

THE ECONOMIC COST OF HIV/AIDS AND ASSOCIATED FACTORS AMONG  
INDIVIDUALS ON ART FOLLOW UP AND THEIR FAMILY IN OROMIA SPECIAL ZONE  
SURROUNDING FINFINE ETHIOPIA.

BY: ASFAW TEREFE (BSC)

A THESIS SUBMITTED TO JIMMA UNIVERSITY COLLEGE OF PUBLIC HEALTH  
DEPARTMENT OF HEALTH ECONOMICS, MANAGEMENT AND POLICY IN PARTIAL  
FULFILLIMEMENT FOR THE REQUIREMENT OF MASTER OF SCIENCE IN HEALTH  
ECONOMICS

NOVEMBER, 2018  
JIMMA ETHIOPIA

THE ECONOMIC COST OF HIV/AIDS AND ASSOCIATED FACTORS AMONG  
INDIVIDUALS ON ART FOLLOW UP AND THEIR FAMILY IN OROMIA SPECIAL ZONE  
SURROUNDING FINFINE, ETHIOPIA.

BY: ASFAW TEREFE

NAME OF ADVISORS

1. DR. TEFERI DABA (PhD)
2. Mr. MULENEH GETACHEW (BSc, MPH)

## **Abstract**

**Background:** HIV/AIDS is a global pandemic which is caused by the virus called human immunodeficiency virus (HIV). The epidemic was firstly recognized in the year 1980. In 2016, an estimated 36.7 million people were living with human immunodeficiency virus (HIV) or acquired immunodeficiency syndrome (AIDS). HIV/AIDS is a disease, which has health, economic and social consequences. The end impact of all these consequences is economic impact.

**Objective:** To estimate the economic cost of HIV/AIDS and associated factors among individuals on ART follow up and their family in Oromia Special Zone Surrounding Finfine, Ethiopia in ,2018

**Methods:** This study was conducted in Oromia Special Zone Surrounding Finfine. Facility based cross-sectional study design was employed to select sample of 350 adult PLWHA on ART follow up using single population mean formula. One public primary Hospital and 4 public Health Centers were randomly selected by random sampling technique using lottery method. Interviewer administered questionnaires were used to get information on the direct and indirect costs related to HIV/AIDS care and treatment. Descriptive statistics such as mean, standard deviation, median and percentage were calculated to describe some parts of the results. The association between the independent and dependent variable were assessed by using multi linear regression model in Statistical Package for Social Science (SPSS) version 23.

**Results:** The mean total cost of HIV/AIDS among individual on ART follow up was US\$10.5 per month, the mean total direct cost was US\$ 6.35 per month and total mean indirect cost was US\$ 5.53) per month. Distance, Supplementary food, opportunistic infection and patient accompanied had statistically significant association with total cost of HIV/AIDs among these individuals at p-value less than 0.05.

**Conclusion and recommendation:** According to this study finding individuals on ART follow up exposed to a significant total cost that comes from direct medical cost, non medical cost and indirect costs.

**Key words:** Economic Cost, Direct cost, indirect cost, HIV/AIDS, Oromia Special Zone.

## **Acknowledgments**

First of all, I would like to thank the almighty God who helped me throughout my work. I would like to forward my deepest appreciation to Jimma University providing me this research opportunity. I also have sincere gratitude to my advisors Dr. Teferi Daba (PhD) and Mr. Mulneh Getachew for their critical remarks, guidance and suggestions which improved the thesis. My special thanks go to the members of Jimma University, Health Economics, Management and Policy department for their contributions throughout course time and thesis development process. I also want to acknowledge data collectors, supervisors and study participants.

Finally, I feel very fortunate to have ever loving family, without their unconditional, emotional and spiritual support it would be very difficult to reach at this stage.

## Table of Contents

|                                                                         |    |
|-------------------------------------------------------------------------|----|
| <i>Abstract</i> .....                                                   | 3  |
| Acknowledgments.....                                                    | 4  |
| Lists of Table .....                                                    | 7  |
| Lists of figure.....                                                    | 8  |
| Abbreviations.....                                                      | 9  |
| CHAPTER ONE: INTRODUCTION.....                                          | 10 |
| 1.1 Background.....                                                     | 10 |
| 1.2 Statement of the problem.....                                       | 2  |
| 1.3 Significance of the study.....                                      | 4  |
| CHAPTER TWO: LITERATURE REVIEW .....                                    | 5  |
| 2.1 General about HIV/AIDs over View .....                              | 5  |
| 2.2 Distribution of HIV/AIDs.....                                       | 5  |
| 2.3 Economic Cost of HIV/AID on Individuals and their House Holds ..... | 5  |
| 2.4 Factors Associated with Economic Cost of HIV/AIDs .....             | 7  |
| 2.5. Conceptual Frame Work.....                                         | 9  |
| 3. OBJECTIVES.....                                                      | 10 |
| 3.1 General Objective .....                                             | 10 |
| 3.2 Specific objectives. ....                                           | 10 |
| CHAPTERT THREE: METHODS AND MATERIALS .....                             | 11 |
| 4.1 Study Area and Period .....                                         | 11 |
| 4.2. Study Design.....                                                  | 11 |
| 4.3 Population.....                                                     | 11 |
| 4.3.1 Source Population:.....                                           | 11 |
| 4.3.2 Study Population:.....                                            | 11 |
| 4.3.3 Inclusion and Exclusion Criteria.....                             | 11 |
| 4.4 Sample size and Sampling procedure/technique.....                   | 12 |
| 4.4.1 Sample size determination.....                                    | 12 |
| 4.4.2 Sampling Technique .....                                          | 12 |
| 4.5 Data Collection Tools and Procedure .....                           | 14 |
| 4.5.1 Data Collection Tool.....                                         | 14 |
| 4.6 Study Variables.....                                                | 14 |
| 4.6.1 Dependent variables.....                                          | 14 |
| 4.6.2 Independent Variables: .....                                      | 14 |

|                                                                                                                        |    |
|------------------------------------------------------------------------------------------------------------------------|----|
| 4.7 Operational Definitions.....                                                                                       | 15 |
| 4.8 Data Analysis Procedure.....                                                                                       | 16 |
| Cost estimation methods.....                                                                                           | 17 |
| Valuation method.....                                                                                                  | 18 |
| 4.9 Data Quality Management.....                                                                                       | 19 |
| 4.10 Ethical Consideration.....                                                                                        | 19 |
| 4.11 Dissemination Plan.....                                                                                           | 19 |
| Chapter Four.....                                                                                                      | 20 |
| 4. Results.....                                                                                                        | 20 |
| 4.1 Socio Demographic and Economic characteristics.....                                                                | 20 |
| 4.2 Health Status of the Respondents.....                                                                              | 22 |
| 4.3 Frequency of Health facility Visit.....                                                                            | 23 |
| 4.4 Costs of Treatment among ART followers.....                                                                        | 23 |
| 4.4.1 Direct Costs.....                                                                                                | 23 |
| 4.4.2 Indirect Costs.....                                                                                              | 24 |
| 4.4.3 Total cost.....                                                                                                  | 25 |
| 4.5 Factor associated to total cost.....                                                                               | 26 |
| Chapter Five.....                                                                                                      | 30 |
| 5. Discussion.....                                                                                                     | 30 |
| 5.1 Total cost.....                                                                                                    | 30 |
| 5.2 Total Direct cost.....                                                                                             | 30 |
| 5.3 Indirect cost.....                                                                                                 | 32 |
| Chapter Six.....                                                                                                       | 34 |
| 6. Conclusion and recommendation.....                                                                                  | 34 |
| 6.1 Conclusion.....                                                                                                    | 34 |
| 6.2 Recommendation.....                                                                                                | 34 |
| Reference.....                                                                                                         | 35 |
| Annexes.....                                                                                                           | 38 |
| Annex 1 Questionnaire.....                                                                                             | 38 |
| Annex 2 Afan Oromo Version Questionnaire.....                                                                          | 50 |
| Annex 3 : Common Opportunistic infection of PLWA on ART follow up in Oromia Special Zone Surrounding Finfine,2018..... | 59 |
| Annex4: Purchasing power parity of some selected country for discussion purpose.....                                   | 60 |

## Lists of Table

|                                                                                                                                                                                                                                      |           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Table 1: Socio-demographic characteristics of the study subjects: among individual on ART follow up in OSZSF Central Ethiopia,2018.....                                                                                              | 21        |
| <b>Table 2: Health status of individual on ART follow up in OSZSF Central Ethiopia, 2018</b>                                                                                                                                         | <b>22</b> |
| Table 3: Direct Costs of HIV/AIDS individuals on ART follow up and their family in Oromia special zone surrounding Finfine ,2018.....                                                                                                | 24        |
| Table 4: Indirect cost of HIV/AIDS and associated factors among individual on ART follow up and their family in OSZSF, 2018.....                                                                                                     | 25        |
| <b>Table 5: Candidate variable for multiple linear regression model of economic cost of HIV/ADS and Associated factors among Individual on ART and their family in Oromia Special zone surrounding Finfine, Ethiopia, 2018 .....</b> | <b>27</b> |
| Table 6: Total cost of HIV/AIDS and associated factors among individual on ART follow up and their family in Oromia Special zone surrounding Finfine, 2018 .....                                                                     | 28        |

## **Lists of figure**

|                                                                                                                                                                                                                         |    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Figure 1: Conceptual framework of Economic cost of HIV/AIDSs and associated factors among individuals on ART follow up and their Family in Oromia Special Zone Surrounding Finfinne, 2018.....                          | 9  |
| Figure 2:Schematic Presentation of sampling Procedure for Economic Cost of HIV/AIDSs and associated factors among individuals on ART follow up and their family in Oromia Special Zone Surrounding Finfine , 2018. .... | 13 |
| Figure 3:Economic cost item of HIV/AIDSs among individual on ART follow up and their family in Oromia special zone surrounding Finfine ,Ethiopia ,2018. ....                                                            | 26 |



## Abbreviations

|       |                                                                          |
|-------|--------------------------------------------------------------------------|
| AIDS  | Acquired immuno deficiency syndrome                                      |
| ART   | Antiretroviral therapy                                                   |
| BSC   | Bachelor of Science                                                      |
| COI   | Cost Of Illness                                                          |
| CSA   | Central Statistics Authority                                             |
| ENHA  | Ethiopian National Health Account                                        |
| FMOH  | Federal Ministry of Health                                               |
| HAART | Highly Active Anti-retroviral Treatment                                  |
| HCA   | Human Capital Approach                                                   |
| HI    | Health insurance                                                         |
| HIV   | Human Immuno deficiency Virus                                            |
| MDG   | Millennium Development Goal                                              |
| NGO   | Non Government Organization                                              |
| NRs   | Nepalese Rupees                                                          |
| OOPs  | Out of pockets                                                           |
| ORHB  | Oromia Regional Health Bureau                                            |
| PLHW  | People Living with Human immune Virus/Acquired immunodeficiency syndrome |
| SD    | Standard Deviation                                                       |
| SHI   | Social Health Insurance                                                  |
| SPSS  | Statistical Package for Social Science                                   |
| SSA   | Sub-Saharan Africa                                                       |
| TB    | Tuberculosis                                                             |
| USD   | United State Dollar                                                      |
| WHO   | World Health Organization                                                |

## **CHAPTER ONE: INTRODUCTION**

### **1.1 Background**

The economic cost is the combination of gain and losses of any goods that have a value attached to them by one individual. The term cost burden refers to direct and indirect costs expressed as a percentage of household income. Some analysts assume that a cost burden greater than 10% of total income per year or greater than or equal to 40% of household's non-substance income (income available after basic needs have been met) is likely to be catastrophic for the household economy, meaning that it is likely to force household members to cut their consumption of other minimum needs, trigger productive asset sales or high levels of debt, and lead to impoverishment(1,2). Direct costs refer to expenditure linked with seeking treatment, including non-medical expenses such as transport or special foods. Indirect costs refer to the loss of productive labor time for patients and caregivers as well as corresponding income loss (2).

Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) is a global pandemic which is caused by the virus called human immunodeficiency virus (HIV), has health, economic and social consequences. Having all these consequences in 2016, an estimated 36.7 million people in the world, 29 million in Africa and 710,000 people in Ethiopia were living with human immunodeficiency virus(3–6). Antiretroviral treatment began in 2003 and free ART was launched in Ethiopia in 2005. An estimated 738,976 Ethiopians are currently living with HIV and all of them require antiretroviral treatment (ART), however only 426,000 are currently taking ARV(7).

The burden of treatment is significantly greater in HIV-affected households than HIV-unaffected households(8). In resource-limited settings, the illness can impose a major financial burden on patients and their families. With the advent and increasing accessibility of antiretroviral therapy, however, HIV/AIDS has now become a fundamentally chronic treatable disease with far-reaching economic and social consequences(8). The households have to spend a higher proportion of their monthly income on the care and support of PLWHA(8)

After the introduction of multiple antiretroviral therapy (ART), HIV/AIDS became a chronic disease, and there is a need to provide long-term care and support for the ill person. The long-term treatment for HIV/AIDS can have lifelong financial implications on HIV-affected households (9). Patients with HIV/AIDS are provided free- of-charge antiretroviral drugs, CD4 cell count tests. However, some HIV/AIDS-related services are not covered like treatment of comorbidity diseases and infectious disease. These consequences finally push the HIV/AIDS affected households into poverty (10). Therefore, the study will benefit the governmental and nongovernmental organizations (NGOs), health professionals and persons with HIV/AIDSs and their family and other stake holders need to be aware of the current and future economic impact of this disease by estimating economic cost of the disease on individuals and households.

## **1.2 Statement of the problem**

Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) is a global pandemic which is caused by the virus called human immunodeficiency virus (HIV). An estimated 36.7 million people were living with human immunodeficiency virus or acquired immune deficiency syndrome in the world in 2016. Sub-Saharan Africa (SSA) contributed 76% (29 million) of the total HIV infected people. In Ethiopia there were 710 [570,000-880,000] people living with HIV, 2016 (3–6).

The HIV/AIDS epidemic poses a severe threat to the economies of developing countries, and those on the African continent in particular (11). HIV/AIDS create severe economic impacts in many African countries. It is different from most other diseases because it strikes people in the most productive age groups and is essentially 100 percent fatal. The two major economic effects are a reduction in the labor supply and increased costs (12).

Research conducted in Nepal 2017 showed that the average total costs due to HIV/AIDS (the sum of average total direct and average indirect cost) were Nepalese Rupees (NRs) 2233 per month (US\$ 30.2/month), which was 28.5% of the sample households' average monthly income (13). The average total direct costs for seeking HIV/AIDS treatment were NRs 1512 (US\$ 20.4), and average productivity costs were NRs 721 (US\$ 9.7). The average monthly productivity losses were 5.05 days per person. According to this study findings the highest proportion of direct costs were accounted by diagnostic tests (32.2%) and access costs (29.4%) (13).

According to research conducted in Nigeria, 2016 the mean out-patient costs incurred direct medical cost of N141.37 (\$0.87), a mean direct non-medical cost of N740.43 (\$4.57) and a mean total out-patient cost was N881.8 (\$5.44). This gives an annual total cost estimate of N3,527.2 (\$21.76) which is an average of four visits per year (14). The other study done in Vietnam revealed that the mean total expenditure for healthcare services for HIV/AIDS individuals was US\$188 per annum or US\$16 per month per patient (15).

The HIV/AIDS-affected households need to pay a substantial amount of money for the care and treatment of their ill family members (10). According to research conducted in Rwanda, shows that expenses on health care twenty times higher in HIV/AIDS affected, as compared to non-affected households and health care expenses for men were 2.6 times greater than for women (16). According to research conducted in Nepal, the major determinants for the direct costs and productive costs were household income, occupation, health status of respondents, respondents accompanied or not (13). The severity or stage of an HIV/AIDS infection is directly related to the economic impact as well (12,17). According to Study done in South Africa on TB/HIV patients direct costs were largely driven by costs of special food purchased as nutritional supplements for the illness (18). Monthly costs of special foods ranged from \$8.06 to \$13.40 per month, representing 53% of direct costs for HIV-only participants, 60% of direct costs for TB/HIV participants and 82% of direct costs for TB-only participants (18). Study conducted in South Africa find out that more than 60% of ill people required someone to care for them at home, while more than half required someone to accompany them to health care (11). Participants with both TB and HIV faced a greater economic burden (US\$74/month) than those with TB-only (US\$68/month) or HIV-only (US\$40/month) care (11).

The economic burden of HIV/AIDS on patients and their family in Ethiopia is not well known due to lack research (no previous research on Economic Cost of HIV/AIDS among individuals on ART and their family). Related researches done in Ethiopia on cost of HIV/AIDS were focused on provider side, which is not clearly show the economic cost of HIV/AIDS on individual and their family. The other main gap of previous researches in different part of Ethiopia like Arba Minch, Addis Ababa, Dire Dawa and Adigrat were didn't consider or estimate indirect costs such as loss of productivity and wage lost during cost estimation which share large proportion of economic burden (19–22). Therefore, there is an information gap in this economic cost issue.

The Study was aimed to estimate direct cost (the direct medical and direct non-medical costs) and indirect of HIV/AIDS on ART patients and their family in one of HIV/AIDS prone area of Ethiopia.

### **1.3 Significance of the study**

In Ethiopia almost all health facility provides free health care service to HIV/AIDS patients. But the HIV/AIDS affected individuals and their family are exposed to a considerable cost to their incomes for transportation, food and productive loss that was not well known by others except patients and their family. Cost of HIV/AIDS in this study will provide information on lists of costs and values of costs related to the diseases. Then, different stakeholders working on HIV/AIDS and individuals with HIV/AIDS will empirically understand the economic consequence of the diseases.

Therefore, this study is important to estimate major economic cost of HIV/AIDS on individuals and their family and give base line information for policy makers, researches ,other stakeholders and as well as for PLWHA in order to design sound strategies.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 General about HIV/AIDs over View**

HIV/AIDS is one of pandemic and re emerging communicable disease which is caused by the virus called human immunodeficiency virus (HIV). It affects the immune system of the body of human beings. The epidemic was firstly recognized in the year 1980(23). HIV/AIDS is one of the most destructive diseases humankind has ever faced. It brings with it profound social, economic and public health consequences(3). It has become one of the world's most serious health and development challenges. Recent global initiatives have renewed focus on rapidly scaling up antiretroviral therapy (ART) to prevent AIDS-related deaths and HIV transmission. In September 2015, the World Health Organization (WHO) early-released revised guidelines recommending that all people living with HIV be offered and voluntarily initiate ART upon diagnosis, regardless of CD4 T cell count(24). In 2015, 17 million people living with HIV were accessing antiretroviral therapy which 46% of all adults living with HIV/AID.

### **2.2 Distribution of HIV/AIDs**

In 2016 Globally 36.7 million people were living with HIV,2.1 million people became newly infected with HIV,1.1 million people died from AIDS-related illnesses,78 million people have become infected with HIV since the start of the epidemic and 35 million people have died from AIDS-related illnesses since the start of the epidemic(5).Sub-Saharan Africa (SSA) disproportionately bears the burden of HIV/AIDS compared to the rest of the word(25). Sub-Saharan Africa(SSA) contributed76% (29million) of the total HIV infected people(3). In Ethiopia there were 710 people living with HIV,30,000 new infection per year, HIV incidence per 1000 population is 0.33 and 20,000 death in 2016(6).

### **2.3 Economic Cost of HIV/AID on Individuals and their House Holds**

Human Immunodeficiency Virus (HIV) is a chronic disease with multiple opportunistic infections requiring lifetime treatment which may increase risks of catastrophic health expenditures for households in the global context, especially in low and middle income country (26).

Although the present emphasis on ART access and adherence is crucial, appropriate and timely prophylaxis of opportunistic infections must also be part of HIV clinical management.

Appropriate prophylaxis can decrease the number of incident opportunistic infections and thus decrease treatment costs for patients(27).

Despite remaining a major killer in Africa, the HIV pandemic has been tamed medically into a chronic disease through advances in treatment drugs antiretroviral therapies (ARTs). From the economic point of view, the introduction of the HAART has supposed an increase in the total treatment cost. Not really because the annual cost of treating is more expensive but because the increase on the life expectancy of patients. The cost of treating a patient along their life period notably increases(28).The long-term treatment for HIV/AIDS can have lifelong financial implications on HIV-affected households(9). The household level impact of HIV/AIDS includes direct costs, including medical and non-medical costs, and productivity costs such as loss of labour time, as a result of the morbidity of HIV positive household members, as well as time spent by others caring for them related income loss(29).

Long-term illness due to HIV/AIDS demands a higher level of treatment costs for the HIV-affected households. If a member of farming household is affected by HIV/AIDS at a young and productive age, the household either reduces the size of their farm due to the reduction in the number of farm (family) workers or hires external labour to work on their farm to replace the ill family member and career. Thus, there is a reduction in the number of family workers and an increment in the labour costs of the farm due to HIV/AIDS. HIV/AIDS cannot only kill the economically active population but will also destroy their experience; skills and knowledge built up over a period of years (13). If a breadwinner dies, then the family struggles to cope, not only emotionally but also economically. Poverty increases if the household's head dies and scarce resources are utilized during the period of ill health. Moreover, the higher health care expenditure of the households reduces investment for nutritional food for the family members, investment for farming or business and the education of the children. Death during the working age of the victim is a major factor in the economic impact of HIV/AIDS(30).

The AIDS epidemic has increased the economic vulnerability of households in many parts of sub-Saharan Africa(31). Research conducted in Kenya shows, there is a significance difference between the caregivers of the affected and non-affected household members in terms of number



of days the care giver is unable to work. The mean days a caregiver was unable to work before hospitalization was 38 days, 34 days during hospitalization and 39 days after hospitalization.

According to research done in Nigeria about a third of respondents (30.4%) reported having missed at least one entire day of work a mean of 9.7 days per month and found that 30% of respondents reported an average of 8 days of limited work output by them or by a household member due to respondents' illness. The loss in wages for an entire missed day of work was (\$5.56) per day(32)

The death of a HIV positive individual results in a permanent loss of income from less labour on the farm, lower remittances from jobs, costs associated with the funeral and mourning, and a possible removal of children from school in order to save on educational expenses and to increase household labour and income, resulting in a severe loss of future earning potential for the family (33). Therefore, the health consequences of HIV/AIDS have an economic impact on individuals and their families. The disease affects the earning capacity of the person and other members of the households too. The working time of household members shifted from productive activities to the care of the sick family members, and thus household income declines further(33).

## **2.4 Factors Associated with Economic Cost of HIV/AIDS**

HIV/AIDS is perhaps the most stigmatizing disease in the world. Stigma and discrimination in HIV/AIDS may result in either not seeking treatment or seeking treatment far from the home where the patient is not known by the health care professionals and others(34). Because of this some PLHIV need to travel long distance to access HIV/AIDS treatment and care(13). This behavior also has economic consequences because not seeking treatment means premature mortality and seeking treatment far from home means increased costs for the HIV-affected household(35).

The economic impact is far more serious on already poor households and female headed households leading to a vicious cycle of impoverishment (36). Gender plays a role in the economic impact of HIV/AIDS as a result of the division of labor between men and women determined by social and cultural norms. The economic impact of HIV/AIDS for families is

more devastating when the infected individual is male. With the male breadwinner incapacitated, the newly female headed households tend to have substantially lower earnings. This is due in part to the fact that female-headed households have greater difficulty maintaining a sustainable agriculture production level(9).

The other factors associated to the economic burden of HIV/AIDS are health status of Patients and HIV/AIDS related opportunistic infections. The severity or stage of an HIV/AIDS infection is directly related to the economic impact as well (36). According to research conducted in South Africa Participants with both TB and HIV faced a greater economic burden (US\$74/month) than those with TB-only (US\$68/month) or HIV-only (US\$40/month). On average, people with TB/HIV made 18.4 visits per year to health facilities, more than TB-only participants or HIV-only participants who made 16 and 5.1 visits, respectively (18).

PLWHA's households face catastrophic out of pockets that are not directly attributable to the cost of ART or to follow-up tests, particularly during a hospitalization period. Transportation, distance to healthcare and time spent at the health facility are the major contributors for OOPs and for indirect opportunity costs. Being on ART and attending the provincial health facilities were associated with a lower risk of catastrophic spending. Decentralization of care, access to ART and alleviation of OOPs are crucial factors to successfully decrease the household burden of HIV-AIDS expenses(37).

Coping strategies can also contribute to the economic burden on individuals and their families, for example if important household assets are sold off, children are taken out of school to contribute to household earnings, or loans with high interests are taken, and the negative impact of such "coping" may be long lasting and potentially irreversible economic effect to PLWHA (38). Health Insurance plays an important role in reducing the economic burden of healthcare for patients and ensuring the financial equity by the risk pooling mechanism(26).

This mechanism refers to a financial protection against high health care cost through spreading risks amongst members of a pool. Social health insurance (SHI) scheme covers most of HIV/AIDS services and treatments in high-income and even in middle-income countries with a higher rate of PLWHA(26).

## 2.5. Conceptual Frame Work

In this conceptual frame work socio demographic, socio economic, health status and environmental factors are independent variables and patient side total cost is dependent variable.

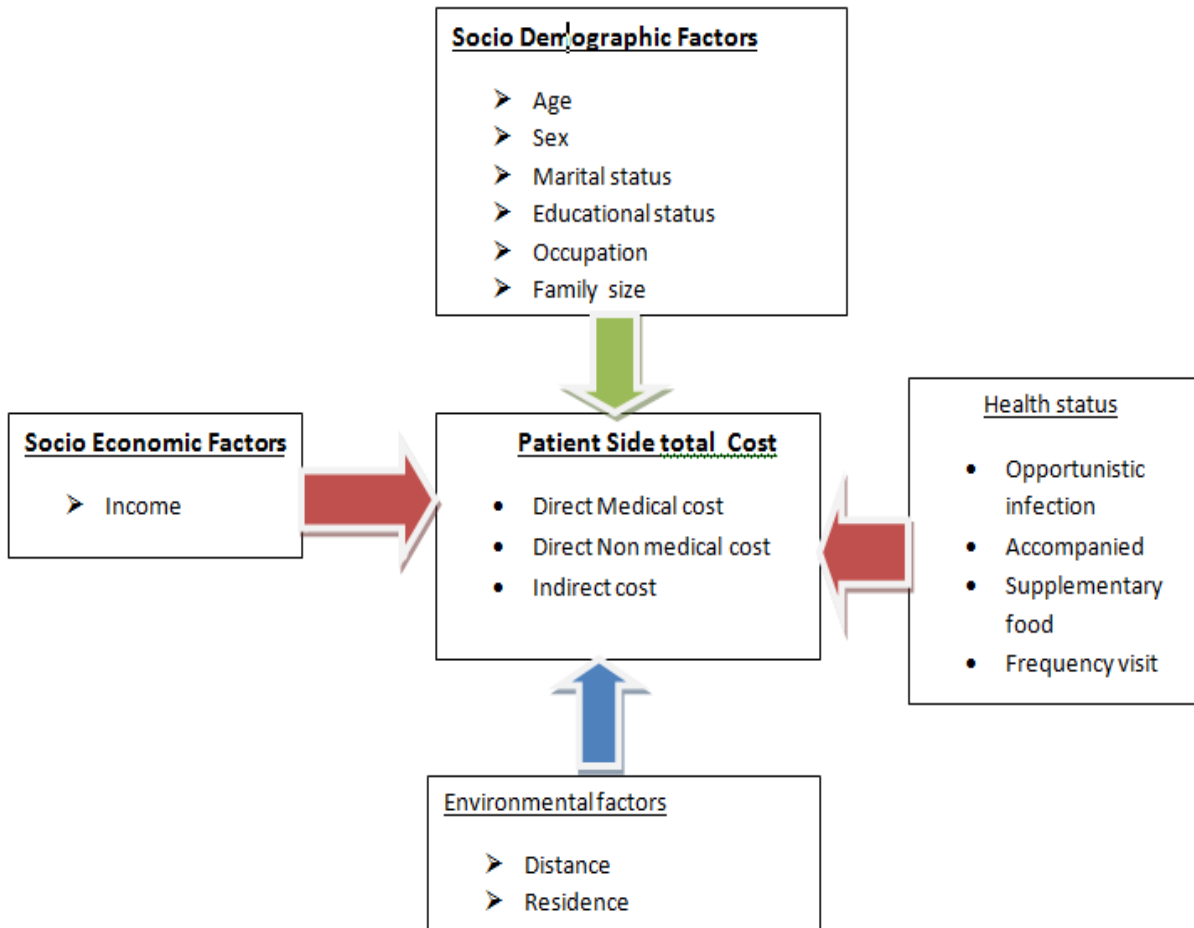


Figure 1: Conceptual framework of Economic cost of HIV/AIDS and associated factors among individuals on ART follow up and their Family in Oromia Special Zone Surrounding Finfinne, 2018.

(Adapted from Economic Burden of HIV/AIDS upon Households in Nepal a Critical Review(10).

### **3. OBJECTIVES**

#### **3.1 General Objective**

The objective of the study was to estimate the economic Cost of HIV/AIDS and associated factors among individual on ART follow up and their family in Oromia Special Zone Surrounding Finfine, Ethiopia, 2018.

#### **3.2 Specific objectives.**

- To estimate direct cost of HIV/AIDS among individuals on ART follow up and their family in study area.
- To estimate the indirect cost of HIV/AIDS among individuals on ART follow up and their family in study area.
- To assess factors affecting total cost of HIV/AIDSs among individuals on ART follow up and their family in study area.

## **CHAPTER THREE: METHODS AND MATERIALS**

### **4.1 Study Area and Period.**

The study was conducted among individual on ART follow up in Oromia Special Zone Surrounding Finfine from August13 up to September09, 2018. Oromia Special Zone Surrounding Finfine is one of the Zones found in Oromia regional State. Its'capital city is Finfine which is also known as Addis Ababa. Finfine is also the capital city of Oromia regional state and the Country (Ethiopia). Oromia Special Zone Surrounding Finfine is admistratively divided into Six(6)Woredas and one Town administration. This zone has 145kebeles and a population of 632,786(M=322721and F= 310066 projected based on CSA (2007) census by the year 2017/18 .Concerning health facilities there are one public primary hospital, 27 health centers, 147 health posts, 18 medium clinics, 40 primary clinics and 18 drug stories in the zone. From this facilities there are ten health facilities currently providing multiple antiretroviral therapy (ART) services. One public primary hospital and nine public health centers provide ART service for 1413 adult's patients(39).

### **4.2. Study Design**

The study used facility based cross sectional study design.

### **4.3 Population**

#### **4.3.1 Source Population:**

In this study the source population all adults PLWHA on ART follow up in Health facilities in Oromia special Zone Surrounding Finfine, Ethiopia.

#### **4.3.2 Study Population:**

The study population was sampled adult individuals who are currently on ART follow up who were visited selected health facilities during data collection period.

#### **4.3.3 Inclusion and Exclusion Criteria**

##### ***Inclusion Criteria's***

- All PLWHA aged 18years or above and who were on ART follow up at least one month in selected health facility during data collection period.

### ***Exclusion Criteria's***

- Adult on ART follow up who severally ill(can't respond to interview) was excluded

## **4.4 Sample size and Sampling procedure/technique**

### **4.4.1 Sample size determination**

The sample size was calculated by using single population mean formula by taking the following assumptions into consideration .From Previous pilot study done in Adigrat Hospital of Ethiopia by Zemenfeskidus Hadgu 2011 used the cost of HIV/AIDs standard deviation of HIV/AIDS birr 441.74 and mean cost 860 assuming 5% precision(d) with 95% confidence interval(39).

When marginal error or precision (d)=5%\*860=43 and standard deviation (S)=birr441.74

$$n = \frac{(Z_{\alpha/2})^2 \cdot S^2}{d^2}$$

$$n = \frac{(1.96)^2 \cdot (441.74)^2}{(43)^2} = 405$$

Hence, the total number of adult HIV AIDS patients enrolled to ART in Health facilities found in Oromia Special Zone Surrounding Finfine were 1413 which is less than ten thousand. Therefore by using population correction formula and adding 10% potential non responding rate, the final sample size for this study was 350 individuals who are on ART follow up.

### **4.4.2 Sampling Technique**

First all health facilities give ART services in the study areas was listed (nine health centers and One public Primary Hospital). From ten Health Facilities one public primary hospital and four health centers selected by simple random sampling technique using lottery method which cover 50% of Health facilities the service of ART in the study area according to WHO guide line used for selecting health facility criteria(40). Those health facilities selected were: Chancho public primary Hospital, Sandafa Health Center, Chancho Health center, Kolobo Health center and Hoja Dure Health Center.

- To get representative sample size the proportion allocation was applied to each selected health facilities depending their number of adult patient on ART follow up. When the total adult on ART follow up in selected Health facility is 1150,SRS method was used to recruit study subjects with sampling interval (K=2) depending on number of patient could contact each health facilities during study period.

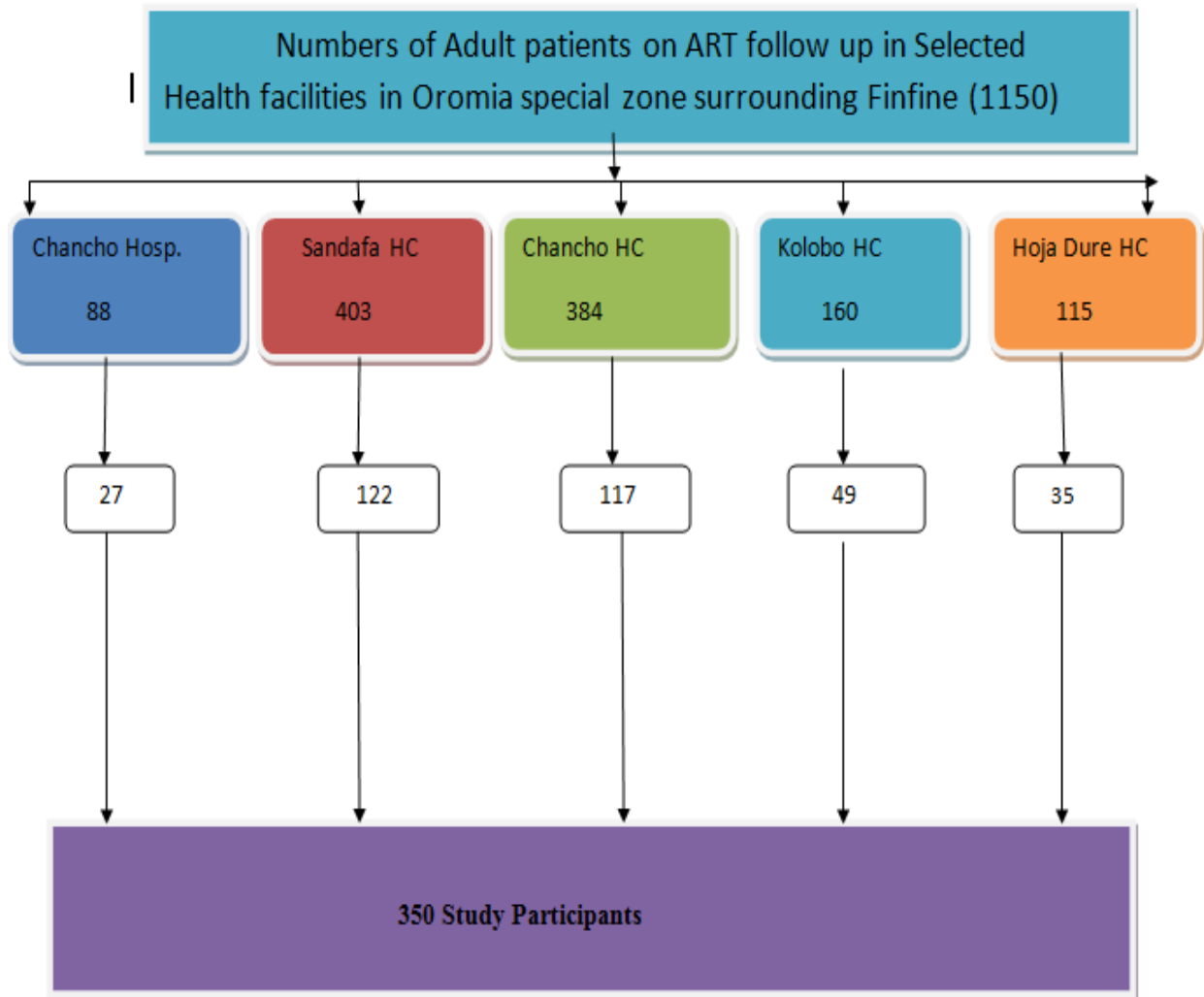


Figure 2: Schematic Presentation of sampling Procedure for Economic Cost of HIV/AIDS and associated factors among individuals on ART follow up and their family in Oromia Special Zone Surrounding Finfine , 2018.

## **4.5 Data Collection Tools and Procedure**

### **4.5.1 Data Collection Tool**

The semi- structured questionnaire was used to measure direct and indirect costs of PLWHA on ART follow up in the study area. The questionnaire was prepared by reviewing literatures of similar studies and guidelines organized to capture direct medical, direct non-medical and indirect costs of care and treatment as well as associated factors of all this costs(10,13).

### **4.5.2 Data collection procedure.**

Face to face exit interview was conducted by using interviewer administered questionnaires to get information on the direct and indirect medical and non-medical costs related to the HIV/AIDS diseases care and treatment. Seven data collectors ( three diploma and four BSc) and two supervisors( both BSc holder), who have experience in data collection, were employed by principal investigator to conduct this data collection.

## **4.6 Study Variables**

### **4.6.1 Dependent variables:**

Total Cost (direct and indirect cost of HIV/AIDS toward patients and their Accompanied person).

### **4.6.2 Independent Variables:**

- Sex.
- Age,
- Marital status,
- Occupation
- Monthly income,
- Educational status,
- Family number,
- Distance
- Frequency visit to health facility,
- Accompanied
- Opportunistic infection



## 4.7 Operational Definitions

**Economic Cost:** means total cost expressed in terms of direct and indirect costs incurred by individuals who are on ART follow up and their accompanied persons.

**Direct costs:** Cost includes the cost of medical treatment, transport and food expenses required to reach health care facilities so as to receive treatment and back. Direct costs in this study were measured from the patient perspective that means what individual or households pays.

Total direct costs for HIV/AIDS treatment were measured by combining all the average out-of-pocket medical and non-medical costs for HIV infected individuals, as well as costs for accompanying person/s.

**Direct medical costs:** are cost incurred due to medical services such as, diagnostic test and non ART drugs

**Drug costs:** are non antiretroviral drugs mostly used to treat opportunistic infection. Non antiretroviral drugs include other antiviral, antibiotic and antifungal drugs and other licensed drugs that are primarily used to treat opportunistic infections and other HIV problems, such as drug side effects.

**Direct non medical costs:** Non-medical expenditures include costs for services such as transportation for the patient and family members to health facilities, foods, lodging cost that estimated from the patient's self-estimate/patient side.

**Indirect Cost:** productivity losses measured due to HIV/AIDS related morbidity and disability, borne by the individual and care takers or inability to carryout normal daily activities which is estimated by wage lost by using Human capital Approach. To determine the loss of income due to HIV/AIDS, respondents were asked how much money the person lost by not being able to work in the previous one month (38)

**Human Capital Approach:** Is a method designed to estimate the value of human capital as the present value of his or her lost of productivity because of HIV/AIDS .It is a simply measuring lost production using gross individual income lost. Regardless of how long the period of absence or disability is, the gross wage a person lost because of his/her absence. This is calculated from gross salary for employed person(41,42).

**Total patient side cost:** In this study refers to direct medical, direct non medical and indirect cost incurred by patient, care givers/ friends during HIV/AIDS care and treatment.

**Normal daily activities:** is formal and non-formal work carried out by individuals in rural and urban settings. To calculate the respondent's days lost due to illness, respondents will be asked whether they were completely or partial unable to work in the last one month (30 days) which is simply estimated by amount of wage lost due to his/her illness and their care takers or not (13).

**Out-of-pocket Expenditures:** The portion of medical and non medical expenses a patient is responsible for paying.

**Opportunity cost:** the value of the forgone revenue/income that lost due to HIV/AIDS morbidity.

**Opportunistic infection:** the presence of any infectious disease along with HIV/AIDS.

**Appointment spacing:** it is the standard which recommend HIV/AIDS patients who have stable health status to visit health facility two times per year for ART service(7).

**Absenteeism:** the number of days last month that the individual was unable to perform his/her normal activities

**Coping strategies:** are all strategically selected acts that individuals are use to for their expenses or earn some extra income to enable them to pay for the HIV/AIDS disease treatment and care.

**Catastrophic Health expenditure:** is if a household's financial contributions to the health system exceed 40% of income remaining after subsistence needs have been met(43).

**Household subsistence spending:** is the minimum requirement to maintain basic life in a society. For this specific research society were PLWHA on ART follow up.

**Purchasing power parity (PPP):** is the inflation rate of each specific country 2018 as base line divided to the inflation rate of that specific country in the study period and multiplying with international currency of specific cost at that time period.

#### **4.8 Data Analysis Procedure**

In this study, the costs of HIV treatment and care were the total costs incurred for an individual patient and their family in one month past period (preceding month of interview). The total costs were calculated by summing the average total direct costs and indirect costs of individual and their accompany in one month preceding data collection period.

## **Cost estimation methods**

In the case of illness, indirect costs include the loss of income to the ill person and to those persons caring for the sick. To determine the loss of income due to HIV/AIDS, respondents were asked how much money the person lost by not being able to work in the previous one month (38).

In terms of caring, respondents were asked to indicate the number of working days the person caring for the ill has lost in the thirty days before the interview in terms of caring for the ill and in terms of accompanying the ill person to a health care facility. The loss in income was estimated based on the number of days of work lost by those caring for the ill, employing the specific average monthly employment earnings divided by working days in one month as a proxy of the daily loss of income.

### **Measurement of average total direct cost**

Direct costs in this study were measured from the patient perspective that means patients are the payer. Average total direct costs for HIV/AIDS treatment were measured by combining all the average out-of-pocket medical and non-medical costs for HIV infected individuals, as well as costs for accompanying person/s. These included costs of Health professionals, diagnostic tests, travel, food, lodging and other items at the time of treatment. Direct costs incurred for accompanying person/s to attending for diagnosis and/or treatment of patient was included in the measure of average total direct costs. Therefore, the direct cost for the last month to the treatment centre was taken to be equivalent to the monthly direct costs due to HIV/AIDS in this study(13).

### **Measurement of average productivity (indirect) cost**

In this study, productivity cost is defined as the inability to carryout normal daily activities and income lost due to unable to work plus income lost to access to treatment and care and their valuation. Normal daily activities are defined as formal and non-formal work carried out by individuals in rural and urban settings. Estimate the productivity losses, the inability of PLWHA on ART follow up and his/her care giver is simple measured by wage lost by patients and his/her care givers(13).

## Valuation method

For this specific study I used Micro costing or bottom up estimation method used for direct costs and Human capital approach for indirect cost(41).The direct costs that were estimated include direct medical costs for Card, Diagnostic, non ART Drugs and consultation. Direct non-medical cost during outpatient travel cost, food cost ,accommodation cost and loading cost, Indirect cost include income lost for both patient and accompanying person as well as unable to work days income lost due to sick patients were also included. Time foregone in seeking care and productive time lost was also converted into indirect cost based on the daily wage rate and then multiplied by the number of working days lost. The daily wage rate for monthly paid patients was estimated by dividing their gross monthly salary by 30 days. Daily wage rate for daily paid patients were calculated based on the patients reported daily earnings. For an employed income lost calculated according to replacement income lost estimation was applied (44).

The data collected was checked for completeness and coded manually. After coding, it was entered into Epi data version 3.1 and exported to SPSS version 23 for analysis. During data analysis all direct costs and indirect costs first analyzed using local currency ( Ethiopian birr) then converted to US\$ as well as purchasing power per dollar (PPP\$) using the official National Bank of Ethiopia average exchange rate at data collection period in order to relate with other study done in different countries. All monetary values were converted to US dollars (US\$) for the analysis by using the average exchange rate for the 15 July, 2018 at a rate of 1 US\$ to 27.25 ETB(45).

Descriptive statistics like percentage and frequency counts were used for discrete variables and mean, median and standard deviation were also calculated for continuous variables. Both descriptive and analytical statistics were applied to the finding of the study during data analysis. In this study total cost was dependent variable and cost associated factors independent variables were analyzed by multi linear regression model using Statistical Package for Social Science (SPSS) version 23.

## **4.9 Data Quality Management**

The semi-structured questionnaire developed for data collection purpose was translated in to local language Afan Oromo which is the working language of the region and Zone, then translated back to English so as to preserve the constancy of the data to be collected. Questionnaire pretest was done in Holeta Heath Center on 5% (17) adult individuals who on ART to check the feasibility.

Data collectors and supervisors who have health background were enrolled and trained for one day on the content and meaning of questions of the designed questionnaires. There was continuous follow-up and supervision throughout the data collection period by two supervisors. Furthermore, on daily basis the quality, completeness, clarity and any on the questionnaires was checked after each data collection process by supervisors and the researcher.

## **4.10 Ethical Consideration**

Ethical clearance was obtained from Ethical Review Board of Jimma University institute of health. After obtaining official letter of permission from ORHB, it was submitted to, OSZSF health department, Woreda and town health office of respective health facilities and finally health facilities where data collection process take place according to their hierarchies. Oral informed consent was obtained from the interviewee by informing the purpose of the study before asking any question. Any interviewee had the right to withdraw from the process at any time in spite of he/she the next person was recruited. All the information was recorded and used anonymously and confidentially throughout the study.

## **4.11 Dissemination Plan**

The final report of the study will be presented and submitted in the form of soft and hard copy to Jimma University, Institute of Health, Department of Health Economics, Management and Policy. Besides that, efforts will be made to present the findings on program based workshop in FMOH and Health Bureau. Publication of these research findings on the peer-reviewed journals will also be considered.

## Chapter Four

### 4. Results

#### 4.1 Socio Demographic and Economic characteristics

All study subjects (350 individuals) were participated in this study, which provided that 100% response rate. Of these 216 (61.7%) were females. . The mean age of the respondents was 38.57 (SD=10.34) with age range of 18-77 years. Majority of respondents (45.4%) were married 152 (43.4%) were not attend formal education, 113 (32.2%) of participant were self employed. From the total study participants, 173 (49.4%) of them had 1-3 family members live in the same house. Concerning residence area 179 (51.1%) of respondents were from urban and the mean distance from health facility 13.26 Km. The mean monthly income for the respondents was US\$ 75.47 (SD=40.03).

**Table 1: Socio-demographic characteristics of the study subjects: among individual on ART follow up in OSZSF Central Ethiopia,2018**

| Variables                    |                         | Frequency | Percent |
|------------------------------|-------------------------|-----------|---------|
| Participants By HF           | Chancho hospital        | 27        | 7.7     |
|                              | Sandafa HC              | 122       | 34.9    |
|                              | Chancho HC              | 117       | 33.4    |
|                              | Kolobo HC               | 49        | 14      |
|                              | Hoja Dure HC            | 35        | 10      |
| Sex                          | Male                    | 134       | 38.3    |
|                              | Female                  | 216       | 61.7    |
| Age Category in year<br>(13) | 18-49                   | 304       | 86.9    |
|                              | >=50                    | 46        | 13.1    |
| Residence                    | urban                   | 179       | 51.1    |
|                              | Rural                   | 171       | 48.9    |
| Marital Status               | Single                  | 35        | 10      |
|                              | Married                 | 159       | 45.4    |
|                              | Widowed                 | 58        | 16.6    |
|                              | Divorced                | 86        | 2       |
|                              | Separated               | 10        | 2.9     |
|                              | Other                   | 2         | .6      |
| Educational Status           | No formal education     | 152       | 43.4    |
|                              | Elementary              | 137       | 39.1    |
|                              | Secondary & preparatory | 42        | 12      |
|                              | Colleges & above        | 19        | 5.4     |
| Occupation                   | Government employee     | 23        | 6.6     |
|                              | Private employee        | 26        | 7.4     |
|                              | Self employee           | 113       | 32.2    |
|                              | NGO employee            | 12        | 3.4     |
|                              | Retired                 | 7         | 2       |
|                              | Farmer                  | 99        | 28.3    |

|                            |             |     |      |
|----------------------------|-------------|-----|------|
|                            | Daily labor | 52  | 14.9 |
|                            | Student     | 3   | .9   |
|                            | unemployed  | 15  | 4.3  |
| Family Size in number      | 1-3         | 173 | 49.4 |
|                            | 4-6         | 157 | 44.9 |
|                            | 7-10        | 20  | 5.7  |
| Income cat in birr<br>(46) | 0-1206      | 87  | 24.9 |
|                            | 1207-1750   | 90  | 25.7 |
|                            | 1751-2508   | 86  | 24.6 |
|                            | >=2509      | 87  | 24.9 |

#### 4.2 Health Status of the Respondents

From the total respondents 158(45.1%) CD4 of individuals on ART was between  $200/mm^3$  to  $500/mm^3$ . The data revealed that 245(70%) of the respondents were perceived their health status as good and 74(21.1%) of them had opportunistic infection.

**Table 2: Health status of individual on ART follow up in OSZSF Central Ethiopia, 2018**

| Health status Characteristics |                         | Frequency | Percent |
|-------------------------------|-------------------------|-----------|---------|
| CD4 level                     | >500/mm <sup>3</sup>    | 149       | 42.6    |
|                               | 200-500/mm <sup>3</sup> | 158       | 45.1    |
|                               | <200mm <sup>3</sup>     | 36        | 10.3    |
|                               | Don't know              | 7         | 2.0     |
| Viral load                    | Lessthan50copy          | 180       | 51.4    |
|                               | 50-100copy              | 101       | 28.9    |
|                               | >1000copy               | 43        | 12.3    |
|                               | Don't know              | 26        | 7.4     |
| Opportunistic infection       | Yes                     | 74        | 21.1    |
|                               | No                      | 276       | 79.9    |
| Self report health status     | good                    | 245       | 70      |
|                               | medium                  | 101       | 28.9    |
|                               | Poor                    | 4         | 1.1     |



### **4.3 Frequency of Health facility Visit**

One month before study period (Hamle1-30E.C) most of respondents (94.3%) had visited their respective health facility once. In normal way from total respondents 246(70.3%) conduct ART follow up monthly, While other 59(16.9%)in two month and 45(12.9%) of them in six month routinely travel to ( visit) health facility according to their appointment for ART follow up.

### **4.4 Costs of Treatment among ART followers**

#### **4.4.1 Direct Costs**

From total 74(21.1%) of respondents were incurred for direct medical costs in preceding one month of data collection period. Majority (65%) of this was incurred by the cost of medicine and diagnostic cost (35%). Direct medical cost in this study was diagnostic and drugs cost used to treat opportunistic infections which didn't include ART routine drugs. From 350 respondents, 53 (15.1%) of respondents buy additional (supplementary food) because of they were taking ART drugs and pay additional cost varies from US\$.73 to US\$16.70 per month per individual. From the total direct non medical cost, transportation cost represents half share (47.57%). Means transportation for patient 194(55.4%) uses car and most (51.1%) of participants were from urban.

**Table 3: Direct Costs of HIV/AIDS individuals on ART follow up and their family in Oromia special zone surrounding Finfine ,2018**

| each cost items in US\$(1 US\$=27.25ETB)                           |      |       |      |         |
|--------------------------------------------------------------------|------|-------|------|---------|
| Cost Items                                                         | Mean | Media | SD   | Sum     |
| <b>Total direct Medical cost(n=74)</b>                             | 6.78 | 5.87  | 4.07 | 502.09  |
| Diagnostic cost(n=73)                                              | 2.41 | 2.02  | 1.09 | 175.89  |
| Drugs/medicine cost(n=74)                                          | 4.41 | 3.21  | 3.46 | 326.20  |
| <b>Total direct non medical cost for patient(n=255)</b>            | 4.22 | 3.67  | 3.09 | 1110.53 |
| Travel Cost (n=255)                                                | 2.02 | 1.76  | 1.38 | 515.74  |
| Food Cost(n=223)                                                   | 1.59 | 1.47  | 0.73 | 353.80  |
| Cost of additional supp. Food(n=53)                                | 4.55 | 3.67  | 1.72 | 240.99  |
| <b>Total direct non medical cost for accompanying person(n=23)</b> | 5.49 | 4.04  | 4.18 | 126.31  |
| Travel cost(23)                                                    | 3.16 | 2.20  | 2.46 | 72.59   |
| Food cost(n=22)                                                    | 2.11 | 1.74  | 2.05 | 46.39   |
| Accommodation cost(n=1)                                            | 7.34 | 7.34  | 0.00 | 7.34    |
| <b>Total non medical cost(P+A.P) (n=263)</b>                       | 4.70 | 3.67  | 4.38 | 1236.84 |
| <b>Total direct cost(M+Nm) (n=274)</b>                             | 6.35 | 4.40  | 6.25 | 1738.94 |

## 4.4.2 Indirect Costs

### 4.4.2.1 Indirect cost of patient

The time lost by patient to access ART services ranges from 15 minutes (0.25hour) to 8.25hours at mean of 1.8hours and standard deviation 1.32. Income lost by patient because of time lost to access ART services varies from US\$ 0.59 to US\$ 11.01 and mean of US\$ 2.37 (SD=1.83) per month. From total,66(18.6%)of respondents had history completely unable to work their normal daily works in last month at minimum of two days to maximum twenty days. Because of unable to work their normal works they lose income range from US\$3.37 to US\$ 80.73per month per patient.

#### 4.4.2.2 Indirect cost of accompanying person

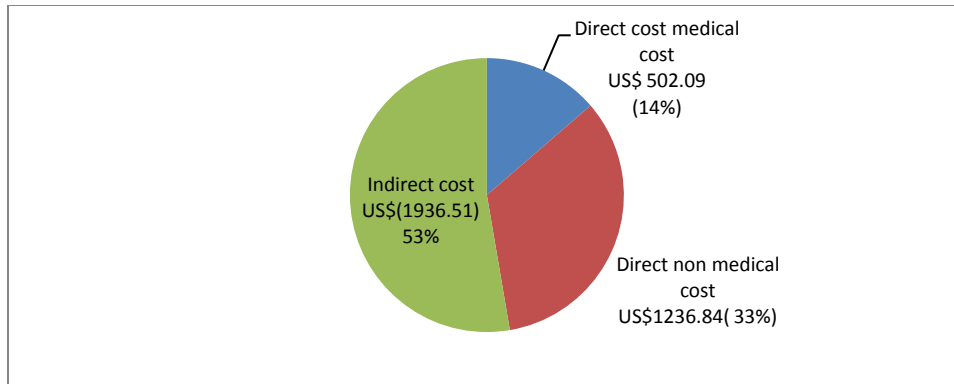
The data showed that 24(6.9%) of respondents took at least one an accompanying person with them in the last visit. Majority (91.7%) took one accompanying person with them during ART follow up. The time lost by accompanying person range from 25 minutes (0.42hour) to 7.2hours per month and income lost due to time lost was range from minimum of US\$1.83 to the maximum US\$ 12.84per month per individual. The total Indirect cost (income lost) of respondents vary from US\$0.59 to 92.33 per month and the total indirect cost of both patient and accompanying person of this study was US\$ 1936.51.

**Table 4: Indirect cost of HIV/AIDS and associated factors among individual on ART follow up and their family in OSZSF, 2018**

| Cost Items                                      | All cost in US\$ (1 US\$=27.25ETB) |       |       |       |         |
|-------------------------------------------------|------------------------------------|-------|-------|-------|---------|
|                                                 | N                                  | Mean  | Media | SD    | Sum     |
| <b>Total Indirect cost of patient</b>           |                                    |       |       |       |         |
| Income lost to access treatment(in ETB)         | 350                                | 2.37  | 1.83  | 1.77  | 829.98  |
| Income lost because of unable to work(Birr)     | 66                                 | 15.33 | 13.14 | 12.22 | 1011.85 |
| Total indirect cost of patient(Birr)            | <b>350</b>                         | 5.26  | 1.83  | 8.74  | 1841.83 |
| <b>Indirect cost of Accompanying person</b>     |                                    |       |       |       |         |
| Income lost by Accompanied Person(Birr)         | 23                                 | 4.12  | 3.67  | 3.05  | 94.68   |
| Total indirect cost(both Patient & A.P) in Birr | <b>350</b>                         | 5.53  | 2.20  | 8.44  | 1936.51 |

#### 4.4.3 Total cost

The total cost of individual on ART(total direct cost and total indirect cost) in study areas was minimum US\$ 0.59 to maximum 92.33 at mean US\$10.50 (SD=10.46).To manage direct cost and indirect cost incurred to patients and accompanying persons, 249(71.1%) respondents use cash, to manage their expenses. Generally study result revealed that direct medical cost share 14%, direct non medical cost share 33% and indirect cost share53% of total mean cost of respondents which is US\$ 10.5 per month which cover 14% total monthly income of participants.



**Figure 3: Economic cost item of HIV/AIDS among individual on ART follow up and their family in Oromia special zone surrounding Finfine ,Ethiopia ,2018.**

#### **4.5 Factor associated to total cost**

For this study the association between dependent and independent variables was tested by using linear regression analysis. Before applying linear regression model first statistical assumption like Linearity, normality, multi co linearity, outliers and hetroscedasticity among the variables were checked. Normality and linearity were checked by using histogram and normality checked by normality probability pilot (Q-Q). Multi co linearity was checked by using tolerance as well as Variance inflation factor (VIF) and outliers were checked by using distance metrics. Multiple linear regressions using a back ward selection procedure, was employed to identify the predictors of cost variability. While checking assumption, the distribution of data was found positively skewed. To correct this skeweness of data, log transformation (log10) was applied for total cost, of individual on ART follow up in study area. To determine association between dependent and independent variables, a multiple linear regression model was fitted.

To conduct the regression analyses for total cost, the predictor variables which were significant to the outcome variables by one to one linear regression having P. Value less than 0.25 were candidate for multivariable linear regression. Candidate variables were , Dummy of sex, dummy e of marital status (married and divorced), dummy of educational status(Elementary and secondary), dummy occupational status( NGO's and self employee),Dummy of residence, Dummy of opportunistic infection, dummy of accompanied person, frequency visit and dummy of supplementary food as displayed on table 5.

**Table 5: Candidate variable for multiple linear regression model of economic cost of HIV/ADS and Associated factors among Individual on ART and their family in Oromia Special zone surrounding Finfine, Ethiopia, 2018**

|                                    |                     | Un standardized Coefficients |            | Standardize d Coefficients | t      | Sig.  | 95.0% Confidence Interval for B |             |
|------------------------------------|---------------------|------------------------------|------------|----------------------------|--------|-------|---------------------------------|-------------|
|                                    |                     | B                            | Std. Error | Beta                       |        |       | Lower Bound                     | Upper Bound |
| (Constant)                         |                     | 2.671                        | .128       |                            | 15.789 | .000  | 1.766                           | 2.289       |
| Dummy of sex                       | M                   | .002                         | .050       | .003                       | .047   | .963  | -.096                           | .103        |
|                                    | F                   | RF                           |            |                            |        |       |                                 |             |
| Age                                |                     | .002                         | .002       | .048                       | .994   | .321  | -.002                           | .005        |
| Dummy of Marital status            | Married             | .043                         | .038       | .062                       | 1.137  | .256  | -.031                           | .157        |
|                                    | Divorced            | .116                         | .099       | .056                       | 1.165  | .245  | -.080                           | .311        |
|                                    | Other               | RF                           |            |                            |        |       |                                 |             |
| Dummy of educational status        | elementary          | .009                         | .035       | .012                       | .249   | .804  | -.061                           | .078        |
|                                    | secondary           | -.071                        | .055       | -.066                      | -1.28  | .201  | -.179                           | .038        |
|                                    | No formal education | RF                           |            |                            |        |       |                                 |             |
| Dummy of Occupation                | Self employee       | .011                         | .036       | .015                       | .299   | .765  | -.060                           | .082        |
|                                    | NGO                 | -.079                        | .093       | -.042                      | -.845  | .399  | -.263                           | .105        |
|                                    | Farmer              | RF                           |            |                            |        |       |                                 |             |
| Family Size                        |                     | .001                         | .010       | .003                       | .051   | .960  | -.019                           | .020        |
| Distance                           |                     | .006                         | .002       | .212                       | 3.663  | .000* | .003                            | .010        |
| Dummy of residence                 | Rural               | -.008                        | .041       | -.012                      | -.196  | .845  | -.090                           | .073        |
|                                    | urban               | RF                           |            |                            |        |       |                                 |             |
| Dummy of OIs                       | Yes                 | .242                         | .041       | .286                       | 5.943  | .000* | .162                            | .322        |
|                                    | No                  | RF                           |            |                            |        |       |                                 |             |
| Frequency of visit health facility |                     | .061                         | .049       | .062                       | 1.245  | .214  | -.035                           | .157        |
| Dummy of supplementary food        | yes                 | .146                         | .048       | .152                       | 3.069  | .002* | .053                            | .240        |
|                                    | No                  | RF                           |            |                            |        |       |                                 |             |
| Dummy of accompanying person       | Yes                 | .232                         | .069       | .170                       | 3.349  | .001* | .096                            | .368        |
|                                    | No                  | RF                           |            |                            |        |       |                                 |             |

- a. Dependent Variable: log total cost  
b. RF=Reference

The final model includes four variables, which were significantly associated with total cost ( $P < 0.05$ ): Distance, dummy of opportunistic infection, dummy of Supplementary food and dummy of accompanied.

The adjusted  $R^2$  value for this model was 0.267. This indicate that 26.7% of total cost explained by four predictors variables in this model. Other percent of total cost was due to the other factors/variables.

**Table 6: Total cost of HIV/AIDS and associated factors among individual on ART follow up and their family in Oromia Special zone surrounding Finfine, 2018**

| Model                            |     | Un standardized Coefficients |            | Standardized Coefficients | t     | Sig. | 95.0% Confidence Interval for B |             |
|----------------------------------|-----|------------------------------|------------|---------------------------|-------|------|---------------------------------|-------------|
|                                  |     | B                            | Std. Error | Beta                      |       |      | Lower Bound                     | Upper Bound |
| (Constant)                       |     | 2.16                         | 0.03       |                           | 84.41 | 0.00 | 2.11                            | 2.21        |
| Dummy Supplementary food         | Yes | 0.15                         | 0.05       | 0.16                      | 3.25  | 0.00 | 0.06                            | 0.24        |
|                                  | No  | RF                           |            |                           |       |      |                                 |             |
| Distance(KM)                     |     | 0.01                         | 0.00       | 0.22                      | 4.66  | 0.00 | 0.00                            | 0.01        |
| Dummy of Opportunistic Infection | Yes | 0.26                         | 0.04       | 0.31                      | 6.73  | 0.00 | 0.19                            | 0.34        |
|                                  | No  | RF                           |            |                           |       |      |                                 |             |
| Dummy of Accompanying            | Yes | 0.26                         | 0.07       | 0.19                      | 4.02  | 0.00 | 0.13                            | 0.39        |
|                                  | No  | RF                           |            |                           |       |      |                                 |             |

RF=Reference

In this study outcome variable (total cost) were log transferred, then the regression equation was as follow.

$$\text{Logy} = \alpha + b_1x_1 + b_2x_2 + b_3x_3 + \dots + b_kx_k + e$$

Where:

- Logy= Outcome variable. In this study mean total cost=105 US\$
- $X_1, X_2,$  and  $X_3$  are predictors variable. Were in this study
  - $X_1$ =Supplementary food (Sf)
  - $X_2$ =distance (D)
  - $X_3$ =Opportunistic infection (OP)
  - $X_4$ = accompanied (Ac)

- $\alpha$ , represent regression constant=2.16
- $b_1, b_2, b_3$  and  $b_4$  are the un standardized regression coefficient,  $e$ , is the error.

$$b_1 = 0.15$$

$$b_3 = 0.26$$

$$b_2 = 0.01$$

$$b_4 = 0.26$$

The equation become as follow

$$\text{Mean total cost (T)} = 2.16 + 0.15Sf + 0.01D + 0.26Ac + 0.26OI + e$$

Therefore, supplementary food, distance, opportunistic infection and patient accompanying were positive determinant variables of total cost. The output result in table 6 was interpreted as:

The total cost individuals who used complimentary food was greater than those not used by US\$ 0.15, as the distance increased by one kilometer, the total cost increased by US\$ 0.01, the total cost of individuals who take accompanying person was greater than those didn't take accompanying person by US\$ 0.26 and cost of individuals who had opportunistic infection was greater than those not had by US\$ 0.26 keeping other factors as constant.

## Chapter Five

### 5. Discussion

For the discussion purpose Purchasing power parity (PPP) was used according to Annex 4. When PPP was the inflation rate of 2018 each country where study was conducted divided by inflation rate of specific year study conducted times amount of cost in international currency in each items of cost to compare with this study. For this study (PPP of Nepal =1.34, Nigeria=1, Vietnam=1.56 and South Africa =1.068)(45).

#### 5.1 Total cost

The aim of study was estimating the total cost incurred to individuals on ART follow up and its determinants in selected health facility of Oromia special zone surrounding Finifine. Although ART services are offered free-of-charge, this study revealed that HIV/AIDS patients still pay out-of pocket for other medical expenditures, such as opportunistic infection, co-morbidities as well as direct non-medical expenditures. The main finding of this study showed that the mean total cost of study participant was estimated mean cost US\$10.5 (SD=\$9.97) per patient per month. This appears to be lower than the study done in Nepal where the total cost was 40.47USdollar/patient per month and greater than research conducted in Nigeria which the total cost out-patient cost of HIV patients on ART follow up was US\$5.44)(13,14). On other study done in Vietnam revealed that the mean total expenditure for healthcare services for HIV/AIDS individuals was US\$293.28 per annum or US\$24.96 per month (15).

These differences might be due to socio economic difference of study area, type of health facilities included in study, items of cost included and health care financing system differences between those countries.

#### 5.2 Total Direct cost

The mean total direct cost this study was US\$ 6.35 ( SD=6.25)which lower than study conducted in Nepal which it's mean was US\$ 27.34(13).This differences might be due to difference in study area , type of health facilities included in study and health care financing system.

The average direct medical cost was estimated at mean US\$6.78 (SD=USD\$4.07), from this the average cost of drug, diagnostic was cover the majority (64.8% and 35% respectively).



Study conducted in Nepal show that drugs and diagnostic costs covers 32.2% and 20.7% (13). Whereas research conducted in Vietnam shows 31.6% of direct medical cost was from medication (15). This show that most direct medical cost in this study area was covered by drugs and diagnosis cost but other countries like Nepal patients needs pay for consultation and other services. According to research conducted in Nigeria respondents incurred a mean direct medical cost of (\$0.87) (14) which is less than this study. This deferens's might be due to health services difference on exempted services. This means some countries make full exemption and some make partial exemption to the services and the other might be due to socio economic differences between those countries. The other difference might be unit of analysis differences between two studies. In Nigeria, they included HIV/AIDs patient diagnosed for first time during data collection period that might decrease the cost because they not incurred for more frequency visit.

The average direct non medical cost of this study was estimated at US\$4.7 (SD=USD 4.38). From this transportation cost cover (46.8%) and food cost (31.9%). According this study result 73% respondents paid for transportation. From this study finding direct non-medical costs still impose a substantial economic cost on individuals and their families and the major cost drivers were transportation and food cost. Transport cost alone cover 46.8%, which it indicate that patients still have to travel far to get to where ART services were delivered. Study conducted in Nigeria shows that the mean direct non medical cost was (\$4.54) and 91% of patients paid for transport to attend ART clinics and transportation was the most significant non-medical expenditure component, with an average of (US\$3.05), followed by average expenditure on food, which was (US\$0.90) (47). This shows the average direct non medical cost in this study area had more related cost with other studies (32,47).

The result of this study revealed that 53 (15.1%) of respondents incurred mean cost of US\$4.55 for additional (supplementary) food because of they used ART drugs. This could increase their direct non medical cost. According to Study done in South Africa on TB/HIV patients direct costs were largely driven by costs of special food purchased as nutritional supplements for the illness (18). Monthly costs of special foods ranged from US\$9.22 to US\$15.34 per month, representing 53% of direct costs for HIV-only participants, 60% of direct costs for TB/HIV

participants and 82% of direct costs for TB-only participants(18).This also indicate that TB patients needs supplementary food more than HIV/AIDs patients due to the nature of the disease and drugs they used (18).

This study revealed that, 74(21.1%) of study participant had opportunistic infection/co morbidity disease which also had contribution to increase direct medical cost. According to study done in South Africa direct out of pocket (OOP) costs incurred by participants ranged from \$10.45per month for TB-only participants to \$23.02 per month for TB/HIV participants(18).

### **5.3 Indirect cost**

The average indirect cost of this study was US\$ 5.53(SD=\$8.44)) which was income lost to access treatment center( health facilities) and back to home for both patient and accompanying person and income lost due to unable to work time because of this disease was changed to income lost. From 350 respondents 66 participants had unable to work history in previous month of data collection period. An average unable day to work was 1.8 days person per month which was almost similar to time lost due to unable to work research conducted in Kenya and less than research done in Nigeria. According to research done in Nigeria about a third of respondents (30.4%) reported having missed at least one entire day of work a mean of 9.7daysper month and It was found that 30% of respondents reported an average of 8 days of limited work out put by them or by a house hold member due to respondents' illness. The loss in wages for an entire missed day of work was (\$5.56) per day(32).

This is discrepancy could be due to socio economic, geographic differences and health status among the respondents. Among unable to works sixty six (66) respondents lost an average mean income of US\$ 15.33 which was a significant indirect cost for them. The result of this study also shows 24(6.9%) respondents accompanied by other person to get ART services .According to research conducted in South Africa more than half(>50%)of respondents requires someone to accompany them to health care for ART follow up (11). This accompanying by other person could increase direct non medical cost and have significant share in indirect cost as well as total cost.

The large differences between mean and median values of the different cost items indicated in this study could be due to the skewness of the cost data. The standard deviations presented in this study are large. Such pattern data was common in cost analysis diseases and supported with other researches (48).

#### **5.4 Limitation of the Study**

The limitation of the study self-reports of costs (patient side cost) can give an underestimation or exaggeration cost and some may missed due to recall bias of cost. The study also excluded the less quantifiable costs associated with suffering, grief, and social exclusion arising from disease such as stigma and discriminations which has economic cost contribution were some limitations of the study.

## Chapter Six

### 6. Conclusion and recommendation

#### 6.1 Conclusion

Although Ethiopia has had a policy to provide free ARVs since 2005, this study indicates that seeking care for HIV/AIDS is still a financial burden to patients.

The public provision of free drugs ART is not enough to eliminate the cost of HIV/AIDS patients as well as their families because of a significant amount of the total cost of individuals on ART follow up comes from non-medical expenses, including travel cost, food cost, other medications, diagnostic cost, and indirect (opportunity costs). Many adjunct treatments like opportunistic infections, expenditure on medicine and diagnostics that are not covered by free ART programmes predispose patients to direct medical cost. According to this research, the result of total cost of HIV/AIDS among ART followers is high relative to their income.

The most determinants of total cost of HIV/AIDS patients on ART follow up were distance from service area, having opportunistic infection, complimentary food, and accompanied patients.

#### 6.2 Recommendation

Exempted service of ART is not enough to reduce/eliminate the economic cost of HIV/AIDS among individuals on ART follow up. Therefore, I recommend:

##### FMOH

- Should exempt for other drugs used to treat related opportunistic infections or co-morbidities
- Should strengthen the overall HIV/AIDS prevention and control strategies to minimize the cost incurred to individuals.

##### OSZSF

- Decentralize/Expand ART Service and integration of HIV/AIDS-related services to all available and functional health centers and hospitals in the zone to reduce direct non-medical cost such as travel and food costs of HIV/AIDS patients.

##### Researchers

- Further studies should be done including intangible cost, social cost, catastrophic and impoverishments of HIV/AIDS among individuals on ART follow up and their families.

## Reference

1. Xu K, Saksena P, Jowett M, Indikadahena C, Kutzin J, Evans DB. Exploring the thresholds of health expenditure for protection against financial risk. *World Heal Rep Backgr Pap*. 2010;19:328–33.
2. Russell S. The Economic Burden of illness for House holds in developing countries focusing on Malaria ,Tuberculosis and Human immunodeficiency virus (Human immunodeficiency syndrome). 2004;71(Suppl 2):147–55.
3. UNAIDS. Global Fact Sheet HIV/AIDS. In Melbourne; 2015. p. 1–20.
4. UNAIDS. Global AIDS up date. Geneva; 2016.
5. UNAIDS. Global HIV/AIDS statistics 2015. Geneva; 2016.
6. UNAIDS. HIV/AIDS data. Geneva; 2017.
7. Health FM of. National Guideline for comprehensive HIV prevention care and treatment. Addis Abeba; 2017.
8. Al K et. Financial burden of health services for people with HIV/Aids in India. 2008;126(6):509–17.
9. Abegunde DO1 SA. The economic impact of chronic diseases:howdo households respond to shocks? Evidencefrom Russia. 2008.
10. Poudel AN, Newlands D, Simkhada P. Economic Burden of HIV/AIDS upon Households in Nepal: A Critical Review. 2015;5(August 2015):502–10.
11. R F, Rensburg V. The Socio-Economic Impact of HIV / AIDS on Households in South Africa : Pilot Study in Welkom ad Qwaqwa , Free State Province. 2002;(May).
12. Stover J, Bollinger L. The Economic Impact of AIDS by. 1999;(March).
13. Poudel AN, Newlands D, Simkhada P. The economic burden of HIV/AIDS on individuals and households in Nepal: a quantitative study. *BMC Health Serv Res* [Internet]. 2017;17(1):1–13. Available from: <http://dx.doi.org/10.1186/s12913-017-1976-y>
14. Etiaba E, Onwujekwe O, Torpey K, Uzochukwu B, Chiegil R. What is the economic burden of subsidized HIV/AIDS treatment services on patients in Nigeria and is this burden catastrophic to households? *PLoS One*. 2016;11(12):1–14.
15. Press D. The cost of antiretroviral treatment service for patients with HIV / AIDS in a central outpatient clinic in Vietnam. 2014;101–8.
16. Africa EC for. The Impacts of HIV/AIDS on Families and Communities in Africa. CHGA-B-11-.
17. Bachmann MO, Booyesen FLR. Health and economic impact of HIV / AIDS on South African households : a cohort study. 2003;8:1–8.
18. Mudzengi D, Sweeney S, Hippner P, Kufa T, Fielding K, Grant AD, et al. The patient costs of care for those with TB and HIV : a cross-sectional study from South Africa. 2017;(February):48–56.
19. Bikilla AD, Jerene D, Robberstad B, Lindtjorn B. Cost Effectiveness and Resource. 2009;(May 2014).
20. Africa S, Tagar E, Sundaram M, Condliffe K, Matatiyo B, Chimbwandira F, et al. Multi-Country Analysis of Treatment Costs for HIV / AIDS ( MATCH ): Facility-Level ART Unit Cost Analysis in. 2014;9(11).
21. Oljira L. IMPACTS OF HIV / AIDS ON THE PUBLIC SECTOR HEALTH CARE SERVICES. 2017;(December).
22. Hadgu Z. The costs of HIV/AIDS care and treatment. 2011;
23. Woldemariame SH. Factors Determining the Prevalence of HIV / AIDS in Ethiopia

- Matematiska institutionen. 2013;
24. Dutta A, Barker C, Kallarakal A. The HIV Treatment Gap : Estimates of the Financial Resources Needed versus Available for Scale-Up of Antiretroviral Therapy in 97 Countries from 2015 to 2020. 2015;5:1–43.
  25. Kabajulizi J, Ncube M. The economy wide impact of HIV/AIDS and the funding dilemma in Africa: Evidence from a dynamic life cycle horizon of Uganda. 2015;(September). Available from: [http://rushfoundation.org/wp-content/uploads/2015/10/Economic-impact\\_HIV\\_Uganda.pdf](http://rushfoundation.org/wp-content/uploads/2015/10/Economic-impact_HIV_Uganda.pdf)
  26. Le Q, Nguyen T, Phan T Van, Tran BX, Nguyen LH, Ngo C. Health insurance for patients with HIV / AIDS in Vietnam : coverage and barriers. 2017;1–10.
  27. Kumarasamy N et al. Financial burden of health services for people with HIV / AIDS in India. 2007;(December):509–17.
  28. Trapero-bertran M, Oliva-moreno J. Economic impact of HIV / AIDS : a systematic review in five European countries. 2014;1–16.
  29. Marlink R, Forsythe S, Bertozzi S, Muirhead D, Holmes M SJ. The economic impacts of HIV on house hold and economies. 2008.
  30. Collins DL LM. The financial impact of HIV/AIDS on poor households in south Africa. 2007.
  31. Ardington et al. The Economic Consequences of AIDS mortality in South Africa. 2015;48–60.
  32. Etiaba E, Onwujekwe O, Torpey K, Uzochukwu B, Chiegil R. What Is the Economic Burden of Subsidized HIV / AIDS Treatment Services on Patients in Nigeria and Is This Burden Catastrophic to Households ? 2016;1–14.
  33. Wyss K, Hutton G NY. cost attributable to AIDs at House hold level in Chad. 2004.
  34. Hounton SH, Akonde A, Zannou MD, Bashi Z, Meda N ND. Costing universal access of highly active antiretroviral therapy in Benin. 2008.
  35. Fasoulakis Z. The social stigma of HIV – AIDS : society ’ s role. 2017;111–8.
  36. Society IS. Indian Sociological Society Review Reviewed Work ( s ): Economic impact of HIV / AIDS on households by Savio P . Falleriro Review by : N . Nakkeeran Source : Sociological Bulletin , Vol . 64 , No . 1 ( January – April 2015 ), pp . 127-129 Published by : I. 2018;64(1):127–9.
  37. Barennes H, Frichittavong A, Gripenberg M, Koffi P. Evidence of High Out of Pocket Spending for HIV Care Leading to Catastrophic Expenditure for Affected Patients in Lao People ’ s Democratic Republic. 2015;132:1–20.
  38. Programme GTB. Protocol for survey to determine direct and indirect costs due to TB and to estimate proportion of TB - affected households experiencing catastrophic total costs due to TB Field testing version. 2015;(November).
  39. Oromia Special Zone Surrounding Finfine Health Department Report. Addis Ababa; 2017.
  40. Sambo LG, Chatora RR. Tools for Assessing the Operationality of District Health Systems.
  41. Organization WH. Methodological approaches for cost–effectiveness and cost–utility analysis of injury prevention measures. 2011;
  42. Jacobs P, Fassbender K. INDIRECT COSTS IN THE HEALTH ECONOMICS EVALUATION LITERATURE : Working Paper 97-4.
  43. Xu K, Evans DB, Kawabata K, Zeramdini R, Klavus J, Murray CJL. Household catastrophic health expenditure : a multicountry analysis. 2003;362:111–7.

44. Organization international labour. Global Wage Report 2014 / 15 Wages and income inequality. 2014.
45. Ethiopia CB of. Commercial Bank of Ethiopia. Addis Ababa; 2018.
46. Getahun B, Wubie M, Dejenu G, Manyazewal T. Tuberculosis care strategies and their economic consequences for patients : the missing link to end tuberculosis. *Infect Dis Poverty* [Internet]. 2016;1–10. Available from: <http://dx.doi.org/10.1186/s40249-016-0187-9>
47. Onwujekwe OE, Ibe O, Torpey K, Dada S, Uzochukwu B. Understanding the economic burden of HIV / AIDS treatment on households in Examining geographic and socio-economic differences in outpatient and inpatient consumer expenditures for treating HIV / AIDS in Nigeria. 2015;(February 2016).
48. Hailu A, Mariam DH. Patient side cost and its predictors for cervical cancer in Ethiopia : a cross sectional hospital based study. 2013;13(1):1. Available from: *BMC Cancer*

## Annexes

### Annex 1 Questionnaire

**JIMMA UNIVERSITY INSTITUTE OF HEALTH DEPARTMENT OF HEALTH ECONOMICS, MANAGEMENT AND POLICY**

**QUESTIONNAIRE FOR INDIVIDUAL ON ART FOLLOW UP (HIV/AIDS PATIENT)**

Greet, my name is ..... I am here on behalf of Asfaw Terefe student of Jimma University Institute of Health department of health economics, management and policy. He is conducting a research on 'Economic Cost of HIV/AIDS among individuals on ART follow up and their family in Oromia special zone surrounding Finfine central Ethiopia for the partial fulfillment of master's of science in Health Economics in Jimma University Institute of Health department of health economics, management and policy. He received Ethical approval (permission) from Jimma University Institute of Health department of health economics, management and policy, Oromia Regional Health Bureau and Oromia Special Zone Health department for administrators to conduct this study.

The aim of this study is to assess the Economic cost of HIV/AIDS among on individuals on ART follow up and their family. The study will help in providing a base line data for policy makers and other researchers on issues regarding Economic cost of HIV/AIDS on individuals and their family. You are selected randomly to participate in this study because you are eligible for this study. Your participation is purely based on your willingness. You have full right either to participate or Decline to be a participant in this study. If you choose to take part in the study you may respond to all the questions or you may not answer questions you don't want to, and have the right to stop the interview at any time. Participating in this study will not have any risk or harm to you and your family. If you decide to participate, I would like to stress that you will not receive any reimbursements for the costs that you report on in this interview. At some point I will ask you about your personal income and the income of your household. I will not provide this information to any tax or welfare authorities, even after the study has been complete. if you agree to participate in the study, you will be asked to answer some questions about yourself and your families, the interview lasts with you will take about 25-35 minutes. Any information that you provide will be kept confidential, names will not be written or specified and all the questionnaires will be coded for anonymity. No one will have access to the



non-coded data except the principal investigator. Only the principal investigator will know the details and he will discard it after completing analysis. The data will not be used for purposes other than the study. Your willingness and active participation is very important for the success of this study. Contact details of principal investigator and the person to whom to contact at any time for further explanation:

Name of principal investigator: Asfaw Terefe

Cell phone No - 0913470265

E-mail: [asfawterefe.75@gmail.com](mailto:asfawterefe.75@gmail.com)

1. Respondent agree to participate? 1. Yes 2. No

If yes, continue the interview

2. If no, skip to the next participant by writing reasons for He/her refusal.

1. No time time to tell you
2. I'am not interest
3. Too sick
4. other \_\_\_\_\_

Interviewer: Name \_\_\_\_\_ Signature \_\_\_\_\_

Date of interview \_\_\_\_\_ Time started \_\_\_\_\_

Name of Health Facility \_\_\_\_\_

Patient code \_\_\_\_\_

Type of service 1. In patient 2. Out patient

**PART I: SOCIODEMOGRAPHICS**

| S.N | Questions                     | Coding Categories                                                                                                                                                                             | Remark/Filter |
|-----|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 101 | Sex                           | 1.Male 2.Female                                                                                                                                                                               |               |
| 102 | Age                           | In year _____                                                                                                                                                                                 |               |
| 103 | Marital Status                | 1. Single 2. Married<br>3. Separated 4. Divorced<br>5. Widowe<br>6. Other(SPECIFY) _____                                                                                                      |               |
| 104 | Educational Status            | 1. No formal education<br>2. Elementary<br>3. secondary and preparatory<br>4. College and above                                                                                               |               |
| 105 | Main occupation               | 1. Government employee<br>2. Private employee<br>3. Self-employee<br>4. NGOs employee<br>5. Retired 6. Farmer<br>7. Merchant 8. Daily Laborer<br>9. Student 10 unemployed<br>11. Others _____ |               |
| 106 | Role in House Hold            | 1. Father 2. Mother<br>3. Child 4. Other _____                                                                                                                                                |               |
| 107 | Head of house holds           | 1.Male 2.Female                                                                                                                                                                               |               |
| 108 | Family Size                   | 1. Total _____                                                                                                                                                                                |               |
| 109 | Where do you live (residence) | 1. Rural 2. Urban                                                                                                                                                                             |               |

|     |                                                    |                                                             |  |
|-----|----------------------------------------------------|-------------------------------------------------------------|--|
|     | area?                                              |                                                             |  |
| 110 | How far away from the health facility do you live? | Number of kilometers_____                                   |  |
| 111 | House ownership                                    | 1. Rented      2. Private<br>3. Not have    4. Kebele house |  |

**PART II : SOCIO ECONOMICS (MEASURE OF ECONOMIC STATUS)**

(Now, I want to ask you about your household monthly income and monthly expenditure)

| <b>HOUSEHOLD INCOME</b> |                                                                                              |                                                                                                                                                                        |                        |
|-------------------------|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 201                     | What are sources of your income?                                                             | 1. My employment<br>2. My spouse's employment<br>3. My son employment<br>4. My Daughter's employment<br>5. My Business<br>6. My Farming<br>7. Others (specify)_____    |                        |
| 202                     | How much income do you get from the employment of you and/or your family per month?          | Income per Month(Birr)<br>1.From your employment_____<br>2.From your spouse's employment ____<br>3.From your son employment____<br>4.From your Daughter's employment__ |                        |
|                         |                                                                                              | <b>5.Incom per Month(Birr)</b> _____                                                                                                                                   | the sum of<br>1-4      |
| 203                     | How much income do you get from your business?                                               | Income per Month(Birr)_____                                                                                                                                            |                        |
| 204                     | How much income do you get from your farming?<br>(convert yearly income to monthly later on) | 1.Year Income(Birr)_____<br><br>2.When Converted to Month_____                                                                                                         |                        |
| 205                     | Total monthly income (Birr)<br>(Sum up all the total monthly income and verify with the      | Total monthly income (Birr)_____                                                                                                                                       | The sum of<br>Q202-204 |

|     |                                                                                                                          |                        |                         |
|-----|--------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------|
|     | respondents by asking ‘your household total monthly income is approximately Birr sum of above income), is that correct?’ |                        |                         |
|     | <b>HOUSEHOLD EXPENDITURE (except HIV treatment)</b>                                                                      |                        |                         |
| 206 | Total Money Expenditure for food                                                                                         | Per month in Birr_____ |                         |
| 207 | Total Imputed Expenditure for food(consumption from own farm)                                                            | Per month in Birr_____ |                         |
| 208 | Expenditure on food (sum of Money & imputed)                                                                             | Per month in Birr_____ |                         |
| 209 | <b>Non-food expenditure</b>                                                                                              | Per month in Birr_____ |                         |
|     | 1 .Education                                                                                                             |                        |                         |
|     | 2. Water                                                                                                                 | Per month in Birr_____ |                         |
|     | 3. Lighting                                                                                                              | Per month in Birr_____ |                         |
|     | 4. Telephone/mobiles                                                                                                     | Per month in Birr_____ |                         |
|     | 5. House rent                                                                                                            | Per month in Birr_____ |                         |
|     | 6. cloth                                                                                                                 | Per month in Birr_____ |                         |
|     | 7. Transport                                                                                                             | Per month in Birr_____ |                         |
|     | 8. Funeral donations/gifts                                                                                               | Per month in Birr_____ |                         |
|     | 9. Health (other than direct cost of treatment of HIV etc)                                                               | Per month in Birr_____ |                         |
|     | <b>10.Subtotal</b>                                                                                                       | Per month in Birr_____ | <b>Subtotal of Q209</b> |
| 210 | Total Households Expenditures                                                                                            | Per month in Birr_____ | The sum of Q.206 -209   |

### PART III: CLINICAL STATUS

|     |                                                                                 |                                                                                                                                                                                                         |                                                            |
|-----|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| 301 | When did you diagnosed (know) as HIV positive?                                  | <ol style="list-style-type: none"> <li>1. Before two months</li> <li>2. Before six Months</li> <li>3. Before one Year</li> <li>4. Before Five years</li> <li>5. Before Ten years or Above</li> </ol>    |                                                            |
| 302 | Are you under Antiretroviral Therapy (ART)?                                     | <ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>                                                                                                                                 |                                                            |
| 303 | After you know yourself as HIV positive how much time did you take to start ART | <ol style="list-style-type: none"> <li>1. Immediately</li> <li>2. After one Month</li> <li>3. After two month</li> <li>4. After six month</li> <li>5. After one year</li> <li>6. Other _____</li> </ol> |                                                            |
| 304 | What is your current CD4 level?                                                 | <ol style="list-style-type: none"> <li>1. More than 500/mm<sup>3</sup></li> <li>2. 200 to 500/mm<sup>3</sup></li> <li>3. Less than 200mm<sup>3</sup></li> <li>4. Don't know</li> </ol>                  | If not known<br>Check from<br>ART multi chart              |
| 305 | What is your current viral load?                                                | <ol style="list-style-type: none"> <li>1. Less than 50 copy</li> <li>2. 50-1000 copy</li> <li>3. Greater than 1000 copy</li> <li>4. Don't know</li> </ol>                                               | If not known<br>Check from<br>ART multi<br>chart.          |
| 306 | How do you feel about your current health status? Is it normal, medium or poor? | <ol style="list-style-type: none"> <li>1. Good</li> <li>2. Medium</li> <li>3. Poor</li> </ol>                                                                                                           | Range 1-10<br>8-10 good<br>4-7 medium<br>1-3 Poor<br>(VAS) |
| 307 | Do you have Opportunistic infection with HIV/AIDs?                              | <ol style="list-style-type: none"> <li>1. yes</li> <li>2. No</li> </ol>                                                                                                                                 |                                                            |

|     |                                                                          |                                                                                        |  |
|-----|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------|--|
| 308 | If the answer of Q.307 yes<br>List what kind of opportunistic infection? | 1. Tuberculosis<br>2. Pneumonia<br>3. Diarrhea<br>4. Fungal infection<br>5. Other_____ |  |
|-----|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------|--|

**PART IV: DIRECT COSTS FOR HIV/AIDS TREATMENT**

(Now, I want to know about the cost of treatment for you. It includes travel cost, food cost, medicine, diagnostic costs and cost for accompanying persons as well. I also ask how much time you and your accompanying person spent for the treatment).

| 401                            | What was your financial source for HIV/AIDs care and treatment?                    | 1. Self                    2. Family<br>3. Government        4. Insurance<br>5. Others_____                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              |                     |                    |  |                      |  |                         |  |                        |  |                                |  |                              |  |               |
|--------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------|--------------------|--|----------------------|--|-------------------------|--|------------------------|--|--------------------------------|--|------------------------------|--|---------------|
| 402                            | How many times in last month did you visit health facility for treatment?          | Frequency of visit _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |                     |                    |  |                      |  |                         |  |                        |  |                                |  |                              |  |               |
| 403                            | How often did you travel to the health facility for follow up in normal situation? | 1. Monthly    2. two month<br>3. six month    5. Other_____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              |                     |                    |  |                      |  |                         |  |                        |  |                                |  |                              |  |               |
| 404                            | Cost of Treatment per visit in one last month                                      | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><i>Items</i></th> <th style="text-align: left;"><i>Cost in Birr</i></th> </tr> </thead> <tbody> <tr> <td>1. Card cost. ....</td> <td></td> </tr> <tr> <td>2. Doctor’s fee.....</td> <td></td> </tr> <tr> <td>3. Diagnostic cost.....</td> <td></td> </tr> <tr> <td>4. Medicine cost .....</td> <td></td> </tr> <tr> <td>5. Bed ( Hospitalization).....</td> <td></td> </tr> <tr> <td>6. Other medical costs .....</td> <td></td> </tr> </tbody> </table> | <i>Items</i> | <i>Cost in Birr</i> | 1. Card cost. .... |  | 2. Doctor’s fee..... |  | 3. Diagnostic cost..... |  | 4. Medicine cost ..... |  | 5. Bed ( Hospitalization)..... |  | 6. Other medical costs ..... |  | Costs in Birr |
| <i>Items</i>                   | <i>Cost in Birr</i>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |                     |                    |  |                      |  |                         |  |                        |  |                                |  |                              |  |               |
| 1. Card cost. ....             |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |                     |                    |  |                      |  |                         |  |                        |  |                                |  |                              |  |               |
| 2. Doctor’s fee.....           |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |                     |                    |  |                      |  |                         |  |                        |  |                                |  |                              |  |               |
| 3. Diagnostic cost.....        |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |                     |                    |  |                      |  |                         |  |                        |  |                                |  |                              |  |               |
| 4. Medicine cost .....         |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |                     |                    |  |                      |  |                         |  |                        |  |                                |  |                              |  |               |
| 5. Bed ( Hospitalization)..... |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |                     |                    |  |                      |  |                         |  |                        |  |                                |  |                              |  |               |
| 6. Other medical costs .....   |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |                     |                    |  |                      |  |                         |  |                        |  |                                |  |                              |  |               |

|                               |                                                                                                         |                                                                                                                                                                                                          |  |
|-------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                               |                                                                                                         | <b>7.Total medical costs in all visit in last month (Birr)_____</b>                                                                                                                                      |  |
| 405                           | If You incur cost for Q. 403 in what type of the organization?                                          | 1.Government(public) organization<br>2.Private<br>3.Private not for profit                                                                                                                               |  |
| 406                           | Cost of accessing treatment in the last one month to health facility<br><b>for patient only</b>         | 1. Travel Cost(Birr)_____                                                                                                                                                                                |  |
|                               |                                                                                                         | 2. Food Cost(Birr)_____                                                                                                                                                                                  |  |
|                               |                                                                                                         | 3. Loading Cost(Birr)_____                                                                                                                                                                               |  |
|                               |                                                                                                         | 4. Accommodation Cost(Birr)_____                                                                                                                                                                         |  |
|                               |                                                                                                         | 5. Other cost (Specify)                                                                                                                                                                                  |  |
|                               |                                                                                                         | 6.Total accessing costs for patient 1-5(Birr)_____                                                                                                                                                       |  |
| 407                           | Cost of accessing treatment in the last one month to health facility<br><b>for Accompanying Person?</b> | 1. Travel Cost(Birr)_____<br>2. Food Cost(Birr)_____<br>3. Loading Cost(Birr)_____<br>4. Accommodation Cost(Birr)_____<br>5. Other cost (Specify)<br>6. Total accessing costs for patient 1-5(Birr)_____ |  |
| 408                           | Do you buy any supplements for your diet (additional) because of the HIV/AIDS disease/ drugs?           | 1. Yes      2. No                                                                                                                                                                                        |  |
| 409                           | If Q407 yes How much money did you spend on these items in the last 30 days approximately?              | 1. _____(ETB)                                                                                                                                                                                            |  |
| 410                           | What means of transport did you use for you and your accompanying person?                               | 1. On foot<br>2. An animal on back (Mule, Horse etc.)<br>3. By car<br>4. Other _____                                                                                                                     |  |
| <b>PART V: INDIRECT COSTS</b> |                                                                                                         |                                                                                                                                                                                                          |  |

|     |                                                                                                           |                                                                                                                                                                  |                  |
|-----|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 501 | How much time did you lose to access the treatment centre for your last visit(in last Month)              | 1. On the way (in hour)_____<br>2. In the treatment Center(in Hour)_____<br>3. Total hours_____                                                                  |                  |
| 502 | Did you normally lose earnings as a result of time lost to access the treatment?                          | 1. Yes<br>2. No                                                                                                                                                  | If no skip Q.503 |
| 503 | If you lost earning (income) how much you lost?                                                           | Wage lost in Birr_____                                                                                                                                           |                  |
| 504 | Did you take an accompanying person with you in last month Visit?                                         | 1. Yes(go to 505)<br>2. No(go to 509)                                                                                                                            |                  |
| 505 | How many accompanying person with you in last visit                                                       | In number_____                                                                                                                                                   |                  |
| 506 | How much time did your accompanying person lose to access the treatment centre for your last month visit? | 1. On the way (in hour)_____<br>2. In the treatment Center(in Hour)_____<br>3. Total time lost(in Hour)_____                                                     |                  |
| 507 | How much money your accompanying person lose earnings as a result during last month visit?                | Total Birr_____                                                                                                                                                  |                  |
| 508 | What is your a companion's main occupation?                                                               | 1. Government employee<br>2. Private employee<br>3. Self-employee<br>4. NGOs employee<br>5. Farmer<br>6. Retired<br>7. Daily Laborer<br>8. Student 9.Un employed |                  |



|     |                                                                                                                                                    |                     |                                |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------------------|
| 509 | Was there any times when you been completely unable to carry out your normal daily activities because of the disease in the last one month period? | 1. Yes<br>2. No)    | (go to Q.510)<br>(go to Q.511) |
| 510 | For how long were you completely unable to attend your normal daily activities in the last one month (30 days) period?                             | Number of days_____ |                                |
| 511 | How money income did lost because of unable to work?                                                                                               |                     |                                |
| 512 | For how long have you worked in a state of poor health in the last one month (30 days) period?                                                     | Number of days_____ |                                |

## PART VI: COPING STRATEGIES

(Now, I want to ask you about the coping strategies you or your family used for the treatment of the disease and to cover work loss due to illness).

|     |                                                                                         |                                                                                                                                                        |                                                                            |
|-----|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| 601 | How did you or your family manage costs for treatment and wage lost due to illness?     | 1. By using cash (income +saving)<br>2. Sale of assets<br>3. Loans<br>4. Borrowing<br>5. Gifts<br>6. Insurance<br>7. Others (specify, with value)_____ | Go to 602<br>Go to 603<br>Go to 604<br>Go to 606<br>Go to 608<br>Go to 610 |
| 602 | If using income or savings, please tell me how much money you spent for your treatment? | 1. In Birr_____                                                                                                                                        |                                                                            |
| 603 | If sale of assets, please                                                               | <b>Items</b> <b>Value in Birr</b>                                                                                                                      |                                                                            |

|     |                                                                       |                                                                                                                                                                                                                            |  |
|-----|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|     | specify<br>what has/have been sold and<br>how much money was received | 1. House .....<br>2. Land.....<br>3. Jeweler.....<br>4. Live stock & poultry.....<br>5. House hold Equipment ...<br>6. Other (specify).....<br><b>Total Value in Birr.....</b>                                             |  |
| 604 | If taking loan, what is the<br>source of the loan                     | 1. Relatives,<br>2. Friends/ neighbor,<br>3. Local saving group,<br>4. Government banks or<br>cooperatives,<br>5. Private banks ,<br>6. Other source                                                                       |  |
| 605 | If taking loan, how much money<br>was received?                       | In Birr_____                                                                                                                                                                                                               |  |
| 606 | If borrowed, please tell me the<br>source                             | 1. Relatives,<br>2. Friends/ neighbor,<br>3. From employer( lab our Wage)<br>4. Local saving group(inkub, idir)<br>5. Government banks or<br>cooperatives,<br>6. Private banks<br>7. Micro finance<br>8. Other source_____ |  |
| 607 | If taking borrowed, how much<br>money was received?                   | In birr_____                                                                                                                                                                                                               |  |
| 608 | If you received gifts, tell me the<br>source                          | 1. Relatives<br>2. Friends/neighbor<br>3. Other (specify) .....                                                                                                                                                            |  |
| 609 | If you received gifts, how much                                       | In Birr_____                                                                                                                                                                                                               |  |

|     |                                                     |              |  |
|-----|-----------------------------------------------------|--------------|--|
|     | money was received?                                 |              |  |
| 610 | If you used insurance, how much money was received? | In Birr_____ |  |

THANK YOU!!!

Time interview ended\_\_\_\_\_

## Annex 2 Afan Oromo Version Questionnaire

**Yuunivarsiitii Jimmaatti Fakalitii Fayyaa Hawaasatti Mummee barnoota BulchinsaTajaajila Fayyaa , Ikoonomiksii Fayyaa fi Poolisii**

**Gaafannoo nama dhuunfaa namoota Hordoffii tajaajila Yaala Qoricha Farraa HIV/AIDS (ART) irraa jiraniif kan qopha'e.**

Nagaa!Maqaankiyya.....jedhama.Barataa**Yuunivarsiitii**

**Jimmaa,muummee Barnoota Bulchinsa Tajaajila Fayyaa, Ikoonomiksii Fayyaa fi Poolisii kan ta'an Obbo** Asfaw Tarrafaa ulagaa barnoota isaanii digirii lammaaffaa guutuuf mata-dureen qorannoo baasii dhukkubsatoota HIV/AIDS hordoffii farraa HIV/AIDS irraa jiraniif fi maatii isaanii Godina Addaa Naannowaa jedhu irratti hojjachaa jiraniif ragaa funaanaa jira.

Qorannoon kun 'Namusa qorannoo Yuunivarsiitii Jimmaa irraa argatee jira. Kaayyoon qorannoo kanaa baasii yaala HIV/AIDSiin walqabatan adda baasuu dha.Isiniis qorannoo kanaaf carraadhaan filatamtanii jirtu. Iccitiin keessan immoo gutumaa guututti ni eegama, akkasumas qaama biraatiif dabarfamee hin kennamu. Maqaan keessan kan hin barreeffamnee fi koodiitti kan fayyadamnu tahuusaa hubattanii Odeeffannoo qabeenyaa isini nuuf kennitan qaama gibira sassaabuuf(qamoolee galiitiif) dabarfamee kan hin kennamne waan ta'eef ragaa dhugaa ta'e akka nuuf kennitan ni gaafanna.

Gaaffiin kun daqiiqaa 25-35 fudhata.Qorannoo kanaaf fedhiin keessan kan eegamee yoo ta'u yoo fedhii dhabdanis addaan kutuu ni dandeessu. Hirmaachuuf yoo fedhii qabaattan kan itti fufnu ta'ee gaaffii kanaaf kaffaltiin isiniif raawwatamu kan hinjirre ta'usaa kabajaan ibsina.Hirmaannaa ho'aa gochuun keessan qorannoo kanaaf murteessaa waan ta'eef odeeffannoo hunda nuuf akka kennitan isin gaafanna.

Odeeffannoo qorataa:

Maqaa Qorataa: Asfaaw Tarrafaa

Lak. Moobaayilaa - 0913470265

E-mail: [asfawterefe.75@gmail.com](mailto:asfawterefe.75@gmail.com)

1.Gaafatamaan tole jedhee? 1.Eeyyee 2. Lakki

Yoo eeyyee jedhe/jette gaaffii itti fufi.

2. Yoo lakki jedhe/jette irra darbi, sababa dideef/diddeef barreessi:

5. Yeroo hinqabu

6. Fedhii hinqabu

7. Sababa baay'ee dhukkubsatuuf

8. Kan biroo \_\_\_\_\_

Gaafataa: Maqaa \_\_\_\_\_ Mallattoo \_\_\_\_\_

Guyyaa gaafatame \_\_\_\_\_ Sa'a eegale \_\_\_\_\_

**Gaafannoo Faana Dhawinsaa**

**Maqaadhaabbata fayyaa \_\_\_\_\_**

**Koodii dhukkubsataa \_\_\_\_\_**

**Gosa tajaajilaa** 1. Ciibsanii yaaluu 2. Yaala deddeebii

**Kutaa I: Odeeffannoo dhuunfaa**

| T/L | Gaaffii                      | Koodii                                                                                                                                                                                                                                         | Ibsa |
|-----|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 101 | Saala                        | 1. Dhiira 2. Dhalaa                                                                                                                                                                                                                            |      |
| 102 | Umurii                       | Waggaadhaan_____                                                                                                                                                                                                                               |      |
| 103 | Haala gaa'ila                | 1. Hinfuune/hinheerumne<br>2. Fuudhe/heerumte<br>3. Adda adda jiraatu<br>4. Wal hiikan<br>5. Irraa du'ee/duute<br>6. Kan biro yoo jiraate ibsi_____                                                                                            |      |
| 104 | Sadarkaa barnootaa           | 5. Barumsi idilee kan hinqabne<br>6. Sadarkaa tokkoffaa<br>7. Sadarkaa 2ffaa fi qophaayinaa<br>8. Koollejii fi isaa ol                                                                                                                         |      |
| 105 | Hojii irratti bobba'an       | 1. Hojjataa mootummaa<br>2. Qacaramaa dhuunfaa<br>3. Hojii dhuunfaa<br>4. Qacaramaa mit-mootummaa<br>5. Soorama ba'ee<br>6. Qonnaan bulaa<br>7. daldalaa<br>8. hojjataa guyyaa<br>9. barataa/ttuu<br>10. hoji-dhabeeyyii<br>11. Kan biroo_____ |      |
| 106 | Gahee maatii keessatti qaban | 1.Abbaa 2. Haadha<br>3.Daa'ima 4. kan biroo _____                                                                                                                                                                                              |      |
| 107 | Hogganaa maatii              | 2. Dhiira 2.Dhalaa                                                                                                                                                                                                                             |      |
| 108 | Baayyina miseensa maatii     | 3. waliigala_____                                                                                                                                                                                                                              |      |
| 109 | Eessa jiraatta?              | 2. Baadiyyaa 2. Magaalaa                                                                                                                                                                                                                       |      |

|     |                                                                 |                                                                      |  |
|-----|-----------------------------------------------------------------|----------------------------------------------------------------------|--|
| 110 | Iddoon jireenya keetii dhaabbata fayyaa kanarraa hagam fagaata? | KM_____                                                              |  |
| 111 | Manni keessa jiraattu kan eenyuti?                              | 1.Kiraadhaan<br>2.Kan dhuunfaa kiyyaa<br>3. Hinqabu<br>4.Mana gandaa |  |

**Kutaa II : Odeeffannoo haala diinagdee/galii fi baasii**

| <b>Galii maatii</b>                                      |                                                                                    |                                                                                                                                                                                                                                                                                                                                      |                                 |
|----------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| 201                                                      | Maddii galii keessanii maali?                                                      | 1. Galii qacarriikoo irraa argamu<br>2. Galii qacarrii haadha warraa/abbaa warraa kiyyarraa argamu<br>3. Galii qacarrii mucaa dhiiraa kiyyarraa argamu<br>4. Galii qacarrii mucaa durbaa kiyyarraa argamu<br>5. Galii hojii dhuunfaa kiyyarraa argamu<br>6. Galii qonnaa kiyyarraa argamu<br>7. Kan biro yoo jiraate adda baasi_____ |                                 |
| 202                                                      | Ji'atti galiin qacarrii kee fi maatiin kee argatu meeqa?                           | <b>Galii ji'aa(qarshiidhaan)</b><br>1.Qacarrii dhuunfaa keessanii irraa_____<br>2.Qacarrii abbaa/haadha warraa irraa _____<br>3.Qacarrii mucaa dhiiraa keessanii irraa_____<br>4. Qacarrii mucaa durbaa keessanii irraa __                                                                                                           |                                 |
|                                                          |                                                                                    | 5.Ida'ama(qarshiidhaan)_____                                                                                                                                                                                                                                                                                                         | Ida'ama lak<br>1-4              |
| 203                                                      | Ji'atti galiin hojii dhuunfaa keessan irra argattan meeqa?                         | Galii ji'aa (qarshiidhaan)_____                                                                                                                                                                                                                                                                                                      |                                 |
| 204                                                      | Galiin isin qonnarraa kee irraa argattan meeqa?<br>(galii waggaa ji'atti jijjiiri) | 1.Waggaatti (qarshiidhaan)_____<br>2.Ji'atti yoo jijjiiramu_____                                                                                                                                                                                                                                                                     |                                 |
| 205                                                      | Galii dimshaashaa ji'aan argamu (qarshiidhaan)                                     | Galii dimshaashaa (qarshiidhaan)_____                                                                                                                                                                                                                                                                                                | Ida'ama<br>gaffiilee<br>202-204 |
| <b>Baasii manaaf ba'ee (baasii yaalii HIV tiin alaa)</b> |                                                                                    |                                                                                                                                                                                                                                                                                                                                      |                                 |

|     |                                                   |                            |                              |
|-----|---------------------------------------------------|----------------------------|------------------------------|
| 206 | Baasii walii gala nyataaf bittaaadhaadhaan ba'ee  | Ji'aan (qarshiidhaan)_____ |                              |
| 207 | Baasii nyaataa galii qonnaa irraa argame          | Ji'aan (qarshiidhaan)_____ |                              |
| 208 | Ida'ama baasii nyaataa bittaa fi qonnarraa argame | Ji'aan (qarshiidhaan)_____ | <b>Gaaffii 206-207</b>       |
| 209 | <b>Baasii nyaataan alaa maatif ba'e</b>           |                            |                              |
|     | 1 .Barnootaaf                                     | Ji'aan (qarshiidhaan)_____ |                              |
|     | 2. Bishaan                                        | Ji'aan (qarshiidhaan)_____ |                              |
|     | 3. Ibsaa                                          | Ji'aan (qarshiidhaan)_____ |                              |
|     | 4. Bilbila                                        | Ji'aan (qarshiidhaan)_____ |                              |
|     | 5. kiraa manaa                                    | Ji'aan (qarshiidhaan)_____ |                              |
|     | 6. bittaa huccuu                                  | Ji'aan (qarshiidhaan)_____ |                              |
|     | 7. Geejjiba                                       | Ji'aan (qarshiidhaan)_____ |                              |
|     | 8. Kennaa/hixannaa nama namni jalaa duyeef        | Ji'aan (qarshiidhaan)_____ |                              |
|     | 9. Yaala fayyaa (yaalii HIV tiin ala)             | Ji'aan (qarshiidhaan)_____ |                              |
|     | <b>10.Ida'ama</b>                                 | Ji'aan (qarshiidhaan)_____ | <b>Gaaffii 209 qofa</b>      |
| 210 | Baasii dimshaashaa maatiif baye                   | Ji'aan (qarshiidhaan)_____ | Ida'ama gaaffiilee 206 - 209 |

**Kutaa III: Haala Fayyaa**

|     |                                                                                                     |                                                                                                                           |  |
|-----|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|--|
| 301 | HIV dhaan qabamuu keessan qoratamtanii kan bartan yoomi?                                            | 1.Ji'a lamaan dura<br>2.Ji'a jahan dura<br>3.Waggaa tokkoon dura<br>4.Waggaa shaniin dura<br>5.Waggaa kudhanii fi isaa ol |  |
| 302 | Qoricha farra HIVs(ART) fudhataa jirtuu ?                                                           | 1. Eeyyee<br>2.Lakki                                                                                                      |  |
| 303 | HIV dhaan qabamuu keessan erga bartanii booda hangam turtanii qoricha farra HIV fudhachuu eegaltan? | 1.Innasuma/Battaluma/<br>2.Ji'a tokkoo booda<br>3.Ji'a lama booda<br>4.Ji'a ja'a booda<br>5.Waggaa tokko booda            |  |

|     |                                                                                           |                                                                                                                          |                                                                     |
|-----|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
|     |                                                                                           | 6.Kan biroo _____                                                                                                        |                                                                     |
| 304 | Yeroo ammaa kana lakkoofsi CD4 kee meeqa?                                                 | 1.500/mm <sup>3</sup> ol<br>2.200nga 500/mm <sup>3</sup><br>3.200mm <sup>3</sup> gadi<br>4.Hin beeku                     | Yoo hin beekne Chart ART irraa ilaalii guuti.                       |
| 305 | Yeroo ammaa kana heddumminni Vaayirasii qaama keessan keessa hagami ?                     | 1. 50 gadi<br>2. 50-1000<br>3. 1000 oli<br>4. Hin beeku                                                                  | Yoo hinbeekne chaartii ART irra ilaali guuti.                       |
| 306 | Haalli fayyummaa kee yeroo ammaa maal sitti fakkataa ? Gaariidga,Giddugaleessa,Badaa dha? | 1 Gaarii<br>2 Giddu-galeessa<br>3 Badaa                                                                                  | Reenjii(VAS)1-10:<br>8-10 Gaarii<br>4-7 Giddu-galeessa<br>1-3 Badaa |
| 307 | Dhukkuboota miiltoo HIV ta'aniin qabamtanii jirtuu?                                       | 1.Eeyyee 2.Lakki                                                                                                         |                                                                     |
| 308 | Yoo deebiin gaaffii 307 eeyyeen ta'e dhukkuba kami?                                       | 1.Dhukkuba sombaa<br>2.Dhukkuba Mich sombaa<br>3.Dhukkuba Garaa kaasaa<br>4.Dhukkuba faalama Fungasii<br>5.Kan biro_____ |                                                                     |

#### Kutaa IV: Baasii kallaatti yaalii dhukkuba HIV/AIDS tiif ba'e

|     |                                                                           |                                                                                  |                          |
|-----|---------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------|
| 401 | Maddii maallaqaa yaala HIV/AIDs keetii maali?                             | 1. Dhuunfaa<br>2. Maatii<br>3. Mootummaa<br>4. Inshuraansii<br>5. Kan biro _____ |                          |
| 402 | Ji'a darbe kana yaala HIV/AIDS tiif yeroo meeqa dhaabbata fayyaa deemtan? | Deddeebii mana yaalaa _____                                                      | Ji'a Adoolessaa1-30/2010 |
| 403 | Yeroo hangamittin Hordoffii HIV/AIDs tiif gara Dhaabbata fayyaa           | 1.Ji'aan<br>2. Ji'a lamaan                                                       |                          |



|     |                                                                                                           |                                                                                                                                                                                                                                                                            |              |
|-----|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
|     | deemta?                                                                                                   | 3.ji'a jaha jahaan<br>4. kan biro _____                                                                                                                                                                                                                                    |              |
| 404 | Al tokkotti ji'a darbe yaalaaf hagam baastan?                                                             | <b>Baasii gosaan (qarshiidhaan )</b><br>1 Kaardiidhaaf. ....<br>3. Baasii hakiimaa.....<br>4. qorannoodhaaf.....<br>5. bittaa qorichaaf .....<br>6. Siree ciisanii yaalamuutiif<br>7. Baasii yaalaa kan biroo .....<br><b>Dimshaasha baasii yaalaa (qarshiidhaan)_____</b> | Qarshiidhaan |
| 405 | Gaaffii 403 irratti gaafatamtaniif baassii yoo baastanii jiraattan dhaabbata fayyaa gosa kamitti baastan? | 1.Dhaabbata fayyaa mootummaa<br>2.Dhaabbata fayyaa dhuunfaa<br>3.Dhaabata dhunfaa bu'aaf hin dhaabbane                                                                                                                                                                     |              |
| 406 | Tajaajila yaalaa HIV bira gahuuf dhukkubsataa qofaaf ji'a darbe baye                                      | 1. Baasii geejjibaa (qarshiidhaan)_____<br>2. Nyaataaf (qarshiidhaan)_____<br>3. Dhukkubsataa korsiiisu fi buusuuf (qarshiidhaan)_____<br>4. Iddoo bultitiif (qarshiidhaan)_____<br>5. Kan biro (adda baasi) (qarshiidhaan)_____<br>6.Ida'ama lak. 1-5(qarshiidhaan)_____  |              |
| 407 | Baasii nama dhukkubsaticha yaalchisuuf gargaaraa turee ji'a darbe ba'e                                    | 1. Baasiigeejjibaa(qarshiidhaan)_____<br>2. Nyaataaf (qarshiidhaan)_____<br>3. Dhukkubsataa korsiiisu fi buusuuf (qarshiidhaan)_____<br>4. Iddoo bultitiif (qarshiidhaan)_____<br>5. Kan biro (adda baasi) (qarshiidhaan)_____<br>6. Ida'ama lak. 1-5 (qarshiidhaan)_____  |              |
| 408 | Sababa HIV/AIDS dhukkubsataniif (qoricha farraa HIV/AIDS fudhattaniif ) nyaata dabalataa ni fudhatuu?     | 1. Eeyyee<br>2. Lakki                                                                                                                                                                                                                                                      |              |

|                                     |                                                                                                                       |                                                                                                                                                                                                   |                         |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| 409                                 | Yoo Gaaffiin 408 eeyyeen ta'ee sababa nyaata dabalataa kanaaf ji'a darbee( guyyaa 30 keessatti) qarshii meeqa baafan? | 1.Qarshii_____                                                                                                                                                                                    |                         |
| 410                                 | yeroo mana yaala dhuftan ati fi namni si gargaru geejjiba kam fayyadamtuu ?                                           | 1. Miilan<br>2. Dugda Horii( Gaangee, Farda)<br>3. Konkolataa<br>4. Kan biro_____                                                                                                                 |                         |
| <b>Kutaa V: Baasii Al-kallattii</b> |                                                                                                                       |                                                                                                                                                                                                   |                         |
| 501                                 | Tajaajila yaalaa bira gahuuf yeroo hagarii qisaassite?                                                                | 1. karaarratti (sa'aatiidhaan)_____<br>2. Yaala irratti ( sa'atiidhaan)_____<br>3. Ida'ama (sa'aatiidhaan)_____                                                                                   |                         |
| 502                                 | Sababa qisaasama yeroo kanaatiin galiin sin dhabdan jiraa?                                                            | 1. Eeyyee<br>2. Lakki                                                                                                                                                                             |                         |
| 503                                 | Yoo gaaffii 502 eeyyee ta'e galii , hagarii dhabdan?s                                                                 | Galii dhabame (qarshiidhaan)_____                                                                                                                                                                 |                         |
| 504                                 | Ji'a darbe yeroo mana yaalaa deemte namini si gargaaru si wajjin dhaqee jiraa?                                        | 1. Eeyyee(gaaffii 505 deemi)<br>2. Lakki(Gaaffii 509 deemi)                                                                                                                                       |                         |
| 505                                 | Ji'a darbe nama meeqatu si gargaaree mana yaalaa si geese?                                                            | Baay'ina lakkoofsaan_____                                                                                                                                                                         |                         |
| 506                                 | Namni mana yaalaa si geese yeroo hagarii qisaasesse?                                                                  | 1. Karaa irratti (sa'atiidhaan)_____<br>2. Manayaalaatti(sa'aatiidhaanHour)_____<br>3. Ida'ama (s'aatiidhaan)_____                                                                                |                         |
| 507                                 | Namoonni si yaalchisuuf mana yaalaa si geessan sababa kanaaf yeroo sanatti galii hagarii dhaban?                      | Ida'ama (qarshiidhaan)_____                                                                                                                                                                       |                         |
| 508                                 | Hojiin nama mana yaalaa si yaalchisuuf si geese maali?                                                                | 1. Hojjataa mootummaa<br>2. Qacaramaa dhuunfaa<br>3. Hojii dhuunfaa<br>4. Qacaramaa mit-mootummaa<br>5. Qonnaan bulaa<br>6. Sooramabaye<br>7. Hojjataa guyyaa<br>8. Barataa<br>9. Hoji-dhaabeeyyi |                         |
| 509                                 | Ji'a darbe kana sababa dhukkuba                                                                                       | 1. Eeyyee                                                                                                                                                                                         | Eeyy, gaaffi 510 dhaqi) |

|     |                                                                                              |                      |                         |
|-----|----------------------------------------------------------------------------------------------|----------------------|-------------------------|
|     | kanaatiin hojiin hojjachuu daadhabde jirta?                                                  | 2. Lakki             | Lakki gaaffii 511 dhaqi |
| 510 | Ji'a darbe keessa guyyoota 30 jiran keessaa guyyaaa meeqa hojii dadhabdee dhaabde?           | Baayyina guyyaa_____ |                         |
| 511 | Sababa hojjachuu dhabdeef galii hagarii dhabdee                                              | Baayina qarshii      |                         |
| 512 | Ji'a darbe keessa guyyoota 30 jiran keessaa otoo dhukkubsattuu guyyaaa meeqa hojii hojjatte? | Baayyina guyyaa_____ |                         |

#### Kutaa VI: Tarsiimoo Madda Maallaqaa Baasiin Yaalaa Ittiin Argamu

|     |                                                                            |                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                              |
|-----|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 601 | Maddi baasii yaalaa keetii maali??                                         | <ol style="list-style-type: none"> <li>1. Galii dhuunfaa (galii fi qusannoo irraa)</li> <li>2. Qabeenyaa gurguruu</li> <li>3. Liqaa dhala qabu</li> <li>4. Liqaa dhala hinqabne</li> <li>5. Kennaa</li> <li>6. Inshuraansii</li> <li>7. Kan biroo(adda baasi)_____</li> </ol>                     | <ol style="list-style-type: none"> <li>1. Gaaffii 602 dhaqi</li> <li>2. Gaaffii 603 dhaqi</li> <li>3. Gaaffii 604 dhaqi</li> <li>4. Gaaffii 606 dhaqi</li> <li>5. Gaaffii 608 dhaqi</li> <li>6. Gaaffii 610 dhaqi</li> </ol> |
| 602 | Baasii yaalaatiif liqaa dhala qabu fudhattanii yoo jiraattan, hagam ture ? | Qarshiidhaan_____                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                              |
| 603 | Baasii yaalaatiif qabeenyaa gurgurtan taanaan isa kami?                    | <p><b>Qarshiidhaan</b></p> <ol style="list-style-type: none"> <li>1. Mana .....</li> <li>2. Lafa.....</li> <li>3. Faaya.....</li> <li>4. Luukkuu fi horii.....</li> <li>5. Meeshaa mana keessaa.....</li> <li>6. Kan biroo (adda baasi).....</li> </ol> <p><b>Ida'ama (qarshiidhaan).....</b></p> |                                                                                                                                                                                                                              |
| 604 | Baasii yaalaatiif liqii dhala qabu fudhattanii taanaan eessaa fudhattan?   | <ol style="list-style-type: none"> <li>1. Fira</li> <li>2. Hiriyaa ykn olla</li> <li>3. Wadlaalee qusannaa naannoo(inqubii, Iddirii)</li> <li>4. Baankii mootuummaa ykn waldaa</li> <li>5. Baankii dhuunfaa</li> <li>6. Madda biroo</li> </ol>                                                    |                                                                                                                                                                                                                              |
| 605 | Baasii yaalaatiif dhala liqii qabu                                         | Qarshiidhaan _____                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                              |

|     |                                                                              |                                                                                                                                                                                                                                                                                                               |  |
|-----|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|     | fudhattanii taanaan qarshii meeqa?                                           |                                                                                                                                                                                                                                                                                                               |  |
| 606 | Baasii yaalaatiif liqii dhala hinqabne fudhattanii taanaan eessaa fudhattan? | <ol style="list-style-type: none"> <li>1. Fira</li> <li>2. Hiriya/olla</li> <li>3. Liqii mindaa</li> <li>4. Waldaalee qusannoo naannoo (iqqubii, iddirii)</li> <li>5. Baankii mootummaa ykn waldaa</li> <li>6. Baankii dhuunfaa</li> <li>7. Dhaabbata qusannoo fi liqii</li> <li>8. Kan biroo_____</li> </ol> |  |
| 607 | Baasii yaalaatiif liqii dhala hinqabne fudhattanii taanaan hagam fudhattan?  | Qarshiidhaan_____                                                                                                                                                                                                                                                                                             |  |
| 608 | Baasii yaalaatiif kennaa fudhattan taanaan eessaa fudhattan?                 | <ol style="list-style-type: none"> <li>1. Fira</li> <li>2. Hiriya/olla</li> <li>3. Kan biroo (adda baasi) .....</li> </ol>                                                                                                                                                                                    |  |
| 609 | Baasii yaalaatiif kennaa fudhattan taanaan hagam fudhattan?                  | Qarshii_____                                                                                                                                                                                                                                                                                                  |  |
| 610 | Baasii yaalaatiif inshuraansii fayyadamtan qarshii meeqa fudhattan?          | Qarshiidhaan_____                                                                                                                                                                                                                                                                                             |  |

GALATOOMAA!!!

Sa'a gafannoon itti xumurame\_\_\_\_\_

### **Annex 3 : Common Opportunistic infection of PLWA on ART follow up in Oromia Special Zone Surrounding Finfine,2018**

1. Pneumocystis
2. Toxoplasmosis
3. Candiasis
4. Tuberculosis
5. Cryptococal infection
6. Cryptococal infection
7. Korposi sarcoma
8. Herpes Simplex
9. Herpes Zoosters

**Annex4: Purchasing power parity of some selected country for discussion purpose**

| S.n | Country where study conducted | Study year | Inflation rate year of study | Inflation rate of 2018 | Purchasing Power parity of 2018 |
|-----|-------------------------------|------------|------------------------------|------------------------|---------------------------------|
| 1   | Nepal                         | 2017       | 4.48 %                       | 6%                     | 1.34                            |
| 2   | Nigeria                       | 2016       | 11.23 %                      | 11.23 %                | 1                               |
| 3   | Vietnam                       | 2014       | 4.09 %                       | 6.39 %                 | 1.56                            |
| 4   | South Africa                  | 2017       | 4.9 %                        | 5.27 %                 | 1.08                            |

(45)

## DECLARATION

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in this or any other university and that all sources of materials used for the thesis have been fully acknowledged.

Name: Asfaw Terefe

Signature: \_\_\_\_\_

Name of the institution: Jimma University

Date of submission: \_\_\_\_\_

This thesis has been submitted for examination with my approval as University advisor

Name and Signature of internal examiner for approval

Dr.Negalign Birhanu(PhD)

Signature\_\_\_\_\_

Name and Signature of the first advisor

Dr. Teferi Daba(PhD)

Signature\_\_\_\_\_

Name and Signature of the second advisor

Mr Muluneh Getachew

Signature\_\_\_\_\_