**ABSTRACT**

The study was conducted in order to estimate the costs and effects of ARVs used in treatment of HIV infected patients, to describe the costs of prophylaxis and treating of opportunistic infections by use of No-ARVs and to determine the incremental cost-effectiveness ratio of No-ART and ART. A cost-effectiveness analysis was conducted from a public health perspective, comparing No- ART with ART intervention. This was a retrospective study done on a cohort of 207 using a pre-ART and ART study design on a five year period observation time (2004 – 2008). The cohort was aged 15 years and above with HIV infection disability and were selected by simple random technique of their records' files.

By the year 2006, with the adult HIV/AIDS prevalence rate of 16% in Zambia, Choma district had a high incidence rate of sexually transmitted infection (STIs) of 15.0 per 1000 population. The HIV infection was at incidence rate of 7.1 per 1000 population and case fatality rate of 195.1 per 1000 admissions and this revealed the high demand of antiretroviral drugs (ARVs) (Choma HMIS, 2006).

The cohort simulation approach used was based on cost-effectiveness Markov Modeling in order to calculate life time costs, life years gained and health effects of ART versus No-ART. The study setting was in a public sector health facility at Choma ART centre. Data was collected using file check list, semi-structured interview schedule and discussion with the key informants who had more than five years experience of managing patients with HIV infections at Choma general hospital. Data analysis was done using Cost Model template (WHO CostIt Model) and Excel spread-sheet.

The study results revealed that the transition probabilities of patients moving from stage 1 – 4 in No-ART was 0.24917 and in ART it was 0.1239. Transition probabilities of moving from 1 to death in No-ART was higher, 0.0678 and in ART it was only 0.0125. In both ART and No-ART cohort, the health status rating patients in stage 1 had a high utility rating of 0.85. In stage 4 the utility rating was 0.28. The lifetime costs of No-ART were $10,166,199 and for ART, $12,226,813. The costs per life year gained with No-ART were $1,166 and ART were $1,223. The health effects quality-adjusted life years (QALYs) for No-ART were 3,381 and ART, 6.073. The incremental cost-effectiveness ratio was $765.45. The life years lived with No-ART were 3.25 and with ART were 8.50.

In conclusion, HAART intervention is reasonably cost-effective for HIV-infected patients in Zambia because the intervention reduces the costs of medical care of HIV disease and the incidences of opportunistic infections. This leads to a corresponding reduction in in-patient health care utilization. Results of cost-effectiveness analysis in this study could assist in enhancing efficient resource allocation and equitable access to HIV treatment.

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**DEDICATION**

I dedicate this dissertation to my husband Lawrence for his love, understanding, patience and support during my studies. To my late mother Mrs. J. Zulu, who couldn't stay to see me complete my studies. To my children, Musanide, Lishimpa, Joao, Malowa, Tawanda, Nthowa, Changa-Chilata and granddaughter Siphokazi Rhoza, I pray to the Almighty Jehovah God that this work will inspire you to aim higher and attain more than what I have been able to reach.

**APPROVAL PAGE**

The University of Zambia approves this dissertation of Rhoza Chiwambo Shonga in partial fulfillment of the requirements for the award of Master of Public Health.

Examiners

Signature…….Date……

Signature…….Date……

Signature…….Date……

**CERTIFICATE OF COMPLETION OF DISSERTATION**

I ……hereby certify that this dissertation is the product of my own work and, in submitting it for my Master of Public Health Degree programme, further attest that it has not been submitted in part or in whole to another university.

Signature:……..Date:…….

(Student)

I/We……having supervised and read this dissertation, am/are satisfied that this is the original work of the author under whose name it is being presented. I/We confirm that the work has been completed satisfactorily and is ready for presentation to the examiners. (Delete sections that are not applicable).

Signature……Date……

Supervisor

Signature…….Date…….

Co-supervisor

Head of Department……Date……

Department…….

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**ACRONYMS**

**ART –** Antiretroviral Therapy

**ARVs –** Antiretroviral drugs

**CD4 –** Cell Differential

**CEA –** Cost-effectiveness Analysis

**CER –** Cost-effectiveness Ratio

**CUA –** Cost-utility Analysis

**CBoH –** Central Board of Health

**FAO –** Food Agriculture Organization

**HAART –** Highly Active Antiretroviral Therapy

**HIV/AIDS –** Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome

**HRQoL –** Health Related Quality of Life

**ICER –** Incremental Cost-effectiveness Ratio

**ILO –** International Labor Organization

**LYs –** Life- years

**MOH –** Ministry of Health

**OIs –** Opportunistic Infections

**PTB –** Pulmonary Tuberculosis

**PMTC –** Prevention of Mother to Child

**QALYs –** Quality-adjusted Life-years

**QOL –** Quality of Life

**VCT –** Voluntary Counseling Centre

**WHO –** World Health Organization

**ZDHS –** Zambia Demographic Health

## DEFINITION OF TERMS

**Pre – ART period:** this is the time between enrollments of a patient in the HIV programme to the time of initiation of ART.

**Treatment period (ART):** this is the time the patient is on ARVs.

**Cost-effectiveness analysis (CEA):** A technique in which the cost and effects of an intervention and alternative are presented in a ratio of incremental cost to incremental effect.

**Cost-effectiveness ratio (CER):** The incremental cost of using an intervention to obtain a unit of effectiveness (such as dollars per life-year gained) compared with an alternative such as another treatment or no treatment.

**Cost-utility analysis (CUA):** A specific type of cost–effectiveness using quality-adjusted life years as the effectiveness endpoint.

**Effectiveness:** The extent to which an intervention achieve health improvements, which can be measured in terms of various outcomes such as cases of disease prevented, years of life saved, or quality-adjusted life years saved.

**Incremental cost:** The difference between the costs/effects of the two interventions of interest.

**Incremental cost-effectiveness ratio:** The incremental cost of intervention divided by the incremental effectiveness.

**Provider's perspective:** This means that all direct health care costs incurred by the provider are considered.

**Societal perspective:** The costing includes costs to the health system and costs to the patient (e.g. patient waiting time and travel costs).

**Gross domestic product (GDP):** A commonly used measure of economic growth of a country.

**Time trade-off:** A method for assessing preferences for a given health state, which the respondent is asked how much time he or she would be willing to trade from a given lifespan in the health state, to have the remaining lifespan in perfect health.

**Utility:** The preference of an individual for a particular health state or treatment outcome measured using the standard gamble technique, which incorporates risk in the assessment.

**Quality-adjusted life years (QALYS):** is a measure of disease burden, including both the quality and the quantity of life lived.

**Opportunity cost:** the value of the far gone opportunity uses in a different way those resources that are used or lost due to illness.

**Quality of Life (QOL):** measures severity of illness or disability which defines death as zero and perfect health as one.

**Extrapolate:** To estimate something or form opinion about something using the facts that you have how and that are valid for one situation and supposing that they will be valid for the new one.

**Health state:** The condition of an individual's health, including any disease, disability, and functional status.

**Transition probabilities:** In a Markov model, these are specific relevant movements between Markov health states.

**Case fatality rate (CFR):** Number of deaths from a disease in a given period divided by number of diagnosis of that disease in the same period.