Addis Ababa University

College of Health Sciences

School of Public Health/Health Economices

Cost of Treating Maternal Complications Among Mothers Attending Mekelle General Hospital in Mekelle city, Tigray, Ethiopia

Teamir Abadi

Octeber, 2019

Addis Ababa, Ethiopia

Cost of Treating Maternal Complications Among Mothers Attending Mekelle General Hospital in Mekelle city, Tigray, Ethiopia

By Teamir Abadi

Thesis Advisor

Dr. Anagaw Deresh

A Thesis Submitted to Addis Ababa University College of Health Sciences School of Public Health in Partial Fulfillment of the Requirements for the Degree of Master of Science in Public Health /Health Economics.

Octeber, 2019

Addis Ababa, Ethiopia

Addis Ababa University

College of Health Sciences

School of Public Health /Health Economics

Cost of Treating Maternal Complications Among Mothers Attending Mekelle General Hospital in Mekelle city, Tigray, Ethiopia.

By Teamir Abadi

Approved By Board of Examiners

Advisors	Signature and date
Dr Anagaw Deresh	_____
External Examiner	
_____	_____
Internal Examiner	
_____	_____
Principal investigator	
Teamir Abadi	_____

Acknowledgment

I would like to express my sincere and deepest gratitude to my thesis advisor Dr. Anagaw Deresh for unreserved support and supervision beginning from the preparation of the proposal to the final development of this thesis.

I would also like to acknowledge the University of Addis Ababa, college of health science and school of public health for giving me a chance to develop this thesis.

I would also like to acknowledge to Tigray Regional Health Bureau for their constructive advice.

I am also very grateful to all professionals who gave me constructive comments and editorial Especially Alemtsehay Tewelde from Mekelle university school of public health.

Last but not the least thanks to all patients, data collectors, and expert who were willing to participate in the study.

Table of Contents

List of Table

LIST OF FIGURE

ACRONYMS

ANC	Antenatal Care
APH	Antepartum hemorrhage
C/S	Cesarean section
EDHS	Ethiopian Demographic Health Survey
Hct	Hematocrit
HEWs	Health extension workers
MNIH	Maternal-Newborn Illness- Health
MSc	Masters of Science
OOP	Out of Pocket Payment
PNC	Postnatal Care
PPH	Post-Partum Hemorrhage
SVD	Spontaneous vaginal delivery
SPSS	Statical package for social science
TRH	Tigray Regional Health Bureau
WHO	World Health Organization
IQR	Inter-Quartile Range
SD	Standard Deviation
VIF	Variance Inflation Factor

ABSTRACT

Introduction: Maternal costs, due to complications are very expensive kind of catastrophic cost expenditure which can put households into poverty. However data is not available in Ethiopian mothers. This study aims to asses the cost of treating maternal complications and factors associated with high out of pocket expenditure for the treatment among mothers in Mekelle, Tigray, Ethiopia.

Objective: The objective of the study was to assess the cost of treating maternal complications and factors affecting out of pocket spending for the treatment among mothers attending Mekelle general hospital.

Methodology: An institution based cross-sectional study design was carried on 267 mothers with complications in Mekelle Hospital. Study participants were selected using purposive sampling techniques. Data were collected using structured questionnaires. Multivartiate linear regression models at 5% level of significance with 95 % CI level was used to analyze the out come on SPSS version 21. Model of fitness was checked with Hosmer-Lemeshow test.

Results: The total median cost of the treatment was US$ 176.78 (IQR=80.18), of this the direct medical costs accounted for the largest proportion of total cost which is US$120.23 (IQR=43.33). The average of days absent from work due to the complication was around 5 days. Mothers with complicated cases also spend 16 hours on transportation and 14 hours for waiting time.

Conclusions and recommendations: The finding from the study indicated that median cost of complication treatment was high that could lead households to catastrophic out-of-pocket expenditures.The overall median cost of complication was found to be significantly influenced by respondents monthly income ,number of laboratory test, number of days absent from their work, transport time and site of diagnosis (investigations in the private sector).To minimize the cost of complication, health insurance needs to be implemented in addition to the establishment of free maternal health service.

Keywords: Maternal Complications, Cost, Treatment, Mekelle General Hospital, 2019

Chapter I: Introduction

1.1 Background

The maternal complication is generally defined as any illness or injury caused by, aggravated by, or associated with pregnancy or childbirth. It includes hemorrhage, eclampsia, unsafe abortion, sepsis, and obstructed labor (1–4). The major causes of maternal death in Ethiopia are hemorrhage, hypertension in pregnancy, obstructed labor, sepsis, and anemia. Providing emergency care is recognized as an essential and effective component of obstetric services. However, policy or guideline, practice for decrease maternal complication or mortality studies indicated/has shown that poor quality of care is one of the major contributing factors to elevated rates of morbidity, mortality and cost of complication. Additionally, socio-demographic and economic factors, reproductive factors, health service factors, clinical and obstetric factors also another factor that affects the cost of maternal complication (3,5).

Worldwide up to 15 percent of expected births develop life-threatening complications during pregnancy, delivery or the postpartum period. Additionally, an estimated 303,000 women died because of pregnancy and childbirth-related complications. Of these, 66 % and 22 % are from Sub-Saharan Africa and southern Asia respectively. Furthermore, 15million women annually develop long-term disabilities attributable to pregnancy-related complications. Recent studies in four developing countries: Tanzania, South Africa, Malawi, and Ethiopia show that 58%–80% of pregnant women developed acute health problems as a result of pregnancy; of which 8%–29% went on to develop chronic health problems. Hypertensive diseases of pregnancy, obstetric hemorrhage, sepsis, anemia, and obstructed labor/dystocia have been identified as the major causes of maternal near-miss (6–12).

Ethiopia, as in many developing countries, has a high rate of maternal mortality. According to the 2011 Ethiopian demographic and health survey, the maternal mortality ratio of the country was 676 per 100,000 live births, and the 2016 EDSH recorded 412 deaths per 100,000 live births (6,13–15). An estimated 2.9 million women give birth every year in Ethiopia, and only 26.2% of them deliver in a health facility. According to the recent 2016 EDSH report, the percentage of

women who received antenatal care, delivery care, and a postnatal check-up from a skilled provider was 62.4%, 27.7% and 16.5%, respectively (6,8,16–18).

1.2 Problem of the statement

Globally, every day, about 800 women die from pregnancy-related complications and almost all these deaths occur in developing countries (19). The global status of maternal health provides one of the most striking examples of disparity between rich and poor countries. Of the approximately half a million maternal deaths that occur each year, 98%–99% occur in the poorest countries of the world (20–22).

Women living in developing countries are 300 times more likely to die as a result of childbirth or pregnancy-related complications than women living in developed countries. about 80% of these deaths are due to severe bleeding (hemorrhage), infections, high blood pressure (preeclampsia and eclampsia) and unsafe abortion (3,8,23,24). There are five major causes of direct obstetric death: hemorrhage (28%), complications of unsafe abortion (19%), pregnancy-induced hypertension (17%), infection (11%), and obstructed labor (11%). direct obstetric deaths account for about 75% of all maternal deaths in developing countries (2,3,6,19,25,26).

Globally, about 15% of pregnant women suffer from maternal complications. Women who survive life-threatening maternal complications are known as near misses. Near misses are more common than maternal deaths (20,27,28).

Economic consequences of maternal complications may be felt through a number of ways. First, poor health is likely to be associated with increased out-of-pocket (Oop) expenditure on medical care, thereby depleting household resources that might otherwise have been spent on consumption of goods. Second, poor health may lead to a loss of labor and, as a result, reduce household income. Any expenditure due to maternal complications has an impact on the total expenditure usually made by household members since resources are typically pooled from within a household. thus, expenditure due to health shocks specific to one family member can affect the welfare of other family members (29,30)

The federal ministry of health of Ethiopia is striving to reduce the rate of maternal mortality of the country. actions taken so far include organizing and mobilizing the health development army

at all levels to promote behavioral change, the distribution of ambulances to all districts of Ethiopia, the provision of free maternity services at different health care levels, the training of human resources and equitable placement of health professionals in health facilities and the provision of adequate drugs, medical supplies, and equipment (3,6,29). Despite all of these efforts, the maternal mortality rate and cost to treat a maternal complication of the country remains high. Therefore, there is a need to assess the magnitude and possible factors that contribute to maternal complication cost.

The government of Ethiopia is striving to reduce MMR through mobilizing the resources from its financial basket and donors funds. Given the limited health care resources in Ethiopia, coupled with the wide range of maternal and child health (MCH) services provided free of charge for all women, efficient use of these resources is essential.

There is need to maximize resources, but few cost studies have been conducted in the country, and as a result there is little information on the costs of treating maternal complication.

Reliable information of estimate of spending on treating maternal complication is a critical pre-condition for sound budgeting and decision making in the health care system.

This study aims to fill this crucial gap by examining the costs associated with running the treatment of maternal complications through estimating the total cost and factors assocated the costs in Mekelle General Hospital, Tigray, Ethiopia.

This study can better enable primary health care managers and policy makers to budget and allocate the appropriate resources that will ensure higher quality of health care services towards reducing maternal complication and mortality.

1.3 Significance of the study

The study can contribute some findings that may help policy makers to formulate effective policy for a maternal health care system (cost of maternal complications) that brings better maternal health care services utilization. In addition, the study might have a significant role in giving direction for those who want to undertake further research on the subject matter. In

general, the study might have significant importance on the provision of information based on stated objectives.

1.4 Scope of the study

The study will focus on determining the cost of maternal complication in times of developing complication by taking a sample of mothers with a complication from Mekelle general hospital, Mekelle city. Therefore, the study will limit to Mekelle city mothers and household respondents.

Chapter II:-Literature review

2.1 General overview of Maternal Complications

Approximately 800 women die every day due to complications during pregnancy or childbirth (31). Complications of pregnancy and childbirth are the leading causes of death and disability among women of reproductive age in developing countries. One in women in these countries suffers from acute or chronic conditions related to pregnancy. A woman in a developed country has a one in- 1,800 chance of dying from pregnancy-related causes; the ratio for the developing world is one in 48. An overwhelming 99% of these maternal deaths occur in low–resource settings, with Sub–Saharan Africa and Southern Asia accounting for 86% of overall global maternal mortality cases in 2013 (32). moreover, the probability that a 15–year–an old woman will eventually die from a cause related to maternal health is much higher for women living in low-income countries than for those who live in high-income countries (1:160 vs. 1:3700) (32). The higher number of pregnancies on average and higher risk associated with each birth contribute to the higher adult lifetime risk of maternal death.

2.2 Global burden of maternal complications

Complications of pregnancy and childbirth are the leading causes of death and disability among women of reproductive age in developing countries. One in women in these countries suffers from acute or chronic conditions related to pregnancy. A woman in a developed country has a one in- 1,800 chance of dying from pregnancy-related causes; the ratio for the developing world is one in 48 (33). About 73% of all maternal deaths were due to direct obstetric causes and deaths due to indirect causes accounted for 27%. The main direct causes of maternal death are Postpartum haemorrhage (27.1%), pregnancy induced or related hypertensive disorders (14%), puerperal sepsis (10.7%), unsafe abortion (7·9%) and other direct causes of death including obstructed labour (9·6%) (19).

2.3 Maternal complications in Ethiopia

The Ethiopian Demographic and Health Survey (EDHS) 2016 reported that 62% of the pregnant women used antenatal care, 28% women delivered with skilled attendance at birth, 17% received postnatal care, and 35% women practiced contraception with variations across regions. Moreover, this survey reported MMR of 412 per 100,000 LB in 2016 (34). The top five causes of maternal mortality in 2013 were other direct maternal causes such as complications of abortions (19.6%), maternal hemorrhage (12.2%), hypertensive disorders (10.3%), and maternal sepsis and other maternal infections (35).

A study in Tigray stated that the leading causes of death were obstructed/prolonged labor hemorrhage and hypertensive disorders. Avoidable factors were mainly related to hospital service or medical factors such as lack of blood for transfusion, delay in transfusion, and inappropriate treatment. Lack of transportation and delayed care- seeking also contributed to avoidable maternal deaths. The quality of medical records was very poor (36). The overall MMR for Tigray Region was calculated at 266 deaths per 100 000 live births. Direct obstetric causes accounted for 61% of all pregnancy-related deaths. Hemorrhage was the major cause of pregnancy-related death (34%) (37).

2.4 Socio-demographic factors and type of complication

A cross-sectional study done in northern Ghana showed that the economic burden of pregnancy complications to households (median = us$32.03) was high. This constitutes a large expenditure for households. It implies that the amount spent on complications represented more than half the monthly minimum wage earned by the individual household. Socio-demographic data of respondents, as well as direct and indirect costs involved in the management of the complications at the hospital, were collected from the patient's perspective (20).

A study shows on the topic of "the true cost of maternal death," which includes original research from two major study groups. Harvard's Francois-Xavier Bagnoud (FXB) center for health and human rights conducted a multi-country, mixed methods study of the impact of maternal mortality on newborn health and survival, family functioning, interrupted education and

economic degradation in four high maternal mortality countries, Tanzania, South Africa, Malawi, and Ethiopia is very high (38).

The economic household burden of maternal mortality in rural Kenya was studied by kes et. Al using mixed methods, with focus group discussions to illuminate the economic findings. While transport, health care during the pregnancy, and delivery costs were high, it was the funeral costs that were the most monumental. In their study of surviving families, 87 % had to find financial support, 27 % sold assets, and 15 % borrowed from moneylenders. across 3 wealth groups, low, middle, and high, funerals cost greater than 100 % of annual per capita household expenditures (39).

A study in Nigeria and Burkina Faso stated that there was an implementation gap regarding the full exemption for obstetric services and neonatal care. additional out-of-pocket fees in the full exemption health districts took into account household ability to pay, with poorer women generally paying less (40,41).

A study has a cross-sectional design and quantitative data was collected from the health provider perspective a cost of maternal health services in selected health centers in Gana Stated A step-down allocation approach. The average annual cost of operating a health center was $136,014 us. The mean costs attributable to ANC and delivery services were $23,063 us and $11,543 us respectively. personnel accounted for the largest proportion of cost (45%). overall, ANC (17%) and delivery (8%) were responsible for less than a quarter of the total cost of operating the health centers. by disaggregating the costs, the average recurrent cost was estimated at $127,475 us, representing 93.7% of the total cost (42).

2.5 Productivity lost

The studies by WHO estimate merely the productivity cost for four African countries. Annual total productivity lost is about us$ 95million for Ethiopia and about us$ 85 million for Uganda. Every year in Ethiopia total productivity loss of about us$ 95 million and per capita productivity losses of about us$ 1.5. the corresponding figures for Senegal are about us$ 51 million total and about us$ 5 per capita (39).

An article done in Bangladesh states that maternal morbidity led to a considerable loss of resources up to six weeks postpartum, with the greatest financial burden of the cost of healthcare among the poorest households. However, families coped up with the loss of resources by taking loans (brows) and selling assets, and by the end of six months postpartum, the households had paid back more than 40% of the loans(borrows) (29).

Studies explored longer-term costs as costs of maternal healthcare associated with maternal ill-health and its impact on the economy of the household (39). women with maternal complications (both severe and less severe) had much higher Oop expenditure compared to women with a normal delivery (29).

A journal done in Ethiopia shows that only about 6.6% of women gave birth in health facilities, among facilities that provided delivery care, 68% charged a fee in cash or kind for normal delivery. Health centers should be providing maternity services free of charge (the healthcare financing proclamation), yet 65% still charge for some aspect of care, including drugs and supplies. The average cost for normal and cesarean delivery was us$7.70 and us $51.80, respectively (40).

2.6 Direct non-medical cost

A cross-sectional study in rural Ethiopia on examining out of pocket payment in maternal health service shows that three fifth of the studied families paid out of pocket expenditures exceeding 20% of their monthly household expenditure for maternal health care seeking. Excluding expenditures for food, about 61% of them paid more than 40% of their non-food expenditure on maternal health care. households in the lower wealth quintiles are paying a greater proportion of their income (49%) than those in the highest wealth quintile who paid 19% of their income. in addition to the direct expenditures made at the point of service, the indirect expenditures of reaching to the services are also found to be substantial. these indirect expenditures share 32% of ANC, 31% of obstetric care, and 44% of abortion services. thus even if direct expenditures at point of service in public providers are assumed to be negligible, women are obliged to go to expensive private providers to reduce the indirect costs of care seeking such as waiting time.

regarding coping mechanism to respond to expenditure, households usually borrow from relatives and friends and 4.4% of the households resorted to distress sale of their assets (43).

2.9 Indirect cost/ productivity cost

Maternal costs, especially when complications occur, can be very expensive and are the kind of catastrophic cost which can plunge a household into poverty or force it to rely on risky coping strategies. A recent review by who found that the direct costs of maternal health care range between one and five percent of total annual household expenditures, rising to between five and 34% if the woman suffers a maternal complication. At the national level, the WHO estimates totals of $95 million and $85 million are lost each year by Ethiopia and Uganda respectively due to poor maternal health. Globally, $15 billion is estimated to be lost every year due to reduced productivity related to the death of mothers. Country estimates range from $1.50 per person per year in Ethiopia to almost $5 in Senegal (30,39).

2.10 Direct medical cost

Empirical evidence showed a strong positive relationship between the provision of fee exemptions or health insurance coverage and the use of ANC and skilled attendance at childbirth leading to positive health outcomes. In Malawi, for instance, fee exemption in mission health facilities brought about a 15% increase in the mean proportion of participants who had at least one ANC visit during pregnancy. On the other hand, studies have established that households still incur costs despite fee exemptions. For example, a study in Bangladesh showed that the majority of women incurred direct Oop payments for registration, consultation, laboratory test, drugs, transportation, and other related expenses in the course of seeking maternal health services. Similarly, some households in India were found to have made significant Oop payments for maternal health services, even though these services were meant to be free. Thus, direct Oop payments in whichever form could still be a serious barrier to the use of health service. A study in Gana shows that women who are uneducated, poor and live in rural areas tend to access fewer ANC visits compared to their counterparts who are educated, wealthy and are urban dwellers. This again shows the need to better understand the cost implications for families utilizing ANC (48).

In Bangladesh, the costs of medicines and supplies account for 25%–38% of total direct costs for normal delivery, rising to 47%–55% for complicated deliveries. Studies by Borghi, Bastus, show that the proportionate costs for medicines and supplies in Africa are similar to those in Asia, at 33%–43% for normal deliveries, and 21%–45% for complicated deliveries (44,45).

A study in Uganda estimated the cost of treatment for postoperative infection with procaine penicillin during an ectopic pregnancy at us$31.22 and us$24.50 for ampicillin prophylaxis (including the cost of hospital admission). The same study estimated the cost of antibiotic treatment for postoperative infection after cesarean section, at us$44.79 for treatment with penicillin and us$28.06 for ampicillin prophylaxis. finally, a study in Tunisia estimated the cost of curative antibiotics for postoperative infection following a cesarean section, at us$912.57 compared to us$91.38 for antibiotic prophylaxis (44).

2.11 Mode of delivery

Findings in India show that the average expenditure on maternal health care is high ($155) in the study population. Findings suggest that factors such as income, place of residence, and number of ANCs, type of delivery are significantly associated with both absolute and relative expenditure on maternity care. The likelihood of incidence of catastrophic expenditure on maternity care is significantly higher among cesarean or forceps deliveries than in normal deliveries (46,47).

A cross-sectional descriptive study design in Rural Communities in Northern Nigeria stated that the cost of delivery ranged from free to an average cost of US$3 for normal deliveries as against US$93 for complicated deliveries requiring Caesarean sections. The cost of cesarean sections accounted for 65.7 % or US$1,113.30 of total delivery costs for all the respondents while normal delivery accounted for only 19.3% or US$326.70. Medications and transportation were responsible for US$79.30 and US$75.07 respectively (40).

A study in three African countries: in Kenya, Tanzania and Burkina Faso stated that Out-of-pocket costs were highest in Kenya (a mean of US$18.4 for normal and complicated deliveries), where 98% of women who delivered in a health facility had to pay some fees. In Burkina Faso, 92% of women reported paying some fees (mean of US$7.9). Costs were lowest in Tanzania,

where 91% of women reported paying some fees (mean of US$5.1).In all three countries, women in the poorest wealth quintile did not pay significantly less for maternity costs than the wealthiest women. Costs for complicated delivery were double those for normal delivery in Burkina Faso and Kenya represented more than 16% of mean monthly household income in Burkina Faso and 35% in Kenya. In Tanzania and Burkina Faso, most institutional births were at mid-level government health facilities (health centers or dispensaries). In contrast, in Kenya, 42% of births were at government hospitals, and 28% were at private or mission facilities, contributing to the overall higher costs in this country compared with Burkina Faso and Tanzania (22).

2.12. Conceptual framework

Conceptual Frame Work Shows the cost of Maternal Complications (19, 30, 51, 52, 54–56).

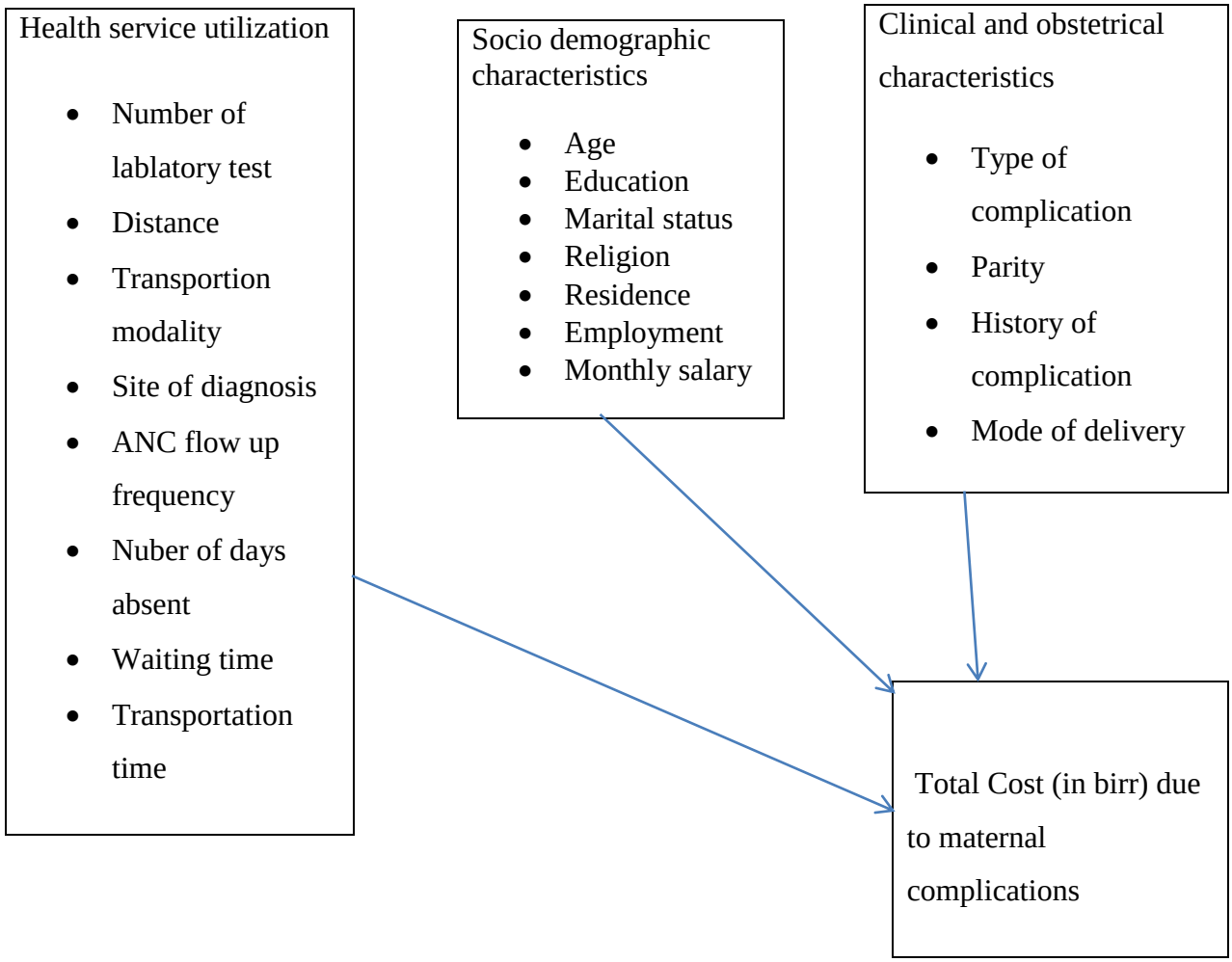

Figure 1: Conceptual framework among mothers attending Mekelle general hospital.

Chapter III: Objective

3.1 General objective

To assess the cost of treating maternal complications among mothers attending Mekelle general hospital, Mekelle city, Tigray, Ethiopia

3.2 Specific Objectives

- To estimate direct medical and non-medical cost of treating maternal complications in the study area.
- To estimate indirect cost (productivity loss of individuals) of treating maternal complications.
- To identify factors driving the cost of treating maternal complications.

Chapter IV: Methods and Materials

4.1 Study area

The study was conducted in Mekelle city, 783 km away from Addis Ababa, the capital city of Ethiopia. Based on 2007 g.c census the town has a total population of 273 thousand. Administratively it is divided into seven sub-administrative units; namely Hawlti, Hadnet, Ayder, Semen, Kedamayweyane, Adihaki, and Quiha. According to Mekelle city Health Office report in 2011, it has one teaching referral hospital, two general hospital and nine health centers owned by the government. Moreover, five general hospitals and 48 clinics (lower, medium and higher including special dental and eye clinics) were owned by the private sector. Tigray regional state is located in the northern part of the country and has an estimated total population of 4.3 million, of whom 50.8% are female. Around 80% of the populations live in rural areas and the majority of the inhabitants are Orthodox Christians. The region is divided into seven zones and 47 districts (weredas), of which 35 are rural. There are two specialized referral hospitals in the region, as well as five zonal hospitals, seven district hospitals, 208 health centers, and more than 600 health posts. coverage estimates from the Tigray health bureau indicate 75% for the first visit of ANC, 32% for skilled delivery (those attended by a nurse, midwife, health officer [non-physician clinician] or a physician), 13% for clean and safe delivery (those attended by HEWs), 51% for PNC (women who, after delivery, are assisted at health facilities by nurses/midwives or visited by HEWs at households) and 90% for family planning use (53).

4.2 Study design

The institutional based cross-sectional study design was conducted in data collection.

4.3 Target Population

All mothers who attending Mekelle general hospital to get maternal health service

4.4 Study population

All women who diagnosed with maternal complication by the physician in Mekelle general hospital

4.4.1 Inclusion and exclusion criteria

All pregnant and laboring mothers who diagnose with maternal complications at Mekelle general hospital in the data collection period and Exclusion criteria Pregnant mothers without complication, mothers who deliver with normal delivery without any complication in the governmental hospital, unconscious mothers (those unable to communicate).those mothers who have complication and follow up at the private health institution. Mothers who have complication by accident.

4.4.2 Sample size determination

A single proportion population formula was used based on a study in rural Ethiopia says, mothers In the study, nearly three-fifth of the studied families paid out of pocket expenditures exceeding 20% of their monthly household expenditure for maternal health care seeking with the 95% confidence interval and margin of error 5% (43).

$$n = \frac{(Z\ \alpha/2)^2\ P\ (1-P)}{d^2}$$

Where: n= is the desired sample

Z= is the standard normal deviation (1.96)

p = is (20%) mothers pay Oop from their house hold income expenditure to get maternal health service in Ethiopia.

q = 1-p = 1-0.2=0.8

d = Margin of error 5%

$$n = \frac{(1.96)^2(20\%)\ (1-20\%)}{(0.05)^2}$$

246 = Study Participants, adding 10% of Contingency total sample size is 271

4.4.3 Sampling procedures

All Mothers who diagnosis with Maternal Complication in Mekelle General hospital with A purposive sampling technique was used. The study units that are available at the time of data collection were selected.

4.5 Data collection instruments

The questionnaires were interviwed to pregnant women diagnosed with having one of the three complications individually and in a face-to-face situation. At the end of each data collection day, discussions were held with the three data collectors to discuss the filled out questionnaires and cross-check to ensure completeness.

A structured questionnaire was used for the data collection and it took about 15 minutes to administer each one of them. The questionnaire was divided into four sections and covered a wide range of socio-economic and medical (cost of illness) topics. The sections are described briefly below:

Section 1: Socio-demographic information

Questions under this section dealt with clinic status, age, education, marital status, religion, employment and salary of the respondent.

Section 2: Obstetric/Medical history and treatment information

Questions under this section considered the diagnostics, a number of children, history of complication of respondent and family, clinic attendance and admissions, as well as who paid for treatment.

Section 3: Direct cost information

This section enquired about the direct medical cost in terms of registration and consultation, drugs, laboratory test, scans and admissions (where possible) and direct non-medical cost in the form of cost of travel, food, drinks/water as well as other costs.

Section 4: Indirect cost information

Questions under this section dealt with days of absence from work, time spent to travel to and the antenatal clinic as well as caregiving in the form of transport, food, drinks, and other expenses.

4.6 Operational definitions for maternal complications

The maternal complication in this study is mothers who develop Hemorrhage, Preeclampsia during pregnancy and Prolonged labor.

Direct medical cost

Direct medical cost includes the cost of diagnosis, treatment and follow-ups and services related to maternal complication treatment (folder, Laboratory tests/investigations, medication, supply (syringe, disposable gloves), hospitalization (bed), consultation fee, dressing, etc.) from the patient perspective in Ethiopian Birr.

Direct non-medical cost

Direct non-medical cost refers to costs due to transportation, accommodation, and food for the patient and caregiver in Ethiopia birr.

Indirect cost

Indirect cost includes loss of productivity to the patient (mothers with complication) and caregiver due to the complication. cost of loss of productivity is measured using human capital approach(for employed individuals work loss of productive is valued by multiplying number of hours or days lost due to the complication by reported monthly income prior to being ill and for those unemployed individuals (housewife, students, etc.) the minimum national monthly wage in 2019 was used.

4.7 Study variables

Dependent variable

The cost incurred (in birr) due to maternal complications.

Independent Variables

- ✓ Socio demographic characteristics
- ✓ Clinical and obstetrical characteristics
- ✓ Health service utilization

4.8 Cost data sources and collection procedures

Costs collected from mother's interview those who pay oop for direct and indirect costs. For those who say get the direct medical costs free to collect the cost data from pharmacy department head by interview and from laboratory head by interview after seeing their mothers card what laboratory tests she get and what medications she was taken.

Measurement: It followed an ingredient based bottom-up approach to identify and measure all costs at the patient level. Direct costs measured in this study were all out-of-pocket expenditures on and obtaining complication treatment by patients. The direct costs were identified and measured in two groups: (1) direct medical costs (diagnosis, medical supplies, obstetrics drugs, other drugs, and consultation), and (2) direct non-medical costs (food on the way to the treatment facility, transportation, other non-medical supplies, and services). All direct cost information was collected in Ethiopian Birr (ETB). Indirect costs were measured in terms of a number of forgone working days of the patients due to the maternal complication.

Valuation: Direct cost was the sum of direct medical costs and direct non-medical costs, and at the outset estimated in monetary values. Indirect cost was valued using a human capital approach (55). Thus, the value of a labor day (the wage rate) was used to convert the workdays lost into monetary value. For adults older than 18 years, the average daily wage rate for agricultural workers was used (56). According to the 2013 National Labor Force Survey (NLFS) report, the average monthly wage rate for an agricultural worker in Ethiopia was ETB 697, which we divided by 20 in order to obtain the daily wage rate of ETB 35. All costs were converted to USD using the official National Bank of Ethiopia average exchange rate for 2019 (US$1 = ETB 29). The reference year for all cost estimates in this study is 2019 USD (57).

4.9 Data quality management

To assure the quality of data the following activities were done before the starting of actual data collection. The questionnaire was translated to Tigrigan again back to English to check for consistency, and then pretesting of the questionnaire was done in 15 subjects (5% of estimated sample size), in the hospital which excluded those from the study. The training was given to data collectors and supervisors prior to data collection. Collected data was checked for its completeness and clarity on a daily basis. Close follow up and supervision by supervisor and investigator throughout the data collection process was done.

4.10 Validation of research instrument

Data was collect after getting approval from the ethical commute Addis Ababa University and get a support letter from the department of public health. Then get permission from the patients. Three data collectors select from the hospitals conduct all the interviews after two days of training on the study tools. The structured interview-administered questionnaires were the data collection tool used for this study. It had both open-ended questions that required written responses and closed-ended questions provide with predetermined options. Data was collected from both inpatient and postnatal women diagnosed with maternal complication; such as Prolonged labor, Hemorrhage and Preeclampsia in pregnancy.

After meeting respondents, the data collector introduced herself and politely explained the purpose and benefit of the study. Those who could read were provided with the consent form. For those who could not read, the consent form was read and explained to them in a language they could understand.

Thereafter, those who agreed to participate in the study were asked to sign (put their signature) the consent form. Those who declined to be part of the study were respectfully replaced by the next available and consenting individuals.

4.11 Data analysis

Data was entered into and export into SPSS 21 version for analysis. A descriptive analysis of background characteristics of respondents and multiple linear regression models was done to see

the association between dependent and independent variables. Data were cleaned and coded before entry. Descriptive statistics like percentage, frequency, mean, median, standard deviation and IQR were used to show a clear picture of the characteristics of the respondents the direct out-of-pocket payment for each pregnancy-related complication was estimated. Direct and direct non- medical costs were estimated by summing the costs and mean/median calculation because the median calculation is best if there are outliers occur in the data. The direct medical costs cover out-of-pocket payments for drugs, laboratory tests, and medical supplies. Direct non-medical costs include all expenditure made on food during the health-seeking process and transportation to the hospital and back home. The transportation costs include both the woman and the person who accompanied her to the hospital. Indirect costs associated with Productivity Lost was Estimated by multiplying the number of days spent at the hospital by the daily minimum wage for the year 2019. This was calculated for both the patient and the caretaker. Finally, results were present using texts, graphs, and figures.

Cost of treating maternal complications was analyzed by summing the money spent on the complications. Initially Bivariate linear regression at a p-value of less than 0.25 was used to identify factors independently associated with the outcome variable. Then to control the effect of confounding, multivariate linear regression analysis was done. Statistical significance was determined using less 5 % of the level of significance with 95% CI. Model goodness-of-fit was checked with Hosmer-Lemeshow test (P=0.000) and Pseudo R Square (Cox & Snell R Square =.366, Nagelkerke R Square= .3214). Multicollinearity was checked using tolerance and Variance Inflation Factor. Findings were presented in texts, tables, and figures.

4.12 Ethical Consideration

Ethical clearance was obtained from the Institutional Review Board committee of Addis Ababa University, Department of public health College of Medicine and Health Sciences, Addis Ababa University. After this, the support letter was being written by school of public health to conduct this research in the hospital. In addition, written consent was obtained from the respondents before interviewing. Respondents were told about the aim of the study and confidentiality of the information which they were given. In addition, they were told that they have the full right to withdraw from the study at any time if they feel that uncomfortable.

4.13 Dissemination of Results

The study findings will be submitted to the University of Addis Ababa, Tigray regional health bureau publication in a scientific journal and online dissemination will be considered.

Chapter V: Results

5.1 Socio-demographic characteristics of study participants

A total of 267 mothers with complication participated in the study with a response rate of 98%. Of the total 267 respondents interviewed in the study, 94.8 % were Tigre, 84.6% were Orthodox, and 94.8 % were married. The mean age of respondents was 28 ±4.032 (SD) years, and the median (IQR) of salary was 3000 (17303) ETB. The demographic and socioeconomic characteristics of study participants are shown below (Table 1).

Table 1: Socio-demographic characteristics of maternal complications among mothers attending Mekelle general hospital, Mekelle city, North Ethiopia, 2019 (N= 267).

Variables	Category	Frequency(n=267)	Percentage (%)
Age	15-24	43	16.1%
	25-34	207	77.5%
	35-49	17	6.4%
Marital status	Married	253	94.8%
	Single	14	5.2%
Ethnicity	Tigre	253	94.8%
	Amara	14	5.2%
Occupation	Governmental	85	31.8%
	Merchant	61	22.8%
	Housewife	100	37.5%
	Others	21	7.8%
Education	unable to read and write	29	10.9%
	able to read and write	119	44.6%
	diploma and above	119	44.6%
Religion	Orthodox	226	84.6%
	Muslim	41	15.4%
Monthly salary	<1000	74	27.7%
	1001-3000	77	28.8%
	3001-5000	62	23.2%
	5001-7000	31	11.6%
	7001-9000	16	6%
	>9000	7	2.6%

5.2 Clinical and obstetrical characteristics of study participants

Among the study participants with maternal complications, 106(39.7%) suffered from preeclampsia and 123(46.1%) women delivered by SVD. 66.3% of them were multigravida mothers and 94.8% of them get the service free. 66.7% of the participants have diagnosed their complications in the hospital. 56.9% of them have four times ANC flow up and 65.2% of them have used private transportation modality (Table 2).

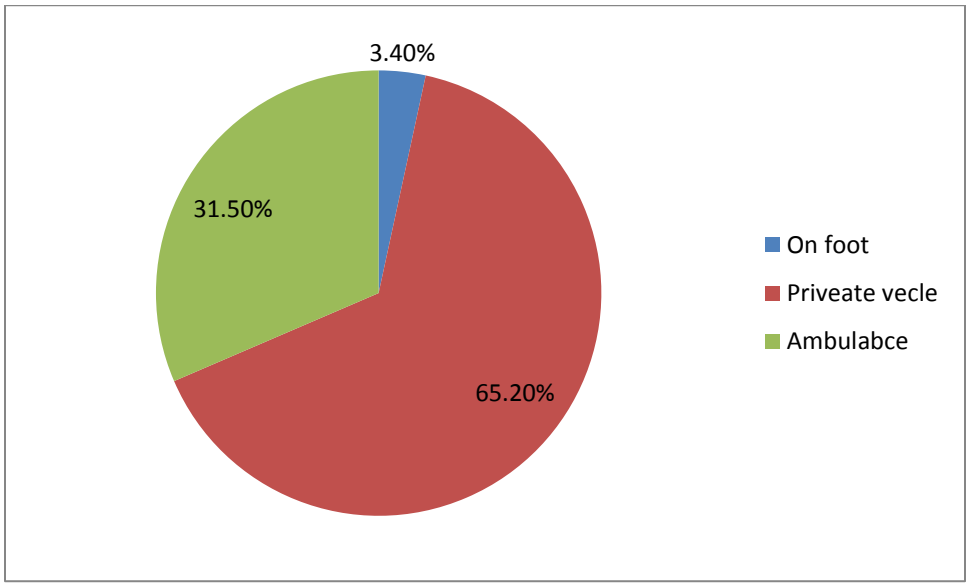

Figure 2: Participants by transportion modality among mothers attending Mekelle general hospital, Mekelle city, north Ethiopia, 2019 (N= 267).

Table 2: Clinical and obstetrical characteristics maternal complications among mothers attending Mekelle general hospital, Mekelle city, North Ethiopia, 2019 (N= 267)

Variables	Category	Frequency	Percentage
Type of complication	Hemorrhage	81	30.3%
	Preeclampsia	106	39.7%
	Prolonged labor	80	30%
Mode of delivery	Instrumental	29	10.9%
	SVD	123	46.1%
	C/S	115	43.1%
Para	One	90	33.75
	two	57	21.3%
	three	68	25.5%
	four	31	11.6%
	five and above	21	7.9%
Method of the service fee	Free	253	78.7%
	Oop	14	5.2%
Site of diagnosis	In the hospital	178	66.7%
	Out of the hospital	89	33.3%
ANCflowup frequency	Twice	8	3%
	Three times	32	12%
	Four times	152	56%
	Above four	75	28.1%
Gravid	Primigravida	90	33.7%
	Multigravida	177	66.3%
Transportation modality	On foot	9	3.4%
	Private transportation	174	65.2%
	Ambulance	84	31.5%

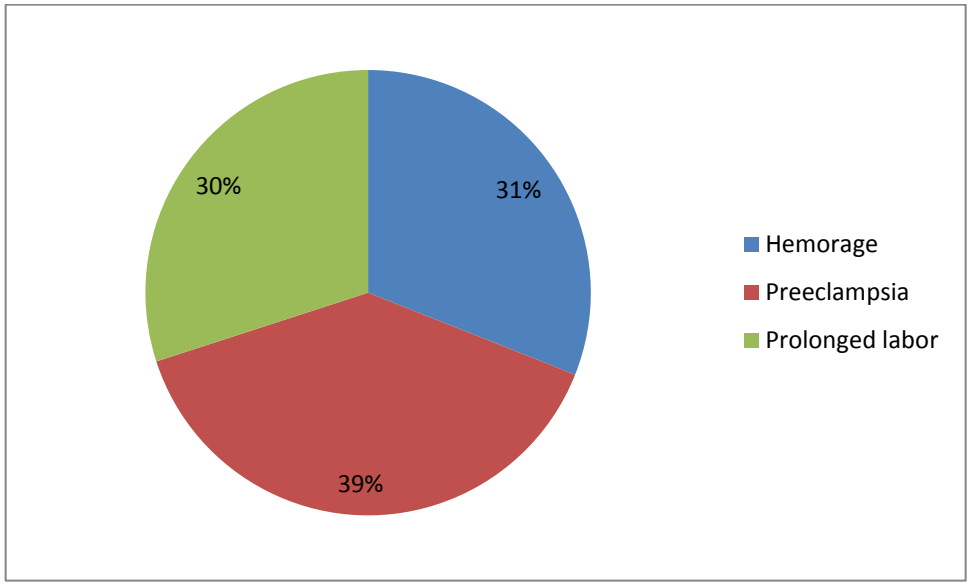

Figure 3: Participants by type of complication among mothers attending Mekelle general hospital, Mekelle city, north Ethiopia, 2019 (N= 267).

5.3 Health Service Utilization and Indirect Cost of Participants.

For the study participants (N=267) the average number of laboratory tests was 2.9251(SD=1.04144), for the number of days absent from work due to complication was 4.5655(SD=1.93076) around 5 days, for transportation time 16.3333(SD=11.43588) that indicates around16 hours taking for transportation, for waiting for time 14.3970(SD=7.88401) approximately 14 hrs., for complication flow up 2.9251(1.18971) and the average mean for distance from facility to home was 6.4494(2.86545) kilometer (Table 3).

Table 3: Characteristics of health service utilization of participants of maternal complications among mothers attending Mekelle general hospital, Mekelle city, north Ethiopia, 2019 (N= 267).

Variables	Mean	SD
Number of laboratory test	2.9251	1.04144
Number of days absent from work due to complication	4.5655	1.93076
Transportation time	16.3333	11.4358
Waiting time	14.3970	7.88401
Complication flow up	2.9251	1.18971
Distance from facility to home	6.4494	2.86545
Total indirect cost	35.55	34.53

Key

1US$=29ETB

5.4. Cost of treating maternal complication among the study participants

Based on this finding the median total cost of treating a complication of the study participants were US$176.8(IQR=80.18) incurred.

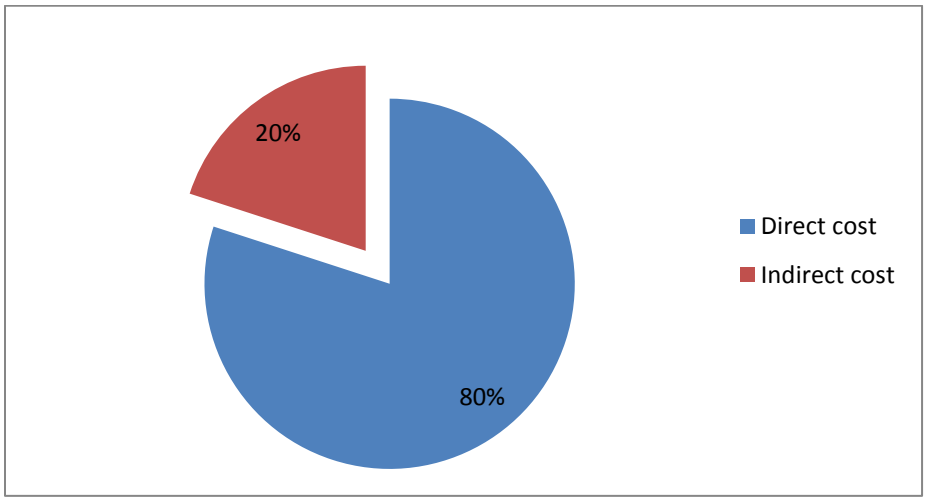

Figure 4 Cost components as a proportion of total cost

5.5. Direct costs of complication treatment

The median total direct cost of complication treatment across all patients were US$ 120.23(IQR=43.33). Direct medical costs arise from expenditures on consultation fees, medication fee and screening fee (including diagnostic tests). The complication treatment medications had not most of time available at governmental institution of the study sites so, direct medical costs were highest for patients accessed from private area. Direct medical costs were US$120 (IQR=43.33). Direct investigation costs were US$ 40.69 (IQR=20.97). Total direct medical costs (medication cost) were US$ 79.31 (IQR=48).

The median total direct non-medical costs were US$ 20.68 (IQR=20.48).The direct non-medical costs consisted of transportation, food, hospitalizition and other expenses were highest when patients come from long distance residence and long waiting times. The high transportation costs were median US$ 10.34(IQR=10.24) arose from the long distance, for food and hospitalization

costs were median US$ 10.66(IQR=10.24) of the patient and accompanying family member(s) during complication screening, treatment and follow up.

Table 4: : Madian direct costs of complication treatment among the study participats,at Mekelle General Hospital,Tigray, Ethiopia, 2019(n=267).

Type of cost	Madian(IQR)
Direct medical cost	
Laboratory cost	40.69(20.97)
Medication cost	79.31(48)
Total direct medical cost	**120(43.33)**
Direct non medical cost	
Food cost	10.66(10.24)
Transportion cost	10.34(10.24)
Total direct non medical cost	**21.23(19.47)**
Total direct cost	**141.23(63.53)**
Total indirect cost	**35.55(21.23)**
Total cost	**176.78(80.18)**

Key

1US$=29ETB

5.6 Cost of treatment by type of Complication

Table 3 Presents the main cost components for each of the three maternal complications. Of the 267 women who had complications, the median cost of direct medical costs was $120.23US (IQR=43.33). 33.3% of these direct medical costs were incurred outside the hospital because of shortage/non-availability of prescribed drugs or non-availability of equipment and they pay Oop.

The median transportation cost was $10.34US (IQR=10.24) per person (patient and person accompanying the patient) representing. Majority of the respondents were transported to the hospital with the private vehicle (65.2 %). The median expenditure made on food for both patient and caretaker was estimated at US$10.34 (IQR = 10.24) per person. In addition, the median indirect cost attributed to productivity losses was estimated at US$26(IQR=44) per person. Overall, the median expenditure made by households on both direct and indirect costs per complication was US$176.78(IQR = 80.18) per person.

Direct medical costs accounted for the largest proportion of total cost which is the median cost= US$120.23 (43.33). Disaggregating costs by type of complication, women who had prolonged labor spent more (median = US$182.48; IQR =78.59) than those who had other types of complications. Women with hemorrhage incurred the least cost (median = US$163.30; IQR =71.50).

Table 5: Table 5: Cost of treating maternal complications by type of complication in (US$) (N= 267).

Type of complication	Variables	Food (US$)	Transportation (US$)	Drugs & medical supplies (US$)	Productivity lost (US$)	Total cost (US$)
Hemorrhage	Observation	81				
	mean	13.2778	13.9027	114.186	33.62	174.9
	median	10.3400	10.34	110.34	26	163.3
	IQR	7	10.24	42.64	44.38	71.50
Pre-eclampsia	Observation	106				
	mean	13.1817	13.7912	125.014	37.2598	189.2
	median	10.34	10.34	117.23	29.5150	182.1
	IQR	10.24	10.24	45.19	43.56	95.37
Obstructed/prolonged labor	Observation	80				
	mean	15.3291	13.6828	134.06	36.1416	199.2
	median	10.34	10.67	130.41	27	182.5
	IQR	10.24	11	51.24	44.11	78.6
Total	Observation	267	267	267	267	267
	Mean	13.8543	13.7925	124.4	35.8216	187.9
	Median	10.34	10.34	120.23	26	176.8
	IQR	10.24	10.24	43.33	44	80.18

Key

1US$=29ETB

5.5 Factors driving the cost of treating maternal complications.

In the binary linear regression residency, occupation, level of education, monthly salary, type of complication, mode of delivery, transportation modality, mode of service fee, ANC flow up frequency, medication covered by, number of laboratory test, facility of diagnosis, number of days absent, complication flow up and transportation time were statistically associated with cost of treating maternal complications. However, in the multivariate linear regression monthly salary, number of laboratory test, the facility of diagnosis, number of days absent and transportation time were the only statistically significant at (p-value 0.05).

In the multivariate linear analysis, regression monthly salary, number of laboratory test, the facility of diagnosis, number of days absent and transportation time were the only statistically significant variables.

It is found that women with a monthly income of birr 1001-3000 incurred 9.216707 Birr higher for treatment of complication than those earning <=1000 holding other independent variables constant.

The result also shows requesting test laboratory increases the cost of treatment by birr 10.12497.more than those who have not laboratory test by holding other independent variables constant.

One mother who had absent from her work increased the cost of complication treatment by5.02468 birr more than those who are not absent from their work. one mother who has taken more time to transport increased cost of treatment by 0.750 birrs more than those who have not taken more time of transport.

Those Participants who have diagnosis their complication out of the hospital (private hospital) where the cost of complication incurred 25.33 birrs more than those who have diagnosed their complication in the hospital.

Table 6: Factors associated with the cost of treating maternal complication using multivariate linear regression analysis 2019 (N= 267).

Variable	Coef	Std err	T	p>(t)	(95%CI,interval)
<1000 referenced income					
1001-3000	9.216707	8.324792	0.11	0.010	-15.44898,17.338
3001-5000	39.92605	8.837494	3.73	0.000	15.52811,50.33436
5001-7000	51.14589	10.5857	4.35	0.000	25.17351,66.86501
7001-9000	55.79787	14.02308	3.95	0.000	27.73229,82.96184
>9000	9.04391	19.70808	4.26	0.000	45.21734,1.540956
Number of laboratory test	4.872163	3.102209	1.57	0.018	-1.236824,10.98115
Laboratory test In the hospital reference					
Laboratory test Out of the hospital	25.333313	6.795459	3.73	0.000	11.9577,38.72145
Absent days	4.333313	1.681889	2.58	0.011	1.021275,7.645352
Transport time	1.0008608	.2703329	3.73	0.000	.4762599,1.540956

Chapter VI discussion

The results of this cross-sectional study showed that the cost of treating maternal complications to households (median = US$176.78; IQG=80.18) was high. This constitutes a large expenditure for households. it implies that the amount spent on complications represented more than half the monthly minimum wage earned Given a minimum monthly wage of about US$22 in Ethiopia (48), household expenditure on pregnancy-related complications will not only deplete household resources, especially poor households, but also the household's ability to meet subsistence needs and therefore lead to poverty or deeper poverty (20).

This study showed that the overall median cost of maternal complication was US$176.8(IQR=80.18). This finding was higher than the cost incurred for maternal complication in India, Janani Suraksha and Northern Ghana which was (US$145, 32.03, US$8.60) (20,46,47,49). The main reason for these direct medical costs incurred in out of public and private health facilities are borne. but lower than a study done in Nigeria, rural Northern Ghana, Northern Nigeria and Ghana (US$ 243.8, US$17, USD$9-99 and US$285) estimated in a study (30,41,50,51).

The median direct medical cost was US$120.23+21 (IQR=43.33). This finding was higher than to Ethiopian and Ghana study, US$7.41, US$8.69 (43) (20). The direct non-medical cost was US$21 (IQR=19.47) US$21 (IQR=19.47). This finding was lower than Ghana's study US$13.48 (20). This may be because the direct non-medical cost that consists of transportation, food, and other expenses were highest when patients come from long distance and have long waiting times and the complication medications are not available at the governmental institution where the study was conducted. So, direct medical costs were highest for patients who have to buy drugs from private sectors.

The median transportation cost was US$10.34 (IQR=10.24). This finding was lower than a study conducted in Ghana that reported below US$13.48 and US$23.44 in Northern Ghana(50). The combined median food and hospitalization was US$21 (IQR=19.47). This cost includes the cost of the patient and accompanying family member(s) during complication screening, treatment, and follow up (20).

This result shows that the indirect cost (median=US$26+9.57; IQR=44) which is lower than the study shows, an annual total of about US$ 95 million for Ethiopia and about US$ 85 million for Uganda which is reported by WHO (5,51,52). This may be because indirect costs are not covered by the free maternal health policy and the study was in one general hospital.

The study shows the average cost for cesarean section is US$201.587, for SVD mean cost US$177.6137 (SD=62.92576) and mean cost for instrumental delivery US$ 177.3472 (SD=55.23512) which is higher than a study in northern Ghana US $7.70 and the US $51.80, respectively) (52). The result is lower than the finding in Ethiopia; Nineteen percent of these facilities required payment in advance for the treatment of an obstetric emergency. The health facilities that charged user fees had, on average, more delivery beds, deliveries (normal and cesarean), direct obstetric complications treated (49,53).

This study indicated that income, the facility of diagnosis, number of days absent, number of laboratory test, and transportion time of the respondents showed statistically significant association with the cost of treating complication for those who develop maternal complication patients and their relatives.

The cost of treatment was high for patients their income 1001-3000 compared with their income <1000 participants. This might be due to those mothers with high income more flow up in the private health sector and spend more on transportation. The richer patients and their relatives incurred more cost of complication treatment than poorer patients. This might be due to expensive drugs and quality services (41,46,47).

Individuals with more laboratory request test have increased the cost of complication treatment compared with those who had no laboratory test request (routine laboratory test request). Individuals who had complication may need further investigation and delayed to come up with the normal laboratory test result. This study was supported by other studies in Nigeria that reported the cost of patient's complication was higher for patients with more request of laboratory test (including blood transfusion) (30).

The patients with complication who absent from work increased the cost of treating complication compared with patients without absent days from work. This study was in line with

other studies done in Nigeria(30). This might be due to need of additional follow up, drugs and hospitalization.

The complicated patients with more transportion time in the hospital had increased cost of complication treatment compared with those who less transportion time. This study was supported by the study in northern Ghana where the cost of treatment increases for patients with more waiting time in the hospital (54). This may be because the mother needs for further investigation, consultation, repeated follow up and hospitalization.

Mothers who diagnosis out of the hospital (requested laboratory tests to the private) had increased cost of complication treatment compare with those have request test in the hospital which is similar to the studies conducted in Ethiopia, Uttar Pradesh and Rural Northern Ghana (43,46,55). This may be because of reagents are not available in the hospital.

The findings from the study raise serious concerns about the context in which the free maternal health policy is being implemented. Maternal health services are not free if the cost of medicines and services are still directly paid by patients.

Chapter VII: Limitation and strength

7.1 Strength

This study is the first of its kind in Ethiopia. The strength of the study goes with its limitation in that the un availability of cost data and tried to alleviate this challenge using scientific references to make the study as a springboard for future studies and fulfills data requirement/gap for costs arising from time lost in seeking care.

7.2 limitation

One limitation was the possibility of recall bias. Some expenditure could either have been overestimated or underestimated. Because recognize that health expenditure and hospitalization are critical events for low-income families and therefore can easily be recollected.

I have not included intangible costs in my analysis which therefore underestimated my cost results. Intangible costs relate to the reduced quality of life due to complication. It includes pain, psychological pressure, reduced joy of life and social prestige due to the complication. However, this cost component, though important, is difficult to measure and is therefore not usually included in cost studies.

Chapter VIII: Conclusion and recommendation

8.1 Conclusion

The finding from the study indicated that the median cost of maternal complication was high as compared to a household's income to catastrophic out-of-pocket expenditures.

The overall median cost of maternal complication was found to be significantly influenced by respondent monthly salary, number of days absent from work, number of laboratory tests, facility of diagnosis and transport time.

The findings of this study raise serious concerns about the context in which the free maternal health policy is being implemented. Maternal health services are not free if the cost of medicines and services are still directly paid by patients.

8.2 Recommendations

For policymakers

Strengthen and develop the necessary technical capabilities within the Region through training of medical and early screening of maternal complications closer to patients. To minimize the cost of maternal complication, it is useful to expand coverage of community-based health insurance (CBHI) scheme for informal and to introduce social health insurance (SHI) scheme for those in the formal sector. Review available data on maternal complication cost. If not already prepared, every Mother has developed complication and is a public health problem should prepare a national programmed for early screening and identified. Review the availability of maternal health-related medications, equipment, laboratory reagents regularly.

For Regional health bureau and health professionals

Coordination and collaboration in the planning and implementation of national maternal complication, screening and identified programs with other concerned ministries, universities and organizations, particularly those screening cases earlier should to reduce the severity of the complication and thus the amount of income lost due to inability to work as well as direct patient

costs related to having to spend more time at a hospital. Screening can be made earlier by expanding the role of health workers and community health workers.

Increasing and improving active cases can also be achieved by looking for complication problems at all health service delivery. Increasing the provision of information about how to prevent and reduce the impact of maternal complications for the general public and for pregnant mothers.

For Researchers

Further study about quality of care of maternal health and its relation with free maternal health policy need to be studied.

Cost of treating maternal complications from the providers perspective and from societal perspective need to be studied.

CHAPTER VIIII REFERENCES

1. Adam T, Lim stephen S, Mehta S, Bhutta ZA, Fogstad H, Mathai M, et al. Cost effectiveness analysis of strategies for maternal and neonatal health in developing countries. Bmj. 2005;331(7525):1107.

2. Gedefaw M, Gebrehana H, Gizachew A, Taddess F. Assessment of Maternal Near Miss at Debre Markos Referral Hospital , Northwest Ethiopia : Five Years Experience. Epidemiology. 2014;4(November):199–207.

3. Mekango DE, Alemayehu M, Gebregergs GB, Medhanyie A, Goba G. Determinants of maternal near miss among women in public hospital maternity wards in Northern Ethiopia : A facility based case- control study. PLOSONE| https://doi.org. 2017;10:1–14.

4. World Health Organization. The WHO near-miss approach for maternal health. 2011.

5. Assfaw YT, Sebastian MS. Determinants of Antenatal Care , Institutional Delivery and Skilled Birth Attendant Utilization in Samre Saharti District , Tigray , Ethiopia. 2010;

6. Liyew EF, Yalew AW, Afework MF. Incidence and causes of maternal near-miss in selected hospitals of Addis Ababa , Ethiopia. pone0179013 June. 2017;1–13.

7. Moran AC, Jolivet RR, Chou D, Dalglish SL, Hill K, Ramsey K, et al. A common monitoring framework for ending preventable maternal mortality , 2015 – 2030 : phase I of a multi-step process. BMC Pregnancy Childbirth. 2016;1–13.

8. Verguet S, Nandi A, Filippi V, Bundy DAP. Maternal-related deaths and impoverishment among adolescent girls in India and Niger : fi ndings from a modelling study. 2016;

9. Souza JP, Cecatti G, Faundes A, Morais S, Villar J, Carroli G, et al. Maternal near miss and maternal death in the World Health Organization ' s 2005 global survey on maternal and perinatal health. 2010;(June 2009):113–9.

10. Assegid M. Obstetric and Gynecological Nursing. 2003rd ed. Assegid M, editor. EPHTI; 2003. 17-353 p.

11. Abdella A. Maternal Mortality Trend in Ethiopia. Heal Dev. 2015;115(1):2–8.

12. Gaym A. Maternal mortality studies in Ethiopia-Magnitude , causes and trends. 2015;(September).

13. Gaym A, Bailey P, Pearson L, Admasu K. International Journal of Gynecology and Obstetrics Disease burden due to pre-eclampsia / eclampsia and the Ethiopian health system â€TM s response. Int J Gynecol Obstet. 2011;115(1):112–6.

14. Report KI. FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA Demographic and Health Survey.

15. Journal E, Pharmaceutical OF. EJPMR DETERMINANTS OF MATERNAL MORTALITY IN CENTRAL ZONE OF TIGRAY REGION : A COMMUNITY BASED CASE-CONTROL STUDY . 2016;3(12):114–20.

16. Akowuah JA, Agyei-baffour P, Awunyo-vitor D. Determinants of Antenatal Healthcare Utilisation by Pregnant Women in Third Trimester in Peri-Urban Ghana. 2018;2018(2000).

17. Utilization of Maternal Health Care Services in Ethiopia.

18. Agency CS, Ababa A. Ethiopia Mini Demographic and Health Survey. 2014.

19. Mekonnen W, Hailemariam D, Gebremariam A. Original article Causes of maternal death in Ethiopia between 1990 and 2016 : systematic review with meta-analysis. Heal Dev. 2016;1(5):18.

20. Dalaba MA, Akweongo P, Aborigo RA, Saronga HP, Williams J, Aninanya GA, et al. Cost to households in treating maternal complications in northern Ghana: A cross sectional study. BMC Health Serv Res. 2015;15(1):1–8.

21. Town G. Prospective Study on Birth Outcome and Prevalence of Postpartum Morbidity among Pregnant Women Who Attended for Antenatal Care in. 2014;3(2).

22. Perkins M, Brazier E, Themmen E, Bassane B, Diallo D, Mutunga A, et al. Out-of-pocket

costs for facility-based maternity care in three African countries. Health Policy Plan. 2009;24(1):289–300.

23. Verguet S, Memirie ST, Norheim OF. Assessing the burden of medical impoverishment by cause : a systematic breakdown by disease in Ethiopia. BMC Med. 2016;1–11.

24. Legese T, Mulatu K. Trend and Timing of Maternal Death in Mizan-Aman and Gebretsadikshawo General Hospitals Ethiopia 2011 – 2015 Case Control Study. Gynecol Women's Heal. 2017;6(1):1–6.

25. Berhe AK, Kassa GM, Fekadu GA, Muche AA. Prevalence of hypertensive disorders of pregnancy in Ethiopia : a systemic review and meta-analysis. BMC Pregnancy Childbirth. 2018;18:1–11.

26. Khatun J, Khanom K. Original Article Obstructed Labour : A Life Threatening Complication. Obstet Gynecol. 2017;29(1):12–4.

27. Bekele BB, Umubyeyi A. Review Maternity waiting homes and skilled delivery in Ethiopia : Review of strategy and implementation to drive sustainable development goals. 2018;9(April):19–26.

28. Austin A, Gulema H, Belizan M, Colaci DS, Kendall T, Tebeka M, et al. Barriers to providing quality emergency obstetric care in Addis Ababa , Ethiopia : Healthcare providers ' perspectives on training , referrals and supervision , a mixed methods study. 2015;1–10.

29. Hoque ME, Powell-Jackson T, Dasgupta SK, Chowdhury ME, Koblinsky M. Costs of maternal health-related complications in Bangladesh. J Heal Popul Nutr. 2012;30(2):205–12.

30. N AA, Adamu H, Ay I, Zubairu S. Women ' s Health Care Expenditure on Emergency Obstetric Care in a Federal Tertiary Institution in Nigeria. Women's Heal Care 2013,. 2013;2(4):2–5.

31. world health statistics [Internet]. Vol. 20. 2014. 561-565 p. Available from:

http://apps.who.int/iris/bitstream/10665/112682/2/9789241507226_eng.pdf?ua=1

32. World Health Organization. Trends in Maternal Mortality: 1990-2013. E. World Heal Organ [Internet]. 2014;56. Available from: http://apps.who.int/iris/bitstream/10665/112682/2/9789241507226_eng.pdf?ua=1

33. From L. Safe Motherhood and The World Bank. 1999.

34. Survey H, Findings K. Ethiopia 2016Demographic and health survey. 2016.

35. Tessema GA, Laurence CO, Melaku YA, Misganaw A, Woldie SA, Hiruye A, et al. Trends and causes of maternal mortality in Ethiopia during 1990 – 2013 : findings from the Global Burden of Diseases study 2013. BMC Public Health. 2017;17:1–8.

36. Enqueselassie F, Berhane Y. Health facility-based maternal death audit in Tigray , Ethiopia. Heal Dev. 2010;23(2):115–9.

37. health journal of. Glob Heal. 2015;5(1):1–228.

38. Miller S, Belizán JM. The true cost of maternal death: Individual tragedy impacts family, community and nations. Reprod Health. 2015;12(1):10–3.

39. Islam MK, Gerdtham UG. The costs of maternal-newborn illness and mortality. 2006;37.

40. Ameur A Ben, Ridde V, Bado AR, Ingabire M, Queuille L. User fee exemptions and excessive household spending for normal delivery in Burkina Faso : the need for careful implementation. BMC Health Serv Res. 2012;12(1):2–10.

41. Kalu-umeh NN, Mph M, Sambo MN, Fwacp M, Idris SH. Costs and Patterns of Financing Maternal Health Care Services in Rural Communities in Northern Nigeria : Evidence for Designing National Fee Exemption Policy. MCH AIDS. 2013;2(1):163–72.

42. Dalaba MA, Akweongo P, Savadogo G, Saronga H, Williams J, Sauerborn R, et al. Cost of maternal health services in selected primary care centres in Ghana: A step down allocation approach. BMC Health Serv Res. 2013;13(1).

43. Akalu T, Guda A, Tamiru M, Mariam DH. Examining out of pocket payments for maternal health in rural Ethiopia : Paradox of free health care un-affordability. Heal Dev. 2012;26(1):1–7.

44. Healthcare C, Exacerbate E. Impact of Maternal and Child Health Private Expenditure on Poverty and Inequity. 2012.

45. Financing HS. WHO GUIDE TO IDENTIFYING THE ECONOMIC CONSEQUENCES Department of Health Systems Financing Department of Health Systems Financing. 2009th ed. 2009. 1-136 p.

46. Goli S, Rammohan A. Out-of-pocket expenditure on maternity care for hospital births in Uttar Pradesh ,. Springer open. 2018;5(8):2–17.

47. Govil D, Purohit N, Gupta SD, Mohanty SK. Out-of-pocket expenditure on prenatal and natal care post Janani Suraksha Yojana : a case from Rajasthan , India. J Heal Popul Nutr. 2016;15(35):1–11.

48. To G, Businessethiopia D. Ethiopia Payroll & Tax Overview. 2018;5–11.

49. Dalinjong PA, Wang AY, Homer CSE. Has the free maternal health policy eliminated out of pocket payments for maternal health services ? Views of women , health providers and insurance managers in Northern Ghana. pone0184830. 2018;12(2):1–19.

50. Dalinjong PA, Wang AY, Homer CSE. The operations of the free maternal care policy and out of pocket payments during childbirth in rural Northern Ghana. Health Econ Rev. 2017;7(41):2–9.

51. Dalaba MA, Akweongo P, Aborigo RA. Cost-Effectiveness of Clinical Decision Support System in Improving Maternal Health Care in Ghana. DOI:101371/journal.pone0125920. 2015;58(1):1–12.

52. Tama E, Molyneux S, Waweru E, Tsofa B, Chuma J, Barasa E. Examining the Implementation of the Free Maternity Services Policy in Kenya: A Mixed Methods Process Evaluation. Kerman Univ Med Sci [Internet]. 2018;7(7):603–13. Available from:

https://doi.org/10.15171/ijhpm.2017.135

53. Pearson L, Gandhi M, Admasu K, Keyes EB. International Journal of Gynecology and Obstetrics User fees and maternity services in Ethiopia. gynacology Obstet. 2011;115(1):310–5.

54. Dalinjong PA, Wang AY, Homer CSE. The implementation of the free maternal health policy in rural Northern Ghana : synthesised results and lessons learnt. BMC Res Notes [Internet]. 2018;1–6. Available from: https://doi.org/10.1186/s13104-018-3452-0

55. Nyein A, Myint M, Liabsuetrakul T, Htay TT, Wai MM, Sundby J, et al. Impoverishment and catastrophic expenditures due to out-of-pocket payments for antenatal and delivery care in Yangon Region , Myanmar : a cross-sectional study. BMJ Open. 2018;10(11):1–8.

Annex 1: Consent form

My name is Teamir Abadi; I am from the University of Addis Ababa department of public health, health economics graduating student. I am here to collect data on the cost of maternal complications. This study will help to assess the total cost of maternal complication. You are selected for the study because you are in the study group. I am kindly requesting you to answer the questions that I have prepared for you. Your information is very useful to this study and it needs your patience, full cooperation, and sincerity. All information will be kept confidential. Only the data collector will access the information. You have the right to not participate in the interview or to refuse at any stage of interviewing. There is no direct compensation that is given to you at the end of the interview. Would you be willing to participate?

Tic "X"

I agree , signature _____ Data collector sign_____

I disagree___ stop Date_____.

Supervisor sign_____

Date _____ Date_____

Annex 2: questionnaire in English

Questionnaire No_____

Interviewer's name_____

Supervisor's name_____

Date of interview dd_____mm_____yy _____

Name of hospital _____

Part1:socio-demographic factors			
NO	Question	Responses	Remark
101	What is your age in the full year?	_____	
102	What is your clinic status	1. Out Patient 2. In Patient (on admission)	
103	What is your marital status?	1. Married 4. Divorced 2. Widowed 5. Separated	
104	What is your Residence?	1. Urban 2. Rural	
104	What is your level of education?	1. Certificate 3. Diploma 2. Degree 4. Masters 3. Specialist	

		Other_____	
105	What is your occupation?	1. Governmental employed 4. Private employed 2. NGO 5. Merchant 3. Daily worker 6. Other_____	
106	If you were in paid work, how much do you estimate your average net wage or average net revenue from labor-related activities (labor income), per month was before you contracted this complication?	1. (Net Wage)_____Birr 2. (Net Labor Income)_ _____Birr	
107	Number of pregnancy	_____Numbers	
108	How many alive children do you have	_____Numbers	
109	What is average monthly income of the household?	1_____ birr 2. I don't know 3. refuse to tell	

Part2: Clinical record and histories given by the study participants

201	Type of complication	1. Preeclampsia 2. Obstructed labor 3. Hemorrhage
202	Mode of delivery	1.SVD 2.Vacum delivery 3.forcef delivery 4.C/S

Part3. Direct Cost (Medical, From Patients Card)

Type of complication_____

I. Patients' Investigation Costs (From Patients Card)

S.No	Description of Investigation Type and procedures	Units* Cost per patient	No. of times? Per stay	Total Cost
1	Hemoglobin			
2	Urine analysis			
3	Complete blood count			
4	Organ function test			
5	Blood group			
6	VDRL			
7	HBsAg			
8	HCV			
9	RBS			
10	FBS			

Part4. Drug Costs (From Patients Card)

Type of complication_____

S.No	Description of Treatment Type	Units* Cost per dose per patient	Total number of dose Per stay	Total cost
1	Iron float			
2	Tramadol50 mg IV QID			
3	Oxytocin			
4	Mgso4			
5	Hydralazine			
6	Ceftriaxone			
7	Bupivacaine			
8				
9				
10				

Part 5: Information collects from Patient Interview

Type of complication_____

Direct non-medical Cost

S.No	Question	Answer categories	Remark
	Patient Costs for food and transpiration during complication and Follow up visit (Non-medical- Direct)		
1.	What Transport modalities have you used to travel from home to the hospital (put it in code)?	Code;- 1=Walked 2=Cycled 3=Bus 4=Minibus 5=Taxi 6=Private car 7=Other	

1. How long is the distance from your home to the hospital the last ANC visit?	_____Km/m	
2. What was the cost of transport (return) for the visit, including parking costs, in total including your attendant?	_____Birr	
4. How much did you spend on food and drinks for the last visit (on the road, while waiting, lunch, etc.), in total for you and your attendant?	_____Birr	
5. What accommodation cost did you when you pick up drugs last picked	_____Birr	
6. Do you buy any nutritional supplements outside your regular diet because of the complication, for example, vitamins, meat, energy drinks or fruits as recommended by health care staff?	1.Yes ____2. No_____	
7 If yes, how much did you spend on nutritional supplements in one month approximately?	_____Birr	
8 What other cost did you spend during your treatment follow up?	Others _____Birr	
2. Hospitalization Cost		
1. Have you been previously hospitalized during your current complication treatment? If yes, how many times	1. Yes, 2. No _____Times	
2. About how much money did you spend for each of these hospitalizations	See the card & fill Type of hospital: _____ Number of days hospitalized:_____	

	Includes outpatient visits as well as hospitalizations. Should be filled in chronological order Day charges: total fees ____.see list Question	
B. Indirect Costs		
How many times did you visit the hospital for ANC flow up?	_____Number	
How long visit take, including travel time and waiting time (total turnaround time)?	_____Minutes	
How many follow-up visits have you had so far during this treatment phase (to see the doctor or nurse, have follow-up tests, etc.)?	_____Times	
Approximately how many working days of have you lost due to your complication Overall	_____Days _____ Minutes	

Annex 3: ሰነድ ብዛዕባ ሓበሬታ መፅናዕቲ

ናይ ፅንዓት ርእሲ: ናይ ሕልክላክ ፀገም ጥዕና ዘጋጠመን ኣደ‌ታት ዘወፅእአ መጠን ገንዘብን ምክንያቱን ንምፍታሽ እዩ።

ዋና ፅንዓት አካያዲት ፡ ተኣምር ኣባዲ

ሽም ትካል ፡ኣዲስ ኣበባ ዩኒቨርስቲ፤ሕክምናን ጥዕና ሳይነስ ኮለጅ፤ሕ/ሰብ ጥዕና ኢንስቲኡት፤ቁጠባ ሃፍቲ ጥዕና ትምህርቲ ክፍሊ

መእተዊ ፡ እዚ ሰነድ ሓበሬታ መፅናዕቲ ዝተዳለወሉ ዋና ምክንያት አብ መቀለ ከተማ ዝርከባ ኣዴታት አብ እዋን ፀገም ጥዕና ዘወፅእአ መጠን ገንዘብን ምክንያቱን ንምፍታሽ እዩ። እዚ ፅንዓት 6 አባላት ዘለውዎ እትኸውን ማለት ዋና ፅንዓቱ መካየዲት፤ 6 መረጃ አከብቲ ፤ 2 ተቆፃፀርቲን 1አማካርን ካብ ኣዲስ ኣበባ ዩኒቨርስቲ ዝሓዘ እዩ።

ናይዚ ፅንዓት ዓላማ

አብ መቀለ ከተማ አብ ሆስፒታላት ዝደቀሳ ኣዴታት አብ እዋን ፀገም ጥዕና ዘወፅእአ መጠን ገንዘብን ምክንያቱን ንምፍታሽ እዩ።

አፈፃፅማ ቃለ መሕተት፡ አብዚ መፅናዕቲ ንምስታፍ ዝተሓረያ ኣዴታት ብዛዕባ እቲ መፅናዕቲ መብራህርሂ ምስተዋሃቦም ንምስታፍ ፍቓደኛ እንተኮይኖም ቃለ ምሕተቱ ይቅፅል።

ከክሰቱ ዝከእሉ ስግኣት ወይም ዘይምምቾቻው፡ አብዚ መፅናዕቲ ብምስታፈነ/ፎም ዘምፅአሎም ምንም ዓይነት ስግኣት የለን ይኹን እምበር ንአስታት 15 ደቂቃ ስለዝፀንሓ /ሑ ዘይ ምምቻው ከስምዐን/ዖም ይኽእል እዩ።

ካብዚ መፅናዕቲ ዝረኽበኡ ረብሓ ፡አብዚ መፅናዕቲ ብምስታፈነ/ፎም ብቀጥታ ዝረከብኡ /ዎ ረብሓ የለን ይኹን እምበር ንሰን /ሶም ዝህቦኡ /ዎ ሓበሬታ ዓብይ ድጋፍ አለዎ። ምስጥራዊነት፡ ነዚ መፅናዕቲ ዝተአከበ ሓበሬታ ሚሸጥሩ ዝተሓለወ እዩ። እቲ ሓበሬታ አብ ናይ ዋና መፅናዒት ፋይል ጥራሕ ስለዝርከብ ማንም ሰብ አይረክቦን።

ካሕሳ ፡ አብዚ መፅናዕቲ ብምስታፈን/ፎም ዝከፈል ክፍሊት የለን

መሰል ምቁራፅ አብ ከይዲ ቃለ መሕተት፡ አብዚ መፅናዕቲ ናይ ዘይምስታፍ ፤ አብ ዝኾነ ግዜ ናይ ምቁራፅ ሙሉእ መሰል ሕሉው እዩ።

ብዛዕባ እቲ መፅናዕቲ ሓበሬታ ንምሕታት እንተደልየን/ዮም ምስ እዞም ዝስዕቡ አካላት ክራከባ/ቡ ይክእላ/ ሉ እዮም።

ሽም: ተኣምር ኣባዲ ሽም: ዶ/ር ኣናጋው ደርብ

ስልኪ: 0914423809 ስልኪ: 0944121769

Annex 4: ናይ ስምምዕነት ቅጥዒ

ጥዕና ይሃበለይ ሹመይ ተኣምር ኣባዲ ይበሃል። ዝመፃእኹሉ ካብ ኣዲስ ኣበባ ዩኒቨርስቲ ፤ ጥዕና ሳይንስ ኮሌጅ ፤ ሕ/ሰብ ጥዕና ትምህርቲ ክፍሊ ኮይኑ ናይ ድሕረ ምረቃ ተመራቒት ተምሃሪት እየ። ናብዚ ዝመፃእኹሉ ዋና ምኽንያት ብዛዕባ ናይ ምስ ኣዴታት ዝተሓላለከ ፀገም ጥዕና ዘለወን ኣዴታት ዘወፀእኣ ወፃኢ ዝምልከት ሓበሬታ ንምርካብ እየ። ዓላማ እዚ መፅናዕቲ ኣዴታት ሕልከላከ ጥዕና ኪጋጥመን ከሎ ዘወፀእኣ ወፃኢ ክንዴየናይ ኣብ ሰደራባተን ዘምፀኦ ፀገም ፈቲሸካ መፍቲሒኡ ተፈፃሚ ንምግባር እዩ። ተሳታፊ/ት ናይዚ መፅናዕቲ ንሙኂን ተመሪፅኩም/ክን ስለዘለኩም/ክን ዘድሊ ምትሕብባር ንክትገቡርለይን ፤ ንዝጥየቁ ሕቶታት ግቡእ መልሲ ንክትህቡኒ ብትሕትና ይላቦ። ኩሉ ኣብዚ እትህባኒ መረዳእታ ምስጢሩ ዝተሓለወ እዩ ። ነዚ ቃለ መሕተት ናይ ምግዳፍ/ምቁራፅ ወይ እውን ናይ ዘይምስታፍ መሰልኩም/ክን ዝተሓለወ እዩ።ኣብ እዚቃለ መሕተት ብምስታፍኩም/ክን እትረክብዎ ቀጥታዊ ዝኾነ ካሕሳ የለን።

ስለዚ ንምስታፍ ፍቓደኛ ዲኩም/ኽን?

ናይ " X " ምልክት ኣቐምጥ

ይስማማዕ _____ቀፅል

ኣይስማማዕን_____ኣቐርፅ

ዕለት

ሽም ሓታቲ_____ ሽም ተቐፃሪ _____

ፊርማ_____ ፊርማ_____

ዕለት _____ ዕለት_____

Annex 5: ትግርኛ ቃለ መሕትት

አብ መቀለ ከተማ ዝርከባ ኣዴታት ብዛዕባ ናይ ምስ ኣዴታት ዝተሓላለከ ፀገም ጥዕና ዘለወን ኣዴታት ዘወፀአአ ወፃኢ ዝምልከት ሓበሬታ ንምርካብ ንምፍታሽ ዝተዳለወ ቃለ መሕተት

ቁፅሪ /ኮድ ቃለ መሕትት፡_____

ሽም ሆስፒታል፡_____

መዘካከሪ: ካብቶም ዝተዋህቡ መማረፅታት ይሕረዩ/ያ፤ካሊእ ሓሳብ እንተሃልዩዎም አብቲ ክፍቲ ቦታ ይፀሓፉ።

ሀ. ስነህዝባዊን ማሕበራዊ ኩነታት ዝምልከቱ ሕቶታት			
ተ.ቁ	ሕቶ	መልሲ	መብርሒ
101	ዕድመ ብ ምሉእ ዓመት	_____	
102	ሃይማኖት	1.ኦርቶዶኩስ ተዋህዶ 2.ሙስሊም 3.ካቶሊክ 4.ፕሮቴስታንት 5.ካሊእ	
103	ኩነታት ሓዳር	1.ዘይተመርዓወ/ወት 2.ዝተመርዓወ/ወ 3.ዝተፋትሐ/ሐት 4.በዓል/ቲፃዝአን/ዝዘአምዝሞተን/ዝሞተቶም 5.ተፈላልዮም ዝነበሩ	
104	ብሄር	1. ትግራይ 2. አምሓራ 3. ኧሮብ 4. ካሊእ	
105	እትነበሩሉ ቦታ	1 ከተማ 2 ገጠር	

106	ደረጃ ትምህርቲ	1.ዲፕሎማ 2.ዲግሪ 3.ማስተርስን ካብኡ ንላዕሊ	
107	እትሰርሐኡ ስራሕ	1 መንግስቲ ሰራሕተኛ 2 መንግስታዊ ዘይኮነ 3 ነጋዴ 4 ማዓልታዊ ሰራሕተኛ 5 ገዛ ሰራሕተኛ 6 ኻሊእ	
108	ወርሃዊ ደሞዝ ብብር	_____	
ለ ኩነታት ጥዕናን ስነ ተዋለዶን ዝምልከቱ ሕቶ			
201	መበል ክንደይ ጥንስኪ እዩ?	_____	
202	ክንደይ ወሊድኪ?	_____	
207	ሐዚ ዘለክን ፀገም ጥዕና እንታይ እዩ?	ነ.መድመይቲ 2. ደም በዝሒ 3. ዝተሓላለኸ ናይ ምውላድ ፀገም	
208	ዓይነት አወላልዳ	1. ብመሳርሒ 2. ብማህፀን 3. ብመጥባሕቲ	
212	ነቲ ሕማም ንምሕካም ዝከፈልክንኡ	1. ብነፃ 2. ካብ ጁባይ ኣወፂእ	

	ክፊሊተ	3. ተለኪሐ 4. ኻሊእ	

Direct Cost (Medical, From Patients Card)

Type of complication_____

I. Patients' Investigation Costs (From Patients Card)

S.No	Description of Investigation Type and procedures	Units* Cost per patient	No. of times? Per stay	Total Cost
1	Hemoglobin			
2	Urine analysis			
3	Complete blood count			
4	Organ function test			
5	Blood group			
6	VDRL			
7	HBsAg			
8	HCV			
9	RBS			
10	FBS			

Drug Costs (From Patients Card)

Type of complication_____

S.No	Description of Treatment Type	Units* Cost per dose per patient	Total number of dose Per stay	Total cost
1	Iron float			
2	Tramadol50 mg IV QID			

3	Oxytocin			
4	Mgso4			
5	Hydralazine			
6	Ceftriaxone			
7	Bupivacaine			
8				
9				
10				

ሐ ግልጋሎት ሕክምናን ዝወፀ መጠን ገንዘብን ዝምልከት ሕቶ

301	ክትትል ጥንሲ ነይርካን ዶ	1. እወ 2. ኣይነበረንን	
302	301 እወ እንተኮይኑ ክንደይ ግዜ ከይዲክን	1. ሓደ ግዜ 2. ክልተ ግዜ 3. ሰለስተ ግዜ 4. ኣርባዕተ ግዜ 5. ልዕሊኡ	
306	ኣብዚ ሐዚ እዋን ዝወሰድካንኣ ዓይነት መድሓኒት ኣሎ ዶ	1. እወ 2. ኣይፋሉን	
307	መልሲ 306 እወ እንተኮይኑ ብከመይ ረኪብክንኣ	1. ብነፃ 2. ጁባይ ኣዉፂኤ 3. ካብ ሰብ ተለኪሐ 4. ኻሊእ	
308	ኣብዚ ናይ ሐዚ ጥንሲኪ ክንደይ ግዜ ላብራቶሪ ኣስሪሕኺ	_____	

309	እቲ ላብራቶሪ ኣበይ ኣሰሪሕኽዮ ነይሪኪ	1.ኣብዚ ሆስፒታል 2. ካብዚ ሆስፒታል ወፃኢ	
310	እቲ ላብራቶሪ ንምስራሕ ዝኽፈልክንኦ መጠን ገንዘብ ክንደይ ይበፅሕ	_____ብብር	
314	ንስኽን ካብ ስራሕ ክንደይ መዓልቲ ከሪክን	_____መዓልቲ	
315	ጠክላላ ንመድሓኒት ዝኸፈልክንኦ መጠን ገንዘብ ክንደት እዩ	_____ብብር	
316	ጠክላላ ንላብላቶሪ ዝኸፈልክንኦ መጠን ገንዘብ ክንደት እዩ	_____ብብር	
317			

ኣደታት ንምግብን ንመጋዓዝያን ዘውፀእኦ ወፃኢ

ሕቶ	መልሲ	መብርሂ
1. ናብዚ ክትመፃ ከለክን ብምንታይ መፂእክን	1. ብእግረይ 2. ብመኪና 3. ካሊእ	
2. ካብዚ ናብ ገዛክ ዘሎ ርሕክት ክንደይ ኪሜ ይኸውን	_____ ኪሜ	
3. ጠክላላ ንመጋዓዝያን ዝከዝከፈልክንኦ መጠን ገንዘብ	_____ብብር	

ምስመላዓሊክንሓዊሱ ክንደት እዩ		
4. ንምግብን ዝከፈልክንአ መጠን ገንዘብ ምስመላዓሊክንሓዊሱ ክንደት እዩ	_____ብብር	
5. ምክንያት እዚ ናይ ሐዚ ሕማም ካብቲ ናይ ኩሉ ግዜ ዝትወስደአ ዓይነት ምግቢ ወፃኢ ወሲድክዶ	1. እወ 2. አይፋሉን	
6. እወ እንተኮይኑ ክንደይ ከርሺ ወዲእልክን	_____ብብር	
7. ካሊእ ወፃኢ እንተሊዩ	_____ብብር	
8. ንክትትል ሕማምክን ናብ ሆስፒታል ክንደይ ግዜ መፂእክን	_____ በዝሒ	
9. አብቲ ሆስፒታል ዝትፀንሐአ ግዜ ሓዊሱ ካብ ገዛክን ናብዚ ሆስፒታል ዝወሰደልክን ሰዓት	_____ ሰዓት	
10. ብሓኪም ንምርኣይን ላብራቶሪ ንምስራሕን ዝወደአልክን ግዜ	_____ሰዓት	
11. ጠክላላ ካብ ስራሕ ዝከረክንአ ናይ ስራሕ መዓልቲ	_____መዓልቲ	

Annex 6: Assurance of principal investigator

The undersigned agrees to accept responsibility for the scientific ethical and technical conduct of the research project and for provision of required progress reports per terms and conditions of the research publications office in effect at the time of grant is forwarded as the result of this application.

Name of the student: _____

Date._____ signature _____

Approval of the primary advisor

Name of the primary advisor: _____

Date._____ signature _____

Name of the External examainer: _____

Date._____ signature _____

Name of the internal examainer: _____

Date._____ signature _____