

**USE OF ROUTINE HEALTH INFORMATION FOR DECISION MAKING
AMONG HEALTH WORKERS AT COAST GENERAL HOSPITAL, MOMBASA
COUNTY, KENYA**

BY

GILBERT NZOMO MBORO (BSc. HRIM)

REG. NO: Q139/CE/24334/2012

**RESEARCH THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF
PUBLIC HEALTH - (MONITORING AND EVALUATION) IN THE SCHOOL OF
PUBLIC HEALTH OF KENYATTA UNIVERSITY**

OCTOBER, 2017

DECLARATION

“This thesis is my original work and has not been presented for a degree in any other University”.

Student:

Signature Date

Gilbert Nzomo Mboro
Q139/CE/24334/2012

Supervisor:

“This thesis has been submitted for review with our approval as University Supervisors.”

Signature Date

Dr. George O. Otieno
Department of Health Management and Informatics

Signature Date

Dr. Daniel W. Muthee
Department of Information and Library Science

DEDICATION

This research thesis is dedicated to my lovely children George, Jimmy, Sharon and Robert who had to stay without the company of their beloved father for the period of study.

ACKNOWLEDGEMENT

First and foremost, I would like to thank the Kenyatta University and its management for admitting me and approving my research. The development of this thesis involved wide consultation with various individuals. I would like to express my sincere appreciation to Dr. George O. Otieno and Dr. Daniel W. Muthee my supervisors for their tireless assistance and guidance in entire process. A big thank you to Dr. Jackim Nyamari and Dr. J.P. Oyore for their valuable inputs during oral defences.

From Coast General Hospital, I would like to thank Dr. Bernard Mwero and Dr. I. Khandwaalla Chief Administrators for granting me time. Others include Mr. Herbert Aseneka my immediate supervisor who supported me while I was out of my work station. Special thanks also go to research participants, without them this study would not have been actualized.

Lastly, I wish to acknowledge all others who contributed in one way or another directly and indirectly to the entire process and whom I may not have mentioned here by name.

Thank you all for rising to the challenge. May God bless you all.

TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
LIST OF ABBREVIATIONS /ACRONYMS	x
OPERATIONAL DEFINATIONS OF KEY CONCEPTS AND TERMS	xi
ABSTRACT	xii
CHAPTER ONE: INTRODUCTION	1
1.1 Background of the study	1
1.2 Problem statement	3
1.3 Justification of the study	4
1.4 Research questions	5
1.5 Broad Objectives	5
1.5.1 Specific Objectives.....	5
1.6 Delimitations and Limitation	6
1.7 Conceptual Framework	6
CHAPTER TWO: LITERATURE REVIEW	8
2.1 Overview	8
2.2 Health information System.....	8
2.3 Level of use of routine health information.....	9
2.4 Technical factors influencing use of health information.....	11
2.5 Organizational factors influencing use of health information.....	13
2.6 Behavioural factors influencing use of health information	16
2.7 Summary of the literature review	17
CHAPTER THREE: MATERIALS AND METHODS	19
3.1 Introduction	19
3.2 Research design.....	19
3.3 Variables.....	19
3.4 Study location.....	19
3.5 Study population	20
3.6 Sampling technique	20
3.7 Sampling size determination	21
3.8 Construction and research instruments	22
3.9 Pre-testing	22

3.10 Validity	22
3.11 Reliability	23
3.12 Data collection techniques	23
3.13 Data analysis	23
3.14 Ethical considerations	24
CHAPTER FOUR: RESULTS	25
4.1 Introduction	25
4.2 Respondents' general characteristics	25
4.3 Level of routine information use for decision making	26
4.3.1 Overall level of RHI use for decision making.....	26
4.4 Technical Factors	29
4.4.1 Training	29
4.4.2 Ability to perform tasks related to information management	30
4.4.3 Overall level of competence and access.....	31
4.5 Organizational Factors	33
4.5.1 Factors that decisions made are based upon.....	33
4.5.2 Access to functional equipments.....	33
4.5.3 Business processes (supervision, roles and meetings)	34
4.6 Behavioural Factors.....	36
4.6.1 Perceived quality of routine health information.....	36
4.6.2 Level of motivation to use routine health information.....	37
4.6.3 Demotivators for use of RHI.....	38
4.6.4 Suggestion on what should be done to improve RHI use	39
CHAPTER FIVE: DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS	41
5.1 Introduction	41
5.2 Discussion	41
5.2.1 Level of use of RHI.....	41
5.2.2 Technical factors that influence use of RHI	43
5.2.3 Organizational factors that influence use of RHI	44
5.2.4 Behavioural factors that influence use of RHI	45
5.3 Conclusion.....	46
5.4 Recommendations	47
5.5 Areas of further Research.....	48
REFERENCES	50
APPENDICES	54
Appendix I: Map of Kenya and Study Area.....	54
Appendix II: Informed Consent Form.....	55

Appendix III: Self- Administered Questionnaire	58
Appendix IV: FGD Guide	64
Appendix V: Key Informant Interview (KII) Guide	66
Appendix VI: Ethical Clearance Letter from KUERC.....	67
Appendix VII: Research Authorization.....	68
Appendix VIII: Research Permit.....	69
Appendix IX: ERC Clearance Letter from CGH	70

LIST OF TABLES

Table 4.1: General characteristics of respondents.....	26
Table 4.2: Overall extent of RHI use for decision making	27
Table 4.3: General characteristics and RHI use	28
Table 4.4: Training and RHI use.....	30
Table 4.5: Perceived ability and Information use/utilization	31
Table 4.6: Competency and access versus information use	32
Table 4.7: Access to functional computer and information use	34
Table 4.8: Business processes and information use	36

LIST OF FIGURES

Figure 2.1: Conceptual framework.....	7
Figure 4.1: Overall level of competency.....	32
Figure 4.2: Basis of decision making among health workers at CGH	33
Figure 4.3: Perceived data quality among health workers	37
Figure 4.4: Level of motivation to use RHI	38
Figure 4.5: Demotivating factors for use of RHI	39
Figure 4.6: Suggested ways to improve use of RHI.....	40

LIST OF ABBREVIATIONS /ACRONYMS

AWP	Annual Work Plan
CGH	Coast General Hospital
CHMT	County Health Management Team
FGD	Focus Group Discussion
HIS	Health Information System
HMIS	Health Management Information System
HMN	Health Metrics Network
HMT	Health Management Team
KAIS	Kenya AIDS Indicator Survey
KDHS	Kenya Demographic and Health Survey
KII	Key Informant Interview
M&E	Monitoring and Evaluation
MDG	Millennium Development Goal
MoH	Ministry of Health
NGO	Non Governmental Organization
PRISM	Performance of Routine Information System Management
RHI	Routine Health Information
UNICEF	United Nations Children's Fund
WHO	World Health Organization

OPERATIONAL DEFINATIONS OF KEY CONCEPTS AND TERMS

Decision making - Is the cognitive process that can be rational or irrational leading to the selection of a course of action among alternatives be based on explicit information or tacit assumptions

Health Information -Is information that relates to or describes health. It's information about people's health status, resources, activities and events as related to health. Sound and reliable health information is the foundation of decision-making across all health system building blocks.

Health information use - Is the practice or act of using health information for making decision.

Health Worker - Is a person trained from medical school/college responsible for the operational, financial and day – to – day running of health facility or health services.

Routine Health Information - Is health facility level data, both from aggregated facility level records and from administrative sources, such as drug procurement records, enable health-care workers to determine resource needs, guide purchasing decisions for drugs, equipment and supplies, and develop community outreach.

ABSTRACT

Health workers collect and report data routinely on all their activities. Studies show that very little of this vast amount of information is used by those who are collecting the data and by local health management at health facility or County levels. Ideally, local data should be collected, analyzed and used in order to support local health management, health promotion and prevention and to improve local health service delivery. Significant resources have been invested on HMIS but we are unsure whether the available routine health information is used for decision making. This study aimed at assessing technical, organizational and behavioural factors that influenced information use among health workers at Coast General Hospital (CGH), Mombasa County, Kenya. The Study design utilized was descriptive cross sectional.. Probability, simple random sampling was used as this avoided bias. Self-administered questionnaire, key informant interview guide and focus group discussion guide were tools used to collect data. A total of 236 health workers participated in the study. Quantitative data was analyzed using Statistical Package for Social Science (SPSS) version 20 and qualitative using QSR international NVivo11. Descriptive statistics and chi-square test to determine significant association was done and results presented in tables, graphs and charts. The results showed 69.6% use of routine health information for decision making with 30.0% reporting having received minimal training on information management areas. Highest education level attained by health worker, professional training and accessibility to resources like computer had statistical significant association to information use for decision making ($p < 0.05$). Inadequate support from the immediate supervisor 124 (52.5%) compounded by unclear roles and responsibilities 107 (45.4%) were reported as hindrance to information use. In conclusion the study demonstrates partial use of routine health information for decision making with interplay of technical, organizational, and behavioral determinants. In the view of the findings, this study recommends need for County HMT in conjunction with the national level to provide training to improve health workers' skills with specific focus on information use through on- job trainings mentorship and enhance organizational context by providing resources that supports information use with targeted regular review meetings, feedback coupled with support supervision are also recommended.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Health information is the foundation of the overall building blocks of health systems strengthening and availability of information will enable health workers to utilize the same for better policy-making, planning, implementation, and monitoring and evaluation of health programmes (Karuri *et al.*, 2014). Significant human and financial resources have been invested worldwide in the collection of data in health facilities and communities. Health workers collect data on patients and health facility workers routinely report on all the activities within the health facilities (WHO, 2007). As such it structures the communication between health professionals and patients and makes the continuous work of managing patient's possible. The use of health information is an essential component of the structural capacity of health departments, and public health performance depends on the effectiveness of information use (MEASURE Evaluation, 2010; Turnock, 2010). The ultimate goal of evidence-based decision making is to improve the quality of healthcare by increasing the health system's ability to respond to the needs of the individuals they serve. Limited resources and the need for accountability further support a strategic response to improving health systems (HMN, 2008).

However, routinely generated health information is often not used by key stakeholders to effectively inform policy, public health performance and programmatic decision making. Studies show that very little of this vast amount of information is used by those who are collecting the data and by local health management at health facility or district levels (Sapirie, 2001). Rarely is sufficient consideration given to the amount of data that are

collected. The failure to consider all the empirical evidence before making decisions hinders the health system's ability to respond to priority needs throughout its many levels. The malfunctioning to address information-based decision making exists because the people who collect and analyze the data are typically not the people who make decisions in the health care system. In a study carried out in Atlantis, in South Africa on a comprehensive evaluation of the information system showed that the volume of data collected is enormous but that the quantity of useful information produced from it is minimal (Braa *et al.*, 2012). Health information lack value if it is not used to inform decisions and efforts to improve data quality will be wasted if they do not include interventions to increase local demand for information and facilitate information use.

There are several reasons why routine information systems in developing countries do not provide the necessary information support for decision-making. Some of the reasons are reported in the literature are poor quality of data; weak analysis of data; lack of an information culture; lack of trained personnel and HIS activities seen as a burden due to high workloads especially at the health facility level (MEASURE Evaluation 2012). Moreover, health data are collected by people who play professional and personal roles in the health system. Although building the capacity of these people is at the centre of HIS strengthening, the behavioural aspects of performance are often the most difficult to identify and confront in a meaningful way. Influencing many of these behavioural factors will require interventions that go beyond simple training that improves knowledge and skills in data collection and use (Galimoto, 2007). This study investigates the use of health information in decision making by health workers. A greater understanding of the roles

that health facility staff plays in the flow of routine information and constraints to use of their own data is needed.

1.2 Problem statement

Significant resources have been invested in Kenya towards improvement of Health Information System (HIS). HIS has been set as a key priority in the National Health Sector Strategic Plan (NHSSP II) 2005 - 2010. The government of Kenya in particular the national office HIS and other stakeholders have embarked on initiatives to develop and improve a web based national health information system (DHIS₂) that captures data from all health systems thus reducing the need for multiple parallel systems that are capturing data at community, facility, county and national levels. One of the most enduring traits of the information age is that we have focused too much on mastering transaction data and not enough on turning it into information and knowledge that can lead to business results (Karuri *et al.*, 2014; Davenport, *et al.*, 2010).

Though district level managers regularly discuss information and use routine information in the review of district implementation plans (DIP), use of information for operational plans and at source for decision-making is limited (MoH, 2010). An assessment on country's status on information use indicated that this area was very weak especially for data that is routinely collected. Planning was also not linked to health information and allocation of resources was not based on available evidence (HMN, 2008).

In Kenya, 43% of data producers lack data analysis and interpretation skills and 42% of health facility managers analyse and use data to influence budget preparation process and planning of clinical services (MEASURE Evaluation, 2008). Less than 37% of collected data is analyzed and used for decision making (MOMs & MOPHs, 2010), hence the ministry is has a lot of data, not turned into information & knowledge to produce results.

At Coast General Hospital, monitoring and evaluation of health programmes and various interventions is based on reports from the routine health management information system (HMIS). Nevertheless, there are minimal efforts by health workers and managers to demand for and use the available routine health information they generate for service delivery planning and decision-making. Data quality audits done at the facility by CHMT and other partners have indicated that data at CGH is incomplete, not readily accessible and is often not used in decision-making and the factors influencing data use are unknown.

1.3 Justification of the study

In today's connected digital world, it is easy to get data but still difficult to convert this data into meaningful information by the health providers due to unaddressed challenges in the service delivery in terms of data collection, processing and use at health facility (MOH, 2010).

In Mombasa County there is no study that had been conducted in on health information use and the results are beneficial in ensuring efficient use of the scarce resources, evidence-based programming and better health outcomes to CGH Health Management

Team. Nonetheless, the study contributes to the literature on comprehensive approaches to improving use of routine health information for better decision making in hospital in Kenya.

1.4 Research questions

1. What extent is health information used for decision making by health workers at CGH?
2. What are the technical factors that influence health information use for decision making amongst health workers at CGH?
3. What are the organizational factors that influence health information use for decision making amongst health workers at CGH?
4. What are the behavioural factors that influence health information use for decision making amongst health workers at CGH?

1.5 Broad Objectives

To assess factors influencing use of routine health information for decision making among health workers.

1.5.1 Specific Objectives

1. To establish the extent to which health information is used for decision making amongst health workers at CGH
2. To determine technical factors that influence health information use amongst health workers at CGH

3. To identify organizational factors that influence health information use amongst health workers in at CGH
4. To determine existing behavioural factors that influence health information use amongst health workers at CGH

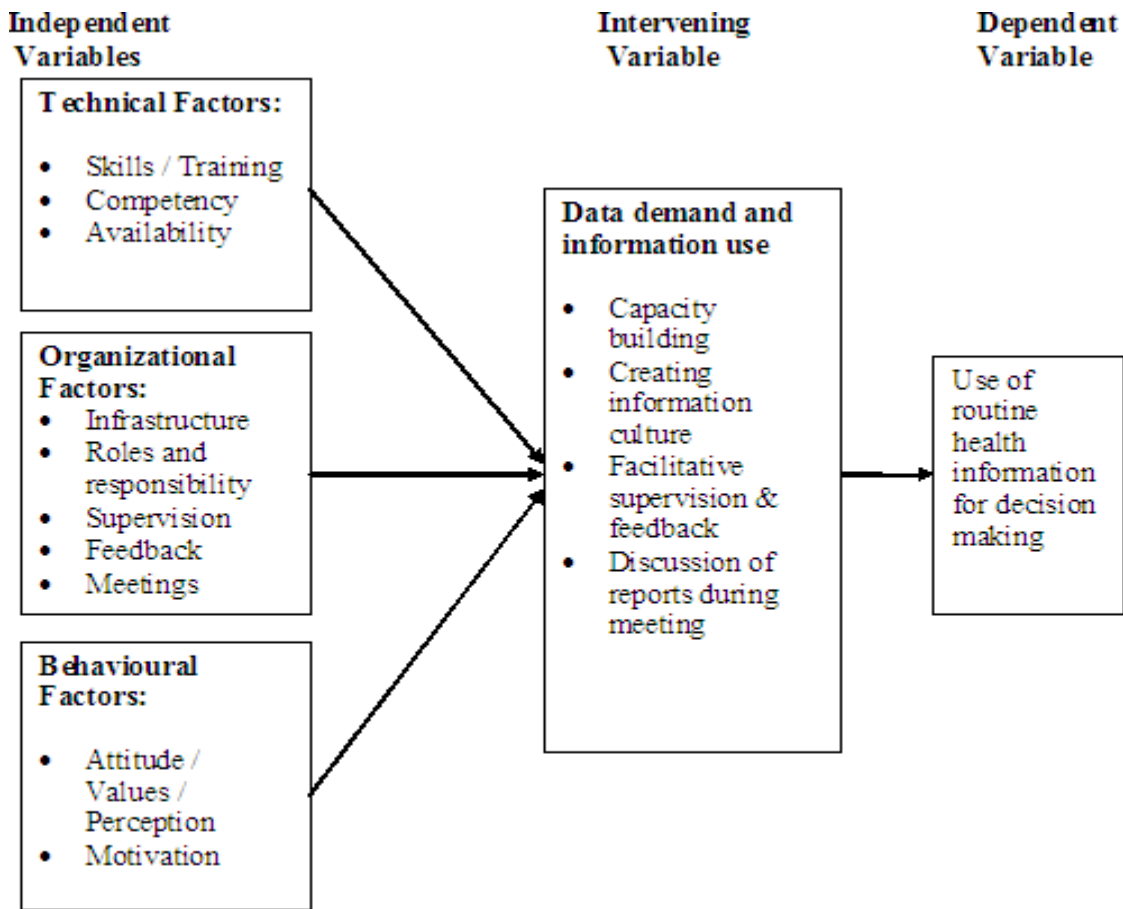
1.6 Delimitations and Limitation

There might several factors that influence information use for instance political and economical, but this study only focused on technical, organizational and behavioural factors in the study area. Respondents that were included were those that were present during the time of study. Those absent were not included in the study even though would have had interesting inputs.

1.7 Conceptual Framework

This study used a framework that Aqil and colleagues (LaFond & Field, 2010; Aqil *et al.*, 2009) developed to improve routine health information systems. The framework, called the Performance of Routine Information System Management (PRISM), identifies three interrelated components that are necessary to improve routine information systems and the use of the data they generate. The three components include technical, organizational and behavioral/individual elements. The technical component refers to systems such as data collection processes, systems, and methods. The behavioral/individual component refers to the behaviors of data users and how data are used for problem solving and program improvement. The organizational component refers to the structure and processes of the organizations that use the resulting information. These three components were used to

identify opportunities for and constraints to effective data use, and strategies to improve data use were then built along the same three parameters.



Source: Modified from MEASURE Evaluation, 2007

Figure 2.1: Conceptual Framework

CHAPTER TWO: LITERATURE REVIEW

2.1 Overview

This thesis is informed by literature review from various sources on use of health information by health workers. Literature that aimed at developing an understanding and knowledge around issues relating to health information use was reviewed on the below thematic areas.

2.2 Health information System

Health information systems refer to any system that captures, stores, manages or transmits information related to the health of individuals or the activities of organisations that work within the health sector (Nutley, 2012). The Division of Health Information System (HIS) is charged with the responsibility of collecting routine data from various sources, collating, analyzing and disseminating health information to all stakeholders for evidence based decision making. The information that is disseminated is used for planning and management of health services and programmes. The demand for evidence towards the achievement of the millennium development goals (MDGs), coupled with the increasing need for both multilateral and bilateral donors to demonstrate their contribution towards health development has also created increased demand for information (MoH, 2015).

The role of the HIS in the health system is not just routine collection of health service data and dutiful conveyance of the same to higher levels of the health care system, but to facilitate evidence based decision-making at all levels especially at the point of collection (Odhiambo-Otieno, 2005). One of the key challenges in the Kenyan health sector

identified in First Medium Term Plan of Vision 2030 document is weak health information systems. Health information system policy, Kenya 2012 – 2030 identifies various weaknesses that exist in current information systems that include inadequate capacities of HIS staff, unskilled personnel handling data and many parallel data collection systems amongst others. Overall, the current HIS provides limited information for monitoring health goals and empowering communities and individuals with timely and understandable information on health. Issues of access and intensity of use of health services have always been of significant concern in the health sector in Kenya (MoH, 2014c).

2.3 Level of use of routine health information

To make management possible health care providers need information about the current situation of the health of the population. Acquiring reliable information, a well functioning health information system (HIS) for gathering, processing, analysing and using health information is necessary (WHO, 2007). Despite the rapid growth of requirements for data recording and reporting within the health information system, there is not much evidence that the information is used (Hotchkiss *et al.*, 2012).

Information systems are developed to meet the needs of multiple information users throughout a health system. Information users have different information needs, need information at different levels of detail and have different roles in the decision-making process (Davies *et al.*, 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 *et al.*, 2009).

A study done in India showed that most common types of decisions reported by respondents at the facility, state and district levels included those related to program management, planning and budgets while staff working in health clinics made decisions about medical and drug supply and emerging epidemics. Health Management Information System (HMIS) data, district-level surveys and state/district departmental reports were the most often cited data used for decision making (Harrison and Nutley, 2010). Another study in Tanzania respondents reported that they used health information to make decisions regarding clinical services, the need for staff training, and the development of organizational policies. The majority of respondents cited high workload, lack of incentives, inadequate technical skills, and insufficient knowledge about existing data sources as hindrance to health information use (Harrison and Bakari, 2008).

A similar study done in Uganda by MEASURE Evaluation (2009) showed that staff in most of the facilities reported using HMIS data for medical supply and drug management, staffing decisions, and service improvement. HMIS data quality, however, was often compromised by being incomplete and inaccurate; therefore staff did not always rely on it for decision making. Lack of computers and frequent power failures reduced staff's ability to access data and delayed the reporting process. Staff's capacity to analyze, interpret and use data was limited. Data accuracy and timeliness affected data quality and thus use. The processes of checking data accuracy and providing feedback on the submitted monthly

reports were not implemented, making it difficult for staff to understand importance of collected data not only for improving their own performance but also for the department or higher level or as a whole (Aqil, 2008). Factors contributing to sustainable production and use of good-quality data are technical factors (e.g. data-collection sheets, processes), IT devices, data analysis, environmental, organizational, and behavioural factors (HMN, 2008).

2.4 Technical factors influencing use of health information

Implementing IT solutions for data collection saves time, limits the number of errors, and increases the timeliness and reliability of the data. It does not matter how fancy the available devices are, and all processing and analyzing of information is done automatically if the managers in the end of the chain still do not actively use the data in the final decisions they make (Chaulagai, 2005).

Inadequate skills in the basics of M&E not only affect data quality but also the ability to use information in decision making. Ability to interpret health information and apply it to the programmatic and policy context requires a skill set that is often never addressed in pre- or post-service training of health professionals. Training in data management and its importance at facility level may improve information use. In this way the system may become a promoter for good quality data to be used in decision making processes (Mohr & Batalden 2009).

Developing skills in analyzing, interpreting, and decision-making promote information use. A study in Zambia found that a well designed Health Management Information

System (HMIS) where health workers were trained in accord with internationally documented practices contributed to quality of data required to support good decisions (Simwanza and Church, 2001). Training in data use must be conducted to strengthen the capacity of health workers at the district and local levels to use health data for better management and health service delivery.

Another study in India showed that inadequate analytic and data use skills were the most commonly reported constraints with a substantial number of respondents expressing a need for further training on data quality assurance, analysis and use. Interestingly, few respondents agreed that poor data quality was a serious impediment although duplication of data and inconsistencies in the data collection process were perceived barriers to data use (Harrison and Moreland, 2009). Additionally, routine health information systems management should be decentralized to improve local use of health information. This happens when local level managers and health service providers are involved in designing data collection and reporting tools. At district level one designated person or team should be responsible for information. In addition, information (including raw data), should be made available to all potential information users (RHINO, 2009)

Furthermore, to improve sustainable demand for and use of data in decision making individual capacity in core competencies to demand and use data must exist at all levels of the health system. Competencies include skills in data analysis, interpretation, synthesis, and presentation, and the development of data informed programmatic recommendations.

Data users often struggle with an underdeveloped ability to understand analyses and interpret them in the programmatic context.

2.5 Organizational factors influencing use of health information

An important aspect of the human behaviour is the ability to relate to information. Members of health care organizations, for instance health workers, make decisions about how to seek and how to use information based on a desire to make right decisions and improve services (Aqil *et al.*, 2009). An information culture is achieved when everyone asks for hard data and clear indicators to plan, take action, or proposes new activities, and when data speaks loudest for all decisions (Nutley, 2012). The organization culture may foster or discourage information use. A good information culture is characterized by information that is being used on a regular basis; graphs and tables are displayed for staff and the public; information should be disseminated to the information providers, the public, and decision-makers in other related segments of the health sector and society. To secure the sustainability of the health information system creating a culture that supports information use in decision making processes is as important as technical devices (Kihuba *et al.*, 2014).

The effectiveness of an organization is directly linked to the performance of its employees (Belita *et al.*, 2013). The organization is governed by rules, processes and systems. These rules, processes and systems have the ability to support or hinder an individual's ability to use data in decision making (Aqil *et al.*, 2009). For example, an organization that has structures and processes for improving the interaction of data users and producers,

providing clear guidelines for data quality processes, and defining roles and responsibilities related to using data will strengthen other interventions put in place to improve data informed decision making. Human resource documents should specify employee roles and responsibilities for data use. A study done in Uganda by MEASURE Evaluation in 2009 showed that organizational factors, such as promoting a culture of information and quality supervision, were weak. There was little evidence of systematic communication about performance targets, use of data for decision making and advocacy, and sharing of success stories (Aqil, 2009).

In addition to culture, feedback is seen as an indicator of information use. Feedback is understood as the procedure by the information users to inform the data collectors of decisions made and actions taken based on the data collected. It could appear as verbal reports to meetings, supervision of facility actions, summary reports to annual reports on a specific topic. The feedback may be presented as tables of monthly data, short programme reports, graphs, or quarterly or annually reports (Nutley, 2012). Feedback is identified as an area where potential improvement would be beneficial for lower level of responsibility related to both M&E, planning and decision-making activities (Kihuba *et al.*, 2014). To enhance how data providers value information, feedback, including comparative feedback with neighbouring facilities, is essential. In this way data providers will feel their data collection contribute to improvements and change benefiting both themselves and patients and create an ownership to the data (Health Metrics Network, 2007).

When organizational systems are in place to support a culture of data-informed decision making, data producers and users are better able to understand the value of data to the health system, data tends to be of higher quality, data is communicated and shared through the health system and, as a result, it is used in decision making. Lack of regular systems to support M&E activities negatively affected the perceived importance and quality of data collection and data use. However, creating an information culture is challenging and a long-term behavioral intervention is required (Azelmat *et al.*, 2010).

The lack of interaction between individuals who design, implement, and manage research and information systems – the data producers – and professionals who use data in program improvement and development contributes to the breakdown in the decision-making cycle (Lomas, 2007). When data users and data producers work together, they become more aware of the data collection processes and methods, the available data sources, and the quality of those data. They have the opportunity to address barriers to data use and improve the sharing of data resources. They can also discuss concerns and seek clarification about the data collection process (Patton, 2008). They can jointly analyze and interpret data to answer programmatic questions. In this context, ownership of data is built so that, when data-informed decisions are made, the necessary buy-in exists to move the decisions forward. By first understanding who your data users and producers are, and then linking them to each other's work, the information cycle is strengthened and the value of data in relation to program improvement becomes clear (Koon, 2012).

The normative decision theoretic perspective assumes that only relevant information will be gathered and analyzed, and when information is available and of good quality it will be

used (Mutemwa, 2006). Evidence exists however that managers gather good information but “leave it in the drawer” (HMN, 2007).

2.6 Behavioural factors influencing use of health information

Behavioural factors explain the way in which health workers collect and use information (or fail to do so). For example, the primary job of most data collectors revolves around their tasks as health workers or managers of health services. They see their other duties, such as stock keeping, evidence-based planning and budgeting, as secondary to providing health care. If expectations with respect to information use are unclear to health professionals, their motivation and commitment to use health information can suffer. Any intervention to strengthen the health information system that does not address behavioural factors such as attitudes toward the use of health information, motivation, and incentives for making decisions based on information will result in poor quality data, underreporting, infrequent information use, and poor decision making (RHINO, 2001).

Perceptions and attitudes of senior management towards data will have a determining influence on the use of health information. If senior managers fail to promote evidence-based decision-making and the use of information for transparency and accountability then a culture of information is unlikely to be fostered. It is therefore crucial to examine the perceptions, attitudes and values of senior managers and other organization members in relation to information-related functions (Odhiambo-Otieno, 2005). To enhance the use of health information in developing countries, there is need to strengthen health workers sense of data ownership and eliminate the perception that the health worker’s role ends

when they collect data and transmit it to the next level. Use of computerized data management tools such as the DHIS2 is expected to enhance the capacity for health workers at all levels to analyze and interpret routine health data, and if this is coupled with focused training on information use for decision making it will lead to more ownership, analysis, interpretation and use of information at all levels. Kenya and other developed countries that have implemented DHIS for management of their routine and other health data are therefore strategically positioned to move from fragmented and non-functional HIS to become role models in effective use of routine health data in low resource settings. For consistent information use to occur, data need to be of high quality so that information 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 program efficiency and effectiveness will suffer (Mavimbe, Braa, & Bjune, 2009). In addition, when data quality is poor the demand for information drops, thus crippling the cycle of data-informed decision making even further (Braa *et al.*, 2012). 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.

2.7 Summary of the literature review

The existing literature has not conclusively established extent of routine health information use. However, the literature revealed several possible issue that could influence use of information, for instance, inadequate skills, poor data quality, inadequate access to equipments like computer, , supervision, negative perception and attitude of

health workers on data and unclear roles and responsibilities on use of information to mention but few.

Health information lack value if not used to inform decisions and the use of health information for decision making is a journey, not a destination. It is an ongoing knowledge-driven process that requires continuous collection, analysis and sharing because that is the only way in which trends both positive and negative can be discovered and acted upon. Again, some of the studies which were available and reviewed were out dated and operationalized within contexts which may not be not similar to those within the context of this study.

CHAPTER THREE: MATERIALS AND METHODS

3.1 Introduction

This chapter deals mainly with the research design, location of the study area, target population, sampling techniques, data collection instrument, data collection procedures, methods of data analysis, reliability, validity and ethical considerations.

3.2 Research design

This study adopted a descriptive cross sectional study design. This design aim was to describe the various determinants of routine health information use among health workers combining both quantitative and qualitative approaches of data collection methods.

3.3 Variables

The dependent variable was utilization of health information for decision making. This was measured using a information use index constructed from a set of nine questions. Whereas, the independent variables were factors revealed in the literature that had significance on utilization of routine health information for instance: technical determinants:- basic skills and competencies; organizational determinants:- information culture, structure and resources and the roles and responsibilities of key contributors at each level of the health system and behavioural determinants:- attitudes, values and motivation of the people who collect and use data.

3.4 Study location

This study was conducted at the Coast General Hospital, Mombasa County. CGH has various departments that provide range of services that include curative, rehabilitative, promotive and preventive services. It is also the main teaching hospital. The major

departments are surgery, maternity, paediatrics, medical, radiography, pharmacy, laboratory, health information among others. The hospital has bed capacity of 700, 563 employees with a number of committees responsible for various entities. CGH is situated at Tononoka area in Mombasa County, along Mombasa - Kilifi highway. Data is collected and managed using both manual and digital methods. Mombasa is the second largest city in Kenya. Mombasa has a population of 1,178,837 and covers an area of 218.86 sq. kms. Mombasa County comprises of six sub-counties / constituencies namely; Likoni, Mvita, Nyali, Kisauni, Jomvu and Chagamwe.

3.5 Study population

Study subjects comprised of professional health workers trained from medical schools/colleges. These were the health care providers that had regular contact and provide close procedures to clients for long periods of time and they were the ones who often collected health data and make most decisions on matters relating to health service delivery. The total number of professional health workers was 484

Inclusion criteria: Health worker who had been practicing for at least six months preceding the survey period as they had some experience with routine health information generated by HMIS and knew how it may be utilized.

Exclusion criteria: Those who had worked for less than six months or those not willing to be interviewed.

3.6 Sampling technique

First sampling frame was established by listing all names and assigning numbers to all eligible professional health workers using the human resource data base or register. Then the study population was stratified to managers (HMT) and others. Thereafter, probability

proportionate to size was used to random select study subjects from random number table. Purposive sampling was adapted to select respondents for FGDs and KII.

3.7 Sampling size determination

The sample size (n) was calculated using Fisher's *et al*, 2003. The formula was used to estimate the smallest possible categorical sample size $n = z^2 pq / d^2$

Where:

n = desired sample size,

z = standard normal deviate, usually set at 1.96 which corresponds to 95% confidence level,

p = proportion of target population estimated to have a particular characteristics, to be measured which is 50% if the proportion is unknown.

q = 1 – p and

d = permitted error (5%, if the confidence level is 95%) = 0.05

Applying the formula, the required sample size will be $n = 1.96^2 (0.5) (0.5) / 0.05^2 = 384$.

Because the target population was 484 (*i.e. less than 10,000*), therefore the final sample estimate was $n_f = n / \{1 + (n/N)\} = 384 / \{1 + (384/484)\} = 214$.

<u>Subcatagories</u>	<u>Sample size</u>
▶ HMT (manager) (30)	13
▶ Others (454)	201
▶ Total sample	214

To cater for non response or low return rate (10%) the sample size was adjusted to 236.

Two FGDs, one for the mangers (HMT) and operational levels officers each with 10 and 12 participants respectively was conducted to elicit and clarify their knowledge, attitudes,

and practices. An interview with key informants (Health information officer and Chief administrator) was also done.

3.8 Construction and research instruments

A self administered semi structured questionnaire that had been careful designed, pretested and revised before final data collection was used to collect quantitative data. A FGD and KII guide was employed to collect qualitative data from purposive selected participants after administering the questionnaire to gather more information. The research instruments were prepared in English (See appendix II – V).

3.9 Pre-testing

The study was carried out in a small scale trial run for all procedures planned for use in the main study. Pre-testing of the questionnaire was conducted at Port Reitz Hospital which has similar characteristics for the study context and respondents as that of the study area among 24 participants (10% of the sample size) to ensured that the questions elicited the information needed, checked the clarity, sequencing and wording of the questions. Appropriate adjustments were made and the tools refined accordingly.

3.10 Validity

Pretesting of the tool to ensure questions were valid, identify any leading and ambiguous questions before the actual field work was done. Identification for errors, omissions, outliers and double entry of the results was done to ensure validity. The study instrument had also in-built cross checks questions. To avoid bias probability sampling technique was adopted and sufficient use of sample size by stratification was applied that increased

validity of the results. Expert opinion from the supervisors was also sought and their inputs taken into account in development of the study tools to enhance validity.

3.11 Reliability

To achieve reliability, Cronbach's alpha was calculated using SPSS Version 20 to determine reliability of all items under the instrument used in this study. Coefficients of between 0.7 to 1.0 are considered good meaning that there is internal consistency (Donald and Delno, 2006). The average Cronbach's alpha reliability coefficient for the instrument was 0.781 which was within the acceptable reliability range.

3.12 Data collection techniques

Permission was sought from the County Health Director and Chief Administrator, before issuing the questionnaire to the respondents. Health workers who were identified through the random sampling after stratification were visited in their respective units/sections or offices and requested to fill the self administered questionnaire after being explained the purpose of the study and signing a consent form (See appendix II).

3.13 Data analysis

Pre- analysis - data cleaning was done to check for inconsistent entries, data mistakenly entered, missing data, outliers, and duplicates before the actual analysis. SPSS Version 20 was used for data analysis. Descriptive analysis especially frequencies, proportions, cross tabulation and chi square test were done to check independent variables that were significantly associated with health information utilization/use at P value of less than 0.05 (95% confidence interval), for instance using predictor variables like whether training, data

quality and access to equipments influence health information use. Information generated was presented in tables, bar graphs, pie charts and spider charts.

The qualitative data was analysed using QSR international NVivo11 into themes to identify emerging trends within and between variables and used to interpret, support, discuss and triangulate the quantitative results.

3.14 Ethical considerations

Approval to carry out the study was sought from the graduate school, Ethical Review Committee of Kenyatta University (Appendix VI). Authorization and permit to carry out the research was obtained from National Council for Science, Technology and Innovation (Appendix VII and VIII). Administrative permission was also obtained from the County Health Director and CGH Ethics Review Committee (Appendix IX). The highest level of confidentiality was maintained. Each respondent signed an informed consent (Appendix II) after being told the purpose of the study and how it would benefit him/her and explained that participation in the study was voluntary, their right to refuse or withdraw from the study at any given time was allowed. All responses were kept confidential and anonymous. Feedback was given during review meetings and continuous medical education sessions held at the facility.

CHAPTER FOUR: RESULTS

4.1 Introduction

This chapter displays results and analysis of the study findings, which are basically an outcome of the combination of quantitative and qualitative research instruments used in data collection. It is organized in terms of general characteristics of the respondents, level of data/information use, technical, organizational, and behavioural factors. Respondents involved were health workers from Coast County Referral Hospital, Mombasa County, Kenya.

4.2 Respondents' general characteristics

The study involved 236 health workers. In terms of age 97 (41.1%) of the respondents were aged between 30 – 39 years. As shown in the table 4.1, out of the 236 respondents, 161 (68.2%) were female, with nurses 125 (53.0%) contributing the highest number and doctors 23 (9.7%) the least. Majority 118 (50.0%) of the respondents had diploma as their highest attained education level followed by 67 (28.4%) had degree. Regarding work experience, 121 (51.3%) had worked for more than five years since first graduated and 113 (47.9%) have been working at CGH for five years and above. More than a half 125 (53.0%) of the health workers were working in outpatient and in-patient during the time of the study.

Table 4.1: General characteristics of respondents

Characteristic	Category	Frequency (n = 236)	Percentage (%)
Age in years	20 - 29	31	13.1
	30 - 39	97	41.1
	40 - 49	73	30.9
	50+	35	14.8
Gender	Male	75	31.8
	Female	161	62.8
Professional training	Doctor	23	9.7
	Nurse	125	53.0
	RCO	30	12.7
	Others	58	24.6
Highest education level	Certificate	13	5.5
	Diploma	118	50.0
	Higher Diploma	24	10.2
	Degree	67	28.4
	Masters	14	5.9
Working experience since first graduated	6 - 11 months	26	11.0
	12 - 35 months	44	18.6
	36 - 59 months	45	19.1
	60 + months	121	51.3
Working experience at Coast CRH	6 - 11 months	30	12.7
	12 - 35 months	41	17.4
	36 - 59 months	52	22.0
	60 + months	113	47.9
Department working currently	OPD	46	19.5
	In-patient	65	27.5
	Both OPD and IPD	125	53.0

4.3 Level of routine information use for decision making

4.3.1 Overall level of RHI use for decision making

Use of routine health information was assessed using information use index (mean) established from a set of nine (9) areas of information use. In the study respondents self

rated the extent to which they use RHI for decision making in each of the nine areas in a scale of 1 to 4 with a rating score of 0% to 100% where 1 meant rarely with a rating score of (0 – 25)%, 2 meant sometimes with a rating score of (26 – 50)%, 3 meant often with a rating score of (51 – 75)%, and 4 meant always with a rating score of (76 – 100)%. According to analysis results shown on table 4.2, use of routine health information for planning had a mean 3.00 (75.1%), monitoring and evaluation 2.98 (74.4%) and supply and drug management 2.96 (74.1%). Use for resource mobilization and staffing decisions had a mean score of 2.656 (66.4%) and 2.40 (60.0%) respectively. The overall RHI use index was calculated by taking the mean of all nine dimensions which come to 69.6%.

Table 4.2: Overall extent of RHI use for decision making

Ranking	use area	Mean (n = 236)	Rating score (%)
1	Planning	3.004	75.1
2	Monitoring and evaluation	2.976	74.4
3	Supply & drug mgt	2.964	74.1
4	Gaps identification	2.872	71.8
5	Detection of outbreaks	2.804	70.1
6	Review strategy / performance	2.708	67.7
7	Service delivery improvement	2.66	66.5
8	Resource mobilization	2.656	66.4
9	Staffing decisions	2.4	60.0
RHI use index		2.784	69.6

Further analysis with an aid of chi-square test was carried out in order to establish association between respondent's general characteristics and use of RHI for decision making. The Pearson chi-square in table 4.3 shows a statistical significant association between level of education and professional training use of information ($\chi^2 = 15.653$, $df = 8$, $p=0.045$) and ($\chi^2 = 7.632$, $df = 6$, $p=0.046$) respectively.

Age, gender of the health worker and working experience had marginal statistical relationship to use of RHI for decision making, $p > 0.05$.

Table 4.3: General characteristic and RHI use

Variable		Use of RHI for decision making (n = 236)				χ^2 , (df)
		Rarely (%)	Sometimes (%)	Always (%)	Total (%)	
Age in years	20 - 29	6 (19.4)	14 (45.2)	11 (35.5)	31 (100)	$\chi^2 = 5.925$ (6) $p=0.432$
	30 - 39	22 (22.7)	42 (43.3)	33 (34.0)	97 (100)	
	40 - 49	8 (11.0)	35 (47.9)	30 (41.1)	73 (100)	
	50+	6 (17.1)	12 (34.3)	17 (48.6)	35 (100)	
Gender	Male	8 (10.7)	37 (49.3)	30 (40.0)	75 (100)	$\chi^2 = 4.0125$ (2) $p=0.134$
	Female	34 (21.1)	66 (41.0)	61 (37.9)	161 (100)	
Highest education attained	Certificate	5 (38.5)	1 (7.7)	7 (53.8)	13 (100)	$\chi^2 = 15.653$ (8) $p=0.045$
	Diploma	15 (12.7)	55 (46.6)	48 (40.7)	118 (100)	
	Higher Dip.	4 (16.7)	9 (37.5)	11 (45.8)	24 (100)	
	Degree	15 (22.4)	34 (50.7)	18 (26.9)	67 (100)	
	Masters	3 (23.1)	4 (28.6)	7 (50.0)	14 (100)	
Professional training	Doctor	5 (21.7)	14 (60.9)	4 (17.4)	23 (100)	$\chi^2 = 7.632$ (6) $p=0.046$
	Nurse	24 (19.2)	55 (44.0)	46 (36.8)	125 (100)	
	RCO	5 (16.7)	10 (33.3)	15 (60.0)	30 (100)	
	Others	8 (13.8)	24 (41.4)	26 (44.8)	58 (100)	
Working experience since first graduated	6-11 mth	7 (26.9)	10 (38.5)	9 (34.6)	26 (100)	$\chi^2 = 8.872$ (6) $p=0.181$
	12-35 mth	5 (11.4)	27 (61.4)	12 (27.3)	44 (100)	
	36-59 mth	7 (15.6)	20 (44.4)	18 (40.0)	45 (100)	
	60 + mth	23 (19.0)	46 (38.0)	52 (43.0)	121 (100)	

4.4 Technical Factors

The PRISM tools identify many technical issues which can affect health information use. Technical factors, both for the health worker and the system may determine use of routine health information. These includes underlying determinant such as, continuous training, confidence in undertaking HMIS tasks by health workers and their actual competence.

4.4.1 Training

The extent of training in aspects of information management, that is, data collection, analysis, presentation, information use and computer software's in the last three years preceding the survey was also determined with 70 (30.0%) reporting to have received minimal training in computer software's. Further analysis was done to establish whether the extent of training in various areas had any statistical significant association with information use by use of chi-square test of independence and results were displayed in table 4.4. The results indicates statistically significant association between extent of training on data presentation ($\chi^2 = 31.176$, $df = 6$, $p = < 0.001$) and information utilization ($\chi^2 = 15.571$, $df = 6$, $p = 0.016 < 0.05$) with RHI use among the health worker participated in the study. Training on data collection and data analysis has no statistical significant relationship to use of RHI for decision making, $p > 0.05$. This was amplified by quote where one of the respondents thus said:

“...the nurse is not well trained on some aspects on data like the records officer..... it is work of the records to analyse , present and give us the data, because some cadres like the nurse is always busy with the patient” (FGD – 04).

Table 4.4: Training and RHI use

Training areas		Use of RHI decision making (n = 236)				χ^2 , (df)
		Rarely (%)	Sometimes (%)	Always (%)	Total (%)	
Data collection	Minimal	18 (22.8)	32 (40.5)	29 (36.7)	79 (100)	$\chi^2 = 9.080$ (6) p=0.169
	Fairly well	9 (10.1)	48 (53.9)	32 (36.0)	89 (100)	
	Well	13 (22.0)	21 (35.6)	25 (42.4)	59 (100)	
	Very well	2 (22.2)	5 (55.6)	2 (22.2)	9 (100)	
Data analysis	Minimal	18 (22.2)	32 (39.5)	31 (38.3)	81 (100)	$\chi^2 = 8.741$ (6) p=0.189
	Fairly well	12 (13.6)	46 (52.3)	30 (34.1)	88 (100)	
	Well	9 (15.8)	27 (47.4)	21 (36.8)	57 (100)	
	Very well	3 (30.0)	1 (10.0)	6 (60.0)	10 (100)	
Data presentation	Minimal	27 (31.4)	29 (33.7)	30 (34.9)	86 (100)	$\chi^2 = 31.176$ (6) p=0.001
	Fairly well	8 (10.4)	41 (53.2)	28 (36.4)	77 (100)	
	Well	4 (6.5)	36 (58.1)	22 (35.5)	62 (100)	
	Very well	3 (27.3)	0 (0.0)	8 (72.7)	11 (100)	
Info. utilization	Minimal	22 (27.2)	29 (35.8)	30 (37.0)	81 (100)	$\chi^2 = 15.571$ (6) p=0.010
	Fairly well	13 (15.3)	46 (54.1)	26 (30.6)	85 (100)	
	Well	3 (5.7)	26 (49.1)	24 (45.3)	53 (100)	
	Very well	4 (23.5)	5 (29.4)	8 (47.1)	17 (100)	
Computer software's	Minimal	14 (20.0)	35 (6.0)	21 (30.0)	70 (100)	$\chi^2 = 11.431$ (6) p=0.076
	Fairly well	8 (10.1)	33 (41.8)	38 (48.1)	79 (100)	
	Well	10 (7.9)	23 (41.1)	23 (41.1)	56 (100)	
	Very well	10 (32.3)	12 (38.7)	9 (29.0)	31 (100)	

4.4.2 Ability to perform tasks related to information management

In terms of ability to perform tasks related to information management, 15.3% rated it to be poor. Chi-square analysis was done and results displayed in table 4.5 indicates statistical significance relationship between health worker's perceived ability to calculate percentages / rate, plot information by months or years and ability to explain findings and their implications with use of RHI for decision making with p- value < 0.05.

Table 4.5: Perceived ability and Information use

Ability to		Use of RHI generated for decision making (n = 236)				χ^2 , (df)
		Rarely (%)	Sometimes (%)	Always (%)	Total (%)	Value
Can calculate percentages / rates	Poor	14 (28.6)	22 (44.1)	13 (26.5)	49 (100)	413.692 (6) p=0.33
	Fair	9 (11.1)	30 (37.0)	42 (51.9)	81 (100)	
	Good	15 (16.5)	45 (49.5)	31 (34.1)	91 (100)	
	Very good	4 (26.7)	6 (40.0)	5 (33.3)	15 (100)	
Can plot information by months or years	Poor	14 (31.1)	21 (46.7)	10 (22.2)	45 (100)	13.168 (6) p=0.40
	Fair	14 (16.1)	32 (36.8)	41 (47.1)	87 (100)	
	Good	11 (13.3)	38 (45.8)	34 (41.0)	83 (100)	
	Very good	3 (14.3)	12 (57.1)	6 (28.6)	21(100)	
Explaining findings and their implications	Poor	11 (30.6)	14 (38.9)	11 (30.6)	36 (100)	16.286 (6) p=0.012
	Fair	20 (25.0)	31 (38.8)	29 (36.2)	80 (100)	
	Good	7 (6.7)	52 (50.0)	45 (43.3)	105 (100)	
	Very good	4 (25.0)	6 (37.5)	6 (37.5)	16 (100)	
Use information to identify gaps and set targets	Poor	13 (33.3)	14 (35.9)	12 (30.8)	39(100)	11.929 (6) p=0.064
	Fair	17 (21.0)	35 (43.2)	29 (35.8)	81 (100)	
	Good	9 (9.5)	44 (46.3)	42 (44.2)	95 (100)	
	Very good	3 (14.3)	10 (47.6)	8 (38.1)	21 (100)	

4.4.3 Overall level of competence and access

In regards to overall level of competence in routine data/information management tasks, 109 (46%) rated themselves to be moderate, 95 (40%) high and 4 (2%) very high while 28 (12%) felt to be low as shown in figure 4.2. During interview, one of the key informants pointed out that:

“....being a doctor, we are not trained on data issues in medical schools therefore not very good and again when appointed in offices with new mandates and roles there are no induction... we learn issues of data in the hard way either during meeting or when asked by county offices” (Key Informant, 002).

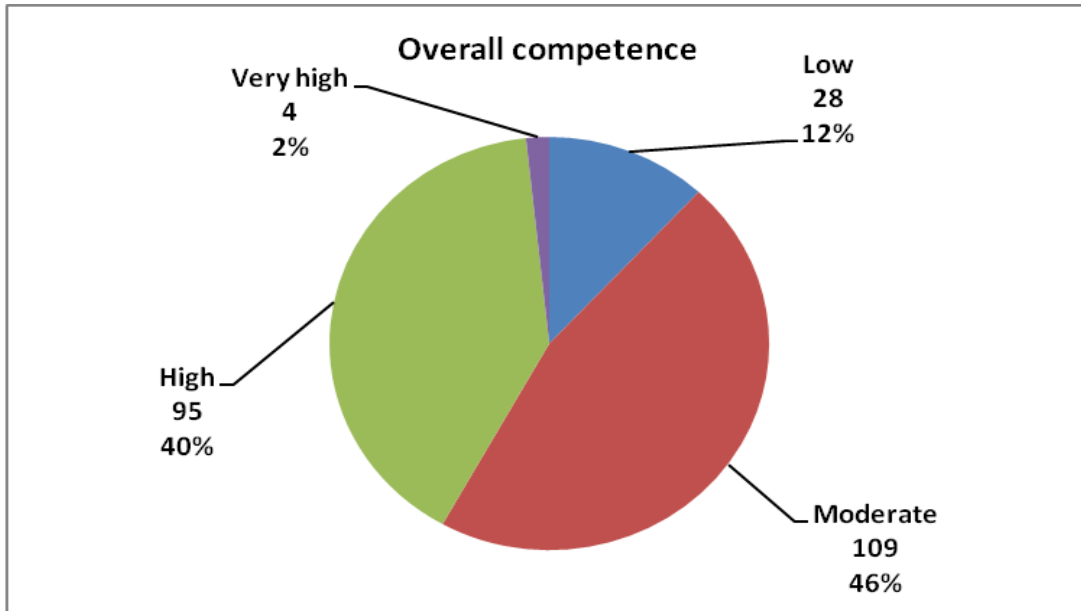


Figure 4.1: Overall level of competency

When asked whether it was ease to access routine data/information whenever they needed it, 116 (49.2%) said yes and 120 (50.8%) said it was not easy for them. Further analysis was done and results displayed in table 4.6 which shows there is a statistical significance between overall levels of competency, access to information and use of health information for decision making.

Table 4.6: Competency and access versus information use

Variable		Use of RHI decision making (n = 236)				χ^2 , (df)
		Rarely (%)	Sometimes (%)	Always (%)	Total (%)	
Overall competence	Low	10 (35.7)	10 (35.7)	8 (28.6)	28 (100)	$\chi^2 = 14.000$ (6) p=0.026
	Moderate	19 (17.4)	47 (43.1)	43 (39.4)	109 (100)	
	High	13 (13.7)	46 (48.4)	36 (37.9)	95 (100)	
	Very high	0 (0)	0 (0)	4 (100)	4 (100)	
Ease of access	Yes	12 (10.3)	45 (38.8)	59 (50.9)	116 (100)	$\chi^2 = 17.303$ (2) p=0.001
	No	30 (25.0)	58 (48.3)	32 (26.8)	120 (100)	

4.5 Organizational Factors

Each organisation has a culture and managerial style that determines the use of routine health information.

4.5.1 Factors that decisions made are based upon

Figure 4.3 shows the extent to which some factors upon which decisions to use RHI for decision making were based upon at CGH. Decisions were based on facts / information (76.7%) health needs (79.7%), while (49.2%) said are base on intuition / arbitrarily and (34.7%) on personal liking.

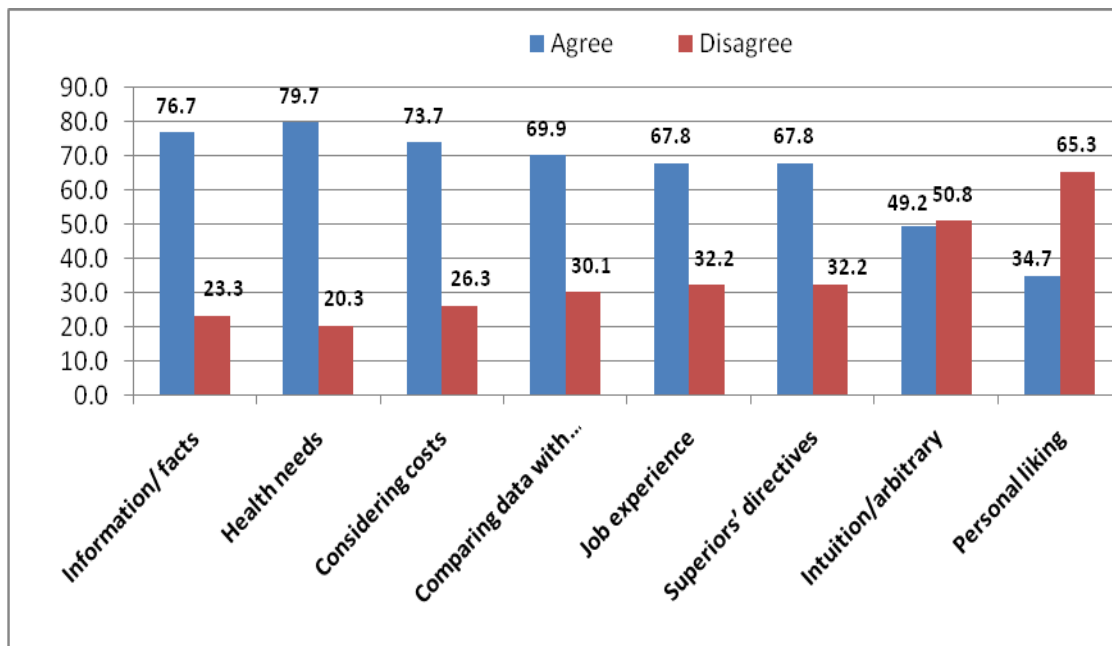


Figure 4.2: Basis of decisions among health workers at CGH

4.5.2 Access to functional equipments

Information use is determined by access to functional resources. Among the health workers who participated in the study 71 (30.1%) and 78 (33.1%) reported to have rare access to computer and internet respectively. Table 4.7 shows chi-square analysis results that

indicates statistical significant association between access to functional computer and information use for decision making ($\chi^2= 17.311$, $df =8$, $p=0.027 < 0.05$). This was amplified in the following statement:

“.....some of us are not trained or rather analogy....but even those who have the knowledge they don’t have opportunity to practice as some wards or units like ours do not have computer ” (FGD, 08).

Access to other resources like calculate, printer and internet has marginal statistical significance to RHI use

Table 4.7: Access to functional computer and information use

Access to functional		Use of RHI generated for decision making (n = 236)				χ^2 , (df)
		Rarely (%)	Sometimes (%)	Always (%)	Total (%)	
Computer	Rarely	16 (22.5)	37 (12.1)	18 (25.4)	71 (100)	$\chi^2 = 17.311$ (8) p=0.027
	Sometimes	8 (17.0)	17 (36.2)	22 (46.8)	47 (100)	
	Often	7 (10.1)	33 (47.8)	29 (42.0)	68(100)	
	Frequently	10 (31.2)	10 (31.2)	12(37.5)	32 (100)	
	Always	1 (5.9)	6 (35.3)	10 (58.8)	17 (100)	
Internet	Rarely	13 (16.7)	36(46.2)	29 37.2)	78(100)	$\chi^2 = 7.804$ (8) p=0.453
	Sometimes	12 (26.1)	16 (34.8)	18 (39.1)	46 (100)	
	Often	10 (14.7)	34 (50.0)	24 (35.3)	68 (100)	
	Frequently	7 (21.9)	11 (34.4)	14 (43.8)	32 (100)	
	Always	0 (0)	6 (50.0)	6 (50.0)	12 (100)	

4.5.3 Business processes (supervision, roles and meetings)

Several business processes that may hinder or promote information use in an organization were assessed. In terms of level of support the health workers were getting from their

immediate supervisor on matter pertaining to information management, 124 (52.5%) said it was low. Among the respondents, 107 (45.4%) reported to have well defined roles and responsibilities in their job description in terms of health information management. Nevertheless, 40 (16.9%) did not analyzed the data they collected and 13 (5.5%) were not holding departmental meeting to discuss or review performance. One of the participants during the KII pointed out that:

“since devolution there is a lot of confusion and resources are also scarce.....we are rarely supervised, workshops and seminars have reduced but still those who have opportunity to go rarely give feedback and departmental data review meetings are lacking in some units.....” (Key informant, 001).

Table 4.8 display results details on further analysis through ch-square on the several processes that may influence information use. The results indicate statistical significant association between leadership support, clearly defined role, data analysis and frequent departmental meetings with information use for decision making.

Table 4.8: Business processes and information use

Variable		Use of RHI generated for decision making (n = 236)				χ^2 , (df)
		Rarely (%)	Sometimes (%)	Always (%)	Total (%)	
Support from in-charge	Very low	5 (16.1)	16 (51.6)	10 (32.3)	31 (100)	$\chi^2 = 19.056$ (6) p=0.004
	Low	24 (25.8)	39 (41.9)	30 (32.3)	93 (100)	
	High	13 (13.1)	49 (49.5)	37 (37.4)	99 (100)	
	Very high	0 (0.0)	2 (15.4)	11 (84.6)	13 (100)	
Roles and responsibilities clearly defined	Not at all	4 (23.5)	8 (47.1)	5 (29.4)	17 (100)	$\chi^2 = 13.528$ (6) p=0.035
	Fairly well	23 (20.5)	49 (43.8)	40 (35.7)	112 (100)	
	Well	14 (14.7)	48 (50.5)	33 (34.7)	95 (100)	
	Very well	1 (8.3%)	1 (8.3%)	10 (83.3%)	12 (100%)	
Analysis of the data collected	Never	8 (20.0)	18 (45.0)	14 (35.0)	40 (100)	$\chi^2 = 13.089$ (6) p=0.042
	Occasionally	15 (2.1)	36 (52.9)	17 (25.0)	68 (100)	
	Sometimes	18 (16.8)	46 (43.0)	43 (40.2)	107 (100)	
	Always	1 (4.8)	6 (28.6)	14 (66.7)	21 (100)	
Dept. meetings to discuss performance	No meetings	7 (53.8)	5 (38.5)	1 (7.7)	13 (100)	$\chi^2 = 24.659$ (10) p=0.006
	Weekly	12 (27.9)	17 (39.5)	14 (32.6)	43 (100)	
	After 2 wks	1 (11.1)	4 (44.4)	4 (44.4)	9 (100)	
	Monthly	7 (7.1)	49 (50.0)	42 (42.9)	98 (100)	
	Quarterly	6 (25.0)	9 (37.5)	9 (37.5)	24 (100)	

4.6 Behavioural Factors

Behaviours of health workers determine their use of health information. There are several underlying determinants of these behaviours, such as their perceived quality and motivation.

4.6.1 Perceived quality of routine health information

Data quality affects demand and information use in all level of health care delivery. At CGH, health workers were of diverse discipline and this influence their perception on data

quality dimensions. Respondents rated data quality characteristics as poor /fair especially in terms of timeliness (48.7%), accuracy (47.0%) and completeness (42.8%).

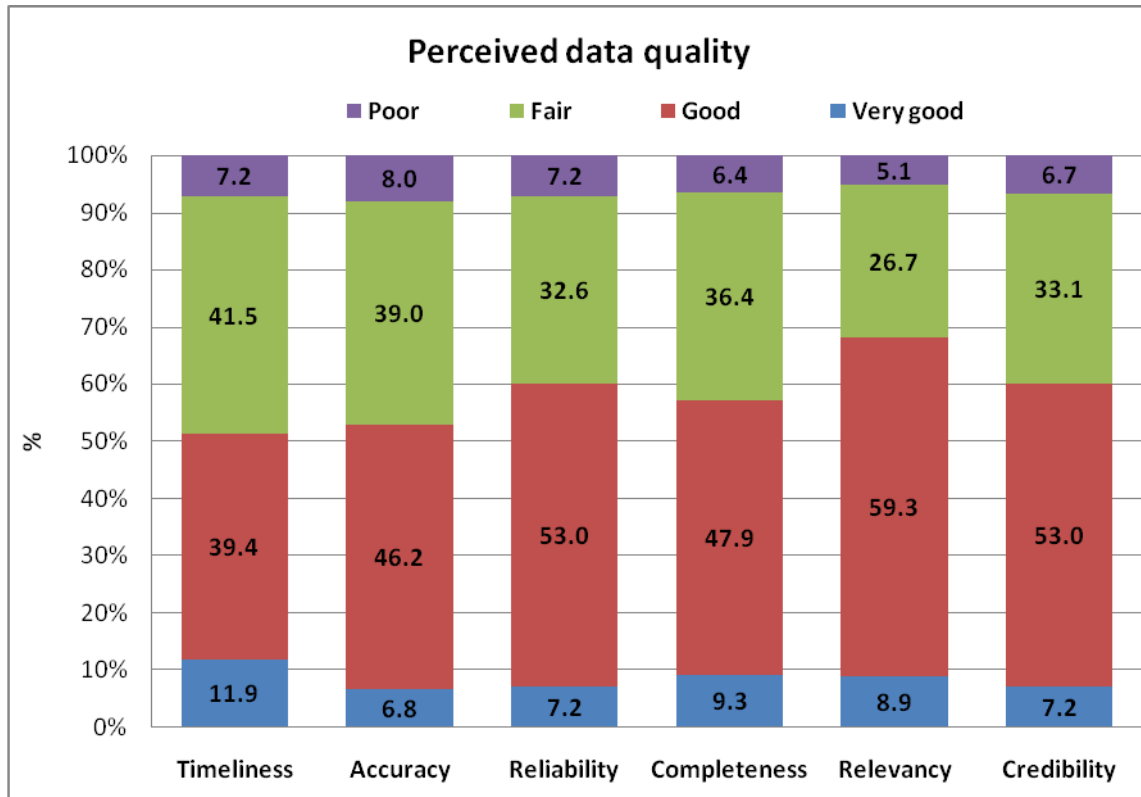


Figure 4.3: Perceived data quality among health workers

4.6.2 Level of motivation to use routine health information

As shown on figure 4.5, when asked to describe their level of motion to use of RHI for decision making 129 (55.1%) of the health workers said it was moderate, while 12 (5.1%) and 32 (13.7%) reported their level of motivation to be very high and low respectively.

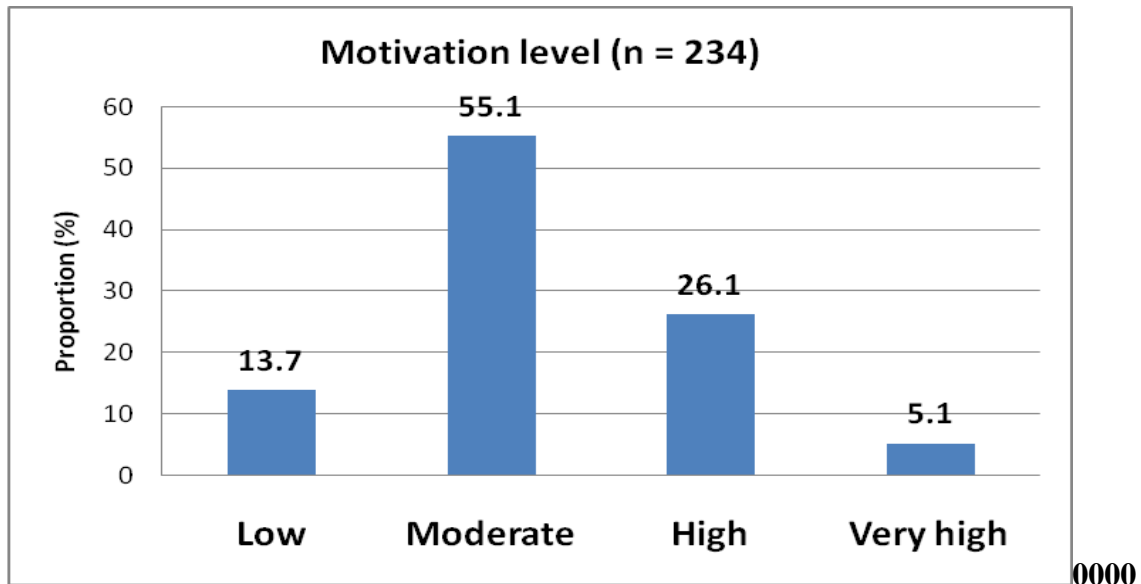


Figure 4.4: Level of motivation to use RHI

4.6.3 Demotivators for use of RHI

When probed on what demotivates them (n = 215), they cited poor connectivity problems 70 (32.7%), lack of feedback or information sharing 65 (30.2%) and inadequate equipments / tools 33 (15.5%) to support information management activities, insufficient skilled personnel 19 (8.8%), poor documentation 9 (4.1%), too much paper work 6 (2.7%) and high workload 5 (2.5%) as the main demotivators among others. During the FGD, one of the health workers pointed out that:

“...to me the most frustrating and demotivating thing in terms of information use at this facility is that we do a lot of paper work.. as in too much documentation and workload to make it worse, no feedback and appreciation from the high authority ...” (FGD, 07).

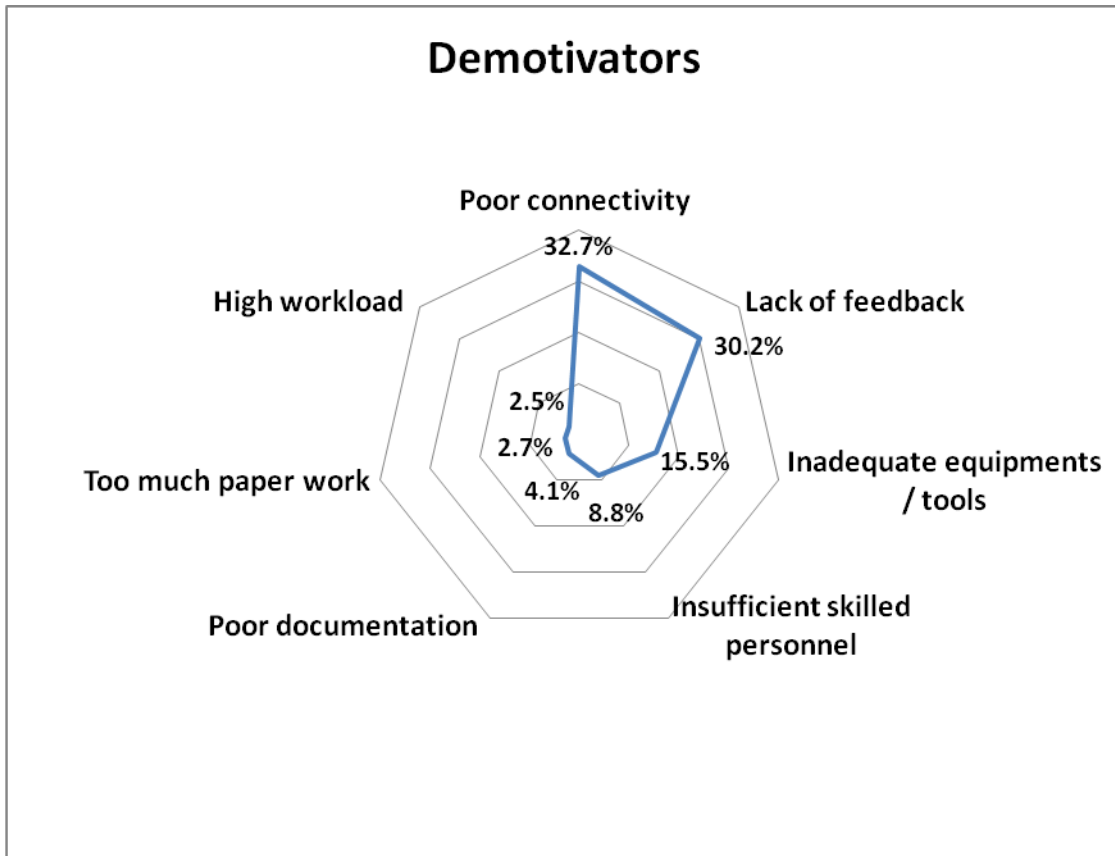


Figure 4.5: Demotivating factors for use of RHI

4.6.4 Suggestion on what should be done to improve RHI use

When asked what they thought could be done to improve information use at CGH they suggested training/mentorship 71 (33.2%), regular feedback / information sharing 45 (20.7%), automation 29 (13.3%) , availing equipments and data tools 20 (9.4%), hire more HRIOs 18 (9.3%) and improve connectivity / networking 17 (7.9%) to mention but a few as shown on figure 4.7.

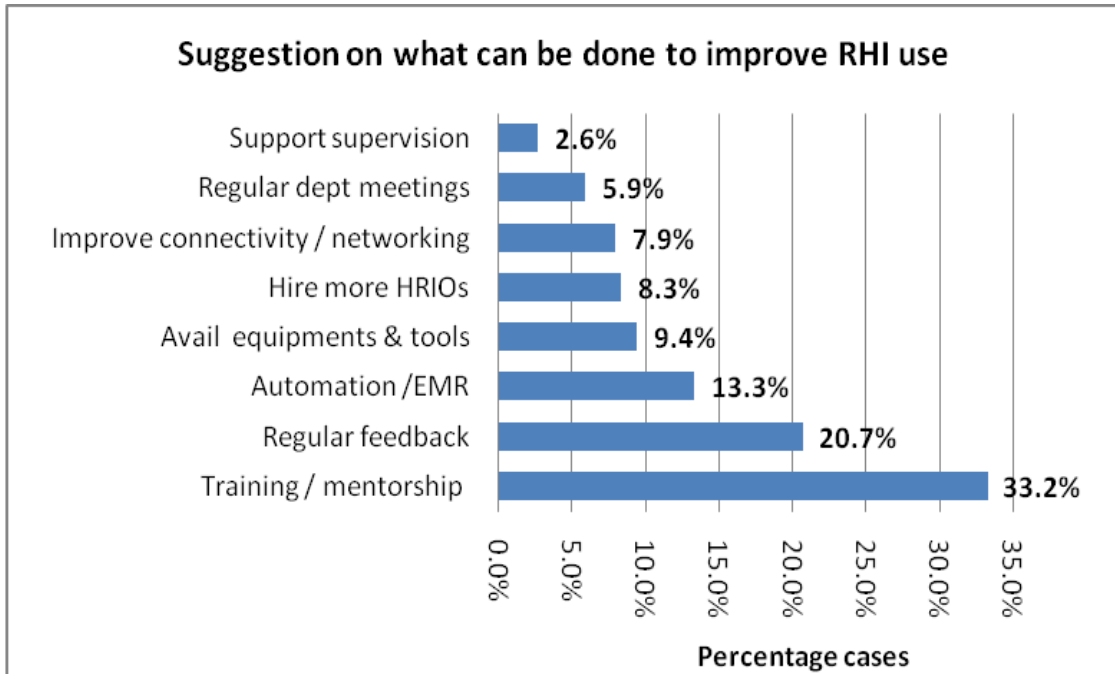


Figure 4.7: Suggested ways to improve use of RHI

CHAPTER FIVE: DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter covers discussion of the findings, conclusions drawn from the results of the study generated by both quantitative and qualitative research instruments. In addition, recommendations, in terms of implications of these findings are presented and areas for further research which were not addressed in this study are also suggested.

5.2 Discussion

5.2.1 Level of use of RHI

An information culture is achieved when everyone asks for facts and clear indicators to make decisions (Nutley, 2012). A positive information culture is characterized by information that is being used on a regular basis. The study revealed 69.6% use of routine health information generated for decision making among the health workers at CGH. This disagrees with (Hotchkiss, 2012; Chaulagai, 2005) which emphasized that little of vast amount of data is used by those who are collecting the data and by local health management at health facility or district levels.

The main areas of routine health information use reported by health workers were mainly on planning (75.1%), monitoring and evaluation (74.4%) and medical supply / drug management (74.1%). Other areas, like resource mobilization (66.4 %) and staffing decisions (60.0%) seem to be less important and rated last. This is consistent with the current practice whereby facilities develop yearly plans and must use previous year data as

their baseline information during the planning process. This is consistent with my findings from the KII. The participants in the KII stressed that routine health information was very crucial especially in preparation of annual work plans and monitoring of activities and disease trends. This findings also corresponds with a study results in India, Tanzania and Uganda which showed that most staff at district level reported using routine health information for program related management especially planning, monitoring, medical supply and drug management (Harrison and Moreland, 2010; Harrison and Bakari, 2008; MEASURE Evaluation 2009).

The level of education and professional training played a significant role in the utilization of data/information. Participants with masters' reported to use information always compared to under graduates. This indicates that education is likely to be associated with RHI use. It appears those health workers who are better-educated places more value on information and use it more often. In regards to professional training, RCOs (60.0%) and nurses (36.8%) reported to use information always. This may be explained by the fact that these two cadres are the one mostly spent more time patients at the hospital compared to the other cadres. On the other hand, the study results showed that, age, gender and working experience of the health worker were not significantly related to use of RHI for decision making.

5.2.2 Technical factors that influence use of RHI

The PRISM tools identify many technical issues which can affect health information use. Technical factors, both for the health care provider and the system may determine use of health information. These include underlying determinants such as, training in information areas, confidence in undertaking health information management tasks and health worker actual competence.

The findings with regards to extent of training the study participants had received showed that 30.0% had received little/minimal training in information areas that is, data collection, analysis, presentation, and information use in last three years preceding the study, indicating a need for more training for health workers. Possible explanation for this is that training function is under the national government and not devolved to the county government and because of several emerging issues the national government has not been able to implement this function as expected. Inadequate analytic and data use skills were a hindrance to RHI use (Harrison and Moreland and Bakari, 2008). This concurs with studies done in Kenya, Zambia and India which indicated that a well designed HMIS does not directly translate to quality data and use of information generated, but continuous capacity building is imperative (Odhiambo-Otieno, 2005; Simwanza and Church 2001; Harrison and Moreland, 2010).

The result indicates statistically significant association between training in data presentation with information use among the health worker. Inadequate technical skills and insufficient knowledge on data management hinder information use. Training health workers in analytic and information use skill has been seen as a way of strengthening the

capacity of health workers at the facility and local levels to use health information for better management and health service delivery.

Information users often struggle with an underdeveloped ability to understand, analyze and interpret them in the programmatic context. The competence or ability to perform a task is an important promoter to information use. When asked to describe their ability, 35.1% rated themselves to be having good ability to undertake HMIS tasks for instance, calculating percentages, plot graphs, explain finding and their implications use information to identify gaps and set targets. On the contrary, they felt less confident in interpreting data and using information to make decisions.

The results also showed statistical significant association between access to information, overall competence and perceived ability to calculate percentages, plotting information by months with use of health information for decision making. Therefore the researcher concluded that to enhance sustainable demand for and use of information in decision making, building core competencies to various aspect of information management must be done at all levels of the health system and information should also be accessible whenever users want it.

5.2.3 Organizational factors that influence use of RHI

The organization may foster or discourage information culture. Information culture is characterized by use of information anytime decisions are being made (Aqil *et al.*, 2009). The results show that 76.7% of the respondents agreed that decisions were based on

facts, 49.2% on intuition and 34.7% on personal liking. Functional computer was not accessible to some of the health workers 71 (30.1%). This conforms to Health Metrics Network. 2007) that lack of computer reduced staff ability to access and use information.

Majority 124 (52.5%) of the health workers described the level of support from their in-charge on matters pertaining to data / information management performance to be low. This is similar to a study done in Uganda by MEASURE Evaluation (2009) which showed that organizational factors, such as promoting a culture of information and quality supervision, were weak. Some respondents 13 (5.5%) expressed lack of departmental meetings as feedback to discuss and review management matter. The finding corresponds to previous study (Azelmet *et at*, 2001; Aqil, 2008) which indicated that lack of regular systems to support M&E activities to local level health workers for instance not holding meetings negatively affected the perceived importance of routine health information use. Feedback is seen as an indicator of information use (Aqil, 2008). When data collectors are given feedback, they feel their data collection contribute to improvements and change benefiting both themselves and patients and create an ownership to the data (Health Metrics Network, 2007).

5.2.4 Behavioural factors that influence use of RHI

Perceptions and attitudes of health workers towards data have a determining influence on the use of health information. On examining the perceptions, attitudes and values of the health workers in respect to data quality 48.7% rated it to be poor / fair in terms of

timeliness, accuracy (47.0%) and completeness (42.8%). The findings concur with a study in India and Uganda which revealed that data quality was often compromised by being incomplete and inaccurate; therefore staff did not always rely on it for decision making (Harrison and Moreland, 2010; MEASURE Evaluation, 2009).

Additionally, poor data quality limits stakeholders' ability to use information for evidence-based decision making. Stakeholders who have had negative perception on data quality are less likely to seek it for future decision making. For consistent information use to occur, data need to be of high quality so that information users are confident that the information they are consulting are accurate, complete, and timely.

Moreover, 55.1% described themselves having moderate level of motivation towards use of available routine health information for decision making. Success of any HMIS is highly dependent on the motivation of the people responsible. This is similar to study by Odhiambo-Otieno, 2005 that indicated low motivation deters health information use among health managers.

5.3 Conclusion

This study revealed 69.6% use of routine health information for decision making with majority using it in planning, monitoring and evaluation and supply and drug management. Information culture has not yet been achieved as some of the decisions were based on personal liking, intuition, supervisor directives and not on facts which may lead to inefficiency and poor health outcomes.

Among the respondents who participated in the study 30.0% had received minimal training at all in information areas like data analysis, presentation, and information use in last three years. Moreover, 15.3% of the health workers at CGH rated their ability to undertake health information management tasks for instance, plotting graphs, explain finding and their implications and use information to identify gaps and set targets to be poor.

The study also demonstrated poor access to functional equipments like computer and internet which jeopardize routine health information utilization. Some staffs lack clear defined roles and responsibilities in their job a description, had not received adequate support supervision and feedback from their supervisors. Even though they were holding departmental meetings to share performance on key indicators, the meetings were irregular.

Furthermore, they were concerns about poor data quality (inaccurate, untimely, incomplete and unreliable) which made respondents to have negative perceptions, attitude that was expressed by all health workers. The results also highlighted low staff morale as an obstacle to use of health information that was attributed to the poor data quality and network problems.

5.4 Recommendations

In order to strengthen routine health information utilization CHMT in liaison with Ministry of Health headquarters should apply appropriate and effective strategies that will promote the consistent RHI use for decision making:

1. Create organizational culture through increased demand for and use of routine health information for evidence based decision making in all aspects
2. Provide continuous training to health workers with specific focus on use of routine health information through on- job trainings, mentorship for those already working and for sustainability, strengthening the curriculum in health training institutions through integrating HMIS module in all cadres.
3. Strengthen organizational resources that supports information use at all levels through provision of tools, computer, skilled personnel, automation, connectivity, complimented by targeted regular support supervision, review meetings and job descriptions outlining information roles and responsibilities.
4. Enhance perception on routine health information amongst staffs through staff attitude change management and institutionalizing proactive information quality assurance mechanisms to identify and address data flaws and strengthen feedback process in which information consumers communicate with data producers to share information needs and challenges encountered.

5.5 Areas of further Research

1. A research to compare private health facilities and government facilities on routine health information use.

2. CGH being at operational level another research is also recommended to assess the utilization of health information among health managers at Sub County (tactical level).

REFERENCES

- Aqil A, Lippeveld T and Hozumi D. (2009). PRISM framework: a paradigm shift for designing, strengthening and evaluating routine health information systems. *Health Policy and Planning*. 24: 217–228.
- Aqil A. (2008). PRISM Case studies: Strengthening and Evaluating RHIS [SR-08-43]. Chapel Hill, NC: MEASURE Evaluation.
- Azelmat, M., Edwards, M., Lippeveld, T., Yassine, M., Naya, S. and Archach, M., 2010. A Decentralized Information System for the Monitoring and Evaluation of Maternal and Child Health/Family Planning Program Performance. In: The RHINO workshop on issues and innovation in routine health information in developing countries, MEASURE Evaluation, JSI Research and Training Institute, 37-44.
- Belita A, Mbindyo P, English M (2013). Absenteeism amongst health workers--developing a typology to support empiric work in low-income countries and characterizing reported associations. *Human Resources for Health*, 11(1)34
- Braa J, Heywood A, Sahay S (2012). Improving quality and use of data through data-use workshops: Zanzibar , United Republic of Tanzania. *Bulletin of the World Health Organization*.,90:379–84.
- Chaulagai C, Moyo C, Koot J, Moyo H, Sambakunsi T, Khunga F, et al (2005). Design and implementation of a health management information system in Malawi: issues , innovations and results. *Health Policy Plan.*;20(6):375–84.
- Davenport, T., Harris, J., De Long, D., and Jacobson, A. (2010). *Data to Knowledge to Results – building an analytic capability*. Institute for Strategic Change. Andersen Consulting.
- Davies, P., Hodge, N., Aumua, A., Malik, A. & Lee, Y. (2011). Conceptualising the information needs of senior decision makers in health [Working Paper Series]. *Health Information Systems Knowledge Hub*, 18, 1-20.
- Galimoto MS (2007). Integration of health information systems: a case study of Malawi. Masters Thesis. Oslo, Faculty of Mathematics and Natural Sciences, University of Oslo.
- Gething PW et al (2007). Information for decision making from imperfect national data: tracking major changes in health care use in Kenya using geostatistics. *BMC Med.*;5:37.
- Harrison T and Bakari B. (2008). Assessment of data use constraints in Tanzania: Decision makers' perceptions. Chapel Hill, NC: MEASURE Evaluation. [unpublished]

- Harrison T, Nutley T. (2010). A Review of constraints to using data for decision making: recommendations to inform the design of interventions. Chapel Hill, NC: MEASURE Evaluation, Carolina Population Center.
- Health Metrics Network (2007). Framework and standards for country health information system, Second edition edn, World Health Organization, Geneva.
- HMN (2008). Framework and Standards for Country Health Information Systems (Vol. 2nd Editio). Geneva.
- Hotchkiss D, Diana M, Foreit K. (2012). How can routine health information systems improve health systems functioning in low-resource settings? Assessing the evidence base. Chapel Hill, NC: MEASURE Evaluation, Carolina Population Center.
- Karuri J, Waiganjo P, Orwa D, Manya A (2014). DHIS2: The Tool to Improve Health Data Demand and Use in Kenya. *J. Health Informatics in Developing Countries*, 8(1):38–60
- Kihuba E, Gathara D, Mwinga S, Mulaku M, Kosgei R, Mogo W, English M (2014). Assessing the ability of health information systems in hospitals to support evidence-informed decisions in Kenya (Vol. 1).
- Koo, D., Morgan, M. & Broome, C. (2002). New means of data collection. In P. W. O'Carroll, W. A. Yasnoff, M. E. Ward, L. H. Ripp & E. L. Martin (Eds.), *Public health informatics and information systems* (pp. 379 - 407). Indianapolis: Springer
- Koon, A., Nambiar, D. & Rao, D.R. (2012). *Embedding of Research into Decision-Making Processes*. Geneva, Switzerland: Alliance for Health Policy and Systems Research, World Health Organization, 1-18.
- LaFond A. and Field R. (2010). The Prism: Introducing an analytical framework for understanding performance of routine health information system in developing. RHINO 2nd International Workshop, South Africa: MEASURE Evaluation.
- Lomas, J. (2007). The in-between world of knowledge brokering [review]. *BMJ*, 334(7585), 129- 132. doi: 10.1136/bmj.39038.593380.AE
- Mavimbe, J.C., Braa, J. & Bjune, G. (2009). Assessing immunization data quality from routine reports in Mozambique. [Research Support, Non-U.S. Gov't]. *BMC Public Health*, 5, 108. doi: 10.1186/1471-2458-5-108
- MEASURE Evaluation (2007). Decision maker perceptions in Kenya and Nigeria: An assessment of data use constraints. [TR-07-44]. Chapel Hill, NC.
- MEASURE Evaluation (2009). Routine Data Quality Assessment Tool: Guidelines for Implementation. Available at www.cpc.unc.edu/measure/tools/monitoring-evaluation-systems/data-quality-assurance-tools.

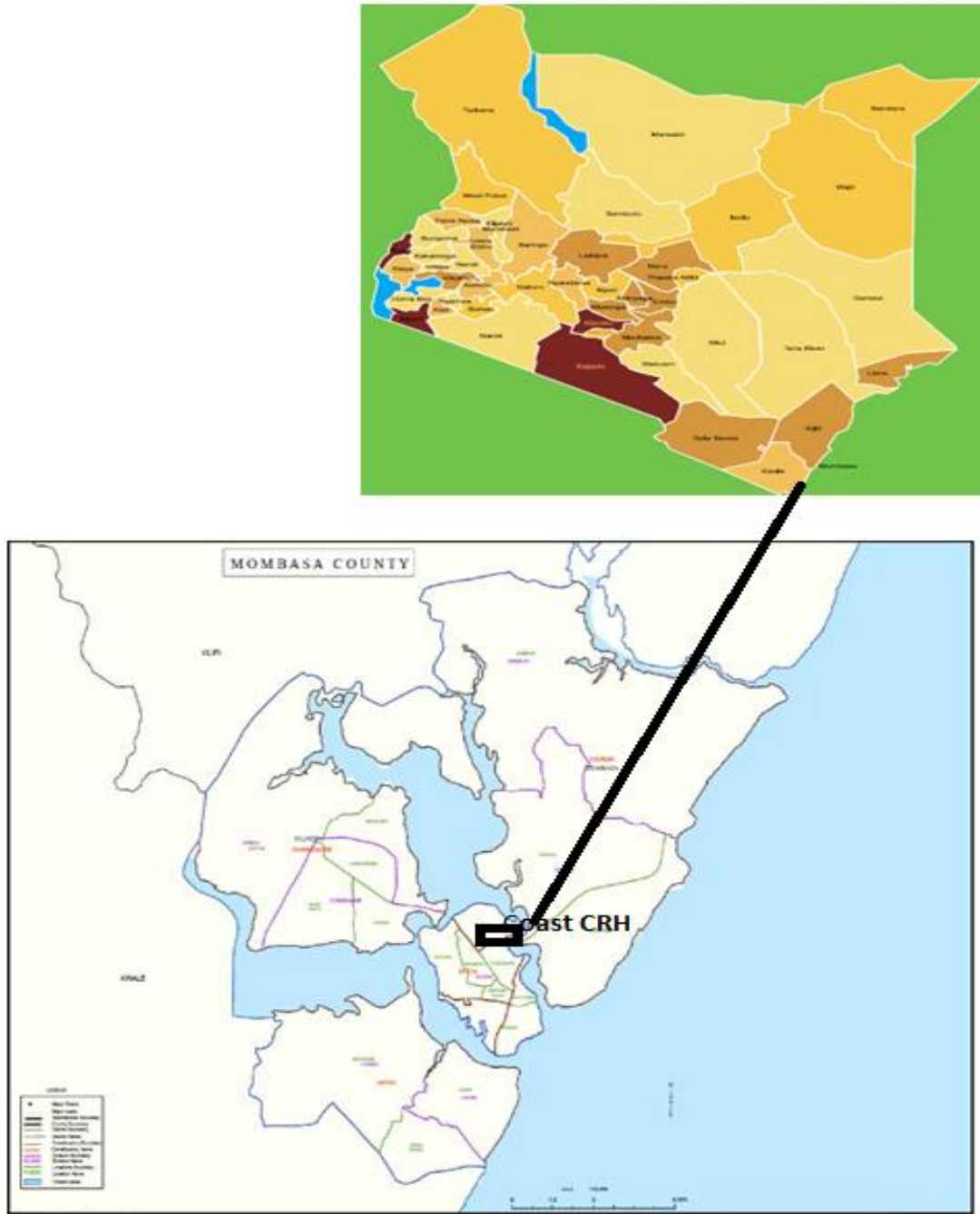
- MEASURE Evaluation (2012). How can routine health information systems improve health systems functioning in low and middle-income countries? assessing the evidence base. *Advances in Health Care Management*
- Ministry of Health (2010). Health Sector Health Information System Policy 2010-2030. Nairobi: Ministry of Health.
- Ministry of Health. Health Information System Policy. Nairobi; 2008.
- Ministry of Medical Services & Ministry of Public Health & Sanitation, {MOMS & MOPHS} (2010). *Annual Operational Plan Consolidated -Health Sector 2010/2011*. Nairobi: MOMS/MOPHS
- MoH (2014b). Kenya Health Information System Annual Statistical Report 2013. Nairobi , Kenya.
- MoH (2015). Kenya Health Sector Monitoring and Evaluation Framework:- Accelerating attainment of universal coverage. Nairobi, Kenya
- MoH.(2015). Kenya Health Sector Monitoring and Evaluation Framework:- Accelerating attainment of universal coverage. Nairobi, Kenya.
- Mohr, J. J. & Batalden, P. B. (2009). "Improving safety on the front lines: the role of clinical microsystems", *Quality & Safety in Health Care*, vol. 11, no. 1, pp. 45-50
- Mutemwa, R. I. 2006, "HMIS and decision-making in Zambia: re-thinking information solutions for district health management in decentralized health systems", *Health Policy Plan.*, vol. 21, no. 1, pp. 40-52.
- Nutley T. (2012). *Improving data use in decision making: an intervention to strengthen health systems*. Chapel Hill, NC: MEASURE Evaluation, Carolina Population Center.
- Odhiambo-otieno GW (2005). Evaluation of existing District Health Management Information Systems A case study of the District Health Systems in Kenya. *International Journal of Medical Informatics*. 2005;74:733–744.
- Patton, M.Q. (2008). *Utilization-Focused Evaluation* (4th ed.). Thousand Oaks, CA: SAGE Publications, Inc.
- RHINO (2009). Second International RHINO Workshop on: Enhancing the Quality and Use of Routine Health Information at District Level, In Conjunction with MEASURE Evaluation, USAID, JSI and The Equity Project, Mpekwini Sun, Eastern Cape, South Africa.
- Simwanza, A. and Church, M., (2010). Establishment of an Information Culture: Achievements and Challenges in Zambia. In: *The RHINO workshop on issues and innovation in routine health information in developing countries*, The Bolger Center, rotomac, MD, USA 14-16 March 2001. Arlington,VA 22209, USA: MEASURE Evaluation, JSI Research and Training Institute, 227-234.

Turnock, B. (2010). Can public health performance standards improve the quality of public health practice? *Journal of Public Health Management & Practice*, 6(19-25).

World Health Organization 2007, International health regulations (2005). Areas of work for implementation. Geneva.

APPENDICES

Appendix I: Map of Kenya and Study Area



Source: Kenya National Bureau of Statistics, 2014
Figure 3.1: Map of Kenya and study area

Appendix II: Informed Consent Form

Introduction

My name is Gilbert Nzomo. I am Master's student from Kenyatta University. I am conducting a study on “**use of routine health information for decision making among health workers at Coast GH**”. You are being invited to participate in this study because you are among the sampled respondents believed to have useful information on the study subject.

Purpose

The purpose of this study is to appreciate factors influence information use. The information will be used by the HMT, CHMT and Ministry of Health to inform strategies and opportunities for improving information use in this hospital and County level as well as other regions of Kenya.

Procedure to be followed

If you agree to be in this study, you will be asked to respond to some questions either through either self administered questionnaire, interview schedule or focus group discussion guide.

Study time: Study participation will take a total of approximately 45 minutes.

Benefits

There is no direct benefit to you anticipated from participating in this study. However, it is hoped that the information gained from the study will help to identify strategies and opportunities for improving information use at this hospital.

Risks/Discomforts

Some of the study instruments may make you uncomfortable or upset, but you are free to decline to answer any questions you do not wish to or to leave the group at any time.

Confidentiality

Your study data will be handled as confidentially as possible. If results of this study are published or presented, individual names and other personally identifiable information will not be used

Rights

Participation in research is completely voluntary. You have the right to decline to participate or to withdraw at any point in this study without penalty or loss of benefits to which you are otherwise entitled.

Question /Contact information

If you have any questions or concerns about this study, you may contact Dr. George O. Otieno on Mob. 0719506770 or Dr. Daniel W. Muthee on Mob. 0723934169 or the Kenyatta University Ethical and Review Committee Secretariat on chairman.kuerc@ku.ac.ke, secretary.kuerc@ku.ac.ke or ercku2008@gmail.com

Participant(s) statement

The above information regarding my participation in the study is clear to me. I have been given a chance to ask questions and my questions have been answered to my satisfaction. My participation in this study is entirely voluntarily. I understand that my record(s) will be kept private and that I can leave the study at any time.

Participant's Name (*please print*)

Participant's Signature

Date

Investigator's statement

I, the undersigned, have explained to the participant in the language s/he understands, the procedure to be followed in the study and risks and benefits involved.

Person Obtaining Consent

Person obtaining consent Signature

Date

Appendix III: Self- Administered Questionnaire

Serial No.

Date:...../...../2016

Introduction

The purpose of this questionnaire is to collect data on **use of routine health information for decision making among health workers at Coast General Hospital**. The findings will assist in informing strategies and opportunities for improvement. Please express your opinions honestly. Your responses will remain confidential and anonymous and will only be used for purposes of the research in aggregated forms. Your participation and assistance in completing this study is highly appreciated.

Instructions

Kindly provide responses by ticking in the boxes as applicable and by filling in the spaces provided.

For any clarification contact Mr. Gilbert Nzomo Tel. 0723-322065

Part 1: Background characteristics

Q1. Age of the respondent _____

Q2. Gender 1. Male 2. Female

Q3. What is your professional training?

1. Doctor 2. Nurse 3. RCO 4. Others (specify) _____

Q4. What is your highest education attained?

1. Certificate 2. Diploma 3. Higher diploma

4. Degree 5. Masters 6. PhD

Q5. What is your working experience since your first graduated?

1. Less than six months 2. Six months but less than 1 year

3. One year but less than 3 years 4. Three years but less than 5 years

5. Five years and above

Q6. For how long have you been working at Coast General Hospital?

1. Less than six months 2. Six months but less than 1 year

3. One year but less than 3 years 4. Three years but less than 5 years

5. Five years and above

Q7. What department are you offering services at the facility currently?

1. OPD 2. In-Patient 3. Both OPD and in-patient

Part 2: Level of use of routine health information

Q8. How often do you use the routine data/health information generated for decision making?

1. Rarely 2. Sometimes 3. Always

Q9. Please indicate the extent to which you use routine health information generated for:-

On a scale of 1-4, where 1 means rarely, 2 means sometimes, 3 means often and 4 Always:	Rarely 1	Sometimes 2	Often 3	Always 4
A: Planning				
B: Monitoring and evaluation of various programs				
C: Identification of gaps and priority areas				
D: Prediction and detection of outbreaks				
E: Review strategy by examining service performance target				
F: Mobilization/shifting of resources based on comparison by services				
G: Ensuring efficient and effective use of limited resource				
H: Medical supply and drugs management				
I: Staffing decisions (deployment, review personnel responsibilities)				
J: Service delivery improvement				

Part 3: Technical factors influencing health information use

Q10. To what extent have you received training in in the following areas?

	Minimal 1	Fairly well 2	well 3	Very well 4
A. HMIS (data collection and reporting)				
B. Data analysis				
C. Data presentation				
D. Computer software's				

Q11. Kindly rate your ability to carry out the following in relation to data/information management:

	Poor 1	Fair 2	Good 3	Very good 4
A:I can check data accuracy				
B: I can calculate percentage/rates				
C: I can plot information by months or years				
D: I can explain findings and their implications				
E: I can use information to identify gaps and set targets				

Q12. How would you describe your overall level of competence in routine data/information management tasks?

1. Low
2. Moderate
3. High
4. Very High

Q13. Do you find it easy to access routine data/information whenever you need it?

1. Yes
2. No

Part 4: Organizational factors influencing health information use

Q14. To what extent, do you agree with the following on a scale of 1-4?

At this facility decisions are based on:

	Strongly disagree 1	Disagree 2	Agree 3	Strongly agree 4
A: Personal liking				
B: Superiors' directives				
C: Information/ facts				
D: Health needs				
E: Job experience				
F: Considering costs				
G: Comparing data with strategic health objectives				
H: Intuition/arbitrary				

Q15. Do you have **access to functional** equipments in your office/workplace?

	Rarely 1	Sometimes 2	Often 3	Frequently 4	Always 5
A: Computer					
B: Printer					
C: Calculator					
D: Data back up units (e,g flash disc, CD etc)					
E: Access to internet					

Q16. What level of support from your in-charge on matters pertaining to data/information management do you receive?

1. Very low 2. Low 3. High 4. Very high

Q17. Describe how your roles and responsibilities are clearly defined in your job description in terms of health information management?

2. Not at all 2. Fairly well 3. Well 4. Very well

Q18. How often do you analyze the data you collect?

1. Never 2. Occasionally 3. Sometimes 4. Always

Q19. How often does your office /department display information on key performance indicators?

1. Never 2. Occasionally 3. Sometimes 4. Always

Q20. How frequent do you hold departmental or staff meetings to discussing or review managerial/ administrative matters?

1. No meetings 2. Weekly 3. After 2 weeks
 4. Monthly 5. Quarterly 6. No schedule

Part 5: Individual factors influencing health information use

Q21. How would you rate the quality of routine health data/information generated by this facility in terms of?

Area	Very good 1	Good 2	Fair 3	Poor 4	Give your reasons
A. Timeliness				
B. Accuracy				
C. Reliability				
D. Completeness				
E. Relevancy				
F. Credibility				

Q22. How would you describe your level of motivation to use information for decision making?

1. Low 2. Moderate 3. High 4. Very high

Q23. Briefly describe what demotivates you in relation to data/information management and use at this facility (**rank them in order of severity**)

- a)
- b)
- c)
- d)

Q24. What do you think can be done to enhance information use?

- a)
- b)
- c)

Thank You for your time and answering the questions

Appendix IV: FGD Guide

Welcome Remarks.

Thank you for agreeing to be part of the focus group. We appreciate your willingness to participate.

Introductions and climate setting (5-10 minutes)

Moderators, members

- **Purpose of Focus Group**

The purpose of the focus group is to explore the factors that influence routine health information use among health workers at CGH. We need your inputs and request that you share your honest and open thoughts with us.

- **Ground Rules**

1. We would like everyone to participate
2. There are no right or wrong answers
3. Everyone's experiences and opinions are important
4. What is said in this room will be kept confidential
5. We do not identify anyone by name in our report. You will remain anonymous
6. In order to capture all you say we will be tape recording

Discussions (45 minutes)

Moderator to facilitate the session and tape recorder set on. Notes taker take necessary points.

Conclusion and Appreciation (5minutes)

FGD guide:

Q1. In your view, to what extent is routine data/information used for decision making at this facility?

Q2. For what purposes are routine data/information used for?

Q3. How would you describe your technical competency in terms of routine data/health information management?

Q4. Do you feel adequately trained and equipped to manage routine data/information?

Q5. What facility factors promote or hinder data/health information use?

Q6. What are your roles and responsibilities in terms of data management / information use?

Q7. What are your opinions in regards to staff motivation on information use?

Q8. What are the key challenges you are facing in use of routine health information?

Q9. How do you think the challenges you have mentioned can be addressed?

Q10. Is there anything else you would want to share about information use among health workers at CGH?

Thanks for your time and God bless you

Appendix V: Key Informant Interview (KII) Guide

Date of the interview: ____/____/2016..... Time:_____

Position of interviewee_____ No. of years in current position_____

Introduction:

I'm [Name] from Kenyatta University. I am conducting a study on determinants of use of routine health information for decision making among health workers at CGH. To improve health system there is need for better use of health information generated. An important first step in this effort is to appreciate the extent of use and the challenges faced by the users. To do that, I am conducting interviews with key informants. Your knowledge will be very valuable. The interview will take around 30 to 45 minutes.

Interview Questions

1. To what extent is routine data/information generated used for decision making?
2. How is the facility using the routine data/information generated?
3. How would you describe health providers' skills and competency in routine data/health information management?
4. What mechanisms are in place at the facility that promotes data/information use?
5. Describe your role in terms of data management and information use.
6. What can you say about health workers perception and attitude on routine data/information use?
7. In your view, what would you say hinder/encourage information use by health workers in facility?
8. What can be done to scale up use of routine health information at facility level?

Appendix VI: Ethical Clearance Letter from KUERC

KENYATTA UNIVERSITY
ETHICS REVIEW COMMITTEE

Email: chairman.kuerc@ku.ac.ke
secretary.kuerc@ku.ac.ke
ercku2008@gmail.com
 Website: www.ku.ac.ke

P. O. Box 43844 - 00100 Nairobi
 Tel: 8710901/12
 Fax: 8711242/8711575

Our Ref: KU/R/COMM/51/602

Date: 18th January, 2016

Gilbert Nzomo Mboro,
 Kenyatta University,
 P.O Box 43844,
 Nairobi

Dear Nzomo,

RE APPLICATION NUMBER PKU/430/I 399 – “USE OF ROUTINE HEALTH INFORMATION FOR DECISION MAKING AMONG HEALTH WORKERS AT COAST COUNTY REFERRAL HOSPITAL, MOMBASA COUNTY, KENYA”

1. IDENTIFICATION OF PROTOCOL

The application before the committee is with a research topic “Use of routine health information for decision making among health workers at Coast County Referral Hospital, Mombasa County, Kenya” received on 29th October, 2015.

2. APPLICANT

Gilbert Nzomo Mboro, Department of Community Health

3. STUDY SITE

Mombasa County, Kenya.

4. DECISION

The committee has considered the research protocol in accordance with the Kenyatta University Research Policy (section 7.2.1.3) and the Kenyatta University Ethics Review Committee Guidelines AND APPROVED that the research may proceed for a period of ONE year from 18th January, 2016.

5. ADVICE/CONDITIONS

- i. Progress reports are submitted to the KU-ERC every six months and a full report is submitted at the end of the study.
- ii. Serious and unexpected adverse events related to the conduct of the study are reported to this board immediately they occur.
- iii. Notify the Kenyatta University Ethics Committee of any amendments to the protocol.
- iv. Submit an electronic copy of the protocol to KUERC.

When replying, kindly quote the application number above.

If you accept the decision reached and advice and conditions given please sign in the space provided below and return to KU-ERC a copy of the letter.

DR. TITUS KAHIGA
 CHAIRMAN ETHICS REVIEW COMMITTEE

I GILBERT N. MBORO accept the advice given and will fulfill the conditions therein.

Signature..... Gilbert N. Mboro Dated this day of..... 31/2/16 2016.
 cc. Vice-Chancellor
 DVC-Research Innovation and outreach

Appendix VII: Research Authorization



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 3310571, 2219420
Fax: +254-20-318245, 318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
when replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No.

Date:

NACOSTI/P/16/82700/9759

2nd May, 2016

Gilbert Nzomo Mboro
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *“Use of routine health information for decision making among health managers at Coast County Referral Hospital - Mombasa County, Kenya,”* I am pleased to inform you that you have been authorized to undertake research in **Mombasa County** for the period ending **29th April, 2017.**

You are advised to report to **the County Commissioner, the County Director of Education and the County Coordinator of Health, Mombasa County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


BONIFACE WANYAMA
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Mombasa County.

The County Director of Education
Mombasa County.

The County Coordinator of Health
Mombasa County.



Appendix IX: ERC Clearance Letter from CGH

COUNTY GOVERNMENT OF MOMBASA
DEPARTMENT OF HEALTH SERVICES
COAST PROVINCE GENERAL HOSPITAL

Phone : 2314202/5, 2222148,2225845
Mobile No : 0722207868
Fax : 2220161, Mombasa
Email : cacoastpgh@yahoo.com
When replying please quote :

P O Box 90231 – 80100
Mzizima Street
MOMBASA

Ref. ERC-CGH/MSc/VOL.I/34

Date: 20TH APRIL, 2016

Mr. Gilbert Nzomo Mboro
MOMBASA

**RE: USE OF ROUTINE HEALTH INFORMATION FOR DECISION MAKING
AMONG HEALTH WORKERS AT COAST GENERAL HOSPITAL MOMBASA
COUNTY, KENYA.**

Reference is made to your letter dated 5th February, 2016. The Ethics Review Committee acknowledges receipt of your protocol.

This is to inform you that the Ethics Review Committee reviewed the document submitted and is satisfied that the issues raised at the meeting of Ethics Review Committee on 20th April, 2016 have been adequately addressed.

The study is granted approval for implementation effective from the date of this letter. Please note that authorization to conduct this study will automatically expire on the 20th April, 2017. If you plan to continue with data collection and analysis beyond this date, please submit an application for continuing approval to the ethical Review Committee-Coast General Hospital in appropriate time.

Any unanticipated problem resulting from the implementation of this protocol should be brought to the attention of the ERC-CGH. You are also required to submit any changes to this protocol to the ERC- CGH.

The ERC-CGH looks forward to receiving a summary of the research findings upon completion of the study to be part of the data base to be consulted when processing related researches to minimize duplication.


DR. M. A. OCHOLA
SECRETARY ERC-CGH