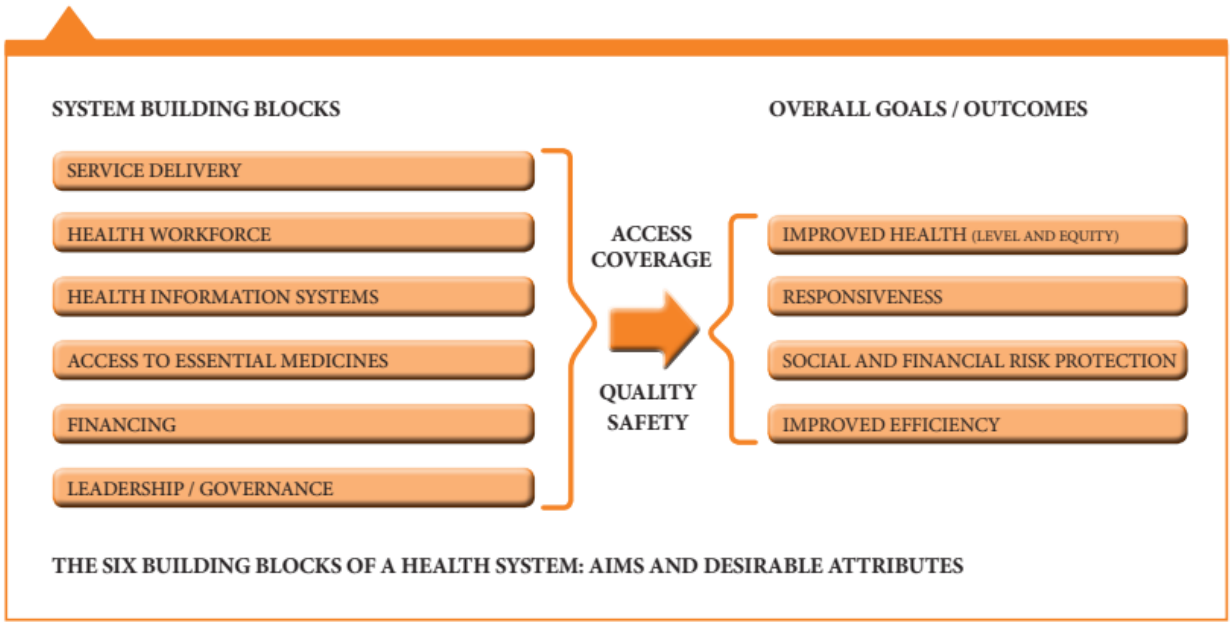

Figure 1: WHO Building Blocks of a Health System: aims and desirable attributes.

A critical aspect concerning the propagation of the different activities within various institutions is managing the health information system. Managing these information systems involves continuous filling in information from the field, information analysis and retrieval, software upgrades, and consistent connection to the different stakeholders. Appropriate health information management is critical in coordinating different health-related activities and informing decision-makers about the health system state (Tamfon et al., 2020). Globally, health information management systems have been utilized by various entities and have undergone various transitions, such as from paper-based reporting to electronic health records.

Both public and private facilities, such as government organizations, private organizations, and public and private hospital facilities, have employed the HMIS to ensure accurate data aggregation and reporting for better decision-making. The United States has utilized the HMIS in various aspects of its public health sector, such as exploring the needs of people experiencing homelessness, evaluating different diseases such as tuberculosis, and among various organizations (Mosites et al., 2021; Self et al., 2021). Other regions and countries, such as China and the United Kingdom, have also

utilized the HMIS system in different sectors, like the health sector, to gather relevant information (Yu et al., 2020; Mehler et al., 2021; Guo et al., 2021). Furthermore, different incentive programs were implemented to drive the utilization of HMIS to promote patient safety, care quality, data exchange capacity, and credible decision-making. However, most of these strategies were implemented in the first world countries, unlike the middle-and low-income countries of which Uganda is inclusive.

Uganda started adopting the health information system in late 1980, which integrated digital means to summarize and capture relevant health information (Nassali Musoke, 2001). By 1997, the HMIS was fully integrated by the Ministry of Health and predominantly analyzed morbidity information for specific communicable and non-communicable diseases, including some vital elements of health care service delivery like immunization (Kintu et al., 2005). The information was predominantly collected from lower peripheral centers like health center IIIs and IVs and later summarized at the district level. This information was fundamental during the ministry's decision-making and planning process.

Furthermore, it played a vital role in resource allocation and problem management, which prompted better outcomes (Nguefack-Tsague et al., 2020). Over the years, the system has had a rapid and incremental transition to incorporate multi-level facilities, like regional referrals, district hospitals, and other ministry arms. However, the transition has been ineffective due to various factors, such as limited literacy, complex systems, and individual attitudes (Ivankovic et al., 2023). These have significantly affected the transition from paper-based records to health management (Gebre-Mariam & Bygstad, 2019). Albeit, most of the facilities within the health care system still need to rely on paper-based records and information management protocols.

Other low-income countries implementing the HMIS in their health sector and other organizational entities include Kenya, Ethiopia, Rwanda, and South Africa (Moukenet et al., 2021; Farnham et al., 2023; Rumisha et al., 2020). Effective healthcare management and delivery of essential services depend on accurate and timely data collection and reporting. In Uganda, as in many other parts of the world, Health Management Information Systems (HMIS) are critical in monitoring and improving public

health outcomes (Wandera et al., 2019). However, the reliability of data collected through these systems is often compromised due to various phenomena, such as underreporting (Nshimyiryo et al., 2020). Underreporting refers to the systematic or unintentional underrepresentation of information in the collected data, which can lead to inaccurate assessments of health-related indicators and hinder decision-making processes (Endriyas et al., 2019; Moukenet et al., 2021).

Different factors have been identified to predispose to underreporting within HMIS, such as human factors, for example, insufficient human resource, limited health worker capacity for reporting, data usage, and healthcare provider's knowledge, and organizational factors, for example, Adherence to HFs, MOHs existing SOPs, regular records review (Nshimyiryo et al., 2020). Other factors include system factors like incompatibility of data collection tools and the HMIS (Nshimyiryo et al., 2020). These hinder effective and accurate data entry within the system. Compassion International is a leading Christian child development organization with a presence in numerous countries, including Uganda. Their work involves partnering with local churches to provide holistic child development services, including healthcare support (Compassion International, n.d.).

To effectively manage these services and track their impact, Compassion International utilizes the Compassion Connect HMIS, a data management system specifically designed for its unique operations. The Ugandan central region is composed of diverse communities with varying healthcare needs. Frontline church partners are pivotal in implementing Compassion International's programs, including healthcare interventions, child protection programs, and healthcare service to children mobilization. Therefore, their accurate reporting in the Compassion Connect HMIS is essential for program planning and evaluation and proper resource allocation, such as finances, to cater to the treatment of different children.

However, like many HMIS, the Compassion Connect system faces challenges related to data quality, including underreporting. Compassion International Uganda operates an internal HMIS that requires, among other information, individual medical incident records for beneficiaries whose medical treatment cost is above USD 9 for

reimbursement. Over the past eight years, it has been observed that this expectation was inadequately met. In 2018 and 2019, it was made mandatory for every FCP requesting reimbursement of medical funds to append a Medical Incident Number (MIN) to the request. The expectation led to a 30% decline in requests for reimbursement of medical funds by FCPs, causing negative balances on the health expenditure code of the FCP budget (Rwamura, 2023). Also, wrong conclusions concerning the reimbursement process were inevitable among stakeholders following the decline in the reporting incidents.

Additionally, minimal efforts were undertaken to explore the factors associated with the decline in HMIS reporting. Several factors can contribute to underreporting in the context of an HMIS, including but not limited to data collection challenges, human error, technical issues, and organizational and cultural factors. However, the magnitude of these factors has not adequately been explored, creating information gaps that hinder the promotion of effective strategies to improve the reporting process. Therefore, understanding the factors contributing to underreporting among the frontline church partners is crucial for ensuring the effectiveness of Compassion International's programs and, by extension, improving the health and well-being of the sponsored children and their communities.

With the main objective of identifying the factors associated with under-reporting in the Compassion Connect Health Management Information System, the study aimed at answering different questions such as: What individual factors facilitate the under-reporting in the CC-HMIS among FCPs? What organizational factors facilitate the under-reporting in the CC-HMIS among FCPs? What technical factors are associated with the under-reporting in the CC-HMIS among FCPs? The study investigated these factors specifically within the Central Region of Uganda and among the frontline church partners of Compassion International.

The study utilized the Performance of Routine Information System Management framework (Hotchkiss et al., 2010). It sheds light on the unique challenges these partners face and offers recommendations for enhancing data reporting accuracy and quality in the Compassion Connect HMIS. By identifying and addressing the underlying

causes facilitating the underreporting within Compassion Connect, this research contributes to the overall improvement of healthcare management and data-driven decision-making within the context of Compassion International's programs in Uganda. Additionally, the information offered in this study will help different management systems monitor performance indicators, such as tracking health incidents and evaluating the intervention efficacy. Ultimately, the findings of this study are relevant not only to Compassion International but also to other organizations that rely on similar HMIS systems to monitor and improve healthcare outcomes in diverse and underserved communities.

1.2 Problem Statement

Compassion International Uganda operates an internal HMIS that requires, among other information, individual medical incident records for beneficiaries whose medical treatment cost is above USD 9, for reimbursement. Over the past eight years, it has been observed that this expectation still needs to be met. In 2018 and 2019, it was made mandatory for every FCP requesting reimbursement of medical funds to append a medical incident number (MIN) to the request. This expectation led to a 30% decline in requests for reimbursement of medical funds by FCPs, causing negative balances on the health expenditure code of the FCP budget (Rwamura, 2023). To solve this issue, the mandatory expectation for MINs was indefinitely made optional. More recent reports from CC-HMIS, indicate that from July 2022 – March 2023, only 40% of the current 474 FCPs nationally have consistently entered MINs for corresponding medical funds reimbursements. For the rest of the FCPs who have requested reimbursements, no corresponding MINs are appended to the requests. This mismatch poses a risk of wrong conclusions by the end-side stakeholders who interact with the CC-HMIS for data to develop health programs and fundraise. One wrong conclusion is that funds are reimbursed for beneficiaries who haven’t accessed services, and it further paints a picture that medical treatment is extremely costly since the MINs are few and the reimbursement costs are high.

Interestingly, the information within the CC-HMIS system does not correlate with the requests submitted for reimbursement of funds used. CIUG receives many reimbursement requests in Google Drive but there are few medical incidents recorded in CC-HMIS. This gap is a true indicator of the existence of different factors that hinder the system's utilization, especially in terms of reporting medical incidents. Even though studies have explored the different factors affecting HMIS utilization, few of them have provided information about the associated factors to this underutilization. Notably, the different factors associated with the under-utilization of the HMIS have not been explored in the NGO setting like Compassion International. The absence of information concerning the various factors leading to HMIS underutilization in NGO settings creates significant barriers to organizational development, program implementation, and donor relationships. Therefore, this study seeks to assess the factors associated with the under-utilization of the CC-HMIS system by the FCPs. Additionally, this study will further address the information gap existing concerning HMIS utilization in an NGO setting.

1.3 Objectives

1.3.1 Main Objectives

I. To identify the factors associated with under-reporting in the CC- HMIS among FCPs.

1.3.2 Specific Objectives

i. To determine the individual factors associated with under-reporting in the CC-HMIS among FCPs.
ii. To analyze the organizational factors that facilitate the under-reporting in the CC- HMIS among FCPs.
iii. To identify the technical factors associated with under-reporting in the CC-HMIS among FCPs.

1.4 Conceptual Framework

The interrelationship between the study variables is conceptualized as shown in figure 2. Individual factors such as attitude, HMIS training, duration on the role, and data management literacy can affect HMIS utilization. Likewise, some organizational factors such as organizational structure, planning, governance, and resource availability can interfere with HMIS utilization thus the need for exploring their relationship. Finally, some technical factors, such as HMIS design, computer software, and complexity of the reporting tools can hinder the utilization of the HMIS system. Thus, exploring these factors in the context of CC-HMIS is critical to understand their contribution and devise appropriate strategies to improve the reporting process.

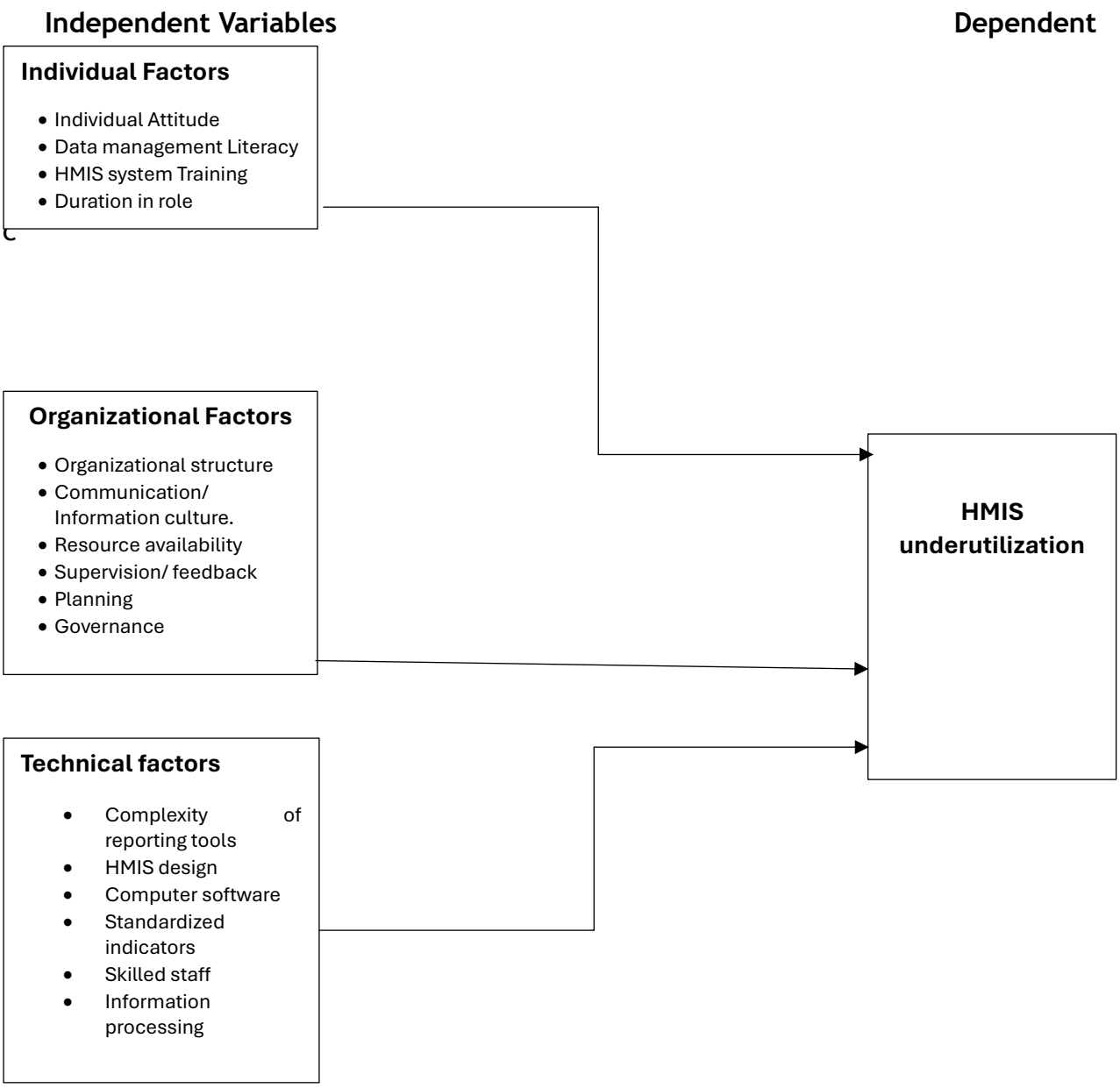

Figure 2: Conceptual framework

Source Adopted from Hotchkiss et al. (2010) and modified by the researcher.

2.0 CHAPTER 2: LITERATURE REVIEW

The section offers comprehensive information on different sections of published and non-published literature. It offers an analysis and relationship between the existing research gap and the available literature and proposes the need for conducting the study. Literature that aimed at developing an understanding and knowledge around issues relating to health information use was reviewed according to the thematic areas listed below.

2.1 Background of the HMIS System

The HMIS has been described as a system whose performance is measured by the quality of data produced by the system and the use of those data in decision-making. Around the 1960s and 1970s, electronic health records emerged following the rampant digitalization of various sectors. By this time, computers were introduced in healthcare settings, which helped capture necessary patient information. Over the next years, significant developments within the healthcare system involving digital systems ensued (Saleem et al., 2009). The systems integrated different functionalities such as patient registration, clinical decisions, medical records, and billing information (Hayrinen et al., 2008).

Over time, advancements occurred as healthcare facilities integrated Health Information Exchange Systems (HIEs), enabling accurate information sharing between various facilities. With the ease of sharing this information, healthcare facilities could adequately manage their patients through real-time consultations (Abouelmehdi et al., 2018). By the early 2000s, the United States government introduced the concept of "meaningful use," which prompted the adoption and utilization of meaningful use of electronic health records (Murphy, 2010). Different incentive programs were implemented to drive the utilization of HMIS to promote patient safety, care quality, data exchange capacity, and credible decision-making. However, most of these strategies were implemented in the first world countries, unlike the middle-and low-income countries of which Uganda is inclusive.

Compassion International, founded in 1952, has been at the forefront of improving the livelihood of different children across the globe. With a vision of releasing children from poverty and developing them into fulfilled and responsible adults, the organization has prioritized offering services and aid to children holistically (Compassion International, 2023). In Uganda, the organization commenced its charitable and compassionate duties in the early 1980s with the same purpose of uplifting children in need (Twemerimana, 2006). Compassion Int. Works with select churches to support impoverished families by providing access to education, livelihood improvement, child safeguarding and protection, psychosocial support, and health / medical services.

All this is aimed at enabling families to become healthy and economically empowered. The programs offered are developed and coordinated by the global and national offices, financed by a strong base of donors worldwide, and are implemented by select churches in those countries. The churches are called Frontline Church Partners (FCPs). FCPs are responsible for identifying children within the community and enrolling them in the program for relevant support according to the program standards. However, a mismatch has been noted in the number of medical incidents reported and reimbursement requests, which signified underreporting in the system. The essence of the study was to evaluate the different factors associated with underreporting among FCPs in partnership with Compassion International.

2.2 Factors Associated with under-utilization of HMIS

2.2.1 Organizational Factors

HMIS underreporting in different organizations can result from different organizational technicalities and factors. A study, "*Examining Policy Intentions and Actual Implementation Practices: How Organizational Factors Influence Health Management Information Systems in Uttar Pradesh, India,*" demonstrated multiple organizational factors influencing underreporting in the HMIS system, such as organizational culture, computer illiteracy, and limited technical understanding (Meghani et al., 2021). Additionally, the study demonstrated that a poor organizational culture hinders the implementation of the different HMIS guidelines, which are relevant in promoting

effective reporting. Furthermore, Meghani et al. (2021) emphasized that failed implementation of HMIS guidelines affects the HMIS data quality, which can later be reflected in the different data-dependent decisions. The study highlighted other associated features affecting the reporting capacity in the HMIS system from the organizational culture, for example, staff rigidity and poor authority over the software. Moukenet et al. (2021) further emphasized the impact of organizational culture on HMIS reporting, highlighting that poor organizational cultures automatically lead to underreporting in the HMIS system. Another study conducted in Pakistan evaluating the "*Factors affecting implementation of hospital management information systems in Pakistan*" showed that organizational functionality is critical in implementing quality data reporting in any HMIS. Poor organizational functionality characterized by inadequate resources, hierarchy, adhocracy, and leadership can primarily lead to underreporting in the HMIS (Malik & Hameed, 2012). Therefore, addressing such issues within the organization can improve the reporting process, reflected in the data quality.

Additionally, the organization's culture is a fundamental concept that enables the proper functionality and running of various activities. Moreover, the organizational culture ensures that every performance activity is conducted according to the set organizational goals and objectives (Abdisa et al., 2022). Also, the organizational culture determines the different communication strategies within the organizations across different departments, for example, between the donors and FCPs. Information culture is achieved when everyone asks for hard data and clear indicators to plan, act, or propose new activities and when data speaks louder for all decisions (Ivankovic et al., 2023). Moreover, a good information culture, characterized by regular information display on tables, graphs, and notice boards, may encourage information use and HMIS utilization (Mekonnen & Gebeyehu, 2021). However, Abdisa et al. (2022) assert that the effectiveness of an organizational employee regarding the HMIS is attributed to the different organizational rules, systems, and processes. These parameters can hinder and facilitate HMIS utilization among employees.

Other organizational factors affecting the HMIS reporting and data quality in various organizations include the HMIS performance and the entry registries. An "*Assessment of*

behavioral and organizational determinants of HMIS performance in Beghi, District West Wollega, Oromia, Ethiopia" demonstrated that HMIS performance can significantly affect the reporting capacity in the system (Dura & Box, 2018). Poor HMIS performance caused by organizational factors, such as failure to purchase the appropriate licenses, software, and connectivity rights, can interrupt the data-filling process. The interruption is later reflected in the quality of data produced. Another study exploring the "*Data utilization and factors influencing the performance of the health management information system in Tanzania*" demonstrated inadequacy in the organization's standard procedures to run the HMIS tools often led to underreporting and poor data quality (Mboera et al., 2021). Thus, exploring these factors can promote HMIS utilization, facilitating better data reporting behavior among employees.

Besides, the interactions among various individuals in the organization can also be a significant factor in underutilizing the HMIS system. Individuals who design, implement, and manage the organization's HMIS must ably and easily communicate with other HMIS end users (Hlaing & Zin, 2020). When the FCPs and organizational system analysts work together, they become more informed about the different data collection processes, like medical incident data collection and reimbursement requests. Moreover, the normative decision-theoretic perspective assumes that only relevant information will be gathered and analyzed, and when information is available and of good quality, it will be used (Wandera et al., 2019). Additionally, the active interactions between the organizational, technical team and FCPs offer an opportunity to explore the barriers that limit the usage of the HMIS (Hotchkiss et al., 2010). These barriers can further be evaluated and assessed to answer the necessary pragmatic questions to further the HMIS efficacy. Therefore, addressing the communication relationship between the system analysts and the FCPs is critical and can promote effective HMIS utilization.

Also, providing formal training about using the HMIS system is fundamental in determining utilization levels. Hlaing & Zin (2020), in a study to evaluate organizational factors and their effect on data quality, demonstrated that these training pieces produced better data-filling results. Wandera et al. (2019) also asserted that offering formal training about data entry among organizational employees improved data system

management by over 60%. Moreover, Hotchkiss et al. (2010) encouraged organizational involvement in training employees concerning electronic system utilization. Haftu et al. (2021), in their study "*A mixed-methods assessment of Routine Health Information System (RHIS) Data Quality and Factors Affecting it, Addis Ababa City Administration, Ethiopia, 2020,*" demonstrated that training was prime in ensuring that different users get acquainted with the HMIS database. Additionally, the authors emphasized that trained employees can easily navigate the system, identify errors, and notify the necessary individuals following any technical issues (Haftu et al., 2021). These various studies demonstrated the essence of training employees to improve HMIS usage outcomes.

2.2.2 Technical Factors

Often, the technicality of the HMIS can hinder its interaction among the professionals meant to do the data entry. A study evaluating "*Data Quality Assessment and Associated Factors in the Health Management Information System among Health Centers of Southern Ethiopia*" emphasized that HMIS complexity affects the reporting capacity in the HMIS (Solomon et al., 2021). The study further revealed that only 11% of the facilities that utilized the HMIS had technical officers who could evaluate the technical errors and rectify them in time. The absence of these technical officers predisposes the HMIS users at different sites to significant time lags in case of an error or system shutdown. These further predispose to the underreporting and poor data quality obtained from the HMIS. Additionally, Kikoba et al. (2019), in the study "*Integrating Electronic Medical Records Data into National Health Reporting System to Enhance Health Data Reporting and Use at the Facility Level,*" reported that technical reporting forms in the HMIS system interfere with the reporting capacity of different users, thus leading to poor data quality. Moreover, technical forms interfere with the data-sharing processes, thus limiting strategic decisions among the stakeholders, which may be relevant in improving the organization's data management capacity (Endriyas et al., 2023). Therefore, evaluating the technicality of the reporting forms, emphasizing their simplification, is vital in enhancing reporting in the HMIS.

Arsenault et al. (2021) also assert that system complexity concerning the reporting format and procedures followed significantly hinders the system's usability. The complexity could contribute to the significant decline in medical incidents among the different FCPs. Additionally, the HMIS design could hinder its utilization among the FCPs. Wandera et al. (2019) assert that complex system designs may require help to navigate, posing significant hindrances in data entry. Also, Hlaing & Zin (2020), in a review to determine *the impact of system design and user interface*, demonstrated that complex design systems hinder effective data utilization, thus limiting effective outcomes. Furthermore, Shama et al. (2021) in their study "*Assessment of quality of routine health information system data and associated factors among departments in public health facilities of Harari region, Ethiopia*" demonstrated that certain technical factors such as standardized indicators within the HMIS system determine the reporting rate of various incidents. These standard indicators could include the quality of personnel training and the availability of feedback concerning the utilization of the HMIS. A deficiency in these factors can easily promote underreporting since critical information is mostly ignored. These studies affirm that technical factors like HMIS design can hinder the effective utilization of the system.

Moreover, HMIS system complexity may be linked to computer software and information technology complexity. Most HMIS systems can be accessed through individual or organizational computers through various software. The software is often linked to the organizational host servers through the internet. Complexity in these frameworks significantly impairs the HMIS usability, later impacting the overall outcomes. A mixed-methods study evaluating "*Feasibility, usability, and acceptability of a novel digital hybrid-system for reporting of routine maternal health information in Southern Tanzania*" demonstrated that technological complexity and data processing barriers significantly contribute to the underreporting in the HMIS (Unkels et al., 2023). Furthermore, Getachew et al. (2022) assert that technological hindrances are a critical factor for evaluating the determinants of underreporting among HMIS. Thus, addressing the different needs and requirements of the organization's members is critical for ensuring accurate data entry and better product outputs.

Transmitting, compiling, analyzing, and presenting data is so protracted that they are often obsolete when a feedback report is prepared and decisions are made without any information input. In strong vertical programs, data transmission does not follow the hierarchical line of communication, with the results that reports often fail to reach line managers (Hotchkiss et al., 2010). Moreover, Digital disparities exist in adopting and utilizing various forms of health IT. Therefore, potential barriers to health IT adoption and utilization must be considered from several perspectives to understand these disparities comprehensively. These technical perspectives may include the provider and healthcare system perspective, the perspective of patients, families, and caregivers; the impact of the technology itself, and finally, the setting or environment (hospital/clinic or safety-net organization) in which the technology is used and the care is delivered and/or received.

2.2.3 Individuals Factors

Various individual factors have been explored, and their significance in contributing to underreporting in HMIS is presented. Haftu et al. (2021) assert that an individual's attitude towards the HMIS system and data reporting is critical in the reporting capacity. Amir (2022), in a study to assess the "*Knowledge, attitude, and practices towards health management information system data use at the health facility level in Tanzania*," demonstrated that 90% of the study participants had a positive perception concerning HMIS use in the facility. However, over 80% of the study participants didn't believe they owned the data they produced. Amir (2022) later suggested that these perceptions are potential determinants of HMIS utilization among individuals in health facilities. A study to evaluate "*factors affecting the utilization of HMIS in Indonesia*" demonstrated that attitudes were significant attributes of HMIS utilization among health workers in the facility (Komalasari, 2020).

Furthermore, Nguise et al. (2022), in their study about the "*utilization of health management information and its determinant factors among health professionals in public health facilities in Ethiopia,*" demonstrated that attitude toward the HMIS was a significant factor in underutilization. Additionally, the authors showed that software

and system literacy also led to HMIS underutilization. Another study evaluating the "*Factors affecting data quality of health management information system at township level, Bago region, Myanmar*" showed that individuals with a poor attitude towards the HMIS may experience difficulties using the HMIS (Hlaing & Myint, 2022). Further, this predisposes to producing poor quality data due to underreporting incidences, which affects the decisions made in the entire organization. The authors further demonstrate that individual factors such as reduced competence and low confidence while using the HMIS contributed significantly to underreporting in the HMIS, leading to poor quality data.

Other factors explored to predispose to underreporting among HMIS include limited literacy among HMIS users. Seid et al. (2021), in the study "*Utilization of Routine Health Information from Health Management Information System and Associated Factors Among Health Workers at Health Centers in Oromia Special Zone, Ethiopia: A Multilevel Analysis*," demonstrates that literacy about the HMIS is critical to ensure that quality data is reported in organizations. Furthermore, the study predicted that knowledge of the different data analysis skills coupled with regular feedback are essential in promoting efficient reporting in the HMIS. These findings correlate with another study that evaluated the "*Evaluation of quality and use of health management information system in primary health care units of east Wollega zone, Oromia regional state, Ethiopia*." The study demonstrated that technical expertise in data management is critical to ensure proper reporting modalities in the HMIS, improving data output quality and decision-making processes (Kebede et al., 2020). Therefore, enhancing the literacy of different professionals utilizing the HMIS in data management and analysis skills is paramount for better data quality and utilization of the HMIS.

More studies have evaluated the duration of the role in any organization as a potential and significant factor affecting reporting in HMIS among organizations. A study exploring the "*Determinants of Utilization of Routine Health Management Information System (HMIS) Data for Effective Decision Making at Selected Health Facilities in Zanzibar*" shows that factoring in the duration of data interface among HMIS users can improve the quality of data entered into the system (Ally, 2019). Furthermore, the author asserts

that the entry of accurate data guarantees accurate decision-making based on the evidence thus promoting organizational development. Other literature considers the experience of an individual as an important factor in promoting proper HMIS utilization. The magnitude of proper data entry is directly related to the quality of decisions made in the institution utilizing the HMIS.

Besides, most of the information offered is conducted from health facilities and not among NGOs. Equally, data literacy among HMIS users significantly influences HMIS utilization among various organizations. Wandera et al. (2019) assert that adequate education concerning the HMIS system through various training promotes easier system utilization and navigation. Shiferaw et al. (2017), in their study of "*routine health information system utilization and factors associated thereof among health workers at government health institutions in Ethiopia*" also demonstrated that individuals who have undergone thorough training about HMIS utilization have 2.72 more chances of using the HMIS system effectively. On the other hand, a lack of sufficient knowledge concerning the HMIS system may lead to HMIS underutilization. Therefore, assessing the association between individual factors and under-utilization is vital to offer information that can be leveraged to improve HMIS utilization and, thus, organizational performance.

2.3 Conclusion

The HMIS system is fundamental for proper governance, resource allocation, and activity coordination in any health management or related organization. For Compassion International, linking stakeholders at Global, Regional, National, and FCP levels is vital. These promote the effective running of goal-directed activities and foster developmental changes. Moreover, the CC-HMIS is vital in capturing information concerning medical incidents, which is critical for organizational financial analyses and promoting investment prospects. However, various individual factors such as attitude and data management literacy, organizational factors such as communication and culture, and technical factors such as HMIS design and Software technicality have been expressed through literature predisposing to underutilizing the HMIS system across

organizations and facilities. Since its inception about ten years ago, the CC-HMIS system has yet to be fully utilized within Compassion International, as evidenced by multiple disparities in reimbursements and medical incidents reported and the amount of funds requested for reimbursement. Also, more information must be provided on the factors leading to CC-HMIS underutilization. Therefore, this study assessed the factors associated with the underutilization of the CC-HMIS system.

3.0 CHAPTER 3: METHODOLOGY

The chapter explains the different steps to collect the data related to the research topic. It explains the study design used, the study setting, and the study population. Further, the chapter explains the sample size determination formula and the sampling methodology used. Also, the chapter describes the inclusion and exclusion criteria utilized to obtain the different study participants alongside the data collection procedures. Furthermore, the chapter elaborates on the different data analysis procedures to ensure that significance was obtained from the information collected.

3.1 Study Setting

The study was conducted among FCPs working with Compassion International in the Central region, and this was an online study where the questionnaires were delivered to the different officials in the FCPs using a Google documents link. Compassion International is structured in a hierarchical format. At the apex of the hierarchy is the Global Office, which houses its headquarters (Global Ministry Centre – GMC) in the USA, followed by the Regional offices in 3 Regions (Africa, Latin America, and Asia), after which are National offices (10 in Africa, 12 in Latin America, 7 in Asia). At the base of the hierarchy are the FCPs. Uganda is one of the 10 National Offices and currently has 474 FCPs. The National Office coordinates the FCPs for program implementation by ensuring Global program standards are contextualized and implemented by FCPs towards outcome attainment. In Uganda, FCPs are categorized into six regions according to geographical location: Northern, Northeastern, Eastern, Central, Southwestern, and Midwestern. Each region comprises multiple FCP clusters according to districts. The Central Region, the study setting under focus, has eight clusters with eighty-six FCPs. Data from the organization reports demonstrates that FCPs in the Central Region have various characteristics, including a mixture of urban and rural FCPs and new and old FCPs

3.2 Study Design

The study employed a cross sectional study design employing mixed methods with quantitative and qualitative data collection methods to identify the factors associated with underreporting in the CC-HMIS system by FCPs of Compassion International. A quantitative study design is a research methodology that focuses on the systematic collection and analysis of numerical data to draw statistical inferences, make generalizations, and test hypotheses (Bloomfield & Fisher, 2019). The research design is commonly used in various fields, including psychology, sociology, economics, medicine, and the natural sciences, to investigate relationships, patterns, and associations between variables. The research commences with a clearly defined research question or hypothesis. The question typically involves exploring the relationship between one or more independent variables (factors that are manipulated or observed) and one or more dependent variables (outcomes or variables of interest). The major research question for this study was: What are the factors associated with underreporting in the CC-HMIS among FCPs? Quantitative research is particularly useful when researchers aim to establish causal relationships, analyze trends, and make numerical comparisons. It is essential for generating empirical evidence in many scientific and social science disciplines, providing valuable insights into the relationships between variables and guiding evidence-based decision-making.

On the other hand, qualitative research design is a research methodology that focuses on understanding and interpreting non-numerical data to gain insights into the complexities of human experiences, behaviors, perceptions, and social phenomena (Small, 2021). Qualitative research is characterized by its emphasis on exploring and describing phenomena in-depth rather than quantifying or measuring them. Just like quantitative research, it also starts with a research question or objective that seeks to explore a specific aspect of a phenomenon (Small, 2021). Researchers aim to gain a deep understanding of the subject of study, often focusing on complex, context-specific, and socially embedded issues.

3.3 Study Population

Data was collected from 70 staff working with the 86 FCPs in the Central Region. These included the Child Development Officer in charge of health (CDO-H), who is mandated to enter CC-HMIS information and have important information concerning the utilization of the HMIS necessary to explore the study objectives. Key informants working with the global, national, and regional offices were also interviewed. Key informants were 2 health specialists, 1 Monitoring and Evaluation Specialist, and 1 Global health specialist.

3.4 Sample Size Estimation

Quantitatively, the sample size was estimated using Solvin's Formula since it allowed the researcher to attain the maximum accuracy during sampling.

Where n= represents the sample size required

N= the number of FCPs (CIUG Central region FCPS = 86)

e= represents the acceptable sampling error (5%) = 0.05

n = N / (1 + Ne2)

n = 86/ (1+ 86 0.052)

n= 70 individuals

Qualitatively, four key informants were interviewed about the different factors that predispose to underreporting of medical incidents among FCPs. Additionally, they were interviewed about the different individual, organizational, and technical factors that predisposed to underreporting in the Compassion Connect Health Management Information System.

3.5 Sampling Method

A random sampling method was utilized in this study because of the chance it offers for each participant to be considered. Random sampling involves selecting a subset of individuals or units from a larger population in a way that ensures every individual or

unit has an equal chance of being chosen. Before, sampling, the researcher must walk through the different pre-sampling steps like defining the population, sample size, and determining the sampling frame. The four staff for the key informant interviews were purposively selected given their role in health programming at the Uganda National and Global office levels.

3.6 Inclusion and Exclusion Criteria

3.6.1 Inclusion

FCP staff in charge of CC utilization in the Central region and willing to participate in the study were included.

Health specialists working with the National and global offices were also considered for the qualitative part.

3.6.2 Exclusion

FCP staff who were new and hadn’t received orientation to the system and those critically ill were to be excluded from the study but none (0) of the potential respondents were excluded.

3.7 Data Collection, Management, and Quality Control

A self-administered online questionnaire was offered to the study participants containing different sections evaluating the factors associated with underreporting in the CC-HMIS using an online Google form link. The online questionnaire was sent to all 86 FCPs, and using a random number generator, 70 responses were selected for analysis and use in this study. The questionnaire was pretested before the study, and its effectiveness was evaluated. A Cronbach's alpha coefficient was utilized to evaluate the questionnaire's reliability. A reliability score of 0.559 was obtained from 16 items in the questionnaire, demonstrating its reliability. Additionally, a mean of 2.723 on a minimum of 1.171 and a maximum of 3.843. Following the quantitative data collection

completion, the Key Informants were interviewed via Zoom using the same interview guide.

3.8 Data Analysis

The raw data from the quantitative analyses was downloaded from Google Documents and exported to the Excel software Ver 2016 for cleaning and transformation. Data were cleaned to ensure that the accurate variables relevant to answering the research question were included. The data were then transformed from alphanumeric to numeric through coding. The transformed data were then exported to the Statistical Product of Social Sciences (SPSS) software ver—29 for further analysis. A Cronbach's scale test was conducted to evaluate further the reliability of the different questions in answering the research question. Descriptive statistics were used to analyze the demographic characteristics of the study participants using parameters such as the mean, counts, frequencies, standard deviation, and standard error. Cross tabulations were also used to understand the different relationships among two or more variables by using the observation frequencies. Additionally, pictorial presentations of this casual relationship were demonstrated using bar charts, as elaborated in the results section. The frequencies of the organizational and FCP characteristics were also determined and tabulated.

Different questions that evaluated the causative factors that could be associated with underreporting in the CC-HMIS were evaluated and analyzed using Likert Scales. Non-parametric sample tests were used to identify the frequencies of the different scales for each question. The mean, standard deviation, and standard error of each question were evaluated. The weighted mean was obtained upon which significant decision concerning the factors was based. The questions whose mean was above the weighted mean were considered significant factors, while the questions whose mean was below the weighted mean were considered not significant. Qualitative responses from the key informants were obtained using audio recordings from the Zoom interviews. The audio recordings were then transcribed into text, and the transcripts were labeled into codes and analyzed thematically using Atlas ti. Software Ver 22.2.3.

3.9 Ethical Consideration

Ethical approval was obtained from the Uganda Christian University Research and Ethics Committee under the research and Ethics Committee number UCUREC-2023-634 to ensure the study was conducted according to the Declaration of Helsinki. Further approval for study conduction was obtained from my course supervisor, who commended the study's credibility for conduction. More approval was sought from the administration of Compassion International to allow me to conduct the study within their setting. Confidentiality was prioritized while obtaining information from the study participants. Names, identification, or security numbers were not collected to ensure the anonymity of the study participants. The questionnaires were identified with secret codes known to the principal investigator during their extraction into the Microsoft Excel document.

4.0 CHAPTER 4: STUDY RESULTS

The chapter demonstrates the results from the analysis of the information collected using the methodological approaches explained in the previous chapter. A summary of the quantitative results shall be made using narratives and summary tables. Different statistics are presented to enhance the credibility of the results. Qualitative results shall be described using themes and direct quotes from the study participants.

4.1 Quantitative Results

4.1.1 Demographic characteristics

More than half of the participants were male, 46 (65.7%) while 24 (34.3%) were female. A total of 58 (82.9%) participants were CDO-health professionals, while only 9 (12.9%) were project directors and 3(4.1%) occupied other roles. Majority of the study participants had spent between 1-5 years working with the FCP 38 (54.3%). 36 (51.4%) of the study participants never had a medical background, and over half of the study participants, 57 (51.4%), were ignorant about the FCP organizational policies, culture, and practices. Additionally, most of the participants, 59 (84.3%), were unaware of the different national policies, practices, and culture concerning Compassion Connect HMIS as demonstrated in Table 1.

Demographic Characteristics			
Variable	Variable category	N	Proportion (%)
Gender	Male	24	34.3
	Female	46	65.7
Age Range	20-25	2	2.9
	26-35	43	61.4
	36-45	22	31.4
	46-55	3	4.3
Role	Project director	9	12.9

	CDO-Health	58	82.9
	Another role	3	4.3
Duration at FCP	Less than 1 year	14	20.0
	1-5 years	38	54.3
	5-10 years	14	20.0
	More than 10 years	4	5.7
Medical Background	Yes	34	48.6
	No	36	51.4
Aware of FCP Organizational policies	Yes	13	18.6
	No	57	81.4
Aware of National Policies	Yes	11	15.7
	No	59	84.3

Table 1 The demographic characteristics of the study participants and awareness of organizational and national policies.

Amongst all the professionals, CDO-health professionals were more ignorant about the FCP organizational procedures compared to the project director and other roles, with a Spearman's rank correlation of 0.569 at 2 degrees of freedom (df), as illustrated in Figure 2.

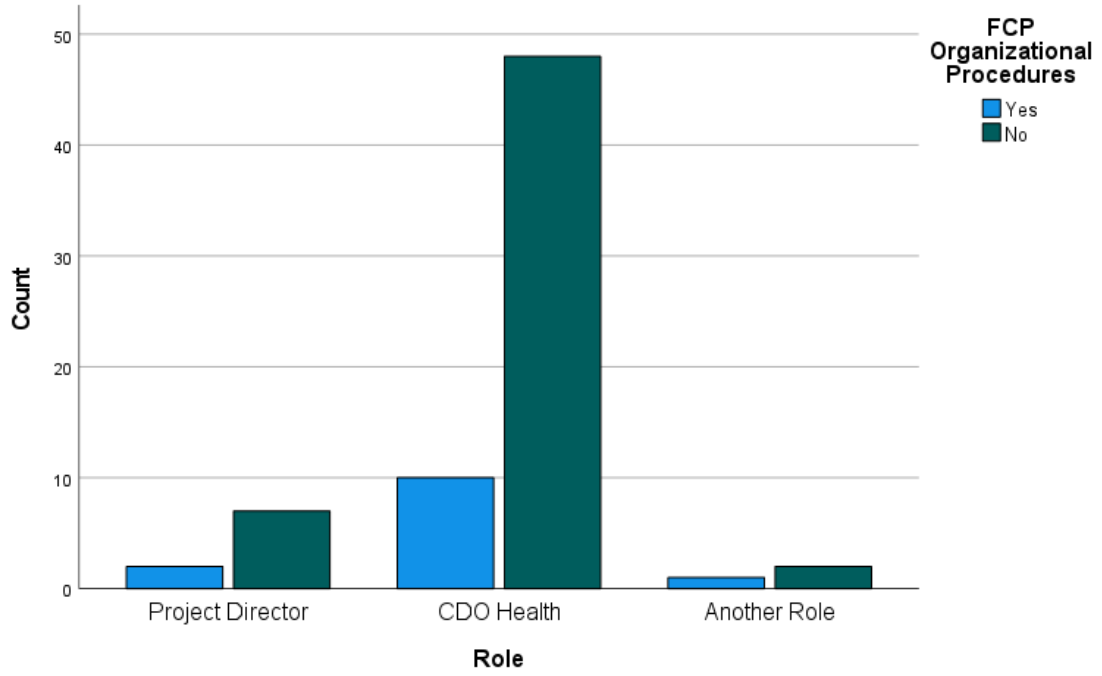

Figure 3 Bar chart demonstrating the awareness about FCP organizational procedures among FCP staff with different professional roles.

4.1.2 Location of FCPs

As illustrated in Table 2, Most Frontline Church Partners (50 (71.4%)) were located in rural areas. Most of the FCPs (26 (37.1%)) had been in partnership for 11-20 years. Additionally, newly created partnerships, less than five years old, were noted to be predominant in rural areas.

FCP Characteristics			
Variable	Characteristic	Frequency	Proportion (%)
Location	Rural	50	71.4%
	Urban	20	28.6%
Partnership Duration	0-5 years	18	25.7%

	6-10 years	15	21.4%
	11-20 years	26	37.1%
	Above 20 years	11	15.7%

Table 2 FCP characteristics

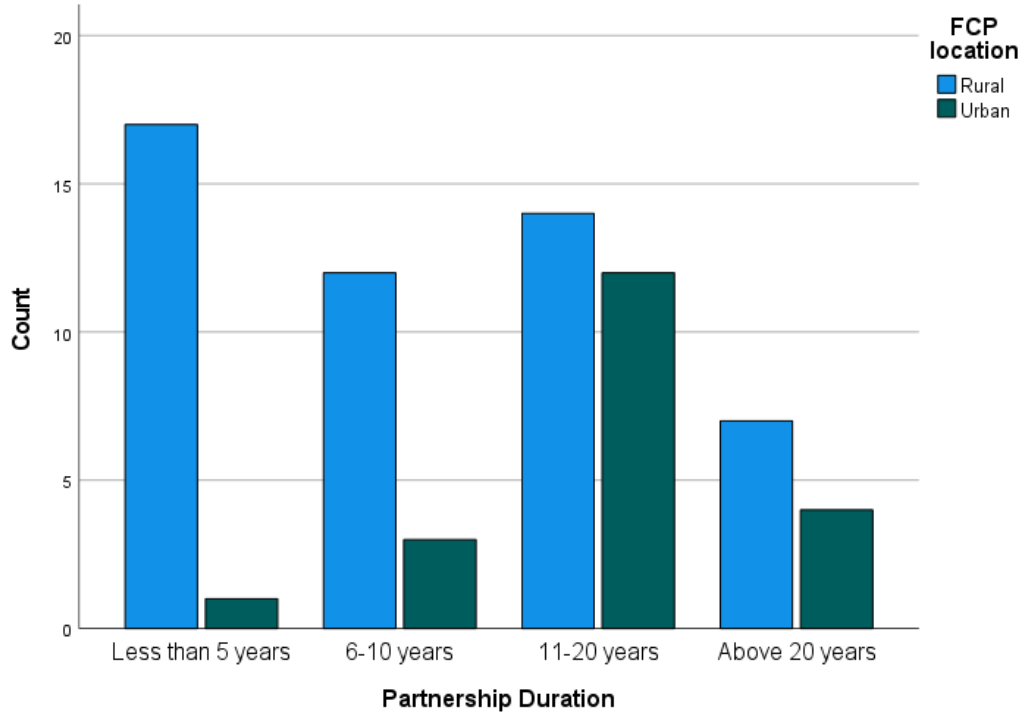

Figure 4: A bar chart showing the relationship between the partnership duration and FCP location.

Of the total individuals employed and responsible for reporting medical incidents, 46 (61.4%) were aged between 26-35 years as illustrated in Figure 4. Slightly more than half of the overall study participants, 36 (51.4%), never had a medical background and yet were expected to report medical incidents. All the study participants in the age range of 20-25 years were from a medical background.

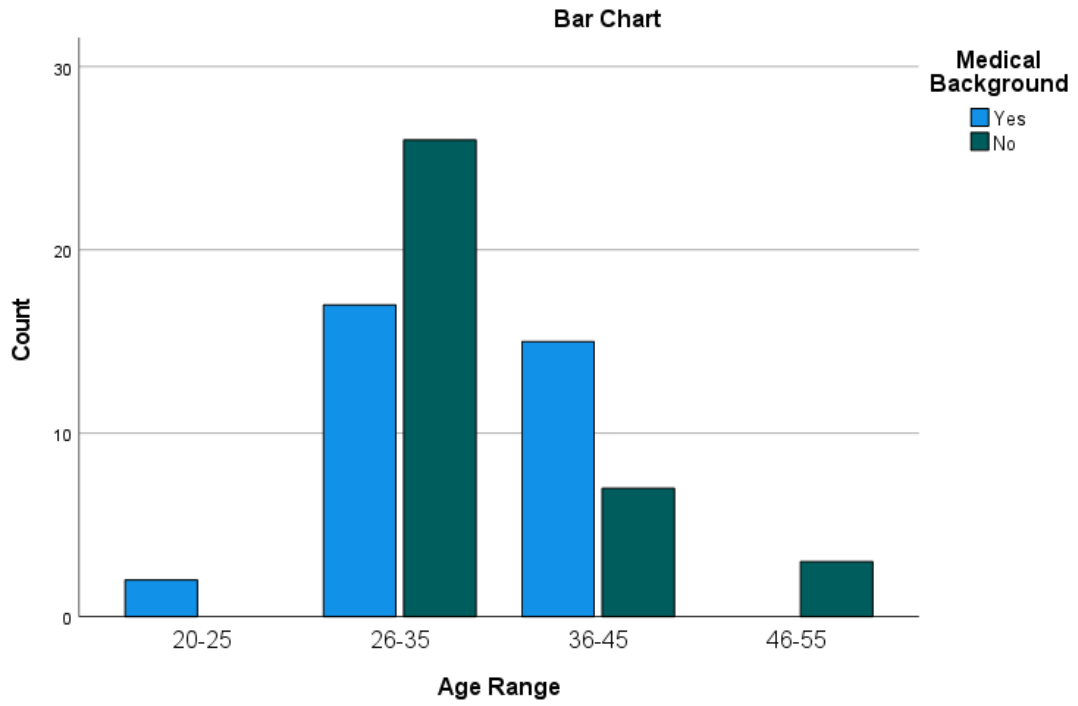

Figure 5: A bar chart showing the proportion of study participants with a medical background categorized in the different age ranges.

4.1.3 Factors affecting reporting of medical incidents.

The different factors postulated to predispose to underreporting were evaluated using Likert scales on a 5-point rating scale. The mean and standard deviation of the individual variable questions were generated and reported, as illustrated in Table 3. Twelve variables were considered, including complexity affecting reporting, internet connectivity, HMIS design, FCP procedures, National procedures, and communication and feedback. Other variables included individual attitude, resource availability, training in system use, data management literacy standardized indicators, and training of CC.

Likert Scale Results							
Variables	SA	A	N	D	SD	Mean	SD

Complexity affects reporting	27 (38.6%)	8 (11.4%)	-	21 (30.0%)	14 (20.0%)	2.81	1.662
Internet connectivity	17 (24.3%)	19 (27.1%)	21 (30.0%)	-	13 (18.6%)	2.61	1.365
HMIS Design	13 (18.6%)	28 (40.0%)	13 (18.6%)	5 (7.1%)	11 (15.7%)	2.61	1.311
FCP Procedures	5 (7.1%)	11 (15.7%)	-	28 (40.0%)	26 (37.1%)	3.84	1.281
National Procedures	16 (16%)	27 (38.6%)	-	-	27 (38.6%)	2.93	1.697
Communication and Feedback	4 (5.7%)	22 (31.4%)	18 (25.7%)	4 (5.7%)	22 (31.4%)	3.26	1.348
Individual Attitude	8 (11.4%)	25 (35.7%)	-	17 (24.3%)	20 (28.6%)	3.23	1.476
Resource availability	14 (20.0%)	22 (31.4%)	15 (21.4%)	19 (27.1%)	-	2.56	1.099
Training in system use	58 (82.9%)	12 (17.1%)	-	-	-	1.17	.380
Data Management Literacy	30 (42.9%)	33 (47.1%)	6 (8.6%)	1 (1.4%)	-	1.69	.692
Standardized indicators	8 (11.4%)	17 (24.3%)	3 (4.3%)	18 (25.7%)	24 (34.3%)	3.47	1.462
Training CC	10 (14.3%)	20 (28.6%)	6 (8.6%)	19 (27.1%)	15 (21.4%)	3.13	1.413
Weighted mean					2.78		

Note: SA- *Strongly Agree*, A- *Agree*, N- *Neutral*, D- *Disagree*, SD- *Strongly Disagree*.

Table 3: Likert Scale analysis results.

The association decision was made based on comparing the individual means of the parameters evaluated and the weighted mean calculated, as demonstrated in Table 4. The calculated weighted mean from the different questions is **2.78.**

Questions about the different variables	Mean	SD	Decision
Do you think CC complexity can lead to underreporting?	2.81	1.662	Higher likelihood of association
Does Poor Internet connectivity lead to underreporting?	2.61	1.365	Lower Likelihood of association
Do you think that the HMIS Design can lead to underreporting?	2.61	1.311	Lower Likelihood of association
Do the FCP Procedures affect the incident reporting in the HMIS?	3.84	1.281	Higher likelihood of association
National Procedures affect the incident reporting in the CC-HMIS.	2.93	1.697	Higher likelihood of association

Does Communication and Feedback also affect the incident reporting?	3.26	1.348	Higher likelihood of association
Does a poor Individual Attitude lead to underreporting?	3.23	1.476	Higher likelihood of association
Does Resource availability affect reporting in the CC-HMIS system	2.56	1.099	Lower likelihood of association
Does Training in the system use lead to underreporting?	1.17	.380	Lower likelihood of association
Does having Data Management knowledge affect the incident reporting in the HMIS system?	1.69	.692	Lower likelihood of association
Does having Standardized indicators lead to underreporting of medical incidents in the CC-HMIS	3.47	1.462	Higher Likelihood of association
Does failure to receive Training about CC-HMIS lead to underreporting?	3.13	1.413	Higher Likelihood of association

Table 4: Decision made based on the weighted mean comparison concerning the different factors.

4.2 Qualitative Results.

The key informants highlighted different factors that could affect the reporting of medical incidents in the HMIS system.

4.2.1 Individual Factors

Individual factors influence how individuals interact with the software and the HMIS system and can influence their capacity to report different medical incidents. A key informant emphasized that if an individual does not have a medical background, they may be unable to report the medical incidents.

> "*.....Medical incidents can only be entered into the Connect platform if someone understands what is written in the medical documents. If the person fails to read what the doctors have written, then; definitely, they will miss out on critical information concerning the medical diagnosis.....*" **Key Informant 3**

Another Key Informant had this to say,

> "*.....workload is also a factor to consider. If someone is having a lot of work to do, they may not prioritize entering medical incidents, especially if they are not from a medical background.....*" **Key Informant 2**

4.2.2 Organizational Factors

All the key informants reported different factors about the organization that could hinder and affect the quality of reporting in the HMIS. Some key factors highlighted by these key informants included policies, HMIS design, and Standard procedures.

A key informant health specialist had this to say:

> "*.....sometimes the platform itself is not well elaborate and clear. Therefore, it may not favor someone who doesn't have a technology*

background, and yet they are expected to fill in the medical incidents....." **Key informant 4.**

Another key informant global adviser had this to say:

"*....most of the time you find the CC-HMIS has different policies before accepting data entry. If a data entrant does not know these policies, they may not adequately enter the necessary data....*" **Key informant 1.**

4.2.3 Technical Factors

The key interviews also identified technical factors as potential items that can lead to underreporting in the CC-HMIS. The key factors noted from the interviews included technology background, support from the IT team, and medical background.

A key informant had this to say:

"*.....for example, if I do not have a medical background, how can I effectively fill in medical data? Therefore, a medical background is critical for properly filling in data.....*" **Key Informant 1**

Another Key informant expressed:

"*.....The Compassion Connect system is limited to a few medical incidents. Therefore, this might hinder some FCPs from reporting all the medical incidents.....*" **Key Informant 4**

5.0 CHAPTER 5: DISCUSSION

The chapter discusses the different results and their relationship with the study's primary objectives. Additionally, the chapter shall offer the different relationships between the results and the research questions formulated at the start of the research project. Moreover, it compares the results with existing literature in scientific and peer-reviewed journals, highlighting any discoveries made while conducting the project.

The findings from the study on factors associated with underreporting in the Compassion Connect Health Management Information System (CC-HMIS) among Frontline Church Partners (FCPs) of Compassion International Uganda in the Central Region provide valuable insights into the challenges faced by individuals and organizations in effectively utilizing the system. These factors can significantly impact the quality and quantity of medical incident reporting, crucial for managing and delivering healthcare services.

5.1 Effects of organizational factors.

Key Informants 1 and 4 pointed out various organizational factors that can affect reporting in the CC-HMIS. Policies and procedures can be barriers to data entry, especially if they are not communicated or if data entrants are unaware of them. HMIS design is also crucial to ensure user-friendliness and ease of entry of medical incidents. These findings agree with a study conducted by Kiberu et al. (2014), which evaluated the strength of reporting within the HMIS in Uganda and showed that user-friendly software in the HMIS system could promote better reporting and better data quality. However, quantitatively, the results demonstrated a lesser likelihood of association between the HMIS design and underreporting in the HMIS system.

5.2 Effects of CC-HMIS complexity, FCP procedures, National procedures, and attitudes.

Other significantly associated variables for underreporting in the HMIS obtained in this study included CC-HMIS complexity, FCP procedures concerning incident reporting in the HMIS, National procedures about medical incident reporting, and poor individual

attitudes. Lack of awareness about the FCP and National organizational procedures concerning medical incident reporting can affect the reporting capacity of different individuals in the CC-HMIS. These individuals may be unaware of the format of reporting and the required information about the medical incidents. Solomon et al. (2021) and Rumisha et al. (2020) also assert that HMIS complexity can affect the quality of data obtained from the system's information analysis agreeing with the results. Therefore, CC-HMIS is a complex system that may require necessary adjustments to ensure user-friendliness and ease of usage to ensure proper reporting and better data quality. These adjustments will promote better decision-making among the appropriate stakeholders. Additionally, standardized indicators and the absence of training concerning the usage of the HMIS were found to be significantly associated with underreporting in the CC-HMIS. These findings agree with the study conducted

The comments from Key Informants 2 and 3 shed lights on the significance of individual factors in medical incident reporting. A lack of medical background can impede the ability of non-medical individuals to comprehend and accurately report medical incidents. The study highlights that it's essential for users to understand the medical documents and diagnoses provided by healthcare professionals. These findings agree with the study conducted by Haftu et al. (2021), which evaluated factors affecting HMIS utilization and assessed the quality of routine data health, and demonstrated that the absence of a medical background can predispose to poor reporting in the HMIS. Therefore, having a background different background rather than medical can affect the way different individuals report medical incidents in the CC-HMIS. The impact is directly observed in the data quality and later in the decisions made by the organization.

The major strength of my study is that it used a mixed-methods study to evaluate the different factors affecting reporting capacity in the HMIS. The mixed methods analysis provided a comprehensive analysis and obtained different perspectives concerning the underreporting of the CC-HMIS. Additionally, the use of mixed methods analysis created a challenge where some responses in the quantitative analysis were insignificantly associated with underreporting. At the same time, qualitatively, these factors were

reported to affect the reporting in the HMIS system. Therefore, this creates a platform for further research evaluating these individual variables to understand their accurate relationship with underreporting in the HMIS system.

5.3 Limitations of the study

The study had a limitation due to not using a systematic approach to assess data quality due to underreporting. Therefore, based on the results of this study, I would recommend that a population-level analysis of the data quality be conducted by evaluating different parameters such as completeness, consistency, and accuracy from the Compassion Connect Health Management Information System. Assessing these parameters can offer the real-time magnitude of underreporting and the different parameters that are not reported within the Compassion Connect-HMIS to provide avenues for evaluating different strategies that can be employed to improve CC-HMIS reporting.

6.0 CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

The final chapter highlights the conclusive remarks obtained from the study.

Investing in developing the HMIS at Compassion International is a great move and strategy to improve the connectivity between stakeholders and beneficiaries through data sharing. Also, developing the system is key to improving data collection modalities and leveraging technological availability. However, based on the poor medical reporting incidences noted in the previous reports, action must be taken to ensure appropriate measures are taken to improve reporting practices. Undertaking measures to improve the different factors noted to significantly predispose to underreporting, such as conducting routine training among the HMIS users and increasing the awareness of the standardized policies and protocols, is critical in improving the reporting expectations. The factors highlighted in this study cut across various organizations and are not limited to Compassion International. Therefore, other related organizations can leverage the HMIS to ensure accurate data reporting, leading to better decision-making among the key stakeholders.

6.2 RECOMMENDATIONS

From the study conclusion the recommendations below are submitted for consideration to address the individual, organizational and technical factors contributing to under reporting.

6.2.1 Recommendations to improve the individual factors associated with under-reporting in the CC-HMIS among FCPs:

1. Compassion International will require FCPs to hire persons with a medical background to ease the entry of medical incidents in the system, and in cases where this is not feasible, consider providing intense training and mentorship to the staff without a medical background.

2. Compassion International to provide ongoing support in form of training, logistical support etc to all FCP staff towards building a positive attitude to technology driven reporting.

6.2.2 Recommendations for the organizational factors that facilitate the under-reporting in the CC- HMIS among FCPs.

1. Implement awareness raising sessions with all FCP staff on the reporting policies and procedures, to enable them to appreciate how they can use the reports and how the reports are used at national office and global levels for health program decision making.

6.2.3 Recommendations for the technical factors that facilitate the under-reporting in the CC- HMIS among FCPs.

1. Conduct a study to assess the complex aspects of Compassion Connect which lead to under reporting and address these accordingly.
2. Review the reporting parameters of Compassion Connect and ensure they comprehensively cover most medical incidents encountered in health programming.

6.3.3 General recommendation

Conduct a population-level (national level studies) data quality analysis by evaluating different parameters such as data completeness, consistency, and accuracy of the Compassion Connect Health Management Information System. Assessing these parameters offers the real-time magnitude of underreporting and the different parameters that are not reported to provide avenues for evaluating different strategies that can be employed to improve reporting.

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APPENDICES

APPENDIX I: LETTER OF TRANSMITTAL

Shellina R. Abaho

Uganda Christian University,

Kampala Campus.

E-mail shellina.abaho@gmail.com.

Dear respondent,

RE: COLLECTION OF DATA FOR ACADEMIC RESEARCH

I am a postgraduate student of registration number RJ16M21/058 at Uganda Christian University, School of Medicine, pursuing a Master of Public Health. I intend to carry out research on the *Factors influencing reporting medical incidents in Compassion Connect in the Central Region* of Compassion International's operations.

This study is part of the fulfillment of the course that I am undertaking. It entails the collection and analysis of data and thereafter a report written. Findings and recommendations from this study will help generate data that will be of benefit to health planners and implementers at the FCP and National Office level in improving and strengthening the quality of health information for decision-making in health care delivery to beneficiaries.

You have been selected to participate in the study by filling out the online questionnaire on the link provided.

You will be required to fill out the informed consent part before responding.

The information provided will be used for academic purposes only and will be held at the highest level of confidentiality.

Thanks in advance for cooperating,

Yours Sincerely,

Shellina R. Abaho

APPENDIX 2: INFORMED CONSENT FORM

The factors influencing the entry of medical incidents in Compassion Connect by FCPs in the Central Region of Compassion International Uganda's operation.

Researcher

Name: Shellina R. Abaho.

Organization: Compassion International Uganda

Background: You have been identified as one of the key persons for this study on the

The factors influencing the entry of medical incidents in Compassion Connect by FCPs in the Central Region of Compassion International Uganda's operation and therefore you are requested to give information as per the questionnaire. This study is being carried out with permission from the Uganda Christian University.

Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. Please take the time to read the following information carefully. You are free to ask the researcher if there is anything that is not clear to you. This study is part of the fulfillment for the attainment of a master's degree in public health.

Duration: This questionnaire takes a maximum of 45 minutes if filled with undivided attention.

Risks: (Something to do with harm……to the participant. Freedom to exit an interview in case someone feels coerced etc.

Confidentiality: All participants in this study will not be identified and their anonymity will be maintained. The information gathered from the field during this research is solely for academic purposes and will not be shared with any unauthorized person.

Benefits: This research will contribute to availing adequate and accurate data for health programming for vulnerable children. It will also inform the training and capacity-building needs of the FCP staff if any are identified.

Consent: By consenting, you confirm that you have read and understood the information and have had the opportunity to ask questions. You understand that your participation is voluntary and that you are free to withdraw at any time, without giving a reason and without cost.

You voluntarily agree to take part in this study.

- Yes
- No

APPENDIX 3: DATA COLLECTION TOOLS

Thank you for your willingness to participate in this study.

A. Demographics/ General information

1. What is our gender?
    - Male
    - Female

2. What is your age?
    - 20 -25
    - 26-35

- 36-45
- 46-55
- Above 56

3. What is your current role with the Frontline Church Partner?
    - Project Director
    - Child Development Officer – Health
    - Another role

4. If you indicated another role above – please specify it here.

5. In your current role are you mandated to update beneficiaries' medical incident data?
    - Yes
    - No
6. How long have you been working at the FCP?
    - Less than 1 year
    - 1-5 years
    - 5-10 years
    - Above 10 years

7. Do you have a medical/health-related training background?
    - Yes
    - No
8. How long has this FCP been in partnership with Compassion International?
    - Less than 5 years
    - 6-10 years
    - 11 – 20 years

- Above 20 years

9. Is this FCP located in an Urban or Rural area?
    - Urban
    - Rural

B. Assessment of Technical factors

1. On a scale of 1 to 5 how do you rate the complexity of using Compassion Connect to input participant medical incidents.
    1. Very complex
    2. Complex
    3. Somewhat complex
    4. Not complex
    5. Not complex at all

2. How often do you think the complexity above affects the expectation of FCPs to enter Medical Incidents on beneficiaries in Compassion Connect?
    1. Very frequently
    2. frequently
    3. occasionally
    4. rarely
    5. very rarely
    6. never

3. To what extent does the system design of Compassion Connect affect its utilization?
    1. Greatly affected.
    2. Affected.
    3. Somewhat affected.

4. Not affected
5. Not affected at all

4. How often do you think internet connectivity affects medical incident entry in Compassion Connect?
    i. Very frequently
    ii. frequently
    iii. occasionally
    iv. rarely
    v. very rarely
    vi. never
5. In a few sentences, make a comment on your experience entering medical incidents in Compassion Connect.

C. Organizational factors

1. Are you aware of any FCP-level organizational procedures, practices, or cultures that affect the entry of medical incidents in Compassion Connect?
    a) Yes
    b) No
2. If yes above, list all that apply.

    ……

3. Are you aware of any National Office-level organizational procedures, practices, or cultures that affect the entry of medical incidents in Compassion Connect?
    c) Yes
    d) No
4. If yes above, list all that apply.

    ……

5. How often do FCP procedures, practice and culture affect the entry of Medical Incidents in Compassion Connect?
    I. Always
    II. Very often
    III. Sometimes
    IV. Rarely
    V. Never

6. How often do National office procedures, practice, and culture affect the entry of Medical Incidents in Compassion Connect?
    I. Always
    II. Very often
    III. Sometimes
    IV. Rarely
    V. Never

7. How often does communication and data feedback on Medical Incidents happen between the National office and FCP?
    I. Very frequently
    II. Frequently
    III. Occasionally
    IV. Rarely
    V. Very rarely
    VI. Never

8. How do communication and data feedback on medical incidents affect the entry of medical incidents?
    I. Doesn’t affect
    II. Somewhat affects
    III. Affects

9. How often do you receive training/ capacity building on Compassion Connect – medical incidents entry?
    I. Very frequently
    II. Frequently
    III. Occasionally
    IV. Rarely
    V. Very rarely
    VI. Never

10. What is your level of satisfaction with the training received in the medical incident entry?
    I. Very unsatisfactory
    II. Unsatisfactory
    III. Somewhat satisfactory
    IV. Satisfactory
    V. Very satisfactory

11. How often does training affect the entry of medical incidents in Compassion Connect?
    I. Very frequently
    II. frequently
    III. occasionally
    IV. rarely
    V. very rarely
    VI. never
12. Make any relevant comments or recommendations on how the National Office or FCP can make entry of medical incidents a success.

D. Individual factors

1. Do you believe the entry of medical incidents in Compassion Connect is important?
    I. strongly agree
    II. agree
    III. Neutral
    IV. disagree
    V. strongly disagree

2. Does your attitude towards computer utilization affect medical incident entry?
    I. strongly agree
    II. agree
    III. Neutral
    IV. disagree
    V. Strongly disagrees.

3. HMIS tools are effective for their purpose?
    I. strongly agree.
    II. agree
    III. Neutral
    IV. disagree
    V. Strongly disagree.

4. How often do you think Compassion Connect data is used in decision-making?
    I. Very frequently
    II. frequently
    III. occasionally
    IV. rarely
    V. very rarely
    VI. never

5. Does Compassion Connect system training affects your entry of medical incidents?
    i. strongly agree
    ii. agree
    iii. Neutral
    iv. disagree
    v. Strongly disagree

6. Kindly share any brief experiences on the utilization of Compassion Connect to record medical incidents whether positive or negative.

7. Give your suggestions and recommendations on how to improve the reporting of medical incidents in Compassion Connect.

Thank you for your time and input into this questionnaire.

APPENDIX 4: KEY INFORMANT INTERVIEW GUIDE

Introduction

You have been identified as one of the key persons for this study on the

The factors influencing the entry of medical incidents in Compassion Connect by FCPs in the Central Region of Compassion International Uganda's operation and therefore you are requested to give information as per the questionnaire. This study is being carried out with permission from the Uganda Christian University.

Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. Please take the time to read the following information carefully. You are free to ask the researcher if there is anything

that is not clear to you. This study is part of the fulfillment for the attainment of a master's degree in public health.

Risks: The information gathered from the field during this research is solely for academic purposes and will not be shared with any unauthorized person.

Confidentiality: All participants in this study will not be identified and their anonymity will be maintained.

Consent: By consenting, you confirm that you have read and understood the information and have had the opportunity to ask questions. You understand that your participation is voluntary and that you are free to withdraw at any time, without giving a reason and without cost.

You voluntarily agree to take part in this study.

- Yes
- No

Interview questions:

- Date of interview Day …….
- Interviewer's name……
- Position……..
- Name of the interviewee…….

Thank you for your willingness to respond to this interview.

1. In your opinion, why do FCPs not consistently/ not report all medical incidents in Compassion Connect?
2. Do you know any Organizational factors that may contribute to FCPs not consistently/ not reporting at all in Compassion Connect?

3. Do you know any technical factors that may contribute to FCPs not consistently/ not reporting in Compassion Connect?
4. Do you know any Individual factors that may contribute to FCPs not consistently/ not reporting at all in Compassion Connect?
5. What are your recommendations for improving reporting of medical incidents in Compassion Connect by FCPs?

Closing

- Expression of gratitude.

- Repeat how results will be used.

- Ensure that documents requested for desk review (secondary information) are collected, or (if not directly available) agree on how these will be made available at a later stage.

- Ask for contact details of other key people you should talk to.

APPENDIX 5: GEOGRAPHICAL DISTRIBUTION OF FCPS IN THE CENTRAL REGION.

REGION	CLUSTER		NO. FCPs	TOTAL
Central Region	1	IGANGA/ KAMULI (11)	11	86
	2	KAMPALA A (11)	11	
	3	KAMPALA B (11)	11	
	4	KAMULI- BUYENDE (11)	11	
	5	LUWERO (11)	11	
	6	MASAKA (13)	13	
	7	MITYANA/MPIGI (9)	9	
	8	MUKONO (9)	9	

Compassion International Uganda's regional distribution of FCPs is aimed at bringing administrative order. It doesn't align with the geographical and political allocation of districts in Uganda, hence Iganga/Kamuli and Kamuli Buyende being categorized under the central Region FCPs.