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**COST EFFECTIVENESS ANALYSIS
OF COMMUNITY HEALTH PROGRAMS IN RWANDA:
A CASE STUDY OF RUSIZI DISTRICT**

A Thesis submitted in partial fulfilment of the Academic requirements of the Master of Business Administration degree at the University of Rwanda/ College of Business and Economics.

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Kigali, November 2016

DECLARATION

I, NDAYAMBAJE RWAGITARE BERTHE, hereby declare that this thesis is my own original work. To the best of my knowledge it contains no material previously published or written by another person, nor materials which to a substantial extent has been accepted for the award of any other degree or diploma at the University of Rwanda or any other institution, except where due acknowledgement is made in the thesis. Any contribution made to the research by others with whom I have worked at Remera College of Education is recognized.

I also declare that the intellectual content of this thesis is the product of my own work.

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APPROVAL

I confirm that this study was carried out by the candidate under my supervision.

Dr. RUHARA CHARLES

Name and Signature of Supervisor

Date

DEDICATION

I dedicate this Master's Degree Thesis to my God Almighty, my creator, my strong pillar, and my source of inspiration, wisdom, knowledge and understanding. Throughout this entire study, He took care of everything that would have stopped me in my tracks and strengthened me even through my most difficult times.

I deeply dedicate my work, also, to my Father Ndayambaje Rugomezwa Francois, who left this world in the beginning on this year, 2016. I am thankful to him for the way he honored me in his last Will and how he considered me as his own daughter. May God grant him happiness in Heaven.

I also dedicate this work to my children (Belicia, Benito and Bertille) who, even at such tender ages, have had to endure so much stress and discomfort.

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ABBREVIATIONS AND ACRONYMS

| | |
|----------------------|--|
| AA | : Africa Ahead |
| ASOC | : Village Health Workers for ‘Affaires Sociales’ |
| CBEHPP | : Community Based Environmental Health Promotion Programme |
| CEA | : Cost Effectiveness Analysis |
| CHC | : Community Health Club |
| CHW | : Community Health Workers |
| EHD | : Environmental Health Desk |
| EHO | : Environmental Health Officer |
| EHP | : Environmental Health Practitioner |
| EHTWG | : Environmental Health Technical Working Group |
| IPA | : Innovations for Poverty Action |
| M&E | : Monitoring and Evaluation |
| MDGs | : Millennium Development Goals |
| MoH | : Ministry of Health |
| NCD | : Non Communicable Disease |
| One Way ANOVA | : Analysis of Variance |
| PPH | : Prevention Postpartum Hemorrhage |
| RBC | : Rwanda Biomedical Center |
| SD | : Standard Deviation |
| SPSS | : Statistical Package for Social Science |
| WHO | : World Health Organization |

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ABSTRACT

This study aimed to determine the effectiveness of Classic and Light community health intervention programs focusing on costs and health promotion practices in regards to community mobilization strategy, hygiene behaviour change, and reduction of disease.

The study employed a cross sectional design in which quantitative and qualitative data was collected. The sample size for this study included 144 households, which were derived from the 225 households targeted through Zuelueta and Clostales' (2003) sample size determination. Both purposive and systematic random sampling techniques were used to select respondents. Both primary and secondary sources of data were employed in this study and the major sources of data collection include questionnaires and documentation review. The reliability and validity of the research instrument was determined through Content Validity Index and test and re-test. The statistical tools used to analyze the data in this study included frequency counts and percentages, mean values, standard deviation and One-Way ANOVA.

The costs incurred in the implementation of the two programs were effective, that health promotion practices among the beneficiaries of the two interventions are still at a moderate level, and that the costs incurred in the two programs varied significantly and results were significantly different between the two intervention programs in terms of health promotion interventions. In summary, classic intervention was found to be more cost effective and more important in enhancing health promotion practices among its beneficiaries than light intervention programs.

The study supports the recommendation that the Ministry of Health and the two programs' administration should take the following actions: revise costs to include a baseline survey so that detailed and appropriate implementation approaches can be designed for better results in health promotion practices; community sensitization on health promotion practices should be intensive and prioritize such that they are aware on how to ensure wellness; local community members should establish rewards and penalties for people whose hygiene has met required standards and or not met such standards; the Ministry of Health and its partners should ensure that items or chemicals to purify drinking water are made affordable and more accessible to local community members so that they can be able to ensure that the water they drink is always clean and safe; and, finally, the administrators of the two programs should empower local community leaders at various sectors so that waste management practices can be imposed or enforced by the local community leader to ensure effectiveness.

CHAPTER ONE: INTRODUCTION

1.1 Background

Hygiene related diseases such as diarrhoea, cholera and malnutrition are one of the leading causes of death in many African countries (WHO, 2012). Diarrhoea disease is a leading cause of morbidity and mortality in less developed countries especially among children aged under 5 years. Similarly, according to UNICEF (2012), diarrheal disease kills an estimated 1.8 million people each year and accounts for 17% of deaths of children under 5 years of age in developing countries.

Ninety-four percent of this disease burden is attributable to the environment, including risks associated with unsafe water, lack of sanitation and poor hygiene. While piped-in water supplies are an important long-term goal, the WHO and UNICEF acknowledge that it is unlikely to meet the Millennium Development Goals (MDGs) target of halving the proportion of the people without sustainable access to safe drinking water and basic sanitation by 2015 (WHO and UNICEF, 2012). As a result, these institutions are seeking alternative interventions that can deliver the health gains of safe drinking water at lower cost.

In a study conducted by Biomedical Center (RBC) in July 2015 it was found that 69% of all the cases in the past six years, were attributed to cholera disease in Rwanda (RBC Report 2015). Although cholera was highlighted as the main hygienic disease, it is well known that hygienic diseases are responsible for undermining child health in developing countries (Taylor et al. 2015). The causes of hygienic diseases and their negative impact to the socio-economic development of the communities mainly in deprived area are documented by research. Yet it is also known that the main causes of hygiene disease can be prevented by providing safe water, giving education and improving sanitation and hygiene behaviours for the population (WHO October 2011).

The household vulnerability due to hygienic diseases coupled with the economic burden, due to the time households lose while seeking health care, led the Ministry of Health and its partners to think of different alternatives to be implemented as responses to hygienic issues.

Many studies have reported the results of interventions to reduce illness through improvements in drinking water, sanitation facilities, and hygiene practices (Taylor 2015). However, the extent to which such interventions are ultimately deployed to reduce the burden of disease will not be determined on their effectiveness alone but also depend on their cost (WHO 2011).

While public sector decisions on health expenditures are often based on political commitments or other expenses, “economic efficiency,” by definition, requires that resources be directed to their most productive use (WHO 2008). In the health context, such allocation efficiency requires “assessing which intervention will produce greatest health gains for a given investment of resources, and focusing on that activity” (Witter 2000). Thus, economic evaluation is normally a function of both the cost of the intervention compared to its impact, as well as estimating the return on cost invested. Two or more interventions are compared, with almost the same objectives done within specific boundaries (WHO 2011). Hence; the economic evaluation will not only consider the cost but also the effectiveness of the intervention as well.

In Rwanda, although the community health clubs had shown to be very relevant in improving the health outcomes of the local population by reducing the burden caused by hygienic diseases, little has been done to compare the program cost and its effectiveness.

Thus, this study aims to assess the cost and the effectiveness of two interventions done by the community hygiene Clubs program in Rusizi District.

1.2 Problem Statement

Diarrhea is a leading killer of children, accounting for 9 per cent of all deaths among children under age 5 worldwide in 2015. This translates to over 1,400 young children dying each day, or about 526,000 children a year, despite the availability of simple effective treatment. Almost 60 per cent of deaths due to diarrhea worldwide are attributable to unsafe drinking water and poor hygiene and sanitation (UNICEF 2016)

Despite the implementation of interventions in Community Health program in Rusizi (from 2013 up to 2015) in regard to light and classic programs, the Rwanda Demographic and Health Survey (RDHS) done in Western Province found that Rusizi district has a higher percentage of Diarrhea compare to other district in the province. RDHS (2014-

2015) reported that, according to mothers' reports, 15 percent of children had diarrhea in the two weeks preceding the survey in the West Province, compared to 12 percent at national level. The prevalence of diarrhea is especially high among children in Rusizi and Karongi Districts (24 percent and 23 percent, respectively).

In Rusizi, 20% of mothers and children are not protected against causes of death by prenatal and maternal conditions, malaria (which is locally at 1.8% compared to the national level of 2.2 percent), and acute lower respiratory tract infections (14%). In addition, 35% of children under five are stunted, 9% are underweight, and 3% are wasted. (RDHS 2014-2015) Additionally, the rate of mortality and of contracting different diseases in Rusizi remains high. This is verified by the Rwanda Demographic and Health Survey (RDHS 2014-2015), which shows that the burden of disease among people in the area remains high.

A large proportion of these diseases are preventable, providing an opportunity to use health promotion practices as a strategy to reduce the growth in disease burden and its associated costs. Safe drinking water, sanitation and hygiene, and hand washing with soap alone can cut the risk of diarrhea by at least 40 per cent and significantly lower the risk of respiratory infections. Clean home environments and good hygiene are important for preventing the spread of both pneumonia and diarrhea, and safe drinking water and proper disposal of human waste, including child faeces, are vital to stopping the spread of diarrhea disease among children and adults. (UNICEF 2016) In Rusizi District health practices mentioned above are taught in Community Health Clubs (CHCs), beneficiaries are submitted either to Classic intervention or Light intervention; both interventions promote hygiene practices and focus on behavior change of the population but Classic Intervention receive high quality instrument materials, more training sessions and Home supervision while light Intervention, receive black and white instruction materials, less training sessions and there is no home supervision. The effectiveness of the two interventions is assessed by measuring the improvement on hygiene practices (latrine, cleanness, hand washing practices, kitchen cleanness, water cleanness, etc) all are indicators which help to measure if the intervention was effective or no.

It is through this background that this study assessed the cost effectiveness analysis in community health program in Rwanda in particular reference to the two interventions

Classic and Light implemented in Rusizi District. How to know if the intervention was cost effective? To the best of my knowledge here in Rwanda there no single study that has compared two interventions and their effectiveness, thus the reason of my research.

1.3 Research objectives

1.3.1 General Objectives

This study attempted to measure the cost effectiveness of two community health programs interventions, Classic and Light, while focusing on costs and health promotion practices in regard to community mobilization strategy, hygiene behaviour change and reduction of diseases.

1.3.2 Specific Objectives

This study was guided by the following objectives:

- (i) To assess the cost effectiveness incurred in the implementation of Light and Classic community health programs in Rusizi district.
- (ii) To assess the perceptions toward the health promotion practices among the beneficiaries of both Light and Classic community health programs in Rusizi district.
- (iii) To establish differences in costs and health promotion practices between Light and Classic community health programs in Rusizi district.
- (iv) Provide recommendations on how to improve hygiene practices in Rusizi

1.4 Research Questions

- (i) What is the effectiveness of costs incurred in implementation of Light and Classic community health programs in Rusizi district?
- (ii) What are the perceptions of health promotion practices among the beneficiaries of both Light and Classic community health programs in Rusizi district?
What are the differences in costs and health promotion practices between Light and Classic community health programs in Rusizi district?

1.5 Research Hypothesis

- (i) Costs incurred in Light and Classic community health programs in Rusizi district are not significantly different.

- (ii) Health Promotion practices among the beneficiaries of Light and Classic community health programs in Rusizi district are not significantly different.

1.6 Significance of the Study

To Policy Makers: Examining the quality of health promotion interventions in public healthcare institutions could be useful to the national, regional and district health policy makers. This could help them review, plan and implement strategies and policy guidelines that can help promote and enhance activities of health workers in both treating and preventing diseases at communities.

To the researcher: This study gave the researcher with techniques for cost analysis and health promotion practices in Rwanda, which are essential at all management levels.

To the Public institution: This study is crucial because it will help to compare the relative evidence on the effectiveness of these two interventions in order to allow decision- makers to choose the best intervention to implement in other Districts of Rwanda. It will help them to know in advance what budget to plan for the implementation of intervention, which will help the population to reduce diseases that come from a lack of hygiene.

To Population of Rwanda: This study will help the population to have a high level awareness on preventing Hygiene diseases and reach a satisfy behaviour change on sanitation. Thus, it offers the potential of reducing death of children and increasing access to clean water.

1.7 Scope of the Study

1.7.1 Geographical Scope

Geographically, this study was carried out in the Rusizi District, Rwanda. The district is located in the western province of Rwanda. The area was selected for this study because there is high disease burden among people in the area even though two health community interventions were implemented in the area. Thus, there was need to assess the cost effectiveness of the community health program in Rwanda in particular reference to Rusizi District.

1.7.2 Content Scope

This study examined the quality of health promotion practices among the beneficiaries of light and classic community health programs in Rwanda in particular reference to Rusizi District. Costs were investigated in terms of administrative cost, baseline survey cost,

training cost, implementation cost and monitoring cost. Health promotion practices were investigated hygiene and cleanliness, waste management, environmental controls, community awareness and wellness, malaria control measures, and availability of water and safe drinking.

1.7.3 Time Scope

This study considered information on health promotion practices among beneficiaries of services within a period of three years from 2013 to 2015. This enabled detailed analysis on different health promotion practices in the district so that appropriate conclusions could be derived.

1.9 Organization of the study

Chapter one introduces the research topic and presents the background of the study, the main objective of the study and the guiding questions. The chapter also highlight the specifics objectives of the study and the hypotheses, as well as the scope of the study.

Chapter two contains a review of the literature specific to the research topic, research objectives and questions. The literature on costs and health promotion practices has also been reviewed so as to understand the study variables. The chapter also presents the theoretical literature review on cost effectiveness analysis and empirical review.

Chapter three is a detailed discussion of the methodology of the research. It discusses how the techniques were used to collect, analyze and record the data. The chapter also looks at how the sample was selected and the specific type of research instruments used on a particular respondent. The justification for the methodology used is also presented in the chapter.

Chapter four contains the findings of the study. Data is analyzed using descriptive statistics and presented using tables. Interpretation of data is also done objective by objective.

Chapter five summarises the key research findings and discusses them objectively. The chapter also draws conclusions and recommendations of the study.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This Chapter focuses on the definition of the key concept of this study, beginning with the definition of the cost effectiveness and then giving a brief distinction between classic and light intervention. The chapter also gives the situation of hygiene in Rwanda and the measures that have been taken to reduce the hygiene disease in Rwanda and especially in Rusizi District.

Through empirical review, this study seeks to examine ideas, opinions from experts and authors on cost and Cost effectiveness, Health Promotions Practices in communities and perspectives on the limitation of cost effectiveness analysis.

2.2 Definition of Key Concept

2.2.1 Cost Effectiveness

According to Ceri Phillips (2009); Cost effectiveness is defined as the cost in monetary terms of producing a unit of effect through an intervention. Cost-effectiveness analysis compares the costs and health effects of an intervention to assess the extent to which it can be regarded as providing value for money. This informs decision-makers who have to determine where to allocate limited healthcare resources.

According to Ceri Phillips (2009) , The incremental cost-effectiveness ratio (ICER) is a statistic used in cost-effectiveness analysis to summarise the cost-effectiveness of a health care intervention. It is defined by the difference in cost between two possible interventions, divided by the difference in their effect. It represents the average incremental cost associated with 1 additional unit of the measure of effect. The ICER can be estimated as:

$$ICER = \frac{(C_1 - C_0)}{(E_1 - E_0)},$$

Here, C_1 and E_1 are the cost and effect in the intervention group and C_0 and E_0 are the cost and effect in the control care group. Costs are usually described in monetary units, while effects can be measured in terms of health status or another outcome of interest. A common application of the ICER is in cost-utility analysis, in which case the ICER is synonymous with the cost per quality-adjusted life year (QALY) gained. Cost-

effectiveness analysis is a fundamental instrument in healthcare intervention that helps decision makers allocate efficiently and set priorities well in healthcare budgeting.

According to Ceri Phillips (2009, the growing use of cost-effectiveness analysis (CEA) to evaluate the costs and health effects of specific interventions is dominated by studies of prospective new interventions compared to current practice. As its name implies, cost-effectiveness is a measure of the cost of a particular intervention and its effectiveness with respect to a certain health outcome (e.g., the prevention of diarrheal disease). Effectiveness requires an assessment of the fatal and non-fatal health outcomes that occur when an intervention is introduced. In general, interventions might change the incidence, duration of time within different health states, or the case fatality rate. Because interventions to reduce hygiene disease are preventive, the main outcome is first a reduction in the number of diarrhea episodes and then a reduction in the number of deaths. A common measure of the population health effect of the intervention is Disability Adjusted Life Years (DALYs) averted as a result of the intervention. DALYs are a time-based measure of health that include the impact of interventions on Years of Life Lost (YLL) due to premature mortality and years of life lived with a non-fatal health outcome, weighted by the severity of the outcome.

2.2.2 Classic and Light Interventions

The Environmental Health Desk (EHD) of the Ministry of Health (MoH) in Rwanda is has implemented the Community-Based Environmental Health Promotion Programme (CBEHPP), which establish Community Health Clubs (CHCs) in all 15,000 villages across Rwanda. The CHC model, as originally developed in Zimbabwe by Africa AHEAD (AA) in 1995, has in-built monitoring systems and tools.

Although the CHC methodology has been adopted in a number of countries in rural and urban settings across East, West and Southern Africa over the past few years, Rwanda is the first country to be rapidly scaling up the model nation-wide. Over nine million people (about 80% of the population) should benefit from CHCs within the next four years if the programme is implemented as intended.

The Ministry of Health seeks to optimize the efficiency of their health extension staff, in order to ensure cost-effective hygiene behaviour change and a significant decrease in the burden of preventable diseases. However, with a range of NGOs currently operating fairly autonomously across 30 districts, there are risks in terms of quality of implementation of CBEHPP, which could lead to less than optimum outcomes.

Since 2008, Africa Ahead (AA) consultants have supported MoH to develop the CBEHPP Road Map (through WSP from 2008-2011) and the CHC Training Manuals (through UNICEF from 2010-2011). EHD has proposed that a practical monitoring system be established at village level in order to track hygiene behaviour change as the CHCs are established across the country. With a small staff at head office, EHD currently lacks adequate capacity to monitor CBEHPP effectively, and has requested AA to assist in setting up monitoring procedures that will enable operational standards to be identified and demonstrated for the benefit of all CBEHPP implementing partners.

A web-based mobile research platform was introduced in an effort to enable easy 'real-time' data collection and analysis using mobile phones. This cutting-edge monitoring system has built capacity for evidence-based policy-making within the MoH and should greatly assist EHD to determine exactly which aspects of the CHC Model are critical in order to ensure this national programme is rolled out at scale and implemented as cost effectively as possible. Rusizi district in Western Province has been selected to demonstrate the 'Classic' CHC Model.

Within three years, 150 CHCs have completed health and hygiene training that benefited 15,000 direct CHC members (average of 100 members per Club) and an estimated 75,000 direct beneficiaries (5 family members on average per household) showed significantly improved hygiene facilities and behavioural practices in the home. Specific standards for the 'Classic CHC' were established in order to provide a bench-mark for the national CBEHPP. In Year 1, a sample of 50 'Classic' CHCs and 50 villages with a minimal 'Light' version of the CHC methodology was randomly selected by IPA and compared in Year 3 with 50 control villages, which received no treatment (i.e. neither exposure to the CHC nor training in health and hygiene).

Monitoring the CHC model over the three years determined precisely how hygiene behaviour had been improved to reduce the national disease burden in Rwanda and similar countries. Rusizi District was also used for an in-depth evaluation study of health impact of the CHC approach. It provided the first independent rigorous research of the CHC approach and will therefore be an important contribution to the national effort to identify the most cost-effective method to achieve sustainable and replicable hygiene behaviour change.

“**Classic**” program group: Communities in this study arm received 20 sessions of training on hygiene given by Environment Hygiene Officers (EHO) and Community Health Workers (CHW), high quality instruction materials, supervision, home competition, and graduation ceremony with certificates. They also received toolkits for good hygiene practices (soap, hand wash, water tapsetc....). CHW also regularly conducted close monitoring by visiting households to check if the hygiene at their home was improving.

“**Light**” program group: Communities in this arm received 8 training sessions on hygiene given by CHWs only, black and white instruction materials, no supervision, no membership cards, and no graduation ceremony. No CHWs visited households in this group, as the group was left on their own and evaluation was only done at the end of the program.

The Ministry of Health has directed that nationally, *every single household* should be monitored for the Ten Golden Indicators of safe hygiene: Water source, Drinking water, Sanitation, Personal hygiene, Hand washing, Kitchen hygiene, Solid waste, Environment, Malaria, Child care (CHC Record 2013)

ASOCs are one of the four village health workers in every village in Rwanda, and have been nominated to be responsible for the CHCs. They have had some training in community health and are specialists in community sensitization and mobilization. They are part of the village leadership committee. In October 2013, MoH and Africa AHEAD trained ASOCs from 100 villages in the Household Inventory. After the two-day training, the ASOCs returned to their villages and registered households into a village CHC. An executive committee was formed to steer the CHC. This committee reports to the Cell Community Based Environmental Health Promotion Programme (CBEHPP) committee, who in turn reports to the Sector Leaders, who convey reports to the District Local Author.

The CHC executive committees and the ASOCs are responsible for ensuring that levels of hygiene are monitored as required by MoH. If a CHC is too large for the ASOC to monitor, it can be broken into clusters, so that a cluster leader is made responsible for conducting this monthly monitoring. Every member has a membership card, which is signed by the ASOC every time they attend a session. Each week they are given homework in the form of some home improvement. The ASOC and the CHC committee members visit each house and observe if the 'homework' has been completed, and enter the information into their registration books, thus enabling each CHC to own and identify exactly when recommended practices have been adopted by each household. This also encourages sustained changes, as the monitoring extends beyond the initial training and becomes part of the duties of the committee.

All these trainings and monitoring were done and there was a cost for implementation.

The aim of this research is to find out if the cost was effective compares to the outcome of the Classic and light groups.

2.3 Hygiene Diseases in Rwanda

According to the Global Water, Sanitation and hygiene- Centers for Disease Control and prevention (WASH), Sanitation and Hygiene are critical to health, survival, and development. Many countries are challenged in providing adequate sanitation for their entire populations, leaving people at risk for water, sanitation, and hygiene (WASH)-related diseases. Throughout the world, an estimated 2.5 billion people lack basic sanitation (more than 35% of the world's population).

Basic sanitation is described as having access to facilities for the safe disposal of human waste (feces and urine), as well as having the ability to maintain hygienic conditions, through services such as garbage collection, industrial/hazardous waste management, and wastewater treatment and disposal.

Hygiene refers to acts that can lead to good health and cleanliness, such as frequent hand washing, face washing, and bathing with soap and water. Keeping hands clean is one of the most important ways to prevent the spread of infection and illness. However, in many areas of the world, practicing personal hygiene is difficult due to lack of resources such as

clean water and soap. Many diseases (including diarrheal diseases) can be spread when hands, face, and body are not washed appropriately at the key times.

According to the Nation Union of Rwanda report (One UN Program 2013-2018) approximately 29% of Rwanda's population does not have access to improved water source and 25% does not have access to an improved sanitation facility. Lack of access to improved water and sanitation facilities and poor hygiene practices in Rwanda, particularly in rural areas, is contributing to high incidence of water, sanitation and hygiene-related mortality and morbidity.

Due to low coverage of improved water supply, women and girls in rural areas have to walk long distances in difficult hilly terrain to fetch water from unprotected sources. This not only affects the physical conditions of women and girls adversely but also their economic productivity, as fetching water takes time from their hectic daily routine. Lack of appropriate water and sanitation services and poor hygiene is also contributing to high stunting among children in Rwanda due to diarrheal diseases and environmental enteropathy.

The WASH component of the One UN Programme, through strong multi-sectorial partnership with the Rwandan Government, aims to contribute to the efforts of the Government of Rwanda to reduce mortality and morbidity due to WASH-related diseases and child stunting as well as improve gender equality and education outcomes through accelerating access to improved water and sanitation facilities in communities, schools and health centres. One UN also continues to support strengthening of institutional and policy framework in the WASH sector, with a strong focus on sustainability, as well as improved sector coordination and knowledge management.

2.4 Reduction of Hygiene Diseases

Recognizing that improving health requires a partnership between the Government and local communities, the Ministry of Health has put in place mechanisms that directly involve and empower local communities in health promotion. Community health workers (CHWs) have proven to be a way to provide effective and efficient basic health care services at the community level, particularly reducing the financial, infrastructural, and

geographical barriers to accessing health care. The significant improvements in the reduction of hygiene disease witnessed over the last five to 10 years are undoubtedly due, at least in part, to the service provided by CHWs through sensitization on washing hand, but there are still some parts of the country where there is no water available for such washing.

According to a Rwanda Biomedical Center (RBC) study in Rusizi and Nyamasheke in July 2015, there are still weaknesses on practices regarding appropriate hygiene and sanitation. Access to safe drinking water and availability of standard latrines is still a challenge for some households. There is also a lack of awareness of diseases, such as cholera. Although a high proportion of household have access to safe water, many Ubudehe and Water and Sanitation Corporation (WASAC) water taps mostly run dry.

It is clear that training on hygiene behaviour change alone is not enough to reduce hygiene disease. There still remains a lot of work that the government need to do through its Ministries in order to ensure the availability of safe water and adequate latrines to the community,

2.5 Empirical Review

Through empirical review, many authors gave arguments about the cost and the cost effectiveness of intervention on health care. Others focus their discussion on the health promotion practices in communities. An argument on the gap of cost effectiveness analysis can also be observed, as well as an exploration of the implications of the cost effectiveness analysis.

2.5.1 Cost Effectiveness Analysis

In Michael et al.'s 2015 study in Senegal on cost effectiveness of two interventions (oxytocin and misoprostol) for prevention of Postpartum Hemorrhage (PPH), the cost per PPH referral averted was found to be US\$ 38.96 for misoprostol and US\$ 119.15 for oxytocin. In all the scenarios, the misoprostol intervention dominated, except in the worst-case scenario, in which the oxytocin intervention demonstrated slightly better cost-effectiveness. Their findings demonstrate that the use of misoprostol for PPH prophylaxis could be cost effective and improve maternal outcomes in low-income settings. I agree with the author in the sense that it is important to show which intervention is the most cost effective when comparing two or more interventions. Cost-effectiveness analysis

helps identify neglected opportunities by highlighting interventions that are relatively inexpensive but have the potential to reduce the disease burden substantially.

Alam et al.'s 2012 study on the dissemination of health messages in Bangladesh showed that identifying pregnancies, bringing pregnant women to birthing huts, accompanying them during their delivery, and providing newborn care by CHWs were all cost effective. The study also focused on costing of CHW dropout from a provider perspective and found out that CHW dropout after training and working for 1 month leads to foregone health services as well as recruitment and training of replacements. With an additional investment double the initial investment per CHW, the organization reduces dropout, can make additional cost savings (not recruiting and training a replacement) and fewer services are foregone in the community.

Sutherland and Bishai (2009) also carried out a maternal health simulation study on the prevention of PPH and anemia by Village health workers (VHWs) in India. Considering the cost-effectiveness study from a provider perspective, the study found that Misoprostol prevention and treatment provided by VHWs are both more cost-effective than standard care, though standard care is not defined. Treatment was also found to be significantly more cost-effective than prevention in terms of cost per life saved.

A study by Chin-Quee et al. (2013) focused on family planning intervention by CHWs in Zambia. The study was on the costs and benefits of a single intervention from a programme perspective. The study found that the provision of injectable contraceptives by CHWs can be done at a low cost when added to an existing community-based distribution package.

Borghi et al. (2005) studied maternal health interventions in Nepal with women's groups, the study was an economic evaluation with provider perspective alongside RCT. This study discovered that women groups facilitated by lay health workers could provide a cost-effective way of reducing neonatal deaths compared to current practice.

Chola et al. (2011) focused on breastfeeding intervention delivered by local women trained as peer supporters in Uganda. The study considered costing from a local provider

perspective. The study found that the use of local women trained as peer supporters to individually counsel women about exclusive breast feeding can be implemented in sub-Saharan Africa at a “sustainable cost.”

Sabin et al. (2012) also carried a study in Zambia on neonatal healthcare delivery by Traditional Birth Attendants (TBAs). Employing costing and cost-effectiveness alongside a randomized control trial, the study found that financial analysis based on trial costs only then expanded to intervention economic costs from a societal perspective.

Given these studies documented in the literature, it can be concluded that cost-effectiveness analysis helps to identify ways to redirect resources to achieve more. It demonstrates not only the utility of allocating resources from ineffective to effective interventions, but also the utility of allocating resources from less to more cost-effective interventions.

2.5.2 Health Promotion Practices in Communities

Healthcare institutions also have an impact on the health of people living and working in the surrounding neighborhoods. Thus, Amone *et al.* (2005) believes that programmes to raise awareness about healthy nutrition may contribute to a change in attitudes and in eating behavior. The authors also contend that, in the long term, they help reduce chronic diseases and thus costs related to the treatment of these diseases. I personally agree with the author since many local people do not have adequate knowledge about healthy nutrition; this has been one of the main reasons for high disease burdens in many African countries. Hanlon *et al.* (2010) pointed out that eating more fruits and vegetables and other fresh foods, rather than ready-made meals and fast food, is one way to cut the risk of developing chronic illnesses. Thus, providing such information to community members can significantly promote their physical and psychological wellbeing.

One of the most important things health practitioners can do to promote health of communities in their catchment areas is promote participation, engagement, and involvement of community members in health related decisions, service designs, and delivery (Chaudhury *et al.*, 2006). Through participation, people’s power and control over health related challenges is likely to be reduced. According to Chaudhury *et al.* (2006), community empowerment is a process by which communities gain more control over the

decisions and resources that influence their lives, including the determinants of health. Community empowerment in health promotion is a core principle of community development. It builds from the individual to the group to the wider collective and embodies the intention to bring about social and political change (Chaudhury *et al.*, 2006). I agree with the authors, as the lack of empowerment and participation of communities in various social and economic activities can be seen in resulting cases of domestic violence, for example, which are also great health challenges.

Laverack (2007) identifies nine domains or areas of influence of community empowerment in health promotion. These include improving participation, developing local leadership, building empowering organizational structures, increasing problem assessment in capacities; enhancing the ability of the community to ask why, improving resource mobilization, strengthening links to other organizations and people, creating an equitable relationship with outside agencies, and increasing control over program management. Much of the recommendations by Laverack are effective ways of promoting health among communities. However, in many cases, these strategies have not been put in place especially in developing countries. Thus, the implementation of these strategies in the case of surrounding communities of the selected public healthcare sectors is yet to be determined.

Similarly, Cohen (2008) believes that health promotion among communities starts with priorities identified by and common to communities. This means that in health promotion, the healthcare practitioners should make a commitment to learn from communities, to be accountable to communities, and to work in partnership. The author acknowledges, however, that this is not easy to do this, especially when statutory and funding bodies identify the needs and priorities of health promotion programs. I also agree with Cohens in saying that failure to learn from communities can hinder healthcare practitioners from identifying the major health needs of their communities.

Capacity building is also one of the most important activities through which health promotion can be effective in communities. According to Robbins *et al.* (2006), capacity building is about working with individuals and groups within the communities to

recognize and develop the skills and resources they have in order to identify and meet their own health needs. This may involve providing opportunities for people to learn through experiences and to be involved in collective efforts so that they gain confidence in their own abilities and for their abilities to influence decisions. This can greatly promote the psychological, emotional and spiritual wellbeing of community members.

According to Morgan (2006), educating village mothers about health during pregnancy and childbirth can have positive health outcomes. This education included encouraging and providing family planning methods to appropriately space births or avoids unwanted or dangerous pregnancies and preventing obstetric fistula through village education on the cause of fistula are most important actions towards health promotion. This is important because maternal health and reproductive health are some of the common health challenges in the developing world. Thus, offering services related to this can significantly help to reduce health burdens related to childbirth and reproduction challenges.

In Uganda, poor sanitation and hygiene is a cross-cutting health concern in all rural villages. Poor sanitation leads to diarrheal diseases, which are responsible for 17% of all deaths of children under five (Whitlock *et al.*, 2002). Poor personal and household hygiene can lead to trachoma, increased rate of infections, and a number of other diseases. A home with standing water can become a breeding ground for mosquitoes and increase malaria rates not just for that family, but for the neighbors as well. Thus, empowering and sensitizing communities on improving sanitation and the promotion of a culture of clean sanitation can help to reduce this disease burdens resulting from poor sanitation.

According to Robbins *et al.* (2006), healthcare practitioners in collaboration with other stakeholders should also spearhead health education programs in their village communities about the importance of household hygiene, personal hygiene, and sanitation. They may also develop partnerships with local schools, encourage children to adopt personal habits of hygiene, and help the schools and families adopt small sanitation

measures like having ‘tippy-taps’ outside of latrines. Such practices indeed can help to promote the health of communities in the catchment areas of hospitals.

It has been noted that many villages have very poor latrine coverage, a condition that increases the prevalence of cholera, dysentery, worms, and many other diarrheal diseases (Morgan, 2006). Thus, the scholar recommended that health workers should launch and conduct “Sanitation Pushes,” innovative and inclusive campaigns to increase latrine coverage and sanitation measures in villages in their surroundings. To emphasise the need for latrine coverage, the author states that such a campaign should involve four steps: Village Project conducts (1) pre-campaign and (2) post-campaign household surveys to determine the increase in coverage for each sanitation improvement, (3) follow-up with households to help finish the longer projects such as latrine construction, and (4) work with community Village Health Teams to create “model households.” I agree with Morgan, as some of the reasons for heavy disease burdens in many rural and slum areas are poor latrines, plate stands, drainage systems for cooking areas, and rubbish pits.

Cohen (2008) noted that hygiene and sanitation interventions supplement innovative and comprehensive water chain interventions to ensure safe water from the source and into the home. According to the World Health Organization, the objectives of a water safety plan are to ensure safe drinking water through good water supply practices, which include: preventing contamination of source waters, treating the water to reduce or remove contamination that could be present to the extent necessary to meet the water quality target, and preventing re-contamination during storage, distribution, and handling of drinking water. In this regard, community members should be challenged to make sure that the water they drink is pure and safe from contamination.

2.5.3 Limitations of Cost Effectiveness Analysis

Cost-effectiveness analysis can indicate which of a number of alternative interventions represents the best value for money, but it is not as useful when comparisons need to be made across different areas of healthcare, as the outcome measures used may be very different. As long as the outcome measure is life-years saved or gained, comparisons can be made, but even in such situations cost-effectiveness analysis remains insensitive to the Quality of Life (QoL) dimension. In order to know which areas of healthcare are likely to provide the greatest benefit in improving health status, a cost–utility analysis needs to be

undertaken using a “common currency” for measuring the outcomes across healthcare areas. If information is needed as to which interventions will result in overall resource savings, a cost–benefit analysis has to be done, although both cost–utility analysis and cost–benefit analysis have their own drawbacks.

This type of analysis does not explicitly take a sectoral perspective where the costs and effectiveness of all possible interventions are compared in order to select the mix that maximizes health for a given set of resource constraints. The estimated cost-effectiveness of a single proposed new intervention is compared either with the cost effectiveness of a set of existing interventions reported in the literature or with a fixed price cut-off point representing the assumed social willingness to pay for an additional unit of health. The implicit assumption that the required additional resources would need to be transferred from another health intervention or from another sector is rarely discussed. Much of the theoretical literature has taken a broader view of cost effectiveness, exploring its use in allocating a fixed health budget between interventions in such a way as to maximize health in a society. This can be referred to as a sectoral CEA. There are only few applications of this broader use, in which a wide range of preventive, curative and rehabilitative interventions that benefit different groups within a population are compared in order to derive implications for the optimal mix of interventions.

Diamond and Kaul argue that cost effectiveness analysis is not the useful approach because there are real problems with cost-effectiveness analysis, which deserve mention. The first is with the quality of data. If a cost-effectiveness analysis is based on one or more randomized clinical results, it will only be as good as the data in the trial. If the trial is biased in some way or not adequately generalizable, the cost-effectiveness analysis will suffer from these same limitations. If a cost-effectiveness analysis is based on a disease simulation model rather than a clinical trial, it will only be as meaningful as the input values. In addition, it is also necessary to have an appropriate control group for comparison.

Ideally, the control group should represent the current standard of care, assuming that this standard is, itself, reasonably cost-effective. If an inappropriate control group is chosen, the resulting comparison will not lead to efficient resource utilization. Unfortunately,

clinical trials of new therapies are often driven by regulatory concerns rather than by addressing important issues of healthcare policy or medical decision-making.

Finally, the time horizon of a cost-effectiveness analysis may extend beyond the data that is available, requiring modelling of outcome instead of direct measurement. The facts in these research documents suggest that cost effectiveness analysis of two or more interventions may not be useful when comparisons need to be made across different areas of healthcare, as the outcome measures used may be very different.

2.5.4 Gap Analysis in cost effectiveness of Healthcare

Many studies calculate the effectiveness of two or more interventions by measuring costs and one healthcare indicator as outcome. They use the incremental cost effectiveness ratio (ICER) to calculate the effectiveness of intervention, this represent incremental change in cost of intervention divided by incremental change in outcome following the intervention. We conducted a literature review to establish what is known about the cost effectiveness of interventions in healthcare. The search identified 7 relevant articles and all articles measured the effectiveness of the intervention using one specific indicator either reduction of diarrhea, or reduction of neonatal death, or reduction of pregnant women death, etc

No article estimated the cost effectiveness of two interventions using many indicators

Thus the reason of this work is to measure the effectiveness of two interventions Classic and Light. The exploration and measurement of the effectiveness of Classic and Light interventions, conducted in Rusizi District in order to reduce hygiene diseases, is of great importance. This study will allow then decision makers to know which interventions can quickly reduce hygiene diseases in a cost effective manner. In addition, to the best of my knowledge there is no single study in Rwanda that compares two interventions by measuring many indicators.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter focuses on how the study was conducted, particularly relating to data collection, processing and analysis. This includes the study design, study population, sample framework, data collection instruments and methods, validity and reliability of instruments, data processing and analysis procedures, ethical considerations and limitations, and the proposed research structure.

3.2 Research Design

The study adopted a cross sectional design in which quantitative and qualitative data was collected. A cross sectional design was proposed for this research because the data was collected at one point in time in order to quantify the cost effectiveness in both Classic and Light community health club interventions in Rusizi District, Rwanda (Amin, 2005). Involving cross sectional design allowed for the use of qualitative and quantitative techniques as well as analytical analysis (Marshall and Rossman 1995) during data collection processes, which consequently helped in the data processing and analysis of information gathered especially for academic purpose.

3.3 Research Area

This study was carried out in Rusizi District. Rusizi is one of the seven districts of the Western Province in Rwanda and is divided into 18 sectors, 89 cells and 595 villages. Rusizi District borders with the Republic of Burundi in the south Nyamasheke District in the north, Nyamagabe and Nyaruguru Districts in the east, and the Democratic Republic of Congo in the west and southwest across the water of Lake Kivu and Rusizi River. Thus, it was strategically chosen because it is where hygiene levels are lower following the Rwanda Demographic and Health Survey (RDHS) of 2014-2016, resulting in spread of cholera and other communicable diseases across the borders.

3.4 Targeted Population

Population refers to an entire group of individuals who have common, observable characteristics. This study targeted the number of households that receive classic and light intervention between 2013 to 2015 in Rusizi District. A total of 225 households benefited from the classic and Light interventions, supported by Innovation for Poverty Action (IPA) and Africa Ahead in Rusizi District especially in two different villages:

Uwinzovu and Gisovu. Despite the constraints of time and money, these 225 households presented similarities that allowed for the research to be conducted.

3.5 Sampling Techniques and Sample Procedures

The study's sample size of 144 households was derived from the 225 targeted households through Zuelueta and Clostales' (2003) sample size determination.

The following sample size formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = is the simple size

N = is the size of the target population

e = Margin of Error at 5% (0.05)

$$n = \frac{225}{1 + 225(0.05)^2}$$

$$n = \frac{225}{1 + 225(0.0025)}$$

$$n = \frac{225}{1 + 0.5625}$$

$$n = \frac{225}{1.5625} = \mathbf{144}$$

Two basic sampling techniques were used in this study: systematic random sampling and purposive sampling. Systematic random sampling was applied to select the beneficiaries of light and classic intervention programs, as they were many and information regarding health promotion practices could be easily obtained from any of them.

Program administrators and trainers were purposively selected. Program administrators and trainers were purposively selected because there was need to involve many of them for detailed information regarding costs incurred in the implementation of the two programs, as they were the ones keeping records and all other necessary information regarding various activities and their implementation costs. This helped in obtaining relevant information about the study variables.

Table 3.1: Population Size and Sample Size

| Category | Population Size | Sample Size | Sampling Techniques |
|---|------------------------|--------------------|----------------------------|
| Administrators and trainers | 44 | 44 | Purposive sampling |
| Households of Beneficiaries of Light Intervention | 91 | 50 | Systematic random |
| Households of Beneficiaries of Classic Intervention | 90 | 50 | Systematic random |
| Total | 225 | 144 | |

Source: CHC Records on Village Self-Monitoring by ASOC

3.6 Data Collection Instruments and Methods

Since the study was both qualitative and quantitative in nature, data collection approaches involved a questionnaire and documentation review.

3.6.1 Questionnaire Survey

The researcher used a closed-ended questionnaire as one of the data collection instruments. The questions were based on the five Likert scale involving: strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5). The

questionnaires were self-administered to respondents who could read and write and administered by the researcher to those who could not read well. The survey had three sections. The first section was about demographic characteristic of respondents. The second section, administered to programs administrators, asked questions about the costs incurred in the implementation of classic and light intervention programs. The, third section, which was directed to the beneficiaries of the two programs, examined the health promotion practices among the beneficiaries of light and classic programs. This method was preferred because it was quick and saved respondents' valuable time, as all the answers were provided, thus only asking respondents to choose among the given options (Amin, 2005).

Table 3.2: Data Collection and the Nature of Information

| | Where we find information | Key information | Documents Reviewed |
|--|---|---|---|
| Program administration | Africa Ahead Ministry of Health District director of health or AA program officer AA | Salaries, communication, transport, Capital cost | Payrolls, financial reports activity reports, Asset register |
| Targeting | Africa Ahead head office, and District program officer Ministry of Health | Cost of identification of project areas, Contacts with Districts, awareness among potential stakeholders | <i>Activity reports</i> <i>Financial reports</i> |
| Staff training and Facilities User training | Africa Ahead head office District program officer | Cost of training Materials, part time trainers, rental of room, meals, trainee compensation... | <i>Training reports;</i> <i>District periodic reports;</i> <i>Financial reports</i> |
| Implementation cost | Training materials | Part-time labor, transport, incentives, allowances, development and printing of materials... | <i>Activity reports</i> <i>Financial reports</i> |
| Monitoring cost | District program officer | Transport, allowances, used to monitor project activities | <i>Activity reports</i> <i>Financial reports</i> |

Source: Africa Ahead report

3.6.2 Documentation Review

This research also sought information from published textbooks, journals, internet, newspapers and magazines, unpublished dissertations, and records from the program administrators on both the costs and health promotion practices among the beneficiaries of the two intervention programs. These sources were used in order to obtain a holistic

understanding on the costs and health promotion practices among the beneficiaries of the two programs.

3.7 Validity and Reliability of Research Instruments

The researcher applied validity and reliable instruments to ensure quality in the study.

Validity

The validity of the questionnaire is concerned with how accurate and correct the instrument is. The purpose of the validity is to provide accurate and useful information. The researcher used content validity in which the intended content in terms of coverage, present activeness and balance of the total domain were measured. This was obtained through a mathematical value called content validity index (CVI) (Lynn, 1986). To ensure the validity of the instrument, the researcher's supervisor assisted in order to determine CVI and check the consistency of the items, conciseness, intelligibility and clarity. The supervisor's input helped the researcher make necessary adjustments to ensure that the instrument adequately measured what it is intended to measure. The researcher took a minimum content validity index of 0.7 to ensure that the instrument is valid (Amin, 2005). The result was 0.91, which implied that the instrument was valid.

$$CVI = \frac{\textit{Relevant Items}}{\textit{Total Number of Items}} = \frac{30}{33} = 0.91$$

Thus, since the CVI computed was above 0.7, the standard Cronbach alpha, the instruments were considered valid. This is also in line with Amin (2005) who noted that the overall CVI for the instrument should be calculated by computing the average of the instrument; for the instrument to be accepted as valid the average index should be 0.70 or above.

Reliability

Before the instrument was used, it was first pre-tested. The purpose of administering the pre-test sample was to establish the consistence of the research instrument. The pre-test was to check how dependable, stable, consistent, predictable, and accurate the instrument was in order to test the hypothesis or research questions. According to Amin (2005), a minimum reliability Cronbach alpha should be 0.7 for it to be regarded as a reliable value. The pre-test was done with 15 people in Nyamasheke district, an area that had the same

characteristics as the study area. The findings were coded in SPSS and the findings are presented here in Table 3.3:

Table 3.3: Results of Reliability Test

| Variable | Anchor | Cronbach Alpha Value |
|---|---------|----------------------|
| Administrative Cost | 5-Point | .7013 |
| Baseline Survey Cost | 5-Point | .9134 |
| Training Cost | 5-Point | .8724 |
| Implementation Cost | 5-Point | .7612 |
| Monitoring Cost | 5-Point | .7010 |
| Hygiene and cleanliness | 5-Point | .7081 |
| Waste management | 5-Point | .8190 |
| Environmental controls | 5-Point | .7201 |
| Community Awareness and wellness | 5-Point | .7011 |
| Malaria Control Measures | 5-Point | .8116 |
| Availability of water and Safe Drinking | 5-Point | .7211 |
| Source: Pilot Research, 2016 | | |

3.8 Data Processing and Analysis Procedures

After data collection, quantitative data was first entered and coded in a computer software package called Special Package for Social Scientists (SPSS), This computer software package was preferred for this study because it is good for keeping variables separated by category. Further still, SPSS comes with more techniques for screening or cleaning the information in preparation for further analysis. In this regard, a database adapted from the SPSS sheet was created according to the way the pre-coded questionnaires appear on the hard copy. Codes were assigned to each response to the question and the corresponding numbers were used to develop a coding sheet. The sheets with codes corresponding to different questions in the questionnaire were referred to when feeding data into the database. The information already entered in the computer was consistently saved so that it could not be lost. The same information was also saved on a flash disk and emailed securely for proper safety purposes.

The quantitative data was analysed through descriptive and inferential techniques. Frequency counts and percentages were used to determine the demographic characteristics of respondents and mean values and standard deviations were employed to examine the various costs in the implementation of light and classic interventions. To establish the relationship differences in costs and health promotion practices between light and classic interventions, One Way ANOVA was employed.

3.9 Measurement Scale

To help to understand the existence of costs and health promotion practices among the beneficiaries in Rusizi district, the following mean ranges and their interpretations were used.

Table 3.4: The Interpretation of Rating Scale on Costs

| Rating Scale | Scale interpretation | Legend scale | Scale interpretation |
|--------------|----------------------|--------------|----------------------|
| 4.21-5.00 | Strongly Agree | 4.21-5.00 | Very effective |
| 3.41-4.20 | Agree | 3.41-4.20 | Effective |
| 2.61-3.40 | Uncertain | 2.61-3.40 | Moderate |
| 1.81-2.60 | Disagree | 1.81-2.60 | Ineffective |
| 1.00-1.80 | Strongly Disagree | 1.00-1.80 | Very ineffective |

Table 3.5: The Interpretation of Rating Scale on Health Promotion Practices

| Rating Scale | Scale interpretation | Legend scale | Scale interpretation |
|--------------|----------------------|--------------|----------------------|
| 4.21-5.00 | Strongly Agree | 4.21-5.00 | Very high |
| 3.41-4.20 | Agree | 3.41-4.20 | High |
| 2.61-3.40 | Uncertain | 2.61-3.40 | Moderate |
| 1.81-2.60 | Disagree | 1.81-2.60 | Low |
| 1.00-1.80 | Strongly Disagree | 1.00-1.80 | Very low |

3.10 Ethical Considerations

According to Cohen *et al.*(2007)“a major ethical dilemma in research is that which requires researchers to strike a balance between the demand placed on them as professional scientists in pursuit of truth, and their subjects’ rights and values potentially threatened by the research” (2007, p.51). In this regard, the following ethical considerations were put in place in this study:

1. Acknowledgement of authors and scholars whose works were reviewed in this study was done through citations and referencing so as avoid cases of plagiarism.
2. Researcher ensured confidentiality of respondents as an ethical measure. Confidentiality of respondents was kept so as to prevent cases of psychological stress and retaliation on respondents after disclosing personal information for this study. This was done through presenting respondent-provided information without revealing their true identity.
3. Further still, respondents’ consent was also sought before they embarked on this study. This was done so as to allow respondents to participate in this study freely and at their own will. Informed consent was established through asking respondents to sign an Informed Consent Form.
4. Before carrying out this study, the researcher sought permission from the relevant authorities concerned with this study’s areas. Permission was sought in order to have correct authorization from the involved institutions or communities. This permission was sought through written request to the responsible persons. This enabled the researcher to freely handle different research activities without much trouble.

3.11 Challenges and Remedies of the Study

Extraneous variables, such as respondents’ honesty, personal biases, and the uncontrolled setting of the study (including anxiety, stress, and motivation etc .of respondents) threatened to negatively influence the data gathered. To minimize such conditions, the researcher requested respondents to be as honest as possible and to be unbiased when answering the questionnaire and responding to questions in the interview. To overcome the uncontrolled setting of the study, respondents were also requested to be as objective as possible in answering questionnaires and questions from interview.

Instrumentation was also another limitation in this study. To solve challenges resulting from instrumentation, reliability and validity tests were ensured through the content validity index and pre-testing; these enabled credible measurement of the research variables.

There was also a degree of financial constraint in facilitating different aspects of this study. However, this limitation was curbed through mobilization of money from friends, relatives, and supporters in order to cover all expenses in terms of transport, meals, communication, and technical needs, including printing.

3.12 Limitations of the Study

A number of limitations were present in this study: The number of households selected for this study was not sufficient to make generalised statements or conclusions on the costs incurred and the quality of health promotion practices among the beneficiaries of the two health intervention programs.

Further still, the data compiled for this study was not random and more centralized to one district in Rwanda. However, the in-depth responses received through the interviews provide helpful data that can be analysed.

Lastly, the sample size in this study is only a small number of the many available. In this regard, the research findings must be understood within the limitations of the study.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 Introduction

This chapter presented and analysed the findings. The chapter started with socio-demographic characteristics of respondents and then transitions to information on costs incurred on Light and Classic Interventions. Following this, the data on health promotion from Classic and Light intervention is reviewed and the differences in costs and health promotion between the Light and classic intervention programs are established.

4.2 Socio-Demographic Characteristics of Respondents

Socio-demographic characteristics of respondents in this study included: gender, age, education level, marital status, and the nature of their position. The details are shown in here below:

4.2.1 Respondent by Gender

Table 4.1: Category of Respondent by Gender

| Gender | Frequency | Percentage |
|---------------|------------------|-------------------|
| Male | 70 | 48.6 |
| Female | 74 | 51.4 |
| Total | 144 | 100 |

Source: Primary Data

According to the findings in Table 4.1, 48.6 % of the respondents who participated in this study were males while 51.4 % were females. This study sampled both males and females so as to capture the correlation between health promotion practices and perspectives and gender, as the burden of disease varies according to gender.

4.2.2 Respondent by Age group

Table 4.2: Category of Respondent by Age group

| Age Group | Frequency | Percentage |
|------------------|------------------|-------------------|
| 20-39 years | 90 | 62.5 |
| 40-59 years | 50 | 43.7 |
| 60 and above | 4 | 2.8 |
| Total | 144 | 100 |

Source: Primary Data

Table 4.2 demonstrates that the majority of the participants of this study (62.5%) young adult from the age group of 20-39 years. 34.8% of the respondents were mid-adulthood (40-59 years) 2.8% were elderly (60 years and above). This shows that people from different age groups were given a chance to participate in this study as respondents and to give their views regarding their health practices resulting from Light and Classic intervention programs.

4.2.3 Respondents by Level of Education

Table 4.3: Category of Respondent by the Level of Education

| Education | Frequency | Percentage |
|------------------|------------------|-------------------|
| Primary | 18 | 12.5 |
| Secondary | 50 | 34.7 |
| Tertiary | 76 | 52.8 |
| Total | 144 | 100 |

Source: Primary Data

Results presented in Table 4.3 indicate that people of different education backgrounds were included as participants in this study. This correlation was important to analyse, as education level sometimes determines health practices and the disease burden among people of different education background can sometimes vary. The majority (52.8%) of the respondents in this study had attained tertiary education level of education; while 34.7% had secondary education level and 12.5% had only attended primary school. Given the complexity of understanding cost effectiveness of the Light and Classic intervention programs, having a majority of participants with tertiary education allowed for detailed data to be collected. Including participants with varying levels of education was important though, as the true recipients of the Light and Classic intervention programs in Rwanda have varied levels of education; thus, the variation in study participants shows this realistic spread.

4.2.4 Respondents by Marital Status

Table 4.4: Category of Respondent by the Marital Status

| Marital status | Frequency | Percentage |
|-----------------------|------------------|-------------------|
| Single | 37 | 25.7 |
| Married | 83 | 57.6 |
| Divorced/Separated | 19 | 13.2 |
| Widowed | 5 | 3.5 |
| Total | 144 | 100 |

Source: Primary Data

Table 4.4 shows that marital status of respondents was also considered in this study. Among the respondents who participated in this study, 57.6% were married, 25.7% were single, 13.2% were divorced, and 3.5% were widowed. This suggests that correlation between health promotion practices and marital difference could also be captured in this study.

4.2.5 Respondents by Position

Table 4.5: Category of Respondent by position

| Position | Frequency | Percentage |
|-----------------|------------------|-------------------|
| Administrator | 10 | 6.9 |
| Trainer | 34 | 23.6 |
| Beneficiary | 100 | 69.4 |
| Total | 144 | 100 |

Source: Primary Data

In Table 4.5 respondents were grouped based on their knowledge of cost incurred in both interventions, light and Classic, and people who benefited from the intervention. 69.4% had participated in the intervention programs, 24.3% were trainers who were aware of the budget, and 6.3% were administrators with the knowledge of all money invested in the two interventions. This suggests that the information on costs incurred in the two programs and health practices resulting from the implementation of the programs was properly covered in this study.

4.3 Intervention Costs

4.3.1 Difference in the two interventions (Classic and Light)

Table 4.6: Differences in the two interventions (Classic and Light)

| COMPONENT | Interventio | Length of CHW training | Transport | Type of Trainer | have an executive | number of training | Membership cards | Model Home competition | Graduation Ceremony | Household inventory | Toolkit of Visual aids | Nutrition |
|-----------|----------------|------------------------|-------------------|-----------------|-------------------|--------------------|------------------|------------------------|---------------------|---------------------|------------------------|-------------------|
| 1 | Classic | 5 days | m/bike & bicycles | CHW + EHO | yes | 20 | yes | Yes | yes | yes | printed Toolkit each | nutrition gardens |
| 2 | Light | 2 days | bicycles | CHW only | no | 8 | no | No | no | no | b/w toolkit | None |

Source: CHC Records on Village Self-Monitoring by ASOC

The first objective of this study was to examine the costs incurred in the implementation of both Classic and Light health intervention programs in Rusizi district in Rwanda. Only program trainers and administrators provided this data, as they are the ones who understood various costs incurred in the two programs. The effectiveness of costs incurred were investigated in regard to program administrative costs, baseline survey and targeting costs, staff training and facilities costs, program implementation costs and program monitoring costs. Mean values and standard deviations were used to determine various costs.

Mean ranged from 1.00-1.79, indicating that the majority of the respondents strongly disagreed with the items investigated under particular cost; thus, the cost incurred in the interventions was very ineffective. Mean ranges from 1.80-2.59 showed that majority of the respondents disagreed with the items investigated under particular costs; thus, the cost incurred in the interventions was ineffective. Mean ranges from 2.60-3.39 indicated that majority of the respondents were not sure about the costs investigated; thus, the cost incurred was moderate. Mean ranges from 3.40-4.19 showed that majority of the respondents agreed with the items investigated under particular cost; thus, the cost

incurred in the interventions was effective; and lastly. Mean ranges from 4.20-5.00 portrayed that the majority of the respondents strongly agreed with the items investigated under particular cost; thus, the cost incurred in the interventions was very effective. The findings are presented in Table 4.7.

4.3.2 Cost of Interventions

Table 4.7: Costs of Intervention

| | N | Min | Max | Mean | Std. Dev | Interpretation |
|--|----------|------------|------------|-------------|-----------------|-----------------------|
| Program Administration | | | | | | |
| The salaries given to the program administrators was generally effective | 44 | 1 | 5 | 3.32 | 1.29 | Moderate |
| Communication costs for the program administrators were also considerable | 44 | 1 | 5 | 3.57 | 1.15 | Effective |
| Transport costs for the program administrators were also effective | 44 | 1 | 5 | 3.34 | 1.22 | Moderate |
| Mean Average | | | | 3.41 | 1.22 | Effective |
| Baseline Survey and Targeting Areas | | | | | | |
| The costs incurred in the identification of project areas was effective | 44 | 1 | 5 | 3.16 | 1.28 | Moderate |
| The costs of contacting respective districts was also considerably effective | 44 | 1 | 5 | 3.09 | 1.22 | Moderate |
| The costs incurred for creating awareness among potential stakeholders was also considerable | 44 | 1 | 5 | 2.73 | 1.32 | Moderate |
| Mean Average | | | | 2.99 | 1.27 | Moderate |
| Staff Training and Facilities | | | | | | |
| The training cost for the two programs was generally affordable | 44 | 1 | 5 | 3.43 | 1.25 | Effective |
| The costs for hiring part time trainers and training them was also considerably effective | 44 | 1 | 5 | 3.43 | 1.19 | Effective |
| The rental rooms for the training of the staff for the programs were also cost effective | 44 | 1 | 5 | 3.64 | 1.01 | Effective |
| The meals provided for the part time trainers during training sessions was considerable | 44 | 1 | 5 | 3.86 | 1.03 | Effective |
| The costs of training materials for classic and light intervention programs were affordable | 44 | 1 | 5 | 3.68 | 1.03 | Effective |
| The trainee compensation was also cost effective for the two programs | 44 | 1 | 5 | 3.64 | 1.16 | Effective |
| Mean Average | | | | 3.61 | 1.11 | Effective |
| Implementing Costs | 0 | | | | | |

| | | | | | | |
|---|----|---|---|-------------|-------------|------------------|
| The costs for the part-time labor during the implementation of classic and light programs was effective | 44 | 1 | 5 | 3.68 | 1.16 | Effective |
| Incentives given to the part-time labor during the implementation of classic and light programs was effective | 44 | 1 | 5 | 3.66 | 1.09 | Effective |
| Allowances given to the part-time labor during the implementation of classic and light programs was effective | 44 | 1 | 5 | 3.50 | 1.07 | Effective |
| Program development during the implementation was also effective enough | 44 | 1 | 5 | 3.25 | 1.18 | Moderate |
| The costs of printing of material during the implementation process of the two programs was also effective | 44 | 1 | 5 | 3.52 | 1.23 | Effective |
| Mean Average | | | | 3.52 | 1.15 | Effective |
| Monitoring Costs | 0 | | | | | |
| Monitoring costs in the two intervention programs in terms of transport facilities was also effective | 44 | 1 | 5 | 3.43 | 1.19 | Effective |
| Allowances used to monitor project activities under classic and light programs was effective | 44 | 2 | 5 | 3.73 | .92 | Effective |
| Mean Average | | | | 3.58 | 1.06 | Effective |
| Overall Mean Average | | | | 3.42 | 1.16 | Effective |

Source: Primary Data, 2016

Considering the overall mean average of 3.42 at standard deviation of 1.16, it can be noted that the respondents generally rated the costs incurred in the two health intervention programs as effective. Considering the various constructs under costs incurred, it was noted that costs were most effectively rated in terms: of staff training and facilities (mean of 3.61; SD=1.11), followed by monitoring costs (mean of 3.58; SD=1.06), then program implementation costs (mean of 3.52; SD=1.15), then in-program administration costs (mean of 3.41; SD=1.22), and, lastly, costs of the baseline survey and targeting areas (mean of 2.99; SD=1.27).

Costs related to staff training and facilities were effectively rated because respondents agreed that: the training cost for the two programs was generally affordable (mean of 3.43; SD=1.25), the costs for hiring part time trainers and training them was considerably effective (mean of 3.43; SD=1.19), the rental rooms for the training of the staff for the programs were cost effective (mean of 3.64; SD=1.01), the meals provided for the part-time trainers during training sessions was considerable (mean of 3.86; SD=1.03), the costs of training materials for classic and light intervention programs were affordable

(mean of 3.68; SD=1.03), and the trainee compensation was also cost effective for the two programs (mean of 3.64; SD=1.16).

Monitoring costs in light and classic health intervention programs were also effectively rated by respondents, who agreed that monitoring costs in the two intervention programs in terms of transport facilities was also effective (mean of 3.43; SD=1.19) and that allowances used to monitor project activities under classic and light programs were effective (mean of 3.73; SD=.92).

Further still, program implementation costs were generally effective. Respondents agreed that the costs for the part-time labor during the implementation of classic and light programs was effective (mean of 3.68; SD=1.16). They also agreed that: incentives given to the part-time labor during the implementation of classic and light programs was effective (mean of 3.66; SD=1.09), allowances given to the part-time labor during the implementation of classic and light programs was effective (mean of 3.50; SD=1.07), and costs of printing of material during the implementation process of the two programs was also effective (mean of 3.52; SD=1.23). However, one item was moderately rated under program implementation, as they note that program development during the implementation was also moderately effective (mean of 3.25; SD=1.18)

Program administration costs were also rated effective by respondents, as communication costs for the program administrators were also considerable (3.57; 1.15); However, two items under program administration were rated moderately effective, as respondents noted that transport costs for the program administrators were effective (3.34; 1.22) and the salary given to the program administrators was generally effective (3.32; 1.29).

Nevertheless, costs of the baseline survey and for targeting areas were moderately rated as respondents stated that: the costs incurred in the identification of project areas was effective (mean of 3.16; SD=1.28), the costs of contacting respective districts was also considerably effective (mean of 3.09; SD=1.22), and the costs incurred for creating awareness among potential stakeholders was also considerable (mean of 2.73; SD=1.32).

4.3.3 Intervention Outcomes

The second objective of this study assessed the level of health promotion practices among the beneficiaries of classic and light health intervention programs in Rusizi district in Rwanda. The health promotion practices among the beneficiaries of the two interventions were determined in areas of hygiene and cleanness, waste management, environmental control, community awareness and wellness, malaria control measures and availability of water and safe drinking water. Mean values and standard deviations were used to determine the level of health promotion practices among the beneficiaries of the two interventions. Mean ranges from 1.00-1.79 indicated that the majority of the respondents strongly disagreed with the items investigated under particular health promotion practices; thus, the level of health promotion practices among the beneficiaries of the two programs is low. Mean ranges from 1.80-2.59 show that majority of the respondents disagreed with the items investigated under particular health promotion practices; thus, the level of health promotion practices among the beneficiaries of the two programs is low. Mean ranges from 2.60-3.39 indicate that majority of the respondents were not sure about the particular health promotion practices; thus, the practice of the particular health promotion is moderate. Mean ranges from 3.40-4.19 show that majority of the respondents agreed with the items investigated under particular health promotion practices; thus, the level of health promotion practices among the beneficiaries of the two programs is high. Lastly, mean ranges from 4.20-5.00 portray that majority of the respondents strongly agreed with the items investigated under particular health promotion practices; thus, the level of health promotion practices among the beneficiaries of the two programs is very high. The findings regarding these are presented in Table 4.8.

Table 4.8: Health Benefits after the intervention

| | N | Min | Max | Mean | Std. Dev | Interpretation |
|---|-----|-----|-----|-------------|-------------|-----------------|
| HEALTH PROMOTION INDICATORS | | | | | | |
| Hygiene and Cleanness | | | | | | |
| The communities now keep their homesteads hygienically sound | 100 | 1 | 5 | 3.26 | 1.22 | Moderate |
| There is also hygiene in critical areas of public use especially toilets | 100 | 1 | 5 | 3.40 | 1.18 | High |
| Many people now have their Kitchens clean | 100 | 1 | 5 | 3.12 | 1.09 | Moderate |
| Mean Average | | | | 3.26 | 1.16 | Moderate |
| Waste Management | | | | | | |
| Households now ensure that kitchen, garden or household wastes are effectively dumped to ensures general cleanliness and the safety | 100 | 1 | 5 | 3.04 | 1.18 | Moderate |
| General waste is stored and transported appropriately and securely, and removed promptly | 100 | 1 | 5 | 2.91 | 1.29 | Moderate |
| Sufficient numbers of suitable containers are conveniently located to allow safe disposal of waste | 100 | 1 | 5 | 2.87 | 1.18 | Moderate |
| Men average | | | | 2.94 | 1.22 | Moderate |
| Environmental Control | | | | | | |
| Procedures are in place to ensure that toxic chemicals and expired medicines are disposed of safely | 100 | 1 | 5 | 3.09 | 1.21 | Moderate |
| Decontamination practices are in place and effective in communities where light and classic interventions were implemented | 100 | 1 | 5 | 2.74 | 1.30 | Moderate |
| Mean Average | | | | 2.92 | 1.26 | Moderate |
| Community Awareness and Wellness | | | | | | |
| Community members now participate in awareness programs on health issues at households levels (on issues related to smoking, alcohol, substance misuse and physical activity) | 100 | 1 | 5 | 3.80 | .89 | High |
| Community members are also involved in medical surveillance plan for those at-risk, based on health risk assessment | 100 | 1 | 5 | 3.21 | 1.18 | Moderate |

| | | | | | | |
|--|---------|---|---|-------------|-------------|-----------------|
| Measures are in place to minimize critical occupationally acquired injuries and diseases among communities | 10 0 | 1 | 5 | 2.88 | 1.12 | Moderate |
| Mean Average | | | | 3.30 | 1.06 | Moderate |
| Malaria Control Measures | 0 | | | | | |
| Community members sleep under mosquito nets | 10 0 | 2 | 5 | 3.82 | .83 | High |
| Stagnant waters are cleared off to stop mosquito breeding | 10 0 | 1 | 5 | 3.36 | 1.14 | Moderate |
| Surrounding bushes are also clearly to avoid mosquito breeding | 10 0 | 1 | 5 | 3.20 | 1.12 | Moderate |
| Malaria treatment is effectively ensured by community members | 10 0 | 2 | 5 | 3.87 | .77 | High |
| Mean Average | | | | 3.56 | .97 | High |
| Availability of Water and Safe Drinking Water | 0 | | | | | |
| Community members ensure that their drinking water sources are safe | 10 0 | 1 | 5 | 3.24 | 1.23 | Moderate |
| Some community members boil water before drinking | 10 0 | 1 | 5 | 3.07 | 1.29 | Moderate |
| Filtration of drinking water is also done in communities where the two interventions were implemented | 10 0 | 1 | 5 | 2.94 | 1.19 | Moderate |
| Mean Average | | | | 3.08 | 1.24 | Moderate |
| Overall Mean Average | | | | 3.18 | 1.15 | Moderate |

Source: Primary Data, 2016

Based on the overall mean average of 3.18 and a standard deviation of 1.15, it can be noted that the respondents generally rated health promotion practices among the beneficiaries of two interventions moderately. Considering various indicators under health promotion practices, it can be noted that health promotion is best practiced in terms of malaria control measures (mean of 3.56; SD=.97), followed by the community awareness and wellness practices (mean of 3.30; SD=1.06), hygiene and cleanliness

practices (mean of 3.26; SD=1.16), availability of water and safe drinking water (mean of 3.08; SD=1.24), waste management practices (mean of 2.94; SD=1.22), and environmental control practices (mean of 2.92; SD=1.26).

Community awareness and wellness as an element of health promotion practice was moderately rated because community members are involved in medical surveillance plans for those at-risk, based on health risk assessment (mean of 3.21; SD=1.18). There are no concrete measures in place to minimize critical occupationally acquired injuries and diseases among communities (mean of 2.88; SD=1.12). However, respondents agreed that community members now participate in awareness programs on health issues at households levels (on issues related to smoking, alcohol, substance misuse and physical activity) (mean of 3.80; SD=.89).

Hygiene and cleanness practices among the beneficiaries of both light and classic health intervention programs were moderately rated by respondents because the communities do not still completely keep their homesteads hygienically sound (mean of 3.26; SD=1.22) and many community members do not still keep their Kitchens clean (mean of 3.12; SD=1.09). However, respondents agreed that there is hygiene in critical areas of public use, especially toilets (mean of 3.40; SD=1.18).

Availability of water and safe drinking water as an element of health promotion practice was also moderately rated because drinking water sources are not yet completely safe in communities (mean of 3.24; SD=1.23), few community members boil water before drinking (mean of 3.07; SD=1.29), and filtration of drinking water is not practiced by many community members in the communities where the two interventions were implemented (mean of 2.94; SD=1.19).

Waste management practices were moderately rated by respondents because not many households ensure that kitchen, garden or household wastes are effectively dumped to safeguard general cleanliness and safety (mean of 3.04; SD=1.18), general waste is not yet stored and transported appropriately and securely, and removed promptly in many communities (mean of 2.91; SD=1.29), and sufficient numbers of suitable containers are conveniently located to allow safe disposal of waste (mean of 2.87; SD=1.18).

Environmental control measures under health promotion practice was also moderately rated by respondents because there are still few procedures in place to ensure that toxic

chemicals and expired items are disposed of safely within communities (mean of 3.09; SD=1.21) and decontamination practices are not always in place and effective in communities where light and classic interventions were implemented (mean of 2.74; SD=1.30).

However, malaria control measures were highly rated by respondents, as they agreed that many community members sleep under mosquito nets (mean of 3.82; SD=.83) and malaria treatment is effectively ensured by community members (mean of 3.87; SD=.77). However, respondents noted that two items under malaria control measures were only moderately effective: stagnant waters cleared away to stop mosquito breeding (mean of 3.36; SD=1.14) and surrounding bushes cleared to avoid mosquito breeding (mean of 3.20; SD=1.12).

4.4 The Cost effectiveness of both Classic and Light Interventions

As this study was carried out in on two different interventions, light and classic programs, there was need to establish the extent of differences in cost effectiveness and health promotion practices between the two programs. This was established with the help of mean differences. The findings are established in Table 4.9.

Table 4.9: The Cost Effectiveness of both Classic and Light Interventions

| Variable | Interventions | Mean | F | Sig. | Interpretation | |
|---|-----------------------------|---------------------|-------------|--------|------------------------|------------------------|
| COST EFFECTIVENESS | Classic Intervention | | 1.6141 | 0.000 | Significant difference | |
| | Administrative Cost | 3.44 | | | | |
| | Survey Costs | 3.31 | | | | |
| | Training Cost | 3.03 | | | | |
| | Implementation Cost | 3.47 | | | | |
| | Monitoring Costs | 4.56 | | | | |
| | Average Mean | 3.56 | | | | |
| | Light Intervention | | 1.6022 | 0.000 | Significant difference | |
| | Administrative Cost | 3.10 | | | | |
| | Survey Costs | 2.72 | | | | |
| | Training Cost | 2.52 | | | | |
| | Implementation Cost | 3.12 | | | | |
| | Monitoring cost | 0 | | | | |
| | | Average Mean | 2.29 | | | |
| | HEALTH PROMOTION | CLASSIC | | 1.6321 | 0.000 | Significant difference |
| Hygiene and Cleanness | | 3.41 | | | | |
| Waste management | | 3.42 | | | | |
| Environmental Control | | 3.09 | | | | |
| Community Awareness and Wellness | | 3.40 | | | | |
| Malaria Control Measures | | 3.52 | | | | |
| Availability of Water and Safe Drinking Water | | 3.01 | | | | |
| Average Mean Classic | | 3.31 | | | | |
| LIGHT | | | 1.6092 | 0.020 | Significant difference | |
| Hygiene and Cleanness | | 2.20 | | | | |
| Waste management | | 3.02 | | | | |
| Environmental Control | | 2.77 | | | | |
| Community Awareness and | | 2.29 | | | | |

| | | | | | |
|--|---|-------------|--|--|--|
| | Wellness | | | | |
| | Malaria Control Measures | 2.41 | | | |
| | Availability of Water and Safe Drinking Water | 2.80 | | | |
| | Average Mean Light | 2.58 | | | |

Source: Primary Data, 2016

The findings in Table 4.9, indicate that there is a significant difference in the effectiveness of costs incurred in light and classic health intervention programs. The differences in the costs incurred between the two intervention programs are shown in average mean differences. The average mean for Classic was 3.56 and the average mean for Light was 2.29. The difference was equal to 1.27 according to respondents the cost that incurred in classic intervention was effective.

In this regard, costs were more effective in Classic, as its mean value for the administrative costs was 3.44 and for the light intervention were 3.10. For the baseline survey, Classic was 3.31 while Light was 2.72. The mean value for training costs under Classic was 3.03 while that for Light intervention was 2.52. The mean value for implementation costs at Classic was 3.47 while that for Light was 3.12. The mean value for monitoring costs at Classic was 4.56 while that for Light intervention was 0.

Table 4.9, also indicates that there is a significant difference in the level of health promotion practices among beneficiaries of light and classic health intervention practices in Rusizi District. The differences are shown in the mean differences of the two interventions. The average mean for Classic was 3.31, for Light was 2.58, and the difference of the two was equal to 0.73

In similar way, the health intervention program with better results in terms of health promotion practices was the Classic; as its mean value for hygiene and cleanness was 3.41 while that for Light was 2.20. The one for waste management under Classic intervention was 3.42 while that for Light intervention was 3.02. The mean value for environmental control under Classic intervention was 3.09 while that for Light was 2.77. The mean value for community awareness and wellness under Classic intervention was 3.40, while that on light intervention was 2.29. For malaria control measures, under

Classic intervention was 3.52 while that under Light intervention was 2.41. The mean for availability of water and safe drinking water under Classic intervention was 3.01 while that on Light was 2.80.

4.5 Findings from secondary Data

In addition to the information obtained from respondents through questionnaires on the differences in costs incurred in the two intervention programs, secondary data was obtained from various financial documents and records and the results showed that there were significant differences in the costs of the programs, as demonstrated in Table 4.10 and Table 4.11.

Table 4.10: Summary of Light Intervention Costs

| Part | Section | Description | Total Costs in US \$ |
|-------------|------------------------|---|-----------------------------|
| 1 | Program Administration | Costs of all full-time staff who worked throughout all phases of the intervention and implementation (not just for a portion of the intervention) and other costs related to program administration. Include any overhead costs here. | 47,314.44 |
| 2 | Survey Cost | Costs that were incurred to target, identify, and raise awareness among potential subjects as part of the intervention. Targeting/identification costs may include costs of a pre-program census or targeting survey given to identify those within a specific region who are eligible and meet certain criteria. This category also includes marketing costs, such as the costs incurred to print and distribute flyers or host information sessions. | 1,746.77 |

| | | | |
|---|----------------------|---|-----------|
| 3 | Staff Training | Costs that were incurred to train <i>staff</i> involved in the intervention. | 6,031.23 |
| 4 | Implementation Costs | Costs of implementing the intervention. This can include the costs of items distributed to participants or the costs of creating and maintaining technologies or resources developed for the intervention. | 4,722.58 |
| 5 | Monitoring Costs | Costs incurred due to oversight, monitoring, or tracking of the program recipients and their progress during the intervention. This tab would also include the costs of monitoring supply chains or other systems set up for the intervention. Here the cost is zero because the light intervention was not eligible to any monitoring after the 8 sessions no CHW is allowed to go to light household and do any kind of supervision or progress of Hygiene. | - |
| | | Total: | 59,815.02 |

Cost per unit of Impact: 59,815.02

----- = 1,196.30 \$ per Household in Light

50 Light households

The column of description explained the meaning of above costs, the total cost of implementing light intervention in 50 households was 59,815 US\$ per year this was computed as shown above in order to have the annually cost per household for light intervention, note that for this intervention there was no Monitoring cost because CHWs was not allow to check the progress of Hygiene.

Table 4.11: Summary of Classic Intervention Costs

| Part | Section | Description | Total Costs in \$ |
|------|------------------------|--|-------------------|
| 1 | Program Administration | Costs of all full-time staff who worked throughout all phases of the intervention and implementation (not just for a portion of the intervention) and other costs related to program administration. Include any overhead costs here. | 47,314.34 |
| 2 | Survey Cost | Costs that were incurred to target, identify, and raise awareness among potential subjects as part of the intervention. Targeting/identification costs may include costs of a pre-program census or targeting survey given to identify those within a specific region who are eligible and meet certain criteria. This category also includes marketing costs, such as the costs incurred to print and distribute flyers or host information sessions. | 1,746.77 |
| 3 | Staff Training | Costs that were incurred to train <i>staff</i> involved in the intervention. | 6,031.23 |
| 4 | Implementation Costs | Costs of implementing the intervention. This can include the costs of items distributed to participants or the costs of creating and maintaining technologies or resources developed for the intervention. | 36,331.61 |
| 5 | User Costs | Costs that the user incurred as a part of the intervention. Includes the opportunity cost of the Participant's time | 43,612.90 |
| 6 | Monitoring Costs | Costs incurred due to oversight, monitoring, or tracking of the program recipients and their progress during the intervention. This tab would also include the costs of monitoring supply chains or other systems set up for the intervention. Classic intervention was eligible of regular supervision and CHW was allow to monitor progress on hygiene practices | 55,980.41 |
| | | Total: | 191,017.26 |

Cost per unit of Impact: 191,017.26

----- =3,820.35 \$ per Household in classic

50 Classic households

The column of description explained the meaning of above costs, the total cost of implementing Classic intervention in 50 households was 191,017,26 US\$ per year this was computed as shown above in order to have the annually cost per household for Classic intervention, which is 3,820.35US\$ per household. Monitoring cost here is very high because CHWs and EHO was regularly checking progress of Hygiene.

Table 4.12: Cost effectiveness of Classic intervention

| Indicators | Classic Household Inventory | % improvement due to classic intervention | Improvement in cost In US\$ |
|--|---|--|------------------------------------|
| Hygienic latrines(clean and well covered are used in classic home | Latrines clean: no urines or feces | 14.4 % | 27,506.49 \$ |
| hand washing with soap at critical time is practiced | Households with hand wash facilities | 41.1% | 78,508.09 \$ |
| safe drinking water and handling is practiced | Household who treating unsafe water | 15.6% | 29,798.69 \$ |
| Pot- Drying racks are constructed and used in Classic household | Safe storage of utensils on pot rack or similar | 8.8% | 16,809.52 \$ |
| Kitchen Hygiene | Keep livestock out of the eating area | 14.8% | 28,270.55 \$ |
| Use of Mosquito net | Sleeping in the good mosquito net | 28.6% | 54,630.94 \$ |

Source: MOH, AA and IPA report

In addition to the primary data presented above, comparison between the baseline and the outcome assessment in all 50 Classic households in Rusizi District show impressive improvement across 10 indicators. The highlights include: hand washing practice improvements, which have improved substantially in two years with a 41.1% increase in hand washing facilities (tippy taps) and kitchen hygiene improvements with the first step to keep livestock out of the eating area with 14.8% more households with animal pens. Drinking water quality is improving as well, with 15.6% more household treating their water. Sanitation upgrading is now taking place as well, with 15.4% having made

improvements to existing latrines and 1.3% with new clean latrines, bringing coverage to 93%. There is also a 28.6% rise in the use of mosquito nets for the whole family.

From table 4.11 we saw the total cost for classic intervention was 191,017.26 us dollars this amount was multiply by the percentage of improvement from table 4.11. This show amount of money the intervention will save when there is improvement, the percentage of improvement was compared with the cost of the intervention in order to show the improvement in monetary value. From Table 17 in classic intervention 27,506.49\$ was saved from latrine cleanness, 78,508.09\$ was saved from hand wash facilities, 29,798.69\$ was saved from the cleaning water, 16,809.52 \$ was saved from environment cleanness, 28,270.55 was saved from the kitchen cleanness, finally 54,630.94 \$ was saved by using mosquito net.

Table 4.13: Cost effectiveness of Light Intervention

| Indicators | Classic Household Inventory | % improvement due to light intervention | Improvement on Cost in US \$ |
|--|---|--|-------------------------------------|
| Hygienic latrines(clean and well covered are used in classic home | Latrines clean: no urines or feces | 2.4 % | 1,435.56 \$ |
| hand washing with soap at critical time is practiced | Households with hand wash facilities | 5.1% | 3,050.57 \$ |
| safe drinking water and handling is practiced | Household who treating unsafe water | 3.7% | 2,213.57\$ |
| Pot- Drying racks are constructed and used in Classic household | Safe storage of utensils on pot rack or similar | 0 | 0 |
| Kitchen Hygiene | Keep livestock out of the eating area | 0 | 0 |
| Use of Mosquito net | Sleeping in the good mosquito net | 10.6% | 6,340.40 \$ |

Source: MOH, AA and IPA report

The secondary data shows that there was a minimum improvement in the 50 Light households. Comparing the baseline and outcome data in all 50 Light households in Rusizi District across all 10 indicators, four indicators were captured. Hand-washing practice only increased slightly in two years, with only 5.1% increase in hand washing facilities (tippy taps). For kitchen hygiene, there was no improvement; livestock was still kept near the eating area. Drinking water quality was still at a low level, as more households were not treating their water. Sanitation was still also at low level, now taking place with 2.4%, In addition, the use of mosquito nets was only at 10.6 % for the whole family.

From table 4.10 we saw the total cost for light intervention was 59,815.2 US dollars this amount was multiply by the percentage of improvement from table 4.12. This show amount of money the intervention will save when there is improvement, the percentage of improvement was compared with the cost of the intervention in order to show the improvement in monetary value. From Table 4.13 in light intervention 1,435.56\$ was saved from latrine cleanness, 3,050.57\$ was saved from hand wash facilities, 2,213.57\$ was saved from the cleaning water, no improvement was done from environment cleanness, no improvement done in the kitchen cleanness, finally 6,340.40 \$ was saved by using mosquito net.

CHAPTER FIVE: SUMMARY AND RECOMMENDATIONS

5.1 Introduction

Chapter five, draws summary and gives recommendations based on the research objectives and findings. Further areas for further research are also suggested.

5.2 Summary

Considering the research objectives and findings, a number of conclusions have been drawn.

On the costs incurred in the implementation of light and classic interventions, this study concludes that the costs incurred in the implementation were generally cost-effective. This is because the costs incurred in terms of staff training and facilities and those related to monitoring were generally effective. Costs for program implementation and program administration were also rated as effective.

Regarding the health promotion practices among the beneficiaries of light and classic interventions, this study concludes that health promotion practices among the beneficiaries of two interventions are still at moderate level. This is because the community awareness and wellness practices and hygiene and cleanliness practices are still moderate. There are still challenges in ensuring availability of water and safe drinking water. Waste management practices are not effectively ensured. In addition, environmental control practices are still only moderately effective among the beneficiaries of the two health intervention programs.

On the comparison of the light and classic intervention programs, this study concludes that the costs incurred in the two programs varied significantly and the results in terms of health promotion interventions have been significantly different. The classic intervention was more cost-effective than the light intervention and the classic intervention was more important in enhancing health promotion practices among its beneficiaries than the light intervention programs.

Judgement on the baseline and the post-assessment data from the Classic Intervention indicated indisputable improvement in the indicators that were assessed.

Furthermore, introducing the classic intervention nationally would reduce the deaths from Diarrhoea, Pneumonia and other disease contacted from the lack of hygiene also will reduce healthcare costs associated with treating patients with lack of Hygiene.

5.3 Recommendations

This study's findings lay the foundation for a recommendation to the Ministry of Health and the administration of the two programs should take the following actions:

- The Ministry of Health and development partners should conduct a nation-wide baseline survey to inform the prioritization of key health practice trainings
- Local leaders should increase community sensitization on health promotion practices by improving communication strategies (radio, television, newspapers, and umuganda)
- Local community members should establish rewards/penalties for people who meet/don't meet required hygiene standards
- The Ministry of Health and its partners should ensure that items or chemicals to purify drinking water are made affordable and more accessible to local community members so that they can be able to ensure that the water they drink is always clean and safe
- Administrators of the two programs should empower local community leaders at various sectors so that waste management practices can be imposed or enforced by the local community leader to ensure effectiveness.

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APPENDICES

APPENDIX 1: INFORMED CONSENT

I am giving my consent to be part of the research study of NDAYAMBAJE RWAGITARE BERTHE that will focus on Cost Effectiveness Analysis of Community Health Program in Rwanda: A case of Rusizi District.

I shall be assured of privacy, anonymity and confidentiality and that I will be given the option to refuse participation and right to withdraw my participation anytime.

I have been informed that the research is voluntary and that the results will be given to me if I ask for it.

Initials: _____

Date : _____

APPENDIX II: RESEARCH INSTRUMENT

PART A: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

1. Gender (Please tick): a. Male : b. Female :
2. Age : a. 20-39 : b. 40-59 : c. 60 and above:
3. Education level : a. Primary: b. Secondary : c. Tertiary:
4. Marital Status: a. Single: b. Married: c. Divorced/separated: d. Widowed:
5. Category of Respondents: a. Administrator: b. Trainer: c. Beneficiary:
6. Interventions program: a. Classic: b. Light : c. Both:

PART 2: COSTS INCURRED IN THE IMPLEMENTATION OF LIGHT AND CLASSIC INTERVENTION PROGRAMS AND HEALTH PROMOTION PRACTICES AMONG THE BENEFICIARIES OF THE TWO PROGRAMS

Direction: Please use the rating guide provided below with reference to the Costs and Health Promotion Practices among the Beneficiaries of Light and Classic Programs in Rusizi. Kindly circle the number corresponding to your answer.

| Response Mode | Rating | Interpretation |
|------------------------|--------|-----------------------------------|
| Strongly Disagree (SD) | (1) | You disagree with no doubt at all |
| Disagree (D) | (2) | You disagree with some doubt |
| Unsure (U) | (3) | You are undecided |
| Agree (A) | (4) | You agree with some doubt |
| Strongly Agree (SA)(5) | | You agree with no doubt at all |

| | SD 1 | D 2 | U 3 | A 4 | SA 5 |
|--|---------|--------|--------|--------|---------|
| COST EFFECTIVENESS | | | | | |
| Program Administration | | | | | |
| The salaries given to the program administrators was generally effective | | | | | |
| Communication costs for the program administrators were also considerable | | | | | |
| Transport costs for the program administrators were also effective | | | | | |
| Baseline Survey and Targeting Areas | | | | | |
| The costs incurred in the identification of project areas was effective | | | | | |
| The costs of contacting respective districts was also considerably effective | | | | | |
| The costs incurred for creating awareness among potential stakeholders was also considerable | | | | | |
| Staff Training and Facilities | | | | | |

| | | | | | |
|---|--|--|--|--|--|
| The training cost for the two programs was generally affordable | | | | | |
| The costs for hiring part time trainers and training them was also considerably effective | | | | | |
| The rental rooms for the training of the staff for the programs were also cost effective | | | | | |
| The meals provided for the part time trainers during training sessions was considerable | | | | | |
| The costs of training materials for classic and light intervention programs were affordable | | | | | |
| The trainee compensation was also cost effective for the two programs | | | | | |
| Implementing Costs | | | | | |
| The costs for the part-time labor during the implementation of classic and light programs was effective | | | | | |
| Incentives given to the part-time labor during the implementation of classic and light programs was effective | | | | | |
| Allowances given to the part-time labor during the implementation of classic and light programs was effective | | | | | |
| Program development during the implementation was also effective enough | | | | | |
| The costs of printing of material during the implementation process of the two programs was also effective | | | | | |
| Monitoring Costs | | | | | |
| Monitoring costs in the two intervention programs in terms of transport facilities was also effective | | | | | |
| Allowances used to monitor project activities under classic and light programs was effective | | | | | |
| HEALTH PROMOTION PRACTICES | | | | | |
| Hygiene and Cleanness | | | | | |
| The communities now keep their homesteads hygienically sound | | | | | |
| There is also hygiene in critical areas of public use especially toilets | | | | | |
| Many people now have their Kitchens clean | | | | | |
| Waste Management | | | | | |
| Households now ensure that kitchen, garden or household wastes are effectively dumped to ensures general cleanliness and the safety | | | | | |
| General waste is stored and transported appropriately and securely, and removed promptly | | | | | |
| Sufficient numbers of suitable containers are conveniently located to allow safe disposal of waste | | | | | |
| Environmental Control | | | | | |
| Procedures are in place to ensure that toxic chemicals and expired medicines are disposed of safely | | | | | |

| | | | | | |
|---|--|--|--|--|--|
| Decontamination practices are in place and effective in communities where light and classic interventions were implemented | | | | | |
| Community Awareness and Wellness | | | | | |
| Community members now participate in awareness programs on health issues at households levels (on issues related to smoking, alcohol, substance misuse and physical activity) | | | | | |
| Community members are also involved in medical surveillance plan for those at-risk, based on health risk assessment | | | | | |
| Measures are in place to minimize critical occupationally acquired injuries and diseases among communities | | | | | |
| Malaria Control Measures | | | | | |
| Community members sleep under mosquito nets | | | | | |
| Stagnant waters are cleared off to stop mosquito breeding | | | | | |
| Surrounding bushes are also cleared to avoid mosquito breeding | | | | | |
| Malaria treatment is effectively ensured by community members | | | | | |
| Availability of Water and Safe Drinking Water | | | | | |
| Community members ensure that their drinking water sources are safe | | | | | |
| Some community members boil water before drinking | | | | | |
| Filtration of drinking water is also done in communities where the two interventions were implemented | | | | | |