COST ANALYSIS OF ECONOMIC IMPACT OF HIV AND AIDS ON LENGTH OF STAY IN ONE HOSPITAL IN THE NORTHERN CAPE PROVINCE IN SOUTH AFRICA

by

NOMHLE ORIENDA GUMBO

submitted in accordance with the requirements

for the degree of

MASTER OF PUBLIC HEALTH

at the

UNIVERSITY OF SOUTH AFRICA

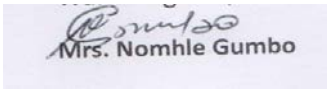
SUPERVISOR: PROF ZZ NKOSI

NOVEMBER 2015

Student Number: 6461204

DECLARATION

I declare that **COST ANALYSIS OF ECONOMIC IMPACT OF HIV AND AIDS ON LENGTH OF STAY IN ONE HOSPITAL IN THE NORTHERN CAPE PROVINCE IN SOUTH AFRICA** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references and that this work has not been submitted before for any other degree at any other institution.



10 May 2016

..... **.....**

Nomhle Orienda Gumbo **Date**

COST ANALYSIS OF ECONOMIC IMPACT OF HIV AND AIDS ON LENGTH OF STAY IN ONE HOSPITAL IN THE NORTHERN CAPE PROVINCE IN SOUTH AFRICA

STUDENT NUMBER: 6461204
STUDENT: NOMHLE ORIENDA GUMBO
DEGREE: MASTER OF PUBLIC HEALTH
DEPARTMENT: HEALTH STUDIES, UNIVERSITY OF SOUTH AFRICA
SUPERVISOR: PROF ZZ KNOSI

ABSTRACT

Background and purpose. The purpose of the study was to determine the costs incurred on the average length of stay (ALOS) on patients with Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) related illnesses admitted in hospital and whether there are any other significant costs involved.

Method. A quantitative approach was used to collect data; analysed; interpretation and report writing. Purposive sampling and data collection was done using data collection sheet. This was a retrospective cost analysis data from in-patients records (record review) of ages from 15 years to 49 years both gender. Data analysis and presentation of information was presented by the use of tables; different types of graphs and the interpretation thereof.

Results. The study found that males (63%) with HIV Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) related illnesses had longer average length of stay in a hospital compared to females. However, females illustrated higher in-patient costs but majority of patients had costs of between R0–R17 500. Patients with longer hospital stay (>3 days of hospitalisation) had higher in-patient costs.

Conclusion. The findings also showed that in-patient care costs were directly proportional to length of stay with higher costs for HIV and AIDS patient management care. Our findings are consistent with other studies regarding higher economic implications of care for HIV infected persons being almost as twice as people who are HIV negative due to longer periods of hospitalisation.

Key words: HIV and AIDS; average length of stay; cost analysis; hospitalisation.

ACKNOWLEDGEMENTS

First and foremost I would like to express my deep gratitude to Professor ZZ Nkosi, my supervisor, for her patience, zeal, guidance, enthusiastic, encouragement, continuous support and useful critiques of my research work. Her willingness to motivate, passion and dedication contributed tremendously to my work.

I would like to extend my thanks to the University of South Africa, Northern Cape Provincial Health Research and Ethics Committee, Chief Executive Officer, Medical Director, for granting me permission to conduct my research.

Special thanks to the staff at the hospital, the three wards, record office and DHIS office where the study was conducted, who made it possible for me to access the information and offered me their resources to conduct my study.

My grateful thanks are also extended to Mr M Khumalo, for his technical assistance throughout my work.

Finally I wish to thank my husband, my sisters, my children and my colleagues, for their support and encouragement.

Dedication

To my late parents Mr and Mrs Nqabeni, my late brothers Mthobeli and Solwandle and my late sisters Nomazwe and Nomatyeba.

Your spirit have been with me all the way, you have been proud of the strides I have made in life.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ANNEXURES

LIST OF ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
ALOS	Average Length of Stay
ANC	Ante-Natal Care
CAP	Community Acquired Pneumonia
CEO	Chief Executive Officer
CHC	Community Health Center
DHIS	District Health Information System
GDP	Gross Domestic Product
GHI	Global HIV/AIDS Initiatives
IDP	Integrated Development Plan
HAART	Highly Active Antiretroviral Treatment
HAI	Healthcare Associated Infections
HCT	HIV Counselling and Testing
HIV	Human Immunodeficiency Virus
HSRC	Human Science Research Council
HST	Health Systems Trust
IMF	International Monetary Fund
LOS	Length of Stay
NDOH	National Department of Health
NIDS	National Indicator Data Set
PDE	Patient Day Equivalent
PDOH	Provincial Department of Health
PHC	Primary Health Care
PMTCT	Prevention of Mother-to-Child Transmission
TB	Tuberculosis
UNAIDS	United Nations Programme on HIV/AIDS
UNDP	United Nations Development Program
UNISA	University of South Africa
WHO	World Health Organization

CHAPTER 1

ORIENTATION OF THE STUDY

1.1 INTRODUCTION AND BACKGROUND

Human Immuno-deficiency Virus (HIV) causing Acquired Immune Deficiency Syndrome (AIDS) is one of the major public health problems with adverse effects on the socio-economic development of many countries, especially the least developing ones mainly found in the Sub-Sahara Africa (Mbuyazi, Mwisongo, Makundi, Pallangyo, Malebo & Mshana 2012:8). HIV and AIDS and its effect poses a very serious threat and continues to be a worry to human kind (Baratedi 2013:4).

Worldwide, 35 million people were estimated to be living with Human Immunodeficiency Virus (HIV) in 2012. The Sub-Saharan region remains to be the epicenter of the HIV epidemic accounting for nearly 70% of the total burden. HIV/AIDS is now the leading cause of death in South Africa and the Northern Cape Province is among the one of the province with an increasing HIV prevalence (Statistics South Africa 2013:37). An estimated 6.3 million people living with HIV were in South Africa, making the country the worst affected in the world. The prevalence rate of HIV in the Northern Cape was 17.5% according to antenatal survey which was conducted in 2013 in the Frances Baard District in South Africa. Frances Baard is the district where the study took place and it accounts for the highest HIV prevalence in the province with an estimated rate of 18.2% (NDOH 2013:64).

The hospital on which the study was conducted is situated in one of the district in the Northern Cape Province and the district has a total population of 382 807. According to the Integrated Development Plan (IDP 2014:6), Frances Baard District is divided into 4 sub-districts and has 2 district hospitals, 25 fixed clinics, 5 mobile clinics and 6 satellite clinics including 1 tertiary hospital which is where the study took place (IDP 2014:6).

The hospital has a quadruple status; it provides primary health care (PHC) services for the surrounding areas as the clinics are operational forty (40) hours per week and no services after hours and weekends. There are no Level 1 and Level 2 hospitals and the

tertiary hospital has its own status of providing tertiary services. The hospital has 775 active beds and Internal Medicine has 126 beds where the study was conducted. There are 33 different specialty disciplines which are all headed by qualified specialists. (NDOH 2013:64). The description of level1 and level 2 are as follows:

The District Hospital which falls under Level 1 provides the service package which includes trauma and emergency, in-patient care, out-patient visits, and paediatric and obstetric care. A limited number of level 2 services can be provided by larger district hospitals and these are provided by family physician, paediatrician, obstetrician/ gynaecologist and general surgeon. District hospitals are classified as small if they have less than 50 beds and not more than 150 beds, medium if they have 150 beds and not more than 300 beds and lastly large if they have 300 and not more than 600 beds. (NDOH 2013:64).

The Regional Hospital falls under Level 2 and the service package at this level render services at a general specialist level and receive referrals from district hospitals. They also serve as a platform for training of health workers and research. These specialist disciplines are general surgery, orthopaedics, general medicine, paediatrics, obstetrics and gynaecologist, family medicine, radiology and anaesthetic (IDP 2014:8).

The Internal Medicine Discipline has grown over the years due to the high demand of service delivery. A lot of successes and challenges had emerged especially with high demand of bed occupancy rate by HIV and AIDS related illnesses; this also has an impact on the morale of staff and very high turnover of professional nurses. There has been great improvement in the physical infrastructure of the wards; the department had procured high technology equipment. Health information systems (Nootroclin) was introduced at ward level and brought professional, effective and efficient ward management. There is also a multidisciplinary team which has been proven to be effective in managing patients holistically (IDP 2014:8).

Therefore the information on costs of treatment and care of these patients is necessary in order to have knowledge of how much cost is spent.The cost analysis gives a detailed information as how much the current budget is used in providing the costs on length of stay and provides a baseline information for health planners for future planning

(Meyer-Rath, Brennan, Fox, Modisenyane, Tshabangu, Mohapi, Rosen & Martinson 2013:323).

UNAIDS, WHO and the United Nations Development Programme have documented a correlation between the decreasing life expectancies and the lowering of gross domestic product (GDP) in many African countries with prevalence rates of 10% or more. Indeed, since 1992 predictions that AIDS would slow economic growth in these countries have been published. The degree of impact depended on assumptions about the extent to which illness would be funded by savings and who would be infected (Over 1992:35).

According to Over (1992:35), conclusions on the macroeconomic impact of AIDS on the Sub-Saharan economies of 30 countries over the period 1990–2025 were that the economic growth rates of these countries would be between 0.56 and 1.47% lower due to AIDS epidemic . The impact on gross domestic product (GDP) per capita was less conclusive. However, in 2000, the rate of growth of Africa's per capita GDP was in fact reduced by 0.7% per year (Clements, Coady & Gupta 2012:43).

The incidence rate of HIV in South Africa is 1.49 and is the lowest as compared to other neighbouring countries, which are Botswana, Swaziland and Lesotho (UNAIDS 2006). According to the annual antenatal survey conducted HIV prevalence amongst pregnant women attending public clinics excluding non-pregnant women showed that the HIV prevalence is at highest level at 29.5%. There are provinces which are affected most; the Kwa-Zulu Natal for example at 40.1% followed by Mpumalanga at 37.5%; Eastern Cape 31.4% Free State at 29.8% and the Northern Cape at 17.5% is amongst these provinces (NDOH 2013:23).

The burden of HIV and AIDS cannot be under-estimated, with the recent HIV Counselling and Testing (HCT) campaign which was launched in 2010; more than 90% of people were tested and the target was 115 753 and 107 306 (93%) were counselled and tested; and 11 531 (11%) were tested positive (DHIS 2014). The activities which were carried out included drawing of blood for CD4 count, screening for Tuberculosis and putting those eligible on antiretroviral (ARV) treatment, thus adding to the number of patients who were already on highly active antiretroviral treatment (HAART) (DHIS 2014).

The increased number of patients treated as outpatients and in-patients exert tremendous pressure and strain on health resources. The caring for HIV and AIDS related illnesses exert pressure on the limited resources (WHO 2012). HIV positive patients tend to be admitted more frequently to hospital due to their immunosuppressed state and this increases their risk of healthcare associated infections (HAI).The resulting HAI can lead to longer hospitalisation, economic burden and higher risk of mortality (Mitha, Furuya & Larson 2014:214)

South Africa has a total population of approximately 54.96 million (0.7% of the world's population). According to Statistic South Africa (2015:1), 6.19 million people are living with HIV (17% of global burden); 2.7 million of them are receiving antiretroviral treatment and these efforts have been largely financed from its own domestic resources. HIV prevalence for adult population (15−29 years) is estimated at 16.6%, and the overall population prevalence rate is 11.2%. The disease has impacted significantly on life expectancy which is currently 54.9 years for men and 59.9 years for women (Statistics South Africa 2015:1).

According to the National Department of Health (2015) there are 1 000 new infections and more than 1 000 AIDS-related deaths daily. According to the HSRC's National HIV Prevalence, Incidence and Behaviour Survey that was released in April 2015, the total number of infected South Africans were 1.2 million more than in 2008. Girls and women were the most affected by HIV and followed by the newly identified as key populations with higher risk of exposure: black African females between the ages of 20 and 24 years (at a rate of 31.6%), people who are co-habiting (30.9%), black African males between ages of 25 and 49 years (25.7%) disabled persons over the ages of 15 years (16.7%), high-risk alcohol drinkers over the age of 15 years (14.3%) and reactional drug users (12.7%) (HSRC 2015).

Over 280 000 people died of AIDS-related illnesses (HSRC 2015). The HIV and AIDS epidemic in South Africa also affects children in many ways. Estimates suggested that there are approximately 300 000 HIV-infected children and with 50 000 new infections occurring each year. HIV prevalence indicates the proportion of young people infected with HIV increasing significantly between childhood (2−14 years) and youth (15–24 years) suggesting that as children progress from childhood to youth their vulnerability to HIV infection increases substantially (Abdool-Karim et al 2014:29).

In 2012 an estimated 410 000 children aged 0 to 14 years were living with HIV. The study showed that there was a decline from 2002 to 2012 due to programmes which were put in place amongst others prevention of mother-to-child-transmission (PMTCT) and scaling up of retroviral treatment. There are also 2.5 million children who have been orphaned by HIV/AIDS. These orphans are vulnerable to HIV transmission as they are forced into sex in exchange for support and typically become sexually active earlier than other children (DOH 2014).

In many settings in AIDS stricken countries working conditions for health workers became so difficult, salaries very low and inadequate resources (equipment and shortage of staff). All these unfavourable conditions resulted in poor quality care though not evident and responsiveness of staff towards AIDS patients may suffer (Unger, Welz & Haran 2003; Shisana, Hall, Maluleke, Stoker, Schwaib, Schwabe, Colvin, Chauveau, Botha, Gumede, Fomundam, Shaikh, Rehle & Udjo 2003).

Despite the good political leadership under the auspice of Dr Motsoaledi, South Africa is still experiencing some challenges such as lack of knowledge and education especially in rural areas; low rate of condom use and sufficient distribution and early sexual debates and HIV-related risk behaviours.

The HIV/AIDS related burden of disease increases demand for medical care and in so doing it indirectly affects the health workforce in terms of emotional, physical and mental stress. Tuberculosis (TB) pneumonia and other opportunistic infections and malnutrition were all on the rise in the AIDS-stricken countries. Public hospitals carry the heaviest burden as witnessed by data on the HIV-related admissions and the length of stay. The HIV/AIDS-related admissions in all categories of hospitals increased by a factor of 7 (Shisan et al 2003). As a result 46% of patients admitted to hospitals were HIV positive and AIDS patients shown to stay longer (mean length of 13.7 days) than non-AIDS patients (mean length of stay 8.2 days) for all categories of hospitals combined (DHIS 2014).

According to Statistics South Africa (2013:37), HIV/AIDS is the leading cause of death in the province. Evidently the increased burden on hospital exerts an impact on morale and job satisfaction of health workers. HIV/AIDS patients are often brought to the

hospital at an advanced stage of illness, resulting to high inpatients deaths rates combined with limited possibilities of effective care contributed to professional frustrations, higher absenteeism; burn-out and low staff morale. The study analysed how HIV and AIDS related inpatient admissions have direct impact on the length of stay (LOS) from a cost perspective for patients in a public hospital in the Northern Cape.

1.2 RESEARCH PROBLEM

The impact of HIV and AIDS on health care sector is exacerbated by the factors which are secondary to HIV infections and these are the opportunistic infections (pneumonias and tuberculosis) and other HIV-related diseases. These are all adding pressure on health services which are already diminished and increasing demand on the limited resources. Information on costs of treatment and care of HIV and AIDS patients in health facility was necessary in order to give an idea of increasing number of AIDS-related admissions (Bachmann & Booysen 2003:3).

With the number of patients admitted per month thus cost the hospital exorbitant amounts of money for example number of patients multiply by number of days spent in hospital multiply by cost per patient admission (44*6* R3 500=R924 000), this was the total expenditure per month (DHIS 2014). This information on costs of admission of these patients in this health facility was necessary in order to guide the budget allocation and designed alternative cost effective programs and services for HIV and AIDS patients to curb admission to the wards. The burden of care and support has fallen heavily on the shoulders of impoverished rural communities, where sick family members return home when they could no longer work or care for themselves; community-based care has been promoted as the best option since it would be possible to care properly for hundreds of people dying from AIDS in public hospitals (Catumbela, Freitas, Lopes, Mendoza, Costa, Sarmento & Da Costa-Pereira 2015:7).

Health system in both public and private has become dominated by the needs of AIDS patients and there has been a consequent squeeze on resources for treating other illnesses. Socially the impact is devastating given the human cost of much illness and many deaths, while the rise in the number of orphans and breakdown of family structures poses challenges for both state and social support system. There were probabilities of increased poverty as households face reduction in income (as

breadwinners became sick and die) and increased in expenditure on medical related costs (Hansen, Chapman, Chitsike & Mwaluko 2000:2).

HIV/AIDS affects the size of the labour force, the availability of skills and productivity. It also affects the labour force and caused resources to be diverted. HIV/AIDS had impact on macroeconomic growth per capita incomes, savings, investment and employment. For government department HIV/AIDS had an adverse fiscal impact, as expenditure rose with higher spending on health care and social support, and revenues were affected by slower growth cited by (Hansen et al 2000:2).

1.3 AIM OF THE STUDY

The aim of this study was to determine the costs paid per patient admission and also established financial implications on the length of stay on patients with HIV/AIDS related illnesses who were admitted in the medical ward. The study will provide cost information for planning; give guidance on the budget allocation; design alternative cost-effective programs and services for patients with HIV and AIDS related illnesses instead of admitting them.

1.3.1 Research objectives

The study was guided by the following objectives:

- To determine the costs of length of stay in caring for HIV positive and AIDS patients admitted in hospital.
- To identify cost containment strategies in caring for HIV positive and AIDS patients.

1.4 RESEARCH HYPOTHESIS

Hypothesis is a statement of the researcher's expectations about the relationship between variables in other words is the predictions of expected outcomes. Most quantitative studies are designed to test hypothesis through statistical numerical analysis (Polit & Beck 2008:66). There are two forms of hypotheses (a) null and (b) alternative. A null hypotheses state that there is no relationship between the variables;

for example on the study the null hypothesis (H_0) is that there is no significance that HIV and AIDS patient admission has cost implications on the length of stay. Statistical hypothesis testing is basically a process of rejection and it cannot be demonstrated directly that the research hypothesis is correct, but using theoretical sampling distribution, it can be shown that the null hypothesis has a high probability of being incorrect (Polit & Beck 2008:587-588).

Alternative hypothesis (H_A) claims that the means are not the same and it is what you might believe to be true or hope to prove for example HIV/AIDS related illnesses exhibit significant cost implication on length of stay (LOS) (Polit & Beck 2008:588).

The hypothesis in the study is: Is length of stay a significant cost factor on patient admission in a public hospital?

1.5 SIGNIFICANCE OF THE STUDY

What is the envisioned significance of this study?

The baseline data will assist health planners to plan for future needs in terms of budget allocation for HIV management. The study will inform the hospital and the provincial department of health financial burden as the result of HIV and AIDS related illnesses.

The study findings will assist to address the economic issues exacerbated by HIV and AIDS. These include, public financing of health care services and assist the policy makers to make decisions about proper provision and financing for HIV related care costs.

1.6 DEFINITIONS OF KEY CONCEPTS

Acquired Immune Deficiency Syndrome (**AIDS)** is a cluster of diseases associated with loss of cellular immunity in adults who had no obvious reason for presenting such immune deficiencies (NDOH 2010:88).

Human Immuno-deficiency Virus (HIV) is the virus that attacks the body's CD4 cell (T cell) that leads to destruction of human immune system (NDOH 2010:88).

Economic impact of the disease (HIV and AIDS) is the macroeconomic effect on commerce, employment or incomes produced by a decision, event or policy. The total costs and benefits that a situation (length of stay) can have on the overall economy and in this case the budget of the institution. HIV has reduced the economic growth rate by 0.3%–4% per annum and it has also reduced the life expectancy and reverses the progress in economic development particularly through the decline of life expectancy. The macro-economic impact has a variety of factors that interplay; the direct and indirect costs related to HIV/AIDS might cause the shift from savings to current productive to the unproductive spending as a result this limit the fixed economic growths (Business dictionary.com).

Cost analysis: This is the breaking down of costs to the identification of current and anticipated costs associated with providing a service with an examination of the impact of those costs on the length of stay with the anticipation of break-even for the purpose of disclosing and reporting on condition subject to improvement (Huber 2006:758).

Cost-effectiveness analysis compares decision options in terms of monetary; for the study the cost analysis of HIV and AIDS related hospitalisation calculating the cost per patient admission (PDE). Cost-effectiveness analysis involves identification of costs for decision options and evaluation of these costs and in many cases determines health outcome decision options. Once the problem has been identified and the theoretical framework has been determined data on costs and outcomes are gathered therefore cost per patient admission is determined (Huber 2006:111).

Patient day equivalent (PDE) average cost per patient admission (inpatient days) and it monitors the effective and efficient management of inpatient facilities. This is a measure of the volume of patients seen in hospital also account for all the patients that do not spend a full day (from midnight to midnight) at the hospital as these day patients, out-patients and emergency room visits patients add to the workload of the hospital calculated in the equivalent number of 24-hours in-patients (WHO 2012).

1.7 OPERATIONAL DEFINITIONS

Average length of stay (ALOS): The average length of stay in hospital is a statistical calculation often used for planning purposes and measures the main outcome of the patient stay. It is calculated by dividing the number of inpatient days by the number of separations and expressed as number of days. The ALOS is a proxy measure for the quality of care received as well as of the efficiency of the hospital (NIDS 2015).

Total discharge days: This is the sum of the number of days spent in hospital for each inpatient who was discharged during the time period examined regardless of when the patient was discharged. The number of inpatients released (separations – transfers; discharges and deaths) from the hospital during the time period examined (NIDS 2015).

Total inpatient days of care: It is a sum of each daily inpatient census for the time period examined. For instance, if the period examined was a week the calculation is based only to 7days. As opposed to discharge days which count all days the patient was in the facility regardless of date of admission; inpatient days of care are days of service for those patients admitted during a specific time period (NIDS 2015).

1.8 THEORETICAL FOUNDATION OF THE STUDY

Theory is defined as interrelated set of constructs or variables formed into proposition or hypothesis that specify relationships among variables. Theory explains the phenomenal 'hypothesis of the study. Theories in research are in a form of interconnected hypotheses and are influences by the series of processes. Once the problem has been identified and the theoretical framework has been determined data on costs and outcomes are gathered therefore cost per patient admission is determined (Creswell 2014:52). Each branch of scientific enquiry is based on asset of theoretical perspectives or paradigms which consist of a set of assumptions on which the research questions are based (Bowling 2009:129).

1.8.1 Research paradigm

A paradigm is the way of looking at natural phenomenon that encompasses a set of philosophical assumptions that guides approach enquiry (Polit & Beck 2008:761). The

study will be guided by positivism which is a reflection of a broader cultural phenomenon that in humanities is referred to as modernism which emphasizes the rational and scientific nature. The approach assumes that the nature is basically ordered and that an objective reality exists and the epistemology is independent of human observation and the findings are not influenced by the researcher. Emphasis is on discrete specific concepts and the focus is quantifiable (Polit & Beck 2008:14-15).

1.9 RESEARCH METHOD

Quantitative research method, using exploratory descriptive statistics guided data collection for the study. The research project adhered to the retrospective study design in collecting information from the patient's records which met the inclusion criteria. The quantitative approach is a formal, objective, systematic process for obtaining quantifiable information and this data is presented in a numerical form analysed through the use of statistics. This method is used to describe variables and test relationship and also examine the cause-and-effect between variables (Burns & Grove 2005:23). Retrospective designs are popularly used in social sciences to investigate the social phenomena and are relevant in providing useful indications for future investigation (Bowling 2009:217).

1.10 ETHICAL CONSIDERATION

Confidentiality and anonymity were the only relevant ethical principles that guided the study. The study was not directly involved with the subjects but confidentiality, anonymity and respect were maintained as only patient's records were used. The researcher was only dealing with retrospective record review. For the purpose of confidentiality no names were disclosed and records obtained were kept under strictest confidence in a lockable cabinet. The findings from the records could not be traced to any person. Only the researcher and Senior Records Clerk had access to the files.

The Ethics Clearance was approved by Ethics Committee at University of South Africa (UNISA) (see annexure A). A letter and research proposal was submitted to the Provincial Review Committee (see annexure B), letter of approval from Provincial Health Research and Ethics Committee (see annexure C), letter to the Chief Executive

Officer and approval (see annexure D), letter to the Medical Director who is responsible for medical records and approval (see annexure E).

1.11 STRUCTURE OF DISSERTATION

Chapter 1: Overview of the whole study
Chapter 2: Literature review
Chapter 3: Methodology
Chapter 4: Presentation of findings
Chapter 5: Conclusion; limitations and recommendations

1.12 CONCLUSION

The purpose of this chapter was to provide an overview of the study that was conducted. The rationale, problem statement and objectives were clearly outlined.

The research design and methods used were identified and concluded with explanation of ethical principles that were adhered to throughout the study.

In chapter 2 the detailed literature review is presented.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The purpose of this chapter is to present the literature relevant to the topic of study. Polit and Beck (2008:757) define a literature review as the critical summary of the topic of interest prepared to put the research problem in context. The purpose of literature review is to present a strong knowledge base of what is already known about the research topic or project. This will provide a foundation on which to base new evidence (Polit & Beck 2012:58).

This chapter will bring extensive literature that was reviewed based on the title of the study. Databases that were consulted are PubMed, Academic Search Premier; EBSCO host; SABINET and other approved research dissertation and repositories.

The following key words were used to conduct literature search:

- Length of stay
- Cost analysis
- Economic impact
- Patient admissions

2.2 LENGTH OF STAY

The length of stay determines the number of days spent by a patient in a hospital for more than twenty four hours and is an indicator of the cost incurred by that particular patient. There are very few studies which were done in South Africa on the length of stay for patients admitted with HIV diseases such as Shisana et al (2003), Xaba, Greef and Becker (2014:189), Bachmann and Booysen 2006:14; Booysen and Van der Berg (2006:563) and Schoeman (2009:46).

The study done by Catumbela et al (2015:2) in Portugal examined the trends of HIV/AIDS- related in-patient admission, cost and length of stay (LOS).The findings demonstrated that the median (LOS) was 11 days and it was significantly higher in men than woman.

According to the study done by Mubyazi, Mwisongo, Makundi, Pallangyo, Malebo, Mshana et al (2012:8), they examined how the health services related to HIV/AIDS can also impose regressive cost burden with poor household spending. The findings estimated that length of stay by HIV/AIDS positive patients were longer than five (5) days compared to HIV negative patients. The impact of HIV/AIDS related burden of disease increased the demand for medical care. Public hospitals carry the burden as witnessed by data on HIV/AIDS related admissions, 72% of deaths were recorded at the study hospital. Cost analysis was difficult to determine the actual costs due to the missing data (Mubyazi et al 2012:8).

Gaugham, Mason, Street and Ward (2012:21) investigated variation in costs and length of stay (LOS) among ten clinical treatments. Their findings discovered that the length of stay was significantly longer for patients who were cared for by more than one doctor regardless of treatment received. Other findings suggested that all hospitals have scope to make efficiency in a small number of hospitals that have higher average costs or (LOS) across multiple treatments than their counterparts and this could not be explained by character of their patients or quality.

According to the study done by Thungjaroenkul, Cummings and Embleton (2007:255-256) which was to determine a systematic review of the effects of nurse staffing on patient outcomes including the length of stay (LOS) and costs, few studies reported that there was a relationship between nurse staffing, length of stay and costs. Their findings revealed that there is a relationship between sufficient staffing, quality patient care, the reduction on length of stay and decreased care cost (Thungjaroenkul et al 2007:255-256).

Schoeman (2009:46-52) did a study on the clinical spectrum and cost implications of hospitalised HIV-infected children; the aim was to describe the demographic patterns as well as cost implication and the length of stay. Findings suggested that the costs of hospitalising HIV-positive children is significantly more than HIV-negative controls,

which increased the financial burden on the already restricted health resources as the HIV positive children stay longer in hospital.

Xaba, Greef and Becker (2014:189) conducted a study on the determinants, outcomes of antibiotics in the treatment of community acquired pneumonia (CAP). HIV infection is a major risk factor for pneumonia that is why people with HIV disease were included in the study. The findings reported that HIV positive patients led to a slightly longer hospital stay after treatment with ceftriaxone vs amoxicillin-clavulanate, however, this was not statistically significant.

Okunji and Daniel (2015:110-118) examined the synergy between substance, alcohol abuse, HIV transmission and also the training of nurses in these institutions. People with mental and behavioural disorders were likely to be at high risk of HIV transmission. The study revealed that the effects of patients and hospital characteristics as it related to inpatients hospitalised with HIV/AIDS in 2007–2010. Most importantly was the difference observed in the ranking of length of stay (LOS) for the HIV/AIDS inpatients and increased number of nurses trained especially for the Bachelor's Degree (Okunji & Daniel 2015:110-118).

Lim and Tongkumchum (2009:25) conducted a study to investigate the length of stay (LOS) for patients who died in hospital in Southern Thailand from 2000 to 2003 with respect to principal diagnosis and demographic, geographic and hospital size factors. The results showed that patients with primary injuries had shortest LOS, whereas cancer patients had the longest LOS. Patients particularly females had the longest of all types of diagnosis (Lim & Tongkumchum 2009:25).

Van den Block, Deschepper, Drieskens, Bauwens, Bilsen, Bossuyt and Deliens (2007:69) conducted the study to describe hospital use in the last three months of life in Belgium and identify associated patient, disease and healthcare factors. The findings reported the increased percentage of patients hospitalised during the last week before they die (Van den Block et al 2007:69). The increased number of patients who were admitted in hospitals had a negative economic impact in the country.

2.3 ECONOMIC IMPACT

Booysen and Van der Berg (2005:109) examined health and economic impact of AIDS related illness on South African household. The impact of AIDS related illness on household income could be varied depending on the stage of illness and the identity of the person who is doing the caring. They also find out that the social grants mitigate the impact of AIDS illness and deaths; however such grants did not totally insulate household from income shocks (Booysen & Van der Berg 2005:109).

Bachmann and Booysen (2006:1861-1867) noted that the macro-economic impact of AIDS in South Africa had obvious negative economic consequences; household suffer from death of income earners and the erosion of savings and investment as resources are channeled into health care cost. This also have the worst impact on health care system as the public health care facilities should carry the burden of the disease (Bachmann & Booysen 2006:1861-1867).

According to Whiteside and Henry (2011:23), on a study that was conducted on the socio-economic impact of HIV/AIDS in Swaziland confirmed that HIV/AIDS affects economic growth by reducing the size of the labour force, by lowering efficiency, productivity, savings and investments. Furthermore, in the study conducted by Whiteside, Russell and Seeley (2010:24) which examined how HIV/AIDS can affect the economic growth on the physical, human capital accumulation and total factor productivity. Findings were that household level prolonged morbidity and mortality due to HIV/AIDS increased expenditure as a result of health care and funeral cost, reduced savings and income due to loss of remittances, loss of labour force and institutional memory. All these had direct and indirect economic impact on the labour force (Whiteside & Henry 2011:23).

The study done by Jefferis, Siphambe and Kinghorn (2006:207) showed how HIV/AIDS has an impact on government employees. The most visible impact was on increased morbidity and mortality, increased absenteeism, sick leaves, attrition and the new recruits affect productivity in the work place which also added to the economic impact and fiscal cost (Jefferis et al 2006:23).

According to Matshe and Pimhidzai (2008:33), the study they conducted was to examine the macro-economic impact of HIV and AIDS on the Zimbabwean economy on human capital approach. Findings were that HIV/AIDS had wide implication for Zimbabwean economy as it affected the economy's capacity to accumulate human capital stock, diminished labour supply as well as labour productivity. Using human capital approach, the results showed that HIV/AIDS led to a 13.32% of 1993's Gross Domestic Product (GDP). The increased morbidity and mortality have direct implications on the macroeconomic performance of Zimbabwean economy (Matshe & Pimhidzai 2008:33).

The multi-country study done by Carael, Marais, Polsky and Mendoza (2009:249) noted that the hospital services in Nairobi, Kenya had tremendous economic impact on hospitalisation due to increased admissions and premature deaths of employees due to HIV/AIDS related illnesses and loss of skills. In Cote D' Ivoire and Uganda 50% to 80% of hospital beds occupied were occupied by patients admitted with HIV/AIDS related illnesses. In Swaziland the average length of stay increased from 6.0 days to 30.4 day for patients who were co-infected having tuberculosis (TB) and HIV/AIDS (Carael et al 2009:249).

According to the study done by Shisana et al (2003) who examined the impact of HIV/AIDS on the health sector, the findings demonstrated that HIV/AIDS reduced the economic growth rate by 0.3–4% per annum. It has also reduced the life expectancy which reversed the progress in the economic development particularly through the decline of life expectancy. However in general it was difficult to assess the macro-economic impact of variety factors which are at interplay (Shisana et al 2003:25).

The study done by Langeni (2012:21) in Kwa-Dlangezwa was to investigate the economic impact of HIV/AIDS on the rural households. The study also investigated the hypothesis that AIDS had massive economic impact on families infected and affected by HIV/AIDS. At household level AIDS resulted in loss of income, assets, and savings; and also increased in spending health care cost. Other results revealed that seventy one (71%) of respondents believed that AIDS had a negative impact on the level of income and fifty seven (57%) believed that AIDS had a negative impact on assets and household (Langeni 2012:23).

The study conducted in Uganda examined the economic impact of HIV/AIDS (Jefferis et al 2006). Findings showed that there was a smaller increase in poverty rate by 6% from 37.7% to 43.7%. The long-term impact on households was loss of income by a breadwinner and impact on funeral cost; and another study which was done in Uganda by UNDP (2008) was to assess the macro-economic impact of HIV/AIDS (2008). The findings stated that HIV-1 infection has changed focus as a rapid lethal disease to a chronic manageable condition, compatible with very long survival. This had special implications on public health around the work as the work affect the cycle of economy and civil stability (UNDP 2008).

According to Mubyazi et al (2012:11) in study done in Tanzania on the analysis of cost impact of HIV/AIDS on the health services provision noted that HIV/AIDS caused 72% of all deaths that were recorded in hospital. The cost impact of HIV/AIDS to the health section has high demand on the minimal resources which were available (Mubyazi et al 2012:11).

According to the study done by Gow, George, Quinlan and Thurlow (2007:27) the aim of the study was to estimate the economic impact of HIV infection on the KwaZulu-Natal (KN) provincial economy. The economic assessment was not limited to household but also to other factors and institutions in an economy such as firms, markets and government. The findings reported a decline in the labour supply which was larger than in the population growth. Population growth fell by 1.06% whereas employment growth rate fell by 1.12% (Gow et al 2007:27).

Murzalieva, Aleshkina, Temirov, Samiev, Kartanbaevaeva, Jakab et al (2009:10) did a study with the purpose of determining the experiences of people from the Kyrgyz Republic on how global HIV/AIDS initiatives impact on the health care system. The main purpose of the research was to track the effects of the major global HIV initiatives. They reported that there was lack of knowledge and public awareness on transmission of HIV infections. They recommended strategies to intensify and improve knowledge (Murzalieva et al 2009:10).

The recommendations are as follows:

- Government to explore ways of increasing the amount of public spending on HIV/AIDS services.
- Improving coordination and cooperation among financing organisations.
- Unify current approaches to monitoring and evaluation from HIV/AIDS related activities (Murzalieva et al 2009:35). These recommendations are also relevant to the South African context in maximising the efforts on HIV/AIDS management.

Semigina, Griga, Bogdan, Pavlenko, Bandar, Nechiporencho, Schevchenko and Spicer (2008:8) conducted the study to explore the effects of global HIV/AIDS initiatives on the Ukrainian health system. The study focused largely on global funds to fight AIDS, TB and Malaria (Global Fund) which is the largest external funder of HIV/AIDS programmes. Recommendations were to review the system of distributing funds among sub-recipients; increased transparency and improved access to HIV/AIDS services (Semigina et al 2008:8).

According to Veenstra and Whiteside (2005:197), their study was to determine what would be the economic effects on the general population and the economic impact of HIV/AIDS. Their predictions were that costs associated on human capital were high due to HIV/AIDS epidemic. Prevention and treatment were the strategies they thought would save the government. Their findings revealed that health services were suffering under a dual burden of increased demand and reduced capacity to deliver which contributed to a cycle of poor health and economic decline (Veenstra & Whiteside 2005:197).

Tawfik and Kinoti (2003:21) examined the impact of HIV/AIDS on health system and the workforce in Sub-Saharan Africa. Their findings noted that there was an increased demand for health services as a result of the epidemic and the decrease in productivity were also due to ill-health and death of service providers (Tawfik & Kinoti 2003:21).

Russel (2004:1) did a study to measure the economic costs and consequences of illness for households focusing on malaria, tuberculosis (TB), and HIV/AIDS. He also examined the direct and indirect cost on the households due to illness and highlighted the need to increase health interventions. The findings were the direct cost burden of illness was catastrophic for households greater than 10%. The catastrophe that

accompanied HIV/AIDS meant that many households in the developing countries were struggling rather than to cope, and the viability was often threatened causing them to be impoverished through loss of income (Russel 2004:1).

2.4 COST ANALYSIS

Catumbela et al (2015:2-10) conducted a study on HIV disease burden, cost, length of stay in Portuguese hospitals from 2000 to 2010. The study was conducted to determine the costs, length of stay and impact of HIV-related admissions per year over a period of ten years and the results showed that there were variations over the years where there were reductions on the length of stay from 12 days to 10 days and thus resultant to reduction on costs (Catumbela et al 2015:2-10).

Hansen et al (2000:434) conducted a study on the cost of HIV/AIDS care at government hospitals in Zimbabwe and the findings showed that estimated costs per in-patient day as well as per in-patient stay in the government facilities were high. The costs per in-patient day and per patient day were estimated through a combination of two methods namely; bottom up costing methodology and through in-patient note review. The impact of HIV/AIDS-related burden of diseases increases the demand for medical care. Public hospitals carry the heaviest burden as witnessed by data on HIV-related admissions (Hansen et al 2000:434).

Nosyk, Sun and Annis (2014:546) did a study on the effects of homelessness on hospitalisation among patients with HIV/AIDS and the purpose of the study was to determine the effects of homelessness on the costs and patterns of hospitalisation in patients with HIV/AIDS. The results suggested that homeless people had a large proportion of total costs attributable to admissions for acute events related to progression of diseases (Nosyk et al 2014:546).

Drummond, Sculpher, Torrance, Brien and Stoddart (2005:3) wrote a book and their purpose was to develop the means of measurement and evaluation of health interventions and tools for patient data analysis in a decision-analytic modelling. Different methods were designed for example cost-utility which is the form of economic evaluation of the consequences of programmes adjusted by the state. This approach is useful for those health treatments or programmes that extend life only at the expense of

side-effects (Drummond et al 2005:3).HIV patients are exposed to different health treatments and programmes which are aimed at prolonging their life span

Guthrie (2003:29) conducted the study that focused on budget allocation and the analysis of actual expenditure against allocated amounts for HIV/AIDS. The findings revealed that South Africa had detailed quarterly reports on expenditure which were published by the national treasury. There were cases where actual disbursements were being lower than the amounts of the originally allocated in budgets (Guthrie 2003:29).

Hutton, Wyss and Diekhor (2003:117) conducted the study to identify the most cost-effective options for HIV control. This study was done in Chad as well as in most sub-Saharan African countries. The findings demonstrated that HIV poses a massive public health threat as well as economic burden with prevalence rates estimated at 9%. Recommendations were peer education and screening of blood donors. In order for the countries to reduce HIV, the prevention and control strategies should be introduced gradually and in phases (Hutton et al 2003:117).

In a paper by Seshamani and Gray (2004:556) to obtain well-founded estimates of the effects of demographic change on future health expenditures, the findings revealed that the expenditure projections had to examine the effects of age on health care costs but this study failed to account the influence of future life expectancy. There was a decline in age-specific mortality rates over time which postpone death to later ages, pushing back death-related costs. The study also strongly confirmed that the pressure of population increases and aging of demographic structure on hospital expenditures would particularly countered by postponement of death-related hospital costs to later in life (Seshamani & Gray 2004:556).

Thomas, Manning, Holmes, Naidoo, Van Der Linde, Gray and Martinson (2007:410) conducted a comparative study in one of the hospitals to determine the cost incurred in carrying for HIV infected versus un-infected adults and children. The findings were that the length of stay (LOS) and intravenous fluid utilisation of HIV-infected adults and children were greater than those who were not infected (Thomas et al 2007:410).

2.5 PATIENT ADMISSIONS

Hajiabdolbaghi, Jafari, Mansouri and Yaghoobi (2014:546) conducted a study to determine the causes of hospitalisation and its related factors in HIV/AIDS patients. Patients with opportunistic infections had significantly lower CD4 counts and longer hospitalisation than other diseases. Their findings reported that the most hospitalised HIV/AIDS patients in the study period were men with a history of intravenous drug users (IDU) and CD4 count less than 200 .These were patients who were at an advanced stage of AIDS and most prevalent cause of admissions were opportunistic infections of pulmonary tuberculosis (TB) (Hajiabdolbaghi et al 2014:546).

Govender, Mabuza and Ogunbanjo (2015:1) conducted a study on the characteristics of HIV and AIDS patients with deep vein thrombosis. The aim was to present a profile of HIV and AIDS patients who developed deep vein thrombosis (DVT) in their primary care in a ward. Their findings reported that patients who are HIV positive are likely to develop DVT due to their susceptibility to a hyper-coagulation state including lower protein S-Levels. The mean duration of stay was 14.1 days versus 4.0 days in those who were HIV negative (Govender et al 2015:1).

2.6 DIRECT AND INDIRECT FACTORS

There are various factors associated with HIV/AIDS, impact on household, decline in labour supply and total population due to HIV/AIDS related mortality which affects the economically active population. HIV/AIDS is believed to be responsible for slowing the economic growth of the gross domestic product (GDP) by more than 1% and large portions of budget and expenditure are directed at health care programmes (Whitefield et al 2010:44).

Legislation as well as rules and regulations are depending on the availability of political will and strong management system for the implementation. New demographics and health needs require changes in the delivery of health care; these have impact on the delivery of health. Direct and indirect costs and losses to the both private and public sector due to HIV/AIDS included experiencing higher expenditure due to health care costs and payment of other employee benefits as well as absenteeism and high staff-turnover. Other factors were loss of skills due to ill-health or death resulting to low

morale to the remaining workers which resulted in increased household's expenditure (Booysen, Le, Geldenhuys & Marinkov 2003:6).

2.7 CONCLUSION

The chapter discussed the literature review conducted for the study. Various articles were reviewed covering length of stay (LOS), the economic impact of HIV/AIDS and cost analysis. Most of the articles which were reviewed showed that there was a link between all three variables of the study. In chapter 3 the research design and methodology will be discussed in detail.

CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

Research methodology is a detailed discussion of the actual application of the design. It describes the methods, techniques and procedure that are used in the process of implementing the research design (Streubert-Speziale & Carpenter 2011:366). Research design and methodology of this study included population, sampling and sample, data collection and analysis; data collection instrument and ethical considerations. Patient's folder numbers were obtained from admission books in the three wards and an audit conducted in order to determine the length of stay. The study reviewed the cost incurred by patients with HIV and AIDS related illnesses on in-patient days (PDE); and this is an institutional based retrospective data analysis to determine the costs in one of the hospital in Northern Cape.

Data on expenditure was collected per month over a period of one year and put on the data sheet designed for cost analysis and determine the number of days the patient spent in hospital (length of stay).

The study approach is quantitative, which is a formal, objective, systematic process for obtaining quantifiable information and this data is presented in a numerical form analysed through the use of statistics. This method is used to describe variables and test relationship and also examine the cause-and-effect between variables (Burns & Grove 2005:23). The study is on cost analysis of economic impact of HIV and AIDS on the length of stay .The importance and characteristics of quantitative research are the following:

- It is more reliable and objective and can use statistics to generate findings.
- It looks at relationships between variables and can establish cause and effect in a highly controlled circumstances.
- It tests theories and hypothesis.

- It assumes that a sample is representative of population; subjectivity of researcher is recognised less and employs closed-ended questions, predetermined approaches and numerical data.
- Uses standards of validity and reliability; lastly uses unbiased approaches and employ statistical procedures.
- It is an excellent way of finalising results and proving and disproving a hypothesis. Experiments can be difficult and expensive; and require a lot of time to perform (Creswell 2014:18).

3.2 RESEARCH DESIGN

Retrospective document review is a study design that was used to collect data from patient's records which are an existing data that have been recorded. Retrospective document review are often called "chart reviews" because the data source are the medical records and are collected at one point in time. Retrospective study has three general types; case reports, case series and case-control. It can help focus the study question, clarify hypothesis, determine the appropriate sample size and identify the feasibility issues for prospective study (Polit & Beck 2008:342). This design was chosen because it is relatively easy, cheaper and economical to conduct. It is also cost effective, quick and a wide range of information may be collected. The design is useful for evaluating the relationship between exposures that are relatively fixed characteristics of individual and outcome (Abdool Karim et al 2007:144). Both exposures and outcome are determined simultaneously for subject as snapshot of the population at a certain point in time (Gordis 2008:28). The study design was limited to patients who were admitted with HIV-related illnesses from 1 April 2014 to 31 March 2015.

3.2.1 Advantages of retrospective

The method is inexpensive as it is uses existing records and allows studies of rare occurrences. It is easier to assess conditions where there is long latency between exposure and diseases; and can generate hypothesis that is then tested prospectively (Polit & Beck 2008:272-273).

3.2.2 Disadvantages of retrospective

It relies on accuracy of written record or recall of individuals and the important data may not be available. It is also difficult to control bias and cofounders, no randomisation, no blinding; maybe impossible to access. The important information is restricted by statute or institutional regulations and it is difficult to establish cause-and-effect (Polit & Beck 2008:272-273).

3.3 MEASUREMENT

Measurement is often regarded as being only means by which observations are expressed numerically in order to investigate the causal relations or association. It is argued that within quantitative research, the results that are shown can be strange. When measurement departs from theory it is likely to yield mere numbers and their neutrality makes them particularly sterile as a source of remedial suggestions. But numbers register the departure from theory within an authority and finesse that no qualitative technique can duplicate and that departure is often enough to start a search (Polit & Beck 2008:580).

3.4 SETTING AND POPULATION OF THE STUDY

3.4.1 Study area/setting

One hospital was selected for cost analysis on the length of stay and only in the medical wards with inpatient admissions including patients with HIV and AIDS related illnesses. This hospital is based in the Northern Cape and is the only tertiary institution in the province.

Population is the entire aggregation of cases in which the researcher was interested in for example the study population were all patients aged 15 to 49 years admitted with HIV and AIDS related illnesses for the period of one year from 1 April 2014 to 31 March 2015. There are three medical wards where the study took place with a bed capacity of 126 and an average of 35% of patients are admitted with HIV and AIDS related illnesses per month (DHIS 2014). Population is not restricted to human subjects, a population might consist of hospital records or files and the population comprises the

entire aggregate of record review of all patient's files admitted with HIV and AIDS related illnesses aged 15 years to 49 years both males and females. The criteria that specify population characteristics are referred to eligibility criteria or inclusion criteria. Sometimes a population is defined as not having the same characteristics thus stipulating the exclusion criteria (Polit & Beck 2008:337-338).

3.4.2 Sampling and sample

The retrospective study can help to focus the study question, clarify the hypothesis, and determine an appropriate sample size. This is a hospital-based study focusing on clinical record review and the study population patient's files admitted with HIV and AIDS related illnesses both gender ages 15 years to 49 years.

Sampling is the process of selecting a portion of the population to represent the entire population so that inferences about population can be made and a sample is a subset of population elements. An element is the most basic unit about information is collected. A key consideration in assessing a sample in a quantitative study is its representativeness. A representative sample is one whose key characteristics closely approximate those of the population to be studied (Polit & Beck 2008:142).

Sampling designs are classified as either probability or non-probability sampling. Probability sampling involves random selection of elements and is more respected because greater confidence can be placed in representativeness of probability sampling. A good choice of study subjects serves the vital purpose of ensuring that the findings in the study accurately represent what is going on in the population of interest (Hulley, Cummings, Browner, Grady & Newman 2012:27). In non-probability samples, elements are selected by non-random methods and there is no way that each element has been included; not every element has a chance of being included (Polit & Beck 2008:337-339).

The sample of the study were patients records from 01 April 2014 to 31 March 2015 were entered on the data collection sheet and the sample size met the inclusion criteria the formula below calculated the sample size:

Sample size: To determine the required sample size for the study the formula that was used is as follows:

$$\frac{n = 2\,(s)^2\ \ (z^{oc}\ + z\beta\ )^2}{(MDC)^2}$$

The value of *n* determined the number of admissions which were selected three hundred (300) and the sample size of 35% of the number of admissions = one hundred and five (105) admission files so proportional allocation to each stratum was applied and the 35% was considered in this study. This is a quota sampling as the researcher determined how many participants were required for each stratum (Polit & Beck 2008:342).

The sample reflects the true proportion in the population of individuals with certain characteristics (Creswell 2014:158). Methodologists have written discussions about underlying logic of sampling theory (Polit & Beck 2008:342). There were essential aspects of population based on two variables gender and medical diagnosis, the focus was to look into patient's records of admitted with HIV and AIDS related illnesses and a total population of 300 files were purposefully selected. Only one file was excluded as the gender was not specified., leading to the sample size of 299 For cost analysis only 105 patient's files were audited and met the inclusion criteria (Polit & Beck 2008:342).

3.4.3 Data collection methods and procedures

The capacity of a retrospective study to adequately detect change and ascertain causes depends on how well the investigator can reconstruct the past from the vantage point of the present. The main purpose for collecting retrospective data is that such data provide a means of measuring change for either descriptive or explanatory purposes.The research seeks to describe the current status of an identified variable which is "Cost analysis". The research was designed to provide systematic information about the phenomenon.The data on cost of average length of stay (ALOS) was collected through the following:

1. A patient record review instrument was developed for data collection on the length of stay.

2. Administrative record review: data on full year's hospital capital and recurrent cost for **1 April 2014–31 March 2015.** The information was gathered from administrative section (fees office) of the hospital; admission books; midnight statistic book and Nootroclin (inpatient information management system).

3.4.3.1 Data collection

The daily statistics book gave detailed information about patient's demography age; gender; date of admission and discharged date and these gave an indication of how many days the patient spent in hospital; reasons for admission (diagnosis).

Confidentiality was maintained by using folder numbers instead of patient's names.

The study design had incorporated sample randomisation of 105 patient records as per inclusion criteria, the data was included as a sample and data collection sheet was developed to collect the information (see annexure F).

The inclusion criteria were as follows:

Only patients admitted with HIV-related illnesses aged 15 years to 49 years, admitted between the period of 1 April 2014 and 31 March 2015.

A data collection instrument was developed to collect and record information such as folder numbers; gender; date of admission and discharge to determine the number of days spent in hospital and lastly individual costs. Instrument development was guided by extensive literature research and the final product was verified by the supervisor. Existing records are regarded as the important data source; hospital records; patient's charts; physician's examination sheet where the patient's diagnosis is recorded. Pre-existing records also permit on examination of trends over-time (Polit & Beck 2008:367-368).

This is a tertiary hospital with quadruple status as it was mentioned in chapter 1 and has 768 usable beds. The area where the study took place was the three medical wards with 126 usable beds. The study sample or patient's records were selected based on the inclusion criteria.

Date of admission

This offered the statistical observations to determine date of entry in the hospital setting. Information on date of admission from patient's files offered insight on the prevalence of HIV and AIDS related illnesses.

Date of discharge

This offered the statistical observation to determine the number of days the patient spent in hospital (inpatient days and patient day equivalent (PDE) which determines mathematical calculation of the cost per patient admission). Data collection was limited to the length of stay.

Essential data was extracted from administrative records (admission books; midnight state books and Nootroclin information system) retrospectively and filled in a format developed for the purpose of the study. The extracted data was collected, entered into a data sheet and analysed in tool which was designed for the purpose. The cost per patient admission was determined by estimating the cost per patient day equivalent (PDE), patient day equivalent is an average cost per inpatient admission (inpatient days) and it monitors the effective and efficient management of a facility. PDE also measures the volume of patients seen in the hospital also account for all patients who do not spend a full day (from midnight to midnight) at the hospital as day patients, out-patients and emergencies add to the workload of the hospital calculated in the equivalent number of 24-hours in-patients .

3.4.3.2 Internal validity

As validity is concerned with the soundness and effectiveness of the measuring instrument (Polit & Beck 2008:345), it must be asking whether the measuring instrument measures what it is intended to measure or not, and the degree of accuracy of the measurement. Internal validity of the study is the extent to which its design and data yields and allows to draw accurate conclusion about cause-and-effect and other relationship within the data. The specific intent of internal validity is to identify cause-

and-effect relationship; in this project is to determine whether HIV and AIDS related illnesses has a significant cost effects on the length of stay (LOS).

3.4.3.3 External validity

It means the degree to which the results of the study can be generalized to other people and or other research settings. The study results apply beyond the study itself (Babbie & Mouton 2007:87). External validity concerns the representativeness of the study; the 300 patient's files which were retrieved represent the population of people admitted with HIV/AIDS related illnesses. After data collection has been completed and the results are generalised, the findings can be more readily applied to a broader group (Polit & Beck 2008:302).

3.4.4 Data summary collection sheet

The data sheet was developed to collect information from 01 April 2014 to 31 March 2015. The design of the sheet had the following information: folder number; gender both males and females; date of admission; date discharged; these dates determined the number of days spent in hospital and total costs. According to the audit the patient's files were suggestive of 6.9 as the mean number of days per admission and the total costs. These were calculated cost per PDE per patient admission which was R2 957.10 (DHIS 2014) and the cost of calculation used was R3 500 an average mean cost.

3.4.5 Descriptive statistics

Approaches of total cost determination for the average length of stay and average cost was calculated for each individual patient with HIV and AIDS related illness admission.

Unit cost based: the cost information was available only on an aggregate basis for three medical wards. The aim of the unit cost was to allocate the hospital costs to care centers such as wards. Therefore to estimate the average costs per in-patient was a combination of two different methodologies.

The main outcome measure was the average length of stay and cost per patient admission. The mean length of stay is 6 days and the mean cost per patient is R3 500.

The analysis of the cost on the length of stay was calculated through the use of patient day equivalent (PDE) cost calculation formula to indicate a general economic understanding on individual cost for an average length of stay per admission.

In-patient:
Total cost in-patient admission (TC) = (B) – average inpatient days
PDE = R3 500 * ALOS = 6 days = S = 105

Formula:
C = Total Hospital Cost – R3 500
L = Length of Stay – 6 days
S = Percentage of sample − 105

The cost per patient day was calculated on the basis of daily bed returns in the ward as inpatients.

3.4.6 Data analysis

Data captured was cleaned first before entered on the spreadsheet. It was analysed using both statistical NCSS10 software and manually. Results are presented in figures, tables and frequencies. An extensive data analysis report is shared in chapter 4.

3.4.7 Ethical considerations

The study involved records as a sample but the ethical principles were observed by the researcher. There are three primary ethical principles on which the standard ethical conduct in this research is based.

- Beneficence − this is the principle which imposes an obligation for researcher to minimise harm and maximise benefit.
- Respect for human dignity − this ethical right has two guiding principles self-determination and full disclosure. Self-determination means that the participants are voluntarily participating to the study without being coerced and full disclosure is where the researcher fully describes the nature of the study to the participants.

- Justice − this principle of justice connotes fairness and equity; participants have the right to fair treatment and the right to privacy.

There are procedures that are used to protect the participants when conducting a research.

Confidentiality procedures

Confidentiality through the use of folder numbers in collecting/retrieving folders was maintained throughout the study. Only the researcher and the Senior Administrative Clerk had access to the files. All retrieved files were kept in a lockable office.

Anonymity

This is the most secure means of protecting confidentiality where the researcher cannot link the participant from the data collected (Creswell 2014:92-98). On the data collection sheets only the folder registration numbers that were used to retrieve patient's files folders. To maintain confidentiality a promise of confidentiality each researcher has an obligation to honour this, the information could not be shared with strangers, family members or any other person who was not involved in the research.

There were steps that the researcher took to ensure that breach of confidentiality did not occur.

Information for the study was obtained by the use of folder registration numbers that were not linked to names or surnames. An identification number was arranged to each participant's folder. All files retrieved were kept in a lockable office and only the researcher and Senior Administrative Clerk had access. Access was restricted to the Record Clerks who retrieved the folders from the record office and other staff members did not have access to the contents of the file/folder. The Senior Record Officer ensured that the Record Clerks retrieved files using folder/registration numbers only. The registration folder numbers were used for the manual filing system at the hospital.

The Ethics Clearance was approved by Ethics Committee at University of South Africa (UNISA) (see annexure A). A letter and research proposal was submitted to the Provincial Review Committee (see annexure B), letter of approval from Provincial Health Research and Ethics Committee (see annexure C), letter to the Chief Executive Officer and approval (see annexure D), letter to the Medical Director who is responsible for medical records and approval (see annexure E). Identification of files when recording made use of codes or folder numbers. The study was not directly involved with the subjects but confidentiality, anonymity and respect were maintained as only patient's records were used. The CEO was informed in writing about the purpose of the study; and what the researcher was intending to do.

For the purpose of confidentiality no names were disclosed, records obtained were kept under strictest confidence in a lockable cabinet and only the researcher and Senior Records Clerk had access to the files. Identification of files when recording made use of codes or folder numbers.

3.5 CONCLUSION

This chapter focused on research design and methods, data collection and data collection tool, setting and population of the study, data analysis and the ethical considerations. In chapter 4, presentation of the findings will be discussed in details.

CHAPTER 4

PRESENTATION OF FINDINGS

4.1 INTRODUCTION

This chapter discusses the data analysis and interpretation of the results. Data analysis is a process of bringing order, structure and meaning to the mass collected data and transforms data into findings (De Vos, Strydom, Fouché & Delport 2005:337). The purpose of this study was to determine the costs paid per patient admission and also established financial implications on the length of stay on patients with HIV/AIDS related illnesses who were admitted in the medical wards.

In order to achieve the purpose the objectives of the study were:

- To determine the costs of length of stay in caring for HIV and AIDS patients admitted in hospital.
- To recommend cost containment strategies in caring for HIV and AIDS patients.

4.2 DATA MANAGEMENT AND ANALYSIS

Data analysis was done using both statistical NCSS10 software and manually. The sample of the study was 299 patient's records and only 105 audited files were included in the cost analysis sample. The study contains of two sets of data, which will be presented as per analysis. The numerical data were presented in the form of tables; graphs and descriptive statistics. The sample was large enough to calculate standard deviations from the mean or confidence intervals and also gave how many variations were there (Creswell 2014:162-164). Coding of inpatient admission and discharge dates were done as recorded in the patient files. The average length of stay in a hospital was calculated using date of admission and the date the patient was discharged from the hospital. Individual age of patients was not collected instead it was clustered as 15 to 49 years and also data on CD4 strata was incomplete for analysis purposes.

4.3 RESULTS

4.3.1 Patient characteristics

All patients in this study were individuals of both gender (15–49 years) HIV positive, however, the status of antiretroviral treatment enrolment was not investigated or recorded due to the fact that during the record review there was minimal information recorded.

The majority of study participants were males 66 %(n=197) as compared to females 34% (n=102). The gender of the patients is shown in Table 4.1.

Table 4.1 Gender (N=299)

Gender	Number	Percentage (%)
Male	197	66 (59.82-70.65%)
Female	102	34 (29.03-39.83%)
Total	**299**	**100.0%**

4.3.2 Average length of stay

The average length of stay in hospital is a statistical calculation often used for planning purposes and measures the main outcome of the patient stay. It also refers to the average number of days when the client is admitted in hospital before discharge. It is a proxy indicator because ideally it should only include inpatient days for those clients separated during the reporting month and it is used in all hospitals and Community Health Centres (CHCs) with inpatient beds (NIDS 2015). The majority of participants (58.53%) stayed in hospital between 1-3 days followed by 20.40 % staying between 1-9 days. Only 1% of participants stayed more than 13 days in hospitals. The median length of stay (LOS) for all patients was 3 days [Interquartile (IQR): 1–5] as indicated in Table 4.2.

Table 4.2 Average length of stay in hospital (ALOS) (N=299)

Average length of stay in hospital	Percentage (%)	
1-3 days	58.53	(52.83-64.01)
1-6 days	17.39	(13.48-22.14)
1-9 days	20.40	(16.19-25.38)
1-12 days	2.68	(13.38-52.79)
13 days	1.03	(3.32-30.83)

The general recurrent inpatient day costs were obtained from the hospital electronic billing system that uses a computed standard formula to estimate daily average costs. The total costs of patients admitted due to HIV related illnesses was calculated based on the standard costing provided by the hospital, with the costs recorded to be 2,691,500 for all 105 patients included in the study. The average (arithmetic mean) of total costs amongst the study population was R1597.32 (see Table 4.3).

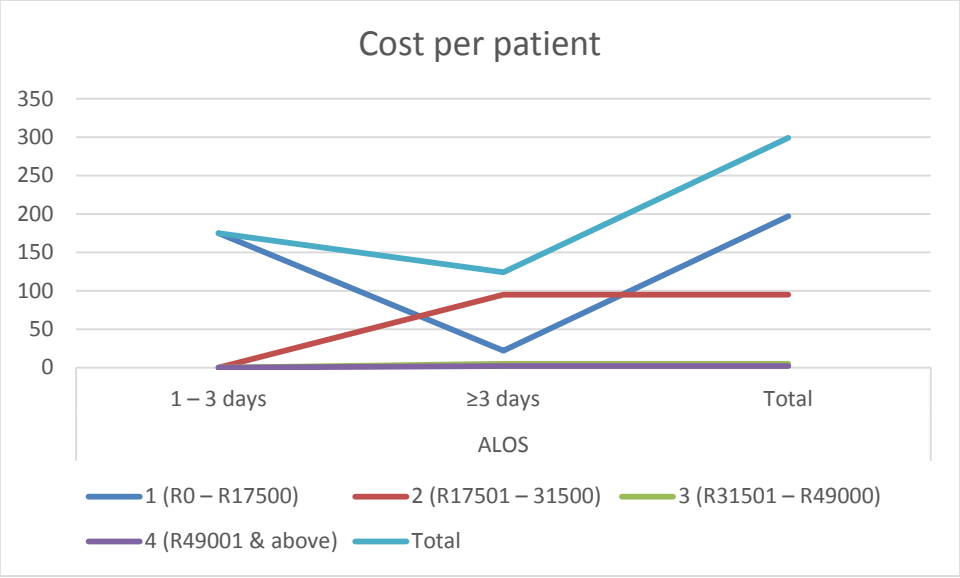


Figure 4.1 Cost per patient

4.3.3 Patient costing

The calculation was done based on the information which is reflecting on the data sheet. Out of 300 sampled patient folders a total of hundred and five 35% (105)

patient's folders were audited individually to ascertain their credibility for the study. The total number of days (length of stay − LOS) spent during the patient's hospitalisation of all who were admitted with HIV-related illnesses/diseases aged 15 to 49 years over a period 1 year. These patients spent 769 days at a unit cost expressed as the patient day equivalent (PDE) of R3 500. PDE is an indicator measure on how the available resources to the hospital are being spent and is a marker of the efficiency of the hospital as a whole. It is a composite marker in that it links financial data with related service data from hospital admissions and out-patients. The indicator measures the average cost per patient per day and is expressed in the South African currency (Rands) per patient day equivalent. Cost per patient day (PDE) reflects the efficiency of the hospital whether that particular hospital is being optimally managed. The cost per patient was directly proportional to increase in length of stay as indicated in Figure 4.1.

Table 4.3 Cost calculation (N=105)

Number of days	Total	Unit cost	Total cost
8*23	184	3 500	644 000
18*1	18	3 500	63 000
10*2	20	3 500	70 000
6*30	180	3 500	630 000
18*1	18	3 500	63 000
23*1	23	3 500	80 500
5*1	5	3 500	17 500
11*1	11	3 500	38 500
14*1	14	3 500	49 000
4*1	4	3 500	14 000
7*34	238	3 500	833 000
105	787	3 500	2 691 500

Summary:

Number of days spent in hospital (LOS) x Patient Day Equivalent (PDE)

= 769 x R3 500

Total = R2 691 500

This is the amount of money which was spent for only hundred and five (105) patients who were admitted over a period of one year. From 105 patient files the total expenditure was R2 691 500, it is evident that there was increased number of days spent and the cost incurred increased (see Table 4.3).

4.3.4 Cost analysis

Only 105 audited patient folders were included for cost analysis. The cost analysis was done based on the number of files that were audited based on the average length of stay and the patient day equivalent. Cost-effectiveness analysis compares decision options in terms of monetary. For this study the cost analysis of HIV and AIDS is related to hospitalisation when calculating the cost per patient admission.

Cost-effectiveness analysis involves identification of costs of decision options and evaluation of these costs and in many cases it determines health outcome decision options. Once the data on costs and outcomes had been identified then cost per patient admission was determined.

4.3.5 Bivariate analysis

Bivariate analysis between ALOS and cost intervals showed that patients who stayed between 10–13 days in a hospital due to HIV and AIDS related conditions/illnesses had significantly higher hospitalisation costs compared to those hospitalised for less than four days. This pattern of increasing in-patient costs per length of stay is to be expected for several reasons. One of the reasons is that tertiary hospitals are intended for treatments that are complex and severe medical conditions requiring more sophisticated care with high costs.

Table 4.4 Bivariate analysis between gender and average length of stay (N=299)

Gender	**Average Length of Stay (ALOS)**		**Total**
	1-3 days	**>3 days**	
Female	51 (50%)	51 (50%)	102
Male	124 (63%)	73 (37%)	197
Total	**175 (59%)**	**124 (41%)**	**299**

Bivariate analysis between ALOS and gender demonstrated that the majority of males spent 1-3 days as compared to females who had an equal number for both categories Approximately 50% of females (51 of 102), had an average length of stay between 1–3

days in a hospital compared to 63% (124 of 197) of males. However, this difference in average length of stay (ALOS) by gender was statistically different (p-value=0.0062).

Table 4.5 Measure of association between gender and in-patient costs (N=299)

Gender	Cost intervals					
	R0-R17 500	**R17 501-R31 500**	**R31 501-R49 000**	**>R49 001**	**Total**	**P-value**
Females	56	41	4	1	102	0.006
Males	141	54	1	1	197	
Total	**197**	**95**	**5**	**2**	**299**	

Comparative analysis of in-patient costs and gender illustrates that a higher proportion of patients amongst females had costs of more than R31 501 compared to males. This is due to a higher number of female patients who stayed longer in hospital. The difference of females having higher in-patient costs was statistically significant with a p-value of 0.006 ($P \leq 0.05$).

Table 4.6 Analysis of frequency costs (N=299)

Costs	Frequency	Percent (%)	
R0-R17 500	197	65.89%	(60.29–71.07%)
R17 501-R31 500	95	31.77%	(26.72–37.30%)
R31 501-R49 000	5	1.67%	(6.94–39.73%)
R49 001-R80 500	2	0, 6%	(1.66–26.55%)

Table 4.6 shows different values with different cost categories. The majority of participants 65.89% (n=197) costed the hospital from R0–R17 500 as compared to. 31.77 %(n=95) who costed the hospital from R17 501−R31 500 and followed by the cost from R31 501–R49 000 by 1.67% (n=5). Lastly the costs are R49 001–R80 500 (n=2) and this account for 6.69% of total sample.

Table 4.7 Analysis on ALOS and cost intervals (N=299)

ALOS	COST INTERVALS				TOTAL
	R0-R17 500	R17 500-R31 500	R31 500-R49 000	≥R49 001	
1-3 days	175	0	0	0	175 (58.5%)
4-6 days	22	30	0	0	52 (17.3%)
7-9 days	0	61	0	0	61 (20.4%)
10-13 days	0	4	5	2	11 (3.6%)
Total	**197**	**95**	**5**	**2**	**299 (100.0%)**

The majority of the participants 58.5% (n=175) spent 1-3 days as compared to 20.4% (n=61) who spent 7-9 days and 17,3% (n=52) who spent 4-6 days in hospital as detailed in Table 4.7 . The huge number (n=197) on the length of stay cost the hospital attribute large amount of money (197 x R3500=R672 000) and this has been calculated as a single episode.

4.4 DISCUSSION

The study was conducted within the Tertiary Hospital (public facility). The inclusion criteria were files of patients admitted with HIV and AIDS related illnesses within ages 15–49 years. The hospital has 775 active beds and Internal Medicine has 126 beds where the study was conducted. The study approach was retrospective with some files becoming untraceable due to loss or transfer of patients to the primary health care facilities. A total of 300 patient folders were reviewed as part of the study, but only 299 were included in the sample. For costing analysis, 105 files were included as they were audited for accurate costs. The data consisted of two sets, the 299 and 105 figures.

4.4.1 Patient characteristics

All patients in this study were individuals of both gender (15–49 years) HIV positive, however, the status of antiretroviral treatment enrolment was not investigated or recorded due to the fact that during the record review there was minimal information recorded. The majority of study participants were males with male-to-female ratio of 1.91 (195/102). The findings are in contrast with Sia, Onadja, Nandi, Foro and Brewer (2013:8) who stated that within the Sub-Sahara region, women as compared to men

are disproportionately at risk of acquiring HIV although gender inequalities varies by countries. Again, in the study by Mitha et al (2014:215) there were more males (65.2%) than females (34,8%) who were HIV positive

Individual age of patients were not collected instead they were clustered as 15 to 49 years. The data on CD4 strata was incomplete for analysis purposes as in the majority of sampled patient folders the CD4 results were not recorded, hence the researcher did not analysed CD4 counts.

4.4.2 Inpatient costs

The general recurrent inpatient day costs were obtained from the hospital electronic billing system that uses a computed standard formula to estimate daily average costs. The total costs of patients admitted due to HIV related illnesses was calculated based on the standard costing provided by the hospital, with the costs recorded to be R2 691 500 for all 105 patients included in the study. The findings correlate with the findings of Long et al (2016:8) where one HIV positive costed the South African government R 14 554.00 for a 3 day stay in a public hospital. The similar finding was shared by Yengopal and Naidoo (2004:32) when calculating the cost of inpatient care for each HIV positive patient in Cape Town, which was R18 765.76.

The tables presented an easy overview of the results where it showed the differences on variables for example there were more males admitted than females. Costs incurred by patients with HIV related illnesses were more than patients who were not having HIV related illnesses.

According to Nijhawan, Kitchell, Etherton, Duarte, Halm and Jain (2015:465-473) readmissions can be prevented if optimal patient care is rendered during the initial admission. Caring for these patients cost a lot of money that why the suggestion would be development of intervention strategies that would prevent the number of admission (Nijhawan et al 2015:465-473).

4.4.3 Average length of stay

In this study, the average length of stay (ALOS) for all patients was 3 days [Interquartile (IQR):1–5], whereas Yengopal and Naidoo (2004:36) reported the average length of stay in hospital was 9 days.

Fifty percent (50%) of females (51 of 102), had an average length of stay between 1–3 days in a hospital compared to 63% (124 of 197) of males. However, this difference in ALOS by sex was marginally statistically different (p-value=0.062) and the findings are similar to Catumbela et al (2015:10), where males stay longer in hospitals than females although there is reported declining figures on admission due to the available support structures in communities.

However, Goncalves and Ferreira (2013:2) reported that there was no statistically significant difference between males and females and that the average length of stay for HIV positive patients was 29.6 days. Long, Fox, Sauls, Evans, Sanne and Rosen (2016:7), reported that the overall mean length of stay was 9.3 days and the longest average length of stay was 13.2 days.

The findings were similar to most studies comparing costs between HIV positive and HIV negative individuals with in-patient costs being higher in the former. The current study showed the total costs of patients with longer stay in a hospital to be higher compared to patients who stayed less than 3 days (Yengopal & Naidoo 2004:38; Meyer-Rath et al 2013:327; Catumbela et al 2015:8).

Coding of inpatient admission and discharge dates were done as recorded in the patient files. The average length of stay in a hospital was calculated using date of admission and the date the patient was discharged from the hospital.Hospitals admissions can also be reduced if patients have access to treatment at early stages (Meyer-Rath et al 2013:325). Worldwide, the introduction of antiretroviral therapy (ART) has resulted in a large decrease in frequency, average length of hospital stay and cost of patient per stay (Meyer-Rath et al 2013:322).

4.4.4 Acceptance/rejection of the hypotheses

Based on the findings the hypothesis is accepted that length of stay was a significant factor on patient admission. The average length of stay (ALOS) for all patients was 3 days [Interquartile (IQR):1–5]. Fifty percent (50%) of females (51 of 102), had an average length of stay between 1–3 days in a hospital compared to 63% (124 of 197) of males. However, this difference in ALOS by gender was marginally statistically different (p-value=0.062).

4.5 CONCLUSION

This chapter discussed data analysis, study results, patient characteristics, and average length of stay, patient costing, cost analysis and bivariate analysis. An in-depth discussion and presentation of the results were done.

In chapter 5, conclusion, scope, limitations and recommendations will be discussed.

CHAPTER 5

CONCLUSION, SCOPE, LIMITATIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

Chapter 4 was the presentation and analysis of data and this chapter will focus on the conclusion, scope and limitation of the study and lastly coming up with recommendations.

5.2 RESEARCH DESIGN AND METHOD

A quantitative approach was used to collect data; analysed; interpretation and report writing. Purposeful sampling and data collection was done using data collection sheet. This was a retrospective cost analysis data from in-patients records (record review) of ages from 15 years to 49 years both gender.

Patient's folder numbers were obtained from admission books in the three wards and an audit was conducted in order to determine the length of stay. The study reviewed the cost incurred by patients with HIV and AIDS related illnesses on in-patient day's equivalent (PDE); and this is an institutional based retrospective data analysis to determine the costs in one of the hospital in Northern Cape.

5.3 SUMMARY OF THE RESEARCH FINDINGS

This study found that males (63%) with HIV & AIDS related illnesses had longer average length of stay in a hospital compared to females. The study done by Catumbela et al (2015:4) had some similarities as they also reported that the median LOS was significantly higher in men by spending 12 days and females staying 10 days in hospitals. Longer admissions affect the financial viability of households especially if the breadwinner is admitted. The findings are similar to the majority of studies done in the Sub-Sahara region (Bachmann & Booysen 2003:4; Catumbela et al 2015:4; Thomas et al 2007:410).

The health care costs incurred for HIV and AIDS hospital admissions were high in this study and were similar to the study done in Kenya by Guinness, Arthur, Bhatt, Achiya, Kariuki and Gilks (2002:904). Costs and length of stay with HIV/AIDS hospitalisation has put strain on the limited resources and compromise the quality of care.The findings are similar to the study done by Schoeman (2009:48) where the costs of hospitalising HIV-positive children were significantly high which increased the financial burden on the already restricted health resources.

5.4 CONCLUSION

The study looked into the costs implication of average length on in-patient costs amongst HIV and AIDS patients. As the HIV and AIDS epidemic continues to advance in our community, economic implications are already apparent in our health care system.

Admission of HIV positive patients represents a significant medical care cost in the public health sector. The average cost for patients with short-term stay was relatively less compared to patients staying longer in a hospital. The total number of in-patient days (ALOS) of an individual can directly influence the average costs per in-patient care. The findings indicate that the mean average length of stay for HIV positive individuals in this study was significantly lower at a mean of 3 days than the findings in a study that was conducted in the children's hospital in South Africa with an average length of stay which was 9 days (Yengopal & Naidoo 2004:38).

Analysis of costs of HIV-associated care illustrated an important picture of the financial implication of HIV and AIDS in public hospitals including patient care costs. The association of longer in-patient stays versus patient care costs due to HIV and AIDS calls for better management of patients at primary healthcare level and community level to minimise long hospital stays.

Females incurred higher in-patient costs compared to male patients. This difference can be explained as literature has demonstrated that females are highly affected than males globally.

The study provides cost analysis with information as how much budget was used up in providing in-patient costs for HIV and AIDS. The study also illustrates the financial impact of lengthy in-patient stay on the already constricted public funding thus providing the much needed baseline information for health planners in future planning and biding for adequate budget.

5.5 SCOPE OF STUDY

The scope of the study was of a limited nature as it was done in one hospital at a Masters level which is of limited scope. It was only limited to one dependent variable the average length of stay (ALOS). Furthermore, the dissertation is of limited scope as stated in the University research policy.

5.6 RECOMMENDATIONS

The study dealt with documents of patients and there were no interviews that were conducted but the researcher recommends based on the findings and the literature of the study In order to decrease the average costs on hospital care of HIV infected patients and also identify cost containment strategies in caring for HIV positive and AIDS patients, the following are recommended:

5.6.1 Practice

- In terms of patient care and home care, hospitalisation can be greatly reduced through home-based care programme, linked to the primary health care (PHC) re-engineering program which advocates for preventative efforts over curative approach. The Minister of Health in South Africa is advocating for re-engineering PHC so as to reduce the high number of patients who are hospitalised (DOH 2012).

5.6.2 Nursing research

- For cost-effectiveness analysis measurement, further research need to be conducted in understanding factors associated with high in-patient costs of HIV and AIDS patients.

- More research studies should be conducted that will be targeted towards preventive, curative and rehabilitative aspects to reduce the burden of patient's admission.
- To conduct a study using different research methodologies and compare the economic impact between HIV positive and HIV negative patients.

5.7 CONTRIBUTIONS OF THE STUDY

The study gave a clear indication of the exorbitant costs incurred by HIV/AIDS related admissions. The understanding of factors affecting HIV-related hospitalisation would help to optimise resource allocation and could also reduce the high cost of hospitalisation. The information gathered on costs; treatment and care for these patients might guide the planners for adequate budgeting.

5.8 LIMITATIONS OF THE STUDY

The analysis of costs had a number of limitations, first of all the economic component was retrospective as a result some patient expenditure records were not be traceable resulting in an incomplete sample although no obvious bias lead to this.

There was a possibility of not getting files as it should due to the system of missing files and records clerks felt overwhelmed of additional work they have to do.

Methodology had limitation as only documents were reviewed for the study. The sample size did not reflect or determine the exact budget allocations for the hospital.

The study was done using retrospective design and there were no interviews that were conducted which might come out with strategies to reduce the costs. Recommendations are based on the findings and also literature.

5.9 CONCLUDING REMARKS

The study findings has managed to analyse the cost involved on the length of stay of HIV and AIDS patients in a public hospital. The findings also showed that in-patient care costs were directly proportional to length of stay with higher costs for HIV and AIDS

patient management care. The findings are consistent with other studies regarding higher economic implications of care for HIV infected persons being almost as twice as people who are HIV negative due to longer periods of hospitalisation.

REFERENCES

Abdool Karim, SS, Baxter, C, Frohlich, J & Abdool Karim, Q. 2014. The need for multipurpose prevention technologies in Sub-Saharan Africa. *British Journal of Obstetrics and Gynaecology* 122 (Supplement 5):27-34.

Babbie, ER & Mouton, J. 2007. *The practice of social research*. 12th edition. Cape Town: Oxford University Press.

Bachmann, MO & Booysen, FL. 2006. Economic causes and effects of HIV/AIDS on South African household. *AIDS* 20(14):1861-1867.

Baratedi, WM. 2013. Lived experiences of HIV sero-discordant couples in Botswana. Doctoral Thesis. Pretoria. University of South Africa.

Booysen, F & Van der Berg S. 2005. The role of social grants in mitigating the socio-economic impact of HIV/AIDS in two communities: South Africa. *South African Journal of Economics* 73 (Supplement):545-563.

Booysen, F Le R, Geldenhuys, JP. & Marinkov, M. 2003. *The impact on the South African economy: A review of current evidence.* Working paper presented at the TIPS/DPRU conference on the challenges of growth and poverty: the South African economy since democracy, Johannesburg, South Africa.

Bowling, A. 2009. *Research methods in health. Investigating health and health services*.3rd edition. England: Open University Press.

Burns, SN & Grove, SK. 2005. *Understanding nursing research*. 3rd edition. Philadelphia: Saunders.

Business dictionary.com. *Definition of cost analysis*. Available from: https;//businessdictionary.com (accessed on 4 June 2013).

Catumbela, E, Freitas, A, Lopes, F, Mendoza, MCT, Costa, C, Sarmento, A & Da Costa-Pereira. 2015. HIV disease burden, cost, and length of stay in Portuguese hospitals from 2000 to 2010: A cross-sectional study. *Biomed Health Services Research* 15:44.

Carael, M, Marais, H, Polsky, J & Mendoza, A. 2009. Is there a gender gap in the HIV response? Evaluating national HIV responses from the United Nations General Assembly Special Session on HIV/AIDS country reports. *Journal of Acquired Immune Deficiency Syndromes* 52:S111-S118.

Clements, B, Coady, D & Gupta, S. 2012. *The economics of public health care reform in advanced and emerging economies.* Available from: www.imf.org (accessed on 10 June 2013).

Creswell, WJ. 2014. *Research design: international student edition qualitative, quantitative and mixed methods approach*. 4th edition. Los Angeles: SAGE.

De Vos, AS, Strydom, H, Fouché, CB & Delport, CSL. 2005. *Research at grass roots: for social sciences and human service professions. 3*rd edition. Pretoria: Van Schaik.

DHIS. 2014. *District Health Information System*. Available from: www.hst.org.za (accessed on 10 October 2013).

Drummond, MF, Sculpher, MJ, Torrance, GW, O'Brien, MJ & Stoddart, GL. 2005. *Methods for economic evaluation of health care interventions*. United Kingdom: Oxford University Press.

Huber, DL. 2006. *Leadership and nursing care management*. 3rd edition .USA: Elsevier.

Gaugham, J, Mason, A, Street, A & Ward, P. 2012. *English hospitals can improve their use of resources: An analysis of costs and length of stay for ten treatments.* 2 CHE Research Paper 78:1-71.

Goncalves, MJC & Ferreira, AA. 2013 Factors associated with length of hospital stay among HIV positive and HIV negative patients with Tuberculosis in Brazil. *PLoS ONE* 8(4):e60487.

Gordis, L. 2008. *Epidemiology*. 4th edition. Philadelphia: Elsevier/Saunders.

Govender, I, Mabuza, LH & Ogunbanjo GA. 2015. The characteristics of HIV and AIDS patients with deep vein thrombosis at Dr. George Mukhari Academic Hospital. *African Journal of Primary Health Care and Family Medicine* 7(1):3.

Gow, J, George, G, Quinlan, T & Thurlow, J. 2007. *An economic assessment of the impact of HIV/AIDS on the KZN economy and its people*. Research for Development.

Guinness, L, Arthur, G, Bhatt, SM, Achiya, G, Kariuki, S & Gilks, CF. 2002. Cost of hospital care for HIV-positive and HIV-negative patients at Kenyatta National Hospital, Nairobi, Kenya. *Aids* 16(6):901-908.

Guthrie, T. 2003. *Budgeting for HIV/AIDS – costing the indirect impact on the health sector*. Research Unit on AIDS and Public Health, Budget Information Service, IDASA, Namibia, August 2003.

Hajiabdolbaghi, M, Jafari, S, Mansouri, S & Yaghoobi, MH. 2014. Hospitalizations and its related factors in HIV/AIDS patients in Tehran, Iran. *Medical Journal of the Islamic Republic of Iran* (28):70.

Hansen, K, Chapman, G, Chitsike, I & Mwaluko, G. 2000. The costs of HIV/AIDS care at government hospitals in Zimbabwe. *Health Policy Plan* 15(4):432-400.

HSRC. 2015. HIV/AIDS statistics on Human Science Research Council reports. Available from: www.hscr.org.za (accessed on 10 August 2015).

Hulley, SB, Cummings, SR, Browner, WS, Grady, DG & Newman, TB. 2012. *Designing clinical research.* 3nd edition. Philadelphia: Lippincott Williams & Wilkins.

Hutton, G, Wyss, K & Diekhor, Y. 2003. Prioritisation of prevention activities to combat the spread of HIV/AIDS in resource constrained setting: a cost-effectiveness analysis from Chad. *International Journal of Health Planning and Management* 18:117-136.

Jefferis, K, Siphambe, H & Kinghorn, A. 2006. *The Economic impact of HIV/AIDS in Botswana. Gaborone.* Available from: http://www.worldbank.org (accessed on 10 November 2015).

Langeni, IN. 2012. Economic impact of HIV/AIDS on rural households in Kwa-Dlangezwa. Unpublished Master's degree thesis from the University of Zululand.

Lim, A & Tongkumchum, P. 2009. Methods of analyzing hospital length of stay with application to inpatients dying in Southern Thailand. *Global Journal of Health Science* 1(1):25.

Long, LC, Fox, MP, Sauls, C, Evans, D, Sanne, I & Rosen, SD. 2016. The high cost of HIV positive inpatient care at an urban hospital in Johannesburg, South Africa. *PLOS ONE* 11(2):e0148546.

Matshe, I & Pimhidzai, O. 2008. Macroeconomic impact of HIV and AIDS on approach. *Botswana Journal of Economics* 5(7):32-45.

Meyer-Rath, G, Brennan, AT, Fox, MP, Modisenyane, T, Tshabangu, N, Mohapi, L, Rosen, S & Martinson, N. 2013. Rates and cost of hospitalization before and after initiation of antiretroviral therapy in urban and rural settings in South Africa. *Journal of Acquired Deficiency Syndrome* 62(3):322-328.

Mitha, M, Furuya, EY & Larson, E. 2014. Risk of healthcare associated infections in HIV positive patients. *Journal of Infection Prevention* 15(6):214-220.

Mubyazi, M, Mwisongo, AJ, Mkundi, EA, Pallangyo, K, Malebo, HM, Mshana, JM. et al. 2012. Analysis of cost impact of HIV/AIDS on health service provision in nine regions, Tanzania: Methodological challenges and lessons for policy. *Rwanda Journal of Health* 1(1):8-20.

Murzalieva, G, Aleshkina, J, Temirov, A, Samiev, A, Kartanbaeva, N. et al. 2009: *Tracking Global HIV/AIDS initiatives and their impact on the health system: The experience of the Kyrgyz Republic*. Global HIV/AIDS Initiative; Network 2007.

NDOH. 2012. *The 2012 National Antenatal Sentinel HIV & Herpes Simplex Type2 Prevalence Survey in South Africa*. Available from: http://www.health.e.org.za (accessed on 10 June 2013).

NDOH. 2015. *A long and healthy life for all South Africans*. Available from: National Department of Health www.ndoh.gov.za (accessed on 10 June 2013).

NIDS. 2015. National Indicator Data Set. Available from: National Department of Health www.ndoh.gov.za (accessed on 20 July 2013).

Nijhawan, AE, Kitchell, E, Etherton, SS, Duarte, P, Halm, EA & Jain, MK. 2015. Half of 30-day hospital readmissions among HIV-infected patients are potentially preventable. *Aids Patient Care* 29(9):465-437.

Nosyk, B, Sun, LiX & Annis AH. 2014. The effects of homelessness of hospitalisation among patients with HIV/AIDS. AIDS Care 19(4):546-553.

Okunji, PO & Daniel, J. 2015. Hospital stay of inpatients HIV/AIDS with mental behavioural disorders: 2007 vs 2010 in United States. *Journal of Nursing Education and Practice* 5(3):110-118.

Over, M. 1992. *The macro-economic impact of AIDS in Sub-Saharan Africa*. Population and Human Resources Department. The World Bank.

Polit, DF & Beck, CT. 2008. *Nursing research: Generating and assessing evidence for nursing practice*. 8th edition. Philadelphia: Wolters Kluwer/Health/Lippincott Williams & Wilkins.

PDOH. 2008. *Annual report from Kimberley hospital*. Available from www.provincialgovernment.co.za (accessed on 5 January 2015).

Russell, S. 2004. The economic burden of illness for households in the developing countries: a review of studies focusing on malaria, tuberculosis, and human immune deficiency virus/acquired immunodeficiency syndrome. *American Journal of Tropical Medicine and Hygiene* 1 (2 Suppl):147-155.

Schoeman, CS. 2009. The clinical spectrum and cost implications of hospitalised HIV-infected children at Karl Bremer Hospital, Cape Town, South Africa. *South African Family Practice* 51(1):46-52.

Semigina, T, Griga, I, Bogdan, D, Pavlenko, P, Bandar, V, Nechiporenko, L, Schevchenko, I & Spicer, L. 2008. *Tracking Global HIV/AIDS Initiatives and their Impact on the Health System in Ukraine*. *Global HIV/AIDS Initiative; Network: Biomed Central* (4):8.

Seshamani, M & Gray, A. 2004. Time to death and health expenditure: an improved model for impact of demographic change on health care costs. *Age and Ageing* 1(33):556-561.

Shisana, O, Hall, E, Maluleke, KR, Stoker, DJ, Schwabe, C, Colvin, M, Chauveau, J, Botha, C, Gumede, T, Fomundam, H, Shaikh, N, Rehle, T & Udjo, E. 2003. *The impact of HIV/AIDS on health sector. National survey of health personnel, ambulatory and hospitalised patients and health facilities.* Pretoria: Department of Health.

Sia, D, Onadja, Y, Nandi, A, Foro, A & Brewer, T. 2013. What lies behind gender inequalities in HIV/AIDS in sub- Saharan African countries: evidence from Kenya, Lesotho and Tanzania? *Health Policy and Planning:*1-12.

Statistics South Africa. 2014. *HIV and AIDS in South Africa*. Available from: www.avert.org.za (accessed on 10 June 2015).

Streubert-Speziale, HJ & Carpenter, DR. 2011. *Qualitative research in nursing. Advancing the humanisitc imperative*. Philadelphia: Lippincott Williams & Wilkins.

Tawfik, L & Kinoti, S. 2003. *The impact of HIV/AIDS on health systems in sub- Sahara Africa with special reference to the issue of human resources. Support for Analysis and Research Africa* (SARA) Project. USAID Bureau for Africa, Office of Sustainable Development. March 2003.

Thomas, LS, Manning, A, Holmes, CB, Naidoo, S, Van Der Linde, F, Gray, GE & Martinson, NA. 2007. Comparative costs of inpatient care for HIV infected children and uninfected children and adults in Soweto, South Africa*. Journal of Acquired Immune Deficit Syndrome* 46(4):410-416.

Thungjaroenkul, P, Cummings, GG & Embleton, A. 2007. The impact of nurse staffing on hospital costs and patient length of stay*:* A systemic review. *Nursing Economics* 25(5):255-265.

UNAIDS. 2006. Report on the global AIDS epidemic: Chapter 4: *The impact of AIDS on people and societies.* Available from: http.www.unaids.org (accessed on November 2015.

Unger, A, Welz, T & Haran, D. 2003. The impact of HIV/AIDS on health care systems: The case of Hlabisa District Hospital, KwaZulu-Natal, South Africa. *International Report of HIV/AIDS and STI Knowledge Programme,* Liverpool School of Tropical Medicine.

Van den Block, L, Deschepper, R, Drieskens, K, Bauwens, S, Bilsen, J, Bossuyt, N & Deliens, L. 2007. Hospitalisation at the end of life: using a sentinel surveillance network to study hospital use and associated patient diseases and healthcare actors. *Biomed Central Health Services Research* (7):69.

Veenstra, N & Whiteside, A. 2005. Economic impact of HIV/AIDS. *Best Practice and Clinical Research Obstetrics and Gynaecology* 19(2):197-210.

Whiteside, A & Henry, FE. 2011. The impact of HIV/AIDS research: A case study from Swaziland. *Health Research Policy and System* 9 (Supplement 1):S9.

Whiteside, A, Russell, S & Seeley, J. 2010. Special Supplement in Expanding antiretroviral therapy provision in resource-constrained settings: social dynamics and policy challenges. *AIDS Care Psychological and Socio-medical Aspects of AIDS/HIV* 22(1):28:44.

WHO. 2012. *Country statistics*. Available from: www.who.int (accessed on 10 December 2014).

Xaba, SN, Greef, O & Becker, P. 2014. Determinants, outcomes and costs of ceftriaxone v. amoxicillin-clavulanate in the treatment of community acquired pneumonia at Witbank Hospital. *South African Medical Journal* 104(3):187-191.

Yengopal, V. & Naidoo, S. 2004. Cost of inpatient care for HIV positive patients at Red Cross children's hospital. *Southern African Journal of HIV Medicine* 51(1):46-52.

ANNEXURES

ANNEXURE A

Ethical Clearance Certificate: Department of Health Studies, Unisa

UNISA university of south africa

UNIVERSITY OF SOUTH AFRICA
Health Studies Higher Degrees Committee
College of Human Sciences
ETHICAL CLEARANCE CERTIFICATE

REC-012714-039

HSHDC/395/2015

Date: 26 February 2015 Student No: 646-120-4

Project Title: Analysis of the economic impact of HIV and AIDS on length of stay in one hospital in the Northern Cape Province in South Africa.

Researcher: Nomhle Orienda Gumbo

Degree: Masters in Public Health Code: DIS4986

Supervisor: Prof ZZ Nkosi
Qualification: PhD
Joint Supervisor: -

DECISION OF COMMITTEE

Approved [√] **Conditionally Approved** [ ]

Prof L Roets
CHAIRPERSON: HEALTH STUDIES HIGHER DEGREES COMMITTEE

Prof MM Moleki
ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRES

Open Rubric

ANNEXURE B

Letter seeking permission from:

The Department of Health, Northern Cape Province

Chief Executive Officer, Kimberley Hospital

8 CASSANDRA STREET
HERLEAR
KIMBERLEY
8301
Tel 0834190796 Fax 0864595268
gumboorie@gmail.com
DATE: 25 JUNE 2015

Dr. Eshetu Worku
The Chairperson
Provincial Health Research Committee
Kimberley
Northern Cape

SUBJECT: REQUEST TO CONDUCT A RESEARCH STUDY

This communiqué' serves as a humbly request to conduct a research study in our province. My project is "Analysis of economic impact of HIV and AIDS on length of stay in one hospital in the Northern Cape Province in South Africa"

The increasing demand on health services relating to HIV and AIDS consequently causes pressure on health care budget to meet a range of health policy priorities. The economic costs continuously increase due to lack of standardized methods to evaluate the magnitude of the problem.

The purpose of the study is to provide information on how the length of stay of HIV and AIDS patients can affect the costs of the overall budget in the province. The study will also determine the burden incurred by the Discipline in admitting these patients instead of them being treated at Day Care Centers

Thanking you in advance

Warm regards,

Mrs. Nomhle Gumbo

ANNEXURE C

Letter of approval:

Department of Health,
Provincial Ethics Research Committee, Northern Cape Province

DEPARTMENT OF HEALTH

LEFAPHA LA BOITEKANELO

ISEBE LEZEMPILO

DEPARTEMENT VAN GESONDHEID

Department of Health
Private Bag X5049
KIMBERLEY
8301

Enquiries / Dipatlisiso / Imibuzo / Navrae : Dr. Eshetu Worku

Reference / Tshupelo / Isalathiso / Verwysings :

Tel: 053 830 2122
Fax: 086 541 7122

Date / Letiha / Umhla / Datum : 24 July 2015

Ms. NO Gumbo
Private Bag X 5049
Kimberley
8300

Dear Ms. N Gumbo

TITLE: **Analysis of the economic impact of HIV and AIDS on the length of stay in one hospital in the Northern cape Province in South Africa.**

Reference Number: NC2015/0017

The application to conduct the study was received and has been reviewed by the Provincial Health Research and Ethics Committee (PHREC)

Approval is hereby granted to conduct the above-mentioned study in the Northern Cape Province

Please note: This approval is valid for a period of one year from the date of approval.

The following conditions have to be noted:

1. The research project shall be conducted at no cost to the Northern Cape Department of Health.
2. The approval is limited to the research proposal as submitted in the application.
3. Variation or modification on the research must be notified formally to PHREC for further consideration.
4. The PHREC may monitor the project at any time.
5. A six months progress report ***must*** be submitted to the PHREC

6. At the completion of your study a copy of the final report must be submitted to the Research and Development Directorate.
7. The Northern Cape Senior Management Committee will be briefed on the outcome of the study prior to publishing.

Furthermore, after the completion of you project, you may be requested to do a presentation on the final findings of your study.

The committee wishes you success on your study

Yours Faithfully

Dr. Eshetu Worku
Chairperson: PHREC
E-mail: eworku@ncpg.gov.za
Tel: 053 830 2122
Fax: 086 541 7122

24/07/2015
Date

ANNEXURE D

Letter of approval:

Chief Executive Officer of the Hospital

8 CASSANDRA STREET
HERLEAR
KIMBERLEY
8301
Tel 0834190796 Fax 0864595268
gumboorie@gmail.com
DATE: 27 JULY 2015

Mr. G.I. MONCHO
CHIEF EXECUTIVE OFFICER (CEO)
KIMBERLEY HOSPITAL

SUBJECT: REQUEST TO CONDUCT A PROJECT AT YOUR CONSTITUTION

This communiqué' as a humbly request to conduct a project at your constitution. My project "Analysis of economic impact of HIV and AIDS on length of stay in one hospital in the Northern Cape Province in South Africa"

The increasing demand on health services relating to HIV and AIDS consequently causes pressure on health care budget to meet a range of health policy priorities. The economic costs continuously increase due to lack of standardized methods to evaluate the magnitude of the problem.

The purpose of the study is to provide information on how the length of stay of HIV and AIDS patients can affect the costs of the overall budget of Internal Medicine Discipline. The study will also determine the burden incurred by the Discipline in admitting these patients instead of them being treated at Day Care Centers.

Thanking you in advance

Warm regards,

NGumbo

MRS

Approved
20150730
MR. G I MONCHO
CEO

RECEIVED
CEO OFFICE
2015 -07- 28

ANNEXURE E

Letter of approval:

Medical Director of the Hospital

8 CASSANDRA STREET
HERLEAR
KIMBERLEY
8301
Tel 0834190796 Fax 0864595268
gumboorie@gmail.com
DATE: 26 August 2015

DR. S. JOUBERT

MEDICAL DIRECTOR
KIMBERLEY HOSPITAL

SUBJECT: REQUEST TO CONDUCT A PROJECT AT YOUR CONSTITUTION

This communiqué' as a humbly request to conduct a project at your constitution. My project "Analysis of economic impact of HIV and AIDS on length of stay in one hospital in the Northern Cape Province in South Africa"

The increasing demand on health services relating to HIV and AIDS consequently causes pressure on health care budget to meet a range of health policy priorities. The economic costs continuously increase due to lack of standardized methods to evaluate the magnitude of the problem.

The purpose of the study is to provide information on how the length of stay of HIV and AIDS patients can affect the costs of the overall budget of Internal Medicine Discipline. The study will also determine the burden incurred by the Discipline in admitting these patients instead of them being treated at Day Care Centers.

Amendments

The study is a retrospective analysis of medical records in the Internal Medicine Discipline. Records will be retrieved from the records office with the assistance of Records Clerk. The record review will be conducted within the premises no records will be taken out. The period of the study has been reviewed for the period of 2014/2015

Herewith find attached approval by the Provincial Health Research and Ethics Committee (PHREC)

Thanking you in advance

APPROVED/
~~NOT APPROVED~~
2015 -08- 2 8
DR S JOUBERT
TEL 053 802 2147

Warm regards,

Nomhle Gumbo

MRS

ANNEXURE F

Data Collection Tool

Folder Number	Male	Female	Code	Date of Admission	Date Discharged	Number of Days	Total

NAME: N.O GUMBO **STUDENT NUMBER: 646 – 120 – 4**

Title: Analysis of the economic impact of HIV and AIDS on the length of stay in one hospital in the Northern Cape

The purpose of the study is to provide information on how the length of stay of HIV and AIDS patients can affect the costs of the overall budget of Internal Medicine Discipline. The study will also determine the burden incurred by the Discipline in admitting these patients instead them being treated at Day Care Canters

1. **Data collection sheet AIDS cases by F/Numbers; Gender; Date of Admission; Date Discharged; Number of Days & Total Costs**

Table: Year - April 2014 – March 2015

	Folder Number	Male	Female	Code	Date of Admission	Date Discharged	Number of Days	Total Costs
1	23667942		x	ICD 10	27/07/2014	03/08/2014	6	R21 000
2	20238754	x		ICD10	19/09/2014	25/09/2014	6	R21 000
3	30437404	x		ICD10	26/09/2014	02/10/2014	6	R21 000
4	31532369	x		ICD10	26/09/2014	01/10/2014	5	R17 500
5	21031133	x		ICD10	16/04/2014	20/04/2014	4	R14 000
6	31104854		x	ICD10	27/06/2014	02/07/2014	6	R21 000
7	31482425		x	ICD10	06/09/2014	12/09/2014	6	R21 000
8	23650609	x		ICD10	05/04/2014	08/04/2014	4	R14 000
9	24179764		x	ICD10	25/09/2014	02/09/2014	7	R24 500
10	25421140	x		ICD10	8/12/2014	15/12/2014	7	R24 500
11	24003147		x	ICD10	16/12/2014	22/12/2014	6	R21 000
12	26731752		x	ICD10	04/12/2014	27/12/2014	23	R80 500
13	21066790		x	ICD10	21/11/2014	05/12/2014	14	R49 000
14	22977490	x		ICD10	22/10/2014	08/11/2014	18	R63 000
15	20243197	x		ICD10	20/03/2015	27/03/2015	6	R21 000
16	22762173		x	ICD10	15/01/2015	21/01/2015	6	R21 000
17	31643174		x	ICD10	25/11/2014	01/12/2014	6	R21 000
18	22145841	x		ICD10	08/08/2014	15/08/2014	7	R24 500
19	21819851		x	ICD10	16/08/2014	23/08/2014	7	R24 500
20	31499601	x		ICD10	22/08/2014	30/08/2014	8	R28 000
21	30752570	x		ICD10	03/09/2014	11/09/2014	8	R28 000
22	30946123	x		ICD10	11/092014	18/09/2014	7	R24 500
23	31544855		x	ICD10	02/09/2014	09/09/2014	7	R24 500
24	20486908		x	ICD10	05/09/2014	14/09/2014	9	R31 500

	Folder Number	Male	Female	Code	Date of Admission	Date Discharged	Number of Days	Total Costs
25	22065551	x		ICD10	17/09/2014	26/09/2014	10	R35 000
26	31415557		x	ICD10	16/09/2014	24/09/2014	8	R28 000
27	29683386	x		ICD10	01/09/2014	10/09/2014	9	R31 500
28	21204690	x		ICD10	20/09/2014	28/09/2014	7	R24 500
29	31103088	x		ICD10	10/11/2014	19/11/2014	8	R28 000
30	31617509	x		ICD10	07/11/2014	16/11/2014	9	R31 500
31	31597792		x	ICD10	02/11/2014	11/11/2014	9	R31 500
32	20157566	x		ICD10	05/11/2014	12/11/2014	8	R28 000
33	316174426	x		ICD10	08/11/2014	16/11/2014	8	R28 000
34	31619117		x	ICD10	03/11/2014	14/11/2015	11	R38 500
35	22475495	x		ICD10	20/10/2014	29/10/2014	8	R28 000
36	30587836	x		ICD10	15/11/2014	22/11/2014	7	R24 500
37	30587836	x		ICD10	20/11/2014	27/11/2014	6	R21 000
38	21131446	x		ICD10	11/11/2014	19/11/2014	8	R28 000
39	24561615	x		ICD10	17/11/2014	26/11/2014	9	R31 500
40	31626732	x		ICD10	05/11/2014	11/11/2014	6	R21 000
41	31638257		x	ICD10	20/11/2014	28/11/2014	7	R24 500
42	22134050	x		ICD10	21/11/2014	29/11/2014	8	R28 000
43	32241198		x	ICD10	03/12/2014	11/12/2014	9	R31 500
44	22070593		X	ICD10	16/12/2014	25/12/2014	10	R35 000
45	22025324	x		ICD10	10/12/2014	17/12/2014	6	R21 000
46	25720154	x		ICD10	14/12/2014	20/12/24	6	R21 000
47	31665078	x		ICD10	06/12/2014	14/12/2014	8	R28 000
48	31624430	x		ICD10	15/12/2014	23/12/2014	8	R28 000
49	23814031		x	ICD10	09/12/2014	17/12/2014	8	R28 000
50	22411987	x		ICD10	13/12/2014	20/12/2014	7	R24 500
51	25421140	x		ICD10	05/12/2014	11/12/2014	6	R21 000
52	31356173	x		ICD10	15/12/2014	22/12/2014	7	R24 500
53	21388707		x	ICD10	07/12/2014	13/12/2014	6	R21 000
54	31632144	x		ICD10	10/10/2014	17/10/2014	6	R21 000
55	31726656	x		ICD10	13/10/2014	20/10/2014	7	R24 500
56	21066790	x		ICD10	02/10/2014	09//10/2014	8	R28 000
57	22584965	x		ICD10	11/10/2014	18/10/2014	7	R24 500
58	31639644		x	ICD10	13/10/2014	20/10/2014	7	R24 500
59	31514078		x	ICD10	05/10/2014	13/10/2014	8	R28 000
60	24030744	x		ICD10	15/10/2014	23/10/2014	8	R28 000
61	25767625		x	ICD10	06/10/2014	14/10/2014	7	R24 500
62	31643174		x	ICD10	03/10/2014	11/10/2014	8	R28 000

	Folder Number	Male	Female	Code	Date of Admission	Date Discharged	Number of Days	Total Costs
63	31647604		x	ICD10	09/10/2014	17/10/2014	8	R28 000
64	24381154	x		ICD10	11/10/2014	18/10/2014	7	R24 500
65	31651649		x	ICD10	22/10/2014	29/10/2014	7	R24 500
66	22128359		x	ICD10	14/10/2014	21/10/2014	7	R24 500
67	25128422	x		ICD10	19/10/2014	27/10/2014	8	R28 000
68	31654411	x		ICD10	06/10/2014	13/10/2014	6	R21 000
69	31447915		x	ICD10	04/10/2014	10/10/2014	6	R21 000
70	20008793		x	ICD10	12/10/2014	19/10/2014	7	R24 500
71	21094933		x	ICD10	10/10/2014	17/10/2014	6	R21 000
72	31561608	x		ICD10	22/10/2014	29/10/2014	7	R24 500
73	24897365	x		ICD10	14/10/2014	21/10/2014	6	R21 000
74	31654395		x	ICD10	11/10/2014	20/10/2014	9	R31 500
75	31654395		x	ICD10	07/10/2014	15/10/2014	7	R24 500
76	20243192	x		ICD10	09/10/2014	17/10/2014	6	R21 000
77	30233688	x		ICD10	05/10/2014	13/10/2014	8	R28 000
78	31658701	x		ICD10	13/10/2014	20/10/2014	7	R24 500
79	31337884		x	ICD10	02/06/2014	11/06/2014	9	R31 500
80	20923087	x		ICD10	16/06/2014	23/06/2014	7	R24 500
81	24307381		x	ICD10	05/06/2014	14/06/2014	8	R28 000
82	23671274	x		ICD10	07/06/2014	15/06/12	8	R28 000
83	31376148	x		ICD10	15/07/2014	23/07/2014	8	R28 000
84	30832620		x	ICD10	16/05/2014	23/05/2014	6	R21 000
85	20786356		x	ICD10	22/05/2014	28/05/2014	6	R21 000
86	24525321	x		ICD10	15/07/2014	21/07/2014	6	R21 000
87	22304786		x	ICD10	03/07/2014	09/05/2014	6	R21 000
88	31342165		x	ICD10	13/07/2014	20/07/2014	7	R24 500
89	20486759		x	ICD10	23/07/2014	29/07/2014	6	R21 000
90	30820039	x		ICD10	15/07/2014	22/07/2014	7	R24 500
91	22290092	x		ICD10	22/04/2014	29/04/2014	7	R24 500
92	31150402		x	ICD10	10/04/2014	17/04/2014	6	R21 000
93	23046832		x	ICD10	11/04/2014	18/04/2014	7	R24 500
94	31065212	x		ICD10	06/04/2014	12/04/2014	6	R21 000
95	31232465		x	ICD10	09/04/2014	16/04/2014	7	R24 500
96	21593892	x		ICD10	16/04/2014	23/04/2014	7	R24 500
97	31236623	x		ICD10	03/04/2014	10/04/2014	7	R24 500
98	25821612	x		ICD10	05/04/2014	12/04/2014	7	R24 500
99	21122106		x	ICD10	13/04/2014	21/04/2014	8	R28 000
100	24448953		x	ICD10	06/04/2014	13/04/2014	7	R24 500

	Folder Number	Male	Female	Code	Date of Admission	Date Discharged	Number of Days	Total Costs
101	24440257	x		ICD10	09/04/2014	15/04/2014	6	R21 000
102	24783540		x	ICD10	05/05/2014	12/05/2014	7	R24 500
103	31431703	x		ICD10	16/05/2014	23/05/2014	7	R24 500
104	23671274 (June 14)	x		ICD10	11/06/2014	17/06/2014	6	R21 000
105	31065147	x		ICD10	19/06/2014	26/06/2014	7	R24 500
	TOTAL COSTS							R2 730 000
106	20341699	x		ICD9	22/06/2014	25/06/2014	3	R10 500
107	31361249		x	ICD9	05/06/2014	7/06/2014	2	R7 000
108	25002262	x		ICD9	04/06/2014	8/06/2014	4	R14 000
109	24113761	x		ICD9	17/06/2014	20/06/2014	3	R10 500
110	30195317		x	ICD9	13/06/2014	16/06/2014	3	R10 500
111	24940371	x		ICD9	01/06/2014	04/06/2014	3	R10 500
112	30378095 (May)	x		ICD9	08/05/2014	11/05/2014	3	R10 500
113	24046120		x	ICD9	13/05/2014	15/05/2014	2	R7 000
114	30050827		x	ICD9	06/05/2014	09/05/2014	3	R10 500
115	22938757	x		ICD9	11/05/2014	14/05/2014	3	R10 500
116	31475841	x		ICD9	17/05/2014	20/05/2014	3	R10 500
117	20575387	x		ICD9	02/05/2014	06/05/2014	4	R14 000
118	31460694		x	ICD9	15/05/2014	17/05/2014	2	R7 000
119	23071061	x		ICD9	14/05/2014	18/05/2014	4	R14 000
120	20404729	x		ICD9	23/05/2014	26/05/2014	3	R10 500
121	21711767	x		ICD9	04/05/2014	07/05/2014	3	R10 500
122	30469910	x		ICD9	02/05/2014	05/05/2014	3	R10 500
123	21619515 (Dec.)	x		ICD9	03/12/2014	07/12/2014	4	R14 000
124	22955868		x	ICD9	16/12/2014	19/12/2014	3	R10 500
125	31679947		X	ICD9	06/12/2014	10/12/2014	4	R14 000
126	20557492	x		ICD9	13/12/2014	16/12/2014	3	R10 500
128	23578933		x	ICD9	03/12/2014	05/12/2014	2	R7 000
129	20879748		x	ICD9	11/12/2014	14/12/2014	3	R10 500
130	23242092	x		ICD9	08/12/2014	11/12/2014	3	R10 500
131	24046120	x		ICD9	13/12/2014	15/12/2014	2	R7 000
132	31691801	x		ICD9	06/12/2014	09/12/2014	3	R10 500
133	25978248		x	ICD9	07/12/2014	09/12/2014	2	R7 000
134	25774266	x		ICD9	19/12/2014	21/12/2014	2	R7 000

	Folder Number	Male	Female	Code	Date of Admission	Date Discharged	Number of Days	Total Costs
135	20645289		x	ICD9	25/12/2014	28/12/2014	3	R10 500
136	20138420	x		ICD9	02/12/2014	06/12/2014	4	R14 000
137	30437099		x	ICD9	10/12/2014	13/12/2014	3	R10 500
138	31705841	x		ICD9	16/12/2014	19/12/2014	3	R10 500
139	20879748	x		ICD9	04/12/2014	07/12/2014	3	R10 500
140	28934800	x		ICD9	20/12/2014	23/12/2014	3	R10 500
141	20648162	x		ICD9	11/12/2014	14/12/2014	3	R10 500
142	24830804		x	ICD9	26/12/2014	28/12/2014	2	R7 000
143	31447915	x		ICD9	09/12/2014	12/12/2014	3	R10 500
144	31710650	x		ICD9	12/12/2014	15/12/2014	3	R10 500
145	31535107 (End Dec)		x	ICD9	22/12/2014	24/12/2014	2	R7 000
146	**20551404 (Jan. 15)**		x	ICD9	03/01/2015	05/01/2015	2	R7 000
147	31702442	x		ICD9	08/01/2015	11/01/2015	3	R10 500
148	21516323	x		ICD9	16/01/2015	19/01/2015	3	R10 500
149	30064869		x	ICD9	22/01/2015	25/01/2015	3	R10 500
150	31686173	x		ICD9	12/01/2015	16/01/2015	4	R14 000
151	21664313	x		ICD9	06/01/2015	08/01/2015	2	R7 000
152	31705791		x	ICD9	14/01/2015	17/01/2015	3	R10 500
153	31704661	x		ICD9	10/01/2015	13/01/2015	3	R10 500
154	31706112	x		ICD9	07/01/2015	10/01/2015	3	R10 500
155	31397615	x		ICD9	22/01/2015	24/01/2015	2	R7 000
156	21871249		x	ICD9	13/01/2015	16/01/2015	3	R10 500
157	31706203	x		ICD9	09/01/2015	12/01/2015	3	R10 500
158	30730165	x		ICD9	12/01/2015	15/01/2015	3	R10 500
159	31706864	x		ICD9	19/01/2015	21/01/2015	2	R7 000
160	31669237		x	ICD9	11/01/2015	14/01/2015	3	R10 500
161	24248601	x		ICD9	01/01/2015	05/01/2015	4	R7 000
162	30831077	x		ICD9	05/01/2015	08/01/2015	3	R10 500
163	20736112	x		ICD9	16/01/2015	20/01/2015	4	R14 000
164	31722275		x	ICD9	23/01/2015	26/01/2015	3	R10 500
165	25534694	x		ICD9	19/01/2015	23/01/2015	4	R14 000
166	23805401	x		ICD9	17/01/2015	20/01/2015	3	R10 500
167	20488490	x		ICD9	09/01/2015	12/01/2015	3	R10 500
168	24738635	x		ICD9	10/01/2015	13/01/2015	3	R10 500
169	21230537		x	ICD9	03/01/2015	06/01/2015	3	R10 500
170	31732225	x		ICD9	07/01/2015	09/01/2015	2	R7 000

	Folder Number	Male	Female	Code	Date of Admission	Date Discharged	Number of Days	Total Costs
171	30730162	x		ICD9	19/01/2015	21/01/2015	2	R7 000
172	21028352	x		ICD9	25/01/2015	28/01/2015	3	R10 500
173	29781820		x	ICD9	02/01/2015	06/01/2015	4	R14 000
174	21724012		X	ICD9	10/01/2015	13/01/2015	3	R10 500
175	23571656	x		ICD9	16/01/2015	19/01/2015	3	R10 500
176	21071931	x		ICD9	04/01/2015	07/01/2015	3	R10 500
177	20768974	x		ICD9	20/01/2015	23/01/2015	3	R10 500
178	21668645	x		ICD9	11/01/2015	14/01/2015	3	R10 500
179	20366100	x		ICD9	26/01/2015	28/01/2015	2	R7 000
180	20296174		x	ICD9	09/01/2015	12/01/2015	3	R10 500
181	20645289		x	ICD9	12/01/2015	15/01/2015	3	R10 500
182	25498882	x		ICD9	22/01/2015	24/01/2015	2	R7 000
183	31741341	x		ICD9	03/01/2015	05/01/2015	2	R7 000
184	23245376	x		ICD9	08/01/2015	11/01/2015	3	R10 500
185	23373764		x	ICD9	16/01/2015	19/01/2015	3	R10 500
186	23315047	x		ICD9	22/01/2015	25/01/2015	3	R10 500
187	31788246		x	ICD9	13/01/2015	15/01/2015	2	R7 000
188	31748247	x		ICD9	17/01/2015	19/01/2015	2	R7 000
189	31759210		x	ICD9	06/01/2015	09/01/2015	3	R10 500
190	23479256 (E. Jan)	x		ICD9	12/01/2015	15/01/2015	3	R10 500
191	31772676 (**Feb 15)**	x		ICD9	13/02/2015	15/02/2015	2	R7 000
192	25129651	x		ICD9	06/02/2015	09/02/2015	3	R10 500
193	31123599	x		ICD9	07/02/2015	09/02/2015	2	R7 000
194	31773765		x	ICD9	19/02/2015	21/02/2015	2	R7 000
195	31167737	x		ICD9	25/02/2015	28/02/2015	3	R10 500
196	30344444	x		ICD9	02/02/2015	06/02/2015	4	R14 000
197	22475172		x	ICD9	10/02/2015	13/02/2015	3	R10 500
198	22884634	x		ICD9	16/02/2015	19/02/2015	3	R10 500
199	25225574	x		ICD9	04/02/2015	07/02/2015	3	R10 500
200	20701363	x		ICD9	20/02/2015	23/02/2015	3	R10 500
201	31782964		x	ICD9	11/02/2015	14/02/2015	3	R10 500
202	22967497	x		ICD9	26/02/2015	28/02/2015	2	R7 000
203	24863632	x		ICD9	09/02/2015	12/02/2015	3	R10 500
204	31236623	x		ICD9	12/02/2015	15/02/2015	3	R10 500
205	25657354		x	ICD9	22/02/2015	24/02/2015	2	R7 000
206	31597438	x		ICD9	03/02/2015	05/02/2015	2	R7 000

	Folder Number	Male	Female	Code	Date of Admission	Date Discharged	Number of Days	Total Costs
207	31723026	x		ICD9	08/02/2015	11/02/2015	3	R10 500
208	20828042	x		ICD9	16/02/2015	19/02/2015	3	R10 500
209	31735616		x	ICD9	22/02/2015	25/02/2015	3	R10 500
210	31738743	x		ICD9	08/02/2015	11/02/2015	3	R10 500
211	22471494	x		ICD9	13/02/2015	15/02/2015	2	R7 000
212	30050827	x		ICD9	06/02/2015	09/02/2015	3	R10 500
213	21309851	x		ICD9	07/02/2015	09/02/2015	2	R7 000
214	28059731		x	ICD9	19/02/2015	21/02/2015	2	R7 000
215	24169633	x		ICD9	25/02/2015	28/02/2015	3	R10 500
216	31748700	x		ICD9	02/02/2015	06/02/2015	4	R14 000
217	23063274		x	ICD9	10/02/2015	13/02/2015	3	R10 500
218	31746688	x		ICD9	16/02/2015	19/02/2015	3	R10 500
219	21144928	x		ICD9	04/02/2015	07/02/2015	3	R10 500
220	31758204	x		ICD9	20/02/2015	23/02/2015	3	R10 500
221	22988968		x	ICD9	11/02/2015	14/02/2015	3	R10 500
222	24968489	x		ICD9	26/02/2015	28/02/2015	2	R7 000
223	21458195	x		ICD9	09/02/2015	12/02/2015	3	R10 500
224	20902573	x		ICD9	12/02/2015	15/02/2015	3	R10 500
225	30344444		x	ICD9	22/02/2015	24/02/2015	2	R7 000
226	24030470	x		ICD9	03/02/2015	05/02/2015	2	R7 000
227	21121181	x		ICD9	08/02/2015	11/02/2015	3	R10 500
228	22580716	x		ICD9	16/02/2015	19/02/2015	3	R10 500
229	31815590 **(E. Feb)**		x	ICD9	22/02/2015	25/02/2015	3	R10 500
230	25697533	x		ICD9	08/03/2015	11/12/2015	3	R10 500
231	22350946	x		ICD9	13/03/2015	15/12/2015	2	R7 000
232	31839319	x		ICD9	06/03/2015	09/12/2015	3	R10 500
233	20449351	x		ICD9	07/03/2015	09/12/2015	2	R7 000
234	20033684		x	ICD9	19/03/2015	21/12/2015	2	R7 000
235	22760110	x		ICD9	25/03/2015	28/12/2015	3	R10 500
236	31844681	x		ICD9	02/03/2015	06/12/2015	4	R14 000
237	21042007		x	ICD9	10/03/2015	13/12/2015	3	R10 500
238	20033684	x		ICD9	16/03/2015	19/12/2015	3	R10 500
239	23870660	x		ICD9	04/03/2015	07/12/2015	3	R10 500
240	31248941	x		ICD9	20/03/2015	23/12/2015	3	R10 500
241	31082589		x	ICD9	11/03/2015	14/12/2015	3	R10 500
242	27241835	x		ICD9	26/03/2015	28/12/2015	2	R7 000
243	20221691	x		ICD9	09/03/2015	12/12/2015	3	R10 500

	Folder Number	Male	Female	Code	Date of Admission	Date Discharged	Number of Days	Total Costs
244	31255599	x		ICD9	12/03/2015	15/12/2015	3	R10 500
245	20747911		x	ICD9	22/03/2015	24/12/2015	2	R7 000
246	24610339	x		ICD9	03/03/2015	05/01/2015	2	R7 000
247	24485534	x		ICD9	08/03/2015	11/01/2015	3	R10 500
248	25604620	x		ICD9	16/01/2015	19/01/2015	3	R10 500
249	31253941		x	ICD9	22/01/2015	25/01/2015	3	R10 500
250	25636051	x		ICD9	09/01/2015	12/01/2015	3	R10 500
251	31257108	x		ICD9	12/01/2015	15/01/2015	3	R10 500
252	21823372	x		ICD9	19/01/2015	21/01/2015	2	R7 000
253	22010771	x		ICD9	11/01/2015	14/01/2015	3	R10 500
254	30822480		x	ICD9	01/01/2015	05/01/2015	4	R14 000
255	31257744	x		ICD9	05/01/2015	08/01/2015	3	R10 500
256	23987662	x		ICD9	16/01/2015	20/01/2015	4	R14 000
257	31175748		x	ICD9	23/01/2015	26/01/2015	3	R10 500
258	25653858	x		ICD9	19/01/2015	23/01/2015	4	R14 000
259	31674229	x		ICD9	17/01/2015	20/01/2015	3	R10 500
260	24919367	x		ICD9	09/01/2015	12/01/2015	3	R10 500
261	24003915		x	ICD9	10/01/2015	13/01/2015	3	R10 500
262	31556202	x		ICD9	03/01/2015	06/01/2015	3	R10 500
263	22978456	x		ICD9	08/12/2015	11/12/2015	3	R10 500
264	21231840	x		ICD9	13/12/2015	15/12/2015	2	R7 000
265	22772990		x	ICD9	06/12/2015	09/12/2015	3	R10 500
266	30148092	x		ICD9	07/12/2015	09/12/2015	2	R7 000
267	25461278	x		ICD9	19/12/2015	21/12/2015	2	R7 000
268	30216725	x		ICD9	25/12/2015	28/12/2015	3	R10 500
269	31696560		x	ICD9	02/12/2015	06/12/2015	4	R14 000
270	22765333	x		ICD9	10/03/2015	13/03/2015	3	R10 500
271	31895790	x		ICD9	16/03/2015	19/03/2015	3	R10 500
272	30025563	x		ICD9	04/03/2015	07/03/2015	3	R10 500
273	25012303	x		ICD9	20/03/2015	23/03/2015	3	R10 500
274	26562462		x	ICD9	11/03/2015	14/03/2015	3	R10 500
275	23878390	x		ICD9	26/03/2015	28/03/2015	2	R7 000
276	21071931	x		ICD9	09/03/2015	12/03/2015	3	R10 500
277	31206287		x	ICD9	12/03/2015	15/03/2015	3	R10 500
278	31698632	x		ICD9	22/03/2015	24/03/2015	2	R7 000
279	21899299	x		ICD9	03/03/2015	05/03/2015	2	R7 000
280	20736112	x		ICD9	08/03/2015	11/03/2015	3	R10 500
281	31706864		x	ICD9	16/03/2015	19/03/2015	3	R10 500

	Folder Number	Male	Female	Code	Date of Admission	Date Discharged	Number of Days	Total Costs
282	31714645	x		ICD9	22/03/2015	25/03/2015	3	R10 500
283	30921993	x		ICD9	08/03/2015	11/03/2015	3	R10 500
284	20946125	x		ICD9	13/03/2015	15/03/2015	2	R7 000
285	27364611		x	ICD9	06/03/2015	09/03/2015	3	R10 500
286	21981972	x		ICD9	07/03/2015	09/03/2015	2	R7 000
287	31670359	x		ICD9	19/03/2015	21/03/2015	2	R7 000
288	20488490	x		ICD9	25/03/2015	28/03/2015	3	R10 500
289	21076161		x	ICD9	02/03/2015	06/03/2015	4	R14 000
290	22471494	x		ICD9	10/03/2015	13/12/2015	3	R10 500
291	22134050	x		ICD9	16/03/2015	19/12/2015	3	R10 500
292	24876807	x		ICD9	04/11/2014	07/11/2014	3	R10 500
293	31632144		x	ICD9	22/11/2014	24/11/2014	2	R7 000
294	31620367	x		ICD9	03/11/2014	05/11/2014	2	R7 000
295	22562227	x		ICD9	08/11/2014	11/11/2014	3	R10 500
296	31635949	x		ICD9	16/11/2014	19/11/2014	3	R10 500
297	25883372		x	ICD9	22/11/2014	25/11/2014	3	R10 500
298	31638257	x		ICD9	09/11/2014	12/11/2014	3	R10 500
299	30772503	x		ICD9	12/11/2014	15/11/2014	3	R10 500
300	24136681		x	ICD9	13/11/2015	15/11/2015	2	R7 000