# IMPACTS OF HIV/AIDS ON THE PUBLIC SECTOR HEALTH CARE SERVICES IN DIRE DAWA ADMINISTRATIVE COUNCIL, EASTERN ETHIOPIA

**BY**

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# List of Abbreviations

**AIDS-** Acquired Immune Deficiency Syndrome

**BCC-** Behavior Change Communication

**E.C.-** Ethiopian Calendar

**HIV-** Human Immune deficiency Virus

**IEC-** Information, Education and Communication

**MOH-** Ministry of Health

**RVI-** Retroviral Infection

**TB-** Tuberculosis

**VCT-** Voluntary Counseling and Testing

# Abstract

A retrospective review of financial documents, cards and/or registration books of HIV/AIDS clients/patients served/treated in Dil chora Hospital for one year and health workers death information in the last ten years was conducted to assess the impacts of HIV/AIDS on the public sector health care services in Dire Dawa Administrative Council. There were a total of 809 HIV/AIDS service users at Dil chora Hospital from July 2002 to June 2003 out of which 206(25.5%) were HIV test positive. Majority of the HIV test positives and patients treated for opportunistic infections were between the age group of 15 to 50 years. The jobless, illiterate, widowed and divorced were more likely to test positive. The health care system subsidized greater proportion of HIV/AIDS services: only 3.6% and 7.9% of expenditure on VCT and treatment of opportunistic infections were recovered from user fees respectively. Admission of one patient with AIDS case barred on average admissions of two patients with other causes. The record of 16 health care worker's died of any cause has been found in the last ten years: 75% of them were males, the mean age at death was 31.18 years and 81.25% were health assistants. This study indicated that HIV/AIDS is: directing health care resources to prime age adults (15 to 50 years of age), blocking other patients from in-patient health care. And health care workers are dying prematurely from any cause. Lastly, ascertaining that all segments of the population are reached by IEC, properly targeting subsidy and looking for other possible ways of caring for AIDS cases, and ensuring health care workers safety at work are worth recommending.

**Key words: HIV/AIDS, cost, impact, public sector, health care.**

# INTRODUCTION

## Background

Global estimates of HIV/AIDS at the end of 2002 indicate that 42 million people are living with HIV/AIDS, 5 million new infections in 2002, 3.1 million deaths due to HIV/AIDS in 2002 and 29.7 million cumulative death since 1981 (1).

Over the next 20 years another 68 million people are projected to die prematurely as a result of HIV/AIDS with the greatest toll in sub-Saharan Africa. Sub-Saharan Africa contains about 10% of the world's population. Yet in 2001, it accounted for over two-thirds of the 40 million people living with HIV, had 68% of incident HIV infections and 77% of AIDS deaths, and accounted for more than 90% of AIDS orphans and children infected with HIV (2, 3)

In Ethiopia the 2001 estimate of HIV prevalence was 6.6% and urban prevalence rate was 13.7%, while that of the rural was 3.7%. The highest prevalence of HIV was among the age group 15 to 24 years of age representing "recent infection." The age distribution of reported AIDS cases show that about 91% of infections occur among adults between 15 and 49 years of age, the most economically productive segment of the population (4).

Information on HIV prevalence among antenatal clinic attendees has been available since 1988, in Ethiopia. In the major urban area, Addis Ababa, HIV prevalence increased

among antenatal clinic attendees tested from 4.6% in 1989 to 17.8% in 1996. Information on HIV prevalence among sex workers in Addis Ababa indicates that less than 1% HIV positive in 1985, by 1990 reached 54%. The data reported based on the HIV database maintained by the United States Bureau of the census (compiled from different sources including: national reports, scientific publications and international conferences) showed that in 1998 the median prevalence rate for antenatal attendees was 5.05%, in 1995, 21.16% and in 2000, 14.8% in major urban areas, for outside major urban areas, 4.8% in 1991, 25.3% in 1995 and 3.08 in 2000. The median prevalence for sex workers was 2.7% in 1987 and 73.7% in 1998 (4, 5).

HIV/AIDS has not only become a global epidemic, but it is also regarded as a major impediment to development and a substantial threat to human security. Most persons living with HIV/AIDS are in the prime of their working lives. If left unattended HIV/AIDS will weaken macroeconomic and microeconomic activity by squeezing productivity, adding costs, diverting productive resources and depleting skills in the countries most affected (2).

Sub-Saharan Africa is the region of the world that is most affected by HIV/AIDS. An estimated 29.4 million people are living with HIV/AIDS and approximately 3.5 million new infections occurred in Sub-Saharan Africa in 2002. Over and above the personal suffering that accompanies HIV infection wherever it strikes, HIV in Sub-Saharan Africa

threatens to devastate whole communities, rolling back decades of progress towards, a healthier and more prosperous future. Sub-Saharan Africa faces a triple challenge of colossal proportions:

- Bringing health care, support and solidarity to a growing population of people with HIV-related illness.
- Reducing the annual toll of new infections by enabling individuals to protect themselves and others.
- Coping with the cumulative impact of over 17 million AIDS deaths on orphans and other survivors, on communities, and on national development. In many countries of Sub-Saharan Africa, AIDS is erasing decades of progress made in extending life expectancy.

Millions of adults are dying young or in early middle age. Average life expectancy in Sub-Saharan Africa is now 47 years, when it could have been 62 without AIDS. In all affected countries, the HIV/AIDS epidemic is bringing additional pressure to bear on the health sector. As the epidemic matures, the demand for care of those living with HIV/AIDS rises, as does the toll amongst health workers (6).

# Literature review

The health sector has obviously been under pressure since HIV was first identified from the actual care of the sick, epidemiological and behavioral surveillance, blood safety, voluntary counseling and testing, vaccine development, and the planning and management of initial prevention responses (7).

Health care systems on the front line in coping with the AIDS crisis are overburdened by the epidemic and the services that Africa can provide are woefully inadequate for not only is Africa the worst HIV/AIDS affected region, it is also the world's poorest region with lowest access to quality health care. Health care systems have to deal with increasing numbers of patients with AIDS – related illnesses such as tuberculosis and spending on HIV AIDS is diverting scarce resources from other major health concerns. Africa's already inadequate health systems have become severely strained by the HIV epidemic. In some parts of the region, one in four hospital beds is occupied by a patient being treated for HIV-related symptoms, and in some cities, the majority of hospital beds are filled with HIV-related illnesses. In Cote D'Ivoire, Zambia and Zimbabwe, HIV – infected patients occupy 50 to 80% of all beds in urban hospitals and 70% of beds in the prince regent Hospital in Bujumbura, Burundi (8).

The bed occupancy rate of HIV/AIDS patients in Ethiopia for the year 2000 was estimated at 42% and is expected to be 54% by year 2005 with an average hospitalization of 40 days (9).

AIDS will affect the health sector in two ways: by increasing demands and by reducing the supply of a given quality of care at a given price. As a result, some HIV negative people who would have obtained treatment had there been no epidemic will be unable to do so, and total national expenditure on health care will rise, both in absolute terms and as a proportion of national product (6).

Most people who develop AIDS are prime-age adults. Without AIDS, this 15 to 50 age group accounts for only 10 to 20% of all deaths in a developing country but these deaths typically generate a disproportionate share of total health care demand. Moreover, since several studies suggest that adults with AIDS use more health care prior to death than those who die of other causes, even of other prolonged illness, the percentage increase in the demand for care by adults is likely to exceed the percentage increase in their mortality due to AIDS. As a result of these two factors, in a country where prime-age adults utilize one-quarter of all health care before AIDS a given percentage increase in their demand for health care will increase total demand by at least one – quarter of that percentage. A 40% increase in the mortality rate of prime-age adults will increase total demand by at least 10% even though total mortality has increased by only 4 to 8%. If AIDS patients use expensive antiretroviral therapies, the increase in demand will be much greater. For example, by the mid-1990s HIV treatment was already consuming 66% of health spending in Rwanda and over a quarter in Zimbabwe, the figures are expected to rise to 70% in Zimbabwe by 2005 and to reach 60% in Kenya (7).

In Ethiopia, a study by Kello AB found that the per capita patient cost per visit under the low cost scenario is estimated to be 12.03 and 22.64 US dollars for outpatient and inpatient costs respectively. Under high cost scenario the costs are estimated at 41.30 and 197.00 US dollars respectively for the corresponding services (10).

How much the demand for care increases in the aggregate depends on, the increase in the prime-age adult death rate, which in turn depends on the level of HIV prevalence and the median time from infection to death. A stable prevalence rate of 5% among prime-age adults eventually increases their annual mortality by about five deaths per 1000 adults if the median time is only five years. A prevalence rate of 30%, such observed in Lusaka, Zambia, will increase the number of deaths per 1000 adults by 30 to 60, depending on the median to death. In Sub-Saharan Africa, where mortality rates in this age group were as high as five per 1000 before the epidemic, even a 5% infection rate will double or triple the adult death rate. In the absence of HIV, the baseline mortality rate per thousand adults age 15 to 50 ranges from 0.8 in industrial countries to as high as 5 in some parts of Sub-Saharan Africa (11).

In a country where adults consume one-quarter of health care prior to the AIDS epidemic, HIV prevalence is constant at 5% of adults, the median time to death is ten years, and the baseline mortality rate among prime-age adult is 5 per 1000, the epidemic will cause a 26% increase in the demand for health care at every price. If the prevalence rate is higher, the median time to death is shorter, or the baseline adult mortality rate smaller, the percentage increase in demand will be correspondingly greater. As the demand for HIV –

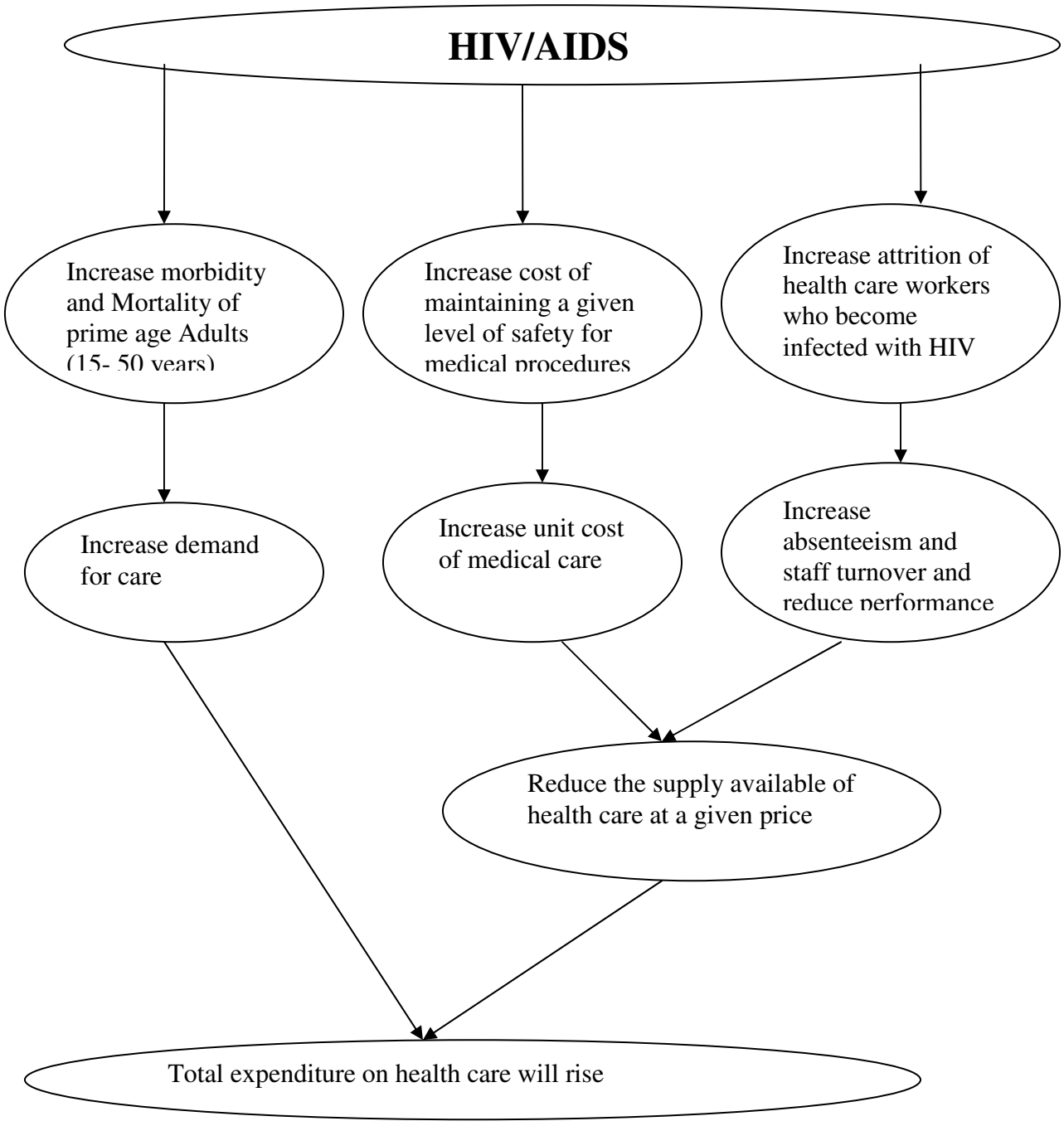
related care increases; patients with other conditions may be admitted later or not treated. Other infections may spread more easily. The World Bank estimates that 25% of people without HIV who die of tuberculosis would not have been infected in the absence of the HIV epidemic (7, 8).

In addition to increasing the demand for care, the AIDS epidemic will reduce the supply available at a given price. The first and largest effect is the increased cost of maintaining a given level of safety for medical procedures. In middle-to-high income countries, where blood screening and sterilization of injecting equipment are already the norm, the impact of AIDS is confined to the incremental costs of adding an HIV test to existing tests and using rubber gloves and facemasks in situations where they were previously not used. In poor countries, where screening and needle sterilization were lacking before the epidemic, the resources needed to maintain the quality of care in the face of the AIDS epidemic can be substantial. For example, the annual recurrent budget of the Ugandan Blood Transfusion service, which was established in response to the epidemic and meets the demands of the entire Ugandan national health care system for clean blood, is estimated to be about $1.2 million including capital and recurrent costs. This amounts to about 2% of national public health expenditures or about 1% of total national health expenditures (11).

The Second factor reducing the supply of medical care at a given price is the increased attrition of health care workers who became infected with HIV. In many countries, health personnel have high rate of HIV infection leading to increased absenteeism and high staff

turnover when they die. The sickness and death of health personnel due to HIV/AIDS in some African countries is high and their skills are hard-sometimes impossible to replace as it requires long training and costly. Like all adults, health care workers may become infected with HIV as a result of sexual contact or use of unsterile injecting equipment. They also face an additional risk of becoming infected in the course of their work; however, this risk is generally much smaller than the risk from sexual contact. Among midwives and nurses in Lusaka in 1991-2, HIV prevalence was 39% and 44% respectively, and in two southern Zambia hospitals, mortality of female nurses rose 13-fold in between 1980 and 1991. In Malawi, death rate of health care workers was 3% in 1997, a six-fold increase on levels before the epidemic. Studies of HIV prevalence among health care workers from Africa suggests that doctors and nurses are at least as likely to become infected as other people. If this is true elsewhere, a country with stable 5% HIV prevalence can expect that each year between 0.5 and 1% of its health care providers will die from AIDS; a country with 30% prevalence would lose 3 to 7% of its health care workers to the epidemic. For example, if labor costs are half of total health care costs, and training or recruiting a replacement worker requires a one – time expenditure equal to the worker's annual salary, then a 7% increase in attrition will increase total costs in the health sector by 3.5%. Thus, a sector critical for responding to the epidemic, is itself seeing its capacity being eroded by HIV infection (8, 12, 13).

**Conceptual framework of the impacts of HIV/AIDS on the public sector health care services: Adapted from background review**



HIV/AIDS epidemic is now a global crisis, and constitutes one of the most formidable challenges to development and social progress. Beyond the suffering it imposes on individuals and their families, the epidemic is profoundly affecting the social and economic fabric of societies. By affecting the most productive segment of the labor force and reducing earnings, HIV/AIDS is imposing huge costs on enterprises in all sectors through declining productivity, increasing labor costs and loss of skills and experience. AIDS affects all socioeconomic groups and all sectors ranging from impoverished subsistence farmers to top professionals (13).

The health sector sees the first impact of AIDS, as people who are experiencing periods of ill health will seek medical care. In assessing the impacts of AIDS, the emphasis is on the public sector health care system. For the private sector, in the short term, increased illness will present an opportunity rather than a threat.

Impact studies of HIV/AIDS are of paramount importance in that showing impact becomes an important tool of advocacy-encouraging politicians, leaders and policy-makers to engage in prevention. Excess in illness and death due to HIV/AIDS can also act as a signal to plan for increased demand. Thus impact studies have a dual purpose: in that they provide rationale for both prevention and mitigation. If we are successful in our advocacy, prevention may be effective and reduce impact. In countries with more advanced epidemics there is no doubt that there will be an impact and the challenge is to predict and mitigate it.

Ethiopia established a National Task force on HIV in 1985. Efforts were made in the area of IEC, condom promotion, surveillance, patient care and expansion of HIV screening laboratories in different health institutions. The government approved in August 1998 a comprehensive HIV/AIDS policy to provide an enabling environment for a multisectoral approach for the prevention and control of the epidemic. The national AIDS prevention and control council was established in April 2000. The priority intervention areas of the strategic framework for the national HIV/AIDS includes (14):

- IEC and BCC for the priority target groups: the youth, women, commercial sex workers, uniformed people, mobile labor force, farmers, refugees and workers.
- VCT
- Condom promotion and distribution
- Management of sexually transmitted infections
- Blood safety
- Universal precautions
- Prevention of mother to child transmission
- Care and support
- Legislation and human right
- Surveillance and research

There are no published studies in Ethiopia exploring the impact of HIV/AIDS on the health care services. Therefore, the purpose of this study is to explore the impact of HIV/AIDS on the public sector health care services in Dire Dawa Administrative Council. Finally the results of this study may help in the advocacy for prevention and for planning to mitigate the current and forthcoming impacts of HIV/AIDS on the public sector health care services.

# Objectives

**General objective**: To assess the impact of HIV/AIDS on the public sector health care services in Dire Dawa Administrative Council.

**Specific objectives**

- To describe the number and characteristics of HIV/AIDS clients seen from July 2002 to June 2003.
- To estimate the per client/patient health care system perspective cost of providing VCT and treatments of opportunistic infections.
- To describe health workers dying of any cause in the last ten years.

# Methods and Materials

## Study area

Dire Dawa Administrative Council is found about 525km east of Addis Ababa. The total population of the Administrative Council is 342,000 with the urban proportion of 72.8%. There are two Hospitals and three public sector health centers in the Administrative Council as of 2002/03. Dil Chora is the only public sector Hospital and it was founded in 1962. The proportion of HIV positives in Dil chora Hospital for the year 2001 was 15.2%. From July 2002 to June 2003 a total 88,820 patients were treated in Dil chora Hospital of which 81,346 outpatient and 7474 treated as in patient. The other Hospital is owned by another governmental agency, (Ethio-Djibouti railway organization). The health professional to population ratio in the Administrative Council is one to 7,773 and 2,631 people for physician and nurse respectively. The potential health service coverage of the Council, according to the 2002/03 health and health related indicators of the Ministry of Health, is 111%. Infant mortality rate is 105.6 per 1000 life births and the life expectancy is 54.1 and 55.8 years for male and female respectively. The primary school enrollment rate for male and female is 80.2% and 70.8% respectively. The secondary school enrollment is 33.2% for males and 26.9% for females.

## Study design

A retrospective review of financial expenditure documents, cards and/or registration books of HIV/AIDS clients treated and/or served in Dil Chora Hospital for one year and health workers death information in the last ten year.

## Study subjects

The study subjects include all HIV/AIDS clients treated and/or served in Dil Chora Hospital for one complete fiscal year. For the health workers death information, all health care workers dying in the last ten years preceding the date of data collection.

### Eligibility criteria

All cards and/or registration books of HIV/AIDS clients treated/served for one year and possibly retrieved were included. Concerning health care workers death, all health workers dying in the last ten years and for whom information was obtained from personnel administration section of the Administrative Council's health office were included.

## Methods of data collection

Data on HIV/AIDS clients was collected using a format prepared for this purpose separately for each card. Cards were traced by using registration number from registration book or copy of monthly/yearly report forms. Before starting the costing exercise, interview with the key informants and observing what is going on was conducted to describe the activities of HIV/AIDS and develop activity based cost framework. Then interview of concerned individuals, review of accounting records and inventory of items with their input category were conducted. And information on the death of health professional in the last ten years was gathered from personnel administration section of the health office directly or indirectly by asking any claim of pension due to death during that period.

## Quality Control Methods

For the review of records, partially its quality depends on the quality of the recording system. Reviewers were recruited from health workers having minimum of Diploma level training and training was given for two days for reviewers. The completeness of formats was regularly checked daily during data collection and data were double entered to enable crosschecking during analysis as well.

## Data Processing technique

Data were entered, edited, cleaned and analyzed using Epinfo version 6 and SPSS version 11. Percentages, averages, odds ratios and $\chi 2$ were used where applicable and data were presented using tables and figures.

## Variables of the study

Variable of the study includes:

**Independent:** Age, sex, address, occupation, educational status, marital status, reason of HIV testing.

**Dependent**: HIV test result, estimated per client health care system perspective cost of providing HIV/AIDS services.

# Description of HIV/AIDS activities

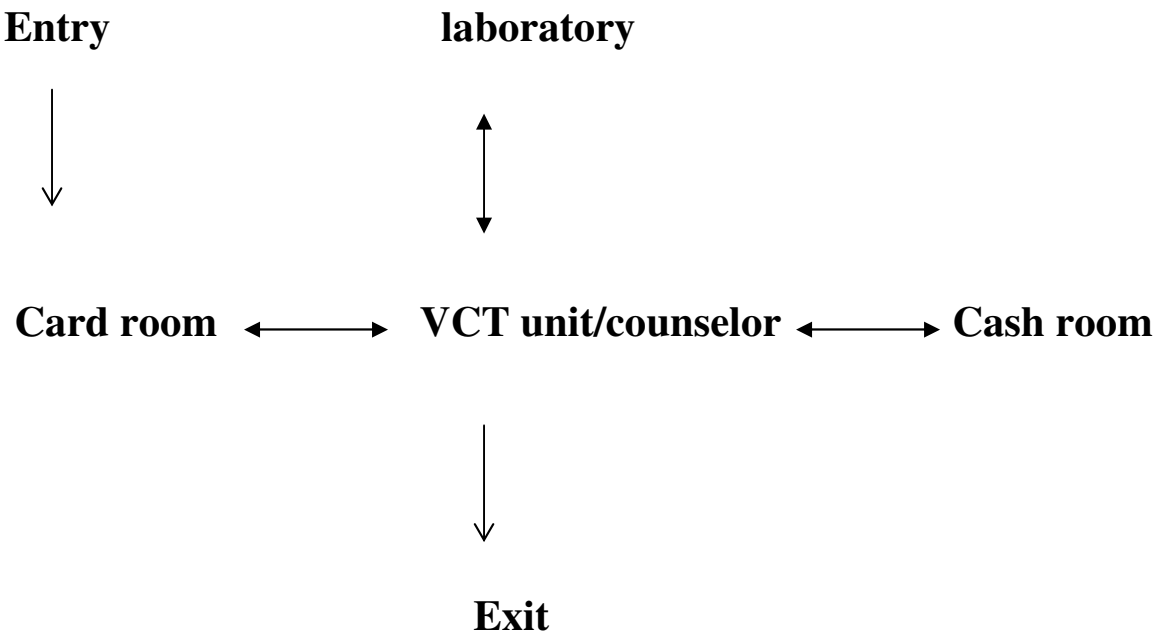
In the Administrative Council, only Dil chora Hospital was giving treatment of opportunistic infections and voluntary counseling and testing for the full study year, July 2002 to June 2003, among the public sector health institutions.

Patients coming for the treatment of opportunistic infections, come in contact with the card room then to the out-patient department. Finally, decision will be made by examining physician to treat either at out-patient department or admit to respective wards. Physicians usually hesitate to diagnose AIDS by clinical findings. When asked why? One of the physician responded “why should I take the risk by putting the diagnosis without HIV blood test because patients can easily get access to their cards”. Another medical ward nurse also replied that majority of beds are occupied by AIDS suspected cases but physicians do not diagnose without blood test. Thus the cost analysis of treatment of opportunistic infection was done for confirmed AIDS cases. There was no antiretroviral therapy involved in the care and support activities.

Clients of voluntary counseling and testing (VCT) come in contact with the hospital either directly with the VCT unit or with the card room then to the VCT unit. All VCT clients get pretest counseling, and then those paying for the services; will be sent to cash room to pay for the services. Then they will come back to the counselor to provide blood sample. The collected blood sample will be sent to laboratory by the counselor and clients collect their result from the counselor. After post-test counseling, certificates

showing the sero-status will be given for those who need; signed by the medical director and the counselor.

## Voluntary counseling and testing process in Dilchora hospital:




The activities are funded by the administrative council health office (MOH) and other multilateral organizations in the form of donations. There was no follow up of patients undertaken after treating in the hospital and blood samples are tested in the hospital compound and no transportation used in the activities. Fees are charged for the services provided from clients and/or patients.

## Cost framework by types of inputs:

**Financial costs-** the expenditure on the program and include the cost of all inputs purchased at the price that paid for them.

**Economic costs** a measure of the value of the opportunities lost by employing the resources in that particular program rather than the next best alternative.

**Recurrent inputs** resources that are used up and consumed within a year of purchase.

**Capital inputs/goods** are items that have a useful life of longer than one year.

## Costing procedures:

### I. Capital costs-buildings

Dil chora Hospital was founded in 1962 with 580,574 birr and served for 42 years. Taking in to consideration the 20 years recommended useful life for buildings by Ministry of Finance it is only left with 100birr book value. As a result, the financial costs of buildings were insignificant and not included in the costing exercise. But the economic costs of buildings was included taking the market value of equivalent rent for a similar unfurnished room/building in the area.

### II. Capital costs-equipment:

Referring to the accounting records and by consulting the purchasing section, the current (study year) price was found out. By asking those who use them, the accepted "useful life" was determined. For others ten-year useful life was taken. Then the annual value of

the item was calculated by dividing the replacement value by the useful life/the annualizing factor.

**III. The value of off budget recurrent costs:**

These are calculated by listing the quantities consumed in the study year and crosschecking with the price of supplier, pharmaceutical and medical supplies team of the Federal MOH.

**IV. Shared costs:**

The costs shared between the HIV/AIDS and other activities were allocated, indirectly by the proportion of outputs.

After all the cost data had been collected and the basic calculations of cost data made, the results were double-checked to make sure that they were reasonable. One useful basic check is to look at any figure that is subset of larger figure and see how they compare. For example, staff costs for the activity costed should be considerably less than total staff costs.

## Ethical Consideration

Ethical clearance was obtained from Faculty of Medicine Addis Ababa University. The review of cards is secondary data collection and patient consent was not included. However, confidentiality of the information collected was kept. Cards were only identified by registration number, names were not included. Moreover, reviewers were cautioned not to give any information from the card to another party. Consent was also secured from concerned authorities at different levels in the study process.

# RESULTS

## 1. Users characteristics

There were 809 HIV/AIDS related services users at Dil chora Hospital from July 2002 to June 2003 (1995 E.C. fiscal year). From these, 729 (90.2%) were clients of VCT and the rest, 80 (9.8%) were treated for opportunistic infections as in-patient. The average monthly client flow was 67.4, the smallest being 31 (in March) and the highest 118 (in May). The sex distribution of clients showed that, 419 (51.8%) females and 390 (48.2%) males. The age ranged from under one to 63 years the mean age being 27.058 (SD 9.87) and majority 746 (92.2 %) of clients were with in the age group of 15 to 50 years. Majority 731 (90.4%) of the clients were from the urban and only 4 (0.5%) were from the rural areas of the Administrative Council. The rest, 69 (8.5%) were from outside the Administrative Council. Majority 466 (61%) of clients were single followed by married 224 (29.4%). Out of 510 clients for whom the educational status found recorded, 234 (45.8%) were educated to grades 9 to 12 followed by grade 5 to 8, 119 (23.3%). In occupational status, 293 (38.9%) were governmental employee followed by jobless and students; 209 (27.8%) and 94 (12.5%) respectively. All clients of VCT were tested voluntarily on their own or by the request of family and patients treated for opportunistic infections were tested by the request of physician anonymously (table1).

Table1. Socio-demographic characteristics of clients, Dil Chora Hospital, Dire Dawa, July 2002 to June 2003.

| VARIABLES | FREQUENCY | |
|---|---|---|
| | **Number** | **Percent** |
| **SEX** | | |
| Females | 419 | 51.8 |
| Males | 390 | 48.2 |
| **Total** | **809** | **100.0** |
| **Age group** | | |
| <14 | 47 | 5.8 |
| 15-24 | 283 | 35.0 |
| 25-34 | 303 | 37.4 |
| 35-50 | 160 | 19.8 |
| >50 | 16 | 2.0 |
| **Total** | **809** | **100.0** |
| **Address** | | |
| Urban | 731 | 90.9 |
| Rural | 4 | 0.5 |
| Out of the Adm. Council | 69 | 8.6 |
| Total | **804** | **100.0** |
| **Marital status** | | |
| Single | 466 | 61.0 |
| Married | 224 | 29.4 |
| Divorced | 43 | 5.6 |
| Widowed | 30 | 4.0 |
| **Total** | **761** | **100.0** |
| **Educational status** | | |
| Illiterate | 51 | 10.0 |
| Grade 1 to 4 | 58 | 11.4 |
| Grade 5 to 8 | 119 | 23.3 |
| Grade 9 to 12 | 234 | 45.9 |
| 12+ | 48 | 9.4 |
| **Total** | **510** | **100.0** |
| **Occupation** | | |
| Governmental employee | 293 | 38.9 |
| Jobless | 209 | 27.8 |
| Students | 94 | 12.5 |
| Merchants | 93 | 12.4 |
| House-wife | 31 | 4.1 |
| Drivers | 27 | 3.6 |
| Others | 5 | 0.7 |
| **Total** | **752** | **100.0** |
| **Reason of HIV testing** | | |
| Requested by physician | 138 | 17.1 |
| Voluntarily/requested by family | 671 | 82.9 |
| **Total** | **809** | **100.0** |

Risk factors favoring exposure to HIV indicated that, 305 (39.1%) reported not using condom persistently, 64 (8.2%) had history of sexually transmitted diseases, 85 (10.9%) had history of multiple sexual partner and 3 (0.4%) had history of blood transfusion. History of opportunistic infections before coming for VCT or to seek treatments showed that, 82 (10.1%) reported history of tuberculosis and 47 (5.8%) had history of chronic diarrhea. Very few reported history of CNS toxoplasmosis and pharyngeal candidiasis; 3 (0.4%) and 5 (0.6%) respectively. The admission diagnosis of patients treated as in-patients indicated that majority 48 (60%) RVI followed by 23 (28.8%) tuberculosis plus RVI. The length of hospitalization ranged from one day to 120 days the average being 13.27 days for confirmed AIDS cases. Majority 44 (57.9%) of patients treated as in-patient were improved at discharge followed by died 31 (40.8%) (table2).

Table2. History of risk factors, opportunistic infections, diagnosis and patient condition at discharge, Dil chora Hospital, Dire Dawa July 2002 to June 2003.

| VARIABLES | FREQUENCY | |
|---|---|---|
| | Number | Percent |
| **Risk factors favoring HIV transmission** | | |
| not using condom persistently | | |
| Yes | 305 | 39.1 |
| No | 132 | 16.9 |
| Not recorded | 344 | 44.0 |
| **Total** | **781** | **100.0** |
| History of sexually transmitted diseases | | |
| Yes | 64 | 8.2 |
| No | 355 | 45.4 |
| Not recorded | 362 | 46.4 |
| **Total** | **781** | **100.0** |
| History of multiple sexual partner | | |
| Yes | 85 | 10.9 |
| No | 314 | 40.2 |
| Not recorded | 382 | 48.9 |
| **Total** | **781** | **100.0** |
| **Opportunistic infections before coming for treatment/VCT** | | |
| History of tuberculosis | | |
| Yes | 82 | 10.1 |
| No | 265 | 32.8 |
| Not recorded | 462 | 57.1 |
| **Total** | **809** | **100.0** |
| History of chronic diarrhea | | |
| Yes | 47 | 5.8 |
| No | 273 | 33.8 |
| Not recorded | 489 | 40.4 |
| **Total** | **809** | **100.0** |
| **Diagnosis of admitted patients** | | |
| RVI | 48 | 60.0 |
| Tuberculosis plus RVI | 23 | 28.8 |
| Chronic diarrheal disease plus RVI | 8 | 10.0 |
| Sepsis plus RVI | 1 | 1.2 |
| **Total** | **80** | **100.0** |
| **Length of hospitalization of admitted patients** | | |
| 1-10 days | 46 | 57.5 |
| 11-20 days | 23 | 28.7 |
| 21-30 days | 4 | 5.0 |
| >30 days | 7 | 8.8 |
| **Total** | **80** | **100.0** |
| **Patient condition at discharge** | | |
| Improved | 44 | 57.9 |
| Died | 31 | 40.8 |
| No change | 1 | 1.3 |
| **Total** | **76** | **100.0** |

Almost all clients of VCT, 704 (96.5 %) paid for the services provided at the Hospital. For the treatment of opportunistic infections only 34 (42.5 %) paid for the services. The most frequently given reason for not paying was, provision of letter of exemption indicating their poor economic status.

The HIV test result showed, 206(25.5%) to be positive and 569(70.3%) negative, while 34(4.2%) were not recorded. There were more female HIV positives compared to male: 115(55.8%) and 91(44.2%) respectively, but the difference is not statistically significant. The majority of the test positives 188(91.3%) were between the age group of 15 to 50 years and HIV test positive result was found to be associated with age in that those above 25 years of age had more chance of being positive compared ages 25 and below (OR=3.05 ; 95% CI 2.14, 4.36). The younger ages (less than 15 years) accounted for 5.8% of positive test results. Occupational status of clients was also found to be related with the HIV test result in that the jobless had greater chance of testing positive (OR=1.67; 95% CI 1.14, 2.43). Patients tested by the request of physicians had 7.7 times more chance of becoming positive compared to clients of VCT and/or those requested by family to be tested (95% CI 5.1, 11.7). The illiterate were more likely to test positive compared to others who had primary education and above (OR=2.41; 95% CI 1.23, 4.68). Those divorced and widowed were more likely to be HIV test positive compared to singles and married (OR=5.83; 95% CI 3.4, 10.03). History of multiple sexual partner was significantly associated with positive test result (OR=2.98; 95% CI 1.74, 5.13). Similarly, history of tuberculosis (69.1%) and chronic diarrhea (73.9%) had a strong association with positive HIV test result; OR 15.54 and 17.84 respectively (table3).

**Table3.** HIV test results by selected demographic variables, history of risk factors and opportunistic infections, DIL Chora Hospital, Dire Dawa, July 2002 to June 2003.

| VARIABLES | | HIV TEST RESULTS | | | OR(95% CI) |
|---|---|---|---|---|---|
| | | +ve | -ve | N (%) | |
| **Age group:** | >25 years | 145 | 249 | 394(50.8) | **3.05(2.14, 4.36)** |
| | ≤25 years | 61 | 320 | 381(49.2) | |
| | **Total** | **206(26.6)** | **569(73.4)** | **775(100)** | |
| **Occupation:** | Jobless | 66 | 134 | 200(27.7) | **1.67(1.14, 2.43)** |
| | Have job | 119 | 403 | 522(72.3) | |
| | **Total** | **185(25.6)** | **537(74.4)** | **722(100)** | |
| **Reason of HIV test:** | | | | | |
| Requested by physician | | 81 | 44 | 125(16.1) | **7.73(5.10, 11.71)** |
| VCT/requested by family | | 125 | 525 | 650(83.9) | |
| **Total** | | **206(26.6)** | **569(73.4)** | **775(100)** | |
| **Educational status:** | | | | | |
| Illiterate | | 18 | 32 | 50(9.9) | **2.41(1.23, 4.68)** |
| Primary and above | | 86 | 368 | 454(90.1) | |
| **Total** | | **104** | **400** | **504(100)** | |
| **Marital status:** | | | | | |
| Divorced and widowed | | 45 | 27 | 72(9.8) | **5.83(3.4, 10.03)** |
| Married and single | | 147 | 514 | 661(90.2) | |
| **Total** | | **192(26.2)** | **541(73.8)** | **733(100)** | |
| **History of multiple sexual partner:** | | | | | |
| Yes | | 30 | 55 | 85(21.5) | **2.98(1.74, 5.13)** |
| No | | 48 | 263 | 311(78.5) | |
| **Total** | | **78(19.7)** | **318(80.3)** | **396(100)** | |
| **History of tuberculosis:** | | | | | |
| Yes | | 56 | 25 | 81(23.6) | **15.54(8.56, 28.2)** |
| No | | 33 | 229 | 262(76.4) | |
| **Total** | | **89(25.9)** | **254(74.1)** | **343(100)** | |
| **History of chronic Diarrhea:** | | | | | |
| Yes | | 34 | 12 | 46(14.6) | **17.84(8.48, 37.54)** |
| No | | 37 | 233 | 270(85.4) | |
| **Total** | | **71(22.5)** | **245(77.5)** | **316(100)** | |

Majority of the HIV test positives and patients treated as in-patients for opportunistic infections lie in the age group of 15 to 50 years of age, the prime age adults; 188(91.3%) 71(88.8%) respectively (figures1,2).

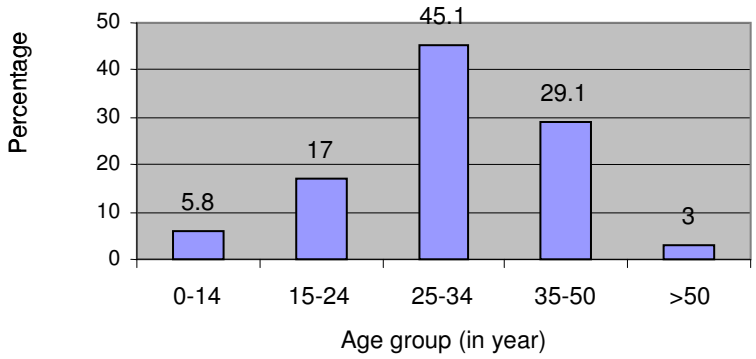



Figure1. HIV test positives by age group at DIL chora Hospital, July 2002 to June 2003.

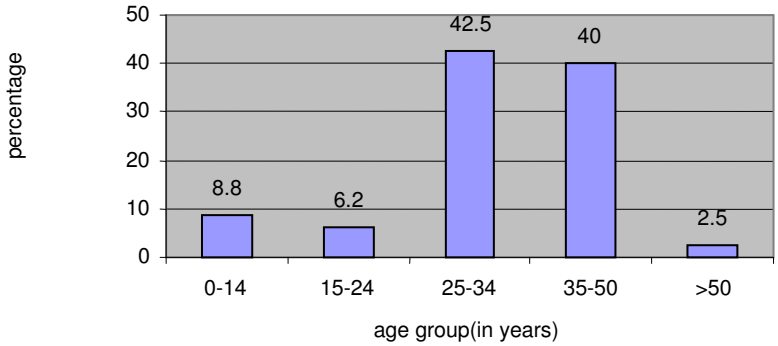



**Figure 2. AIDS cases treated as in patient by age group Dil chora Hospital, Dire Dawa,July 2002 to June 2003**

## 2. Cost of HIV/AIDS Activities

An estimated total cost of 136,815.02 Ethiopian birr has been expended for both activities of HIV/AIDS in Dil chora Hospital from July 2002 to June 2003 (1995 Ethiopian fiscal year). Out of which 118,983.62 (87%) was expenditure for VCT and 17,831.4 (13%) was for the treatments of opportunistic infections of HIV/AIDS. Only 4224 birr (3.6%) and 1404 birr (7.9%) of the activity costs were recovered from user fees collected from the above activities respectively. The capital costs of activities were 24,566.79 birr (17.5%) and the recurrent costs were 112, 248.23 birr (82.5%) (Table4).

Table4. Summary of HIV/AIDS activity costs in Dil chora hospital, Dire Dawa, July 2002 to June 2003.

| **Cost Category** | **HIV/AIDS activities** | | | |
|---|---|---|---|---|
| | Voluntary counseling and testing | Treatment of opportunistic infections | Total costs | |
| | Amount (birr) | Amount (birr) | Amount(birr) | % |
| **Capital costs** | | | | |
| Buildings | 4,438.44 | 1,955.34 | 6393.78 | 4.8 |
| Equipment | 16,490.06 | 1682.95 | 17,173.01 | 12.7 |
| **Total capital costs** | **20,928.5** | **3638.29** | **24,566.79** | **17.5** |
| **Recurrent costs** | | | | |
| Personnel | 43,279.55 | 8241.89 | 51,521.44 | 38.0 |
| Supplies | 53,733.78 | 5,838.04 | 59,571.82 | 43.6 |
| Building operation and maintenance | 1,041.79 | 113.18 | 1,154.97 | 0.9 |
| **Total recurrent costs** | **98,055.12** | **14,193.11** | **112,248.23** | **82.5** |
| **Total costs** | **118,983.62** | **17,831.4** | **136,815.02** | **100** |

The cost of VCT indicated that the majority of VCT cost was taken by the recurrent inputs; 98,055.12 (82.4%) and from the recurrent input, supplies took the highest share 53,733.78 (45.1%) followed by personnel cost, 43,279.55 birr (36.4%). Majority of VCT cost was covered by economic costs 69,826.24 birr (58.7%) (Table5).

Table5. Cost summary for voluntary counseling and testing by types of cost at Dil chora hospital, Dire Dawa July 2002 to June 2003.

| **Cost category** | **Types of cost** | | | | | |
|---|---|---|---|---|---|---|
| | **Financial costs** | | **Economic costs** | | **Total costs** | |
| | Amount( in birr) | % | Amount (in birr) | % | Amount (in birr) | % |
| **Capital costs** | | | | | | |
| Buildings | 00.0 | | 4,438.44 | 100 | 4,438.44 | 3.7 |
| Equipment | 00.0 | 00 | 16,490.06 | 100 | 16,490.06 | 13.9 |
| **Total capital costs** | **00.0** | **00** | **20,928.5** | **100** | **20,490.06** | **17.6** |
| **Recurrent costs** | | | | | | |
| Personnel | 43,279.55 | | 00.0 | 00 | 43,279.55 | 36.4 |
| Supplies | 4,836.04 | 9.0 | 48,897.74 | 91.0 | 53,733.78 | 45.1 |
| Building operation & maintenance | 1,041.79 | 100 | 00.0 | 00 | 1,041.79 | 0.9 |
| **Total recurrent costs** | **49,157.38** | **50.1** | **48,897.74** | **49.9** | **98,055.12** | **82.4** |
| **Total costs** | **49,157.38** | **41.3** | **69,826.24** | **58.7** | **118,983.62** | **100** |

The cost of treatment of opportunistic infection showed that the majority of the activity cost had gone to recurrent inputs (14,193.11 birr (79.6%) and personnel cost took greater share of the recurrent inputs (8,241.89 birr (46.2%). The majority of the costs for the treatment of opportunistic infections were covered by the financial cost; 9,522.67 birr (53.4%) (Table6).

Table6. Cost summary of treatment of opportunistic infections by types of cost, Dil chora Hospital, Dire Dawa, July 2002 to June 2003.

| **Cost category** | **Types of cost** | | | | | |
|---|---|---|---|---|---|---|
| | **Financial costs** | | **Economic costs** | | **Total costs** | |
| | Amount (in birr) | % | Amount (in birr) | % | Amount (in birr) | % |
| **Capital costs** | | | | | | |
| Buildings | | | 1,955.34 | 100 | 1,955.34 | 11.0 |
| Equipment | 00.0 | 00 | 1,682.95 | 100 | 1,682.95 | 9.4 |
| **Total capital costs** | **00.0** | **00** | **3638.29** | **100** | **3638.29** | **20.4** |
| **Recurrent costs** | | | | | | |
| Personnel | 8,241.89 | 100 | 00.0 | 00 | 8,241.89 | 46.2 |
| Supplies | 1,167.6 | 20.0 | 4,670.44 | 80.0 | 5,838.04 | 32.7 |
| Building operation & maintenance | 113.18 | 100 | 00.0 | 100 | 113.18 | 0.7 |
| **Total recurrent costs** | **9,522.67** | **67.1** | **4,670.44** | **32.9** | **14,193.11** | **79.6** |
| **Total costs** | **9,522.67** | **53.4** | **8,308.73** | **46.6** | **17,831.4** | **100** |

## 3. Health workers dying in the last ten years

Information on death of health workers in the ten years preceding the study was obtained from the personnel administration section of the Administrative Council health office. Death information was directly found from the personnel record and indirectly from the claim for pension during the specified period due to death. Further information could have been used from community based organizations like Idir but not included due to not recording occupation.

The death of 16 health workers was found from the records and the majority 12(75%) of them were males and 25% females. The age at death ranged from 24 to 41 years, the mean being 31.18 years (SD 4.69). The professional category indicated that majority (81.25%) were health assistants and the rest were physician, laboratory technician and environmental health each 1(6.25%). The total years of service before death ranged from 8 to 19 years the mean year of service being 12.56(SD 3.42).

# DISCUSSIONS

The population distribution of the Dire Dawa Administrative Council is concentrated in the urban area. The Administrative Council is found on the railway to Djibouti and the population characteristics of the Administrative Council may be influenced by the people of the bordering countries. This may restrict generalizability of the findings of the study.

This study revealed that 90.4% of the HIV/AIDS related service users were from the urban area of the Administrative Council. This could be attributed to the nature of population distribution of the Administrative Council in that the majority are urban or could still be by targeting more IEC to urban population. In addition, it could also be due to accessibility to and ability to pay for these services.

This study found out that 25.5% of clients tested were positive for HIV. The result was higher than the 2001 proportion for the same Hospital by MOH, disease prevention and control department which was 15.2%. This could be attributed to the difference in target population; the previous report was based on pregnant women study and the current is from clients of VCT and patients who presented themselves to seek treatment/service.

The age distribution of clients showed that the majority of the HIV test positives and patients treated for opportunistic infections were between the age group of 15 to 50 years, 91.3% and 88.8% respectively. This finding is consistent with reported AIDS cases to Federal Ministry of Health from 1986 to 2001, which showed 91% of cases to be between 15 to 49 years of age (4).

In this study, the jobless and illiterate were at increased risk of testing positive compared to those who were engaged in either private or government work and who had at least primary education and above respectively. This could be due to lack of access to IEC and /or the education media may not target these group of population or still HIV/AIDS may not be the priority concern for the poor.

HIV test result was also found to be associated with the marital status of clients in that the divorced and widowed were more likely to be positive compared to those in marital relationship and single. Could be due to experiencing multiple sexual partners after becoming out of marital relationship even though it is difficult to know which came first: HIV infection or being out of marital relationship.

The total health care system perspective cost of providing VCT for a single client was estimated to be 157.4 birr, about 27 times higher than the average cost recovered from user fee per client, which was 5.8 birr. Similarly, the health care system perspective cost of providing an inpatient treatment for opportunistic infections of HIV/AIDS was estimated to be 205.3 birr per patient about 11.6 times higher than the average cost recovered from user fee per patient which was 17.6 birr.

Out of the confirmed AIDS cases treated as in-patents 40.8% were died during discharge from the Hospital. This may be due to those who are terminally ill may come to seek treatment.

All of the admitted patients on average undergo about 2 to 3 tests per visit in addition to HIV test and 46 (57.5%) of the patients treated free of charge. Patients treated for opportunistic infections incurred an additional 130.5 birr per patient from indirect cost of other diagnostic tests and treatment other than the direct HIV/AIDS related cost; making the total health care system perspective cost of treatment per client 335.8 birr about 19 times higher than the average cost recovered from user fee per patient.

The average per patient/client financial costs of treatment of opportunistic infections was higher than that of providing VCT; 232 birr and 61.6 birr respectively. Considering the average cost recovered per patient/client of 17.6 birr from treatment of opportunistic infections and 5.8 birr for VCT; on average 214.4 birr per patients treated and 55.8 birr per clients of VCT were subsidized by the health care system.

The in-patient treatment cost of opportunistic infections of HIV/AIDS was costly. During the study period, the average length of Hospital days was 6.37 for all causes of admission; but that for confirmed AIDS cases was 13.27 days. Thus, admission of one AIDS patient on average barred admission of two patients due to other causes. During the study period, if half of the admitted patients were AIDS cases it would have been far above the capacity of the Hospital. Considering 7474 patients treated as in-patient during the study period as the optimal capacity of the Hospital, if half of the admitted patients were AIDS cases it would be above the capacity demanding construction of new Hospital to accommodate more AIDS cases and patients with other cause.

The death information in the last ten years indicated that health care workers are dying prematurely with mean age at death of 31.18 years and the mean year of service before death was 12.56. The cause of death was not documented and difficult to do so; yet the role of HIV/AIDS can not be totally ruled out from the causes of death because as a member of the community health workers risk acquiring the infection and also they face an additional risk of becoming infected in the course of their work even though this risk is generally much smaller than the risk from sexual contact. Studies of HIV prevalence among health care workers from Africa suggests that doctors and nurses are at least as likely to become infected as other people (12).

Considering on average the 5% prevalence of HIV and assuming that on average about 200 health workers lived in the Administrative Council in the last ten years, in the last ten years 10 to 20 health care workers would have died of HIV/AIDS. The current finding of 16 deaths of health workers from all cause lies with in the expected range due to HIV/AIDS alone. And considering all causes it would have been more. The reason for finding less number of health care workers death record than expected in the last ten years could be attributed to not recording all deaths, health care workers may drop from work when sick and leave the area before their fate known and poor record keeping.

# STRENGTHS AND WEAKNESSES

## Strength:

This study is the first in its kind in the area and could generate new ideas for further studies.

## Weaknesses:

1. The review parts of the study carry all the limitations of secondary source data.
2. Lack of previous similar study made comparison difficult.

# CONCLUSIONS

Taking in to consideration the limitations, the following conclusions can be made from the study:

1. The Majority of clients of HIV/AIDS were from the urban areas of the Administrative Council.

2. The Majority of HIV test positives and patients treated for opportunistic infections were prime age adults, 15 to 50 years of age: 91.3% and 88.8% respectively.

3. Joblessness, illiteracy, history of multiple sexual partners, history of tuberculosis and chronic diarrhea, and divorced/widowed after being in marital relationship were major predictors of positive HIV test result.

4. The health care system subsidized greater proportion of costs of HIV/AIDS related services indicated by only 3.6 % and 7.9% cost recovered from user fees from VCT and treatments of opportunistic infections respectively.

5. The in-patient treatment of opportunistic infections of HIV/AIDS is costly, admission of one AIDS case on average barred admissions of two patients due other causes.

6. Health care workers are dying prematurely before the investment in education pays-off.

# RECOMMENDATIONS

The results of this study showed that HIV/AIDS is directing health care resources to prime age adults (15-50 years of age), blocking other patients from in-patient care, and health care workers are dying prematurely from any cause. To mitigate these impacts, the following are worth recommending:

1. The disadvantaged segments of the population: the jobless and the illiterate are more likely to test positive. So this necessitates the health planners of the Administrative Council to assure that these are targeted and reached by IEC.
2. HIV/AIDS related health services are highly subsidized by the health care system. Taking in to consideration the chronic nature of the disease and the expensiveness of its care, subsidy is humane and mandatory. But as more AIDS cases are subsidized and given care in the Hospital, roughly double of that number will be discriminated from care. Thus, this calls for properly targeting subsidy and looking for other possible ways of caring for AIDS cases like home-based care.
3. Health care workers are dying prematurely due to any cause before investment in education pays off. This demands the attention of health managers to ensure the safety of professionals and document causes of death of their workers for the future as much as possible.
4. Further study covering wider area and more samples is crucial to substantiate the findings of this study.

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# APPENDICES

## A. Patient card and/or registration book review format

**Reg. /card number** _____

| No | Questions | Response | code |
|---|---|---|---|
| **101** | Month of test: | 1. Jul (11) 2. Aug(12)<br>3. Sep (1) 4. Oct(2)<br>5. Nov (3) 6. Dec(4)<br>7. Jan (5) 8. Feb(6)<br>9. Mar (7) 10. Apr(8)<br>11. May (9)12. Jun(10) | |
| 102 | Age of patient/client | _____ years | |
| 103 | Sex of patient/client | 1 male<br>2 female | |
| 104 | Reason for HIV test | 1 sickness/required<br>2 VCT<br>3 other(specify) _____ | |
| 105 | Address of the patient/client | 1 urban<br>2 rural<br>99 out of the adm. council | |
| 106 | Educational status of patient/client | 1 illiterate<br>2 1-4 grade<br>3 5-8 grade<br>4 9-12 grade<br>5 12+ | |
| 107 | Marital status | 1 married<br>2 single<br>3 divorced<br>4 widowed<br>5 not recorded | |

**Reg. /card number** _____

| | | | |
|---|---|---|---|
| 108 | Occupation of the patient/client | 1 merchant<br>2 teacher<br>3 health worker<br>4 other gov. employee<br>5 driver<br>6 house wife<br>7 commercial sex worker<br>8 bar owner<br>9 student<br>10 farmer<br>11 jobless<br>12 military<br>13 other(specify)_____ | |
| 109 | Risk factors in favor of RVI: | | |
| | A) persistent condom use | 1 yes<br>2 no | |
| | B) history of sexually transmitted diseases | 1 yes<br>2 no | |
| | C) history of multiple sexual partner | 1 yes<br>2 no | |
| | D) history of blood transfusion | 1 yes<br>2 no | |
| 110 | Opportunistic infections: | | |
| | A) tuberculosis | 1 yes<br>2 no | |
| | B) chronic diarrhea | 1 yes<br>2 no | |
| | C) CNS toxoplasmosis | 1 yes<br>2 no | |
| | D) pharyngeal candidiasis | 1 yes<br>2 no | |
| | E) other (specify)_____ | | |
| 111 | Result of HIV test (HIV-spot): | 1 positive<br>2 negative | |

**Reg. /card number** _____

| | | | |
|---|---|---|---|
| 201 | Other diagnostic tests performed | | |
| | A) sputum-test | _____times | |
| | B) Blood group | _____times | |
| | C) urine analysis | _____ times | |
| | D) stool analysis/test | _____ times | |
| | E) blood R/L function test | _____ times | |
| | F) blood sugar | _____ times | |
| | G) ESR | _____ times | |
| | H) blood- other serological tests | _____ times | |
| | I) X-ray | _____ times | |
| | J) WBC | _____ times | |
| | K) hemoglobin | _____ times | |
| | L)blood film | _____ times | |
| | M) other test(specify) _____ | _____ times | |
| | N) other tests(specify) _____ | _____ times | |
| | O) other tests(specify) _____ | _____ times | |

**Reg. /card number** _____

| | | | |
|---|---|---|---|
| 202 | Diagnosis of the patient: | 1 Retroviral infection<br>2 TB plus RVI<br>3 CDD plus RVI<br>4 Other (specify)_____ | |
| 203 | If treated as in-patient: | | |
| | A) length of hospitalization | _____ days | |
| | B) patient condition during discharge | 1 improved<br>2 no change<br>3 died<br>99 not recorded | |
| 204 | Is patient/client paying for the services? | 1 yes<br>2 no | |
| 205 | If "no" to question 204 above, reason for not Paying? | 1 letter of exemption<br>2 staff<br>3 service policy<br>4 other reason_____ | |

Reviewer's name & signature _____
Supervisor's name & signature _____
Date _____

# B. Cost data collection formats:

## Form1: capital cost-Buildings

Health facility_____
Department/section _____

| (1)buildings list | (2)funded by | Annual rent/hire | | (5) furn. (10%) | Total cost | | (% allocation) cost | | Study Year cost | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (3)fin. | (4)ec. | | (6)fin. (3+5) | (7)ec. (4+5) | (8)fin. | (9)ec. | (10)fin | (11)ec |
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| Total | | | | | | | | | | |

# Form2: Capital cost-Equipment

Health institution _____
Department/section _____

| (1) equ. list | (2) funded by | cost | | Life Expe-tancy Working life | Annual cost | | (%allocation) cost | | Base year (study year) cost | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (3)fin | (4)ec | | (6)fin | (7)ec | (8)fin | (9)ec | (10)fin | (11)ec |
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| | | | | | | | | | | |
| Total | | | | | | | | | | |

# Form3: Recurrent cost-personnel

Health facility_____
Department/section_____

| (1)category | (2)funded by | Gross annual sala. | | Annual allowances | | Total Annual cost | | (%allocation) cost | | Study year cost | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (3)fin | (4)ec | (5)fin | (6)ec | (7)fin (3+5) | (8)ec (4+6) | (9)fin | (10)ec | (11)fin | (12)ec |
| | | | | | | | | | | | |
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| | | | | | | | | | | | |
| Total | | | | | | | | | | | |

# Form4: Recurrent cost-supplies

Health facility _____
Department/section _____

| (1)supplies (list) | (2) Funded by | (3) Quantity Consumed (including Lose and Wastage) | Unit cost | | Cost | | (% allocation cost | | Study year cost | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | (4)fin | (5)Ec. | (6)Fin (3x4) | (7)Ec. | (8)Fin | (9)Ec. | (10)Fin | (11)Ec. |
| | | | | | | | | | | |
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| | | | | | | | | | | |
| Total | | | | | | | | | | |

# Form 5: Recurrent costs –Building and Maintenance

**Health facility** _____
**Department/section**_____

| (1) Utility | Telephone/Fax | electric | water | Other |
|---|---|---|---|---|
| (2) Source of found | | | | |
| **(3)** July | | | | |
| (4) August | | | | |
| (5) September | | | | |
| (6) October | | | | |
| (7) November | | | | |
| (8) December | | | | |
| (9) January | | | | |
| (10) February | | | | |
| (11) March | | | | |
| (12) April | | | | |
| (13) May | | | | |
| (14) June | | | | |
| (15) Annual cost | | | | |
| (16) % Allocation cost | | | | |
| (17) Study year cost | | | | |

# Form 6: Cost recovery: Private costs

Health facility_____

| Fee type (Specify) | | | | | |
|---|---|---|---|---|---|
| July | | | | | |
| August | | | | | |
| September | | | | | |
| October | | | | | |
| November | | | | | |
| December | | | | | |
| January | | | | | |
| February | | | | | |
| March | | | | | |
| April | | | | | |
| May | | | | | |
| June | | | | | |
| Annual total | | | | | |

## C. Health care worker's death information Collection format

1 age at death _____ years

2 year of death 19_____

3 sex:

A. Male

B. Female

4 professional category _____

5 total year of service before death _____ years