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Requirements for the
A Research Project Report Submitted in Partial Fulfillment of the

By Dr. Dimako So Victoria Moloi

Limpopo Province

At The WF Knobel Hospital, Capricorn District,
A Study Of The Cost Of Treating HIV/AIDS Patients
DATE: 15\/10\/2020

Dimarkedo Victoria Mbojo

I, Dimarkedo Victoria Mbojo, declare that this research report is my own work.

DECLARATION
When I embarked on the course, I took the long and winding road which I had underestimated. I finally wish to thank God Almighty for having given me the courage to follow the road.

For Prof. Becker at the MRC for the insight I gained on statistical analyses.

The drug's.

To the pharmacy staff at Parklands Hospital for providing me with costs for patient records.

In an environment where the manual system was still being used for storing the data at W.F. Knoppel Hospital, who had to work overtime to search for files, they enabled me.

My husband, Jerry and family for the disruption I brought in their lives and not encouraging when I felt I could not go on any more.

My supervisor, Professor Mary Ross for her patience, support and

ACKNOWLEDGEMENTS
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The source of those (148) included in the study.

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Figure number
SUMMARY

TB: Tuberculosis

PT: Prevention of Mother To Child Transmission (PMTCT): Provision of ARVs in the form of single dose of Nevirapine to both the mother and infant during delivery for mothers infected with HIV.

PEP: Post Exposure Prophylaxis (PEP): Provision of prophylaxis in the form of ARVs (and HAART) antiretroviral drugs provided as combination therapy (and HAART) anti-retroviral drugs provided in a combination of at least three drugs each having a different pharmacological action rather than a single.

PE: Personal Health Care.

CD4: count: The number of CD4+ T-lymphocytes per ml.

HIV: Human Immunodeficiency Virus

HIV e.g. HIV infections

Opportunistic Infections: Infections which occur in conditions of lowered immunity e.g. HIV infections

GDP: Gross Domestic Product

V: variable costs: Costs which depend on unit usage or output

ARVs: Antiretroviral drugs (Drugs used to treat HIV infection)

AIDS: Acquired Immune Deficiency Syndrome

HIV: Human Immunodeficiency Virus
Analysis:
The data was skewed to the right, and the median length of stay was 8.5 days. The average length of stay for admissions was 1.2 days. The total inpatient days was 1348.

This made the total number of episodes 137. The longest hospital stay was 85 days. There were 23 (21.1%) repeat visits and 6 patients (6.5%) visited three times.

Seventeen (16%) of the 106 patients were outpatients.

Inclusion for the year 2002. The remaining 191 (23%) could not be found. Total of 140 clients who were diagnosed as HIV positive and identified for inclusion for the year 2002. One hundred and eight clients were located and examined out of a total of 140.

Results: One hundred and eight clients were located and examined. All of these clients were obtained from the perceived positive diagnoses.

Methods: This study was a retrospective review of patients' medical records. The medical records were obtained from the pharmacy department of the hospital.

During the study period, 1 January until 31 December 2002, HIV infection was performed from 1 January until 31 December 2002. Patients were identified through a laboratory profile of all the ELISA tests for HIV infection.

Aims: To estimate the cost of medications for HIV-related hospitalisations and outpatient visits.
HIVART programme has commenced. However, studies conducted elsewhere and to be able to compare the results with studies should be conducted so as to be able to compare the results with further improve on the clinical management and proper record keeping. It was recommended that clinical staff should undergo training in order to learning opportunistic infections in line with National guidelines. Taking data missing. It was evident from the finding that the medical staff were no The quality of medical records was of poor quality with a lot of The need was to improve record keeping since some of the files could not. The cost of medication was not related to length of stay except P.T.P.

Discussion and conclusions

Pains

The most expensive cost was for TB treatment and the lowest for abdominal.

Outpatient visits was R77.23 (R2.44 - R1.54.52). The median drug cost for outpatient was R202.64 (R1.96 - 394.22). The highest cost was related to an admitted patient whilst the lowest cost was for R394.22 and the lowest cost was R2.44.
Trends in the prevalence.

and the national prevalence between 1980 and 2002. Illustrating the relatively
26.56% Figure 1 shows the antenatal HIV prevalence in Limpopo province
Limpopo was 15.77% as compared to the National prevalence which was

When this study was conducted in 2002, the HIV antenatal prevalence in

consultations in health facilities and admissions in hospital

morbidity of HIV/AIDS. This will be managed by the increase in the number of
adversely affected by the Department of Health due to the mortality and
South Africa are infected with HIV. One of the service providers that is
indicate that more than 28.5% of the public and private sector antenatal attendees in
HIV and Syphilis antenatal sero-prevalence survey in South Africa 2004(1)
Growing from year to year worldwide. The latest statistics from the National
HIV/AIDS is continuing to be a serious pandemic with the number of affected

BACKGROUND AND LITERATURE REVIEW

followed by discussion and recommendations.

In this report the methodology is described and the results are presented.

During the initial visits or admission after introduction of ARVs

This information can be used as a baseline for comparison with drug costs

patients and in the TFF Knob Hill hospital during 2002.

During inpatient stay for HIV related visits and admissions during the pre-

prescribed per outpatient visit and the average cost of medicines prescribed

The aim of this study has been to document the average costs of medicines

INTRODUCTION
Costs and benefits of preventing and treating HIV/AIDS were commissioned at the University of Cape Town (4). The study and the report, The Study and the Report, were commissioned by the Centre for Actuarial Research of the University of Cape Town (4). Among other sections of the Act is one allowing for parallel importation of drugs. According to Coovadia (5), intellectual property rights and the required proofs manufactured on the basis that the patent of the drugs has not yet expired. This was aggravated by the fact that a generic could not be the drug. The dilemma concerning provision of ARVs originates from the high cost of ARVs and AIDS.

The same dilemma affects health managers when they compile their annual budgets for health services, which will obviously include funding for patients with HIV and AIDS. The most important issue to provide a complete package of care to those infected (2). Health authorities at public sector facilities. It was the National Department of Health, the Minister of Health was faced with the dilemma of whether or not to provide ARVs at public sector facilities. It was the National Department of Health that provided ARVs at public sector facilities. It was the National Department of Health that sponsored an International Conference on Community-Based HIV/AIDS Care in South Africa, which was held in 2002. (6)

Figure 1: HIV aneutral seroprevalences in Limpopo 1992 - 2002

effective and efficient utilisation of funds.

The AIDS epidemic poses another big challenge regarding monitoring and evaluation of health services. Hospital Performance Indicators are used by the Department of Health as a tool for measuring performance and to ensure in order to assist provinces in the country to implement the HAART programme an Operational Plan was produced in November 2003.(6)

An option of introducing anti-retroviral therapy for people with AIDS who are non-progressors and integrating additional interventions, including the policy interventions, and integrating additional interventions, including the component of the country's 5 year strategic plan, including scaling up current health sector (5).

This report provides options to support the strengthening of the second health sector. Options to support comprehensive care for HIV and AIDS in the public health system, namely treatment, care and support for those infected and affected by the pandemic.

A particular focus of the Task Team was on the second component of the Strategic Plan, namely treatment, care and support for those infected and affected by the pandemic.

In July 2002 a report was released which indicated the reluctance of the Department of Health to release the outcome of the study they conducted in 1999.

In July 2002 Cabinet decided to instruct the Minister of Health to make ARVs available to HIV-infected people with a CD4 count of less than 200. This was followed by Cabinet’s receipt of the Report of the Joint Health Programme that could provide the lives of 1.7 million people (5).

Subsequently, on 6th August 2003 Cabinet decided to instruct the Minister of Health to make ARVs available to HIV-infected people with a CD4 count of less than 200. This was followed by Cabinet’s receipt of the Report of the Joint Health Programme that could provide the lives of 1.7 million people (5).

In July 2003 Cabinet produced a Joint Health and Treasury Task Team to investigate issues relating to the financing of an enhanced response to HIV providing treatment with ARVs. By the Treatment Action Campaign to calculate the costs and benefits of...
• Be proactive in approach
• Planning and delivery of service

To eliminate duplication of activities and enhance cost-effectiveness
• To reduce unnecessary visits and admissions to hospitals

• Appreciate proper education and learning through
• To empower the client (s) and the community through

• To empower the community/family to take care of their own health
    and formal health system

• To integrate a comprehensive care plan into the informal, non-formal

• To ensure access to care and follow-up through a functional referral

• To shift the emphasis of care to the beneficiaries

This programme aims and objectives are as follows:

(3)

Department of Health published guidelines toward this programme in 2001.
This is where the programme of home community-based care comes in. The

themselves.

communities towards those who are already sick and cannot look after
Health has come up with programmes targeting the involvement of
This study will be focusing on this goal. Toward this end, the Department of

support services in communities.

The plan, GOAL 8 reads as follows: Provide adequate treatment, care and
Strategic Plan for South Africa 2000-2005 (7). There are thirteen (13) goals in
Management of HIV/AIDS in the public sector is guided by HIV/AIDS and STI

HIV & AIDS programs in the Public Sector

patients who contribute to high rates of admission and length of stay.

The important indicators include average length of stay (ALOS) as well as bed
was ongoing debate regarding whether to treat or not to treat the infection with
controllers in the country regarding the issue of treating HIV/AIDS. There
before cabinet approved provision of ARV treatment in 2003; there was much
injections, in other words they did not receive antiretroviral drugs.
This study concerns HIV-positive patients who visit public facilities at a
There are "wellness" or "hope" clinics,
in two recorded kerb of patients who were diagnosed. The exception is where
am also to assess the cost incurred. Most of the time there is
therefore becomes difficult to assess the cost incurred with antiretroviral
not because patients present to a health facility with antiretroviral
lack of knowledge concerning how many
in the PMTCT
is the lack of follow-up by health workers. This was manifested in the
one of the challenges regarding clinical management of HIV-infected patients.
Inpatient admission to be compared before and after the introduction of ARVs.
ent inpatient cost per outpatient visit and medicines costs per
enables the medicines cost per outpatient visit and medicines costs per
Africa. This study will still be useful once ART treatment is provided as it will
2002. During this period ART was not provided in public facilities in South
The period during which this study was conducted was January to December
and if so by how much. The study will also show the need for development of
and it so by how much. The study will also show the need for development of ART
ART costs for medicines have been influenced by the introduction of ART
information for decision makers for the purpose of deciding whether (non-
This study will focus on the costs of pharmaceuticals as background
(d) Seeking ways to reduce cost of drugs
(e) Developing and using standard protocols
(f) Decentralising care
(g) Improving planning for the provision of care

Provision of ART. They are as follows:

Kersestad (g) has identified four important steps in the quest to provide

Treatment and care
residents of the city and county of Denver, in the United States.

In-patient vs. out-patient care

perspective of the patient (From scheme) and not from a societal perspective.

Economic analysis was carried out from the

subsequent, it was found that those individuals submitting claims for either

carried out on the number of CD4 counts of viral loads used 300% more medicine than the average for the

CD4 count of viral load test and CD4 count test were developed.

years later, when the viral load test and CD4 count test were developed,

Medscheme reimbursed all identifiable HIV/AIDS claims except for pathology.

Compared to others, it is during the early years of the HIV epidemic,

The medscheme experience

is already low and at this stage patients present with symptoms.

However, in practice, most of the time patients request testing when the CD4

500, which means that patients should rather be tested earlier.

advanced stages of the disease, in other words, their CD4 count is less than

They further argue that this is because most of the patients are in the

ART therapy for the patients life.

HIV/AIDs defining illnesses were more expensive than providing double or triple

demonstrated that hospital treatment arising from complications, for the

According to Commiss[17] a number of studies were conducted by Medscheme

The cost of treating the symptoms

is more cost-effective than treating the viral infection itself.

ARVs. There was also debate about whether treating opportunistic infections
Infection or tuberculosis.

(c) Thirdly, no prophylaxis has been given against Pneumocystis carinii.

hospital in South Africa.

(1) Secondary patients were not placed on ARVs, since the venue is a public

Africa, hence the same monetary value.

(2) They are similar in the sense that they were both conducted in South

patient costs of treating opportunistic infections were investigated.

conducted by Kessler et al. (12), in which the in-patient as well as out-

One study, which is more relevant to the study being conducted, is the one

The Bergwann study

Discussion of the study.

difficult to compare. However, this point will be taken into consideration in the

collars which is in South Africa is in Rand, the exchange rate of which is

study lies in the comparison of the monetary values since the USA study is in

The second limitation in comparison of the Denver study with the current

public hospitals in South Africa.

opportunistic infections was studied since ARVs were not yet provided in

treatment for opportunistic infections in the present study only treatment for

current project is that the patients were receiving both ARVs as well as

The limitation of this study as compared to the study conducted for this

care, and the total cost for both was $7,859,690 for the year 1990.

that 77% of patients presented for in-patient care and 47% for ambulatory
during 1990 and were followed up over a period of 13 years. Here they found

HIV/AIDS patients for 1990. They studied 812 infected patients who presented

They compared the out-patient with in-patient utilisation of services by
lead to competition with and disruption of other PHC essential services. Africa where resources are limited. The forecase that the epidemic would as early as in 1993. The author focussed this attention on rural hospitals in The impact of HIV/AIDS on hospital services was also raised by Capper (14).

To treat these opportunistic infections.

opportunistic infections and it would cost up to Rs 729,11 per patient per year. a year a patient would consult four times a year with the different types of

Regev et al, management of opportunistic infections, the paper indicated that in

reducing costs of ARVs.

recommended that pharmaceutical companies had to look into the issue of.

The paper highlighted among other things, the importance of providing cost.

466.50 per patient per year for life long ARVs, on the regimen used.

estimated in 1999 for ARV therapy ranged between Rs 5,000.00 and Rs 18.

facilitate cost extrapolation versus current and future expenditure. The
to facilitate cost extrapolation versus current and future expenditure. The
costs both in the public and private sector. A spreadsheet was created.

The drugs
costs both for ARVs and for treatment of opportunistic infections. These drugs

opportunistic infections in South Africa. The recommended drugs and their

the economic implications of drug treatment for HIV/AIDS and treatment of

another study with a similar design to this study, Mhlye et al (12), looked at

under study, in line with the essential drug programme.

5 (c) Some drugs like secodol are not rouinely available at the hospital.

counterparts and patients.

patients who presented to the hospital for medical attention, both as

were followed for a year whereas this project looks only at all the

administration.

drugs, shells, other consumables, running costs like equipment and

The differences are as follows:

The Bergmanahl study considered all costs, namely laboratory costs,
standard medical care without specific interventions targeted at HIV/AIDS.

different types of HIV/AIDS prevention & care programmes compared to
assist decision-makers in the private sector in assessment of affordability of

The objective of the development of the cost-effectiveness model was to

for HIV/AIDS was concerned.

from Zimbabwe (17) where different models were looked at. As far as finding
Barcelona addressing the cost of treating HIV/AIDS. One of the papers was

A number of papers were presented at the International AIDS conference in

additional 50% to approximately R350 per month.

genetic formulations could reduce the cost of the initial schedule by an
approximately 50% of current retail pricing. It is assumed that availability of
preferential pricing which will reduce the cost of the initial regimen to
management programme. Their plan was to hopefully accessed UNAIDS
the attributable cost of adding ART to the existing primary care HIV
expenditure. They also showed that procurement accounted for 61% of
Viral load and CD4 cell testing contributed 10% of total attributable

Specialists medical support and training 29%. Medical officers accounted for 39.9%, nurses 16.9%, laboratory staff

with a C4A count of 200 and less. Deckers et al (20) pointed out that
Health Centre (16), A study was conducted in ART being provided to patients
in the country was the ART clinic which is situated in Engcuthu Community
Regarding provision of ARV drugs in the public sector, one of the first clinics

regarding ARV drugs on a very small sample.

Regarding was of a poor nature. As a result the study objective was based only
within a secondary acute hospital. In that study it was found that recent

A similar study was conducted by Hopley in Cape Town (15) where the aim was

management of HIV & AIDS.

selected health facility does adhere to National Guidelines on clinical

Regarding data collection, this study is also intended to indicate whether the
aspects of costing i.e. personnel, drugs, laboratory tests, radiology, travel and patients attending the facilities. The cost part of the study looked at all the cost of treating HIV and AIDS as well as a study of the quality of life of patients in the Western Cape Province. The aim was to study both the direct and indirect costs of treating HIV.

Wenger et al (19) conducted a study at Groote Schuur and Connaught and were less than those of using the conventional approach.

The research showed that 227 men were correctly treated for sexually transmitted infections. The symptoms of these patients could be collected from 347. The symptoms were: fever, headache, rash, incontinence and urinary tract infections. A total of 46 men complained of genital symptoms were noted. Of these, 46 men complained of genital symptoms were noted. The cost of treating these patients was used. The main components were patterns of HIV infection and the different approaches. A very important lesson health managers have to take into consideration when planning to find the different approaches is that people are not always convinced with benefits that would be achieved. This is a very important lesson health managers have to take into consideration when planning to find the different approaches. A very important lesson health managers have to take into consideration when planning to find the different approaches.

Health care providers:

- Be easy to use and understandable as a policy planning tool by company managers, health union leaders and health care providers.
- Allow a comparison of the existing medical care programs with those that are not being followed.
- Describe the main costs and benefits of running HIV/AIDS prevention and treatment programs within a company environment.

The model should:
Tuberculosis protocols are also used for the TB Control Programme (23).

Advocating the use of a treatment protocol for the ART programme (22) would be too costly. The Department of Health in South Africa is also using in limited resource settings where laboratory confirmation of diagnosis is not available, as shown by Plumier et al. (21). This method is popularly referred to as a "profile" of patients. The use of treatment guidelines has also contributed to reduction of costs in the healthcare system.

We were concerned with the impact of the HIV epidemic on health care in the community and the need to collaborate. In a study by Tseman et al. (20), the epidemiological, clinical, and economic impact of the epidemic was assessed in the community and the need for integration of primary health care and improved procedures for referral and discharge of patients needed to be addressed. A need for a focus on patient care was made, as follows:

Recommendations:

1. Impact of healthcare utilization on the patient's life.
2. Travel costs were also included as a way to measure the impact of healthcare utilization on the patient's life. Hospitalization, and so on.
3. The cost of the opportunistic infections prevented or treated, days saved from HAART was made available in the public sector. The evaluation was in terms of HAART was conducted in April 2001, before the study was started. This was the case then because the study was conducted on the prevalence of HIV/AIDS care was concerned since there was only palliative treatment. This study highlighted limitations as far as evaluation of the effectiveness of ART were described.

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same authors (Z7) was to entrench TB Performance Based Process Review. The overall aim of a further study reported by the authors of tuberculosis diagnosis of long disease, the overall aim of a further study reported by the study compared in the study conducted by Hurley et al. (Z7) was also demonstrated that problems existed with regards to tuberculosis diagnosis. In a study conducted by Hurley et al. different costs could be that Demana's study was based on 2002 drug prices.

The author came to the following conclusions: The highest medical cost was

- Facility fees
- Radiology
- Procedures
- Drugs
- Laboratory fees
- Professional fees

Following: At medical treatment whereas the study by Demana was also looking at the difference between the two studies is that the present study is looking at only a similar study was conducted by Demana at Pretoria general hospital (Z7). The improvement medication will be, however, the quality of life for these patients would be controlling for other factors. This then means that in the short term the costs of the same time they demonstrated longer time-to-incident admission guidelines ended up with more prescriptions and higher drug costs while all were treated according to treatment guidelines for HAART with those not

Programme (Z5).
decisions on the use of intravenous ART and other immunoglobulins.

to provide ART after clinical trials have been conducted to make informed
for general paediatric patients. The purpose of the letter was to advocate
the hospital. The pharmacological cost per admission was R373 compared with
This was far in excess of the mean of 5 days for general paediatric patients at
per child was 54 days and the mean hospital stay per admission was 26 days.
where each of them received a 2.1% admission rate. The mean hospital stay
conducted on 20 cases of children who were seen at the Red Cross Hospital
was also written in 1992 in the pre-ART era. The letter was based on a study
a comprehensive package of care to children infected with HIV. This letter
Hussay et al (29) also indicated in a letter their concern regarding provision of
significant.

and R60.59 per day respectively and this difference was statistically
ANDS patients after adjusting for length of stay. The drug costs were R38.59
the median delay cost was compared between 40 medical admissions and 20
the difference was statistically significant (p=0.05) in the second part of the study.
The difference was compared to those of 81 HIV negative patients which was five days as
the duration for 35 HIV positive patients was eight days as
not infected. The duration for 35 HIV infected patients against those
the study compared the length of stay of HIV infected patients against those
the cost of other medical patients not infected with the virus. The first part of
the cost of treating HIV infected patients admitted in a medical ward versus
infected with HIV was raised as far back as 1991. These authors compared
in a letter by Peter et al (28), the burning issue of treatment of patients
important opportunistic diseases.

HIV revealed lung diseases which the present study indicated to be
introduced in the public sector to improve diagnoses and management of
recommended that a training programme along similar lines could be
cases of PTB from 66% in 1999 to 54% in 2003 in the mining industry. It is
outcome was such that there was a decrease in the proportion of missed
the mine visits and confronting professional development exercises. The
the project, many doctors and other health professionals were trained on the
PPR programme through attendance at various presentations, as well as at
(PPR) and to evaluate the impact of this programme. During the course of
not differing much from the cost for other chronic diseases e.g. end-stage
found that studies done in the US have shown the cost of treating HIV/AIDS
resources. Regarding developed versus underdeveloped countries, they
favored policy formulating but not useful in determining allocation of
They further pointed out the fact that burden of disease data may be helpful
of most studies.
application of most studies, highly variable results and the very limited scope
almost all research conducted until then which were named: limited policy
identifying contributory factors. They mentioned the limitations characterizing
developed countries against those in developing countries with the aim of
as a model for projection. Their research looked at the possible impact in
Broome and et al. (19) also looked at the economic impact of HIV/AIDS in 1991.
• Diarrhoea as a result of malabsorption leading to further loss of weight.
• Malabsorption due to inability of the gut to take up nutrients.
• Infection deteriorating the lining of the gut.

(b) Physical problems

(1) Personal

Isolation of public events affecting the eating behavior of the infected
• Lack of money for food
• Poor sense of taste due to medication.
• Poor appetite due to infections and depression or anxiety.
• (a) Lowered food intake

Reinforcement protocols for patients infected with HIV also include nutritional

Nutritional supplementation
Period of six weeks.

In-patients from the Internal Medicine and Paediatric departments over a

June 2005. The data was collected from records of discharges and deaths of

Paediatric wards of Chittagong Medical College Hospital during the period May –

of coming for hospitalized patients with HIV & AIDS in the Medical and

Thomas et al. (33) conducted a study with the aim of estimating the total cost

A costing study was also conducted at a tertiary hospital in Chittagong province.

A drug intervention like education, condom distribution, etc.

concerning the use of non-HAART therapeutic interventions as well as non-

patient is already on HAART. Another aspect which was looked into was

of continued use of prophylaxis against opportunistic infections even when the

that ARTs should be made available. The paper also indicated the importance

These predictions were made in 2001 just before Cabral made the decision

incremental costs over a 10 year time horizon.

an intervention to South African mines. The study calculated the net

perspective (that might arise as a result of the introduction of highly active

among issues which were addressed on the work done was the investigation

Highly Active Antiretroviral Treatment (HAART) on South African Mines.

and AIDS. Girdner-Brown (32) conducted a cost-utility study on the cost of

Other researchers also looked at future projections on costs for treating HIV

Broome and et al. show that the cost will more than double within ten years.

reminiscent spike between 1991 and 2000 whereas the one predicted by

The document was comparing different economic models. In some the cost

capital spending than in developed countries.

expenditure on HIV/AIDS constituted a far greater proportion of per health

the studies was conducted in Zaire and Tanzania showed that total

renal failure. For developing countries where is limited data available, one of
To record details of medicines prescribed.

(c) To record length of stay of inpatients according to diagnosis.

(d) To determine the ages and genders of the patients seen.

(e) To obtain details of all outpatient visits and admissions that were HIV-

Objectives

is a district hospital in Limpopo Province. HIV-related conditions in patients at Wk Knoedel Hospital, Wk Knoedel Hospital perspective in 2004 prices for inpatient admissions and outpatient visits for To estimate the average direct costs of medication from the provider.

AIM

STUDY AIM AND OBJECTIVES

Patients seen in a district hospital over one calendar year.

and out-patients) and the pre-ART opportunity infection rates for a group of

This study provides the average pre-ART medication costs in 2004 prices (in-

known and if the outcomes with and without ARVs are also known.

estimates can only be made if the initial costs with and without ARVs are other things through utilisation of treatment protocols. Cost-efficiency are utilised and whether there is cost-effectiveness which would be among other health programmes. Therefore it is important to assess how these funds

Huge amounts of money are being spent on the programmes at the expense of

incurred and how to prolong life.

that will be passed by the effects of the epidemic both in terms of costs can resist their planning programmes so as to meet with the new challenges

majo cost driver in the health system such that managers and policy makers

The study was conducted based on the fact that HIV/AIDS has become a

Reasonable for the study
was collected from the records. Followed up, a retrospective record review was conducted. The following data were collected: (a) Asymptomatic people who came purely for HIV test. (b) Patients whose visits were for non-therapeutic/diagnostic purposes. (c) Patients who only came for non HIV-related incidental conditions.

**Sampling strategy**

(c) Both sexes were considered.
(b) Patients of all ages were considered. Selected provided the visit was for an HIV-related condition.
(a) Patients who were diagnosed as HIV-positive through ELISA were considered.

**Exclusion criteria**

31 December 2002 for HIV-related conditions. This consisted of patients who visited the hospital between the 1 January and

**Study population**

Pilot review of records The data was collected using a sheet based on the literature review and a retrospective record review of all patients consulting during 2002.

**Study design**

**METHODS**

and calculate the average by dividing by the number of admissions.

(g) To work out the total cost of medicines prescribed for inpatient visits.

(f) To work out the total cost of medicines prescribed for outpatient visits.

(e) To ascertain the direct cost to the provider in 2004 prices of the prescribed medicines.
informed consent was not required since the patients were not personally involved in the study.

- Hospital registration numbers.
- Names of patients were not entered on the data collection form, only their data entry.
- To ensure confidentiality, files were kept in the Superintendent’s office.

Ethical considerations

Clinical Records:

Patients were not staged according to WHO because of the poor quality of data entry. The data was obtained from the patient files and from the medical records (Appendix 2) and used for the analysis.

3. Indirect costs:

Electricity, water, equipment,

2. Other direct costs namely laboratory, X-ray, linen, food,

1. Residential address,

The following information was not collected:

Data was collected per visit of each patient.

For outpatient visits and for admissions were noted.

and per outpatient visit in addition the highest and lowest cost of prescriptions

Using this information the average drug costs were determined per admission

for the drugs that were prescribed.

The pharmacy section at Polokwane hospital provided the 2004 tender prices

6. Main diagnosis for each visit, admission

5. Number of admissions per patient

4. Number of visits per patient

3. Length of stay per patient for each admission.

2. Details of drugs prescribed at each visit/ admission.

1. Details concerning gender and age for each visit/admission.
Other: this category was covering conditions like arthritis and fever.

Neurological includes meningitis

Records were lost or weight in some cases or malnutrition in others.

Malnutrition: here the only medical condition mentioned in the patient

Anaemia: anaemic cardiac failure, post-abortal anaemia.

Gastroenteritis: chronic diarrhoea and other gastro-intestinal conditions

Oesophagitis: oral leukoplakia, oral thrush, esophagitis and oral herpess.

Bronchitis.

Pneumonia: PCP, interstitial pneumonia, bronchopneumonia, abscesses and TB adeitis.

Conditions grouped together were as follows:

because in some cases where some conditions which presented only once.

some medical conditions were grouped together to enable data analyses

Classification of medical conditions

developments, and other summary statistics.

4. The results are presented using frequency tables, means, standard

3. The data was then analyzed at the MRC using Stata version 9 (34).

Researcher.

The completeness of the entry was checked manually by the

2. The data was then entered directly into an MS Excel spreadsheet.

1. Data was extracted directly from the files and hand-written into the

Data analysis

Science Ethics Committee (Appendix 2).

The study protocol was approved by the Wits University Faculty of Health
Pneumocystis carinii pneumonia (PCP) prophylaxis (co-trimoxazole) routinely.

There were 19 TB cases in all patients with TB were also all given bacteriological proof available in the notes for approximately half the cases.

Regarding diagnoses for TB, patients were placed on TB treatment without

in 35 (32.4%) of the 108 medical records no formal diagnosis was recorded.

Quality of patients' records

| 108 | 32 missing files |
| 140 | less 32 repeat positive results |
| 78 | less 8 routine positive results |
| 181 | Total sero-positive test results during 2002 |

Balance

Table 1: The source of those (108) included in the study

Visits/admissions has not been included.

analyses concerns only the first visit for admission: data for second or third

Files were found for 108 of those people (77.1%); (see Table 1 below). This

Leaving 140 subjects available for analysis.

excluded from this study. In addition, 35 results were repeat positive results,

of confirmed HIV positive test results. Eight of these results were for routine

During 2002 the NHL’s laboratory serving the M. Kwalus hospital noted 181

Summary of files

RESULTS
<table>
<thead>
<tr>
<th>Number of times (%)</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Others</td>
</tr>
<tr>
<td></td>
<td>Malnutrition</td>
</tr>
<tr>
<td></td>
<td>Anaemia</td>
</tr>
<tr>
<td></td>
<td>Skin conditions</td>
</tr>
<tr>
<td></td>
<td>Sexually Transmitted Infections</td>
</tr>
<tr>
<td></td>
<td>Neurological</td>
</tr>
<tr>
<td>7 (7.7%)</td>
<td>Gastroenteritis</td>
</tr>
<tr>
<td>9 (8.3%)</td>
<td>Oesophageal candidiasis</td>
</tr>
<tr>
<td>18 (16.7%)</td>
<td>PTE</td>
</tr>
<tr>
<td>6 (7.8%)</td>
<td>Pneumonia</td>
</tr>
</tbody>
</table>

Table III: Number of episodes by diagnostic group grouped as well as their frequencies. Other: Table III shows all the episodes (in- and out-patients) by diagnostic group. On reviewing patients' files, some conditions were noted more often than others. Table III shows all the episodes grouped as well as their frequencies. Other: Table III shows all the episodes (in- and out-patients) by diagnostic group. On reviewing patients' files, some conditions were noted more often than others.

The above table indicates that the highest numbers of patients were females aged between 21 and 40 years.

<table>
<thead>
<tr>
<th>AGE</th>
<th>MALE (%)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>108</td>
</tr>
<tr>
<td>31</td>
<td>28.7%</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>61.5%</td>
<td>&gt;51</td>
</tr>
<tr>
<td>41-50</td>
<td>53.8%</td>
<td>13</td>
</tr>
<tr>
<td>31-40</td>
<td>17.1%</td>
<td>13</td>
</tr>
<tr>
<td>21-30</td>
<td>6.9%</td>
<td>5</td>
</tr>
<tr>
<td>14-20</td>
<td>0%</td>
<td>5</td>
</tr>
<tr>
<td>&gt;41</td>
<td>36.5%</td>
<td>8</td>
</tr>
</tbody>
</table>

Table II: Distribution by sex and age group. About the first visit/admission was used in the analysis. Table II shows the gender and age profile of the 108 patients whose data distribution by gender and age.
8 days. The data was skewed to the right, and the median length of stay was 1 to 85. The average length of stay for admissions was 134/18 = 11.33 days (range 1 to 85). The total inpatient days was 1,348.

Length of hospital stay

The total number of inpatient admissions during the year was 43.

The number of episodes

The total number of outpatient visits for HIV-related conditions during the year was 43.

Patients with dual HIV/TB infections often present with pleural effusion by PTB. The diagnosis of PTB included cases of pleural effusion since the figure above, pneumonitis was the most common diagnosis followed by the consumption of antibiotics.

Figure 2: Distribution of the cases between disease categories.
Total cost of medicines for outpatient visits = R723.25
Total cost of medicines for admissions = R856.66

Cost of medication

LENGTH OF STAY PER CONDITION

Figure 3: Length of stay by condition for the ten longest admissions

<table>
<thead>
<tr>
<th>LOS (days)</th>
<th>CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>PIB</td>
</tr>
<tr>
<td>35</td>
<td>Pneumonia</td>
</tr>
<tr>
<td>37</td>
<td>Acute lymphoedema</td>
</tr>
<tr>
<td>37</td>
<td>Recirculation PIB</td>
</tr>
<tr>
<td>41</td>
<td>Anemic cardiac failure</td>
</tr>
<tr>
<td>42</td>
<td>URTI</td>
</tr>
<tr>
<td>42</td>
<td>Bipolar manic</td>
</tr>
<tr>
<td>45</td>
<td>Lung Collapse</td>
</tr>
<tr>
<td>76</td>
<td>PIB</td>
</tr>
<tr>
<td>83</td>
<td>Lung abscess</td>
</tr>
</tbody>
</table>

Table IV: The ten conditions with the longest length of stay

Table IV and Figure 2 show the ten longest lengths of stay by condition.
<table>
<thead>
<tr>
<th>Condition</th>
<th>Average Cost / Length of Stay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anemia</td>
<td>8.65</td>
</tr>
<tr>
<td>Sexually Transmitted Infections</td>
<td>24.22</td>
</tr>
<tr>
<td>Malnutrition</td>
<td>24.02</td>
</tr>
<tr>
<td>Skin conditions</td>
<td>32.20</td>
</tr>
<tr>
<td>Other</td>
<td>60.74</td>
</tr>
<tr>
<td>Neurological</td>
<td>66.05</td>
</tr>
<tr>
<td>Gastrointestinal candidasis</td>
<td>74.88</td>
</tr>
<tr>
<td>Gastroenteritis</td>
<td>84.4</td>
</tr>
<tr>
<td>Lung conditions</td>
<td>372.32</td>
</tr>
</tbody>
</table>

Table V: Drug costs and lengths of stay (in-patients) by condition.

Table V and Figure 4 illustrate the information.

Stay as well as being the most costly, medication and length of stay, although PTB showed the longest length of stay from lung conditions, there was no direct relationship between cost of medication versus cost of inpatient stay.

The most expensive inpatient drug costs were for Pulmonary TB (R394.22). Zoster (R144.10).

The most expensive outpatient visit cost was for Antiviral cream for Herpes.

Was positively skewed.

The data was skewed. The median was R202.68 (Range 11.01 - 10394.22). Again, the data cost of medicines per Inpatient admission was 6669.68/11.9 = R72.85 (SD = R2.24 - R14.10). The distribution of the costs is positively skewed. The mean = 48.30. The median cost of drugs per outpatient visit was R77.26 (Range: 10.36 - 932.59) = R16.82 (SD = 80.85). The median was R202.68 (Range 11.01 - 10394.22). Again, the data cost of medicines per Inpatient admission was 6669.68/11.9 = R72.85 (SD = R2.24 - R14.10). The distribution of the costs is positively skewed. The mean = 48.30. The median cost of drugs per outpatient visit was R77.26 (Range: 10.36 - 932.59) = R16.82 (SD = 80.85). The median was R202.68 (Range 11.01 - 10394.22). Again, the data cost of medicines per Inpatient admission was 6669.68/11.9 = R72.85 (SD = R2.24 - R14.10). The distribution of the costs is positively skewed. The mean = 48.30. The median cost of drugs per outpatient visit was R77.26 (Range: 10.36 - 932.59) = R16.82 (SD = 80.85). The median was R202.68 (Range 11.01 - 10394.22). Again, the data cost of medicines per Inpatient admission was 6669.68/11.9 = R72.85 (SD = R2.24 - R14.10). The distribution of the costs is positively skewed. The mean = 48.30. The median cost of drugs per outpatient visit was R77.26 (Range: 10.36 - 932.59) = R16.82 (SD = 80.85). The median was R202.68 (Range 11.01 - 10394.22). Again, the data cost of medicines per Inpatient admission was 6669.68/11.9 = R72.85 (SD = R2.24 - R14.10). The distribution of the costs is positively skewed. The mean = 48.30. The median cost of drugs per outpatient visit was R77.26 (Range: 10.36 - 932.59) = R16.82 (SD = 80.85). The median was R202.68 (Range 11.01 - 10394.22). Again, the data cost of medicines per Inpatient admission was 6669.68/11.9 = R72.85 (SD = R2.24 - R14.10). The distribution of the costs is positively skewed. The mean = 48.30. The median cost of drugs per outpatient visit was R77.26 (Range: 10.36 - 932.59) = R16.82 (SD = 80.85). The median was R202.68 (Range 11.01 - 10394.22). Again, the data cost of medicines per Inpatient admission was 6669.68/11.9 = R72.85 (SD = R2.24 - R14.10). The distribution of the costs is positively skewed. The mean = 48.30. The median cost of drugs per outpatient visit was R77.26 (Range: 10.36 - 932.59) = R16.82 (SD = 80.85).
There was no direct relationship between cost of condition and length of stay.
For this must be made when making comparisons, was to give 1 week's supply. If this policy were to change then allowance for referrals and the take home prescriptions for outpatients. The policy average costs of medicines are influenced by the take home prescriptions.

Although larger numbers were expected at the outset of this study the

actual numbers of admissions and outpatient visits (especially) were small.

These findings cannot be generalised to other districts where the case mix
differed substantially from those that were found. The case details contained in the missing files might have

retrieved. The case details contained in the missing files might have

Laboratory list of ELISA tests conducted in 2002, only 109 files were

Not all the files could be found. Out of 140 records obtained from the

LIMITATIONS
anti-microbials, antibiotics, supplements and painkillers. However, the study by Nkemel et al. focused on drug costs. One of the differences between this particular study and the present study was the fact that only one patient treatment costs were computed. Also excluding ART, in 2000, as between R15.625 and R20.160. These study results refer only to the drug cost for admission or per outpatient.

General supplements intended to address the nutritional required to the infections. None of the patients who were admitted were placed on any of the food.

Nutrients does not perform CD4 counts, this could not be done. According to the World Health Organization however, because the hospital calculated of length of stay was meant to be based on staging of the disease.

Treatment like circumcision in which case specific terms are used.

Type of treatment they receive. This system is not used in the case of complacently a treatment they receive and this has nothing to do with the fee system is such that all patients pay the same amount of money. The fee system is such that all patients pay the same amount of money because of their salary level. Those examined from payment like pregnant woman and children under five. Patients are classified into H1 to H4. H1 referring to unemployed patients or patients on the Unemployment Fund or UEP where hospital uses a system called the Unemployment Patient Fee System. When the study was initially planned, one of the objectives was to compare treatment costs for treating HIV positive patients against the total costs for all types.

Study objectives

DISCUSSION
However, gastrointestinal and dermatological conditions were far less common.

- Vestibular disease
- Croup
- Meningitis
- Pneumonia
- TB

were similar to the ones used in this study, namely:

as such costs were markedly higher. The first four commonest conditions conducted at a tertiary hospital as compared to the hospital under study and Thomas et al and here both children and adults were studied. The study was the other Baragwanath study which was conducted a decade later by gastric intestinal and neurological were similar to those in the present study.

neurological and sexually transmitted illnesses. Two of these namely conditions were listed as follows: mucocutaneous, gastrointestinal.

In the Baragwanath study by Karkseau (1995) the commonest occurring
Among the inpatients those who stayed in hospital the longest were those prescribed prescriptions. Inpatient prescriptions were much higher in cost than outpatient prescriptions. The following conclusions are made:

Conclusions


<table>
<thead>
<tr>
<th>Cost</th>
<th>Treatment</th>
<th>Present Diagnosis</th>
<th>Discharged Date</th>
<th>Age</th>
<th>Sex</th>
<th>Ref. No. of Admission</th>
</tr>
</thead>
</table>

**Annexure A**

**Clinical Data Collection**
<table>
<thead>
<tr>
<th>Data Collection</th>
<th>Clinical Data</th>
<th>Personal Data</th>
<th>Demographic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Intestinal diarrhoea</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-infection with Tuberculosis</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight loss</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Herpes zoster</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral hairy leukoplakia</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral thrush</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaposis sarcoma</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The following diseases will be considered: WHO classification of HIV</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slagging will be done according to</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date of out-patient visit</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date of death</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date of discharge</td>
<td>•</td>
<td></td>
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</tr>
<tr>
<td>Date of admission</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date of diagnosis</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital number</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Annexure B