

**COSTING OF ST FRANCIS NYENGA HOSPITAL HEALTH SERVICES,
FOR FINANCIAL YEAR 2012/2013.**

BY: RONALD KAMARA

2010-MBA-PT-006

A Post Graduate research dissertation presented to the Institute of Health Policy and Management in partial fulfillment of the requirements of the award of a Masters Degree of Business Administration Health Services Management of International Health Sciences University

December, 2013

DECLARATION

I Ronald Kamara hereby do declare that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

Signature of the student.....

DEDICATION

This Study is dedicated to all fellow students and researchers who are interested in Health Economics. May your passion lead to more effective and efficient utilization of resources to promote health of God's people.

ACKNOWLEDGMENT

This dissertation would not have been possible without the support of the management of St Francis Hospital, Nyenga. In particular the Hospital Administrator Sr Gorreth Nalwanga and Mr Richard Kizito Waisana, the Hospital Accountant. Your support in this process was remarkable. To Dr Isaac Kyazze and the team in the HIV/AIDS clinic, your efforts in linking up and tying loose ends greatly contributed critical information towards the completion of this dissertation. I thank my beloved wife Catherine and the entire family for the patience and understanding, especially during precious family moments, while I worked on this report. Last but not least, my employer, the Uganda Episcopal Conference and the Uganda Catholic Medical Bureau in particular, you not only provided me a platform to nurture my interest in Health Economics but also enabled me to access much information from Nyenga hospital.

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ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
ALOS	Average Length of Stay.
AT	Activity Time.
BOT	Board of Trustees.
DFID	Department for International Development
HC	Health Center
HIV	Human Immune Virus
HSSP	Health Sector Strategic Plan
HSD	Health Sub District.
JMS	Joint Medical Stores.
MDG	Millennium Development Goal
MoH	Ministry of Health.
NDA	National Drug Authority.
NGO	Non-Governmental Organization
NMS	National Medical Stores
PEAP	Poverty Eradication Action Plan
PNFP	Private Not for Profit.
PD	Professional Development
SNO	Senior Nursing Officer.
UBOS	Uganda Bureau of Statistics
UCMB	Uganda Catholic Medical Bureau.
UMU	Uganda Martyrs University.
WHO	World Health Organization

OPERATIONAL DEFINITIONS

- **COST:** the value of resources used to produce a good or service (UNAIDS 2000).
- **COSTING/COST ANALYSIS:** is obtaining the cost of services rendered in an organization through the allocation of direct and indirect costs to the service.
- **COST CENTERS:** these are centers of activity in an organization which consume resources, produce or contribute to the production of outputs.
- **ALLOCATION OF COSTS:** also known as stepping down costs is the process where by the total costs of the overhead, support and intermediate cost centers are distributed sequentially until the final cost centers.
- **ALLOCATION STATISTIC:** this is a factor, which is used to calculate the proportion of the costs of the allocating cost center to be allocated to the other cost centers. The proportion calculated reflects the extent to which the receiving cost center uses the services of the allocating cost center.
- **DIRECT COSTS:** costs incurred at the cost center and whose value in terms of money can be obtained at the cost center
- **INDIRECT COSTS:** this is an overhead cost used in production of the service but whose value cannot be obtained at the cost center it is allocated to the cost center using an appropriate allocation statistic.
- **INTERMEDIATE COST CENTERS:** provide ancillary services to support the final cost centers, and only deal with clients to some degree.
- **FINAL COST CENTERS:** are responsible for the direct clients services that is, they deal directly with the clients at contact level and produce the final product.

- **OVERHEAD COST CENTERS:** are those cost centers that primarily provide overhead support services and are necessary for the satisfactory operation of the hospital. They do not deal directly with the patients care.
- **SUPPORT COST CENTERS:** are those centers that provide support services that ensure the smooth running of all cost centers but do not directly deal with students.
- **THE FINAL PRODUCT/OUTPUT:** this is the service of a final cost center whose unit cost is the subject of interest. In this study one inpatient day, visit, unit operation.
- **UNIT COST:** is the cost of producing one output i.e. one inpatient day/ OPD visit/one operation

ABSTRACT

This study was to cost the health services provided by Nyenga Hospital in the FY 2012/2013.

The main objective of the study was to establish the average cost of providing a unit output of a service in Nyenga hospital and the specific objectives were to:

- i. To determine the total cost of providing services for the financial year 2012/13
- ii. To determine the average cost per unit output for the financial year 2012/2013
- iii. To determine the average cost recovery per cost service charged in the FY 2012/13.

The study was a retrospective descriptive costs analysis study using a step down costing methodology (Shepard 1998). The cost of providing health services in Nyenga in the financial year 2012/2013 was determined using relevant data from 1st July 2012 to 30th June 2013.

The major findings of the study were as shown in the table below

Final Cost Centre	Total Cost per Cost Centre	Unit of Measure	Number of Out puts	Average Unit Cost in UGX	Average Unit cost in USD	% Cost recovery
Laboratory	89,145,044	Test	19,452	4,583	1.8	-15
OPD	168,140,023	Visit	19,692	8,538	3.4	11
MCH/ANC clinic	59,708,664	Visit	4,055	14,725	5.9	-80
Radiology.	11,007,083	Scan	296	37,186	14.9	-46
		Major	32	1,795,405	718	-91
		Cesarean	218	131,773	52.7	37
Theatre	95,008,292	Minor	931	9,483	3.8	127
Pediatric ward	122,150,309	Admission	1,394	87,626	35.1	-66
Maternity ward	137,492,690	Admission	859	160,061	64	-66
Male ward	74,357,043	Admission	422	176,202	70.5	-69
General Ward/F	146,517,610	Admission	706	207,532	83	-73
HIV clinic	308,330,190	Visit	1,228	251,083	100.4	-100

The study therefore recommends;

- i. The hospital should use this information to justify need for more financing other than user fees to government and other development partners.
- ii. The facility should adopt a flat rate for all services in OPD as this will enhance certainty and hence utilization
- iii. Since the theatre is underutilized the facility should consider revising the charges downwards and benefit from increased utilization and economies of scale and consider employing a surgeon.
- iv. Efficiency gain measures in terms of medicines selection and prescriptions should be implemented in attempt to reduce costs.
- v. Government should increase support to the facility if it has to remain providing quality services at a low cost

Further studies should be done to cost other related levels of care to be able to make comparisons.

CHAPTER ONE: INTRODUCTION

1.1 Background to the study

Globally, there is scarcity of resources in the health sector. This is even worse in Sub-Saharan countries (*Parker and Newbrander, 1993*). The health sector is one of the areas highly affected by shortage of resources from the hospitals to the lower level health facilities. This mainly has been due to the current economic crises of the and the looming budget cuts which form part of the structural adjustment programmes so that increased adequate government funding of health services is unlikely, at least in the near future (*Okware 2005*).

The share of the public sector health resources in developing countries consumed by hospitals ranges from 50% to 80% (*Shepherd et al, 1998*).

The health care systems of many developing countries are facing a severe crisis. Problems of financing services lead to high patient fees which make institutions of Western type health care unaffordable for the majority of the rural poor. The conflict between sustainability and affordability of the official health care system, challenges both local decision-makers and health management consultants. Decisions must be made soon so that the existing health care systems can survive. However, these decisions must be based on sound data, especially on the costs of health care services. The existing accounting systems of most hospitals in developing countries do not provide decision-makers with these data. Costs are generally underestimated (*Flessa, 1998*).

Hospital management has a responsibility to the community to provide health care services that the community needs at an acceptable level of quality and at least possible costs. Cost finding

and analysis can help departmental managers, hospital administrators and policy makers to determine how well their institutions meet these public needs (*Shepherd et al, 1998*).

In Uganda, the National Health System comprises all the institutions, structures and actors whose actions have the primary purpose of achieving and sustaining good health. The boundaries of Uganda's National Health System encompass the public sector including the health services of the army, police and prisons; the private health delivery system comprising of the private-not-for-profit organizations (PNFP) and private for profit (PFP),(*HSSP III, 20010/11*)

The health sector is pre-dominantly funded by the government of Uganda and donor funds. Inadequate financing remains the primary constraint inhibiting the development of the health sector in Uganda. One of the major reforms Uganda has undergone in the recent past is decentralization. This is meant to take services nearer to the people and empower the communities the more to participate in the management of their services.

The districts constituted the decentralized local government basis and the hospital therein constituted the district hospital. According to Corkery, the pace of public service reforms must be adapted to the available resources and good decisions need good information. Costing information is such information needed for good decision making and monitoring pace of the reforms (Corkery J., 1998).This costing information can also be used for advocating for more funding, improve efficiency and ensure quality.

The present rate of increase of the cost of providing quality health services, coupled with declining funding to the health sector, poses a big challenge in the provision and the

sustainability of these services. This is even worsened by the emerging and re-emerging diseases, economic decline and increasing shortage of human resources among others.

1.2 Background to the study area

Nyenga Hospital is located in Nyenga District, 55km South East of Mukono town which is 20km East of Kampala City along Kampala- Jinja highway. It is the Headquarters of Ntenjeru North Health Sub District.

St. Francis' Hospital – Nyenga was founded in 1932 by the Franciscan Missionary Sisters for Africa under their Foundress- Mother Kevin Kearney as a Leprosy Center to take care of the leprosy patients. During that time Leprosy patients were regarded as outcasts and were discriminated against in their communities. They had no future and were people without hope and resigned to fate.

As a result of untreated leprosy, they were mutilated and had bad ulcers /wounds. There was no effective cure by that time; not even in Europe but these Sisters were not deterred by all this. They came to Africa with a “Mission”; which mission was to care for the Leprosy patients that had no body to take care of them. They started by providing a home (leper camp) since they were outcasts, started giving them the basic possible medical care i.e. dressing their bad wounds; and later established a farm where they could provide them with food as well. They gave them comfort and made their life as meaningful as possible by providing pastoral care and social activities.

In the 1940's, a wonderful drug for the cure of leprosy was discovered; this was "Dapson". With this drug, any patient presented in the early stages could be cured completely. The sisters wasted no time in making arrangements to procure this drug to the patients.

The Sisters had a holistic approach to life in their quest for total care of these patients. They eventually built a special primary school for the children suffering from leprosy since they could not study in other schools as they were discriminated against. They went ahead to even cater for their post primary education as well and indeed some of those trained were later employed in the hospital.

The Sisters did not only care for the leprosy patients alone, but also the "needy" in the community. In order to do all this, they recruited many allies for Nyenga Hospital. These include;- Germany Leprosy Relief Association (GLRA)- the biggest donors, London Leprosy Guild, OXFAM, Rotary International, St. Francis Leprosy Guild; to mention but a few. Some of the donors have become traditional donors and are still supporting leprosy activities in Nyenga to-date i.e. GLRA, and St. Francis Leprosy Guild.

With growth and development, the Franciscan Missionary Sisters for Africa transformed the leper Camp/Center to a one hundred and sixty (160) bed General Hospital which was later gazetted into a General Hospital on the 18th December 1992.

The Franciscan Missionary Sisters administered the Hospital up to the 24th September 1994, when it was finally handed over to the Congregation of the Little Sisters of St. Francis –

Nkokonjeru. It is currently a one hundred (100) bed capacity Hospital located on the Kampala – Jinja highway about 13kms to Jinja Town.

It is a Private Not for Profit (PNFP) Catholic Hospital owned by the Diocese of Lugazi, whose Ordinary is Rt. Rev. Dr. Bishop Matthias Ssekamanya. The Hospital employs a total of 103 staff (i.e. Professional and non-professional) working in the respective departments.

Nyenga Hospital has continued providing Preventive, Promotive, Curative and Supportive services through its various departments which include; the Out-Patients Department (OPD), In Patient Departments i.e. Maternity Ward with 14 beds, Children’s Ward with 36 beds, Adult General Female 25 beds and Adult General Male 25 beds. Others include Operating Theatre, Eye Clinic, Skin Clinic, Laboratory and blood transfusion, Pharmacy, X-ray, Ultra Sound, Medical Records, PMCTC and VCT services, HII/AIDS Clinic and with an active PHC Department.

The Community and Health Status:

Nyenga Hospital also serves as the headquarters of Buikwe North Health Sub District, comprising of fourteen (14) Lower Health Units, two (2) Sub Counties and one (1) Town Council.

Socio-economic Activities.

The community basically engages in peasant farming and fishing. However, when coffee and vanilla lost value, peasant farmers were greatly demoralized. A good number of the men resorted to fishing along the shores of Lake Victoria, currently settling in the three major landing sites of Buwagajjo, Bugoba and Kikondo. However, owing to the increased number of people migrating

to these sites to carry out various social and economic activities have widely accelerated the spread of HIV/AIDS and other related illnesses, hence the burden where the major causes of morbidity and mortality are malaria, HIV/ AIDS, TB, pneumonia and bilharzias and other related diseases.

Social Organization:

The multi-ethnic community makes it cosmopolitan in nature with the Soga, Baganda, Banyala, Samia, Gisu, Ateso, and the Jalu from Kenya etc. Due to the diverse cultures in this region there are a number of cultural practices potentially dangerous to health. Among these cultures are those of Bagishu, Luo, the Baganda and Basoga. However due to the different cultural behaviours and practices, the social status of some of these tribes are not favorable.

The Human Resource, Discipline and Quality Assurance Committee, a Sub Committee of the Board of Governors of Nyenga Hospital is responsible for the recruitment, and all other Human resource functions in collaboration with the Hospital Management Team.

Management:

The facility has a functional Board of Governors comprising of sixteen (16) members; appointed by the Ordinary of the Diocese; and a Management Committee comprising of seven (7) members. They include; Hospital Director (Chief Executive), Medical Director, Nursing Director, Hospital Accountant, Human Resource Officer, Coordinator - HIV/AIDS Clinic and Principal Tutor. The Board meets quarterly while the Management Committee meets fortnightly.

Financial Status:

The Hospital Level of funding is still very low and associated with declined external and internal donor support/funding. Government support in form of Delegated Funds has also continued

declining year after year and is irregular. The Hospital budget is mainly being financed by user fees, constituting to about 37%; Delegated Funds – 19%; Donations for Capital Development – 17%, traditional donors towards goods and serviced 14% and others – 13%.

Shortage of drugs has continued being one of their main setbacks and about 75% of staffs are accommodated.

Challenges: - Among the challenges currently being faced include: -

1. High employment costs.
2. High rate of staff attrition to Government.
3. High-accumulated electricity bills.
4. Frequent drug-stock outs.
5. Declined external and internal donor support/funding.
6. Declined and irregular Delegated Funds.
7. On-going Patients' failure to pay the medical bills.
8. Increasing number of mushrooming clinics around the hospital

Nyenga hospital presently lacks basic cost analysis/description of its services as a basis for planning, policy making, decision-making, budgeting, accountability and financial sourcing.

Government of Uganda is presently preparing for the compulsory Social Health Insurance Scheme. The referral and general hospitals like this one will be key in the implementation and success of this scheme.

1.3 Research Question

What is the average cost of providing a unit output in Nyenga Hospital?

1.4 Statement of the problem.

Like many other health facilities, Nyenga hospital is experiencing increasing challenges of providing quality health services. This is mainly due to the higher rate of increasing costs of providing the services, increase in the level of utilization and challenges caused by emerging and re-emerging diseases and yet the finances have tended to decrease or have stagnated both from government and donors. Social health insurance is being introduced as an attempt to remedy this gap.

However, due to this dilemma, there is a need for generation of “additional resources” by using existing resources more effectively and efficiently through improved allocation patterns and increased efficiency of management of Nyenga hospital operations.

Therefore there is need to provide costing information for effective planning, budgeting, accountability, policy making and informed decision-making. And also to establish the cost of providing health services in this hospital in preparation for the compulsory social health insurance scheme, hence this study. Absence of costing information is a major barrier to hospital managers’ effective and efficient delivery of the services. This affects the quality of services rendered and eventually the patients.

This costing information if generated is hoped to act as a basis for fixing the respective charges for the services offered.

1.5. Purpose of the study

The purpose of the study is to generate average cost/ costing information in order to contribute towards scientific evidence based planning and decisions in the health care. This cost information if used may contribute towards improved service delivery which in turn may contribute towards the health status of the population.

1.6 General Objective

The general objective of the study is to establish the cost of providing a unit output of a service in Nyenga hospital FY 2012/2013.

1.7 Specific Objectives

1. To determine the total cost of providing services for the financial year 2012/13
2. To determine the average cost per unit output for the financial year 2012/2013
3. To determine the average cost recovery per cost service charged financial year 2012/13

1.8. Research questions.

1. What was the total cost of providing services for the financial year 2012/13
2. What was the average cost per unit output produced for the financial year 2012/2013
3. What was the average cost recovery per cost service charged financial year 2012/13

1.9 Justification/Significance

This study is hoped to generate costing information in terms of total cost, cost per unit out put, and in the areas of efficiency gains. This information in turn is hoped to guide Government, policy makers, and health managers in general to show cause for additional funding by establishing the total cost of producing services. The deficits or surpluses will then justify appropriate action by the financers.

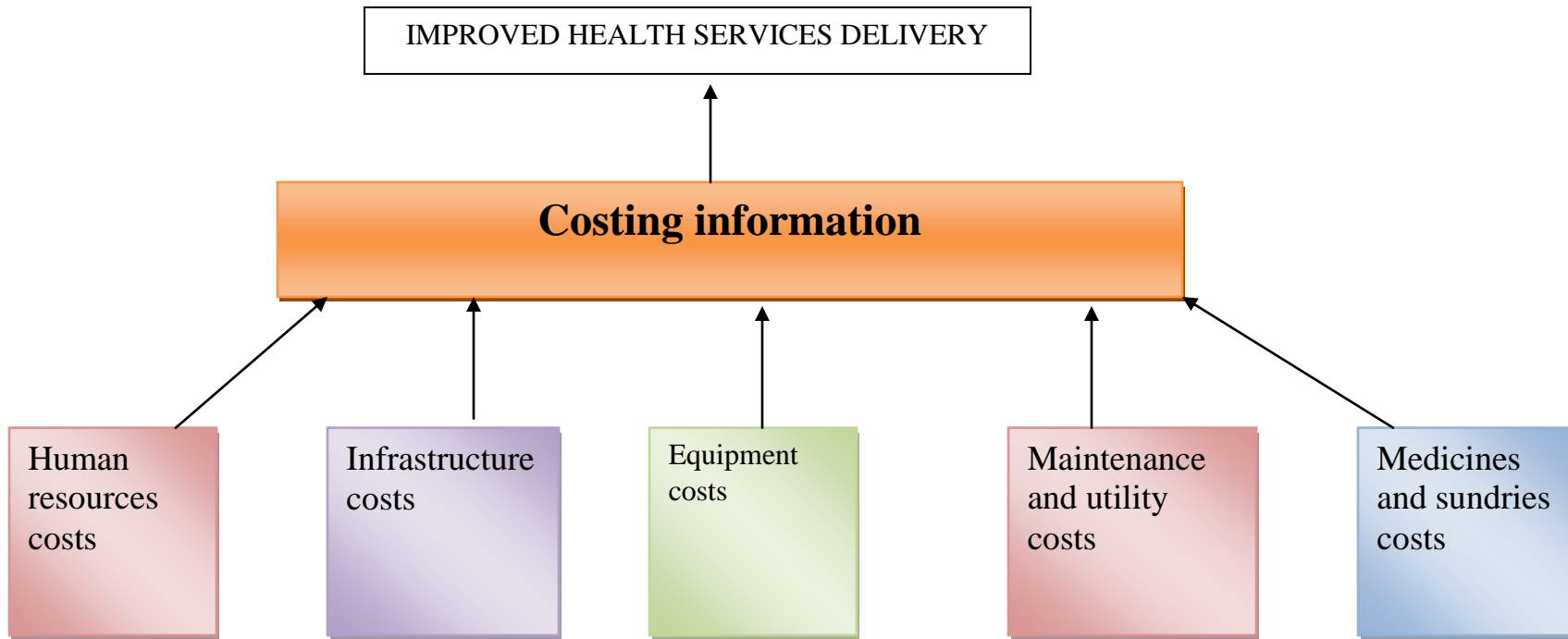
In preparation for implementation of the Social health insurance scheme; there is need to establish the cost of producing the unit output as a basis for charges The facilities are hoped to use this information to set fees

In order to be able to enact policies which are in line with the Government's programmes, costing information is necessary. This is especially in this era of scarcity of resources.

Proper planning can be done more effectively with availability of relevant information thus a sound rationale for resource allocation, informed decision making and quality measures. It is hoped that the study will benefit the Government by guiding in developing appropriate policies and plans for the sector. The hospital managers too will be able adopt efficiency measures, with evidence advocate for more funds, which if well utilized may lead to improvement of the quality of their services. And as the quality of services delivery improves, the overall beneficiary is the patient.

It is therefore urgent now that the resources for health have either stagnated or even reduced to do these costing studies in order to able justify for more funding, adopt efficiency measures and set fees in preparation for the forth coming social health insurance. Otherwise, the sustainability and the quality of health services is at stake.

Figure 1: CONCEPTUAL FRAME WORK



Explanation

The five variables HR, Infrastructure, Equipment, Maintenance and utilities and Medicines are the key cost drivers in health care are required to provide services and therefore constitute the costing information framework

CHAPTER THREE: LITERATURE REVIEW

2.1 Introduction

This chapter is dedicated to the review of relevant literature to costing methods, use and relevance of cost description information basing on the several studies so far done.

Hospital managements all over the world have started to realize that thorough understanding of the cost of delivery for each hospital service is important with current growth rate of the health demands and challenges.

A cost accounting system should replace the present financial book-keeping, to enable management to assess unit cost of services so that the relationship between costs and productivity can clearly be understood and integrated into the government financial planning. Further more cost analysis may be used to set up detailed and complete hospital cost accounting, which would permit a better understanding of patterns, resource distribution among departments, better opportunities for cost saving and, cost control for hospital managers and health authorities (Garattini, *et al.* 1996).

These views are in line with the current needs and challenges faced by Nyenga Hospital.

Various cost analysis methods may be used to set a detailed and complete hospital cost data base which is a necessary tool for hospital managers to realize cost control and recovery. Cost control is essential if hospital facilities are to survive under restricted resources and increased competition for resources (Garattini, *et al.* 1996).

Relevance and use of costing information

Budgeting

Information on the costs of health interventions is valuable to health decision makers for at least two reasons. The first is for budgeting purposes, to identify the resources necessary to undertake, sustain or scale up an intervention. The second is for efficiency assessment, to identify if the benefits outweigh the costs of undertaking an intervention or which of the many interventions that could be undertaken is the best use of scarce health resources (Flessa, 1998: Creese and Parker, 1993).

Information on the unit cost of inpatient and outpatient care is an essential element for pricing, budgeting and economic-evaluation exercises and yet many countries lack reliable estimates. However, WHO has recently undertaken an extensive effort to collect and collate data on the unit cost of hospitals and health centers from as many countries as possible; so far, data have been assembled from only 49 countries, for various years during the period 1973–2000. The database covers a total of 2173 country-years of observations.

Large gaps remain, however, particularly for developing countries. Although the long-term solution is that all countries perform their own costing studies, the question arises whether it is possible to predict unit costs for different countries in a standardized way for short-term use (Taghreed *et. al*, 2003).

Policy

Costing information can help national policy makers decide which curative care is best delivered in hospitals and examine the tradeoffs among various preventive, primary curative and secondary curative services (Shepard, 1998: Witter, *et al*, 2000).

To ensure that policy makers are provided with consistent evidence, it is important that costing studies use comparable and appropriate methods, regardless of the form of analysis being used. Otherwise it is not possible to compare the efficiency of the various competing alternatives or be sure that the interventions claimed to be cost-effective have been analyzed in an appropriate manner (Taghreed, 2006).

In both developing and industrialized countries, hospitals are viewed as vital and necessary community resources that should be managed for the benefit of the community.

And as such hospital management has a responsibility to the community; to provide health care services that the community needs, at an acceptable level of quality, and at least possible cost.

Cost finding and analysis can help departmental managers, hospital administrators, and policy makers to determine how well their institutions meet these public needs (Shepard, 1998).

Methodologies currently in use to carry out costing

A number of methods have been used to carryout cost analysis studies in various studies.

Samir, (May 1993). In the study of estimating cost of procedures and services, employed accounting methods and tracked resource use in order to determine unit cost of procedure and service at Embaba Hospital in Egypt.

Generally, step down costing was used to establish the unit costs of services.

The analysis of costs for economic evaluation focuses not only on the direct cost incurred by a facility or programme but also in the indirect cost borne by individual and society as a whole (Witter, 2000).

The methodology used in the above exercise was part of the series of models used in the WHO-CHOICE project. And works through a series of tools or instruments designed for use at national and district levels. It involves defining the basic health care package, costing the district health care facility services.

The tools are used in three dimensions considering the availability of resources to provide the basic service package, assessing the efficiency with which resources are used and integrating the district with an analysis of financing and sustainability issues.

This is in order to identify the changes in organizational and management structures required to improve the management of district health services. This too is quite applicable to our setting.

Hilaire and Crepeau (2000) discussed different allocation methods in attempt to verify whether the choice of one or the other methods greatly affect the unit cost of a final service or product. Direct method, step down, multiple allocation, and simultaneous equation were compared.

The direct method allocates costs proportionally to the services provided; it does not however take into account the allocation of costs shared by more than one cost center. The step down however, utilizes the principle that the cost center requiring the most services have their costs assigned first hence giving a better indicator of resources used than in the direct method.

The multiple allocation method is quite similar to the step down method, however, it is fairly more complex than step down with no additional significant merits apart from its ability not to prevent the flow of reciprocal services between cost centers.

The simultaneous equation method uses linear equations, which represent activity between the cost centers and the support services. This method is the most ideal as it can be programmed and accurate method. However, it is not user friendly. Despite these different approaches, the authors empirically tested all these methods and found negligible differences.

Efficiency assessments

Costing information is used in many ways to judge efficiency in the use of scarce available resources. Creese *et al* (WHO, 1994) observed that costing information could be used to judge efficiency in the following: the efficiency of use of resources employed (supplies, transport and level of utilization of facility).

To assess the use of personnel in delivery of services, for comparison of efficiency among wards/units within a hospital and other similar hospitals/programmes; and areas of wastage of resources can also be identified for correction.

By studying cost analysis data, the percentage of resources used for the various inputs among wards/unit within a hospital and that in one hospital compared with other similar hospitals can show level of efficiency in the different centres (Creese *et al*.1994, and Stephen et al. 2003). In the second, staff productivity can be compared among different wards/units in a hospital or with other similar hospitals.

We sometimes need to allocate costs to different programmes in order to set prices(for customers, insurance funds, or for use in contracting).we also need to understand cost in order to prioritise between different health care intervention (Witter, 2000).

In the case of wastage of resources, for example, Macintyre and others in their costing study reported that reducing inappropriate use of high volume drugs such as antibiotics could be more effective in optimising health facility drug budgets than attempts that concentrate solely on reducing use of high cost drugs alone (Macintyre *et al.* 2001). They recommended that systematic measurement of drug utilisation patterns is a key element of drug cost control strategies.

Their findings and recommendations are similar to the guidelines for utilization of PHC conditional grants for Health Sub-District (2003/04) where medical drugs and supplies account for about 25% - 30% of a hospitals budget. Hence it is important to monitor their use through cost analysis to contain hospital costs and increase efficiency.

Similarly Conteh and others observed that pharmaceutical costs are critical inputs into effective health service delivery and consume a significant share of the budget apart from personnel costs (Conteh *et al.* 2004). For example they accounted for 20–30% of total recurrent costs across four different hospitals in Balochistan, Pakistan (Green *et al.* 2001). They therefore demand particular attention to monitor expenditure on them as well as their proper management and rational use to improve a hospitals' efficiency.

Beck and others found out that reliance on generic hospital prices to derive cost estimates for paediatric HIV services produced considerable underestimates of the cost of service provision compared with data derived through the costing exercise (Beck, *et al.*1994). This implies that when such anomaly occurs across all or most areas of service provision, it could lead to

substantial financial deficits, which in turn could mean that the needs of specific client populations would not be met with required services.

The situation of relying on generic hospital prices to derive cost estimates is similar in a number of PNFP units. This brings up the issue of whether PNFP units should continue to scale up HIV/AIDS interventions in the advent of shrinking resources for health services delivery? If such a decision is to be taken then the health administrators and the management boards should have costing information about the new interventions to be introduced for informed decision-making and bargaining with relevant stakeholder/ or organisations.

Costing information enables management to see where most of the unit resources are being used and whether the activity implemented was their priority service area. It can also be used to assess efficiency by comparing cost of one unit of output in different departments within a hospital or that in one hospital with other hospitals (Shephard *et al*, 2003; Anand *et al.*, 2000; Murru *et al.*, 2003).

Flessa's costing study report also revealed that the costs of providing adequate services were much higher than expected. The most important factors determining the costs, according to him, were the administrative efficiency of the hospital management team and the scope of services offered. Hence costing information can help to improve administrative efficiency of the hospital management team. The cost analysis results will continue to be used in the ongoing training on financial management. Training will focus on improving management use of this information to deliver services more cost efficiently.

Improving the cost efficiency of hospitals is a critical ingredient in the overall financing of health care in a country; more efficient hospitals make it possible for more resources to be made available for much-needed primary health care (Stephen et al, 2003).

Kirunga (2002) observed that achieving efficiency is a matter of comparing the costs and benefits of competing health activities and ensuring that resources are allocated in such a way as to maximize health gains to the society. Musau further observed that the process of analyzing costs by departments allows responsibility for costs and revenue to be placed on the heads (managers) of each cost centre as a major step towards improving a hospital's cost efficiency.

Okiria (2006) in the costing of Kayunga Hospital adopted a step down methodology in line with Shepard's approach. And in his findings he established that the average cost of providing services in FY2005/2006 was OPD 6,200 Ugx equivalent to 3.3 USD. And the major cost drivers were the in fracture and human resources.

CHAPTER FOUR: METHODOLOGY

3.1 Study design

The study was a retrospective descriptive costs analysis study using a step down accounting methodology (Shepard 1998). The cost of providing health services in Nyenga in the financial year 2012/2013 was determined using relevant data from 1st July 2012 to 30th June 2013.

This period of study has been chosen because Nyenga Hospital had already reported on the activities for this financial year and the data is likely to be available.

A step-down cost accounting method as described by Shepard and others in 1998 and by Conteh and Walker in 2004 was used (Shepard *et al.*, 1998; Conteh and Walker, 2004).

3.2 Scope of Study

All the services in Nyenga hospital were studied. These include; inpatient, outpatients, laboratory services, preventive, supportive and promotive services, but excluding those not directly under the provision of health care services of the Hospital for example the training school and school health programs.

Buildings, equipment, drugs and other assets not used in the production of the services in the specified period of study were not costed as they were assumed not to have been consumed.

Cost incurred during in service staff development were included in this costing study.

3.3 Determination of total costs.

3.3.1 Cost centers

Cost centers were taken as units of activity within the hospital that consume resources to produce or to contribute to the production of outputs and for which costs can be calculated. They were classified as overhead, intermediate and final cost centers.

3.3.2 Determining the direct cost of the centers.

These included ;

Personnel costs

The actual salaries, all fringe benefits and allowances were considered.

The salaries and benefits of volunteers and expatriates were computed at the rate of hiring a local person for that post. The reason being that at times it might even be difficult to establish the true emoluments of these expatriates and they are not normally in line with the local salary rates and benefits. In addition, their rates are usually highly outrageous as compared to the local rates.

Salaries for Medical personnel who work in more than one department of the hospital were apportioned using the duty rosters present at each department. And where duty rosters were not available, time motion sheet were used to determine the proportions of time spent doing a particular activity and the salary apportioned accordingly.

Medicines & Sundries

The total value of medicines & sundries was established from the total purchase invoices for the period of time under the study and costed directly to pharmacy for drugs, since all the drugs pass through pharmacy to other cost centers. Assumption was made that all the drugs and sundries received during the financial year under study were consumed in the same period. The opening stocks and the closing stocks were considered in determining actual amount expended in the financial year under study.

The individual cost centers will then be allocated the cost of drugs and sundries according to the value of drugs & sundries received from pharmacy.

Buildings

The hospital plans would have been first be relied on in the determination of the cost the cost of the buildings. However, in absence of the plan, the cost of the building was established by first measuring the square meter area and multiplied by the estimated present cost of constructing a square meter area and finally annualized at a given rate of (Buildings expected useful life 30years, at real interest rate of 3%).This useful life span and rate will adopted as it has already been used in other cost studies. This will enhance comparability of the findings (Flessa S, 1998; Guisti *et al.*, 2004)

The shared buildings were apportioned according to the fraction of the space area under use by each or fraction of time. The cost per square meter shall be estimated at UGX.1,000,000/= general buildings and the fence at 150,000/= per meter length (Ministry of Works Housing, Transport and Communication, and Nyenga Engineering Department estimates was adopted).For storeyed buildings, the cost of building the ground floor was taken to be the cost of each subsequent floors.

Equipment, Furniture & Motor Vehicles.

The inventory data was used to determine the types and the number of equipment in each cost center. The replacement value of equipments for each cost center was adduced from the asset records, average catalog prices of Joint Medical Stores, National Medical Stores and NACME where applicable.

These costs were the annualized to determine the value expended in one financial year. The heavy equipment like X-ray, Ultra Sound Scan, Operating tables, Dental chairs, Autoclaves, Drug cupboards and Furniture is hoped to have a useful life of 10 years and an interest rate of

3% will be used. The motor vehicles and the light/portable equipment will be considered to have a useful life span of 5 years and an interest real rate of 3% and it will be apportioned on the basis of usage if not specific to the cost centre. This useful life spans is adopted from other costing studies (Flessa S, 1998; Guisti *et al.*, 2004)

For vehicles donated the current market value of replacement shall be used.

In calculating the annualization factor, a real interest rate of 3% was used in all related considerations as suggested by Shepard and others so as to ease comparison with other studies internationally (Shepard *et. al*, 1998).

Maintenance of Medical and Non medical Equipment

Costs of maintaining the equipment in the respective cost centers was determined from review of relevant records and interviews.

Utilities

These included electricity, water, and telephone. The costs were as per consumption.

3.3.3 Allocation of costs to final cost centers

In determining the total cost per cost centre, direct costs and apportioned indirect cost are summed. This enabled us to determine how much was consumed or spent in the production of services in various cost centers in the financial year under study.

The total cost is given by the formula: $TC=DC+A/IC$ (TC=Total Cost, DC=Direct Cost, A/IC=Allocated/Indirect Cost).

The basis/ criteria of allocation for various cost is summarized in table 1 below.

Table 1 Summary of Cost Centers and their allocation criteria

Cost centre	Allocation Criteria
Overhead costs	
Administration	Proportion of Direct costs of the cost centres
Support departments	
Security	Flat rate
Inside cleaning	Area occupied/ under use by the cost center
Compound cleaning	Area
Transport	Mileage
Mortuary	Number of Bodies
Intermediate	
Pharmacy	Value of drugs supplied to cost centre
Stores	Value of goods supplied to cost centre
Laboratory	Number of tests carried out for each cost centre.
Theatre	Number of operations.
Radiology	Number of X-rays/ examinations
Laundry	Number of bucket fills

Each intermediate cost centres above has a value attached to it. The individual cost centres will be expressed as the percentage of the overall total cost. This percentage will then be used as an allocation statistic of the administration cost.

3.4 Determination of average unit cost

This was determined by dividing the total cost of each cost center by the number of units produced. This involves the following steps;

3.4.1 Identification of the final products per final cost center

These are services for which we are interested in computing their unit costs. These include: Immunization visits, number of deliveries & surgical operations, OPD visits, inpatient days, average length of stay, standard unit output, and tests. In practice this is done first as they are the products of interest. As shown in table 2 below.

Table 2 Measure of Unit output per final cost center

FINAL COST CENTRES	OUTPUT COSTED	SOURCE OF THE DATA	DATA COLLECTION METHOD
Theatre	Major/Caesarian/ minor operation	HMIS 108	Review of records
OPD	Visit	HMIS 105	Review of records
Female Ward	Inpatient day and an Admission	HMIS 108	Review of records
Maternity Ward	Inpatient day, normal and caesarian delivery	HMIS 108	Review of records
Paediatric Ward	Inpatient day and an Admission	HMIS 108	Review of records
Male Ward	Inpatient day and an Admission	HMIS 108	Review of records
ANC/MCH	Visit	HMIS 105	Review of records
Laboratory	Test	HMIS 105	Review of records

Allocation of theatre costs by type of operation.

After establishing the total cost of theatre, a total number of surgical operations namely; Major, Minor and Caesarian was established from the hospital records. A composite allocation statistic basing on the time and personnel costs which are the major variables were used as the allocation basis and the allocation statistic as follows;

Set Activity Standard Time and Personnel costs as shown below (Namaganda 2004)

Table 3: Activity and Set Activity Standard time

ACTIVITY	SET ACTIVITY STANDARD TIME	STAFF REQUIRED
Major (uncomplicated)	120	1 DOCTOR, 2NURSES AND 1ANAESTHESIST
Caesarian	60	1 DOCTOR, 2 NURSES AND 1ANAESTHESIST
Minor	30	1 DOCTOR, 1 NURSE

Basing on the activity standard time set and the personnel requirement for each type of operation, total emoluments of each cadre under consideration for the financial year will be added together. For a major operation total annual emolument of 1 Doctor, 2 nurses and 1 anesthetist. This will be the same for a Caesarian operation.

However, for the minor it will be 1 doctor and 1 nurse. These considerations were used to distribute the total cost of theatre in terms of the 3 types of operations

3.5 Determining and comparing the composition of Costs in each final cost centre

This involved establishing the relevant inputs involved in the production of the respective services in various cost centres. Their total cost and percentage contribution will then be determined.

3.6 Quality Measures/Control

Pre-testing of the instruments was done in Kawolo Hospital to ensure reliability and accuracy. Persons with basic knowledge of health services were recruited as research assistants. They were vigorously trained to ensure that they have known and understood what to do.

Daily short briefing and debriefing meeting were held to allocate duties, report on the work done and problems encountered. This ensured that all the data needed was collected and any problems encountered solved on time.

Completeness of data was ensured and where not complete reasonable extrapolations was done.

3.7 Ethical Issues/Consideration

A letter of introduction was obtained from the faculty. With the introduction letter, permission will be sought from the Chief Administrator and the Medical Superintendent. A programme was drawn up with the respective persons/ departments to minimize disruption of the services.

3.8. Plan for dissemination

The University, the Hospital, UCMB and Ministry of Health will be provided with copies.

It is hoped that, the findings of this study if approved shall be published with the consent of the authorities.

3.9 Limitations of the study

These costs may only be applicable to the hospital to be studied and may not be generalized to other hospitals. However, it is hoped that the costs obtained can apply to other hospitals of averagely the same size and scope of activities.

CHAPTER FOUR: PRESENTATION OF THE RESULTS

4.1. Introduction

This chapter presents the results of the study in line with the objectives with two scenarios considered. That is the average costs considerations under total cost and recurrent expenditure only.

4.2. Objective one: Determination of Total Costs per Cost driver and Cost Centre

This was done by the identification of the key cost drivers and the facility cost centers and outputs

Table 4: Final cost centers, out puts for FY 2012/2013

Final Cost Centre	Measure	Out put	Number	Deaths
Laboratory		Test	19,452	-
Radiology.	Examination	Scan		-
Theatre	Operation	Minor	931	-
		Caesarean	218	-
		Major	32	-
ANC clinic		Visit	4,055	-
Pediatric ward	Inpatient	Inpatient Day	4,818	44
		Admission	1,394	
Maternity ward	Inpatient	Inpatient Day	3,404	3
		Admission	859	
Female ward	Inpatient	Inpatient Day	2,442	18
		Admission	706	
Male	Inpatient	Inpatient Day	1,589	31
		Admission	422	
OPD	Attendance	Visit	19,692	-
HIV clinic	Client	Client	1,228	-

Source: HMIS 105/108

According to the HMIS 105 and 108 reports there were a total of 19,452 tests excluding CD4 and Viral load test carried out, with the OPD utilization of 19,692 visits. The highest inpatient admissions were 1,394 in paediatric ward in the FY 2012/2013 There were 1.228 active HIV/AIDS clients on first line, second line and pre ART.

Table 5: Summary of the Human Resources annualized costs

Cost Centre	Monthly Gross pay	Annual Gross Pay	Other Monthly Benefits	Other Benefits Annualized	Total Annual Pay /Cost
Overhead Cost Centre					
Administration	8,081,000	96,972,000	1,850,000	22,200,000	119,172,000
Transport.	450,000	5,400,000	100,000	1,200,000	6,600,000
Security.	1,173,000	14,076,000	450,000	5,400,000	19,476,000
Ancillary Cost Centre					
		-		-	-
Stores	113,000	1,356,000	20,000	240,000	1,596,000
Pharmacy	770,000	9,240,000	260,000	3,120,000	12,360,000
Mortuary.	150,000	1,800,000	80,000	960,000	2,760,000
Laundry	150,000	1,800,000	80,000	960,000	2,760,000
Final Cost Centre					
		-		-	-
Laboratory	814,800	9,777,600	270,000	3,240,000	13,017,600
Radiology.	104,600	1,255,200	20,000	240,000	1,495,200
Theatre	1,833,845	22,006,140	310,000	3,720,000	25,726,140
MCH/ ANC clinic	712,000	8,544,000	280,000	3,360,000	11,904,000
Pediatric ward	2,216,230	26,594,760	730,000	8,760,000	35,354,760
Maternity ward	2,430,230	29,162,760	730,000	8,760,000	37,922,760
Female/General	2,489,053	29,868,636	1,001,000	12,012,000	41,880,636
OPD	2,448,015	29,376,180	530,000	6,360,000	35,736,180
Male	1,414,023	16,968,272	429,000	5,148,000	22,116,272
HIV clinic	11,266,200	135,194,400	1,640,000	19,680,000	154,874,400
Cervical cancer	310,000	3,720,000	150,000	1,800,000	5,520,000
Total	36,925,996	443,111,948	8,930,000	107,160,000	550,271,948

Table 5 above shows the annual human resources expenses that was expended by the hospital in Fy 2012/2013. This costs include the gross salaries that were paid and other benefits that included allowances and accommodation value as the current per the current declared of estimated rates of hire/ rent or annualized house values considering the useful life of buildings.

The overall value that was adduced from the calculations was a total of **550,271,948Ugx** equivalent to **221,080** US dollars with the highest cost being in the HIV clinic at 154,874,400 Ugx followed by Administration at 119,172,000 Ugx.

Table 6: Annualized Infrastructure Costs per cost Centre

Department	Length	Width	Sq m2	Unit Cost per sq m	Estimated Value	Useful Life	Annualized Cost
Cost Centre						30	
Overhead CCs							
Administration	24.8	9.4	316.72	1,000,000	316,720,000	30	16,159,184
Transport.	0	0	0	1,000,000	-	30	-
Security.			0	1,000,000	-	30	-
Ancillary CCS			0	1,000,000	-		-
<i>Stores</i>	8	6.1	48.8	1,000,000	48,800,000	30	2,489,796
<i>Pharmacy</i>	15	6.1	91.5	1,000,000	91,500,000	30	4,668,367
<i>Mortuary.</i>	8	5	40	1,000,000	40,000,000	30	2,040,816
<i>Laundry</i>	20.4	8	163.2	1,000,000	163,200,000	30	8,326,531
Final CCS			0	1,000,000	-		-
Laboratory	13.2	6.4	84.48	1,000,000	84,480,000	30	4,310,204
Radiology.	6.4	5.2	33.28	1,000,000	33,280,000	30	1,697,959
Theatre	21.5	9.7	208.55	1,000,000	208,550,000	30	10,640,306
ANC clinic	12.3	8.5	104.55	1,000,000	104,550,000	30	5,334,184
Pediatric ward	24.8	9.9	245.52	1,000,000	245,520,000	30	12,526,531
Maternity ward	48	9.9	475.2	1,000,000	475,200,000	30	24,244,898
Adult and General Ward	30	9.9	297	1,000,000	297,000,000	30	15,153,061
OPD	20.1	10	201	1,000,000	201,000,000	30	10,255,102
Male	24.8	9.9	245.52	1,000,000	245,520,000	30	12,526,531
HIV clinic	29.8	13.1	390.38	1,000,000	390,380,000	30	19,917,347
Cervical cancer	6.6	6.4	42.24	1,000,000	42,240,000	30	2,155,102
Total	313.7	133.5	2945.7		2,945,700,000		150,290,816

As per the costing considerations buildings are considered to have a useful life of 30 years and in general, a real interest rate of 3% was used. “This rate has been found and used in many industrialized and developing economies. As this rate is being used in a comprehensive set of cost effectiveness studies for the health sector (Jamison et al 1993) its use makes hospital costing consistent with the international literature”.

The highest annualized value of the buildings was the maternity ward/cost centre at 24,244,898Ugx equivalent to 9,697 US dollars, HIV clinic with a total annualized value of

19,917,347 Ugx equivalents to 7,666 US dollars followed by Administration cost centre at an annualized value of 16,159,184 Ugx (6,463US dollars).

Table 7: Summary of Direct Cost per Cost Centre

Cost Centre	Personnel	Drugs/sundries/ reagents	Admin. & Maintenance	Buildings	Medical & Non Medical Equipments	Total
Overhead Cost Centre						
Administration	119,172,000	-	270,160,911	16,159,184	5,615,475	411,107,569
Transport.	6,600,000	-	-	-	27,510,917	34,110,917
Security.	19,476,000	-	-	-	11,137	19,487,137
Ancillary CC	-	-	-	-	-	-
Stores	1,596,000	-	-	2,489,796	121,923	4,207,719
Pharmacy	12,360,000	-	-	4,668,367	341,149	17,369,516
Mortuary.	2,760,000	187,420	-	2,040,816	-	4,988,236
Laundry	2,760,000	897,700	-	8,326,531	3,517	11,987,748
Final CC	-	-	-	-	-	-
Laboratory	13,017,600	24,631,377	-	4,310,204	4,990,504	46,949,685
Radiology.	1,495,200	792,885	-	1,697,959	790,739	4,776,783
Theatre	25,726,140	7,135,966	-	10,640,306	2,150,059	45,652,471
MCH/ANC clinic	11,904,000	4,757,311	-	5,334,184	767,878	22,763,373
Pediatric ward	35,354,760	13,064,818	-	12,526,531	1,210,434	62,156,542
Maternity ward	37,922,760	10,307,507	-	24,244,898	3,294,842	75,770,007
Adult and General Ward	41,880,636	19,029,244	-	15,153,061	2,562,720	78,625,661
OPD	35,736,180	11,271,933	-	10,255,102	1,024,033	58,287,248
Male ward	22,116,272	5,000,678	-	12,526,531	1,295	39,644,776
HIV clinic	154,874,400	6,550,196	-	19,917,347	-	181,341,943
Cervical cancer	5,520,000	240,890	-	2,155,102	1,565,651	9,481,643
Total	550,271,948	103,867,926	270,160,911	152,445,918	51,962,271	1,128,708,974

From table 7 the total costs expended by the hospital in the FY 2012/2013 was 1,128,708,974 Ugx (451,483 US dollars) with the highest being from the human resources with 550,271,948

Ugx (220,108 US dollars) and the lowest from medical and non medical equipment at 51,962,271 Ugx (20,784 US dollars).

4.3. Objective two: Determination of the average unit costs

Two scenarios were considered namely the average unit cost under total cost and under recurrent expenditure only

4.3.1 Scenario One: Average unit cost under total cost (Excluding cost of ARVs)

Table 8: Average Unit Cost with Total cost considered for FY 2012/2013

Final Cost Centre	Total Cost per Cost Centre	Unit of Measure	Number of Out puts	Average Unit Cost in UGX	Average Unit cost in USD
Laboratory	89,145,044	Test	19,452	4,583	1.8
OPD	168,140,023	Visit	19,692	8,538	3.4
MCH/ANC clinic	59,708,664	Visit	4,055	14,725	5.9
Radiology.	11,007,083	Scan	296	37,186	14.9
Theatre	95,008,292	Major	32	1,795,405	718
		Cesarean	218	131,773	52.7
		Minor	931	9,483	3.8
Pediatric ward	122,150,309	Admission	1,394	87,626	35.1
Maternity ward	137,492,690	Admission	859	160,061	64
Male ward	74,357,043	Admission	422	176,202	70.5
Female and General Ward	146,517,610	Admission	706	207,532	83
HIV clinic	308,330,190	Year (excluding cost of ARVs)	1,228	251,083	100.4

As shown in the table 8, the average unit cost for the laboratory test was the lowest at 4,583 Ugx (1.8 USD). However, this cost excludes the cost of CD4 counts and Viral loads tests. As far as admissions are

concerned the highest average cost was on Adult/Female and general ward at 207,532 Ugx (83 USD) and the lowest admission average unit cost was in paediatric ward at 87,626 Ugx (35.1 USD). The average unit cost of the HIV clinic of 251,083 Ugx (100.4 USD), is of annual cost of managing a client per year without ARVs.

Table 9: Determination of average cost per type of operation

Operation	Standard Activity Time in Hours	Man Hour Value	Allocation Statistic	Amount per Type	Out puts	Average Unit Cost in Ugx
Major Operations	2	5,502,000	60.5	57,452,945	32	1,795,405
Caesarian Section	1	2,751,000	30.2	28,726,473	218	131,773
Minor Operations	0.5	845,500	9.3	8,828,874	931	9,483
Total /Average		9,098,500	100.0	95,008,292	1181	80,447

From the practical aspects of the operations in theatre three categories of operations are reported the Major. Caesarean and the Minors. Each of this has different requirements in terms of time and human resources. So it will be wrong to just get the average cost of an operation without considering the major differences that they demand. So the redistribution of theatre costs is shown in table 9. Because of the few major operations done the average cost is as high as 1,795,405 Ugx (718 USD). This was because only 32 major operations were reported to have been done in the whole year, however just an increase of one major operation per day would reduce the unit cost by more than ten times. The average cost of the minor operations which were mainly safe male circumcision was 9,483 Ugx (3.8USD)

Table 10: Average Unit cost per Inpatient day with total cost scenario

Cost Centre	Total Cost in Ugx	Number of Inpatient Days	Average Unit Cost	
			Ugx	USD
Pediatric ward	122,150,309	4,818	25,353	10.1
Maternity ward	137,492,690	3,404	40,392	16.2
Male ward	74,357,043	1,589	46,795	18.7
Female and General Ward	146,517,610	2,442	59,999	24
TOTAL /AVERAGE	480,517,652	12,253	39,216	15.7

On average the average cost of an inpatient day in the hospital was 39,216 Ugx (15.7 USD). Female and general ward had the highest average unit cost of 59,999 Ugx (24 USD) per inpatient day with paediatric ward having the lowest at 25,353 Ugx (10.1 USD)

4.3.2. Scenario two: Average unit cost with re current expenditures only

In this scenario only the costs of human resources, medicines and sundries, maintenance and utilities were considered. The cost of infrastructure and medical equipments were excluded

Table 11: Average Unit cost with recurrent expenditure only for FY 2012/2013

Cost centre	Recurrent Cost in Ugx	Unit of Measure	Outputs	Average Unit Cost	
				Ugx	USD
Laboratory	74,999,446	Test	19,452	3,856	1.5
OPD	141,344,355	Visit	19,692	7,178	2.9
MCH/ANC clinic	46,697,014	Visit	4,055	11,516	4.6
Radiology	7,514,265	Scan	296	25,386	10.2
Theatre	8,828,874	Minor	931	9,483	3.8
	28,726,473	Cesarean	218	131,773	52.7
	41,855,891	Major	32	1,307,997	523.2
Pediatric ward	98,919,769	Admission	1,394	70,961	28.4
Maternity ward	93,267,627	Admission	859	108,577	43.4
Male ward	54,697,346	Admission	422	129,615	51.8
Adult and General Ward	118,576,808	Admission	706	167,956	67.2
HIV clinic	289,916,202	Year (excl. ARVs)	1,228	236,088	94.4

The highest average cost was still the major operation at 1,307,997 Ugx(523.2 USD). Overall there is a minimal reduction of the costs across the cost centres and unit out puts with highest being in the radiology cost centre of about 30%.

Table 12: Percentage contribution of recurrent costs

Cost Centre	Unit	Average unit costs		Percentage recurrent cost contribution
		Recurrent	Total cost	
Laboratory	Test	3,856	4,583	84.1
OPD	Visit	7,178	8,538	84.1
MCH/ANC clinic	Visit	11,516	14,725	78.2
Radiology	Scan	25,386	37,186	68.3
Theatre	Operation	58,608	80,447	72.9
Pediatric ward	Admission	70,961	87,626	81.0
Maternity ward	Admission	108,577	160,061	67.8
Male ward	Admission	129,615	176,202	73.6
Adult and General Ward	Admission	167,956	207,532	80.9
HIV clinic	Year (excl.ARVS)	236,088	251,083	94.0

As shown in table 11 on average the overall contribution of re current cost is over 75% in all the cost centres and the highest being in the HIV clinic with 94%. This implies human resources and medicines are the major cost drivers of health care services.

Table 13: Average inpatient day with recurrent expenditure only FY 2012/2013

Cost Centre	Total Cost	Inpatient Days	Average Unit Cost
Pediatric ward	98,919,769	4,818	20,531
Maternity ward	93,267,627	3,404	27,399
Male ward	54,697,346	1,589	34,422
Adult and General Ward	118,576,808	2,442	48,557
Overall average	365,461,551	12,253	29,826

The reduction of the unit costs in the inpatient day average cost is minimal on average of 24%

Table 14: Percentage contribution of the recurrent costs on average unit cost of inpatient day

Cost centre	Average Unit Cost		Percentage contribution of the recurrent costs
	Recurrent	Total cost	
Pediatric ward	20,531	25,353	81.0
Maternity ward	27,399	40,392	67.8
Male ward	34,422	46,795	73.6
Adult and General Ward	48,557	59,999	80.9
Overall average	29,826	39,216	76.1

On average over 76% costs that are incurred in the provision of the services in the facility are contributed by the recurrent costs

1.4. Objective three: Determination of costs recovered/lost

The average charges/prices are charged to patients in the hospital was used to determine the level of cost recovery in the two scenarios

Table 15: Percentage cost recovery under total cost scenario

Cost Centre	Unit Measure	Cost	Price/ Charge	Cost recovered/Lost	Percentage Recovery
Laboratory	Test	4,583	3,900	(683)	-15
OPD	Visit	8,538	9,500	962	11
MCH/ANC clinic	Visit	14,725	3,000	(11,725)	-80
Radiology	Scan	37,186	20,000	(17,186)	-46
Theatre	Minor	9,483	21,500	12,017	127
	Cesarean	131,773	180,000	48,227	37
	Major	1,795,405	170,000	(1,625,405)	-91
Pediatric ward	Admission	87,626	30,000	(57,626)	-66
Maternity ward	Admission	160,061	55,000	(105,061)	-66
Male ward	Admission	176,202	55,000	(121,202)	-69
Adult and General Ward	Admission	207,532	55,000	(152,532)	-73
HIV clinic	Year (excl.ARVs)	251,083	0	(251,083)	-100

Under the total cost scenario there were only surpluses in the OPD visit of only 963 Ugx per visit on average, 12,012Ugx on minor operations and 48,227Ugx on average on caesarean sections.

Otherwise all the rest were on a deficit at different rates/ percentages.

Table 16: Percentage cost recovery/loss under recurrent expenditure scenario

Cost Centre	Unit Measure	Cost	Price/ Charge	Cost recovered/Lost	Percentage Recovery
Laboratory	Test	3,856	3,900	44	1.2
OPD	Visit	7,178	9,500	2,322	32.4
MCH/ANC clinic	Visit	11,516	3,000	(8,516)	-73.9
Radiology	Scan	25,386	20,000	(5,386)	-21.2
Theatre	Minor	6,909	21,500	14,591	211.2
	Cesarean	96,000	180,000	84,000	87.5
	Major	1,307,997	170,000	(1,137,997)	-87.0
Pediatric ward	Admission	70,961	30,000	(40,961)	-57.7
Maternity ward	Admission	108,577	55,000	(53,577)	-49.3
Male ward	Admission	129,615	55,000	(74,615)	-57.6
Adult and General Ward	Admission	167,956	55,000	(112,956)	-67.3
HIV clinic	Visit (Yr)	236,088	0	(236,088)	-100.0

Figure 15 shows overall shows a very low cost recovery even when only the recurrent expenditures are considered. However, there is an increase in surplus under the OPD visit by about 1,300 Ugx (0.5 USD), and a full cost recovery from laboratory.

CHAPTER FIVE: DISCUSSION OF THE FINDINGS

5.1. Introduction

This chapter presents the discussion of the findings of the study in line with the objectives of the study. The similarities and the differences in the methodologies, assumptions and the results are herein discussed.

According to the findings of the study the key cost drivers in the provision of health services were the human resources and medicines this in line with what Okiria (2006) in the his costing of Kayunga hospital established.

The average unit cost of the major operations of 1,795,997Ugx is very high as compared to the average cost of 194,896 Ugx in Arua Regional Referral Hospital and 260,515 of Kayunga general hospital as per the findings of Odaga, Okiria et al (2008). However, this big difference could be as a result of the low utilization of the surgical services with only 32 major operations in a year as opposed to 2,578 major operation in Arua RRH 2008.

The average cost of OPD visit of 8, 538 under total cost is comparable to the average unit cost Arua of 7, 964 Ugx and 7,450Ugx in Kayunga general hospital especially considering the current exchange rate of approximately 2500 Ugx/USD as compared to the 2000 Ugx/USD in 2008.

The general findings show that whereas the human resources are the major recurrent cost drivers and even overall cost contributors, the facility has only 3 doctors in addition to the medical director and yet at the same time one of the doctors is specifically for the HIV clinic only. These understaffing whereas it may appear to be a saving of costs leads to long waiting times in the facilities burn out among the workers and eventually the efficiency gains are lost over non performance or doctors involved in what could have been not their role in the service delivery.

Whereas limited studies limited studies have been done to determine the levels of cost recoveries using total cost, the findings of this study point to the fact that unless there will be alternate sources of financing this facility, the rate of cost recovery endangers the sustainability of the facility. This is evident because the cost recovered in most cases is less than 25% of the cost of providing services.

The alternative intervention would be to increase the user fees. But this is probably not feasible as already there is a low utilization of the services which is most likely because of the contributions that the patients are expected to make.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1. CONCLUSION

It is evident from the findings that the facility is spending more resources than it is recovering. This raises the issues of sustainability of the services upon having no reliable sources of income. The average unit cost of most of the services offered exceeds even the current recurrent expenditure for the hospital.

It therefore implies that for maintenance and sustainability of quality services alternate sources of income should be found and with little attempt to increase on user fees as this will definitely reduce further the utilization of the facility.

The theatre services are the most under utilized giving a high unit cost of the services offered hence very low cost recovery.

6.2. RECOMMENDATIONS

- vi. The hospital should use this information to justify need for more financing other than user fees to government and other development partners.
- vii. The facility should adopt a flat rate for all services in OPD as this will enhance certainty and hence utilization
- viii. Since the theatre is underutilized the facility should consider revising the charges downwards and benefit from increased utilization and economies of scale and consider employing a surgeon.

- ix. Efficiency gain measures in terms of medicines selection and prescriptions should be implemented.
- x. Government should increase support to the facility if it has to remain providing quality services at a low cost
- xi. Costing of other health services should be done to be able to make scientific comparisons among different levels of care

Table 17: Work Plan

ACTIVITY	RESPONSIBLE PERSON			
		Nov	Dec	Jan
Pre-testing (Kawolo Hosp)	Kamara and research Assistants			
Preparing for the field	Kamara Ronald			
Collecting data	Kamara and research Assistants			
Compiling data analysis and presentation	Kamara Ronald			
Handing in of the first draft	Kamara Ronald			
Handing in of the final draft	Kamara Ronald			
Defending of the dissertation	Kamara Ronald			

Table 18: Budget Proposal

**PROPOSED BUDGET ESTIMATES FOR NYENGA COSTING
STUDY FOR A PERIOD 2012/2013 FY**

ACTIVITY		RATE	DAYS	NUMBER OF RESEACHERS	TOTAL COST
PRETESTING	TRANSPORT HIRE	100,000	2	7	200,000
	ALLOWANCES	50,000	2	7	700,000
	LUNCH	5,000	2	7	70,000
	STATIONERY	30,000	2		60,000
	ADJUSTMENT OF INSTRUMENTS	50,000			50,000
	COMPUTER SERVICES	30,000	2		60000
	SUB TOTAL				1,140,000
DATA COLLECTION	TRANSPORT HIRE	120,000	2		240,000
	ALLOWANCES	50,000	7	7	2,450,000
	MEALS	12,000	7	7	588,000
	ACCOMODATION	30,000	7	7	1,470,000
	PRINTING AND STATIONERY	200,000			200,000
	SUB TOTAL				4,948,000
DATA ANALYSIS	ALLOWANCES	50,000	5	3	750,000
	MEALS	12,000	5	3	180,000
	ACCOMODATION	50,000	5	3	750,000
	COMPUTER SERVICES	100,000			100,000
	SUB TOTAL				1,780,000
REPORT PREPARATION	ALLOWANCES	50,000	5	1	
	MEALS	12,000	5	1	
	ACCOMODATION	50,000	5	1	
	TYPE SETTING	50,000			50,000
	PRINTING 8 COPIES	160,000			160,000
	BINDING 8 COPIES	160,000			160,000
	SUB TOTAL				370,000
DISSEMINATION	TRANSPORT	100,000	2		200,000
	ALLOWANCE	50,000	2		100,000
	SUB TOTAL				300,000
	GRAND TOTAL				8,538,000

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Drug Tracking Form

User Departments																	
Drug Name	Qty	Unit Cost	OPD	Medical Ward	Children Ward	Surgical Ward	Maternity Ward	Mental Ward	TB Ward	Lab	X-Ray / Ultrasound	CBHC	ENT Ward	Eye Ward	Dental Unit	HIV Clinic	VCT Unit

Table: Direct Allocation

Cost Centres	Personnel	Drugs/ Sundries/ Reagents	Stationery	Buildings	Equipment	Fuel	Spares & Machinery	Donations	Others	Total
Overhead CCs										
Administration										
Transport										
Security										
Utilities										
Maintenance										
Cleaning										
Ancillary CCS										
Supplies Department										
Pharmacy										
Mortuary										
Laundry										
Final CCS										
Laboratory(IP)										

Laboratory(OPD)										
Radiology										
Theatre(Main)										
Theatre(OPD-Minor)										
Dental Clinic										
Physiotherapy										
ANC/PMTCT										
Pediatrics Ward										
Maternity(Gyn)										
Maternity(L/Suite)										
Surgical Ward										
Medical Ward										

Table..... Building Cost Information

No.	Name of Building	Sq m ²	Dep't using it	Estimated Value	Useful Life	Annualised Cost	Year's Cost	No. of Bulbs	T.C

Unit of Outputs		
Direct Service Departments	Unit of Output	Total Outputs
OPD	VISIT	
Paediatric Ward	IP.Day	
Maternity(Gyn)	IP.Day	
Maternity(L/Suite)	Deliveries	
Surgical Ward	IP.Day	
Medical Ward	IP.Day	
TB ward.	IP.Day	
Child Health(Immunization)	Contact	
ANC	Visit	
HIV Clinic	Visit	
	Per Patient Per Yr without ARVs	
	PMTCT OPTION B	
	Per patient per yr with ARVs	
OPD Dept(Adults)	Visit	
Mental OPD	Visit	
Mental Ward	IP.Day	
PMTCT OPTION B	VISIT	
VCT Centre	Visit	
Radiology	X-ray Examination	
	Ultrasound Scan	
CHD/PHD	**	
Labaratory(OPD)	Test	
Physiotherapy Unit	Visit	
Private Ward	IP.Day	
Theatre(Main)	Operation	
Theatre(OPD-Minor)	Operation*	
Orthoepadic Dept	Visit	
Dental	Visit	

NYENGA HIV CLINIC COST CENTRE HUMAN RESOURCES

POSITION	SOURCE OF FUNDING LOE		GROSS PAY	DEDUCTIONS				Net Pay
	ACT	OTHERS		NSSF 5%	Local Service Tax	PAYE	Total	
Coordinator	100%	0%	3,465,000	173,250	8,333	941,500	1,123,083	2,341,917
Clinical Officer	100%	0%	800,000	40,000	5,833	142,000	187,833	612,167
Clinical Officer	100%	0%	800,000	40,000	5,833	142,000	187,833	612,167
Midwife	100%	0%	385,000	19,250	2,500	20,000	41,750	343,250
Midwife	50%	50%	385,000	19,250	2,500	20,000	41,750	343,250
Nurse	100%	0%	502,530	25,127	3,333	52,759	81,219	421,311
Nurse	100%	0%	444,780	22,239	2,500	35,434	60,173	384,607
Counsellor	100%	0%	716,625	35,831	5,833	116,988	158,652	557,973
Counsellor	100%	0%	716,625	35,831	5,833	116,988	158,652	557,973
Nurse	100%	0%	444,780	22,239	2,500	35,434	60,173	384,607
Counsellor	100%	0%	425,530	21,277	1,667	29,659	52,602	372,928
Laboratory Technician	52%	48%	882,438	44,122	6,667	166,731	217,520	664,918
Laboratory Assistant	70%	30%	601,780	30,089	5,000	82,534	117,623	484,157
Laboratory Assistant	100%	0%	513,240	25,662	3,333	55,972	84,967	428,273
ACT Accountant	100%	0%	1,155,000	57,750	8,333	248,500	314,583	840,417

Data Manager	100%	0%	630,000		31,500	5,000	91,000	127,500	502,500
Data Clerk	100%	0%	630,000		31,500	5,000	91,000	127,500	502,500
ACT Driver	100%	0%	288,750		14,438	833	5,375	20,646	268,104
Counsellor/Records Clerk	100%	0%	682,500		34,125	5,000	106,750	145,875	536,625
Nurse	100%	0%	554,400		27,720	3,333	68,320	99,373	455,027
Nurse	100%	0%	424,410		21,221	2,500	29,323	53,044	371,367
Nurse	100%	0%	424,410		21,221	2,500	29,323	53,044	371,367
Pharmacy/Store Keeper	100%	0%	472,500		23,625	2,500	43,750	69,875	402,625
Medical Director	17%	83%	1,857,240			8,333	459,172	467,505	1,389,735
Hospital Administrator	25%	75%	1,651,125		82,556	8,333	397,338	488,227	1,162,898
Personnel Officer	40%	60%	924,000		46,200	7,500	179,200	232,900	691,100
Hospital Accountant	27%	73%	1,059,188		52,959	8,333	219,756	281,049	778,139
Nursing Officer	20%	80%	724,500		36,225	5,833	119,350	161,408	563,092
			22,561,351		1,035,206	135,000	4,046,155	5,216,361	17,344,990