



**MANAGEMENT FUNCTIONS AND SUCCESS OF CLINICAL RESEARCH  
PROJECTS IN UGANDA: A CASE STUDY OF NON  
COMMUNICABLE DISEASES PROJECT AT  
THE MEDICAL RESEARCH COUNCIL**

**BY**

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**10/MBA/3/054**

**A DISSERTATION SUBMITTED TO THE SCHOOL OF MANAGEMENT  
SCIENCES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE**

**AWARD OF THE MASTERS DEGREE IN BUSINESS**

**ADMINISTRATION OF UGANDA**

**MANAGEMENT INSTITUTE**

**DECEMBER, 2013**

## **DECLARATION**

I, Jackson Were, hereby declare that this dissertation is my original work and has never been submitted for any academic award or publication in any other institution or University. Due acknowledgement has been made for the work of others in this report, through quotation and references.

Signed \_\_\_\_\_

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Date \_\_\_\_\_

**APPROVAL**

This is to certify that this dissertation entitled “**MANAGEMENT FUNCTIONS AND SUCCESS OF CLINICAL RESEARCH PROJECTS IN UGANDA: A CASE STUDY OF NON COMMUNICABLE DISEASES PROJECT AT THE MEDICAL RESEARCH COUNCIL**” was conducted under our supervision and is now being submitted to Uganda Management Institute for examination with our approval.

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Date: \_\_\_\_\_

## **DEDICATION**

This work is dedicated to my family: My wife, mum, children and siblings.

## **ACKNOWLEDGEMENT**

I would like to express my thanks and gratitude to various people who contributed to the completion of this work. It is not possible to name all those who supported me but I am greatly indebted to everyone. I wish to express my sincere gratitude to my supervisors Dr. Benon Basheka and Mr. Fred Wahitu whose support, guidance and constructive criticism and their untold commitment to supervise this research.

I also appreciate the profound support and encouragement rendered by the Director General and Consultants of Uganda Management Institute during the study which made this study successful.

I extend special thanks to the management and staff of Medical Research Council and specifically those who participated in the Non Communicable Disease project in Entebbe and Masaka for accepting to respond to this study with commitment.

I must greatly thank my wife Lynda Nabayiinda for being so encouraging, supportive and co-operative during my study even when I came home late from classes. To my children, Janelle, Jordana, and Jemimah, this is an inspiration for you to achieve greater heights in future. I want to thank my mother Mrs. Mary Hasahya Were and late Father Mr. Nimrod Were for giving me a foundation in Education and for their parental guidance.

I am also greatly indebted to my friends and course mates who equally helped in many different ways Haruna Siita, Valerian Moses Mwanje, Late Janat Watuwa, Steven Munabi, Abraham Nkata, Peter Busingye, Sarah Nakazana, and Jacent Namuwawu.

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## **LIST OF ABBREVIATIONS**

CVI	:	Content Validity Index
MRC	:	Medical Research Council
NCD	:	Non Communicable Diseases
PMBOK	:	Project Management Body of Knowledge
UMPC	:	Ultra - Mobile Personal Computers
UVRI	:	Uganda Virus Research Institute

## **ABSTRACT**

The study examined the relationship between management functions and the success of the non-communicable disease (NCD) project, a clinical research project at the Medical Research Council (MRC). Specifically, the study strived to determine the extent to which planning, organizing and controlling influenced the success of non-communicable diseases project at MRC. The study used a case study design using both quantitative and qualitative approaches on an accessible populations of 110 staff who were directly involved with the NCD project of which 86 were sampled. Data was collected using a questionnaire and interview guide. Quantitative data was analyzed using frequency, mean and standard deviation, correlation and regression analyses. The study found out that planning function had a high positive significant relationship with project success and it predicted 26.2% of the variance in the NCD research project success. Organizing had a high positive significant relationship with project success and it predicted 22.8% of the variance in the NCD research project success. Controlling had a high positive significant relationship with project success and it predicted 23.6% of the variance in the NCD research project success. The study concluded that success of scientific research projects depends on the extent to which management of the institutions examines and establishes the external and internal factors that may impact on the project leading to development of relevant strategies; develops appropriate and adequate project schedules; identifies and plans for the required project needs; establishment of a responsive organizational structure, establishment and communication of project policies and procedures; establishment and observance of pre-controls, concurrent and post controls. The study recommends that the management of MRC and related scientific research institutions should always conduct strategic planning retreats moderated by internal and external strategic management consultants to offer expertise; establish project or matrix organizational; communicate the project proposal to project implementers at the different levels as a policy document for identification of deviations and taking of corrective actions; and continuously strengthen the internal controls that may compromise the effectiveness of the control function in MRC.

## **CHAPTER ONE: INTRODUCTION**

### **1.1. Introduction**

This study focused on management functions and success of clinical research projects in Uganda, a case study of non-communicable diseases project at the Medical Research Council. Management functions as the independent variable and project success as the dependent variable. This chapter presents the background to the study, the statement of the problem, the purpose and objectives of the study, the research questions, the hypotheses, scope of the study, significance, justification, the conceptual framework, operational definition of terms and concepts and limitations to the study.

### **1.1. Background to the Study**

#### **1.1.1 Historical Background**

Globally, the use of projects management techniques has a long history although initially the practice was predominant in industrialized countries, it has since been adopted among developing countries as well (Mohinder & Anastasia, 2007). Projects need management and historically, as early as 300BC in the city of Ur (Iraq) Sumerian priests were the first to keep written records as a means of recording business transactions. Translations from early Egyptian Papyri, dating back to 1300 BC, recognized the importance of management function of planning and organizing which helped them build tall pyramids. The Biblical Moses is credited with employing his father-in-law, Jethro, as a management consultant who helped design the organization through which Moses ruled the Hebrews in the desert (Nell, 2006). Around 400 BC, Socrates defined management as a skill

separate from technical knowledge and experience. Plato also recognized management as a separate art and promoted principles of specialization where he described how carefully selected young men should be trained so that they would develop the appropriate personalities and skills necessary to serve as leaders. This marked the beginning of delegation of authority and chain of command. Using the scalar principle and the delegation of authority, the city of Rome efficiently expanded to an empire. The historical rooting of management and leadership still stand firm today in modern management and project management (Wolfgang, Sandra, & Pan, 1995).

This approach of management thinking was adopted world over although in Africa there existed traditional hierarchically organized chiefdoms which were used to organize the different communities and tribes. In Uganda chiefdoms existed and were responsible for planning, organizing, controlling and leading their subjects. Through colonization, African countries including Uganda as a British colony were introduced to new forms of management aimed at providing services with a result oriented management approach which involved planning, organizing, controlling and leading functions structured from the top to the bottom (Kiyaga, 2004).

### **1.1.2 Theoretical Background**

This study was guided by the Classical Organisational Theories and specifically Henri Fayol (1917) Administrative Theory which focuses on the personal duties of management at a much more granular level. In other words, his work is more directed at the management layer. Fayol believed that management had five principle roles: to forecast and plan, to organize, to command, to co-ordinate, and to control. Forecasting and



planning was the act of anticipating the future and acting accordingly. Organization was the development of the institution's resources, both material and human. Commanding was keeping the institution's actions and processes running. Co-ordination was the alignment and harmonization of the group's efforts. Finally, control meant that the above activities were performed in accordance with appropriate rules and procedures. Principles of management postulates that organisational performance (and in this case project success) depends on five principle roles of planning, organizing, staffing, directing, and controlling.

In using Henry Fayols administrative theory Pryor and Taneja (2010) noted that Archer (1990) was promoting Fayol's principles. Archer observed that from the 1930's to 60's when Fayol's work was seen as a blueprint of good management, the productivity and living standards in America were increased. Furthermore he notes that much of the Japanese work style, i.e. just in time production, quality circles or lower level decision making, reflect techniques that were firstly introduced by Fayol. Pryor and Taneja (2010) therefore believe that Fayol's principles are still relevant to an organization's effectiveness.

The Henri Fayol (1917) principles of management and administrative decisions have been widely used in the project management with convincing results to the extent that all present day management acknowledges that management functions include planning, organizing, leading, controlling and directing to achieve the desired project performance (Koskela & Howell, 2002, Olum, 2004; Brooks, 2009, Pryor & Taneja, 2010).

The Henry Fayol's administrative theory postulates that to achieve successful implementation of projects in any organization, there is need for effective execution of the planning, organizing, and controlling functions of management. This study asserts that success of clinical research projects in MRC was influenced by the extent to which the planning, organizing and controlling functions are executed.

### **1.1.2 Conceptual Background**

Management is the art, or science, of achieving goals through people. Since managers also supervise, management can be interpreted to mean literally looking over i.e., making sure people do what they are supposed to do. Managers are, therefore, expected to ensure greater productivity or, using the current jargon, continuous improvement (Olum, 2004; Brooks, 2009). More broadly, management is the process of designing and maintaining an environment in which individuals, working together in groups, efficiently accomplish selected aims (Pryor & Taneja, 2010). This above definition of management means several things; first, as managers; people carry out the managerial functions of planning, organizing, and controlling among others (Olum, 2004). Consequently, management involves the development of bureaucracy that derives its importance from the need for strategic planning, organizing, directing and controlling of large and complex decision-making processes. Management is exercised through the five managerial functions, namely; planning, organizing, staffing, leading, and controlling but this study examined the three functions of management which are; Planning, Organizing, and controlling.

Planning involves selecting missions and objectives and the actions to achieve them. It requires decision-making – i.e., choosing future courses of action from among

alternatives. No real plan exists until a decision – a commitment of human and material resources has been made (Resource planning). People working together in groups to achieve some goal must have roles to play within a given time and cost estimate following a well-developed schedule (Falshaw, Glaister & Tatoglu, 2006). Planning in this study was conceptualized to include three indicators of environmental analysis, schedule development and resource identification.

Organizing, therefore, is that part of management that involves establishing an intentional structure of roles for people to fill in an organization. Intentional in that all tasks necessary to accomplish goals are assigned and assigned to people who can do those tasks best. Indeed, the purpose of an organization structure is to help in creating an environment for human performance (Eugenia & Paraskevi, 2004). In this study, controlling included three indicators setting appropriate organizational structures, and putting in place policies and procedures to guide the operations of the organization.

Controlling, for example, budget for expense, is the measuring and correcting of activities of subordinates to ensure that events conform to plans. It measures implementation against goals and plans, shows where negative deviations exist, and, by putting in motion actions to correct deviations, helps ensure accomplishment of plans. Control can generally be categorized under pre-controls, concurrent and post controls (Siryama, 2007) that this study adopted as indicators of the controlling management function.

According to Pinkerton (2003) project success is defined as the successful accomplishment of the project with regards to cost, time and quality. The project hexagon

model however provides a more comprehensive definition of project success by extending the time, quality and cost approach to include six project success criteria as time, cost, quality, the realization of the strategic objectives of the organization that initiated the project, the satisfaction of the people using the resulting service and/or product, the satisfaction of other stakeholders (Aslam, 2009).

### **1.1.3 Contextual Background**

The Medical Research Council and Uganda Virus Research Institute (MRC/UVRI) Uganda Research unit on AIDS is an institution of the MRC of the United Kingdom (UK) integrated into the Uganda Virus Research Institute (UVRI) in Entebbe, Uganda. The Unit was established in 1989 to conduct research on HIV Infection and AIDS. The MRC/UVRI Uganda Research Unit has a mission to conduct research on HIV disease and related infections to facilitate their control in Uganda and elsewhere in Africa ([www.mrcuganda.org](http://www.mrcuganda.org)).

To-date numerous context - specific challenges exist in developing large scale epidemiological resources in low and middle income country settings. An efficient and optimal study design will require consideration of both cultural and existing research and health infrastructure, which is unique to each country. In addition to gauging overall feasibility and scientific potential, pilot studies can be used to establish and assess relevant protocols, infrastructure and human resources (General Population cohort study Round 22, Study protocol, 2010).

The NCDs research project planning process involved a number of stake holders namely; MRC, University of Cambridge and Wellcome Trust Sanger institute and Uganda Ministry of health (General Population cohort study Round 22, Study protocol, 2010).

A review of the General Population cohort study Round 22, Study protocol, 2010 for NCDs research project reveals that the project was formulated with the following objectives;-

1. To provide a unique framework for building on a large scale prospective cohort study in an African population to examine a wide range of health indices – and lay the ground work for further long- term studies.
2. To estimate the prevalence and distribution of cardio metabolic risk factors and diseases in these populations
3. To provide etiological insights into the variation in cardio metabolic and infectious risk factors in children and adults using both population genetics and epidemiological approaches.
4. To inform health policy and public health programmes aimed at addressing the rise in NCDs in Uganda, which may also shape public health strategies in other African countries.

The project strategy was to use a pilot study approach in an existing general cohort of which the planned activities included;-Submission of study protocol and questionnaire to the ethics committee, approval of final protocol from all research ethics committees, training of staff on study protocol, pilot village testing, equipment and reagent

procurement, design of UMPC screens for questionnaires, validation of SOPs, Production and finalizing SOPs and Data collection (General Population cohort study Round 22, Study protocol, 2010). The project document is silent about identification of key resources such as human, financial and material and equipment while it's equally silent about the project structure (General Population cohort study Round 22, Study protocol, 2010). Other than the project document, there is no illustration of the management controls to guide concurrent and post activity controls such as a project logical framework and corrective measures for any deviation in the planned actions and activities.

A number of key stakeholders involved in this project include but not limited to; Government of Uganda which offers political, social, technical and moral support; the government of United Kingdom through the University of Cambridge and the welcome Trust Sanger institute which initiated the NCDs research project and provided the financial, technical and expert advice on the project; Medical Research Council which adopted the NCDs research project and is carrying out the implementation of the project by providing both the scientific and support staff and establishment of the cohort for the study and community members who participate in the study as study subjects (General Population cohort study Round 22, Study protocol, 2010). Despite the efforts to put in place such mechanisms a lot of discrepancies are evident in the implementation of the NCD project as shown in table 1 below.

**Table 1: Activities with corresponding timelines and their variations in implementation of the Non-communicable diseases project**

Target area	Target	Actual	Comments
Submission of study protocol and questionnaire to the ethics committee	By august 2010	Instruments submitted in September,2010	
Approval of final protocol from all research ethics committees	By September,2010	Approval was only granted on the 17 <sup>th</sup> December,2010	The approval from president's office took so long due to the current political focus on election.
Data collection	Starting November,2010	Started on the 7 <sup>th</sup> January, 2011	
Training of staff on study protocol	By September 2010	Training was conducted in Feb,2011	
Pilot Village Testing	By October,2010	Just started on 7 <sup>th</sup> Jan,2011	
Equipment and reagent procurement	By August 2010	Some Equipment(UMPC screens)were procured in November,2010	Reagents were procured but some got expired before being consumed.

Source: General Population cohort study Round 22, Study protocol, 2010

## 1.2. Statement of the Problem

Management is the process of designing and maintaining an environment in which individuals, working together in groups, efficiently accomplish selected aims (Pryor & Taneja, 2010). To this effect, the management functions of planning, organizing and controlling are widely used in the management of projects envisaging project success (Koskela & Howell, 2002, Falshaw, Glaister & Tatoglu, 2006; Eugenia & Paraskevi, 2004; Siriyama, 2007). Despite the fact that MRC has technical expertise and knowledge to deliver its mandate of improving human health through world class medical research in Uganda, successful execution of clinical research projects in MRC seem to be variously constrained. Not only did the approval of final protocol from all research ethics

committees and data collection which are vital steps in achieving the goal of the research, lagged for a period of two to three months, but also the UMPC screens were procured three months later. This culminated into late publication of the research findings by MRC. Similarly, the project incurred about 80% cost overruns which the major donors demanded a management review to ensure compliance to budget expectations and strengthening of internal controls (NCD quarterly reports, September, 2010).

If the management constraints are not addressed, the achievement of the objectives of the General Population cohort study project Round 22 would be in a precarious situation yet management of MRC will always be held accountable for the project discrepancies. Although the NCD project discrepancies may be attributed to many factors at play, questions point to the extent to which the management functions of planning, organizing, controlling and stakeholders support have influenced the success of the NCD research project in MRC.

### **1.3 Purpose of the Study**

The study examined the relationship between management functions and the success of the non-communicable disease study, a clinical research project at the MRC.

### **1.4. Research Objectives**

The study was guided by the following objectives:

1. To determine the extent to which planning influenced the success of the non-communicable diseases project at the MRC.
2. To establish the relationship between organizing and success of the non-communicable diseases project at the MRC.



3. To find out how controlling influenced the success of the non-communicable diseases project at the MRC.

### **1.5. Research Questions**

1. To what extent did planning influence success of the non-communicable diseases project at the MRC?
2. What is the relationship between organizing and success of the non-communicable diseases project at the MRC?
3. How did controlling influence success of non-communicable diseases project at the MRC?

### **1.6. Research Hypotheses**

1. There is a relationship between planning and success of scientific research projects.
2. There is a relationship between organizing and success of success of scientific research projects.
3. There is a relationship between controlling and success of success of scientific research projects.

### **1.7 Conceptual Framework**

The conceptual framework below shows the relationship between the management functions and success of the NCD research project in MRC. Management functions is the independent variable while project success is the dependent variable.

**Independent variable: Management Functions**

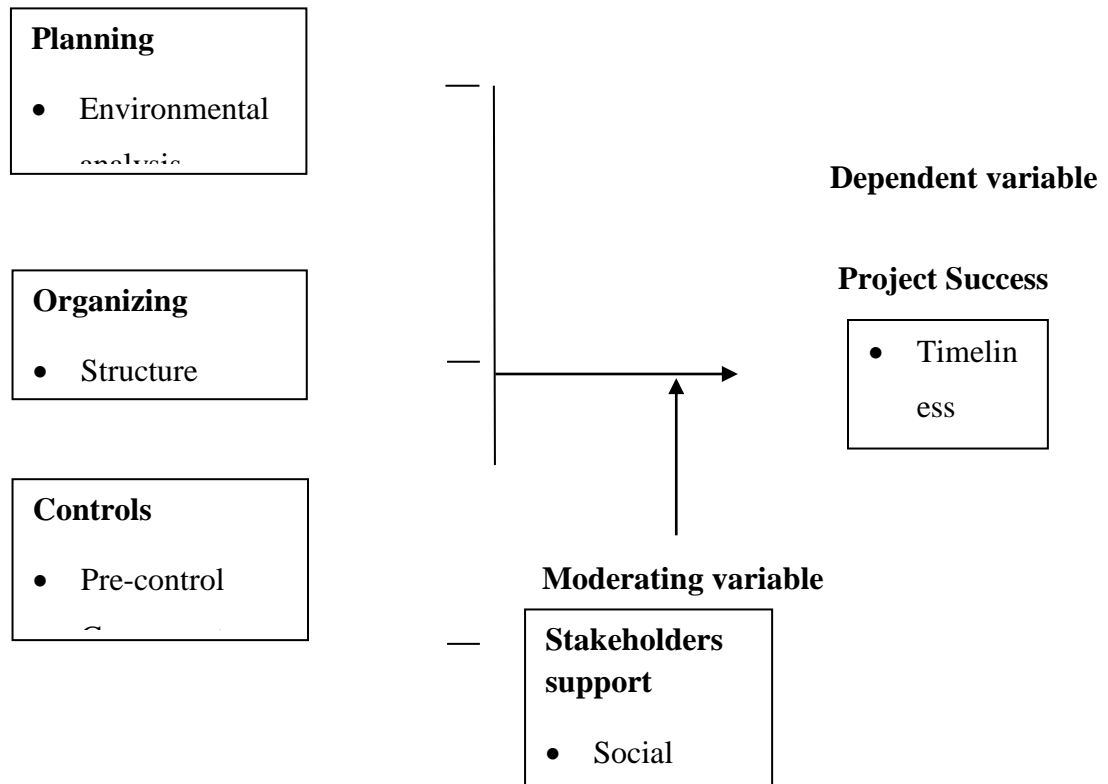


Figure 1: Conceptual framework: Effect of Management on the Success of Clinical Research Projects.

**Source: Adopted and modified from Fayol (1917) classical administrative theory**

Since project success cannot be achieved as a single element and a number of factors are known to contain it, this study focuses on success as the dependent variable and management functions as the independent variable. The contribution of management was evaluated and analyzed in relation to its functions that is in terms of planning, organizing and controlling, and how all these relate and contribute to the success of clinical research projects in Uganda which was measured by appropriated level of meeting cost, time and cost expectations.

The model therefore shows that the success of clinical research projects depends on the effective execution of the management functions of planning, organizing and controlling. Planning has indicators of efforts undertaken to perform an environmental analysis by conducting an external and internal analysis using the PESTLE and SWOT analysis respectively. Organizing involves the efforts to put in place appropriate functional or project/matrix organisational structures and establishment of policies and procedures to guide the project operations. Controls have key indicators of pre-control, concurrent and post control used to identify deviations and taking of corrective actions to ensure project success.

### **1.8. Scope of the study**

The study content scope included management functions of planning, organizing and controlling as the independent variable. The study also concentrated on project success indicators of time, cost and quality which were the key success indicators set for all scientific research projects in MRC. The study geographical scope included MRC headquarters in Entebbe and the Masaka branch office where the NCD cohort was collected from. The study covered the period 2009-2011 the time when the NCD project was executed.

### **1.9. Significance of the research**

To the management of MRC, the study helps identify project planning weaknesses affecting successful implementation of clinical research projects in medical research council which will facilitate recognition of planning problems and taking corrective actions to enable effective planning for improved implementation of clinical research

projects in Uganda. Similarly, identification of project organizing weaknesses will enable designing appropriate intervention to organize the activities related to management of clinical research projects in Uganda thereby improving on their implementation. Examination of project control weaknesses will yield intervention for improving on project controls through identification of deviations and taking corrective actions. These will lead to provision of empirical data that could be used to develop the MRC management policies for enhanced project success.

To the academia, the findings of this study shall add on the body of knowledge of academicians in the project management discipline under clinical research.

#### **1.10. Operational Definition of Terms and Concepts**

**Management** in this study referred to the planning, organizing and control activities undertaken by management to achieve organizational objectives.

**Planning in** this study referred to the resource planning, activity duration estimating, schedule development, activity costing.

**Organising** in this study referred to the project structure, assigning role, training, policies and procedures.

**Controlling** in this study referred to the pre-control, co-current and post control with the overall aim of identifying deviation and taking of correction actions.

**Project success** in this study referred to the achieving the cost, time and quality expectations of the project

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1. Introduction**

This chapter examines and describes related literature and discusses the literature on the causal effect relationship of management and successful implementation of projects based on what other scholars have observed. The first section presents a review of related literature on project planning and project success, organising and project success, controlling and project success.

### **2.2. Planning and Project Success**

Metaxiotis, Zafeiropoulos, Nikolinakou and Psarras (2005) highlighted that to achieve project success, it is essential for the project team to setup a project mandate. In order to make a decision as to whether a project should be started or not, the sponsor needs a description of the important aspects of the project. Such a description should include: the name of the project; the sponsor or the client of the project; background information; the objectives of the project; the goals of the project; limitations on the project; and budget. The planning function of the project should equally incorporate the project milestone plan which is a development strategy showing the intermediate products or deliverables build towards the final objectives of the project. It is a stable framework specifying what has to be done and not how to do it. It is a result of group activity and it represents the baseline document for future project progress reports.

Metaxiotis et.al (2005) noted that in order to properly address changes, milestones are grouped into what are called result paths. A result path leads the way to achieve a specific aspect of the project goals, for instance well informed and trained people, a correct

business model and live software. These paths are the columns in a milestone plan. The placement of milestones along the result paths demonstrates the principle that changes must be met in a balanced way. Grouping milestones into result paths makes it easier to control certain aspect areas as they relate to one another. A milestone plan gives a graphical depiction of the milestones selected in a certain project, the relationships between these milestones and the result paths. In a milestone plan: the milestones are distributed over the result paths; dependencies between the milestones are indicated by arrows; and target dates are initially assigned to milestones, then are finalized after being checked against the activity plan.

A key aspect of the planning function of management is the resource planning activity which accompanies the organization planning of the project, it is structured in such a way that recognizes the needs of the project, with a view to consolidate the processes that are required for the acquisition of the essential sources, and the awareness of the available resources. The planning should include: human resources; the planning of resources, equipment and supplies; and the organizational structure (PMBOK, 1990; Mosca et al., 2001). In a case study of Community planning and budgeting for HIV/AIDS projects in Uganda, Awio, Northcott and Lawrence (2011), described that the community members proposed several activities to address the HIV/AIDS-related needs of which they identified: community sensitization seminars to increase awareness of HIV/AIDS; home visits to families with HIV/AIDS patients to provide guidance and counseling; supporting orphans' education; and supporting those living with HIV/AIDS and affected families. The next task was to determine the cost of identified activities for

the funding application. This entailed specifying output measures for the activities, attaching costs to their various elements, and specifying target populations. For example, the general community was identified as the target for sensitization seminars while orphans, people living with HIV/AIDS, widowers and widows were targeted to receive “first aid kits” (anti-malarial drugs and pain killers). The responsibility for implementing each activity was also specified, along with an implementation schedule and expected costs.

In support of the above findings on the planning function that guides project implementation, planning of resources, equipment and supplies, recognition of basic supplies that are required in each stage of the work flow of the project, determines the type, the numbers and the technical characteristics that are required and connected with the applicable project, the recognition of the source of resources, the possession type and the terms of the engagement and if special technical equipment or special scientific bodies are required, technical models should be determined and it is vital (Metaxiotis et.al 2005). This needs to be complemented by assessment of cost-budget concerned with the development of a cost approach method.

The above observations offer a guide for assessing the extent to which the planning function of the NCD Project was undertaken and how such a planning function execution could have contributed to project success in MRC.

Seven blockers to successful project implementation according to Kuruppuarachchi, Mandal, and Smith (2002) include (1) ignorance by not knowing what should be done in a well executed project (2) lack of skills by not knowing how to do particular tasks and

task underestimation, (3) miss applied processes such as laden bureaucracies or over applied processes, (4) too much confidence by believing to already know the outcomes, (5) Lack of good leadership discipline (6) big hurry and cut corners (7) too many projects and not enough resources. They argue that successful project implementation would improve if management paid more attention to the aforementioned blockers. Khalfan (2003) analysis of the Alpha-Omega case shows that the implantation of the outsourcing project in Kuwait was attributed to the lack of attention by the outsourcing parties to critical elements. Major oversights include lack of client authority over selection and changes in developmental team staff from the consulting firm; lack of punitive incentive systems of delays; lack of IT project management expertise from both parties; lack of communication of the importance of standard operating procedure; lack of top management and user departments involvement; and lack of attention to the cultural and environmental issues. In a related study, Morardet, Merrey, Seshoka, and Sally (2005) noted that weaknesses in planning and implementation have been identified as one of the main reasons for the disappointing results of agricultural water development and management projects. This study assessed the project planning practices which could be negatively impacting on the success of the MRC NCD projects.

### **2.3. Organizing and Project Success**

All organizations need to identify a series of operating procedures, carefully aligned to clear boundaries of individual responsibilities and authority. Once this structure has been drawn up, it needs to be implemented consistently across all levels and all departments. Organizing involves management getting prepared, getting organized, organizing all its resources well before hand to put into practice the course of action to decide what has



been planned in the base function (De Waal & Gerritsen- Medema, 2006). Metaxiotis et.al (2005), asserts that in a project perspective the method of organizing projects requires a thorough discussion of what the people involved in the project will do. The responsibility chart is constructed in the same way either at the global (drawing up a project responsibility chart and principle responsibility chart) or on the detail level (activity responsibility chart). But the charts clarify different types of questions. The project responsibility chart and the principle responsibility chart explain and describe the roles of the different parties in important project matters. The activity responsibility chart explains and describes the roles of specific people in concrete project activities. Similarly, the PMBOK (1990) further noted that the activity responsibility chart is used for the realization of the activity planning which is the drawing up of a plan to achieve the goals of the milestone plan. Activity planning can be divided into four stages: (1) identify all the activities that must be performed to reach the milestone; (2) identify all the people who will be affected by each activity and determine in which way they should be involved in the activity; (3) estimate the work input necessary for the execution of each activity; and (4) put the work on each activity into calendar time.

Cicmil (1995) highlights that the acquisition of personnel has an objective of acquisition of necessary human resources of (individuals or teams) to whom the project will be assigned and who will work in the project. In many cases, the suitable sources may not be available and thus the administrative team of the project should assure that the available resources will cover the needs of the project. On the same note, the use of project teams of recent has taken a new twist and Zwickl (1995) in his study of project self-directed

work teams in an effort to understand where we were heading, some research was needed which turned up the following description. Self-directed work teams: comprise an intact team of employees who work together on an ongoing, day-to-day basis and who are responsible for a “whole” work process or segment; assume “ownership” of products or services and are empowered to share various management and leadership functions; are limited to a particular work unit; function semi-autonomously, are responsible for controlling the physical and functional boundaries of their work and for delivering a specified quantity and quality of a product or service within a specified time and at a defined cost; are all cross-trained in a variety of work skills; share and rotate leadership responsibilities; team members have equal input to decisions; accept the concept of multi-skills and job rotation; work together to improve operations, handle day-to-day problems and plan and control work; set own goals and inspect own work, often create own work and vacation schedules and review performance as a team; may prepare own budgets and coordinate work with other departments; usually order materials, keep inventories and deal with suppliers; are frequently responsible for acquiring new training and maintaining on-the-job training; may hire own replacements and assume responsibility for disciplining own members; monitor and review overall process performance.

Although the management function of organising has been around for many decades, organizations are still constrained in the success of their projects due to organising function constraints. Oladipo (2008) for example noted a lack of qualified Manpower significant in manpower shortages have remained the bane of effective project planning and implementation in the local government areas. Professional and trained planners were

virtually non-existent while administrative officers performing planning functions lacked any form of training and experience. The result of this scenario was poor quality of project proposals emanating from the local government authorities in Nigeria for screening and assessment. The double jeopardy here is that not only was plan formulation poor but also that continuity was not ensured.

While not compromising the above observations of management function of organising using the responsibility chart and the implied organizational structure and resource deployment may be true and a necessary condition, the extent to which the organising function has been considered in medical research projects is not well documented. This study thus had interest in examining the extent to which the organising function of management could have been carried out to influence success of medical research projects using the NCD project in MRC as a case study.

#### **2.4. Controlling and Project Success**

According to Lowrie & Cobbald (2004) control, includes establishing performance standards which are of course based on the company's objectives. It also involves evaluating and reporting of actual job performance. Management undertakes efforts to measure the planned points of actions against the actual which is an unending process as it involves management continuously taking corrective action. Siriyama (2007) contends that in an organisation, control consists of verifying whether everything occurs in conformity with the plan adopted; instructions issued; and the principles established. Controls can be either strategic or operational. Strategic controls are concerned with the overall performance of the organisation or a significant part of it. Operational controls

measure activities within sub-units of an organisation and usually cover a shorter time period than strategic controls. The preceding is supported by (Naceur, 2004) who highlights three forms of control namely, (i)pre-control which is essentially pre-emptive, as in planning, as it sets out the future direction, goals, targets, outputs and outcomes and identifies potential difficulties and risks in advance; (ii)concurrent control which is exercised while an event is taking place or as soon as possible after the event; (iii) post-control which is the poorest form of control in terms of corrective action as it is exercised after the event. However it focuses on quantitative and qualitative evaluations and therefore is an essential component of a holistic approach to organisational performance management. Control activities may be classified by specific control objectives, such as ensuring completeness and accuracy of information processing (Sawyer and Vinten 1996).

Examples of activities include: top level reviews of actual performance, reviews by management at the functional or activity level, management of human capital, controls over information processing, physical control over vulnerable assets, establishment and review of performance measures and indicators, segregation of duties, proper execution of transactions and events, accurate and timely recording of transactions and events, access restrictions to and accountability for resources and records, and appropriate documentation of transactions and internal control (Govindarajan, and Fisher 1990).

In a project context Luthy (2006) highlights that a growing number of laws and regulations have implications for project management and related internal control systems. Awareness of applicable laws and regulations and frameworks for assessing compliance provide a valuable resource for many project managers. This implies that

there is need to set regulations and standards which must be adhered to by the project team for successful implementation of projects. This should also provide a system for assessing deviations from standards and taking the necessary corrective actions. Pongratz (2003) argues that data and information pool enables the user to check at every planning and realization stage whether the project is still in line with the objectives. This concurrent approach enables the timely response to observed deviations during the implementation process. Metaxiotis, et.al (2005) asserts that reporting is describing what has occurred and what the situation is. Control is doing something about what the reports show. Reports are necessary in order to be able to check whether the project is sticking to the plan. The purpose of reports is to establish whether there is need for corrective measurement – while there is still time to take those measures. Control at global level includes controlling milestones, and at detail level controlling activities. The project manager will report on how the project is developing in relation to the milestone plan. The report consists of two parts: (1) The milestones and their mutual dependencies. (2) The expected completion dates for the milestones. Reporting must cover both these aspects. In order to control activities the project manager should report on seven different matters: (1) use of resources; (2) time schedule; (3) quality; (4) responsibility chart; (5) changes/additions; (6) waiting time; and (7) special problems.

Anderson, Grude, and Haug (1999), further highlight that quality and control preview are necessary under the management function of control. The project manager is supposed to determine the processes of control, with which the subjugation in the formal specifications will be ensured, and undesirable results will be avoided during the process

of quality improvement. One should act aiming at the increase of the effectiveness and the efficiency of the project and at the additional profits that will be allocated to the involving members. This is possible through use of progress reports which should provide knowledge on issues related to the sphere of activities, the program, the cost and the quality. It should also give information about the danger where it is judged necessary. The main elements of progress report are: (1) the guidance committee – the project manager presents to the sponsors and to the people involved in the project the current situation of the project, the required decisions, and the graduated resolution of problems. The daily provision includes: concise depiction of precedent activities; the project timetable; the current situation; subjects that need resolution or decisions; demands of modification; open discussions; and agreed actions/next steps.

On the contrary, a case study by Oladipo (2008) in Nigeria observed problems and constraints to effective project planning and implementation, one of which was a lack of effective project planning as he noted in planning a project, local government officials charged with the responsibility of supervising and monitoring projects lack the exposure, focus and the prerequisites of a tough task. This was compounded by lack of collaboration and cooperation due to differences in orientation and training. In addition, field officers were known to compromise roles and standards due to lack of motivation and logistic supports. The result was that projects collapsed shortly after handover, boreholes that had been drilled were without water yet contractors got paid for not doing or doing shoddy jobs and incidence of abandoned/uncompleted/white elephant projects adorns the landscape. Could the NCD project have strictly considered the above control function requirement and learnt from the failures of others to achieve project success?

This question could only be answered through empirical research which study will strive to establish by filling the literature gap.

## **2.5. Summary of the literature**

The literature offers a rich background on how the management function could be effectively executed to include planning, organizing and controlling. However the literature is generally silent on the how medical research projects have undertaken to consider the management function to guide project success. This study therefore investigated and provides empirical findings on how the management functions of planning, organizing and controlling had been carried out and how it has influenced project success in MRC.

## **CHAPTER THREE: METHODOLOGY**

### **3.1. Introduction**

This chapter presents the research methodology used in investigating the effect of management functions and success of clinical research projects. This chapter presents the research design, study population, sample size and selection, sampling techniques and procedures, data collection methods, data collection instruments, quality control (validity and reliability), procedure of data collection, data analysis and measurements of variables.

### **3.2. Research Design**

The study used a case study design using both quantitative and qualitative approaches. The case study design enabled an in depth study of the single phenomenon of clinical research projects from which a basis could be obtain as to gain insight into larger cases. The case study method helps in describing and explaining the effect of the relationship between the variables of the study which have no clear boundary (Yin, 1994). The quantitative approach was used to quantify incidences and establish the relationship while the qualitative approach was sought to explain the phenomenon under study. The unit of the data analysis included all the departments of MRC which are; Social Sciences, Finance and Administration, Medical, Laboratories and Statistics.

### **3.3. Study Population**

The study population included all staff at the MRC headquarters and the Masaka MRC centre where the NCD project was implemented to include principal investigators, project coordinators, and heads of departments, technical staff and support staff. These all



constitute a total of 300 subjects under study. However, a total of 110 staff was directly involved with the NCD project which this study considered as the accessible population. The sought study population had worked in various projects including the NCD project and had experiential knowledge on MRC research project planning and project success.

### 3.3.1. Sample Size and Selection

The study selected up to 86 subjects based on Krejcie & Morgan (1970) sampling guidelines as shown in table 2 below (see also appendix 111).

**Table 2. Population, sample and sampling technique to be used to select the study respondents**

<b>Population category</b>	<b>Population</b>	<b>Sample size</b>	<b>Sampling technique</b>
Principal investigators	2	2	Purposive
Project coordinators	4	3	Purposive
Head of departments in MRC	5	4	Purposive
Technical staff	80	62	Simple random or stratified
Support staff	19	15	Simple random
<b>Total</b>	<b>110</b>	<b>86</b>	

Source: MRC Personnel records October, 2012

### 3.3.2 Sampling Techniques and Procedure

The study used a probability sampling method of simple random. Simple random sampling involved selecting a sample of the population in such a way that samples of the same size have equal chances of being selected (Amin, 2005). In using the simple random sampling the researcher used the lottery method where all names of the elements were written on tag and placed in a container of which one tag was picked without replacement until the required number is reached (Amin, 2005). Purposive sampling involved

selection of respondents who were most knowledgeable and experienced on project planning and clinical research project success. To arrive at the sample size, the study used proportionate sampling by dividing the expected sample size with total population times the population of the strata. E.g.  $82/110 * 2 = 1.56$  which is approximately 2. This was repeated for all population categories.

### **3.4. Data Collection Methods**

The study used a survey method to collect data. There many forms of survey but for purpose of this study, the following approaches were used.

#### **3.4.1. Questionnaire Survey**

The questionnaire was used as it enabled gaining data on variables that could not be observed such as views, opinions, perceptions and feelings of the respondents (Sekeran, 2003). Similarly, the questionnaire was used because respondents can read and write the questions, the respondent possess the information to answer the questions or items and were willing to answer the questions honestly and it was thought to be less expensive for data collection (Amin, 2005). The respondents recorded their answers within closely defined alternatives. In this study the questionnaire was administered by both post and also personally delivering some to the respondents. A total of 86 questionnaires were distributed to the targeted population.

#### **3.4.2. Interviewing**

An interview is a dialogue between an interviewer and an interviewee (Mugenda and Mugenda, 1999). It is an organized conversation aimed at gathering data about a

particular topic. It is a learning exercise on both parties involved. Through this method, the researcher interviewed respondents face to face to obtain in depth information on project management and success of clinical research projects. The study specifically interviewed the Masaka NCD research project team leader and Principal Investigator.

### **3.5. Data Collection Instruments**

#### **3.5.1. Questionnaire**

The study used a close ended questionnaire divided into sections of background information, planning function, organising function, controlling function and project success. A standard Questionnaire on a five point Likert scale was used to get quantifiable primary data from individual respondents. The scale was designed as indicated below: 1- Strongly agree; 2- Agree; 3- Not sure; 4- Disagree; 5- Strongly disagree.

#### **3.5.2. Interview Guide**

Interviews with the target respondents were conducted by meeting the respondents and asking them questions of which the researcher recorded all the responses. The interviews were structured where they comprise of a set of issues on which the researcher wished to draw data and the same questions were posed to the respondents using a guide to conduct the interview.

### **3.6. Quality Assurance**

Pretesting was conducted to establish the reliability and validity of the study instrument.

Each of the pre-testing criteria are presented below.

### 3.6.1. Validity

Validity refers to the truthfulness of the findings or the extent to which the instrument is relevant in measuring what it is supposed to measure (Amin, 2005). The validity of the instrument will be tested using the Content Validity Index. This involved judges scoring the relevance of the questions in the instruments in relation to the study variables and a consensus judgment given on each variable. The Content Validity Index (CVI) was arrived at using the following formula.

$$\text{CVI} = \frac{\text{Number of items declared valid}}{\text{Total number of items}}$$

The closer the CVI to 1, the more valid is the instrument and the results are shown in table 3 below.

**Table 3: Content Validity Results**

Variable	Total No of items	Number of valid items	CVI
Planning	12	10	0.833
Organising	12	11	0.917
Controlling	11	09	0.818
Project success	11	08	0.727

Source: Expert Judgment

Table 3 shows that planning yielded CVI of 0.833, organizing yielded a CVI of 0.917, controlling yielded a CVI of 0.818, while project success yielded a CVI of 0.727. Since all variables yielded a CVI above 0.70 accepted for social sciences, it was inferred that the instrument was relevant in measuring management and project success and therefore declared valid.

### 3.6.2 Reliability

Reliability of a measure indicates the extent to which it is without bias and therefore ensures consistent measurement across time and across the various items in the statement suggesting that the finding would be consistently the same if the study was done over again (Mugenda & Mugenda, 1999). In this study a Cronbach's alpha coefficient was computed to show how reliable the data is using Software Package for Social Sciences (SPSS) and the results are presented below.

**Table 4: Reliability Results**

Variable	Total No of items	Cronbach's alpha
Planning	12	0.832
Organizing	12	0.816
Controlling	11	0.762
Project success	11	0.721

Source: Primary data

Table 4 above shows that planning yielded Cronbach's alpha value of 0.832, organizing yielded alpha value of 0.816; controlling yielded alpha value of 0.762 while project success yielded alpha value of 0.721. Since all variables yielded an alpha value higher than 0.70 accepted for social sciences, it was concluded that the instrument was consistent in measuring management functions and project success and therefore reliable.

### 3.7. Data Collection Procedure

Permission to conduct the study was sought from MRC management to authorize the study. Anonymity and confidentiality of the respondents was observed by not asking the respondents to put their names on the questionnaires. A covering letter from UMI accompanied the questionnaires to show that authority was granted to do the study.

### **3.8. Measurement of Variables**

The variables were measured by operationally defining concepts. For instance the questionnaire was designed to ask responses about management and Clinical research projects success. These were channeled into observable and measurable elements to enable the development of an index of the concept. A five- Likert scale namely: 1- Strongly agree; 2- Agree; 3- Not sure; 4- Disagree; 5- Strongly disagree was used to measure both the independent and dependent variables. The characteristics of the respondents were measured at nominal and ordinal as appropriate.

### **3.9. Data Analysis**

#### **3.9.1. Qualitative Analysis**

The useful qualitative information gain through the interviews was arranged in major themes of planning, organizing and controlling. These were then presented using the verbatim (narratives) as presented by the interviewee. The analysis then involved indentifying the implications, conclusions and inferences of qualitative information. Effort was also directed to cross-examine the qualitative data with the quantitative findings on their level of agreement or disagreement.

#### **3.9.2. Quantitative Analysis**

Quantitative data was presented in form of descriptive statistics using mean and standard deviations for each of the variables used in the study. A mean result ranging from 1-1.49 was considered as strongly disagree, 1.50-2.49 was considered as disagree while a mean in the range of 2.5.-3.49 was considered as not sure. A mean in the range of 3.5-4.49 was considered as agree while a mean in the range of 4.5-5 was considered as strongly agree.

Pearson's coefficient  $r$  and significance  $p$  tested at the 95 and 99% confidence limits were used to test if there was any significant relationship between the independent and dependent variable. A positive correlation coefficient  $r$  indicates a direct positive relationship between the variables while a negative correlation indicates an inverse, negative relationship between the two variables.

The regression analysis was used to test the extent to which the independent variables predicted the variance in the dependent variable using ANOVA statistics of adjusted  $R^2$  values, beta,  $t$  values and significance values (Amin, 2005). Specifically the adjusted  $R^2$  value gave a statistical indicator of the percentage to which the independent variable predicted the variance in the dependent variable.

## CHAPTER FOUR: PRESENTATION, ANALYSIS AND INTERPRETATION OF FINDINGS

### 4.1. Introduction

This chapter presents, analyses and interprets the study findings on management functions and success of clinical research projects in Uganda. The first section presents response rate, this is followed by background information about the respondents, presentation and analysis of the study findings in relation to the specific objectives.

### 4.2. Response rate

A total of 86 questionnaires were distributed but 81 useable questionnaires were returned giving a response rate of 94% which was high. Amin (2005) suggested that a high response rate also suggests more accurate survey results. Two interviewees were targeted but only one interview with the project coordinator was successfully conducted. The principal investigator was always busy with protocols in and outside the country.

### 4.3. Background Information

This section gives the characteristics of the respondents in relation to age group, education, job title, and time worked with the Medical Research Council.

**Table 5: The Age Group of the Respondents**

Age	Frequency	Percent
<24 years	4	4.9
25-30 years	22	27.2
31-35 years	36	44.4
36-40 years	11	13.6
41-45 years	8	9.9
<b>Total</b>	<b>81</b>	<b>100.0</b>

Source: Primary data



Table 5 above shows that the majority of the respondents 36(44.4%) were aged between 31-35 years followed by 22(27.2%) who were aged between 25-30 years and 11(13.6%) were aged between 36-40 years. Those who were aged between 41-45 years constituted 9.9% (8) and 4.9% (4) of the respondents were aged below 24 years.

These findings implied that the respondents were of a reasonable maturity to appreciate the management functions and success of clinical research projects at the MRC and could give an objective position on the status performance of management functions and success of the NCD project.

**Table 6: Level of Education of the Respondents**

Level of education	Frequency	Percent
Diploma	8	9.9
Degree	47	58.0
Masters	20	24.7
PhD	6	7.4
Total	81	100.0

Source: Primary data

Table 6 above shows that the majority of 47(58%) of the respondents had attained first degree as their highest level of education followed by 20(24.7%) who had attained masters degree as their highest level of education. A total of 8(9.9%) of the respondents were diploma holders and 6(7.4%) of the respondents had attained PhD as their highest level of education. This finding implied that the MRC project staff needed tailor made training courses based on their academic level to gain competencies in performing the management functions at their level for enhanced project success.

**Table 7: Job Title of the Respondents**

<b>Job title</b>	<b>Frequency</b>	<b>Percent</b>
Doctor	3	3.7
Field officer	4	4.9
Statistician	8	9.9
Project Manager	14	17.3
Lab technologist	22	27.2
Social Scientist	12	14.8
Administrator	12	14.8
Accountant	6	7.4
<b>Total</b>	<b>81</b>	<b>100.0</b>

Source: Primary data

Table 7 above shows that 22(27.2%) of the respondents were Lab technologists, 14(17.3%) were Project Managers, 12(14.8%) served as Social Scientists while 12 administrators equally constituted 14.8% of the total number of respondents. Those who held the title of Accountants constituted 6(7.4%) of the total number of respondents and 4(4.9%) of the respondents were field officers followed by Doctors who constituted only 3(3.7%) of the total number of respondents. This finding suggested that MRC employed personnel with different professional backgrounds who needed training in effective project management to enhance their project management skills especially scientists who may not have gone through project management given their training in natural sciences.

**Table 8: Period Worked with MRC**

<b>Time worked with MRC</b>	<b>Frequency</b>	<b>Percent</b>
less than a year	10	12.3
1-5 years	30	37.0
6-10 years	33	40.7
11-15 years	8	9.9
<b>Total</b>	<b>81</b>	<b>100.0</b>

Source: Primary data

Table 8 above shows that 33(40.7%) of the respondents had worked with MRC for a period of 6-10 years while 30(37%) had worked for a period of 1-5 years. Those who had worked with MRC for less than a year constituted 10(12.3%) of the total number of respondents while 8(9.9%) had worked for a period between 11-15 years. These findings implied that a majority of 87.7% of the respondents had worked with MRC for over one year and had gained adequate experience with the performance of the management functions at their level which contributes to the success of the MRC projects.

#### 4.4. The extent to which Planning influenced the Success of NCD Project at MRC

The first objective of the study was to establish the extent to which planning influenced the success of non-communicable diseases project at MRC. Planning was one of the dimensions of management functions and had three indicators of environmental analysis, schedule development, and resource planning measured using 12 items scored on five(5) point Likert scale ranging from 5= strongly agree, 4 = agree, 3 = not sure, 2= disagree, 1= strongly disagree and the findings are shown in table 9 below.

**Table 9: Descriptive Statistics for Planning**

<b>Planning</b>	<b>MEAN</b>	<b>S.D</b>
<i>Environmental analysis</i>		
1. The Non-Communicable disease research project conducted an external environmental analysis to determine external factors that may impact on the project success	1.59	1.00
2. The Non-Communicable disease research project regularly conducted a strength, weakness, opportunities and threats (SWOT) analysis of the project	2.09	1.42
3. The Non-Communicable disease research project had well established strategic objectives of the project	3.94	1.22
<i>Schedule development</i>		
4. The Non-Communicable disease research project had well developed performance indicators for each project functional	3.52	1.05

area		
5. The Non-Communicable disease research project had a well-developed action plan for each project functional area	3.99	0.97
6. The Non-Communicable disease research project had a well-developed work break down structure for each project	3.57	1.17
7. The Non-Communicable disease research project had well defined responsibility centres to guide achievement of the objectives	3.62	1.08
8. The Non-Communicable disease research project had well developed timelines for each project activities	3.99	0.99
<i>Resource planning</i>		
9. Adequate none financial resources were identified for each functional department to facilitate achievement of the project objectives	3.88	1.00
10. Human resources were adequately identified for each functional department to facilitate achievement of the project objectives	3.80	0.97
11. Material resources were adequately identified for each functional department to facilitate achievement of the project objectives	3.74	1.15
12. Appropriate equipment were identified for each functional department to facilitate achievement of the project objectives	3.91	1.07
<b><i>Aggregated Mean</i></b>	<b>3.57</b>	

Source: Primary data

The results in table 9 above revealed an aggregated mean of 3.57 which implied that the respondents agreed with the majority of the items of planning suggesting that the management reasonably executed the management function of planning. The Standard deviation ranged between 0.97 and 1.17, which was relatively narrow suggesting that most means did not deviate from the central mean by a big margin. Item 5 which asked whether the NCD research project had a well-developed action plan for each project functional area and item 8 which asked whether the NCD research project had well developed timelines for each project activity received the highest mean of 3.99 each suggesting that in performing the management functions of planning, the management of MRC emphasized schedule development by developing action plans and timelines for each NCD project activity.

However, item 1 which asked whether the Non-Communicable disease research project conducted an external environmental analysis to determine external factors that may impact on the project success and item 2 which asked whether the Non-Communicable disease research project regularly conducted a SWOT analysis of the project received the lowest means of 1.59 and 2.09 respectively. These findings suggested that planning in the MRC did not evaluate the macro and internal organisational environment which could impact on the success of the NCD project. In the next subsection an item by item analysis is provided on each of the indicators of planning management function of environmental analysis, schedule development and resource planning.

On environmental analysis, table 9 above shows that the respondents disagreed that the management of the NCD research project conducted an external environmental analysis to determine external factors that may impact on the project success (mean = 1.59, standard deviation = 1.00), disagreed that NCD research project regularly conducted a strength, weakness, opportunities and threats analysis of the project (mean = 2.09, standard deviation = 1.42) . However the respondents agreed that the NCD research project had well established strategic objectives of the project (mean = 3.94, standard deviation = 1.22). These findings suggested that although the management of MRC set strategic objectives of the project, the NCD project strategic objectives were not derived from the macro analysis of the external and internal environmental factors that impacted on the NCD project which could constrain effective project implementation and success for pursuing a project strategy which was not sensitive to the external and internal factors of the project.

In an interview, with the project coordinator however put it that:

*“In MRC, and specifically the NCD project planning practices followed a number of dimensions which include; planning for sources of funding and provisioning for inflation and exchange rate fluctuations through allocation of 5% allowance for any fluctuations, planning of community engagement and acceptance activities, planning for the grant application activities which saw the study being funded by MRC London, Wellcome Trust and the Sanger Institute, UK. Effort was also undertaken to budgeting to ensure that all funding was secured in pounds and the expenditures made in shillings which created flexibility in the budget”.*

The project coordinator also observed that

*“SWOT analysis of the project was conducted from which strengths such as experience staffs to handle the project and huge database of round 21 participants to select from were indentified. We also identified weakness such as a big number of staff who had worked with MRC for over 10 years had elementary knowledge on this new research area (Non Communicable Diseases) since MRC had established itself as a centre of excellence in HIV/AIDS. Therefore, there was a challenge of changing the attitude and mind set of staff. Here training needs of staff were evaluated. Among the opportunities, we noted that the prevailing trends in medical research was towards Non Communicable Diseases world over, and therefore this was seen as an opportunity by Ministry of Health to gain insight into the disease burden within the local population which would help inform policy on care and intervention strategies. The existence of well established cohort and infrastructure developed by MRC created an opportunity for easy access to study participants and literature. Some threats were identified and the included delayed ethical approvals from the relevant scientific committees and the president’s office were bound to stifle the success of the NCD project, the Procurement processes were not smooth and this was further worsened by the bureaucratic tendencies within MRC, disagreements between collaborators on how to allocate the funds between the different functional units posed a threat to the success to the NCD project”.*

The interview findings when compared with the quantitative findings point one fact that external and internal analysis of the factors that would impact on the project success were

done by the management team but they were inadequate as perceived by the other project implementers

On schedule development table 9 above shows that the respondents agreed that the NCD research project had well developed performance indicators for each project functional area (mean = 3.52, standard deviation = 1.05) while they agreed that the NCD research project had well developed action plans for each project functional area (mean = 3.99, standard deviation = 0.97). The respondents further agreed that the NCD research project had a well developed work break down structure for each project (mean = 3.57, standard deviation = 1.17) while they agreed that the NCD project had well defined responsibility centres to guide achievement of the objectives (mean = 3.62, standard deviation = 1.08). The respondents further agreed that the NCD research project had well developed timelines for each project activity (mean = 3.99, standard deviation = 0.99). These findings suggested that the management of MRC emphasized schedule development by developing clear performance indicators for each functional area which guided the development of action plans, development of responsibility centers, timelines and an eventual work break down structure in the project plan for effective project implementation and project success.

On schedule Development the project coordinator put it that:

*“The NCD project had well developed performance indicators for each project function area where staff and functional area performance was assessed based on; Number of participants seen per day per person, Number of errors or mistakes encountered per staff, Turn Around Time for key result areas and staff output. These were always reviewed through regular meetings which were scheduled daily, weekly, bi-weekly, monthly, and quarterly depending on the level of engagement in the project. The NCD project had action plans for all activities which included; monitoring quality of data, what was to be done by each functional area, Established finance updates to evaluate the course of the project.*

*There were also work break down structures for each project area showing clear work flow systems and activity based planning processes. The NCD project developed timelines for each project activity; time tables for all activities per village, turnaround time for Laboratory activities and Data management processes”.*

In view of the interview findings, this study inferred effort was undertaken to adequately develop project schedules which contribute to monitoring project progress and enhanced project success.

On resource planning, table 9 above shows that the respondents agreed that adequate none financial resources (mean = 3.88, standard deviation = 1.00); human resources (mean = 3.80, standard deviation = 0.97); material resources (mean = 3.74, standard deviation = 1.15); and appropriate equipments (mean = 3.91, standard deviation = 1.07) were identified for each functional department to facilitate achievement of the project objectives. These findings suggested that a commendable job was done in the management function of planning to identify the necessary resources by the management of MRC which should foster project success.

The project coordinator interviewed agreed with the efforts to identify project resources and put it that observed that:

*“None financial resources were identified for each department through the use of existing infrastructure in MRC and the existing political leadership structures in the community setting Human resources were adequately identified which involved experienced and well trained Statistician, Lab professional, nurses, doctors and community engagement officers. Appropriate equipment for each functional department was available and a few new ones were procured beforehand”.*

#### **4.4.1. Correlation Analysis between Planning and Success of the NCD Project**

To test the relationship between planning and project success, Pearson’s correlation analysis was conducted at the 2-tailed level and the findings are presented below.



**Table 10: Correlation Matrix between Planning and Success of the NCD Project in MRC**

		1	2
1. Planning	Pearson Correlation	1	.521**
	Sig. (2-tailed)		.000
	N	81	81
2. Project Success	Pearson Correlation	.521**	1
	Sig. (2-tailed)	.000	
	N	81	81
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Primary data

Table 10 above shows Pearson’s correlation coefficient  $r = 0.521^{**}$  and  $p = 0.000$  between planning function and project success suggesting that there was high positive significant relationship between planning function and the success of the NCD project in MRC. The implication was that project success depends on the efforts undertaken to assess the organizational external and internal environmental, developing project schedules and resource planning performed in the management function of planning.

#### **4.4.2. Regression Results between Planning and NCD Project Success**

To establish the extent to which organisational planning influenced the NCD project success, a regression analysis was conducted using the ANOVA techniques of adjusted  $R^2$  values, standardized beta values, t-values and the significance measured at 0.05 levels.

The results are tabulated in the Table 11 below.

**Table 11: Regression Results between Planning and Success of the NCD Project**

Model	R	R Square	Adjusted R Square	t-value	F-constant	Sig	Std. Error of the Estimate
1	.521 <sup>a</sup>	.272	.262	5.426	29.445	0.000	.40128
a. Predictors: (Constant), Planning							

$P \leq 0.05$

Source: Primary data

The regression model in Table 11 above shows adjusted  $R^2$  value of 0.262 between planning and success of the NCD project suggesting that planning alone predicted 26.2% of the variance in the success of the NCD project in MRC. This also suggests that observance of the management function of planning contributed to a quarter of the project success. The adjusted  $R^2 = 0.262$ ,  $t = 5.426$ ,  $F = 29.445$  and significance 0.000 suggested that the planning function of management was a strong significant predictor of project success. The implication is that the success of medical research project is significantly influenced by the executions of the management function of planning.

The study therefore confirmed the hypothesis that there is a significant relationship between planning and success of scientific research projects.

#### **4.5. The relationship between Organizing and Success of NCD project at MRC**

The second objective of the study was to establish the relationship between organizing and success of non-communicable diseases project at MRC. Organizing was one of the dimensions of management functions and had three indicators of establishment of an organizational structure, policies and procedures measured using 12 items scored on

five(5) point Likert scale ranging from 5= strongly agree, 4 = agree, 3 = not sure, 2= disagree, 1= strongly disagree and the findings are shown in Table 12 below.

**Table 12: Descriptive Results on Organizing Management Function at MRC**

<b>Organizing function</b>	<b>Mean</b>	<b>S.D</b>
<i>Structure</i>		
1. The Non-Communicable disease research project had a well defined structure with distinct functional divisions	3.79	1.14
2. The Non-Communicable disease research project structure put in place provisions for reporting to more than one supervisor	1.63	0.92
3. The Non-Communicable disease research project structure put in place provisions for reporting to more than one functional area	1.73	0.92
4. There are distinct roles/responsibilities and functions of the different work units in the project	3.84	0.87
5. There are distinct roles/responsibilities and functions of the different individuals in the project	3.86	1.02
6. The different functional units in the non communicable disease project were well coordinated to facilitate the achievement of the objectives of the project	3.94	1.05
7. There were efforts to redesign the project structure whenever necessary for project success	1.85	1.01
<i>Procedures and policies</i>		
8. The Non-Communicable disease research project had well established standard operating procedures, policies and rules for the project	4.00	1.26
9. The Non-Communicable disease research project had well established project policies	3.78	1.01
10. The Non-Communicable disease research project had well established project rules	4.70	0.95
11. There was effort to deploy adequate communication avenues to share project information for decision making	4.53	1.07
12. There was effort to deploy modern information and communication technology in the project	4.23	1.18
<b>Aggregated mean</b>	<b>3.50</b>	

Source: Primary data

The results in table 12 above revealed an aggregated mean of 3.50 which implied that the respondents agreed with the majority of the items of organizing suggesting that the management reasonably executed the management function of organizing. The Standard

deviation ranged between 0.87 and 1.18 which was relatively narrow suggesting that most means did not deviate from the normal mean by a big margin.

Item 10 which asked if the NCD research project had well established project rules received the highest mean of 4.70 suggesting that the respondents strongly agreed with this position which revealed project organizing in the MRC emphasized establishment and following of standardized operating rules in the research project. However item 2 which asked if the NCD research project structure had put in place provisions for reporting to more than one supervisor received the lowest mean of 1.63 suggesting that less effort was undertaken to develop the organisational structure involving the use of matrix structure where project staff report to more than one functional supervisor. In the next subsection an item by item analysis is provided on each of the indicators of organizing function of organisational structuring, policies and procedures.

On structure aspect of organizing Table 12 above shows that the respondents agreed that the NCD research project had a well defined structure with distinct functional divisions (mean = 3.79, standard deviation = 1.14) while they agreed that there were distinct roles/responsibilities and functions of the different work units (mean = 3.84, standard deviation = 0.87); the different individuals in the project (mean = 3.86, standard deviation = 1.02). The respondents further felt that the different functional units in the non communicable disease project were well coordinated to facilitate the achievement of the objectives of the project (mean = 3.97, standard deviation = 1.05). This finding suggested that there were commendable efforts to organize by putting in place organisational structures with distinct functional divisions, allocations of different and distinct roles to

different units and individuals which guarantee accountability for the assigned roles and responsibilities in the project management.

However, the respondents disagreed that the project structure provided for reporting to more than one supervisor (mean = 1.63, standard deviation = 0.92), disagreed that there were provisions for reporting to more than one functional area (mean = 1.73, standard deviation = 0.92) while they also disagreed that there were efforts to redesign the project structure whenever necessary for project success (mean = 1.85, standard deviation = 1.01). The failure to effectively put in place a project structure responsive to the NCD project design was indicative of inadequate observance of organizing function which constrains project success.

The coordinator seemed to acknowledged the inappropriate organisational structure and put it that:

*“The NCD project modified the existing structures in MRC to suit the study needs. Sections and teams were created with team leaders and coordinators to facilitate the implementation of the project. The project leader would communicate to leaders at the different levels. There were several reporting channels. There were clear roles and responsibilities assigned to each project staff with a responsibility log specifying the functional areas and what was to be done there. However, the structure was never static; it was redesigned to suit the changing needs of the project for example; Consenting and interviewing were later separated and done on different days by different staff, flow of samples to Entebbe was changed with allocation of a dedicated vehicle for that activity, study clerk position was created to manage records which were originally being handled by the nurses”.*

On the organisational procedures and policies aspects of organizing, the respondents agreed that the NCD research project had well established standard operating procedures, policies and rules for the project (mean = 4.00, standard deviation = 1.26);

well established project policies (mean = 3.78, standard deviation = 1.01); well established project rules (mean = 4.70, standard deviation = 0.95); deployed adequate communication avenues to share project information for decision making (mean = 4.53, standard deviation = 1.07) and modern ICT tools were identified and deployed in the NCD project (mean = 4.23, standard deviation = 1.18). These findings suggested that effort was undertaken to put in place clear project procedures and policies coupled with identification of modern ICT tools for improved communication among project stakeholders for enhanced project success.

The project coordinator agrees with the efforts provide adequate procedures and policies and put it that:

*“Policies and Procedures were drafted; Protocols were well written, SOPs also written to guide the project activities. MRC had well established policies to guide how projects are managed, standard rates for each activity and which steps to be followed when initiating a study. There were clear communication avenues developed both locally and with colleagues in the UK through email systems, reports, teleconferences, and regular meetings”.*

#### **4.5.1. Correlation Analysis between Organizing and Success of the NCD Project**

To test the relationship between organizing and project success, Pearson’s correlation analysis was conducted at the 2-tailed level and the findings are presented below.

**Table 13: Correlation Matrix between Organizing and Success of the NCD Project in MRC**

Variable		1	2
1. Organizing	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	81	
2. Project Success	Pearson Correlation	.487**	1
	Sig. (2-tailed)	.000	
	N	81	81
**. Correlation is significant at the 0.01 level (2-tailed).			

$P \leq 0.05$

Source: Primary data

Table 13 above shows Pearson's correlation coefficient  $r = 0.487^{**}$  and  $p = 0.000$  between organizing function and project success suggesting that there was a high positive significant relationship between organizing function of management and the success of the NCD project in MRC. The implication was that project success depends on the efforts undertaken to establish an organizational structure responsive to the project implementations expectations and establishment of standard operating procedures and policies by the management of medical research institutions.

#### **4.5.2. Regression Results Between Organising and NCD Project Success**

To establish the extent to which organising influenced the NCD project success, a regression analysis was conducted using the ANOVA techniques of adjusted  $R^2$  values, standardized beta values, t-values and the significance measured at 0.05 levels. The results are tabulated in the Table 14 below.

**Table 14: Regression Results between Organising and Success of the NCD Project**

Model	R	R Square	Adjusted R Square	t-value	F-constant	Sig	Std. Error of the Estimate
1	.487 <sup>a</sup>	.238	.228	4.961	24.612	0.000	0.41054
a. Predictors: (Constant), Organising							

$P \leq 0.05$

Source: Primary data

The regression model in Table 14 above shows adjusted  $R^2$  value of 0.228 between organising and success of the NCD project suggesting that organising alone predicted 22.8% of the variance in the success of the NCD project in MRC. This also suggests that observance of the management function of organising contributed to close to a quarter of the project success. The adjusted  $R^2 = 0.228$ ,  $t = 4.961$ ,  $F = 24.612$  and significance 0.000 suggested that the organising function of management was a strong significant predictor of project success. The implication is that the success of medical research project is significantly influenced by the executions of the organising function of management.

The study therefore confirmed the hypothesis that there is a relationship between organizing and success of scientific research projects.

#### **4.6. The influence of Controlling and Success of NCD at MRC**

The third objective of the study was to find out how controlling influenced the success of non-communicable diseases project at medical research council. Controlling was one of the dimensions of management functions and had three indicators of pre-controls, concurrent controls and post action controls measured using 11 items scored on five(5) point Likert scale ranging from 5= strongly agree, 4 = agree, 3 = not sure, 2= disagree, 1= strongly disagree and the findings are shown in Table 15 below.



**Table 15: Descriptive Statistics on the Management Function of Controlling if the NCD at MRC**

<b>Controlling</b>	<b>Mean</b>	<b>S.D</b>
<i>Pre controls</i>		
1. The project proposal was openly communicated to guide project staff on the different project expectations	1.79	1.10
2. The project put in place standardized documents to ensure complete and consistent information is gathered	3.89	1.11
3. The project put in place modern management information systems to ensure complete and consistent information is gathered	3.86	1.16
<i>Concurrent control</i>		
4. The management of the non communicable disease project research regularly assessed its performance against the set project performance expectations/standard.	1.96	1.22
5. The management of non communicable disease project research strongly emphasized conformity to plan adopted.	1.84	1.11
6. The management of non communicable disease project research strongly emphasized conformity to instructions issued.	3.69	1.16
7. The management of the non communicable diseases strongly emphasized conformity to established principles.	3.74	0.98
<i>Post control</i>		
8. Deviations in the work processes are regularly identified in time to facilitate project success	3.78	0.91
9. The management of the project reports on the project performance as scheduled	4.64	0.90
10. The management of the project strived to adhere to the preventive measures (controls) put in place in its plan to ensure achievement of project objectives	3.84	0.87
11. The management of the project took efforts to strengthen project internal controls	1.63	0.62
<b><i>Aggregated mean</i></b>	<b>3.08</b>	

Source: Primary data

The results in table 15 above revealed an aggregated mean of 3.08 which implied that the respondents agreed and disagreed on the different management control functions. The Standard deviation ranged between 0.62 and 1.22 which was relatively narrow suggesting that most means did not deviate from the normal mean by a big margin.

Item 2 which asked if the NCD project had standardized documents to ensure complete and consistent information is gathered received the highest mean of 3.89 suggesting that controls in the NCD project provided for pre-controls and through use of standardized

documents for consistence in the information gathered. However item 11 which asked if the NCD project took efforts to strengthen project internal controls received the lowest mean of 1.63 suggesting that less effort was undertaken to enhance internal controls in the project which may compromise project quality, time and costs. In the next subsection an item by item analysis is provided on each of the indicators of management controls of pre-controls, concurrent controls and post controls.

On the pre-control aspect of controlling, table 15 above shows that the NCD project put in place standardized documents to ensure complete and consistent information was gathered (mean = 3.89, standard deviation = 1.11); while they also agreed that the project put in place modern management information systems to ensure complete and consistent information is gathered (mean = 3.86, standard deviation = 1.16). However, the respondents disagreed that the project proposal was openly communicated to guide project staff on the different project expectations (mean = 1.79, standard deviation = 1.10). This finding suggested that although efforts were undertaken to provide for pre-controls through use of standardized documentation for information gathering and use of ICT tools for data collection, the failure to communicate the project proposal constrained effective controls project implementers at the different levels could not refer to the established official proposal provisions as a basis for identification of deviations and taking of corrective actions.

In interview the project coordinator put it that:

*“As a pre-control, the management of the project developed protocols to guide the study and they train staff on those protocols and other specific procedures. Staffs were always paired when carrying out different activities to benefit from both the weak and strong staff”*

On the concurrent control aspect, table 15 above shows that the respondents agreed that the management of non communicable disease project research strongly emphasized conformity to instructions issued (mean = 3.69, standard deviation = 1.16) while they also agreed that the management strongly emphasized conformity to established principles (mean = 3.74, standard deviation = 0.98). However the respondents disagreed that the management of the NCD project research regularly assessed its performance against the set project performance expectations/standard (mean = 1.96, standard deviation = 1.22) while they also disagreed that there was strong emphasis on conformity to plan adopted (mean = 1.84, standard deviation = 1.11). These findings suggested that although effort was undertaken to emphasize conformance to instructions issued and principles in the concurrent controls, the failure to assess performance against set project performance expectations, standards and plans constrained project success as performance deviations could not be easily identified and corrected in time during project implementation.

The project coordinator in an interview put it that:

*“As a concurrent control measure, staff performance was regularly assessed through appraisal processes and checking data for consistency. To manage the requisition of supplies, this was centered to two people who were made responsible for any anomalies in the supply chain processes”.*

On the post control aspect of controlling, table 15 shows that the respondents agreed that the deviations in the work processes are regularly identified in time to facilitate project success (mean = 3.78, standard deviation = 0.91) while they agreed that the management of the project reported on the project performance as scheduled (mean = 3.84, standard deviation = 0.90) while they also agreed that the management of the project strived to adhere to the preventive measures (controls) put in place in its plan to ensure

achievement of project objectives (mean = 3.84, standard deviation = 0.87). However, the respondents disagreed that the management of the project took efforts to strengthen project internal controls (mean = 1.63, standard deviation = 0.62). These findings suggested that there were reasonable efforts to identify project deviations, report on the project progress and adherence to preventive measures to ensure project success as post control approaches. However the failure to continuously strengthen the internal controls compromised the effectiveness of the control function in the MRC.

#### 4.6.1. Correlation Analysis between Controlling and Success of the NCD Project

To test the relationship between the controlling management function and project success, Pearson’s correlation analysis was conducted at the 2-tailed level and the findings are presented below.

**Table 16: Correlation Matrix between Organizing and Success of the NCD project at MRC**

Variable		1	2
1. Controlling	Pearson Correlation	1	.495**
	Sig. (2-tailed)		.000
	N	81	81
2. Project Success	Pearson Correlation	.495**	1
	Sig. (2-tailed)	.000	
	N	81	81
**. Correlation is significant at the 0.01 level (2-tailed).			

$P \leq 0.05$

Source: Primary data

Table 16 above shows Pearson’s correlation coefficient  $r = 0.495^{**}$  and  $p = 0.000$  between controlling function and project success suggesting that there was a high positive significant relationship between the controlling function of management and the success of the NCD project in MRC. The implication was that project success depends on establishment of pre-controls, conducting of concurrent controls during project

implementation and post controls through identification of deviations and taking of corrective measures.

#### 4.6.2. Regression Results between Controlling and NCD Project Success

To establish the extent to which controlling influenced the NCD project success, a regression analysis was conducted using the ANOVA techniques of adjusted  $R^2$  values, standardized beta values, t-values and the significance measured at 0.05 levels. The results are tabulated in the Table 17 below.

**Table 17: Regression Results between Controlling and Success of the NCD Project**

Model	R	R Square	Adjusted R Square	t-value	F-constant	Sig	Std. Error of the Estimate
1	.495 <sup>a</sup>	.245	.236	5.069	25.697	0.000	0.408
a. Predictors: (Constant), Controlling							

$P \leq 0.05$

Source: Primary data

The regression model in Table 17 above shows adjusted  $R^2$  value of 0.236 between controlling and success of the NCD project suggesting that controlling alone predicted 23.6 % of the variance in the success of the NCD project in MRC. This also suggests that observance of the management function of controlling contributed to close to a quarter of the project success. The adjusted  $R^2 = 0.236$ ,  $t = 5.069$ ,  $F = 25.697$  and significance 0.000 suggested that the controlling function of management was a strong significant predictor

of project success. The implication is that the success of medical research project is significantly influenced by management control function by the research institution.

The study therefore confirmed the hypothesis that there is a relationship between controlling and success of scientific research projects.

#### 4.7. Project success

Project success was the dependent variable of the study and had three indicators of meeting time, costs and quality expectations measured using 11 items scored on five(5) point Likert scale ranging from 5= strongly agree, 4 = agree, 3 = not sure, 2= disagree, 1= strongly disagree and the findings are shown in Table 16 below.

**Table 18: Project Success**

<b>Project success</b>	<b>MEAN</b>	<b>S.D</b>
<i>Time</i>		
1. The NCD Project milestones were met as specified in the project schedule	1.81	0.87
2. The NCD Project supplies were always in time	1.84	0.86
3. The NCD project was completed in the specified time schedule	1.79	0.85
<i>Cost</i>		
4. The NCD project was accomplished in the budgeted human resource costs	3.49	1.13
5. The NCD project was accomplished in the budgeted material costs	3.67	0.87
6. The NCD project was accomplished in the budgeted overhead costs	1.74	0.74
<i>Quality</i>		
7. The NCD project results answered the key research specifications	3.54	1.11
8. The NCD project results met the expectations of the research projects	4.14	0.82
9. The NCD project met the international research standards	4.01	0.98
10. The NCD project results were published in the peer reviewed journal	3.89	0.88
11. The NCD project publication received the good rating in the journal	4.09	0.82
Aggregated mean	<b>3.09</b>	

Source: Primary data

The results in table 18 above revealed an aggregated mean of 3.09 which implied that the respondents agreed and disagreed on the different NCD project success. The Standard deviation ranged between 0.74 and 1.13 which was relatively narrow suggesting that most means did not deviate from the normal mean by a big margin.

Item 8 which asked if the NCD project results met the expectations of the research projects received the highest mean of 4.14 suggesting that the NCD project achieved the quality expectation of satisfactory results to the project stakeholders. However, item 5 which asked if the NCD project was accomplished in the budgeted overhead costs received the lowest mean of 1.74 suggesting the project experienced cost overruns failing to meet the cost expectations of the project. In the next sub section a summary of the indicators of project performance is presented.

On the time indicator of project success, table 18 shows failure to meet the NCD Project milestones as specified in the project schedule (mean = 1.81, standard deviation = 0.87), project supplies were not always in time (mean = 1.84, standard deviation = 0.86) and the project was not completed in the specified time schedule (mean = 1.79, standard deviation = 0.85). These findings revealed that the project was not successful in meeting the time expectation a situation which could be attributed to the weakness in the performance of the management functions of planning, organizing and controlling.

On the cost indicators of project success, table 18 above shows that the respondent were not sure if the NCD project was accomplished in the budgeted human resource costs (mean = 3.49, standard deviation = 1.13) but indicated that the NCD project was accomplished in the budgeted material costs (mean = 3.67, standard deviation = 0.87).

However, the respondents disagreed that the NCD project was accomplished in the budgeted overhead costs (mean = 1.74, standard deviation = 0.74). These findings revealed that the project was only successful in meeting material costs expectation but not successful in meeting the cost expectation accomplishing the project within budget a situation which could be attributed to the weakness in the performance of the management functions of planning, organizing and controlling.

On the quality indicator of project success, the respondents agreed that the NCD project results answered the key research specifications (mean = 3.54, standard deviation = 1.11) while they agreed that project results met the expectations of the research projects (mean = 4.14, standard deviation = 0.82). The respondents also agreed that the NCD project met the international research standards (mean = 4.01, standard deviation = 0.98) while they agreed that the project results were published in the peer reviewed journal (mean = 3.89, standard deviation = 0.88). The respondents further agreed that the NCD project publication received the good rating in the journal (mean = 4.09, standard deviation = 0.82). These findings revealed project success in relation to quality expectations of compliance to specifications, good results in consonant with international standards, publication of results and a good rating of the study results.

#### **4.8. Summary of the Study Results**

The purpose of the study was to examine the relationship between management functions and the success of the non-communicable disease study, a clinical research project in medical research council. The multiple regression results which according to Aldrich



(2005) helps understand how the typical value of the dependent variable changes when any one of the independent variables is varied, while the other independent variables are held fixed was conducted to establish the extent to which management functions influenced the variance in the overall project success. The multiple regression analysis was also used to describe the effect of planning, organizing and controlling acting jointly to predict the success of the NCD and to identify which among the independent variables was a more significant predictor of the variance in the NCD project and to explore the forms of these relationships (Freedman, 2005). The findings of the multiple regression analysis are shown in table 19 below.

**Table 19: Summary of Correlation and Multiple Regression Results between Management Functions and NCD Project Success**

Variables		1	2	3	4	
1. Planning		1				
2. Organizing		.541**				
3. Controlling		.305**	.535**	1	.495**	
4. Project Success		.521**	.487**	.495**	1	
Regression Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	
1		.636 <sup>a</sup>	.405	.381	.36744	
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta $\beta$		
1	(Constant)	.948	.307		3.093	.003
	Planning	.256	.075	.357	3.409	.001
	Organizing	.218	.023	.223	2.045	.049
	Controlling	.280	.091	.321	3.082	.003
a. Dependent Variable: Project Success						

b. predictors: planning, organizing and controlling.

Source: Primary data

The summary of the correlation results in table 19 show that the management function of planning had high positive significant relationship with project success ( $r= 0.521^{**}$ )

while the management function of organizing had high positive significant relationship with project success ( $r= 0.487^{**}$ ). The management function of controlling equally had a high positive significant relationship with project success ( $r= 0.495$ ).

Table 19 above shows an adjusted  $R^2$  value of 0.381 between management functions of planning, organizing, controlling and success of the NCD project in MRC suggesting that management functions predicted 38.1% of the variance in success of the NCD while other variables predicted the remaining 61.9% of the variance in the project success. The management function of planning had the highest influence on the success of the NCD research projects in MRC ( $\beta = 0.357$ ,  $t = 3.409$ , and significance 0.000). This was followed by control function ( $\beta = 0.321$ ,  $t = 3.082$ , and significance 0.03). Thus any efforts to enhance research projects in MRC should emphasize adequate planning through environmental analysis, schedule development and resource identification. This should be complemented with effective management controls of pre, concurrent and post controls. The establishment of a responsive organisational structure with clear project policies and procedures equally plays a significant role in enhancing project success.

In an interview the project coordinator acknowledge the efforts to conduct the management functions and put it that:

*“The management functions of Planning, Organizing, and controlling greatly influenced the NCD project success. The success of the project was greatly attributed to the regular meetings that offered updates on the progress of the study, challenges and the solutions that need to be developed for a successful project implementation, quality control measures designed in the protocols helped the project to produced quality research work, intensity of communication and community engagement, availability of well written Standard Operating Procedures, experienced , well skilled personnel and the project structure, automation of the data collection procedures and quality of care to participants”*

## **CHAPTER FIVE: SUMMARY, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS**

### **5.1. Introduction**

This chapter presents a summary, discussion, conclusions and recommendations of the study in relation to the research objectives of the study and review of the related literature on management and success of the NCD in MRC. The first section presents a summary of findings on management functions and project success. This is followed by a discussion, conclusion, recommendations, limitations of the study, contributions of the study and recommendations for further studies.

### **5.2. Summary of the Study Findings**

This sub section presents a summary of the study findings on the extent to which planning influenced the success of NCD. The first section presents a summary of the relationship between planning and the NCD project success which is followed by organizing and success of the NCD project and controlling and project success in MRC.

#### **5.2.1. Planning influenced the Success of NCD Project at MRC**

The study found out that although the management of MRC set strategic objectives of the project, the NCD project strategic objectives were not derived from the macro analysis of the external and internal environmental factors that impacted on the NCD project which could constrain effective project implementation and success. The study also found out that the management of MRC emphasized schedule development by developing clear performance indicators for each functional areas which guided the development of action plans, development of responsibility centers, timelines and an eventual work break down

structure in the project plan for effective project implementation and project success. The study further found that effort was undertaken to perform the management function of planning by identifying the necessary resources for project implementation.

Planning function had a high positive significant relationship with project success and it predicted 26.2% of the variance in the NCD research project success. The study confirmed the hypothesis that there is a relationship between planning and success of scientific research projects.

### **5.2.2. Organizing and Success of NCD Project at MRC**

The study found failure to effectively put in place a project structure responsive to the NCD project design was indicative of inadequate observance of organizing function which constrains project success. Effort was also undertaken to put in place clear project procedures and policies coupled with identification of modern ICT tools for improved communication among project stakeholders for enhanced project success.

Organizing had a high positive significant relationship with project success and it predicted 22.8% of the variance in the NCD research project success. The study confirmed the hypothesis that there is a significant relationship between organizing and success of scientific research projects.

### **5.2.3. Controlling and Success of NCD Project at MRC**

This finding suggested that although efforts were undertaken to provide for pre-controls through use of standardized documentation for information gathering and use of ICT tools for data collection. The study also inferred that the failure to communicate the

project proposal constrained effective controls, project implementers at the different levels could not refer to the established official proposal provisions as a basis for identification of deviations and taking of corrective actions.

It was found that although effort was undertaken to emphasize conformance to instructions issued and principles in the concurrent controls, the failure to assess performance against set project performance expectations, standards and plans constrained project success as performance deviations could not be easily identified and corrected in time during project implementation.

The study however found that there was reasonable effort to identify project deviations, report on the project progress and adherence to preventive measures to ensure project success as post control approaches. However the failure to continuously strengthen the internal controls compromised the effectiveness of the control function in the MRC.

Controlling had a high positive significant relationship with project success and it predicted 23.6% of the variance in the NCD research project success. The study confirmed the hypothesis that there is a relationship between controlling and success of scientific research projects.

### **5.3. Discussion of the Study Findings**

This sub section presents a discussion of the study findings in relation to the literature review on the influence of planning on the NCD project success in MRC based on the study findings.

#### **5.3.1. Planning and Project Success**

The study found out that although the management of MRC set strategic objectives of the project, the NCD project strategic objectives were not derived from the macro analysis of the external and internal environmental factors that impacted on the NCD project which could constrain effective project implementation and success. The study also found out that the management of MRC emphasized schedule development by developing clear performance indicators for each functional area which guided the development of action plans, development of responsibility centers, timelines and an eventual work break down structure in the project plan for effective project implementation and project success. The study further found that a commendable job was done in the management function of planning to identify the necessary resources by the management of MRC fostering project success.

Planning function had a high positive significant relationship with project success and it predicted 26.2% of the variance in the NCD research project success. The study confirmed the hypothesis that there is a relationship between planning and success of scientific research projects.

These study findings echo a view that principles of management and administrative decisions have been widely used in the project management with convincing results to the extent that all present day management acknowledges that management functions the management function of planning to achieve the desired project performance (Koskela & Howell, 2002, Olum, 2004; Brooks, 2009, Pryor & Taneja, 2010). In complement, Falshaw et al., (2006) observed that planning involves selecting missions and objectives and the actions to achieve them based on the outcome of the external and internal organisational analysis.

Metaxiotis, et al., (2005) highlighted that the planning function of the project should equally incorporate the project milestone plan which is a development strategy showing the intermediate products or deliverables build towards the final objectives of the project. It is a stable framework specifying what has to be done and not how to do it. Similarly, some project management authorities have highlighted that a key aspect of the planning function of management is the resource planning activity for human resources, equipment and supplies (PMBOK, 1990; Mosca et al., 2001). Morardet, et al., (2005) noted that weaknesses in project planning have been identified as one of the main reasons for the disappointing results of agricultural water development and management projects. This study therefore inferred that effective planning by conducting of external and internal factors was instrumental in the success of the research project.

### **5.3.2. Organizing and Project Success.**

The study found failure to effectively put in place a project structure responsive to the NCD project design was indicative of inadequate observance of organizing function which constrains project success. Effort was also undertaken to put in place clear project procedures and policies coupled with identification of modern ICT tools for improved communication among project stakeholders for enhanced project success.

Organizing had a high positive significant relationship with project success and it predicted 22.8% of the variance in the NCD research project success. The study confirmed the hypothesis that there is a significant relationship between organizing and success of scientific research projects.

These study findings are supported by the view that the principles of management and administrative decisions have been widely used in the project management with convincing results to the extent that all present day management acknowledges that management functions the management function of organizing to achieve the desired project performance (Koskela & Howell, 2002, Olum, 2004; Brooks, 2009, Pryor & Taneja, 2010). In complement, De Waal & Gerritsen- Medema (2006) highlights that organizing involves management getting prepared, getting organized, organizing all its resources well before hand to put into practice the course of action to decide what has been planned in the base function.

Furthermore, Metaxiotis et.al (2005), asserts that in a project perspective the method of organizing projects requires a thorough discussion of what the people involved in the project will do. The responsibility chart is constructed in the same way either at the global or on the detail level explaining and describing the roles of the different parties in important project matters. However, Oladipo (2008) noted a lack of qualified Manpower significant in manpower shortages have remained the bane of effective project planning and implementation in the local government areas. Professional and trained planners were virtually non-existent while administrative officers performing planning functions lacked any form of training and experience. The result of this scenario was poor quality of project proposals emanating from the local government authorities in Nigeria for screening and assessment. This study therefore inferred that effective organizing by conducting of external and internal factors was instrumental in the success of the research project.

### **5.3.3. Controlling and Project Success**



This finding suggested that although efforts were undertaken to provide for pre-controls through use of standardized documentation for information gathering and use of ICT tools for data collection. The study also inferred that the failure to communicate the project proposal constrained effective controls, project implementers at the different levels could not refer to the established official proposal provisions as a basis for identification of deviations and taking of corrective actions.

It was found that although effort was undertaken to emphasize conformance to instructions issued and principles in the concurrent controls, the failure to assess performance against set project performance expectations, standards and plans constrained project success as performance deviations could not be easily identified and corrected in time during project implementation.

The study however found that there was reasonable effort to identify project deviations, report on the project progress and adherence to preventive measures to ensure project success as post control approaches. However the failure to continuously strengthen the internal controls compromised the effectiveness of the control function in the MRC.

Controlling had a high positive significant relationship with project success and it predicted 23.6% of the variance in the NCD research project success. The study confirmed the hypothesis that there is a relationship between organizing and success of scientific research projects.

These study findings are supported by the view that the principles of management and administrative decisions have been widely used in the project management with convincing results to the extent that all present day management acknowledges that

management functions the management function of controlling to achieve the desired project performance (Koskela & Howell, 2002, Olum, 2004; Brooks, 2009, Pryor & Taneja, 2010). Siriyama (2007) contends that in an organisation, control consists of verifying whether everything occurs in conformity with the plan adopted; instructions issued; and the principles established. Controls can be either strategic or operational. Strategic controls are concerned with the overall performance of the organisation or a significant part of it. Operational controls measure activities within sub-units of an organisation and usually cover a shorter time period than strategic controls.

Metaxiotis, et.al (2005) asserts that reporting is describing what has occurred and what the situation is. Control is doing something about what the reports show. Reports are necessary in order to be able to check whether the project is sticking to the plan. The purpose of reports is to establish whether there is need for corrective measurement – while there is still time to take those measures. Control at global level includes controlling milestones, and at detail level controlling activities. Anderson, et al., (1999), further highlight that quality and control preview are necessary under the management function of control.

A case study by Oladipo (2008) in Nigeria observed problems and constraints to project success compounded by lack of collaboration and cooperation due to differences in orientation and training. In addition, field officers were known to compromise roles and standards due to lack of motivation and logistic support leading to collapse of the project shortly after handover, boreholes that had been drilled were without water yet contractors got paid for not doing or doing shoddy jobs and incidence of abandoned/uncompleted/white elephant projects adorns the landscape. This study

therefore inferred that effective organizing by conducting of external and internal factors was instrumental in the success of the research project.

#### **5.4. Conclusions of the Study**

This sub section presents the study conclusions on the influence of management functions on scientific research projects. The first subsection presents conclusions on planning which is followed by organizing and controlling and project success.

##### **5.4.1. Planning and Project Success**

The study concluded the success of scientific research projects depends on the extent to which management of the institutions examines and establishes the external and internal factors that may impact on the project leading to development of relevant strategies; develops appropriate and adequate project schedules based on project performance indicators, functional action plans and work breakdown structure; identifies and plans for the required project needs in the management function of planning. This position affirms Fayols theory that management had a principle role of forecasting and planning by anticipating the future and acting accordingly.

##### **5.4.2. Organizing and Project Success**

The study concluded that the success of scientific research projects depends on the establishment of a responsive organisational structure requiring project managers to report to more than one manager which considers effective coordination among the different organisational functional units. Establishment and communication of project policies and procedures was necessary in the performance of the management function of organizing. This position affirms Fayols theory that management had a principle role of

developing the institution's material and human resources through effective organisational structuring and establishment of standard operating procedures.

#### **5.4.3. Controlling and Project Success**

The study concluded the success of scientific research projects depends on the establishment and observance of pre-controls, concurrent controls and post controls which help identify performance deviations and taking of corrective action, this position is also espoused by Fayol's theory that management had a principle role of ensuring that the organization's activities are performed in accordance with appropriate rules and procedures.

#### **5.5. Recommendations of the Study**

This sub section presents the recommendations of study based on the study findings, discussion and conclusions. Specifically it presents the recommendations of the study in relation to planning, organizing and controlling and success of scientific research projects.

##### **5.5.1. Planning and Success of Scientific Research Projects**

The study recommends that the management of MRC should always conduct an external and internal environmental analysis of factors that affect project success through use of strategic planning retreats moderated by internal and external strategic management consultants to offer expertise where necessary.

##### **5.5.2. Organizing and Success of Scientific Research Projects**

The study recommends that the management of MRC should always establish and put in place a project or matrix organisational structure enabling project implementers to report to more than one supervisor and for effective coordination found failure to effectively put in place a project structure responsive to the NCD project design. This should be enhanced with continuous enhancement of modern ICT tools for improved communication among project stakeholders.

### **5.5.3. Controlling and Success of Scientific Research Projects**

The study recommends that the management of MRC should always communicate the project proposal to project implementers at the different levels as a policy document for identification of deviations and taking of corrective actions; assess performance against set project performance expectations, standards and plans during project implementation; and continuously strengthen the internal controls compromised the effectiveness of the control function in the MRC.

### **5.6. Limitations of the Study**

The study relied on primary data collected using a standardized questionnaire and interview guide without use of secondary data to effectively triangulate and enhance the data quality. Use of secondary data gained from the project proposal, progress and evaluation reports if accessed would have enhanced the quality and objectivity of the study findings. Never the less, the views and opinions in this report are representative of the project implementers' independent position based on personal experiences and the study findings could be generalized to other studies.

### **5.7. Contributions of the Study**

The study makes project time, cost and quality success managerial contributions in scientific research projects demanding that management should effectively observe the management functions of planning, organizing and controlling. Similarly, the study has also helped cover literature gaps by providing empirical evidence on the extent to which management functions of planning, organizing and controlling influences project success in scientific research projects.

### **5.8. Areas for Further Studies**

The study found out that management function of planning, organizing and controlling predicted 38.1% of the variance in the NCD project success while other variables predicted the remaining 61.9% of the variance in project success. Other studies need to examine the role of directing, coordination and staffing on scientific project success while considering the triangulation of the study data collection methods to incorporate use of documentary reviews.

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## **APPENDIX I: STUDY QUESTIONNAIRE**

### **INTRODUCTION**

Dear respondent,

My name is Jackson Were, a post graduate student of Uganda Management Institute pursuing a Masters degree in Business Administration. I am carrying out a study on management and project success. You have been selected to volunteer in this study as a respondent. Your views will be kept and treated confidentially in line with the study. I appreciate every contribution that you make in furthering this research endeavor. Thank you for your time and cooperation.

### **SECTION I: BACKGROUND INFORMATION**

1. Age group: < 24 Years [ ] 25- 30 Years [ ] 31-35 Years [ ] 36-40 Year [ ] 41-45 [ ]
2. Level of education: Diploma [ ] Degree [ ] Masters [ ] PhD [ ]
3. Your job title in MRC: Doctor [ ] Nurse [ ] Field Officer [ ] Statistician [ ] Project Manager [ ] Lab technologist [ ] Social Scientist [ ] Administrator [ ] Accountant [ ]
4. How long have you worked with MRC. Less than a year [ ] 1-5 Years [ ] 6-10 Year [ ] 11- 15 Year [ ] 16+ [ ]

### **SECTION II: MANAGEMENT FUNCTIONS**

#### **Instructions**

Indicate the extent to which you agree with the following observations on the management functions of the planning, organizing and controlling in relation to the completed Non-Communicable disease research project on a scale of (1) Strongly disagree, ( 2 ) Disagree,

(3) Not sure (4) Agree (5) strongly agree.

<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Planning</b>					

<i>Environmental analysis</i>					
13. The Non-Communicable disease research project conducted an external environmental analysis to determine external factors that may impact on the project success					
14. The Non-Communicable disease research project regularly conducted a strength, weakness, opportunities and threats (SWOT) analysis of the project					
15. The Non-Communicable disease research project had well established strategic objectives of the project					
<i>Schedule development</i>					
16. The Non-Communicable disease research project had well developed performance indicators for each project functional area					
17. The Non-Communicable disease research project had a well developed action plan for each project functional area					
18. The Non-Communicable disease research project had a well developed work break down structure for each project					
19. The Non-Communicable disease research project had well defined responsibility centers to guide achievement of the objectives					
20. The Non-Communicable disease research project had well developed timelines for each project activities					
<i>Resource planning</i>					
21. Adequate none financial resources were identified for each functional department to facilitate achievement of the project objectives					
22. Human resources were adequately identified for each functional department to facilitate achievement of the project objectives					
23. Material resources were adequately identified for each functional department to facilitate achievement of the project objectives					
24. Appropriate equipments were identified for each functional department to facilitate achievement of the project objectives					
<b>Organizing</b>					
<i>Structure</i>					
25. The Non-Communicable disease research project had a well defined structure with distinct functional divisions					
26. The Non-Communicable disease research project structure put in place provisions for reporting to more than one supervisor					
27. The Non-Communicable disease research project structure put in place provisions for reporting to more than one functional area					
28. There are distinct roles/responsibilities and functions of the					

different work units in the project					
29. There are distinct roles/responsibilities and functions of the different individuals in the project					
30. The different functional units in the non communicable disease project were well coordinated to facilitate the achievement of the objectives of the project					
31. There were efforts to redesign the project structure whenever necessary for project success					
<i>Procedures and policies</i>					
32. The Non-Communicable disease research project had well established standard operating procedures, policies and rules for the project					
33. The Non-Communicable disease research project had well established project policies					
34. The Non-Communicable disease research project had well established project rules					
35. There were effort to deploy adequate communication avenues to share project information for decision making					
36. There was effort to deploy modern information and communication technology in the project					
<b>Controlling</b>					
<i>Pre-control</i>					
37. The project proposal was openly communicated to guide project staff on the different project expectations.					
26. The project put in place standardized documents to ensure complete and consistent information is gathered.					
27. The project put in place modern management information systems to ensure complete and consistent information is gathered.					
<i>Concurrent control</i>					
28. The management of the non communicable disease project research regularly assessed its performance against the set project performance expectations/standard.					
29. The management of non communicable disease project research strongly emphasized conformity to plan adopted.					
30. The management of non communicable disease project research strongly emphasized conformity to instructions issued.					
31. The management of the non communicable diseases strongly emphasized conformity to established principles.					
<i>Post control</i>					

32. Deviations in the work processes were regularly identified in time to facilitate project success					
33. The management of the project reports on the project performance as scheduled					
34. The management of the project strived to adhere to the preventive measures (controls) put in place in its plan to ensure achievement of project objectives					
35. The management of the project took efforts to strengthen project internal controls					

### SECTION III: PROJECT SUCCESS

#### Instructions

Indicate the extent to which you agree with the following observations on non-communicable project success on a scale of (1) Strongly disagree, ( 2 ) Disagree, ( 3 ) Not sure( 4) Agree ( 5) Strongly agree.

Scale	1	2	3	4	5
<i>Time</i>					
12. The NCD Project milestones were met as specified in the project schedule					
13. The NCD Project suppliers were always in time					
14. The NCD project was completed in the specified time schedule					
<i>15. Cost</i>					
16. The NCD project was accomplished in the budgeted human resource costs					
17. The NCD project was accomplished in the budgeted material costs					
18. The NCD project was accomplished in the budgeted overhead costs					
<i>Quality</i>					

19. The NCD project results answered the key research specifications					
20. The NCD project results met the expectations of the research projects					
21. The NCD project met the international research standards					
22. The NCD project results were published in the peer reviewed journal					
23. The NCD project publication received the good rating in the journal					

## **APPENDIX II: INTERVIEW SCHEDULE**

1. Describe the project planning practices in MRC and specifically to the NCD project
2. Describe the efforts to organize the NCD project in MRC in relation to the different functional departments
3. Describe how the management controls were undertaken in the NCD project
4. To what extent did the project management functions of planning, organizing and controlling influence the NCD project success.



**APPENDIX III: TABLE FOR DETERMINING SAMPLE SIZE FROM A GIVEN POPULATION**

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is population size  
 "S" is sample size.

Krejcie, Robert V., Morgan, Daryle W., "Determining Sample Size for Research Activities", Educational and Psychological Measurement, 1970.