DETERMINANTS OF EFFECTIVE UTILIZATION OF ROUTINE HEALTH INFORMATION WITHIN PRIVATE HEALTH FACILITIES IN KAMPALA -UGANDA

BY

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DECLARATION

I have read and fully understood the rules of Uganda Technology and Management University (UTAMU) concerning plagiarism. I hereby state that this work is my own and has not been submitted to any other institution for another degree or qualification, either in full or part. Throughout the work I have acknowledged all sources used in its compilation.

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APPROVAL

This is to certify that this dissertation titled, 'The Determinants of the Effective Utilization of Routine Health Information in the Private Health Facilities in Kampala-Uganda was submitted with our approval as the authorized and nominated supervisors of Uganda Technology and Management University.

Name of the Supervisor**:**

Professor Benon C Basheka, PhD

Signature: .....

Date: .....

DEDICATION

I dedicate this research work to all private health providers who have endeavoured to make use of their routine generated data and information to deliver quality health care services, even with limited resources, to analyse and interpret data for evidence-based decision-making.

May God reward them!

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May God reward them all!

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LIST OF ABBREVIATIONS

CQI	:	Continuous Quality Improvement
GAVI	:	Global Alliance on Vaccines and Immunization
GFTAM	:	Global Fund to Fight AIDS, TB and Malaria
HIS	:	Health Information System
HMIS	:	Health Management Information System
HMN	:	Health Metrics Network
IT	:	Information Technology
MOH	:	Ministry of Health
PPP	:	Public Private Partnership
PRISM	:	Performance of Routine Information System Management
RHI	:	Routine Health Information
RHIM	:	Routine Health Information Management
RHINO	:	Routine Health Information Network
UTAMU		Uganda Technology and Management University
WHO	:	World Health Organization

ABSTRACT

This study examined the extent to which the identified determinants influence the effective utilization of routine health information in the private health facilities in Kampala. The study was based on the following research objectives: to describe how technical determinants influence utilization of routine health information in private health facilities in Kampala; to determine how organizational determinants influence utilization of routine health information in private health facilities in Kampala; and, to examine how behavioural determinants influence utilization of routine health information in private health facilities in Kampala. The study adopted a cross sectional survey research design and both quantitative and qualitative approaches were used. Four health facilities from each of the five administrative divisions that make up Kampala Capital City (Kampala Central Division, Kawempe Division, Nakawa Division, Makindye Division and Lubaga Division) were selected as a study sample. In total, a sample of 122 respondents were chosen who included division health officers, district health officer, health facility managers/directors, frontline health workers, district biostatistician and health information officers in the different health facilities in the five divisions. In collecting the data, the researcher used both secondary and primary sources. Data collection methods used were questionnaires and KI interviews, and the collected data was analyzed using multinomial logistic regressions analysis, Chi-square tests and Pearson correlation coefficient. The study findings revealed that: organizational and behavioural determinants are statistically significant in influencing effective utilization of routine health information than the technical determinants. Further analysis revealed that among the organizational variable composite index, planning had greater statistical significance than other organizational variables. It was concluded that: (i) among the technical determinants, only IT complexity was found to optimally have a statistical significant influence on routine health information use in the private sector; (ii) organizational planning has the most significant contribution to information use and this demonstrated the need for health facility management in establishing systems that support and promote routine evidence-based decision-making. It was recommended that: (iii) there is need to continuously provide technical support supervision to the private health facility in data and information management. Secondly, there is also need to support training of private health staff in RHIS management. Thirdly, private health facility managements should promote information use for evidence-based decision-making through integration of RHIS in the facility planning and management.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This study examined the determinants of effective utilization of routine health information in the private health facilities within Kampala. The independent variable was conceived as determinants of the effective utilization of routine health information and the dependent variable was conceived as effective utilization of routine health information. The World Health Organization (WHO, 2003) regards routine health information system an integral component of any health care system as it provides the context within which effective data collection, analysis and reporting of health information. Utilization of routine health information has the potential of facilitating the development of the private health care facilities' indicators such as decision making, planning and monitoring and evaluation. Routine health information is likely to allow private health facility managers and service providers to document, analyze and use information to improve coverage, continuity and quality of health care services at all levels by better planning, monitoring and evaluating of private health facility services.

The study considered, effective utilization of routine health information as the dependent variable (DV), while determinants of effective utilization of routine health information were the independent variable (IV). The chapter also presents the background of the study; statement of the problem; purpose of the study; objective of the study; research questions; hypothesis; scope of the study; significance of the study; justification; and, operational definition of terms and concepts.

1.2 Background of the Study

1.2.1 Historical Perspective

Since the 18th century, accurate and complete data was delivered to users as information which played an important role in the health planning, management and decision-making (Schaufeli, 2007). Evidence-based plans and decisions were of great necessity and were based on accurate, complete and timely data. Good planning and management depended on the availability of reliable, accurate and timely information. Most often, decisions on whether or not to use routine collected data for planning and decision-making were made subjectively.

Snow (1936) demonstrates how the appreciation towards the originality of use of health information relates to the cholera epidemic that ravaged London in the mid-1800s and how officials used local registers of births and deaths to provide information on mapping the number of deaths in relation to the sitting water pumps. This helped in controlling the epidemic as a public health concern in the community.

This later evidenced the foundation of American Health Information Management Association (AHIMA) in 1928 "when the American College of Surgeons established the Association of Record Librarians of North America (ARLNA) to elevate the standards of clinical records in hospitals and other medical institutions such that effective health information records are put in place to ensure health practitioners easily tracked the prevalence of diseases as well as knowing how treatable they can be (Sauerborn, 2000).

Thereafter, the Healthcare Information and Management Systems Society (HIMSS)was established in 1961 to increase health information knowledge. The HIMSS was organized as the Hospital Management Systems Society (HMSS), an independent, unincorporated, nonprofit, voluntary association of individuals. It was preceded by increasing amounts of management engineering activity in healthcare during the 1950s, when the teachings of Frederick Winslow Taylor and Frank Bunker Gilbreth began to attract the attention of health leaders. The HIMMS grew to include chapters, membership categories, publications, conventions, and continues to grow in different parts of the world via its Europe, Asia Pacific, and Middle Eastern branches. Health information managers are charged with the protection of patient privacy and are responsible for training their employees in the proper handling and usage of the confidential information entrusted to them. With the rise of technology's importance in healthcare, health information managers must remain competent with the use of information databases that generate crucial reports for administrators and physicians (Sauerborn, 2000).

The Declaration of Alma-Ata in 1978 led most developing countries to implement health sector reforms, among which the utilization of routine health information became very important for reference and evidence (WHO, 1978). A central feature of the reform strategy has been a process of structural decentralization, the aim being to vest greater decision-making responsibility in the district health systems. The underpinning primary level health management units in the delivery of health services were taken as the core providers of health services to the people especially in rural areas which meant that they also carried the responsibility of managing health-related information (WHO, 1978).

Globally, all countries in the world have adopted the system of Health Information System which first led to the output of high quality and timely data which are the foundation of the functionality of the health system and inform decision-making in each other five building blocks of the health care system that finally affect quality health service delivery and health outcomes (WHO 2008). Although the geo-politics vary from country to country, the district tends to be the last format unit of local government and administration (Mills, 1990). Across the variations of decentralization of developing health systems, the success of decentralization has predominantly been considered to rely significantly on the capability of the district health system to effectively exercise its assigned authority and play its role in the reformed health structure. Thus, there has been a deliberate movement to strengthen the management capacity of the district health system (Boone, 2013).

In the United Kingdom, the government and non-governmental organizations considered the improvement of the use of health information in all health-related entities to be integral in scaling up the delivery of quality health care services. This is because improved health information use requires improved quality of data and of information products which in turn requires improved health information systems (HIS) (Boone, 2013).

On the African continent, most countries, particularly Sub-Saharan countries such as Nigeria, have witnessed growing private sector engagement and interest in the role of private for-profit sector in health service provision. This is also a similar case to most countries of the world of low and middle-income countries. Many countries have a vibrant and growing private health sector which is perceived by some to respond to public health failures. Private health providers

are urged to deliver services that are more accessible, affordable and responsive to the needs and preferences of users (Aqil, 2009).

In the 1970s, driven by the international health agenda efforts were underway across Africa to improve the health care and reduce barriers to service uptake (Dedan, 2011). In the early 1970s, Kenya's Ministry of Health (MOH) recognized the need to establish the health information systems (HIS) which is a system for the collection and processing of data in various sources. The HIS was made of several data sources. Data collected focused on Ministry of Health headquarters needs. The information generated was expected to assist in the formulation of health policies, setting of priorities and evaluation of health care programmes. In the HIS, the Health Management Information System (HMIS) was created followed by subsequent units of Vital Health Statistics Unit and Evaluation and Research Unit (Jutand, 2000).

In the Uganda context, health information dates back to 1985, at a time when it was a central health information system (HIS) focused on morbidity and mortality (Schaufeli, 2006). Based on the need for more information with an impact on management aspects, the system was reviewed in 1992, 2000 and 2004 with culmination into the current human management information system. Among the aims of the new system was to improve the capacity of health-related decision-making at the district level in the light of the decentralization policy that was being implemented in the country.

With the new system in place, improvements in the aspects of timeliness and completeness of reports were progressively registered. In terms of content, the system is paper-based at the health unit level where the information is collected using various HMIS forms and registers and computerization takes place at the higher levels, i.e. the district headquarters and at the national

level. The system collects information regarding resource management, logistics and commodities management, individual client activities and preventive for Maternal Child Health (MCH) among others (Boone, et. al. 2013).

1.2.2 Theoretical Perspective

The study was underpinned by the Evidence Based Health Information System Theory by Carbone (2008). The theory holds that there is a need for evidence-based information regarding the organization of daily routine information to make planning and policy formulation for any developmental organization. Carbone (2008) defends the need to know the importance of having information system theories that will be conducive to the adoption of new technologies in health settings cannot be underestimated. According to Carbone (2008), the concept of evidence is not new to health settings; however, in health the use is normally reserved for medico-clinical endeavours only. The findings from this examination and the relevant authoritative literature suggest evidence to be the key conduit or foundation pathways where information system implementation is quickly accepted and sustainably adopted. The arguments are drawn on the following premises and conclusions.

The theorist further argued that health settings are owned and run by health workers who at the same time are key personnel for decision-making (Carbone, 2008). Clinicians are trained in scientific thought (empirical rational methods). Empirical rational change management strategies exist. Empirical rational methods influence clinical practice behavioural change / motivation device. Evidence of care deficit in clinical practice is found in the local (electronic) health records. Empirical rational change management strategies using local data (evidence)

affects behavioural change positively. Sustainability of change and further change depends on the evidence success (Carbone, 2008).

Where the evidence-based system construct represents the core business of health (patient core),identifiable by its twin concerns: input task (drivers) and output task (outcomes), it can be thought of clinical task (business) that needs to be performed or improved (though the adoption of information system) like the management, prevention or treatment of the clinical problem of any health setting. As much, it sub-sums all other concerns in this theory. The bottom line, to borrow a business term, is 'the clinical improvement of patient care'. The catalyst, as with an operating system is the enabler of that overall 'clinical care' task. However, along the way (from input to output) the catalyst, like an operating system, must make sure that a set of circumstances or optimization occurs to allow the clinical (input) task-driven by the expectation of improving the health of an individual or population is satisfactorily carried out (output) known in the health field as a clinical outcome (Jutand, 2000).

The tasks carried out by the catalyst (operating system) to enable the evidence-based system to succeed are multiple: for example, just to name a few of the potential sub-systems in health settings, it must allow members of the clinical team (doctors, nurses, staff etc.) to communicate with each other; it must make sure that a risk management system exist to follow up on patients that might miss out on clinical care; it must ensure that there is a sound financial system underpinning the work being carried out. Another principal role is to measure the success in achieving that original task (improvement in health outcomes) (Aqil A, et. al. 2009).

A key aspect of this theory is the relationship between catalyst and the human / workforce sub-system. This relationship needs to be built around principles of mutual trust and purposeful

action between individuals that appear to share a common 'end' goal (health outcomes improvements). This connection between the catalyst and health setting is not always evident as sometimes 'individual's short term goals' might not be the same; for example the Information System (IS) practitioner (catalyst) might be more compelled to be financially and workforce savvy; each sharing their expertise to create a contextually customized and optimized health information system. This explanation is by no means comprehensive, but begins to discuss the basic assumptions behind the construct' relationship (Jutand, 2000).

1.2.3 Conceptual Perspective

Information which is a key concept of the study is defined by Dumont (2012) as data which is accurate and timely, specific and organized for a purpose, presented within a context that gives it meaning and relevant and can lead to an increase in understanding and decrease in uncertainty.

Health information, on the other hand, refers to the demographic information, medical history, test and laboratory results, insurance information and other data that is collected by a health care professional to identify an individual and determine what type of care that individual should receive or to determine appropriate care (Schaufeli, 2006). He shortens it as any information about health status, provision of health care, or payment for health care that can be linked to a specific individual.

According to Schaufeli (2006), there must be full utilization of information routinely collected by private health facilities in the facilities' decision making and planning in order to influence the facility's development and performance. Ideally, local data should be collected, analyzed and used in order to support local health management and local health service delivery in order to foster the decision-making process.

Routine health information which is one of the key concepts of the study has been used to mean "information that is derived at regular intervals of a year or less through mechanisms designed to meet predictable information needs" (Gopalan, 2013). An example of routine health information is information generated from data collected by health workers on various programmes, Maternal and Child Health, communicable diseases, tuberculosis and drug programmes. Routine data can also be collected from the community. According to Aqil et al. (2009:488), routine health information has much been disregarded especially by private health facilities in the decision-making process and policy formulation and thus the failure of health facilities to consider routine health information for decision making and planning has been a result of several determinants, which forms a motivation for carrying out this study.

The determinants to the routine utilization of routine health information are categorized into: technical factors, organizational factors and behavioural factors (Gopalan, 2013) and this will be a basis for the formulation of the objectives of the study that will guide the whole research process. In this study, these categories of determinants are reported to have an influence on the proper utilization of routine health information for better private health facility management (Boone et al. 2013).

The term 'utilization' of data (routine health information), which in this study has been used as a concept of the dependent variable, means the analysis, synthesis, interpretation and review of data as part of a decision-making process, regardless of the source of data. The study focuses on the demand for and use of data as captured in various data sources such as surveys and facility recordings. Junker (2004) asserts that effective utilization of information collected by a health facility is a key factor for proper formulation of key principles, policies and regulation on which

a good operating health facility can continue to succeed. 'Data informed decision making', then, refers to the proactive and interactive processes that consider data during programme monitoring, review, planning and improvement, advocacy, and policy development and review (Junker, 2004). Similarly, Aqil (2009) argues that the failure of some private health facilities to utilize routine health information needs to be blamed on the lack of a technical team within a private health facility to properly utilize data to good end results.

Junker (2004) defines information system as a common name for an organization within an enterprise that is responsible for its data processing and information system or systems. Khunga (2005) argues that health institutions should have organizations for maintaining and organizing information for the health systems. Information is used at various levels of the health system for health service and system management planning, advocacy and policy development. Therefore, support to planning and decision making and improved quality of and access to health care were key among other benefits of the health information systems reported by the nurses and doctors during an evaluation of the health management information system in Uganda Catholic Medical Bureau (Boone, 2013).

1.2.4 Contextual Perspective

In the Ugandan perspective, a health information system (HIS) was designed in 1985 to capture and analyze morbidity data for selected communicable and non-communicable diseases and other services like immunization and family planning (MOH, 1985). Information was collected in the health facilities, summarized at the district level and later forwarded to the Ministry of Health at the centre where data analysis would be done. After seven days of implementation, it was felt that the system was leaving out vital management information such as staffing levels,

infrastructure, health facility management, medical equipment availability, financial information and drug management. A review was therefore commissioned in 1992 with the aim of determining possibilities of collecting management information using the same channel.

Until 1993, Uganda had a central Health Information System (HIS) focusing on mortality and morbidity reporting with data flow from one individual health unit to the district and national level. With government policy of decentralization and public private partnership (PPP) of service delivery, health management information system harmonized integration of data information from both public and private sector health facilities.

Kampala the capital city of Uganda with five administrative divisions, namely: Central, Nakawa, Kawempe, Lubaga and Makindye. All these five divisions accommodate a very big population which means a representation of a number of private health facilities to serve the people's demand for health services. It is however important to note that all these health facilities are mainly private, which continuously receive patients and make routine recording of patients' information concerning disease and treatment. What is important to understand is whether the continuously recorded data is regarded by these private health facilities as vital to decision making for quality service delivery and contributing to national policy formulation. The major intention of this study therefore was to document the determinants for effective utilization of routinely collected health information for evidenced decision making in these private health facilities in Kampala.

1.3 Statement of the Problem

The private health sector is considered an important and relevant sector much as it is a profit-oriented business sector and its operation and progress in the provision of quality health care services is less monitored. This implies that private health facilities may do their things out of line with the district health system and the standards of the ministry of health (Chaled et al., 2013).

Private health facilities are supposed to provide routine relevant health information to the ministry of health and the relevant authorities on the statistics concerning the health state of the people who seek medical attention from them and way forward to either improve or to keep the standard of the health system; but it is surprising that this is rarely or not done at all (Gnassou, 2008). More so, private health facilities are meant to routinely record and document data on a daily, weekly and monthly basis; but such records are either not complete or non-existent; meaning that they cannot effectively be used as a yardstick for routine decision making and contribute to policy formulation. It is, however, sad to note that the information recorded is only used by private health facilities not as a basis of decision-making process and policy formulation but as a basis of analyzing the cost and profit stand of these health facilities. This in itself is not bad; but if the data was used to look at the side of decision making, it would help them to improve service delivery (Uganda Demographic and Health Survey, 2011).

It is therefore not clear why these health facilities have continuously put a widening gap in managing their routine health information, a gap this study intends to fill.

The detrimental part of this is that private health facilities might fail to realize growth in terms of effective service delivery which counts on the positive outcome of tasks completed in time with

the satisfaction of their clients; and if this continues, the success of private health facilities might become a nightmare. This study therefore attempted to examine the determinants of effective utilization of routine health information by private health facilities for decision making, planning and evaluation.

1.4 Objectives of the Study

1.4.1 General Objective

The major objective of the study was to examine the extent to which the existing determinants of influence effective utilization of routine health information by the private health facilities towards decision making, planning and evaluation of performance.

1.4.2 Specific Objectives

The study was guided by the following objectives:

1. To describe how technical determinants influence utilization of routine health information in private health facilities in Kampala.
2. To determine how organizational determinants influence utilization of routine health information in private health facilities in Kampala.
3. To examine how behavioural determinants influence utilization of routine health information in private health facilities in Kampala.

1.5 Research Questions

The study attempted to answer the following research questions:

1. How do technical determinants influence effective utilization of routine health information in private health facilities in Kampala district?

2. How do organizational determinants influence effective utilization of routine health information in private health facilities in Kampala district?

3. How do behavioural determinants influence effective utilization of routine health information in private health facilities in Kampala district?

1.6 Research Hypotheses

The study was premised on the following research hypotheses:

Technical determinants significantly influence the effective utilization of routine health information in private health facilities.

Organizational determinants significantly influence the effective utilization of routine health information in private health facilities.

Behavioural determinants significantly influence the effective utilization of routine health information in private health facilities.

1.7 Conceptual Framework

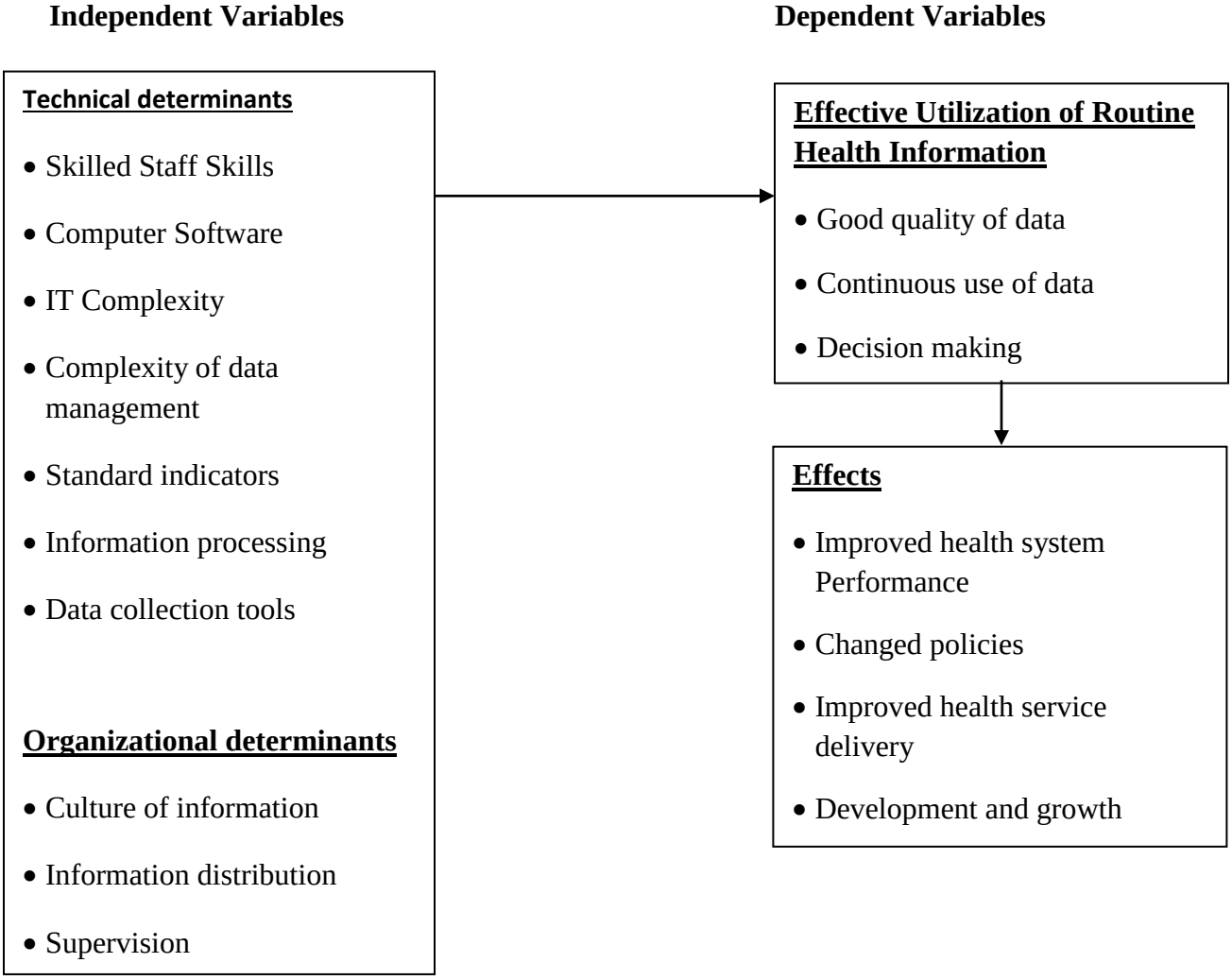

Figure 1. 1: The relationship between the study variables

Source: Deming (1993) PRISM (Performance of Routine Information System Management) framework

The framework above depicts an effect that in order to effectively utilize routine health information by private clinics, several determinants must be considered. These are technical, organizational as well as behavioural as far as this study is concerned. Technically, the skills by the health facility staff, to manipulate data into useful information using the data management

tools and available advanced computer software, among other aspects, affect the utilization of routine health information system. More so, organizational determinants with systems that promote information culture, plan and avail resources for information management, supervision and distribution for its effective utilization in making decisions. Lastly organisational systems and culture have impact on individual beliefs, values and attitudes towards the health information system, hence affecting its effective utilization among private health clinics. Effective utilization of routine health information is determined and influenced by monitoring and evaluation for quality data that impact on planning, continuous use that eventually affect the decisions on performance, quality improvement and health outcome of the communities.

1.8 Justification of the Study

The good completion of the earlier scientific works like the work of John Snow in cholera epidemics were made possible by using registers (data) of births, deaths and addresses maintained in the 1800s (Doyle, 2002). Kaen (2006) points out that where resources are scarce, it is more important that evidence informs decisions for wise use of limited resources. Keeping information and referring to information for national and international findings is a key component of all big sectors -- be it agricultural, fishing and transport -- and therefore to health recording keeping it is very crucial and must be emphasized for better and improved service delivery. Particularly in the private sector where the major intention of the owners is profit making, it is possible to disregard information for decision making and reporting information daily to managers. In local areas where record keeping in private health facilities is not strictly emphasized, increased deaths seem to be evident, and quality of care services doubtable; and the blame for this can put on the exemption of daily routine health information utilization for

decision making and policing. Realization of this means that there is urgent need to transform the conditions contributing to this problem, hence the need for this study.

1.9 Significance of the Study

The researcher hopes that study findings will act as an eye opener for the private health facilities management on the relevance of routine health information for the purposes of decision making, planning and evaluation. The study unveiled how organizational determinants spearhead other factors like the behavioural and technical in effective utilization of routine health information in the private health facilities.

The study findings, once implemented, will be useful for private health facilities to appreciate the relevance of installing health information systems for better information management. This will guide and change the mindset of private health facilities management from purely aiming at the profit motive and orienting their behaviour and practice towards better and improved service delivery.

The study results will be a source of literature for scholars who wish to do further studies about health information utilization specifically for other interventions like resource mobilization or in other fields related to the factors that affect the effective utilization routine health information both in private and public health facilities.

The study may be an eye opener for the Ministry of Health and other relevant health authorities in strengthening capacity and systems to improve routine health information utilization as per the recommendations highlighted by the study.

1.10 Scope of the Study

1.10.1 Content Scope

The study specifically focused at investigating the determinants of effective utilization of routine health information by private health facilities in Kampala. The independent variables were the determinants whereas the dependent variable was the effective utilization of routine health information.

1.10.2 Geographical Scope

The study was carried out among twenty (20) randomly selected private health facilities offering comprehensive health care services in the five divisions of Kampala, that is, Kampala Central, Makindye, Lubaga, Kawempe and Nakawa. Health facility managers, health workers and district division health officers, biostatistician and health information officers were the key respondents who provided information necessary for the study.

1.10.3 Time Scope

The literature considered relevant for this study was that from 2000 to 2014 and statistical information ranging from 2004 to 2014 was used for the study. The field study activity was conducted between the months of July and August 2015 and therefore private health facilities that offered comprehensive health care package at the time of the study were among the sample population of the study.

1.11 Operational Definitions

Comprehensive health care package: A facility offering the minimum health care services including HIVAIDS care and SMC services.

Data: Unprocessed raw data or facts.

Determinants: The elements guiding and limiting use of routine health data and information.

Information: In this study, information refers to collected and effective data for use.

Health Information System: A set of component and procedures organized with the objective of generating information which will improve health care management decisions at all levels of the health system. Health information system integrates data collection, processing, reporting, and use of the information necessary for improving health service effectiveness and efficiently through better management at all levels of health services (Leppeveld et al, 2000).

Health Information Management System: A system designed to produce information to be presented to the management to assist in decision-making and to enable it to ascertain the progress made by the health facility in the achievement of its major objectives

Routine Health Information System: Ongoing data collection on health status, health interventions and resources

Private Health Facilities: Non-government health providing units that include ONLY private for profit (PFP).

Utilization: The ability to manually or use computer, analyze and interprete data for decision making

Conclusion: This chapter reviews the determinants of effective utilization of routine health information by the private health facilities towards decision making, planning and evaluation of performance. The aim, problem statement, objectives, research questions, significance and

operational definitions are the key areas discussed in this chapter. The parameters of the study scope and limitations were highlighted in this chapter. The next chapter provides an overview of literature on the determinants of effective utilization of routine health information by the private health facilities towards decision making, planning and evaluation of performance.

CHAPTER TWO

LITERATURE REVIEW

2.1Introduction

Literature reviewed in this chapter is related to the guiding objectives of the study which are: to establish what technical determinants influence utilization of routine health information in private health facilities; to establish the organizational determinants influencing utilization of routine health information in private health facilities; and, to establish what behavioural factors influence utilization of routine health information in private health facilities. Literature used in this study was obtained from textbooks, libraries, internet and journals to fit the notes of the topic under study.

2.2 Theoretical Review

The study used an Evidence Based Health Information System Theory by Carbone (2008). In a study by Lorenzi, (2011:13) in Melbourne, Australia, he utilized the Evidence Based Health Information System Theory. The study was to bridge the gap between the Information systems theory and service delivery in health. He argued that neither the information systems literature nor the health sector have been able to provide any satisfactory pathway to facilitate the adoption of information systems in health settings. He, however, acknowledged how the Evidence Based Health Information System Theory is helpful in this respect by saying that there was need for evidence based information to effectively have any information system functional. He continued by reviewing the common pathway to develop information systems theory and the knowledge foundations used in the process, and then proceeded to highlight how it is only the existing

evidence of information or collected health information that can improve information availability for any form of technology to be supplied with the relevant data for routine utilization.

Chaled (2013:24) in his study carried out in Kenya on design and implementation of health information systems noted that for any health information to be useful to the final decision or policy makers there must be concrete evidence that it was collected and processed very well to suit the final user. In this, he referred to the Evidence Based Health Information System Theory saying that the evidence is needed for the information to be available or availed by the health workers, and that there must be evidence that the information is credible for use in health-related functions. In the same study, he noted that clinicians need to be trained in scientific enquiry such that the health information they gather is highly regarded with enough evidence that it is worthy to be used by decision-making entities. He also used the Health Information System Theory to give explanation regarding the effect that health information has on its usage and health facilities level.

Dedan (2011:43), in his study carried out in Ghana on health Information systems, argues that quality data must be in place to reduce clinical and medical errors. He also used the Evidence Based Health Information System Theory to state clearly that the evidence based systems construct the core business in the extension of health care to patients. Using information technology, health practitioners can reduce rates of medication errors in hospitals but evidence of reliable health information must be acquired from the clinicians as well as other personnel responsible for information gathering in health facilities.

A study by Gnassou (2008:78) on HMIS Evaluation Report in the HIS Department, Ministry of Health, Cote d'Ivoire, also talked about how evidence is critical in health information in

hospitals. He argued that the tasks carried out by the catalyst (operating system) to enable evidence-based system to succeed are multiple: for example, it must allow members of the clinical team (Doctors, Nurses, Staff etc) to communicate with each other; it must make sure that risk management system exist to follow up on patients that might miss out on clinical care; it must ensure that there is a sound financial system underpinning the work being carried out, hence, the Evidence Based Health Information System Theory.

2.3 Conceptual Review

The study referred to the conceptual model called the PRISM framework, an innovative approach to design, strengthen and evaluate routine health information systems (RHIS), emphasizes RHIS performance and incorporates organizational, technical and behavioural determinants of performance.

Authors such as Aqil, Hotchkiss, Lippeveld, Mukooyo and Asiimwe (2008:33) in their study in Angola on improving Routine Health Information System for a better health Management noted that, in recent times of resource constraints, good governance, transparency and accountability have become the mantra of development, and consequently more attention is given to strengthening evidence-based decision-making and information systems. Also, the emphasis on tracking Millennium Development Goals (Schaufeli, 2006), and the practice of performance-based release of funding requested by international funding agencies, such as the Global Alliance on Vaccines and Immunization (GAVI) and the Global Fund to Fight AIDS, TB, and Malaria (GFTAM), require increasing amounts of quality information. This trend is reinforced in the health sector by emerging infectious diseases and environmental disasters, which need timely information for action.

Recently, the Health Metrics Network (HMN) was established as an international network to increase the availability and use of timely and accurate health information from a variety of data sources (HMN Secretariat, 2006). Debates abound at different forums regarding which data source is preferable for developing and tracking health system targets, documenting best practices or effectiveness of interventions, and identifying gaps in performance. Health system managers have no substitute for routine information in terms of monitoring progress towards achieving service coverage objectives and managing associated support services (e.g. logistics, human resources, finance) for their local target populations. Thus, the focus of debate should shift from abandoning RHIS over other sources of data to showing how to improve RHIS.

In response to this need, and based on empirical work (Boone, 2013) presented a draft Prism framework at an international workshop on district HIS in South Africa (Rhino, 2003). In the absence of an 'operational' definition of RHIS performance in the literature, RHIS performance was defined as 'improved data quality and continuous use of information'. It was stated that RHIS performance is affected by three categories of determinants: technical, behavioural and environmental/organizational (Boone, 2013). The RHIS performance occurs within an environment/organizational setting. Organizational members need motivation, knowledge and skills (behavioural factors) to perform RHIS tasks, and specialized technical know-how/ technology (technical) is required for timely analysis and reporting.

The PRISM framework brings a paradigm shift in RHIS design and evaluation by considering RHIS to be a system with a defined performance (Deming, 1993), and by describing the organizational, technical and behavioural determinants and processes that influence its performance. The PRISM framework states that RHIS performance is affected by RHIS

processes, which in turn are affected by technical, behavioural and organizational determinants. It shows that behavioural determinants have a direct influence on RHIS processes and performance. Technical and organizational determinants can affect RHIS processes and performance directly or indirectly through behavioural determinants. For example, the complexity of data collection forms (technical) could affect performance directly or indirectly by lowering motivation. Thus, the PRISM framework delineates the direct and indirect relationships of the determinants on RHIS utilization and measures their relative importance. The PRISM framework also opens opportunities for assessing the relationships among RHIS utilization, health system performance, and health status.

2.3.1 RHIS performance / Utilization

According to Lippeveld (2009:12), in his book titled Performance of Routine Health Information System (PRISM) framework, utilization is defined as improved data quality and continuous use of information. Data quality is further described in four dimensions: relevance, completeness, timeliness and accuracy. Relevance is assessed by comparing data collected against management information needs. Completeness is measured not only as filling in all data elements in the facility report form, but also as the proportion of facilities reporting in an administrative area (e.g. province or district). However, without assessing use of information, it is difficult to know whether a RHIS is meeting its intended objectives, improving evidence-based decision-making, and consequently leading to better health system performance. Therefore, efforts were made to operationalize the use of information for measurement (HISP, 2005; MEASURE Evaluation, 2005). The PRISM framework defines the use of information employing criteria such as the use of information for identifying problems, for considering or making decisions among alternatives, and for advocacy.

2.3.2 Technical determinants affecting utilization of routine health information

Boone (2013:12), in his study carried out on Botswana's Integration Data Quality Assurance into Standards operating procedures defines technical determinants as all the factors that are related to the specialized know-how and technology to develop, manage and improve RHIS processes and performance. These factors refer to development of indicators: designing data collection forms and preparing procedural manuals; types of information technology; and software development for data processing and analysis. Thus, it is necessary that RHIS users have good knowledge and information technology skills to effectively use and sustain it. However, in low-technology settings, well-designed, paper-based RHIS can still achieve acceptable levels of performance.

According to Sauerborn (2000:49), in her study carried out on using information to make decision, he notes that the complexity of the system design used in entry and recording of data is the most important technical factor affecting utilization of routine health information by private health facilities. Particularly, in health facilities where external data systems consultants are hired for only designing and framing the system of data entry, it becomes difficult for the health workers who are responsible for daily routine entry to use and manage the system. Most of the consultant personnel for designing these systems have the tendency of selling the new versions and editions of data entry system such as Sun Systems and E-views. These systems then require the employment of a special person for entry of data and management of the system as it also requires renovation and update. In relation to the above, Boone (2013) also argues that the complexity of these systems makes it hard for health workers to utilize the system and end up using manual paper files recording which makes information spoilt and poorly managed.

In addition to the discussion of the technical factors limiting utilization of routine health information, Rhoda (2010) discovered that some of the software for running the system of data entry and computation is also scarce, expensive and complex. The complexity of the software also is a scary matter of private health facilities to invest a lot of money in such complex software which is only done for modernizing the health facility not for motivating workers in the system.

In the course of arguing the technical factors determining utilization of the routine health information, the arguments made by Jutand (2000:54) in commenting on the influence of IT complexity cannot be ignored. Gopalan (2013:23) argues that IT use and applications are a new concept in modern institutions in developing countries, particularly those in Africa. African institutions right from the top district level are fond of using manual systems of data recording; that is through writing on papers and keeping in cupboards. The use of digital systems alone means firing the existing working team and employing new working team which has knowledge of IT use and application. Again, leaving the existing old team without knowledge of IT use requires further training. To make matters worse, the existing old working teams have a lot of experience and knowledge regarding the history of the health facilities, making them hard to fire. It is therefore the advancement of technology that requires use of digital IT-based systems that makes utilization of routine health information hard and difficult.

According to Adeya (2006: 441), in United States of America, the importance of linking information production to use in strengthening health information systems has been emphasized. Users of health information include those delivering care and those responsible for managing and planning health programmes both within countries (health and finance ministries) and outside

(donors, development banks and technical support agencies). At the same time, decision-making around country health priorities necessarily involves the wider community, including civil society. A good health information system should therefore present and disseminate data in appropriate formats for all audiences and this mainly depends on the competence of the working team.

The process of conveying technical information effectively also influences routine health information utilization among private health facilities. Dumont (2012:11), noted that there are difficulties in conveying technical information effectively which include low numeracy skills limit the extent to which percentages, rates and ratios can be used; low literacy levels may limit acceptance, understanding, and use of information; messages are misunderstood if they are not adapted to appropriate culture and language; they are ineffective if they stop short of suggesting an action; it is difficult to craft compelling messages on routine, "boring" subjects.

Complexities in sharing information with the media and the public are also opined (Dumont, 2012:11) as one of the technical determinants of effective utilization of routine health information. Fear of the misuse of information may impede its being communicated at all or may require that a spokesperson communicates only distilled information to the media; journalists may be "bloodhounds" who search for bad or sensational news; information is powerful and may be deliberately misused by the media to send the wrong message (e.g., cholera epidemic used as a weapon to criticize entire department of health).

Systemically, all stakeholders' involvement in indicator development of data use is a strong factor in determining the level of utilization of routine health information in private health facilities especially in Sub-Saharan countries such Uganda. This issue also falls under the

behavioural category. Lack of coordination and poor system design can lead to inefficiencies or non-use of information. Donors may have different agendas or needs that work against program needs and an efficient RHIS. Donor needs often result in special studies that bypass RHIS and further burden the health system. Including the private sector may be challenging, but in some countries it is necessary because the private sector plays a major role and RHIS and indicator selection require adequate budgetary resources.

The competence of health information system operators to manage data quality also influences the effective utilization of routine health information. For consistent data use to occur, data need to be of high quality so that data users are confident that the data they are consulting are accurate, complete and timely. Without quality data, data-informed decision making will not occur and programme efficiency and effectiveness will suffer (Dedan, 2011:45). Data quality protocols need to be developed, communicated, and implemented, as well as training and retraining of health professionals on data quality techniques and approaches.

In South Africa, changes have been made to identify information needs by the technical team of the health information management system so as to ensure that it has an impact on the level of utilization of routine health information. Information systems are developed to meet the needs of multiple data users throughout a health system. Because of the many types of data users that access information systems and their diverse needs, the resulting data may not necessarily respond to the specific information needs of all data users (Davies, 2011:91). Moreover, the vast amount of information may be overwhelming to the potential users who are ill-equipped to navigate the data resources available to them. To facilitate data use, a focus needs to be placed

on what stakeholders need to know to effectively run health programmes instead of what data are available to them (Schaufeli, 2006).

Among private health facilities in Uganda, the level of data availability in form of synthesis, communication and access has influence on the level of utilization of routine health information in private health facilities. Ensuring that data are understood by potential users requires that data be synthesized and disseminated in formats that are targeted to the individual and organizational contexts in which they are intended to be used. Data users have different information needs, need information at different levels of detail and complexity, have different intensities of interest, and have different roles in the decision-making process (Davies, Hodge, Aumua, Malik, & Lee, 2011). All of these factors need to be taken into account when data are synthesized and communicated into information products for stakeholders at the different levels of the health system. Making data available through the development of targeted information products that respond to specific data users' information needs is important (Aqil, 2009). The consideration of data synthesis, communication, and access all need to be improved to support the use of the information in decision making (Aqil, 2009).

2.3.3 Behavioural determinants affecting utilization of routine health information

RHIS users' demand, confidence, motivation and competence to perform RHIS tasks affect RHIS processes and performance directly. How an individual feels about the utility or outcomes of a task (Chaled, 2013), as well as the complexity of the task (Jutand, 2000), all affect the likelihood of that task being performed. Limited knowledge of the usefulness of RHIS data is found to be a major factor in low data quality and information use (Rotich, 2003). The blind spot (Sauerborn, 2000) shows that people are unaware of a gap between their perceived and actual

competence in performing a task. It is possible to use this gap for learning to change and meet expected behaviours (Sauerborn, 2000). The PRISM framework postulates that organizational and technical determinants also affect behavioural determinants.

The confidence level of health information management team also has a potential in influencing the level of utilization of routine health information by the private health facilities. Half the health facility management members are confident to undertake HIS tasks. They feel less confident in interpreting data and using information, and more confident in checking data quality (Chaled, 2013).

The competence of working staff of the management and technical teams for the supervision of the private health facilities and the utilization of routine health information also has an influence on data use. Health facility managers are able to accomplish only one-third of the given HIS tasks. Further, they are collecting data without understanding completely why they are collecting that data and its utility has not been explored and thus probably create little appreciation for collecting it (Dumont, 2012).

Among private health facilities in developing countries of Africa, capacity building of Monitoring and Evaluation (M&E) teams has been implemented at all levels to promote full utilization of routine health information in private health facilities. Indicators contribute to an overall M&E strategy. In many countries, the overall M&E plan and strategy are not clear (e.g., objectives are not SMART), so indicators are not well designed and do not serve clear purpose and limit utilization of routine health information. Sometimes M&E is not effectively linked to the RHIS. For example, indicators may be adequate, but the data sources are not defined, or the information system collects the indicator in a format that is not readily useful to managers. The

last point can be considered a systemic issue as well, as it may reflect a lack of communication among HIS, M&E and management functions (Dumont et al, 2012).

Arguments according to Gopalan, (2013), policies and guidelines needed on indicators for selection, collection, analysis and use, including: criteria for selecting indicators and the need to relate indicators to problems, objectives, priorities and goals are crucial for boosting effective utilization of routine health information. Every country requires good indicators that meet multiple needs, but should maintain a manageable number. The frustration of working with dysfunctional systems with too many indicators to manage has also been noted. Multiple country examples given include where managers want hundreds of indicators, and "success" is cited as reducing the number of indicators to a manageable level. The benefit of establishing a "minimum" list of essential indicators (information that is "nice to have" versus information that one "needs to know") is noted.

According to Boone (2013: 23), coordination in partnerships and organizational performance by the management and working team in the health management system has an impact towards the utilization of routine health information in private health facilities. Coordination involves bringing together the different elements and parts of an organization and its strategic fit in the internal and external environment. This tallies with the open systems approach that looks at organizations as interrelated units and a sum of its parts (Davies, 2011). It requires a functional feedback system and communication cycle that allows for sharing of information and managing complexities that come with bringing systems together and may hinder mutually beneficial relationships. While there are diverse views that exist on partnerships, Susan (2009) concurs with the need to mutually enable inter-dependent interactions that are built on trust and shared vision

for sustainable NGO partnerships. Absence of mutual interactions will result into lack of focus on the purpose of partnerships and failure to meet the expectations of the different stakeholders in an efficient and effective way.

In addition, networks among the stakeholders involved in the management of health information help in the utilization of routine health information by the private health facilities.

Holmen (2002) in his study carried out in USA notes that networks are particularly suitable for NGOs to improve performance as a cost-effective means to share information. Prakash (2008) describes CSO alliances as a step-wise progression where partners develop shared understanding and build towards a more lasting relationship as is the case of Food Rights and Uganda Land Alliance in Uganda. The analysis made on the NGO sustainability index (2008) indicate that sustainability will require a critical mass of NGOs that can efficiently provide services that consistently meet the needs, priorities and expectations of their constituents, and thus organizational performance. The underlying assumptions include the ability of NGOs to provide services in a variety of fields, provision of goods and services that reflect the needs and demands of the pro-poor (Action Aid Country Strategic Paper III). Similar experiences exist with other national and international organizations like World Vision, Uganda Red Cross Society and CARE Uganda. Reviewing its partnerships with local civil society organizations in 2004, CARE International Uganda explored reasons for the formation of partnerships and how partnerships should be managed, and explained differences in working with and through partners.

Shared values related to information systems are alluded to as a pre-existing culture of data collection (Rotich, 2003) or ‘culture of information’ (Davies, 2011) without specifying how these values originate and sustain themselves. Sauerborn (2000) also showed the positive

influence of values on organizational members' behaviour. Therefore, understanding collective values related to RHIS processes and tasks could open up opportunities for promoting values conducive to RHIS tasks and lead to better performance.

2.3.4 Organizational determinants affecting utilization of routine health information

RHIS users work in an organizational context which influences them through organizational rules, values and practices. This organizational context is the health services system and can be managed by the public or the private sector. Organizational factors such as inadequacies in human and financial resources, low management support, lack of supervision and leadership affecting RHIS performance are described in the information system literature (Rotich, 2003). The PRISM framework considers organizational determinants crucial for affecting performance and defines this category as all those factors that are related to organizational structure, resources, procedures, support services, and culture to develop, manage and improve RHIS processes and performance. In other words, people do not always act on what they are told to do but act on sharing what is important and valued in an organization.

On international standards, all countries have placed the need for the management of private health facilities to have improvement towards data storage and management in order to influence the effective utilization of routine health information by private health facilities (Gopalan, 2013:42). Routine paper data recorded and collected through registers, cards, aggregation or reporting forms are likely to remain the dominant format for the foreseeable future in less-developed countries (Gopalan, 2013:67). Ensuring the proper storage and accessibility of such data over the medium to long term will facilitate its validation (accuracy, timeliness, completeness and reliability); analysis of disease trends; assessment of quality of care;

comparison of different levels of service performance; and ultimately the equitable distribution of resources (Gopalan, 2013:14).

Data registers and reporting forms should be filled and stored properly at each administrative level and classified according to date, geographical location, title and/or national code.

In advanced countries such as the United Kingdom, the unified storage of different forms in a single setting facilitates retrospective investigations and studies and supervisory activities has enabled the effective utilization of routine information system among private health facilities (Rhoda, 2010).

Various periodical or ad hoc reports derived from surveys, statistical summaries, epidemiological bulletins, special research studies and evaluation reports should also be carefully stored in a dedicated library or other resource centre (Jutand, 2000). These documents and publications frequently represent the major reference source for programme and intervention evaluation. A uniform system (for example, universal library codes) should be used to classify such documents at all levels – from Ministry of Health headquarters to the most peripheral district office. At the same time, the evolution and dissemination of ICT devices in less-developed countries has been rapid and an increasing number of hospital and peripheral health facilities now have at their disposal well-maintained hardware and basic IT skilled staff (Jutand, 2000).

Sauerborn (2000) argues that capacity building for health management teams from the district management to lower private health facilities supervision leads to effective utilization of routine health information by private institutions. At the district, sub-county and county health authorities, there is facilitation to offer systematic supportive supervision to the ‘One-Stop

Primary Level Centers' to ensure that guidelines are adhered to, skills are reinforced and ultimately high-quality services are offered. Some members of the health management teams have been supported to receive training on supervision, leadership and management to enhance their capacity to effectively manage health services in the districts (Boone, 2013).

Chaled (2013), in his study carried out in Tunisia on auditing the quality of immunization data in Tunisia, noted that the availability and access to timely reporting and feedback has the potential to determine the level of utilization of routine health information by private health facilities. The process of transmitting, compiling, analyzing, and presenting the data is usually so tedious that by the time a report is prepared, the data are frequently obsolete and decisions are often made without any information input. Planners and managers face deadlines and time constraints in their daily decision making. Outdated information, even if of high quality, is of low value to them. Delays in data transmission and lack of feedback at the district level are often caused by the presence of strong vertical programmes. Health facilities report data directly to national programme managers, and line managers at the district level receive outdated feedback reports, if any.

The level of supervision quality of the district health inspection has a great influence on the effective utilization of routine health information by the private health facilities. A big percentage of the facilities receive one or more supervisory visit in three months. Of those facilities reporting one or more supervisory visit in the last three months, all reported that the supervisor checked data quality and helped them make a decision. None of the supervisors discussed facility performance using HIS information or gave feedback from their supervisory visit (Sauerborn, 2000).

The level of culture of information use of a health facility also influences the utilization of health information by the private health facility (Jutand, 2000). People working within an organization perform tasks and behaviours which they believe are valued and promoted by the organization. In other words, organizations create a culture for promoting and sustaining certain values around organizational functions to be performed at optimal levels. When these values are about the way the information systems function, we say that the organization is promoting a culture of information.

Jutand (2000), in his study carried out on Lot quality assurance sampling: methods and applications in Public health further asserts that health information system information policies also has an influence on the utilization of routine health information by the private health facilities. The legal and regulatory contexts in which health information is generated and used are important as they enable mechanisms to be established to ensure data availability, exchange, quality and sharing. The health information policy framework should identify the main actors and coordinating mechanisms, ensure links to programme monitoring, and identify accountability mechanisms.

Gopalan (2013), in his study on Health sector demand-side financial incentives in low- and middle-income countries in Tanzania, argues that health information system financial and human resources also have an influence on the utilization of routine health information by the private health facilities. At national level, skilled epidemiologists, statisticians and demographers are needed to oversee data quality and standards for collection, and to ensure the appropriate analysis and utilization of information. At peripheral levels, health information staff should be accountable for data collection, reporting and analysis. Too often, such tasks are given to

overburdened care providers who see this as an unwelcome additional task that detracts from their primary role. The study by Gopalan was carried out in Tanzania, yet Tanzania has a different health system from that of Uganda

The state of health information system infrastructure also determines the degree of utilization of routine health information by private health facilities. The infrastructural needs of the health information system can be as simple as pencils and paper or as complex as fully integrated, web-connected ICT. At the level of the most basic record keeping, the health information system needs the ability to store, file, abstract and retrieve records. Many countries describe overflowing storerooms filed with mouldering patients' records, facility logbooks and paperwork that is never sorted or analyzed. Emerging technologies can help countries to dramatically increase their storage and performance capacities and accelerate the processing timeframes previously required. As a result, the availability, quality, dissemination and use of health-related data can be radically improved by ICT. Coherent capacity building in electronic and human resources throughout the health system is a far more effective and cost-efficient approach (Chaled et al., 2013).

2.4. Synthesis and Gap analysis

Much has been written and documented by earlier authors and scholars relating to determinants of effective utilization of routine health information but the following gaps were found existing within the above literature. A great deal of the reviewed literature has been done in public health facilities and little has been done in the area of private sector and how it has effectively utilized data, and this is a big concern of this study. This research therefore acted as a source of future

reference to all studies related to determinants of effective utilization of routine health information among private health facilities in Uganda.

Since models regarding data utilization in health institutions have been compiled for a couple of years, there is need for a model that works in relation to the current ICT model system that regards current data compilation and usage using modern information technologies. Literature reviewed in earlier studies does not relate the impact of effective utilization of routine health information towards the development of a health sector be it public or private. This gap remains a big challenge since most of the health facilities will not be motivated to understand the reasons for routine health information compilation and utilization; and if this is particularly encouraged, then its adoption in the private sector will not be a problem.

Literature reviewed in earlier studies relates negatively the earlier intervention or current government and health institutions' intervention towards data utilization by lower health facilities. Literature and documentation is needed to emphasize the necessary policies towards the improvement of data recording and information utilization in all health care facilities particularly those in the private sector. Literature reviewed by earlier authors and studies does not make use of understanding how effective utilization does not only help in decision making but also how it is important to other development variables such as the training and human resource management area. This study will also make use of the finding to relate to the importance of information utilization towards other development factors such as effective human resource recruitment and training.

A lot of literature has been published on determinants of routine utilization of health information as cited above. This ranges from the historical perception of routine utilization of health

information. The above literature also provides a valuable input to the researcher especially in bringing out variables such as determinants of routine utilization; and it will also help the researcher in designing the instruments to use in data collection. However, the reviewed literature does not explain the extent to which determinants of utilization actually influence routine utilization of health information.

CHAPTER THREE

METHODOLOGY

3.1. Introduction

This chapter describes the research design that was used, the study population, the sample size, the sampling techniques and procedures, data collection methods, data collection instruments, the validity and reliability, data collection procedures, data analysis and measurement of variables.

3.2. Research Design

A research design is a detailed outline of how an investigation will take place. A research design typically includes how data is to be collected, what instruments are adopted, how the instruments are used and the intended means for analyzing data collected. Across-sectional survey design was adopted for this study, i.e. the researcher collected data from a cross-section of respondents at a single point in time. Kothari (2004:103) states that cross-sectional surveys contain multiple wealth of details, totality and variation which allow the author to understand fully how and where intervention may have worked collectively with correlated general effects. The descriptive cross-sectional survey designs validate emerging constructs and proposition in the data set; guiding the study of various units within the identified case by underlining the mechanism by which an incident is brought to being (Kothari, 2004:101).

A cross-sectional survey contributes significantly to a researcher's own learning process by shaping the skills needed to do a good research. The above design is usually the simplest and least costly alternative. Though proof may be hard to come by owing to absence of hard theory, learning is certainly possible (Kothari, op, cit). The study also applied both quantitative and

qualitative approaches. Creswell (2009: 65) notes that quantitative methods are more objective and help to investigate the relationships between the identified variables. This study applied qualitative approaches which involved in-depth probe and application of subjectively interpreted data. As pointed out by Kothari (2004) qualitative researchers aim to gather an in-depth understanding of human behaviour and the reasons that govern such behaviour. The quantitative and qualitative approaches were adopted in sampling, collection of data, data quality control and data analysis. Triangulation was adopted for purposes of getting quality data. Triangulation means using more than one method to collect data on the same topic (Somekh& Lewin, 2005:35). This is a way of assuring the validity of research through the use of a variety of methods to collect data on the same topic, which involves different types of samples as well as methods of data collection (Groves, Fowler, Couper, Lepkowski, Singer, Tourangeau& 2009:79). However, the purpose of triangulation is not necessarily to cross validate data but rather to capture different dimensions of the same phenomenon (Kothari, 2004:44).

3.3. Study Population

The population under study comprised of district and division health officers, district health information officers (biostatistician), private health facility managers and frontline health workers within over 200 private health facilities in the five divisions of Kampala, Uganda.

With each health facility employing a minimum of ten health workers, the total targeted study population was about 2,200. The researcher sampled only 20 health facilities offering comprehensive health care package, including specialized services like HIVAIDS and EMTCT-EID services. Four health facilities from each of the five administrative divisions of Kampala, that include Kampala Central, Kawempe, Nakawa, Makindye and Lubaga. In each health

facility, at least five respondents were randomly selected from the staff engaged in direct provision of health care services and data management to participate in the study. Key informative interviews were conducted with five division health officers, one district health officer, one district biostatistician and five health information officers in the respective five divisions.

3.4. Sample Size determination

A sample is simply a subset of the study population. Sampling is the process of selecting sufficient numbers of elements from the study population so that a study of the sample and its characteristics would make it possible for the researcher to generalize such characteristics to the population elements (Sekaran, 2003).

Based on the MOH (2007) statistics, over 2,000 health workers were employed in the private health sector in Kampala. Using the Krejcie and Morgan (1970) sampling table, the sample size of 122 was drawn.

Table 3. 1: Target population Sample size, Sampling formula and Sampling techniques

Category	**Targeted Population**	**Sample size**	**Sampling formula**	**Sampling technique**
District division health officers	5	3	Krejcie and Morgan table	Purposive sampling
District Biostatistician-KCCA	1	1	Krejcie and Morgan table	Purposive sampling
Division Health information officer	5	3	Krejcie and Morgan table	Purposive sampling
Health facility managers/Directors/in charges	20	17	Krejcie and Morgan table	Purposive sampling
Frontline health workers	120	90	Krejcie and Morgan table	Stratified random sampling
Total	**151**	**122**		

Source: RV. Krejcie and Morgan (1970)

3.5. Sampling Techniques/Procedures

3.5.1 Purposive sampling

This purposively sampling technique helped the researcher to access key respondents with knowledge about the topic being investigated, as argued by Amin (2005). In this method, the researcher targeted a specific group of health workers in the selected private health facilities in the respective divisions, especially those who had been involved in the implementation of health-related information because they were believed to be reliable and knowledgeable about the topic (utilization of routine health information) and so they were in position to give dependable, detailed and relevant information about the study. Purposeful sampling was also applied to the KI informants like division health officers, information officers, biostatistician and health facility managers /in charges /director to provide in-depth information regarding utilization of routine health information in the divisions and at the facility level.

After selecting the respondents with the knowledge of health information using purposive sampling, the researcher applied simple random sampling technique to all the health workers who had been chosen in order to have a manageable sample for the study. A list of private Private For Profit (PFP) health facilities offering comprehensive health care package was generated in collaboration with district health offices, division health offices, DHIS11 database, and Private Health Support Program, an implementing partner mandated to support private health facilities in offering health care services in the country. A list of each facility was generated and randomly mixed up in a box for each division and simple random picking without replacing was done until four sites were selected.

3.5.2 Stratified Sampling

Probability sampling, or random sampling, is a sampling technique in which the probability of getting any particular sample may be calculated (Kothari, 2004). The advantage of probability sampling is its lower cost compared to simple random sampling. Under probability sampling, stratified random sampling was adopted in sampling frontline health workers. According to Creswell (2003:48), stratified random sampling ensures that every member has an equal chance of being recruited into the sample. A sample frame was constructed and then the members were randomly sampled. Random sampling of professional health workers from each health facility was determined based on the targeted sample size. Identified health workers were made to pick papers from the basket with numbers 1 to 150 written on, and everyone who picked an odd number was part of the sample until the targeted number of respondents was reached in each unit.

3.6. Data Collection Methods

Questioning, interviewing and document review were the data collection methods used in this study. As argued by Amin (2005), that interviewing is the strongest tool which focuses on purposeful discussion between two or more people; it was very helpful to get reliable and valid data which was relevant to research questions and objectives. The researcher used face-to-face interview with the frontline health workers and health facility managers/in-charges /directors, key informant interviews with division health officers, health information officers, and biostatistician. This provided in-depth information regarding the routine health information collection, management and utilization in the private health facilities. Observation and document

review was used to ascertain data collection, reporting and health information utilization at the health facilities demonstrated by the existence of the indicators for data collection and use.

3.7 Data collection Instruments

3.7.1 Questionnaires

The researcher distributed questionnaires among the randomly selected respondents from different health worker background. To facilitate uniform flow of questions, pre-determined semi-structured questionnaires were administered by trained interviewers to frontline health workers and other respondents. Since instrument intended to answer as many of the research questions as possible, the researcher kept the questionnaire simple and straight forward so as to elicit as much information as possible, while taking the shortest respondents' time possible.

Self-administered questionnaires were the most appropriate instruments in collecting data in certain circumstances because of the big number of respondents and time available for face-to-face interviews with busy respondents in private health facilities. Self-administered questionnaires were used because of the standardized responses and saved time to make it easier to present information by way of categorizing and tabulating (Redman, 2001).

3.7.2 Interview guide (Key Informant Interview)

An interview guide with a set of guiding questions was developed and appropriately used because the method collects data from an informed respondent such as health facility administrators/managers, health information officers, district health officers and biostatistician. Interviews were open-ended discussions and administered by the researcher after fixing appointments with the various key informants. The KI interview guide helped the researcher to

gather some vital information relating reporting systems, mandate of the district director of health services and divisions that was not provided for in the questionnaire. The method also gave immediate feedback from respondents and generated a wide variety of relevant themes, proposals and ideas relating health information use for decision making that helped to understand the reactions of respondents to various topics, thus going deep into the study. This is as stated by Mugenda (1999:46) that interview guides are advantageous because they help the respondent to give in-depth information on the subject matter. They also save time in analyzing the data collected. The method further limits irrelevant responses as the questions target specific issues.

3.7.3 Observation and document review Checklist

The use of information was observed through the review of documents that demonstrated whether and how routine health information system data was used in decision-making processes. The researcher focused on organizational and technical indicators that promoted and showed the culture of information use at the health facility. These observed indicators included whether the health facilities have data collection tools; data processing and transmission equipment to process data into useful information; displayed information and performance review graphs & reports; documented administrative meeting minutes with action point plan for quality improvement; presence HIS mission and DHMIS organizational chart showing functions related to RHIS/Health information. The researcher also took steps to observe whether health workers were aware and able to manipulate data into information manually or using the computer software systems in the context of utilization of routine health information for decision-making.

Table 3. 2: Observational Indicators for routine health information utilization

Independent Variable	Key Health Information Utilization Indicator
Organizational Indicators	Presence of RHIS mission displayed at appropriate position
	Presence of updated DHMIS organizational chart showing functions related to RHIS/Health information
	Presence of health facility RHIS targets displayed
	Presence of health facility indicator performance charts, graphs and table displayed
	Presence of staff meeting minutes reflecting reports, data and feedback from health facility or district discussed
	Presence of RHIS supervisory checklist
Technical Indicators	Presence of action work plan relating identified data gaps and how they were addressed
	Presence of performance improvement tools like flow charts, QI journals, charts and projects
	Presence of RHIS standards at the facility
	Presence of RHIS training manual and guide
	Presence of RHIS supervisory report
	Presence of data quality assurance checklist
	Presence of updated database for monthly reports submitted to the district
	Existence of functioning HIS software

3.8. The Validity and Reliability

3.8.1 Validity

Validity refers to the truthfulness of findings or the extent to which the instrument is relevant in measuring what it is supposed to measure (Amin, 2005). The validity of the instrument quantitatively was established using the Content Validity Index (CVI). This involved the expert scoring of the relevance of the questions in the instrument in relation to the study variables. The instruments yielded a CVI above 0.7 after being fed in SPSS and were within the accepted ranges. Amin (2005) notes that a CVI of more than 0.7 implies that the tool is valid. Index (CVI) was computed using the formula below: $$CVI = \frac{\text{Number of relevant items}}{\text{Total number of items}} \times 100$$

Table 3. 3: Results of the Content Validity Index for Likert-type Scale test for the Questionnaire

Variables	Content Validity Index	Number of items
Technical determinants	0.788	7
Organizational determinants	0.854	6
Behavioural determinants	0.921	6
Effective utilization of routine health information	0.840	6

Source: Primary data (2015)

The content validity index revealed that validity results for the questionnaire as an instrument for technical determinants was 0.788; for organizational it was 0.854; and for behavioural it was 0.921.For the dependent variable, which is effective utilization of routine health information, it was 0.800.

Table 3. 4: Results of the Content Validity Index for Likert-type Scale test for the Interviews

Variables	Content Validity Index	Number of items
Technical determinants	0.701	8
Organizational determinants	0.841	8
Behavioural determinants	0.788	8
Effective utilization of routine health information	0.732	8

Source: Primary data (2015)

The content validity index revealed that validity results for the questionnaire as an instrument for technical determinants was 0.701; for organizational determinants it was 0.841; for behavioral determinants it was 0.788;and for the dependent variable which is effective utilization of routine health information it was 0.732.

3.8.2 Reliability

Qualitatively, the reliability of the instruments was established through a pilot test of the questionnaire to ensure consistency and dependability and its ability to tap data that would answer the objectives of the study. The results of the findings were then subjected to a reliability analysis. Based on Cronbach's Alpha Coefficient, the scales for the variables was reliable. Quantitatively,

reliability was established using the Cronbach's Alpha Reliability Coefficient test. Upon performing the test, the values that were 0.7 and above were regarded reliable. In the case of psychometric tests, they must fall within the range of 0.7 above for the test to be reliable (Creswell, 2003).The formula below that was applied to test reliability of the instruments:

$$\alpha = \frac{K}{K-1}\left(1 - \frac{\sum SD^2 i}{SD^2 t}\right)$$

- α = Alpha coefficient
- K = Number of items in the instrument
- $\sum$ = Sum
- $SD^2 i$ = Individual item variance
- $SD^2 t$ = Variance of total score

A reliability of .70 indicates 70% consistency in the scores that are produced by the instrument (Amin, 2005).

Table 3. 5: Results of the Cronbach's Alpha Reliability Coefficient for Likert-type Scale test for Questionnaire

Variables	Cronbach Alpha Coefficient	Number of items
Technical determinants	0.890	6
Technical determinants	0.807	6
Organizational determinants	0.786	6
Behavioural determinants	0.742	6
Effective utilization of routine health information	0.799	6

Source: Primary data (2015)

The Cronbach Alpha Reliability Coefficient test revealed that reliability results for the questionnaire as an instrument for technical determinants was 0.890; for organizational determinants it was 0.807; for behavioral determinants it was 0.786;and for the dependent variable which is effective utilization of routine health information, it was 0.799.

Table 3. 6: Results of the Cronbach's Alpha Reliability Coefficient for Likert-type Scale test for the Interviews

Variables	Cronbach Alpha test results	Number of items
Technical determinants	0.888	8
Organizational determinants	0.822	8
Behavioural determinants	0.705	8
Effective utilization of routine health information	0.800	8

Source: Primary data (2015)

The Cronbach Alpha Reliability Coefficient test revealed that reliability results for the questionnaire as an instrument for technical determinants was 0.888; for organizational determinants it was 0.822; for behavioural determinants it was 0.705; and for the dependent variable which is effective utilization of routine health information it was 0.800.

3.8 Data collection Procedure

Once the data collection tools were pre-tested, reviewed, the research assistants were oriented to understand the study objectives, study unit and data collection tools. The targeted private health facilities and KIs were informed in two weeks advance so that targeted staff be found at the facility. Prior appointments were arranged for the KIs. Two research assistants were used for each division covering four health facilities per day. Re-appointments were made for those health workers and managers that were not available or busy and this caused delays in data collection. Self-administration of questionnaire was allowed after thorough orientation of the health workers on answering the tool; and cross-checking the completeness of the answers was examined when picking the tool.

The principal researcher was part of team to interview key informants and review of key documents relating to the objectives of the study. Meetings with research assistants were held at every two days to discuss challenges and crosschecking for data completeness and accuracy. Data collection tool reviews for completeness, accuracy and cleaning was done after full sites coverage; and tools were re-arranged according to health facility code for entry into the SPSS data entry sheet for analysis.

3.9. Data Processing and Analysis

3.9.1 Quantitative data analysis

Data from the questionnaires was arranged, coded, edited for consistency and easiness, and later entered using Statistical Package for Social Scientists (SPSS Version 22). The entered data was later analyzed and the relationship between the determinants that influence effective utilization of routine health information using Pearson's correlation coefficients was established. The correlation coefficient always takes a value between -1 and 1, with 1 or -1 indicating perfect correlation. A positive correlation indicates a positive association between the variables (increasing values in one variable correspond to increasing values in the other variable), while a negative correlation indicates a negative association between the variables (increasing values in one variable correspond to decreasing values in the other variable). A relationship value close to 0 indicates no association between the variables.

Furthermore, regression analysis using SPSS was also used to analyze how (the extent to which) these determinants (independent variables) under investigation influenced routine health information utilization.

The study adopted the hypothetical regression model that guided this study which is in the multiple regression equation form of:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots + \beta n Xn$$

Where: Y is the dependent variable (Routine Utilization of Health Information), "α" is a regression constant; β_1, β_2, β_3 and β_n are the beta coefficients; and X_1, X_2, X_3, and Xn are the independent (predicator) variables, and in this study, they are determinants.

Data from questionnaires was later presented in form of frequency tables, pie charts and graphs for easier interpretation.

3.9.2 Qualitative data analysis

Regarding qualitative data, the different answers from the respective respondents were categorized into common responses. Qualitative data was descriptive and obtained from interviews and open-ended questions. This data was presented in accordance with the objectives of the study and helped to substantiate findings from quantitative data. Some themes and appropriate response from the interview were stated to support the quantitative findings in form of direct quotations from the respondents as noted by (Kothari, 2004).

3.9. Measurement of Variables

The format of a typical five-level Likert item, for example, could be:

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree

4. Agree
5. Strongly agree

The Likert scale, as stated above, was used to measure the variables of the study. Likert items are used to measure respondents' attitudes to a particular question or statement. To analyze the data it is usually coded as follows. • 1 = strongly disagree • 2 = Disagree • 3 = Neutral • 4 = Agree • 5 = strongly agree. One must recall that Likert-type data is ordinal data, i.e. we can only say that one score is higher than another, not the distance between the points. Likert scaling is a bipolar scaling method, measuring either positive or negative response to a statement. Sometimes an even-point scale is used, where the middle option of "Neither agree nor disagree" is not available. This is sometimes called a "forced choice" method, since the neutral option is removed. The neutral option can be seen as an easy option to take when a respondent is unsure, and so whether it is a true neutral option is questionable. A 1987 study found negligible differences between the use of "undecided" and "neutral" as the middle option in a 5-point Likert scale

Basing on Amin (2005), different variables can be measured at different levels. The researcher used the nominal scale of measurement which applies to some common set of characteristics such as sex, age, level of education, category of respondent, among others. Numbers were assigned only for purposes of identification but not for comparison of variables. The ordinal measurement was used to categorize and rank the variables being measured; for example, the use of statements such as greater than; less than; or, equal to (Amin, 2005).

3.11 Ethical considerations

Permission to do the study was sought from Uganda Technology and Management University. The researcher sought the consent of the respondents to conduct the study in the respective private health facilities and other KIs. Strict confidentiality was observed. Special codes were used for study participants recorded on questionnaires and interview guides. Filled questionnaires were kept under lock and key and only the researcher had access to the keys.

CHAPTER FOUR

PRESENTATION AND INTERPRETATION OF RESULTS

4.1 Introduction

In this chapter the researcher presents the results of the study.The findings of this study are an outcome of the combination of quantitative and qualitative research instruments used in data collection. The results are presented based on the order of the objectives of the study in the sequence of the methods of data collection that included questionnaire, KI interviews and observation/document review

Respondents interviewed were district health officers, division health officers, district biostatistician, division health information officers, health facility directors/managers/in charges and frontline health care providers. These interviewees were of different professions that included doctors, laboratory technicians,' nurses and midwives. Findings have been presented in form of tables, pie charts, bar graph and, where necessary, narratives have been provided.

4.2 Response Rate

The study achieved 93.4% response rate. This is a result of some KI respondents at the division and facility level not being able to fix appointment due management responsibilities as they remained busy throughout the study period. Similarly, some frontline health workers who were not available at the facility much as they were target participants were not interviewed despite trying to fix appointments

This response rate was possible through re-visits to the clinics under study since the personnel in management positions scheduled appointments to collect data, particularly interviews, whereas others retained the tools, especially questionnaires, and filled them at their convenience. This flexibility enabled the researcher to have ample space to make necessary visits to get the required number of respondents per clinic, that is, four respondents. This response rate indicates that data was collected from a reasonable number of respondents compared to the target population; hence study findings can be relied on according to Mugenda and Mugenda (1999).

Table 4. 1: Response rate

Category of Respondents	**Targeted Population**	**Sample Size**	**Response**	**Response rate**
District division health officers	5	5	3	60%
District biostatistician-KCCA	1	1	1	100%
Division health information officer	5	5	3	60%
Health facility managers/directors/in-charges	20	19	17	89%
Frontline health workers (clinical staff)	120	92	90	98%
Total	**151**	**122**	**114**	**93.4%**

Out of the total 122 targeted study respondents, 114 were reached and positively responded by participating in the study, giving a 93.4% response rate. Non-achievement of 100% was due to respondents being busy and out of station during the period of the study despite several attempts to make appointments.

4.3 General characteristics of the respondents

This sub-section presents the demographic characteristics of the respondents with reference to age, gender, marital status, level of education, department of affiliation, job title and number of years respondent served in the health facility.

Table 4. 2: Age of the Respondents

The table below presents the summary statistics on the age of the respondents

Age	Frequency	Percent
20-29 years	30	26.3
30-40 years	68	59.6
Above 41 years	16	14.1
Total	114	100

From the above table, all the respondents that took part in the study were above the age of 20. Over 26 per cent (26.3 %) were between 20 and 30 years; 59.6% were between 30 and 40 years; and those above 40 years were 14.1%. This shows that they were mature enough to analyze issues relating to the determinants for effective utilization of routine health information. The respondents adequately responded to the questions put forward and by virtue of their experience, their responses were sound enough such that the researcher was able to generate adequate data from them for his study.

Table 4. 3: Gender of the Respondents

The table below presents the summary statistics on the gender of the respondents

Gender	Frequency	Percent
Female	69	60.5
Male	45	39.5
Total	114	100

Table 4.3 shows that the majority of the respondents were female (60.5%) with only 39.5% being males. These results show that gender representation indicated much variation between the male and female with a difference of 21%. This meant that both males and females provided their views representative of gender groups. The male respondents had good views on the determinants for effective utilization of routine health information. It further shows that health facilities are keen on matters of gender balance, which can translate into better performance.

Table 4. 4: Department of affiliation of the Respondents

The table below presents the summary statistics on department of the respondents

Department	Frequency	Percent
Clinical	67	59
Dispensary	17	15
Maternity	16	14
Administration	14	12
	114	100

The majority of the respondents worked under the clinical department (59%), followed by 15% in the maternity, 14% in administration and 12% in the dispensary, a sign that they were technical and well placed to provide viable and dependable information to help the researcher make appropriate conclusion from the findings.

Table 4. 5: Highest Level of Education the Respondents

The table below presents the summary statistics on highest level of education of the respondents

Highest Level of Education

Education level	Frequency	Percent
Certificate	5	4
Diploma	68	60
Degree	26	23
PGD	6	5
Masters	3	3
Doctorate	06	5
Total	114	100

The majority of the respondents were diploma holders (60%) compared to 23% Master's degree, 5% Post-Graduate diploma holders, 5% Certificate holders and 5% Doctorate holders. This showed that majority of the respondents were either nurse or clinical staff with minimum qualification of diploma. Those with certificate were enrolled and comprehensive nurses. These results indicate that the respondents had reasonably good education qualifications and the desired skills and knowledge to deliver health service delivery. Besides, on the basis of the education levels, the respondents were able to read and understand the questionnaire, and gave appropriate responses.

Table 4. 6: Job title of the respondents

Title of respondent	Frequency (n =114)	Percentage (%)
Nurses/midwives	50	43.8
Doctor	20	17.5
Biostatistician	1	0.9
Administrator/Directors/In-charge	19	16.7
Laboratory technician	24	21.1
Total	122	100.0

According to Table 4.6 above, 50 (4.3%) of respondents were professional nurses and midwives, 17.5% % doctors,16.7% administrators/in-charges, 21% laboratory technicians and only 0.9% reported to be biostatisticians. This implies that the majority of the respondents had experience in routine patient care where routine client information is collected and needed for use in routine decision making to improve quality of care. Hence, they provided reliable information relating the study variables

Table 4. 7: Number of years worked in the health facility

Year worked at facility	Frequency	Percent
1-5 years	56	49.1
Less than 1 year	22	19.3
11 years above	11	9.6
6-10 years	25	21.9
Total	114	100.0

The majority 56 (49%) of the respondents reported to have worked with health facilities for between 1 and 5 years, 22 (19%) for less than 1 year, 25(21%) for between 6 and 10 years, and only 11 (10%) had served at the health facility for 11 and more years. The findings mean that the respondents had knowledge relating to their work environment to provide enough information relating management and service delivery systems.

4.4 Technical determinants' influence on the effective utilization of routine health information

In this section, the researcher describes the findings on the technical determinants' influence the effective utilization of routine collected health data in decision making within the private health facilities. These findings were derived from interviews and discussions with frontline health workers, health facility managers/in-charges and district and division-based KIs. Data was mainly collected on key technical variables like health workers' skills, computer software, IT complexity, complexity of data management, understanding of standard indicators, information processing and data collection tools. The researcher interviewed frontline health workers and health facility managers/ directors using the pre-determined questionnaire. In this, the participants were asked to provide their understanding in response to the technical factors questions using the Likert scale of responses; Strongly agree (5), Agree (4), either Agree or Disagree (3), Disagree (2) and Strongly Agree (1) in addition to qualitative discussion regarding influence on utilization of routine health information.

Key Informant (KI) interviews were conducted using a KI guide to provide in-depth insight on how these technical factors influence the utilization of routine health information. The study also

observed the existence of technical and organizational indicators to demonstrate their impact on managing data for the decision-making process.

This section presents the study findings in sequence of data and information extracted from the interviews and discussion with frontline health workers and key informants as well the review of documents using the observation checklist.

Table 4. 8: Technical determinants' influence on effective utilization of routine health information in private health facilities in Kampala

Technical Variables	Mean	Strongly disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
		N (%)	N (%)	N (%)	N (%)	N (%)
Skilled Staff	3.38	0(0)	15(32)	45 (40)	50 (44)	4 (3)
Computer software	3.17	3 (3)	20 (17)	52 (46)	33 (29)	6 (5)
IT complexity	3.44	3 (3)	22 (19)	28 (25)	44 (39)	17 (15)
Complexity of data Management	3.96	4 (4)	6(5)	20 (17)	44 (39)	40 (35)
Information processing	3.04	5 (4.4)	26 (23)	48 (42)	30 (26)	5 (4.4)
Data collection tools	3.25	8 (7)	20(17)	40 (35)	28 (25)	18 (16)
Standard Indicators	3.25	2 (2)	22(19)	42 (37)	41 (36)	7 (6)
Technical factors index	3.28	0 (0)	11(10)	62 (54)	39 (34)	2 (2)

Respondents were asked to respond to the technical determinants' variables on their influence to routine utilization of health information.

On average 36% of the respondents agreed that technical factors index at a mean value of 3.28 are more likely influence the routine utilization of health information, but only 2% strongly agreed that the technical factors actually influence utilization of health information.On average, 74% of the respondents believed that complexity of data management influences information utilization but only 35% strongly agreed. Averagely, 54% respondents agreed and only 15% strongly agreed that IT complexity influences routine health information utilization. On average,

41% of the respondents agreed that data collection tools have influence on routine information utilization, but only 16 % strongly agreed.

These findings were complemented by the statement mentioned by one of the KIs that,

> "Having information technology skills and understanding data collection tools, health indicators, the use of the IT complexity and data management ……we can do the analysis of data into simplified understandable and user-friendly information which directly facilitate easy information sharing and use for routine action and feedback for services improvement."

And on average, 54% of respondents neither agreed nor disagreed that technical factors index influence routine health information utilization. This means that probably the majority of the respondents may not know the importance of data collection and its use.

In contrast, on average 22%, 9% and 24% of the respondents came out to disagree that complexity of data management, IT complexity and data collection tools respectively have no influence on effective routine health information utilization.

The findings were supported by the statement of one of the nurses thus:

> "Here we only use HMIS tools to collect, record data and make use of data for reporting to the district, no any other way we use data in this facility."

On other factors like staff skills, information processing, computer software and standard indicators, the average response was 47%, 30.1%, 34% and 42% respectively agreed that these factors influence routine health information.

To complement the above findings, one of the senior midwives was quoted as saying:

> "When you know how to use the computer, data analysis is very easy but much as we have the computers, we lack basic training in IT, therefore we cannot completely analyze the routine collected data, we only use it in reporting to the district using the provided HMIS forms provided by either the district or implementing partners only computers are used by management as database for their records."

> "We only lack knowledge on how to use the computer software to analysis, process our data into useful information to make evidenced based decision from our own collected data, we need training in data processing, analysis and interpretation,"said the clinician head of ART clinic in one of the private health facilities .

Table 4. 9: Correlation between technical determinants and effective utilization of routine health information in private health facilities in Kampala

		Skilled staff	IT complexity	Data management	Information processing	Data collection tools	Standard indicators	Dependent variable
Skilled staff	Pearson Correlation	1	.381(**)	.233(*)	.565(**)	.427(**)	.286(**)	0.146
IT complexity	Pearson Correlation	.381(**)	1	.326(**)	.332(**)	.244(**)	.256(**)	-0.015
Data management complexity	Pearson Correlation	.233(*)	.326(**)	1	0.123	0.152	0.153	-0.058
Information processing	Pearson Correlation	.565(**)	.332(**)	0.123	1	.246(**)	.288(**)	-0.009
Data collection tools	Pearson Correlation	.427(**)	.244(**)	0.152	.246(**)	1	.311(**)	-0.159
Standard indicators	Pearson Correlation	.286(**)	.256(**)	0.153	.288(**)	.311(**)	1	0.103
Technical_factors index	Pearson Correlation	.709(**)	.551(**)	.393(**)	.640(**)	.511(**)	.475(**)	-0.019
Dependent variable	Pearson Correlation	0.146	-0.015	-0.058	-0.009	-0.159	0.103	1

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Using Pearson correlation model of analysis, the majority of the technical factors were found to have a negative correlation with the dependent variable -- utilization of routine health information (Table 4.8: above). Only standard indicators and skilled staff variables have a weak positive correlation of 0.103 (P.V= 0.227, 95%) and 0.146 (P.V=0.121, 95% C.I) respectively in relation to influencing routine health information use.

Even with the technical factors index, the results revealed a negative week correlation of -0.019 with a P.V of 0.842 at 95% C.I to statistically influence routine health information utilization.

On inter-technical variables correlation analysis revealed that majority of the technical factors have a statistically significant relationship at 0.01 (99%) with each other in relation to the dependent variable. This finding implies that some of these technical factors support each other to strengthen their effect on the utilization of routine health information.

Inter-variable correlation findings indicate that data management complexity has no statistically significant correlation with information processing, data collection tools and standard indicators.

The statistically significant relationship findings are supported by the statement by a respondent who was quoted saying:;

> "Improved computerised HIS easy to manage and process routine collected data, simplifies the reporting and use of health information. However capacity building and motivation of staff and demand for evidence-based decisions support the quality of data and use at all levels of management. Very few private health facilities submit reports in the DHIS, because they either lack the technical skills to compile, analysis and compile the report,'' (KCCA Biostatistician).

The majority of the respondents reported that ever-changing HMIS tools including data collection tools and new indicators versus health workers orientation and training in the use and appreciation of new tools and indicators affected quality of data and use for decision making. It was reported that once these data collection tools with new indicators are not well appreciated by the frontline health workers, it affects their motivation, attitude and value attached to collect data, hence affecting its use

> "The ever changing MOH data collection tools with new indicators, not understanding the data management process, not trained in IT and data analysis, interpretation and use, affect the whole process of quality of data collection which eventually limits its use in decision making as the data collectors do not understand how to use the tools, indicators, and how to use it for making decision for quality services delivery."

Quoted mentioned by one of records assistant

Further the study results revealed as mentioned by most ART team leader

> "…not only having the tools, computers and HIS guidelines but also staff training in data analysis, interpretation and use of the sophisticated computer software that makes the work easier and simple to understand the information for use in decision making".

Further, the observation findings indicates that even in the private health facilities that were found to have complex computer software and all standard MOH data collection tools and indicators, effective use of routine health information was limited.

The above findings imply that not only the availability of technical tools, complexity of computer software, but staff training and orientation on new data collection tools, data analysis and management promotes utilization of the routine collected data.

Table 4. 10: Multinomial Regression analysis of technical determinants against utilisation of routine health information

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	23.774(a)	0	0	.
Technical factors index	29.414	5.64	9	0.775

The regression analysis revealed that the technical factors have no statistically significant relationship to influence effective utilization of routine health information at a P.V of 0.775 at 95% C.I. On further analysis based on Nagelkerke R^2, this relationship would be characterized as weak (at 0.056) implying that the technical determinants are less likely or have no relationship with the ability to have the routine collected health information utilized for decision making within the private health facilities.

4.5 Behavioural determinants' influence on effective utilization of routine health information

In this section, the researcher examined how the behavioural determinants influenced the utilization of routine health information for decision making in the private health facilities. The study used the Likert scale responses on the behavioural factor questions administered to the

frontline health workers and private health facility in-charges/managers /directors. KI interviews and discussions were conducted using the KI guide for facility managers and district and division health teams to provide in-depth information on their understanding on how the behavioural traits influence the use of routine health information. The behavioural factors examined included: individual staff beliefs, customs, attitudes and values and understanding Health Information System tasks.

Findings are presented in sequence of quantitative and qualitative analysis with descriptive interpretation as collected using the questionnaire and KI interviews and discussions.

Table 4. 11: Behavioural determinants' influence on effective utilization of routine health information

Behavioural Variables	Mean	Strongly Disagree	Disagree	Neither agree or Disagree	Agree	Strongly Agree
		N (%)	N (%)	N (%)	N (%)	N (%)
Values	3.13	2 (2)	19 (17)	58 (50)	32 (28)	3 (3)
HIS Tasks	3.85	0(0)	3 (3)	27 (24)	68 (59)	16 (14)
Attitudes and values	3.51	0(0)	12 (10.5)	44 (39)	46 (40)	12 (10.5)
Beliefs	3.2	2 (2)	19 (17)	55 (48)	30 (26)	8 (7)
Customs	4.06	0 (0)	1 (1)	12 (11)	80 (70)	21 (18)
Behavioural factors index	3.68	0 (0)	1 (1)	36 (31)	76 (67)	1 (1)

On average, 67% of the respondents reported to agree that behavioural determinants combined have influence on utilization of routine health information, compared to only 1% that disagreed

and 31% were not sure (neither agreed nor disagreed). This finding implies that individual behaviours are more likely to have impact on how information can be put to use.

Further, the responses indicated that, on average, 88%, 73% and 50.5% of the respondents believed that customs, HIS tasks and attitudes and values respectively have more predict value to influence routine health utilization. Similarly, these three behavioural variables showed to have the highest mean value (Customs 4.06, HIS tasks 3.85 and Attitudes and values 3.51) compared to other behavioural factors examined in the study. This means that to ensure effective use of health information-promoting HIS customs, values and individual awareness of their HIS roles and responsibilities have influence on the attitudes towards use of routine health information.

Table 4. 12: Correlation of behavioural determinants and effective utilization of routine health information

		Values	HIS Tasks	Attitudes and values	Beliefs	Customs	Behavioural factors
Values	Pearson Correlation	1	0.153	.253(**)	.445(**)	.201(*)	.377(**)
	Sig. (2-tailed)		0.103	0.007	0	0.032	0
HIS Tasks	Pearson Correlation	0.153	1	-0.069	0.142	.321(**)	.371(**)
	Sig. (2-tailed)	0.103		0.468	0.132	0.001	0
Attitudes and values	Pearson Correlation	.253(**)	-0.069	1	.377(**)	.235(*)	.421(**)
	Sig. (2-tailed)	0.007	0.468		0	0.012	0
Beliefs	Pearson Correlation	.445(**)	0.142	.377(**)	1	0.173	.454(**)
	Sig. (2-tailed)	0	0.132	0		0.066	0
Customs	Pearson Correlation	.201(*)	.321(**)	.235(*)	0.173	1	.530(**)
	Sig. (2-tailed)	0.032	0.001	0.012	0.066		0
Behavioural factors index	Pearson Correlation	.377(**)	.371(**)	.421(**)	.454(**)	.530(**)	1
	Sig. (2-tailed)	0	0	0	0	0	
Dependent variable	Pearson Correlation	0.147	.546(**)	0.109	.255(**)	.518(**)	.441(**)
	Sig. (2-tailed)	0.119	0	0.249	0.006	0	0

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

The correlation analysis findings that behavioural variable index has a strong positive correlation with the dependent variable at 0.441 with a Value of 0.000 at 95% that is statistically significant to effectively influence utilization of routine health information in the private health facilities.

Further findings indicate that there a positive significant correlation between all the behavioural factors and varied as in Table 9 above. The majority of the behavioural variables have significant positive correlation, with most of them being significantly correlated with customs at a P.V of < 0.005. Beliefs and values are more statistically significant positively correlated as well as customs and HIS tasks. This means that changes in one of the behaviour factor has an impact on the other to influence the use of routine health information.

The findings further reveal that customs (0.518) and HIS tasks (0.546) variables are more significant positively correlated to each other at P.V of 0.001 and more with the dependent variable at P.Values of 0.000 at 95% C.I than other variables. This means that strengthened staff awareness of HIS roles and responsibilities and promoting culture for customized HIS in the health facility greatly influence other behavioural factors for effective use of routine health information.

These correlation analysis findings agreed with the majority 88% and 73% of the respondents, who believed that HIS and customs greatly influence routine health information utilization. These findings mean that individual behaviors drive routine health information use. However, understanding health information system tasks and promotion of HIS customs has more impact on use information.

On analyzing the qualitative data from the KIs and discussions with health workers, study findings indicated that understanding and appreciating individual roles and responsibilities relating health information system, builds the individual behaviours and attitudes in improving value and custom attached to the data management and utilization process that influence routine quality data collection and use. One of the health workers was quoted as saying:

> "I don't understand my roles and responsibilities in data collection and its management, why do we collected all this data, it seems to be useless as it only for reporting,…..we are not oriented on how to analyze and use it and therefore less value and interest to collect quality data, filling and updating many tools of which no one make use of the data."

However, some interviewees reported individual staff laziness, lack of motivation and demand for quality data from management as limiting the value and customized data use in the private health facilities,

> "It staff laziness, lack of motivation plus demand for quality data use in routine decision making." Mentioned by one the head of ART clinic

Table 4. 13: Multinomial regression analysis of behavioural determinants against utilization of routine health information

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	16.209 (a)	0	0	.
Behavioural factors index	45.991	29.782	9	.000

The regression findings revealed that the behavioural factors indices are statistically significant to influence effective utilization of routine health information at P.V of 0.000 at 95% C.I. This implies changing individual behaviours towards RHIS positively increase routine health information utilization in decision making.

In support of the study finding, the district key informant was quoted as saying:

"Routine Health Information System and it key components is understood by health workers as a special duty that needs specialized professional employed specifically for data management and use, this attitude and belief affects the quality of data and its management for use."

The findings indicate that major gaps exist in private health facilities culture of information use in strengthening individual behaviours in promoting routine health information use at all levels. Therefore from these study findings, behavioural factors significantly influence effective routine health information utilization. This implies that to ensure effective utilization of the routine collected health information, much as all behavioural factors significantly influence the

dependent variable, emphasis should be focused on the individual customs, Health Information System tasks and attitudes which eventually promote change in individual beliefs and values attached to information use.

4.6. Organizational determinants' influence on effective utilization of routine health information

This part of the study intended to determine how organizational context supports and value for data collection and use, nearly impossible to make links among health data, health information, and health action. Therefore the study used the organizational factors such as culture of information use, resource availability, governance, information processing, planning and supervision to determine their influence on the utilization of routine health information in the private health facilities in Kampala.

The study interviewed frontline health workers, health facility managers/directors and district and division health teams using relevant tools with questions related to the above variables on influencing routine health information utilization. Respondents gave responses depending on their understanding on how these factors influence their ability to use their routine collected health information.

The findings highlighted here demonstrate the result of responses from the questionnaire, KI discussions and observed organizational indicators for information utilization.

Table 4. 14: Organizational determinants' influence on utilization of routine health information

Independent variables	Mean	Strongly disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
		N (%)	N (%)	N (%)	N (%)	N (%)
Culture of information	3.7	1 (1)	6 (5)	25 (22)	76 (67)	6 (5)
Supervision	3.64	0 (0)	6 (5)	42 (37)	53 (47)	13 (11)
Resource availability	3.68	5 (4)	7 (6)	37 (33)	35 (31)	30 (26)
Governance	3.57	0 (0)	5 (4)	46 (41)	56 (49)	7 (6)
Information distribution	3.67	1 (1)	5 (4)	37 (32)	59 (52)	12 (11)
Planning	3.68	1 (1)	8 (7)	35 (31)	53 (46)	17 (15)
Organizational factors index	3.72	0 (0)	5 (4)	29 (26)	73 (64)	7 (6)

The findings indicate that, on average, 70% of the respondents agreed that the composite organizational factors index at a mean value of 3.72 influence utilization of routine health information, but only 6% of these strongly agreed. Table findings also indicate that, on average, over 50% responses agreed that all organizational variables have influence on routine health information utilization.

On average, 72%, with a mean value of 3.7 of the respondents, agreed that organizational culture of information influenced routine health information use; but only 5% strongly agreed. On average, 61%, 63%, 58%, 57% and 51% of the respondents agreed that planning, information

distribution, supervision, resource availability and governance respectively influence routine health information utilization. However, majority 26%, 15%, 11% and 11% strongly agreed in their response to resource availability, planning supervision and information distribution. This implies that much as promotion of information enhances information use, planning and availability of resources are very critical to facilitate key processes of HIS like supervision, information distribution and capacity building.

Table 4. 15: Correlation of organizational determinants and effective utilization of routine health information

Study Variables	Culture of information use	Supervision	Resource availability	Governance	Information distribution	Planning	Organizational factors
Culture of information use	1	.557(**)	.424(**)	.480(**)	.534(**)	.469(**)	.705(**)
Supervision	.557(**)	1	.463(**)	.509(**)	.545(**)	.647(**)	.682(**)
Resource availability	.424(**)	.463(**)	1	.496(**)	.447(**)	.375(**)	.577(**)
Governance	.480(**)	.509(**)	.496(**)	1	.475(**)	.557(**)	.713(**)
Information distribution	.534(**)	.545(**)	.447(**)	.475(**)	1	.559(**)	.674(**)
Planning	.469(**)	.647(**)	.375(**)	.557(**)	.559(**)	1	.739(**)
Organizational factors index	.705(**)	.682(**)	.577(**)	.713(**)	.674(**)	.739(**)	1
Dependent variables	.349(**)	.451(**)	.376(**)	.466(**)	.453(**)	.601(**)	.525(**)

** **Correlation is significant at the 0.01 level (2-tailed).**

The Pearson correlation analysis indicates that organizational factors indecies have a high positive correlation of 0.525 with a P.V of 0.000 at 95%. All organizational factors have

statistically significant correlation with each other and the dependent variable (effective utilization of routine health information).

Further examination of the power of individual variables correlation indicates organizational planning having the highest positive correlation of 0.601, followed by governance 0.466 and supervision at 0.451 all with Value of 0.000 that is statistically significant at 95% C.I. This means that organizational management systems that integrate HIS functions at leadership and planning level influence other HIS processes and culture like supervision, resource allocation, information distribution and use at all levels.

This correlation analysis results relates to the statement made by two of the KI informants that:

> "We only need management support for RHIS in terms of providing resources to support quality data collection like training staff, supervision, routine demand for data and information and provision of feedback on performance routinely." Said the health facility in charge.
>
> "We have all the necessary IT computer system for each department and trainings have been done on how to use the equipment to collect, analyses and share data but still routine data management process and use has remained a challenge. Even reports are hardly got on time, need pressing and reminding throughout. "Mentioned by one of the facility director.

The findings seem to mean that internal organizational environment through good governance, planning, resource allocation and supervision matters a lot in promoting culture of HIS

functionality by influencing behaviour values attached to data collection and use for decision making.

A head of department said,

> "Data management is a very essential area in improving health services management, without this there no way performance can be improved. There is need to have management support in planning for HIS, build capacity and strengthen systems that promote a culture of routine data collection and management for evidenced decision making other than financial audits. Being a private for profit organization does not mean we should not have data, the issue of money first then data has affected health care improvement."

Relating to the above statement, most private health facilities' managements were reported putting much emphasis on financial management and profits, with less focus on quality data collection and use for service improvement. One of the directors of a private health facility was quoted as saying,

> "Effective routine health information system requires heavy financial investment that involves staff training and with high attrition rate, retraining plus computer systems which provides no benefits for a profit making organization."

This implies that facility managements believe that RHIS is only by computerized system which an expensive venture that has no value addition to private health service providers and hence the value attached to data collection and use by management limiting the support and functionality of RHIS.

The interviews and discussions with Key Informants also indicate that management planning for the integration of HIS functions promotes a culture of information use and this requires management appreciating the benefits attached to quality data and information in decision making for quality health service delivery in addition to the profit margin benefit. This is reflected in the statement by one KI reported saying:

> "Health facility management planning for RHIS plays a key role in promoting and sustaining the quality of evidence-based decisions with clearly stipulated vision and systems of data capture, management and use."

Table 4. 16: Multinomial regression analysis of behavioural determinants against utilization of routine health information

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	30.578(a)	0	0	.
Organizational factors	62.221	31.644	9	.000

From the regression analysis table above, organizational determinants (factors) were found to have a statistically significant positive impact on effective utilization of routine health information in private health facilities of probability value of 0.000 at 95% C.I.

This implies to improve routine health information utilization, institutionalization of information use for evidence-based decision making through clear HIS roles and attached value by managers motivates individuals to change their behaviour to make use of information.

Findings from the observation revealed that facilities that had organizational supportive HIS systems for culture of information use like HIS mission and vision, clear roles and responsibilities relating HIS, information sharing and feedback meetings, HIS guidelines and policies were found more likely to use routine information in decision making. This is because in these health facilities, staff were supported in terms of training on IT and use of computer to analyse data, management demand for data and information, supervision of staff and existence of quality improvement teams that facilitate data use for service improvement. This observation is supported by one of the health workers quoted as saying:

"With our boss, each department is empowered to make decisions provided it is based on the guidance by routinely analyzed data and other technical staff support…. All staff have access to information and reports regarding performance and actions taken to improve."

Table 4. 17: Comparison of the predictive contribution of the three independent variables to effective utilization of routine health information

Independent Variables	Model Fitting Criteria	Utilization of Health Information		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	33.220(a)	.000	0	.
Technical determinants	39.124	5.904	4	.206
Organizational determinants	56.668	23.448	4	.000**
Behavioural determinants	43.741	10.521	4	.033*

*Statistically significant

Findings indicate that organizational and behavioural factors have a high statically significant contribution to effective utilization of routine health information than the technical factors. At 95% C.I, organizational factors have greater influence on utilization of routine health information with a high statistically significant score value (P.V=0.000 compared to other independent variables: behavioural (P.V= 0.033, at 95% C.I) and technical factors (P.V=0.206.95% C.I). This means that technical factors alone are less likely to statistically influence the utilization of routine health information in the private health facilities.

Furthermore, the study interviews found out that the majority of these private health facilities prioritize performance indicators on profit margin, and only a few support HIS functioning in data collection (HMIS) tools and reporting and support for health workers training in HIS is done through Implementing Partners supporting MOH, as well continuous medical education and mentorship sometimes influenced through the implementing partners.

Therefore the hypothesis test of the variables' contribution to utilization of routine health information in private health facilities depicts that organizational and behavioural factors have greater statistically significant contribution compared to technical factors. The technical variable indices are not statistically significant to influence health information utilization in private health facilities as predicted by the study findings.

Table 4. 18: Correlation between independent variables (the determinants) and dependent variable (effective utilization of routine health information)

Variables	Technical determinants	Organizational determinants	Behavioural determinants	Dependent Variable (Effective utilisation of routine health information)
Technical determinants	1	.208(*)	.143	-.019
Organizational determinants	.208(*)	1	.369(**)	.525(**)
Behavioural determinants	.143	.369(**)	1	.441(**)
Dependent variable	-.019	.525(**)	.441(**)	1

*** Correlation is significant at the 0.05 level (2-tailed).**

**** Correlation is significant at the 0.01 level (2-tailed).**

Pearson correlation model of analysis indicated that organizational determinants have a positive statistically significant relationship with other independent variables. The analysis revealed that organizational and behavioural determinants have a statistically strong and positive correlation at a P.V of 0.01. This means that organizational systems have influence on the technical and behavioural functions to promote the culture of information utilization in decision making. This is because organizational context influences RHIS users through organizational rules, values, and practices, and provides technical support in terms of capacity building, resource allocation and support supervision with demand for quality data. The findings further indicated that technical determinants have no direct statistically significant relationship with behavioural determinants as well to the effective utilization of routine health information; but technical determinants showed a positive statistically significant correlation with organizational determinants. These findings imply that strengthening organizational systems for RHIS has a significant effect on other independent variables impacting on routine health information utilization.

Table 4. 19: Multinomial regression analysis of independent variables (determinants) against the dependent variable (effective utilization of routine health information)

Independent Variables index	**Model Fitting Criteria**	**Utilization of routine health information**		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	50.429(a)	.000	0	.
Technical determinants index	63.315(b)	12.885	9	.168
Organizational determinants index	86.754(b)	36.324	9	.000
Behavioural determinants index	68.035	17.605	9	.040

The multinomial regression results revealed that organizational and behavioural determinants have positive statistically significant influence on the dependent variable than technical determinants that are non-statistically significant. Organizational determinants index has a greater statistically significant relationship with P.V of 0.000 at C.I 95% influence on effective utilization of routine health information in the private health facilities than other independent variables. These findings imply that organization systems that support a culture of information greatly influence the effective utilization of routine collected data and information for evidence-based decision making.

Figure 4. 1: Showing observed indicators for utilization of Routine Health Information

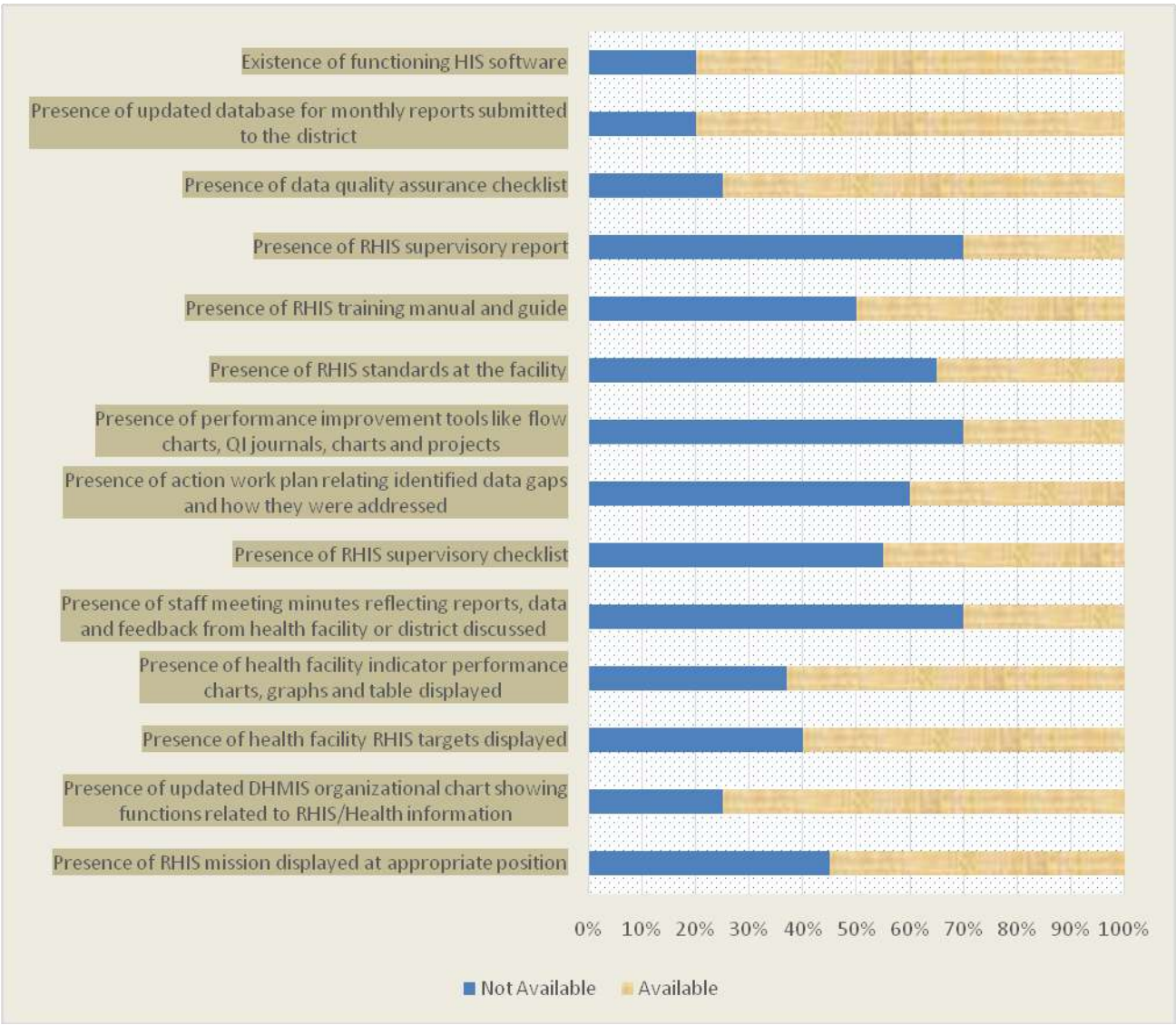

Figure 4.1 above shows that over 50 % of the private health facilities had no organizational indicators (Presence of RHIS mission displayed at appropriate position; presence of updated DHMIS organizational chart showing functions related to RHIS/Health information; presence of health facility RHIS targets displayed; presence of health facility indicator performance charts; graphs and tables displayed; presence of staff meeting minutes reflecting reports; data and

feedback from health facility or district discussed; and, presence of RHIS supervisory checklist) to support utilization of routine health information . 70% of the studied health facilities had functioning HIS software, update with monthly reports and data quality assurance checklist available though not routinely used to assess data quality. However less than 50% of the sites demonstrated use of data through QI action plans, QI journals and performance charts. Further analysis indicated that those health facilities that had HIS mission, updated DHMIS organizational chart showing functions related to RHIS/Health information, targets displayed and RHIS supervisory checklist and data quality assurance in use, had QI action plans, performance graphs displayed and QI journals and projects updated. This indicated technical ability to manipulate data into information for decision making. This observation related to the findings that organizational factors were more statistically significant to influence the utilization of routine health information through promotion of a culture of understanding and appreciating data collection and use.

CHAPTER FIVE

SUMMARY, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the findings, conclusions and recommendations regarding the study findings. This chapter is also arranged according to the study objectives

5.2 Summary of the findings

5.2.1 Technical determinants and their influence on effective utilization of routine health information

The study findings revealed that technical determinants are less likely to influence the effective utilization of the routine health information in the private health facilities. There is no statistical significant relationship between technical determinants and effective utilization of routine health information (a P.V of 0.577, at 95% C.I.).

5.2.2 Behavioural determinants' influence on effective utilization of routine health information

The study findings indicated that the behavioural determinants composite index of all behavioural factors statistically influence the effective utilization of routine health information in the private health facilities at 95% C.I with P.V of 0.000. However, analysis of the statistical significance contribution of individual behavioural factors revealed that individual Health Information (HIS) Tasks and customs have greater statistically significant contribution than other variables (0.000, 0.028 respectively at 95% C.I). This indicates that individual understanding and appreciation of the HIS tasks and attached values builds confidence to among officials and staff to perform their HIS

roles and responsibilities, which significantly influence how the routinely collected data can be effectively and appropriately utilized.

5.3 Organizational determinants' influence on effective utilization of routine health information

The organizational determinants composite index indicated that all organizational factors significantly influence the effective utilization of routine health information in the private health facilities (P.V = 0.000, 95% C.I). However, planning has a high statistically significant influence among all the organizational variable complex index of P.V = 0.013, 95% C.I). This implies to statistically have a significant organizational influence on effective use of routine health information, planning for integration of RHIS is very critical to ensure resources are catered for to reinforce and support health facility good governance, information culture and information processing systems.

5.4 Discussion of findings

The findings are discussed according to the objectives of the study

5.4.1 Technical determinants and effective utilization of routine health information

The findings indicated that there is a negative less statistically significant relationship between technical determinants and effective utilization of routine health information.

The majority of the respondents reported that lack of trainings in IT computer software, data management, use of new HMIS tools and not understanding standard indicators limited the routine use of health information. The respondents strongly believed that not understanding how to use the tools limits the use and the quality of data collected, hence limiting its use in decision making. This is consistent with Saurborn (2006). Lack of IT skills limited their ability to make use of the advanced computer systems to manipulate data into useful information. Because of lack of training and not appreciating the importance of routine health information system, staff have limited cognizance of the value attached to data collection and use as reported by one of the respondents. This is consistent with Aquil (2009) in his study in Uganda that suggested that data analysis, communication and access and understanding specific user needs need to be improved to support information use. This still relates to staff appreciating why they are collecting data to have value attached to the process of collecting quality data and getting feedback on the performance relating HIS activities.

This is consistent with Saurborn's (2000) findings that complexity of IT system design is the most important technical factor that affects routine health information utilization in private health facilities is as a result of hiring external consultants to design and frame the system for data entry without training the end user on how to use the computer system to enter data, analyze and

interpret it for use in decision making. This is supported by Boone (2013) that complexity of data management system where health workers are not trained how to use the system, affects data quality and use as usually data is spoilt and poorly managed when manually collected and analyzed for interpretation and use in decision making.

Also in the study, the majority of the KIs supported training in IT complexity and data management, information use as it improves the ability to manipulate data easily improving the use of health information in the format that can be easily interpreted by the users. This is based on upgrading staff technical skills, improving data design systems and revamping the technology to improve availability of timely quality data, which must be reinforced with management support to motivate staff in the utilization of health information. This is in line with findings from a study in Uganda private health facilities that revealed that synthesized data in different forms related to the needs of the users increased access and utilization as data users had different information needs in terms of complexity for decision making (Davies, 2011).

Furthermore, though most respondents said lack of training limited routine information use, observational findings revealed that even in those facilities that have trained staff in IT and access to advanced computer software that can easily manage data into useful information, evidence-based decision making was minimum. Some of these health facilities had no documented indicators for data use, and only used their system as database for client details and generating financial reports. This implies that not only having the technical expertise in IT and software but also understanding the importance of routine data facilitates value attached to data collection and use. To counteract this finding, private health systems need to promote and incentivize a culture of information by ensuring

that all personnel within the facilities are trained and aware of their duties in supporting routine health information system.

Further study findings indicated that low skills level in data management and interpretation and use of information is also consistent with the findings that very few respondents could at least describe reasons for collecting data. Most respondents reported collecting data mainly for reporting.

To counteract the major study findings, private health systems need to promote and incentivize a culture of information by ensuring that all staff within the facilities are trained and aware of their duties in supporting routine health information system. More importance should be placed on why data should be collected than on how.

Much as the study findings suggest that the technical determinants are statistically not significant to influence utilization of routine health information, these technical factors have positive correlation with each other affecting data management and use in decision making. Training of staff to appreciate the importance of HIS, data collection, analysis and interpretation would increase routine health information utilization and this is supported by Stedman (2011). However, the overall hypothesis stands that technical factors do not significantly influence routine health information utilization in the private health facilities.

5.4.2 Behavioural determinants and effective utilization of routine health information

To answer this research question, the researcher asked respondents several questions and study findings indicated that there is a relationship between behavioural determinants and effective utilization of routine health information. The study revealed that individual Health Information (HIS) Tasks and customs have greater statistically significant influence with P.V of 0.000 and 0.028

respectively at 95% C.I. This indicates that individual understanding and appreciation of the HIS tasks and attached value builds confidence to perform their HIS roles and responsibilities, which significantly influence how the routinely collected data can be effectively and appropriately utilized.

The study further found out that individual customs towards effective routine health information utilization has a more significant positive correlation with HIS tasks, meaning that staff clarity and awareness of their HIS roles and benefits relates to the custom or information culture of the health facility.

This indicates that individuals' understanding and appreciation of the HIS tasks and attached value builds confidence to perform their HIS roles and responsibilities, which significantly influence how the routinely collected data can be effectively and appropriately utilized.

The findings are consistent with similar study findings by Chaled and colleagues (2013) that confidence to undertake HIS tasks provides individual feel and ability to check data quality, interpret it and use information for decision making. This finding highlights the need for private health facilities to have systems that clearly support individual staff roles and responsibilities to stimulate customs and culture that attach value on information use.

Other individual behavioural factors (values, attitudes and beliefs) were found to have low statistical significant contribution on effective utilization of routine health information but are more reinforced in the organizational context that supports and values the data collection and use to influence individual beliefs, values and attitudes towards information use.

The findings are consistent with Kamadjeu (2005) and colleagues' finding that shared values related to information systems are eluded from the pre-existing organization information culture on data

collection and use. Therefore understanding collective values related to RHIS processes and tasks creates opportunities' in promoting values conducive to RHIS tasks and lead to information utilization for better performance

Majority of the respondents in the private health facilities reported lack of motivation in terms of understanding the need to routine collect data that is not relevant to the directors and management. It was reported that only management requires staff to submit monthly report to the district with major focus on the financial targets and this is supported by Rotich (2003) study which revealed that limited knowledge of the usefulness of RHIS data was found to be a major factor in low data quality and information use. Health workers' attitudes towards data collection as a useless activity, were noted as individual behaviours influenced by the organizational culture on RHIS which translates to individual value and motivation attached to routine health information responsibilities in line with organizational RHIS mission and goal to make use of routine data (Rotich, 2003).

Similar findings by to Dumont and colleagues (2012) which found that health facility manager were able to complete only one-third of their HIS tasks because they did not understand why they were collecting it and this affected its utility.

In further study findings, respondents reported laziness and unwillingness of staff to routinely fill and update data collection tools which affected the availability and timeliness of quality data for decision making. This was because staff could not appreciate the importance and value attached to HIS tasks like routine data collection and use where there was no demand for data.

According to WHO (2007), understanding why some data/information is collected illustrates the level of data demand for information. There is empirical evidence that people perform more those behaviours that are meaningful and have value for them.

This is similar to the study respondents who reported laziness and staff unwillingness to routinely fill and update data collection tools which affects availability of quality and timely data for decision making. Lack of teamwork, lack of staff meetings and feedback to the staff on the health facility performance and progress were also reported as undermining continuity in collecting routine health data in some of health facilities.

This is consistent with findings of Boone (2013) that coordination and organizational performance by management and teamwork with functional feedback in the health care system have impact towards utilization of routine health information in private health facilities.

These findings demonstrate how the organizational systems towards information use facilitate individual beliefs and attitudes regarding data collection and information use for decision making. They also highlight the role of organizational context in sharpening and promoting individual behaviour towards routine data and information collection, management and use through clear defined and stipulated RHIS roles and responsibilities.

Therefore understanding collective values related to RHIS processes and tasks creates opportunities in promoting values conducive to RHIS tasks that lead to information utilization for better performance.

Therefore the study findings agree with the hypothesis that behavioural factors significantly influence effective utilization of routine health information use in private health facilities.

5.4.3 Organizational determinants and effective utilization of routine health information

It was revealed that there is a relationship between organizational determinants and effective utilization of health information.

Study findings revealed that respondents believe that once health facility management emphasized and showed the importance of routine health information, other HIS functions would be smoothly implemented and information effectively utilized. This is because people in an organization perform tasks and behaviours which they believe are valued and promoted by the organization (Jutand, 2000). This means that activities for promotion of a culture of information use are important organizational determinants. This is promoted by different activities such as communication of targets, directives to use information, sharing success stories and advocacy by using HIS information.

Furthermore, the findings indicate that planning, information culture and resource availability were highly rated to determine information utilization in the private health facilities.

The study findings revealed that to effectively implement integration of the HIS function, the organization planning for resources with efficient and effective distribution is very critical to facilitate the HIS activities in the private sector. In this context of planning, it was revealed that the health facility management needs to ensure that resources like finance to procure IT complexity equipment, recruiting and training of staff in data and information collection, management and interpretation as well putting systems in place to monitor and evaluate RHIS performance against the set targets and objectives.

The findings are consistent with Gopalan (2013) and Chaled and colleagues (2013), who found out that planning for HIS financing, human resource and infrastructure development for data collection, reporting and analysis improves data availability, quality, dissemination and use for decision making. They emphasized the use of advanced ICT and training of human resources in simplifying data collection and management process for use in decision making than use of paper manual data management system.

Furthermore, the study revealed that private health facilities fear to finance HIS as directors believe that it is a very expensive venture with no profit benefit. This is because of limited understanding and appreciation of the role of HIS in quality health service delivery by private health facilities management. Similarly, during document review, it was observed and reported that most health facilities had no financial plan that catered for HIS.

Further, the study revealed that in health facilities that had management support for HIS, routine information use was evident with availability of indicators like graphical performance charts displayed on notice boards or walls, presence of quality improvement project journals and action plans, staff meeting minutes and filed feedback reports. The staff in these facilities demonstrated use of computer software to analyse and interpret information for decision making. These facilities also had RHIS mission, DHMIS organizational chart specifying RHIS functions and RHIS targets displayed on the walls demonstrating organization culture on effective utilization of routine data for decision making to improve quality of services.

During the study, it was also found that those facilities that cited lack financial muscle to invest in RHIS on reports that it was highly costly in terms of installation in addition to recruiting and training technical staff responsible for data analysis and presentation, also lacked RHIS structure

management, budget for HIS and information culture to spearhead information utilization in the facilities.

The above findings are consistent with Liveppeveld (2000) and others in their study findings that if senior management provided the resources (finance, training materials, reporting forms, computer equipment, etc.) and developed organization rules (RHIS policies, data collection procedures, etc.) the information system would be used and sustained.

This implies that health facility good governance and leadership that support information culture through planning for RHIS system, promote the value of evidence-based decision making, information use norms and standards with respect to data quality that directly influence information use.

The findings above are consistent with Copalan (2013), who notes that resources in terms of financial and human resource have a major influence on the effective utilization of routine health information in the private health facilities as these facilitate technical data collection, oversight of data quality and standard and ensure appropriate analysis and utilization for decision making.

Further study identified that health facility good governance and leadership builds teamwork with clear organizational vision and mission for information use. It was noted that facilities that demonstrated good governance and leadership in terms of HIS policies and routine health information use had functional quality improvement teams with updated documented journals, filed departmental and health facility meeting minutes indicating action plans and responsible persons, staff understood their HIS roles and responsibilities relating data management and processing for decision making. Good governance for HIS was also reflected in technical support and ability by

staff to take action with confidence to ensure appropriate action for improvement as mentioned by one of the clinical head of a section.

Consistently, Jutand (2000) also found that clear policy framework on legal and regulatory context of organizational health information and how it is generated, exchanged and shared, promoting programme monitoring and accountability has an influence on routine health information utilization in the private health facilities.

The study found that information distribution and sharing was limited as the only data collected was used for reporting to the district. Facilities that had information culture systems supported CQI and staff meetings where information was shared on computer software and displayed in form of graphs, charts and quality improvement action plans developed. In facilities that lacked management HIS support systems, information was not shared and majority of the health workers reported having no access to computer and even not knowing how to use the computer to access the health data or information.

These findings are consistent with Chaled and colleagues (2013), that availability, access to quality data and dissemination and use of health-related data can be radically improved by ICT

The study findings revealed that an organization creates a culture information use by promoting and sustaining certain values around organization functions to be performed at all levels.

Most respondents believe that the Ministry of Health promotes the culture of information use with emphasis on quality data, promotes use of HIS information system, problem identification, feedback and reporting; but reported limited support by health facility management in promoting culture of information use and supervision by MOH. They believe that MOH training health facility managers

to understand and appreciate the value of routine HIS functions, would translate into promotion of information culture through planning and demand for quality data and information use. This will change the individual behaviours and values attached to data collection, processing, interpretation and use for decision making.

The studies by Sauerborn (2000) and Boone (2013), in support of the findings on the role health facility management and district health offices to promote culture of information use, also believe that building capacity of the district health team in supervision, leadership and management skills reinforce quality of data and effective utilization of routine health information in low private health facilities. However, Sauerborn (2000) noted that in public health facilities, much as managers reported providing supervisory roles, no feedback or discussion was ever done on the performance of using HIS. This indicates that routine HIS supervision and feedback on the findings by the district health team improves the value of HIS and information use promoting information culture and routine quality data collection and use. This also relates to study findings that respondents reported not willing collect data, not knowing why and who needs it and they will always find it difficult to use it.

In the study, culture of information was measured by the availability of the RHIS vision and mission statement and established organizational support systems for planning, training, supervision and financial support to ensure data and information is analyzed and often used for decision making. Health facilities that were found to have RHIS mission and RHIS management systems with staff roles and RHIS objectives well spelt out, had their routine quality data, updated tools and database, functional IT complexity software that analyze routine data and information was shared with staff, management and MOH. Monthly data quality checks with performance review meetings, feedback

and action plans with graphical performance charts were found to be displayed on the walls in all client care points including the management and waiting rooms.

In support of the above study finding, Jutand, (2000) study revealed that the level of information utilization in any organization depends on organizational culture as people tend to perform tasks and behaviours that which they believe are valued and promoted by the organization with clarity on roles and responsibilities for information use.

One of the key district KIs argued that lack of institutional support for information use may be as a result of management not understanding and appreciating the benefit attached to routine health data management. It was found out that private health facilities attach more value to the maximization of the profit margin than performance improvement and therefore need to build their capacity through training. This greatly affects planning and allocation of resources to RHIS system as well putting in place systems to ensure quality data and its effective use for decision making at all levels. The findings are consistent with the assertions of Dedan (2013).

The district KI further mentioned that there is limited technical support supervision provided by the district health sector to the private health facilities to monitor and support their HMIS on effective use of data for their own decision making for quality service delivery improvement.

Further analysis of the qualitative responses from frontline health workers and KIs revealed that inadequate human resource with high staff attrition rates in some facilities with limited information management technical skills, coupled with lack of management support for RHIS, especially with managers majorly focusing on identifying faults, financial audits without providing support for data quality management and use, greatly affects appropriate data analysis and timely use for decision

making and services improvement. The findings are consistent with the assertions of Rotich (2003), Sauerborn (2000) and Boone (2013).

Interviews with the frontline health workers respondents revealed lack of support and motivation for RHIS use where management has less interest in data quality and use for decision making. The study found out that the majority of these private health facilities prioritize performance indicators for profits, provision of data collection (HMIS) tools and encouraging timely filling, documentation and reporting. Health workers are only supported for HIS trainings through other organizations (Implementing Partners) supporting MOH, sometimes continuous medical education and mentorship by the implementing partners' agencies like USAID Uganda Private Health Support Programme.

During the study, the researcher interviewed frontline health workers and facility managers by asking questions related on how routine health information was being utilized in the private health facilities and what strategies can be implemented to improve routine health information utilization. Further, the researcher using the observation checklist assessed the indicators that demonstrated utilization of routine health information.

The study findings indicated that those private health facilities that attempted to use their routinely collected data effectively were found to have systems that supported and promoted RHIS like RHIS mission and clearly defined roles and responsibilities regarding quality data collection, information processing, sharing and reporting. These facilities were found to use their routine data and information in: reporting, forecasting supplies, monitoring diseases trends and patients, continuous quality improvement, performance and procurement of new equipment and as well income and profits.

When the staff were asked how they used the routinely collected data in the last three months, the study qualitative discussion revealed that routine health data was more used in forecasting stocking of drugs, CQI that prompted staff mentorship and coaching, improving records keeping and customer care, recruitment of new staff and supporting community outreaches to take services closer to the community.

Further, the study findings indicated that the minority of the sampled private health facilities were found to have the key indicators that demonstrated effective use of routine health information that included: availability of RHIS missions and RHIS management structure, staff minutes indicating data quality and management action plans, CQI improvement journals and monthly reports. On the other hand, majority of the other private health facilities that lacked RHIS management system were found mostly using their routine health information to submit reports to the districts, ministry of health and implementing partners, and evaluating the profit margin. The findings are consistent with the assertions of Were (2011).

Regarding factors hindering utilization of routine health information, the study's qualitative discussion with respondents and KIs agreed with the study quantitative analysis results that lack of management support and promotion of evidence-based decision making, ambiguity in information throughout the health facility, lack of technical skills in use of IT to effectively analyze data, interpret and use had effect on routine health information utilization. Respondents also reported the challenge of many ever-changing HMIS MOH tools which were tiresome to fill as greatly affecting the availability of quality of health information for decision making.

Furthermore, some respondents reported laziness and lack of interest among staff in data collection and use of information being one of the reasons for not having quality data and information.

In finding out how utilization of routine health information in the private health facilities could be strengthened, the study findings revealed that majority of the respondents suggested that strengthening and promoting the culture of information use within the internal private health facility management system to increase demand for information, routine RHIS support supervision, training of staff in use in quality data collection, processing, analysis and interpretation, and ensuring staff are motivated to continuously update data tools and use information for decision making. The findings are consistent with the assertions of Junker (2004).

This means that activities for promotion of a culture of information use are important organizational determinants. This is promoted by different activities such as communication of targets, directives to use information, sharing success stories and advocacy by using HIS information. An organization creates a culture of information use by promoting and sustaining certain values around organizational functions to be performed at all levels.

Findings revealed that health facilities that had HIS systems that promoted data quality and information use, staff were more positive in understanding their HIS tasks, with high value attached to data collection and use in decision making. The findings are in line with Were (2011).

In a similar study, Chaled and colleagues (2013) revealed that confidence to undertake HIS tasks provides individual feel and ability to check data quality, interpret it and use information for decision making.

Furthermore, most respondents believe that the Ministry of Health promotes the culture of information use with emphasis on quality data, promotes use of HIS information system, problem identification, feedback and reporting; but reported limited support by health facility management in

promoting the culture of information use and supervision by MOH. They believe that MOH training of health facility managers to understand and appreciate the value of routine HIS functions would translate into promotion of information culture through planning and demand for quality data and information use. This will change the individual behaviours and value attached to data collection, processing, interpretation and use for decision making. The findings are consistent with the assertions of Sauerborn (2000) and Boone (2013).

Further, the study findings revealed that to effectively implement the integration of HIS function in the organization planning for resources with efficient and effective distribution was very critical to facilitate the HIS activities in the private sector. In this context of planning, the health facility managements need to ensure that resources like finance to procure complex IT equipment, recruiting and training of staff in data and information collection, management and interpretation and putting systems in place to monitor and evaluate RHIS performance.

These findings demonstrated how the organizational systems towards information use facilitate individual beliefs and attitudes regarding data and information use for decision making. It also highlights the role of organizational context in sharpening and promoting individual behaviours towards routine data and information collection, management and use through clearly defined and stipulated RHIS roles and responsibilities. The findings are consistent with the assertions of Rippo (2012).

These study findings highlight the critical importance of private health facilities management in strengthening and promoting the culture of information use. Therefore the study findings agree with the hypothesis that organizational determinants influence the routine utilization of health information in the private health facilities.

5.5 Conclusions

5.5.1: Technical determinants and effective utilization of routine health information

Among the technical determinants, only IT complexity was found to optimally have a statistically significant influence on routine health information use in the private sector. The results suggest that building capacity of frontline health workers and understanding their HIS roles and responsibilities would enhance application of technical skills to analyze, interpret and use routinely collected data and information for decision making. The study results suggest that strengthening organizational and behavioural drivers for routine health information use would improve the evidence-informed and result-oriented decision making in the private health facilities.

5.5.2 Organizational determinants and effective utilization of routine health information

The study further noted that organizational planning has the most significant contribution to information use and this is demonstrated by the need for health facility management in establishing systems that support and promote routine evidence-based decision making. Organizational RHIS systems were found to influence individual HIS tasks and customs that greatly showed statistically significant influence on routine health information use in the private health facilities.

5.5.3 Behavioural determinants and effective utilization of health information

It was revealed that there is a positive relationship between behavioural determinants and effective utilization of health information. It was observed that behavioural RHIS systems were found to influence individual HIS tasks and customs that greatly showed significant influence on routine health information use in the private health facilities. Individuals' understanding and appreciation

of their HIS roles and responsibilities was found to optimally promote positive beliefs and attitudes towards information use.

5.6 Recommendations

5.6.1 Technical determinants and effective utilization of health information

To improve technical capacity for effective information utilization, the study recommends that MOH in partnership with implementing partners support

Training health workers in RHIS, information technology, complexity data management to improve their technical skills in data analysis, interpretation and use in decision making;

Continuously provide for technical support supervision and mentorship for data quality collection and information management; and

Routinely orient clinical staff on the updated MOH tools and indicators in order to facilitate collection of quality data relevant to the growth needs of the health facilities and Ministry of Health.

5.6.2 Organizational determinants and effective utilization of health information

In order improve information culture and effective utilization of routine health information, the study findings recommends:

Training of health facility management and directors in RHIS to understand and appreciate the importance of RHIS and increase demand for quality data and information during planning and monitoring purposes; Private health facility management integrate RHIS in their annual strategic planning and budgeting in order to support and motivate staff during HIS processes; Provision of

regular technical HIS support supervision and mentorship by district health team and Ministry of Health;

Review the HMIS policy to integrate private health facilities operation licence and renewal guidelines to include facility management strategic planning with RHIS component in addition to routine submission of reports to the district.

5.6.3 Behavioural determinants and effective utilization of health information

The study recommends that in order to improve individual behavioural information culture and effective information utilization in the private health facilities:

There is need for clearly outlined and understood staff HIS roles and responsibilities related to health information management and use; why they collect routine data; and provision of feedback on their routine health information system performance.

There is need to customize routine health information demand and use at all levels through health facility (HIS) policies, standard operating procedures and guidelines for data collection and use; there is need for training staff to understand and appreciate importance of RHIS.

5.7. Limitations of the Study

The study relied on primary data collected using a questionnaire and interview methods alone. The use of secondary data would have enabled triangulation of the data and enhanced the quality of data to inform the conclusions on the study. The study also focused only on technical,

behavioural and organizational determinants without looking at the management factors and existing constraints and opportunities for effective routine health information utilization. The other limitation of the study is the use of case study approach which limits the generalization of the study findings to other private health facilities in the region.

5.8. Contributions of the Study

The findings and recommendations of this study will be very useful to different stakeholders as specified below:

The findings will benefit the Ministry of Health and private health facilities as they highlight gaps within data management and use that need to be addressed in order to generate correct, relevant and accurate data from private health facilities for routine decision making, reporting strategic planning, monitoring and evaluation, and formulation of policies in order to improve health service delivery.

USAID Uganda Private Health Support Program in collaboration with MOH will use the findings of this study to come up with strategies to bridge the gaps in order to strengthen information culture and use in the private health sector.

The study findings will add new concepts and knowledge to the existing body of knowledge of effective information utilization in the private health sector. The study findings will provide up-to-date literature to academicians who may wish to carry out similar or related studies. The study findings should stimulate further research in health information utilization.

5.9. Areas for further research

There is need to carry out a research on:

Management factors affecting effective utilization of health information;

Constraints and opportunities for effective utilization of health information.

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APPENDICES

APPENDIX I: QUESTIONAIRE

Dear Sir / Madam,

Abias Katesigwa Asiimwe a student of Uganda Technology and Management University (**UTAMU**) working on his dissertation for an award of Masters of Project Monitoring and Evaluation

This study is about the Determinants of Effective Routine Utilization of health information in Private Health Facilities in Kampala district. The information you will give is purely for academic purposes and will be treated with confidentiality.

Your participation is purely voluntarily and has no monetary value

The report produced will be intended mainly for academic purposes shared with the University and Kampala district health office to understand the constraints in data-information use for decision making to support the design for appropriate interventions.

Thanks for taking 20 Minutes and answering the questionnaire

Are you willing to participate? ☐ Yes ☐ No

SECTION A: BACKGROUND INFORMATION

The section below you to tick the most appropriate option that best describes you for faster compilation in this inquiry.

1. Age of the respondent

a) 20-29 ☐

b) 30-39 ☐

c) 40 and above ☐

2. Gender of respondent

(a) Male ☐ (b).Female ☐

3. Religion of respondent

a) Islam ☐

b) Catholic ☐

c) Protestant ☐

d) Seventh day ☐

e) Others specify……

4. Department/Division of affiliation

a) Clinical department ☐

b) Dispensary ☐

c) Maternity ☐

d) Administration ☐

5. Level of education

a) Certificate ☐

b) Diploma ☐

c) Degree ☐

d) Post graduate ☐

e) Masters ☐

f) Doctorate ☐

6. What is your Job Title?

a) Nurse ☐

b) Doctor ☐

c) Biostatistician ☐

d) Administrator/In-charge ☐

e) Laboratory technician ☐

7. For how long have you been at the this facility

a) Less than 1 year ☐

b) 1-5 years ☐

c) 6-10 years ☐

d) 11+ years ☐

SECTION B: INDIPENDENT VARIABLES

I would like to know your opinion how you agree with statements. There is no right or wrong answer only express your opinion using the Likert scale; 1-Strongly Disagree, 2 Disagree, 3-Neither Agree or Disagree, 4-Agree 5-Strongly agree.

Please be open and flank to choose the answer honestly

TECHNICAL DETERMINANTS

CODES	**8. Indicate your level of agreement on the following statements regarding how technical factors influence the utilization of Routine health information in the private health facilities.**					
00	**Statement**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
TF1	Health information users have good knowledge to effectively use routine health data-information	**1**	**2**	**3**	**4**	**5**
TF2	Health information users have good information technology skills to effectively use data –information in in decision making	**1**	**2**	**3**	**4**	**5**
TF3	The system design used in data management is user friendly	**1**	**2**	**3**	**4**	**5**
TF4	Information systems of data entry are designed by external consultants hence difficult for the health workers who are responsible for daily routine entry	**1**	**2**	**3**	**4**	**5**
TF5	Most health information systems require employment of special personnel for entry of data special skills	**1**	**2**	**3**	**4**	**5**
TF6	The complexity of RHI systems makes it hard for health workers to utilize the system	**1**	**2**	**3**	**4**	**5**
TF7	Use of manual paper files recording makes information spoilt hence poorly managed for use	**1**	**2**	**3**	**4**	**5**
TF8	Some of the software for running the system of data management are also scarce, expensive and complex.	**1**	**2**	**3**	**4**	**5**
TF9	Lack of coordination with poor system design	**1**	**2**	**3**	**4**	**5**
TF10	The competence of health information system operators to manage data quality	**1**	**2**	**3**	**4**	**5**
TF11	The needed health information data is not readily available for the targeted information products that respond to specific data users'	**1**	**2**	**3**	**4**	**5**

TF12	Incomplete data	**1**	**2**	**3**	**4**	**5**
TF13	Poor quality data	**1**	**2**	**3**	**4**	**5**
TF14	Late data presented	**1**	**2**	**3**	**4**	**5**
TF15	No data presented	**1**	**2**	**3**	**3**	**5**
TF16	Poorly data -information presented	**1**	**2**	**3**	**4**	**5**
TF17	Provision of feedback to health information/record management team	**1**	**2**	**3**	**4**	**5**
TF18	Provision of feedback to data collectors routinely done at all levels	**1**	**2**	**3**	**4**	**5**
	Lack of skills among health workers in the following;					
TF23	Many data collection registers to be filled by one health worker for one particular client visit	**1**	**2**	**3**	**4**	**5**
TF24	Staff not oriented through the use of data collection tools	**1**	**2**	**3**	**4**	**5**
TF25	Data collection tools hard to use due to inadequate space to write in all the information	**1**	**2**	**3**	**4**	**5**
TF26	Standard health indicators NOT well understood to the facility	**1**	**2**	**3**	**4**	**5**
TF27	Facility Indicators targets displayed accessible to all staff at the facility	**1**	**2**	**3**	**4**	**5**
TF28	Monthly indicator performance discussed to assess progress	**1**	**2**	**3**	**4**	**5**

9. What other technical challenges do face in trying to utilization of Routine Health Information decision making in the facility?

……
……

ORGANIZATIONAL DETERMINANTS

10. Indicate your level of agreement on the following statements regarding how organizational factors influence the effective utilization of Routine health information in private health facilities						
	Statement	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
	RHIS users work in an organizational context, which influences their information use through;					
OF9	Routine health information compilation supervision	**1**	**2**	**3**	**4**	**5**
OF10	Access to timely reporting	**1**	**2**	**3**	**4**	**5**
OF11	Timely feedback on routine health information	**1**	**2**	**3**	**4**	**5**
OF12	Tedious expensive data management processes to reporting often result in decision making without information in put	**1**	**2**	**3**	**4**	**5**
OF13	The level of culture of information use of a health facility is very low to facility evidenced based decisions	**1**	**2**	**3**	**4**	**5**
OF14	Well streamlined Health information system policies	**1**	**2**	**3**	**4**	**5**
OF15	State of health information structures in information use	**1**	**2**	**3**	**4**	**5**
OF16	Regular staff meetings to review action plans on decisions	**1**	**2**	**3**	**4**	**5**
OF17	Performance indicator information display to monitor progress in different forms	**1**	**2**	**3**	**4**	**5**
To what extend do you agree with following statements on influencing information use at organizational level ; whether Decision making is based on;						
OF18	Seek feedback from staff	**1**	**2**	**3**	**4**	**5**
OF19	Emphasize data quality in regular reports	**1**	**2**	**3**	**4**	**5**
OF20	Promote culture of data use	**1**	**2**	**3**	**4**	**5**

OF21	Explain what they expect from staff	**1**	**2**	**3**	**4**	**5**
OF22	Share data with other stakeholders	**1**	**2**	**3**	**4**	**5**
OF23	Staff are aware of their responsibilities	**1**	**2**	**3**	**4**	**5**
OF24	Staff are trained in data management and use	**1**	**2**	**3**	**4**	**5**
OF25	Rely on data for planning, setting targets and monitoring	**1**	**2**	**3**	**4**	**5**
OF26	Discuss conflicts openly and resolve them	**1**	**2**	**3**	**4**	**5**
OF27	Check data quality at the facility regularly	**1**	**2**	**3**	**4**	**5**
OF28	Provide regular feedback to the staff through regular report on evidence	**1**	**2**	**3**	**4**	**5**
OF29	Report on data accuracy regularly	**1**	**2**	**3**	**4**	**5**
OF30	Staff are reward for their good work	**1**	**2**	**3**	**4**	**5**
OF31	Display data for monitoring their target performance	**1**	**2**	**3**	**4**	**5**
OF32	Use HMIS data for day to day management of the facility	**1**	**2**	**3**	**4**	**5**
OF33	Gather data to find route cause of the problem	**1**	**2**	**3**	**4**	**5**
OF34	Can develop appropriate criteria for solving the problem	**1**	**2**	**3**	**4**	**5**
OF35	Staff are empowered to make decisions	**1**	**2**	**3**	**4**	**5**
OF36	Staff admit mistakes and make corrective actions	**1**	**2**	**3**	**4**	**5**
OF37	Are able to say no superior, colleagues for demands and decisions	**1**	**2**	**3**	**4**	**5**
OF38	Are accountable for poor performance	**1**	**2**	**3**	**4**	**5**
OF39	Use HMIS data for education and community mobilization	**1**	**2**	**3**	**4**	**5**
OF40	Can develop particular targets for interventions	**1**	**2**	**3**	**4**	**5**
OF41	Can evaluate whether they have achieved their targets	**1**	**2**	**3**	**4**	**5**

11. In your own opinion what other organizational factors influence the effective utilization of Routine health information use in this facility

……

12. How does your health facility support having the necessary information to make decisions?

……

13. How does your health facility support prioritization and use of information?

……

14. How does your facility support staff in training in the use of information for decision making?

BEHAVIORAL DETERMINANTS

15. Indicate your level of agreement on the following statements regarding how behavioral factors influence the utilization of Routine health information.						
	Statement					
BF1	RHIS users demand for information	**1**	**2**	**3**	**4**	**5**
BF2	Confidence to use the generated information by HIS management team	**1**	**2**	**3**	**4**	**5**
BF3	Staff competence to perform their HIS tasks	**1**	**2**	**3**	**4**	**5**
BF4	Poor attitude toward data collection	**1**	**2**	**3**	**4**	**5**
BF5	Belief that RHIS data is useless	**1**	**2**	**3**	**4**	**5**
BF6	Lack motivating incentives to staff during data management team	**1**	**2**	**3**	**4**	**5**
BF7	Customized to patients treatment not collecting data	**1**	**2**	**3**	**4**	**5**
BF8	. Collecting information that adds no value irritates me	**1**	**2**	**3**	**4**	**5**

To what extend do you agree with following on influencing information use; using the scale 1-5 below on how individual behavior influence Decision making is based on						
	Individual /personal level					
BF9	Personal Liking	**1**	**2**	**3**	**4**	**5**
BF10	Superior directive	**1**	**2**	**3**	**4**	**5**
BF11	Cost consideration	**1**	**2**	**3**	**4**	**5**
BF12	Comparing data with strategic objectives /indicators	**1**	**2**	**3**	**4**	**5**
BF13	Evidence /facts	**1**	**2**	**3**	**4**	**5**
BF14	Health needs	**1**	**2**	**3**	**4**	**5**
BF15	Data collection makes one bored	**1**	**2**	**3**	**4**	**5**
BF16	Data collection meaningful to me	**1**	**2**	**3**	**4**	**5**
BF17	Collecting data gives me feeling that it is for planning and monitoring performance	**1**	**2**	**3**	**4**	**5**
BF18	Document their activities and keep records	**1**	**2**	**3**	**4**	**5**
BF19	Feel committed in improving health status of the targeted community	**1**	**2**	**3**	**4**	**5**
BF20	Set appropriate targets do able of their performance	**1**	**2**	**3**	**4**	**5**
BF21	Feel guilty of not accomplishing their targets and performance	**1**	**2**	**3**	**4**	**5**
BF22	Collecting information not used for decision making is discouraging	**1**	**2**	**3**	**4**	**5**
BF23	Collecting information gives me feeling data is needed for monitoring facility performance	**1**	**2**	**3**	**4**	**5**
BF24	Collecting information gives a feeling that is forced on me	**1**	**2**	**3**	**4**	**5**
BF25	Collecting information is appreciated by the co-workers and supervisors	**1**	**2**	**3**	**4**	**5**

BF26	Understand and appreciate my roles and responsibilities regarding health information management	**1**	**2**	**3**	**4**	**5**

16. Mention other behavioral factors and how you think influence the effective utilization of Routine health information?

……

17. Describe three reasons for collecting data on routine and monthly basis

……

18. Which decisions have you made in the last three months using the routinely collected data – information?

……

SECTION C: DIPENDENT VARAIABLE

ROUTINE UTILISATION OF HEALTH INFORMATION

19. Indicate your level of agreement on the following statements regarding the effective utilization of Routine health information in the private health facilities.						
	Statements	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
	Good quality data for use :					
RU1	Collected using standard tools	**1**	**2**	**3**	**4**	**5**
RU2	Checked for completeness	**1**	**2**	**3**	**4**	**5**
RU3	Checked for accuracy	**1**	**2**	**3**	**4**	**5**
RU4	Timely available	**1**	**2**	**3**	**4**	**5**
RU5	There is continuous use of the data collected for the benefit of patients as well as the health facilities	**1**	**2**	**3**	**4**	**5**
RU6	Exist data processing system into information	**1**	**2**	**3**	**4**	**5**
RU7	Monthly reports compiled shared with stakeholders	**1**	**2**	**3**	**4**	**5**
RU8	Routinely use health facility data to monitor indicator performance	**1**	**2**	**3**	**4**	**5**
RU9	Health facility gets feedback on the monthly health information report submitted	**1**	**2**	**3**	**4**	**5**
RU9	Decision making regarding quality of health information data is collected timely for the stakeholders	**1**	**2**	**3**	**4**	**5**
RU10	Decisions made based on routine health information	**1**	**2**	**3**	**4**	**5**

	findings					
RU11	Like Patient utilization	**1**	**2**	**3**	**4**	**5**
RU12	Like Disease data	**1**	**2**	**3**	**4**	**5**
RU13	Like Drug stock out	**1**	**2**	**3**	**4**	**5**
RU14	Quality gaps	**1**	**2**	**3**	**4**	**5**
RU15	Data quality	**1**	**2**	**3**	**4**	**5**
RU16	The administrators of health facilities make a follow-up on the quality of data before submitting to respective authorities for review	**1**	**2**	**3**	**4**	**5**
RU17	Periodically evaluate facility target indicator performance	**1**	**2**	**3**	**4**	**5**
RU18	Health facility data routinely used to monitor health facility indicator performance	**1**	**2**	**3**	**4**	**5**
RU19	The information users seek feedback from the health facility staff regarding the data collected	**1**	**2**	**3**	**4**	**5**
RU20	The facility administrators share data with other stakeholders for proper health service delivery	**1**	**2**	**3**	**4**	**5**
RU21	Data –information based decision made at all levels of facility management	**1**	**2**	**3**	**4**	**5**
RU22	Existence of facility action plan showing decision based on routine health information	**1**	**2**	**3**	**4**	**5**
RU23	Review strategy by examining performance target and actual performance from month to month	**1**	**2**	**3**	**4**	**5**

RU24	Review facility personnel responsibilities by comparing performance service targets and actual performance month to month	**1**	**2**	**3**	**4**	**5**
RU25	Health facility priority allocation of resources based on the evidenced data based gaps	**1**	**2**	**3**	**4**	**5**
RU26	The stakeholders most especially the health facilities rely on data for planning their service delivery	**1**	**2**	**3**	**4**	**5**
RU27	Regular decisions review meetings about use of information	**1**	**2**	**3**	**4**	**5**
RU28	Decisions based on evidence improve services delivery	**1**	**2**	**3**	**4**	**5**

20. Do you have any suggestions on how to improve routine health information use at the health facility?

…….....

21. Describe how the health facility uses the routine health information

……

Thanks for your time and cooperation

APPENDIX II: Observation Checklist - Routine Health Information Utilization

Health Facility:		
Observer :	**Date:**	
ITEMS	**NO**	**YES**
Presence of RHIS mission displayed at appropriate position		
Presence of updated DHMIS organizational chart showing functions related to RHIS/Health information		
Presence of health facility RHIS targets displayed		
Presence of health facility indicator performance charts, graphs and table displayed		
Presence of staff meeting minutes reflecting reports, data and feedback from health facility or district discussed		
Presence of action work plan relating identified data gaps and how they were addressed		
Presence of performance improvement tools like flow charts, QI journals, charts and projects		
Presence of RHIS standards at the facility		
Presence of RHIS training manual and guide		
Presence of RHIS supervisory checklist		
Presence of RHIS supervisory report		
Presence of data quality assurance checklist		
Presence of updated database for monthly reports submitted to the district		
Existence of functioning HIS software		

APPENDIX III: INTERVIEW GUIDE FOR KEY INFORMANTS

i. Briefly describe term health information and how routinely should it be utilized?

ii. How often is health information gathered/collected?

iii. If not so often, why isn't health information routinely gathered?

iv. How does the health facility maintain health information?

v. Does the health facility go through recommended procedures to process health related data?

vi. If yes, what procedures does it go through to process data?

vii. If No, why doesn't the health facility go through recommended process to process health related data?

viii. Does the facility's culture promote data and information utilization of routine health information? How?

ix. Does the facility has a set of demands that does not comply the effective utilization of routine health information?

x. Does the facility manager report communicate with the district health leaders to know the district requirements of private health facilities?

xi. Is the tradition of health workers attendance allow all information of patients to be routinely entered in the system?

xii. Are the process related challenges hindering routine utilization? How?

xiii. In your own view, which technical related factors influence the routine utilization of health information in health facilities?

xiv. How can the technical factors be eliminated such that routine health information is utilized?

xv. In your own view, which behavioral related factors influence the routine utilization of health information in health facilities?

xvi. How can the behavioral factors be eliminated such that routine health information is utilized?

xvii. Does management, district MOH give feedback on the facility performance?

xviii. If yes ,can you describe the feedback given by the above

xix. In your own view, which organizational related factors influence the routine utilization of health information in health facilities?

xx. How can the organizational factors be eliminated such that routine health information is utilized?

xxi. In your view, what can health facilities do to routinely utilize health related information?

Thank you

APPENDIX IV: BUDGET

No	ITEM	QTY	EACH	AMOUNT
1	Personnel			
	Research Assistant / Guide	01	50.000= for 15 days	750.000=
2	Clipboard	02	5.000=	10.000=
	Umbrella	02	9,000=	18.000=
	Bags	02	25.000=	50.000=
3	Travel in the field			750.000=
	Meals			450,000=
	Accommodation			1,800.000=
4	Acquisition of data packages			400,000=
6	Stationery			
	Reams of ruled study	03	15.000=	40.000=
	Notebooks	2	5.000=	10.000=
	Computer printing	500pages	200=	100.000=
.7	Photocopying	1000 pages	50=	50.000=
	Binding	04	40.000=	160.000=
8	Miscellaneous			3 00.000=
	Sub- Total			**100.000=**
	Grand Total			**5,148,000=**

APPENDIX V: SAMPLE SIZE DETERMINATION TABLE

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970