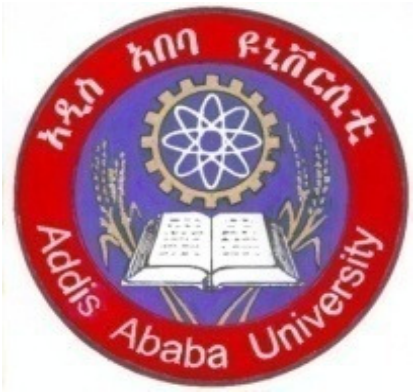
Cost of Major Mental Illnesses to the Public Health Service Provider, Amanuel Hospital, Ethiopia



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Acronyms

CI	Confidence Interval
ETB	Ethiopian Birr
E.C.	Ethiopian Calendar
G.C.	Gregorian Calendar
HRQOL	Health-Related Quality of Life
ICCMH	Integrated Clinical and Community Mental Health
ICD-10	International Classification of Diseases Ten
mhGAP	Mental Health Global Action Programme
SNNPR	Southern Nations, Nationalities and Peoples Region
SPSS	Statistical Package for Social Sciences
WHO	World Health Organization

Abstract

Background: Mental health is about enhancing competencies of individuals and communities and enabling them to achieve their self-determined goals. Since mental illness is problem of society as a whole, it is a major challenge to global development.

Objectives: To estimate the economic cost of major mental illnesses and determinants of cost from the public health service provider's perspective.

Methods: The design of the research was hospital based cross sectional quantitative survey. The costing method that the research used was prevalence based bottom-up costing approach. The cost identified is direct costs incurred by the health service provider for providing mental health service during one year period for major mental illnesses. Using this method cost was estimated by calculating average costs of major mental illnesses (Schizophrenia and Bi-polar). The average cost of treatment was identified by adding together the various pieces of cost of treatment. Cost items identified from outpatient, inpatient and emergency departments and laboratory units. Additionally physical resources of the hospital used were also added.

Results: The hospital incurred a unit cost of 1,204.2 ETB to provide mental health services for major mental illnesses. The marginal cost of providing health care for each additional patient at the hospital was 118 ETB. The hospital incurred a unit cost of 229.3 ETB to provide emergency health service, 23,016.1 ETB to provide inpatient health and 611.4 ETB to provide outpatient health service for major mental illnesses. Among the total hospital cost the drugs cost amount was 31.5 ETB, 220.4 ETB and 496.6 ETB for providing emergency, inpatient and outpatient mental health service respectively.

Conclusion: Distribution of the hospital cost significantly differs by the residence area of the patients. Distribution of the hospital outpatient cost significantly differs by the number of visits made to the outpatient department of the hospital. Providing inpatient mental health service is more costly than outpatient and emergency mental health services.

1. Introduction

1.1. Background

Mental health is about enhancing competencies of individuals and communities to enable them achieve their self-determined goals. Mental illness is problem of society as a whole and major challenge to global development. Even though no group is immune to mental disorders, the risk is higher among the poor, homeless, the unemployed, people with low education, victims of violence, migrants and refugees, abused women and the neglected elderly. Mental, physical and social health are closely interwoven and vital strands of life. As this interdependent relationship grows, mental health is crucial to the overall well-being of individuals, societies and countries. Unfortunately, in most parts of the world, mental health and mental disorders are not accorded the same importance as physical health. Rather, they have been largely ignored or neglected (1).

Mental health is an essential component of economic productivity and well-being. Without mental health interventions, cost of care and treatment increases. Inaction related to mental health generates additional current and future costs. Not investing in mental health is very expensive (2).

Cost of illness Study is a partial economic evaluation method aiming to measure the burden of illness. It is a tool to inform decision makers. It is also a descriptive study that provides information to support political process as well as the management functions (3). Analyzing cost of illness presents useful opportunities for communicating with the public and policy makers on burden of specific diseases and injuries (4). The study was conducted to estimate the cost of major mental illnesses on the health service provider (government). It is aimed to complement the cost information gap on the cost of major mental illnesses on the government. Schizophrenia and Bi-polar disorders are selected for the study as major mental illnesses since they are the first top ten categories of diseases for hospitalization.

1.2. Statement of the Problem

About 14% of the global burden of disease has been attributed to neuropsychiatric disorders. The burden is due to the chronically disabling nature of depression and other common mental disorders, alcohol-use and substance-use disorders, and psychoses. Such estimates have drawn attention to the importance of mental disorders in public health. The estimates stress separate contributions of mental and physical disorders to disability and mortality, they might have entrenched the alienation of mental health from mainstream efforts to improve health (5).

The burden of mental disorders is likely to have been underestimated because of inadequate appreciation of the connectedness between mental illness, other health conditions and burden on the health service provider. In terms of contribution to disability adjusted life year (DALY) mental illnesses accounts about 28% of the total non communicable diseases. Over 80 percent of people with mental and psychosocial disabilities live in developing countries and have little to no access to any form of psychological or psychiatric treatments (5).

Previous studies conducted on economic burden of mental illnesses in Ethiopia indicate that no study has documented about cost of mental illness treatment from the health service provider perspective (6-9).

1.3. Significance of the Study

Resources are scarce and cost of health care is rising from time to time. Hence it is critical to have an understanding of the cost of major mental illnesses on the government in order to implement sound public health and prevention policies. It also helps to practice result based government resource allocation (budgeting) for public health institutions.

Cost-of-illness study is used to estimate cost of treating patients with major mental illnesses to the hospital (government). This enable to identify how much additional cost would be incurred to provide health and health related services to patients with major mental illnesses. Alternatively, it shows how much resource is required to commence new service or to expand available service for specific target population.

2. **Literature Review**

2.1. Prevalence of Mental Illness in Ethiopia

Mental health is more than mental disorders. As stressed in WHO's definition of health: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." Mental health include subjective well-being, perceived self-efficacy, autonomy, competence, intergenerational dependence and recognition of the ability to realize one's intellectual and emotional potential (1).

Mental health has positive and negative dimensions. The positive dimension refers to the concepts of well-being and ability to cope in the face of adversity. The negative dimension relates to the presence of symptoms defined as psychological distress as well as to mental disorders. These mental disorders are defined through recognized classifications such as the International Classification of Disease (ICD10). Mental health is influenced by a wide range of factors, which include individual biological and psychological factors, social interaction, societal structures or resources and cultural values. Crucial demographic factors which relate to mental health are sex, age, marital status, ethnicity and socio-economic status. Socio-demographic factors can combine with personality characteristics to influence the onset, course, restitution and relapse of disorders in various ways (10).

The prevalence of mental illness in Ethiopia is almost the same as the western settings that underlies the illness is not a luxury of westerns. In the country the incidence of the Schizophrenia is 0.5, Bipolar Disorder 0.5, Depression 5, Suicide attempt 0.2, Alcohol drinking problem 2.2-3.7, Alcohol dependence 1.5, Canabis abuse 1.5, Childhood mental illnesses 12-25 and epilepsy 1 per 100,000 (11).

2.2. Mental Health Service Provision

There is controversy on whether mental health services should be provided in community or hospital settings. There is no worldwide consensus on which mental health service models are appropriate in low, middle and high income countries. The evidence supports a balanced approach, including both community and hospital services. Areas with low levels of resources may focus on improving primary care, with specialist back-up. Areas with medium resources may additionally provide out-patient clinics, community mental health teams, acute in-patient care, community residential care and forms of employment and occupation. High-resource areas may provide all the above, together with more specialized services (12).

The mental health services are also provided in low income countries with the help of development partners. But the services provided in this manner have challenges. Two common challenges were found in Nigeria on services provided by development partners. The program become donor dependent i.e. without the donor funding it is unlikely that the program would continue to exist. The second challenge is lack of human resources for providing the care. This evidence also states that when planning or establishing mental health service programs it is critical to consider whether program resources are reasonably sufficient for providing services in the intended catchment area assuring quality of the services (13).

2.3. Mental Illnesses and Co-morbidities

Drug abuse and mental disorders commonly co-occur because of overlapping genetic vulnerabilities, overlapping environmental triggers, involvement of similar brain regions, and drug abuse (14).

Studies revealed a high frequency of co-morbidities of mental and behavioral disorders among patients with chemical dependency who sought the care from Alcohol and Other Drug Psychosocial Care Centers. These diagnoses need to be made to optimize treatment. The relevance of waiting for at least one month of abstinence before a diagnosis of co-morbidities of mental and behavioral disorders should be emphasized, especially when it

comes to diagnoses of depressive disorders and anxiety disorders. However, diagnosing co-morbidities of mental and behavioral disorders, even in the period of detoxification, can increase the likelihood of adherence to treatment (15).

The co morbidity group in mentally ill persons had the highest proportion of smokers of all the groups. For both males and females, there were higher proportions of smokers in the groups with a mental disorder compared with the groups without a mental disorder. Slightly higher proportions of males were smokers compared with females in the co morbidity groups. There was a higher proportion of risky alcohol behavior among males in the co-morbidity group compared with the other groups, with substantially higher prevalence in the co-morbidity group. For females, risky alcohol consumption was also more prevalent in the groups with a mental disorder compared with the two groups without a mental disorder. A higher proportion of males than females were overweight (but not obese). Obesity was more prevalent among females in all the population groups except in the group with 'no mental disorder or physical condition'. There was little variation across the groups in the proportion of females that were overweight, with more variation seen among males. In the case of obesity, there was substantially more variation for both males and females, with higher prevalence seen amongst the co-morbidity group and the 'any physical condition only' group (16).

2.4. Mental Health and Development

Work and employment represent important objectives for people with poor mental health and are important elements of a holistic community care programme. Active participation in the workforce brings with it many clinical, economic and social benefits and plays an important role in enabling people with mental health problems to become integrated into the community in which they live by fostering self esteem. Poor mental health imposes a great variety of consequences on individuals, families and caregivers, and society. The consequences of poor mental health is the pain (physical, emotional, mental and existential), effects on physical health, personal relationships, access to employment and housing, ability to participate in society, and a higher risk of being incarcerated in prison. In addition, the vast majority of families and care givers devote considerable amounts of time

and resources to helping those with the effects of mental health problems. The wider society provides health and other services to people with mental health problems which may be publicly resourced (17).

2.5. Cost of Illness Study and Economics of Mental Illness

Cost of illness studies translates burden of diseases or injuries into monetary terms, the universal language of decision makers and the policy arena i.e. It attaches monetary values to a variety of societal or governmental costs associated with a particular disorder often expressed as an annual estimate aggregated across all involved agencies. The principal aim of this is to influence policy-making and resource allocation by demonstrating the relative magnitude or burden associated with a particular disorder (18).

The economic burden is defined in terms of three measures of economic cost. Direct and indirect resource costs, government and private insurer transfers and losses in health-related quality of life or in terms of the various costs born by the three economic agents (i.e., government, private insurers and households and businesses). A full economic assessment considers all three measures of economic cost in analyzing spending decisions which basically includes direct resource costs, indirect resource (work-loss) costs, government transfer payments, private insurer's disability payments, and losses in health-related quality of life (HRQOL) (19).

Cost-of-illness estimates are a useful measure of the potential cost savings to society only in the case where preventive interventions that could completely prevent the illness are known. There are three potential uses of cost-of-illness estimates of mental health problems: it highlight the scale of the problem, inform health and social care spending decisions and show the distribution of costs. The information contained in a cost-of-illness study certainly provides a useful framework for considering the scale of the problem. The cost exercise offers information about the amount of resources consumed due to a particular illness, as well as identifying where these resources are being employed. This helps decision-makers to become knowledgeable about actual resource allocation.

This also reveals how the impact of mental illness is distributed across different population cohorts and what services are responsible for most of the burden. A cost-of-illness study also indicates where resources need to be directed among management functions of the organization. Similarly, it may be necessary to get some indication of the indirect effects that poor mental health has on the economy and society in general (17).

Costs of mental illnesses depend on some of the demographic factors such as age, marital status, and employment type (20).

The aim of hospitals unit cost analysis is to allocate hospital costs (direct and indirect) to patient care centers or departments and also intermediate departments whose costs are to be measured. Since the problems and responses often differ according to the line item, the costs of illness can be divided and analyzed categorizing into line items including salaries, fringe benefits, donated items, ministry of health spending, drugs, fuel, maintenance, spending from user fee revenue, delayed payments, capital items. Hospitals can use cost information to establish rates and comply with both internal and external reporting requirements, determine whether departments are operating within budget, construct a budget for a department or new initiative, and allocate budgets among departments or cost centers (21).

2.6. Determinants of cost of mental illnesses

Costs of mental illnesses depend on different factors. Studies conducted on relapse and predictors of relapse in treatment of Schizophrenia reveal that due to relapse direct mental health costs that extend to beyond the cost of hospitalization to other costly outpatient services and medication costs. This difference was primarily driven by a higher number of hospitalizations and longer hospital stay per admission. Importantly, the expected higher acute care costs of relapsed patients were accompanied by higher costs for various outpatient services and medication, suggesting that the cost of relapse is not confined to the cost of hospitalizations and emergency services as payers tend to believe, as relapse is also linked to more intense and thus more costly medication management, day treatment, individual therapy, and case management (22).

Another study indentified that age, sex, years of education, and symptoms of illness are major factors that affect the cost of mental health service. In this study it was found that higher cost is associated with being male, Costs might rise with age because people lose support of informal care givers as get older and older, clients with more symptoms had higher service cost and also costs were inversely associated with years of education (23).

The way of life of patients also determines cost of treatment for mental illnesses. The study demonstrates that for schizophrenia specific patients overall health care costs of unstable patients are clearly higher than is the case with stable patients and mainly determined by inpatient hospital treatment (24).

2.7. Burden of Mental Illness

Another way of looking impact of mental illness is through asking what proportion of suffering in the community is due to mental as opposed to physical illness. We can define those who are suffering as those who are least satisfied with their lives (17, 25).

Traditionally, the health burden of an illness has been measured only in terms of morbidity and mortality, indices which are well suited for acute diseases but not for chronic, disabling and recurring diseases such as mental and substance use disorders. One way to capture the chronicity of disorders and the disability caused by them is the Global Burden of Disease methodology. It uses Disability-Adjusted Life Year to quantify the disease burden (19).

Data from the Global Burden of Disease project reveal that while neuropsychiatric conditions were responsible for slightly more than 1% of deaths in 1990, they accounted for 10.5% of disease burden worldwide, measured in Disability-Adjusted Life Year's. In 2002, the disease burden was 13% and it is estimated that the burden share will increase to 15% by 2020. It is anticipated to become the second leading cause of disease burden worldwide by 2030, behind ischaemic heart disease. In developed countries, not only is uni-polar depression projected to be the leading cause of disease burden, Alzheimer and other dementias, and alcohol use disorders are also projected to be among the top four causes of disease burden in 2030. Considering the disability component alone, Global Burden of Disease 2002 estimates that neuropsychiatric conditions accounted for 31.7% of

all years lived with disability, with uni-polar depression being the leading cause of disability worldwide, accounting for 11.8% of the total years lived with disability (19).

With public spending of resources under intense scrutiny, it is more important than ever to ensure that the funds available are serving the nation's highest priority health needs efficiently. Because of the increasing complexities of public health problems and activities, we need to bring to bear a wide array of quantitative approaches and solutions to these problems. Cost of illness studies provide an important guide and resource for policy development, priority setting, and management of public health (26).

Data on each of cost categories can be extracted by employing either a top-down or bottom-up approach for estimating the service provider side direct costs. The latter examines the records of a sample of service users or follows a sample of service users' of health services to estimate cost of illness. Sample of service users can be extracted from different health service provision units of the health facilities which are called cost centers or departments such as outpatient, inpatient and emergency. The bottom-up method requires a representative sample to undertake. A top-down approach relies on available aggregate or national figures of health services utilization or morbidity/mortality information by identifying particular disease codes. Therefore, studies employing this approach tend to be representative of national populations and less costly to undertake. The national survey data provide not only prevalence rates but also access rates (17).

Most of existing evidences on mental illnesses in Ethiopia show how much huge the problem is in terms of its impact on morbidity and mortality. Evidence also show that how much big its economic burden is on the society was studied but it's not known about the cost of mental illnesses from the service provider or government perspective.

Therefore this study was intended to fill the information gap on the cost of mental illness on the service provider using the bottom up costing method. The study was conducted by collecting data on the time taking to provide health services, drugs and reagents used, capital items of the hospital and recurrent costs incurred to provide the service. The data was collected from four major health service provision centers or departments of the

hospital. This includes outpatient department, inpatient department, emergency department and laboratory unit. The result of the study will help other researchers, planners, policy makers, and program mangers as a decision making tool and reference material.

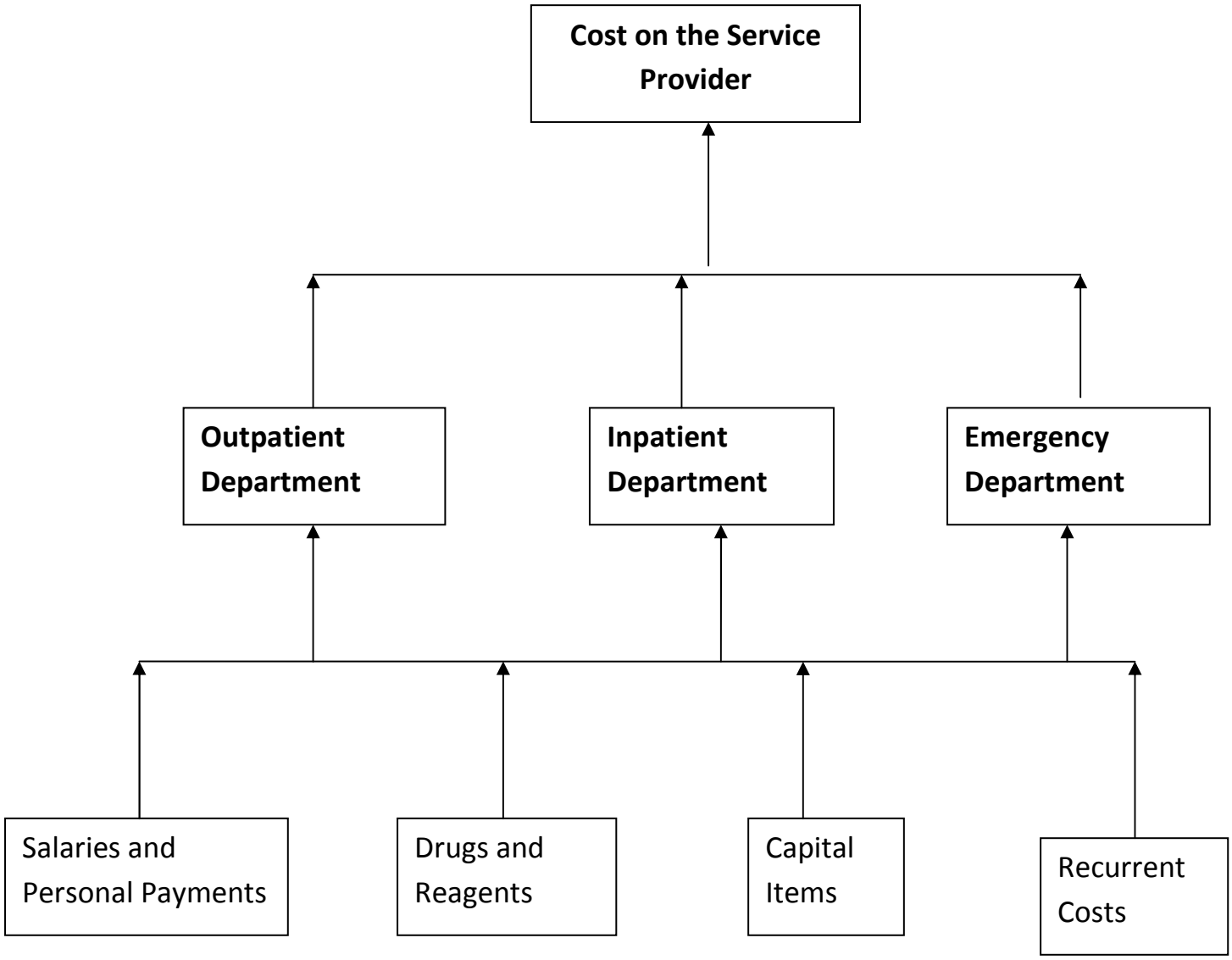

Figure 1: Conceptual framework of the Study, Addis Ababa, Ethiopia, 2013

3. Objectives

3.1. The general objective of the research was to estimate the economic cost of major mental illnesses from the public health service provider perspective.

3.2. The specific objectives were:-

- To estimate cost incurred as a result of major mental illnesses per individual patients,
- To estimate cost of major mental illnesses at cost centers of the hospital under study,
- To compare distribution of cost of major mental illnesses to the hospital,

4. Methods

4.1. Study design

The design of the research was hospital based cross sectional quantitative survey. Cross sectional study was selected due to relatively inexpensive and takes up little time to conduct, can estimate outcome of interest because sample was taken from the total patients visited the hospital, useful for public health planning, and there is no loss to follow-up (27). The costing method that the research used was prevalence based bottom-up costing approach since the cost identified is direct costs incurred by the health service provider for providing mental health service during one year period for major mental illnesses. Using this method cost was estimated by calculating average costs of major mental illnesses (Schizophrenia and Bi-polar). The average cost of treatment was identified by adding together the various pieces of treatment from outpatient, inpatient and emergency departments and laboratory unit as well as other resources used.

4.2. Study area

The study was conducted at Amanuel Hospital which is located in Addis Ababa. The Hospital was established by the year 1938 G.C. by the Italians to be used as a quarantine center for the mentally ill ones. Currently the Hospital provides mental health services for patients coming from every corner of the country. The Hospital has about 300 beds, 11 psychiatry specialists, 14 general practitioners, 111 clinical and psychiatry nurses, 29 public health professionals, 22 pharmacists and 11 laboratory technicians and technologists, and 285 administration staffs. In addition to health service provision, the hospital also engaged in teaching and research activities. Currently the hospital is one among the four specialized hospitals administered under Federal Ministry of Health.

4.3. Study Population

Source population

The source population for the study was all medical record of patients who have visited Amanuel Hospital at outpatient department, emergency department and inpatient department between November 2011 and December 2012 and diagnosed to have Schizophrenia and Bi-polar disorders. Health Professionals in the hospital that are directly dealing with providing care was also source population for the expertise judgment made about the time taking for treating and making diagnosis for schizophrenia and bi-polar disorders at the outpatient, emergency, inpatient departments and laboratory unit. The experts working in finance and administration department of the hospital were source for determining the current value of the capital items and recurrent costs.

Study population:

The study population for the research was medical record of patients diagnosed for schizophrenia and bi-polar disorders from those visited the hospital during the month of December 2012 and selected using systematic random sampling procedure. The month was selected since it was the most recent month for which complete report was available at the hospital by the time of the project identification.

Randomly selected patient medical record cards from the hospitals' outpatient, emergency and inpatient departments were assigned for data collection using check list. The medical register was used for assigning the patient's medical record cards for review. The number of medical record cards assigned for review was made to be proportionate to the number of all available medical record cards of patients that visited the hospital during the month of December 2012 G.C. from each of three departments. The sampling interval to be taken between the medical record cards to be reviewed was identified. This interval between the medical record cards reviewed was identified based on the proportion of cards to be reviewed and the number of patients visited the hospital during the month of December 2012 for the two major mental illnesses.

From each category of health professionals that are providing health care service 3 psychiatry specialists, 5 general practitioners, 11 clinical and psychiatry nurses, 6 public health professionals, 5 pharmacists and 3 laboratory technicians and technologists 3 ICCMH, and 1 Psychologist participated. They were asked to made expertise judgment in their professional group on the time taking for treating and making diagnosis for the schizophrenia, bi-polar disorders to minimize the bias.

In addition the value of the capital items was estimated with the experts from finance and administration department of the hospital and recurrent costs were taken from the account section of the hospital. For selecting the professionals for making the expertise judgment year of service was taken into consideration i.e. those working in the department for more than a year were included in the expert judgment process.

Table 1:- Time cost of providing health service by categories of health professionals to major mental illnesses, Amanuel hospital, Ethiopia, 2013

S.N.	Types of Professionals Provided care	Average Salary	Time taking (Minutes)		Cost (ETB)	
			First contact	Repeat contact	First contact	Repeat contact
1	Psychiatry specialists	7619	40	20	21	10.6
2	General practitioners	3414	40	20	9.4	4.7
3	Clinical nurses	1200	40	20	3.32	1.66
4	Psychiatry nurses	2151	40	20	6	2.9
5	Public health professionals	2989	40	20	8.3	4.2
6	Pharmacists	2989	20	10	4.2	2.1
7	Laboratory technicians and Technologists	2989	60	60	12.4	12.4
8	Psychologist	3414	40	20	9.4	4.7
9	ICCMH	3414	40	20	9.4	4.7

4.4. Inclusion criteria:

Only patient medical cards of the schizophrenia and bi-polar disorders that was systematically selected based on the interval identified among those attended the hospital in the month of December 2012 with complete patient medical cards was included in the study (408 medical cards were included out of 10,182 medical cards). The health professionals and administration staff were included in the study for making expertise judgment was those working in the hospital for more than one year in the mentioned departments. Those professionals included in the study were asked for their service year in the department and asked their consent to participate in making expertise judgment.

4.5. Exclusion criteria:

Key informants i.e. health professionals and administration staffs that worked for the hospital for less than a year was also excluded from the study.

4.6. Sample size

The sample size of the study was determined using the continuous data sampling method (28). Based on the pilot test of the study tool (check list) done by reviewing history of 40 patients, at psychiatry unit of St. Paul hospital standard deviation of total outpatient cost was 706.68 ETB with 95% significance level and up to ±102.72 ETB acceptance of error the actual sample size was determined. In addition 10% incomplete records were considered by the time of determining sample size for the study. Thus,

$$n = \frac{(Z_{\alpha/2} + Z_{\beta})^2 \times \delta^2}{d^2}$$

Where n = Sample size needed

δ = standard deviation,

$Z_{\alpha/2}$ = 95% C.I, 1.96

Z_{β}= Desired Power of study which is 80% i.e. 0.84

d = the margin of error between the sample and the population, for standard deviation estimated which was 706.68 ETB

$$\frac{(1.96+.84)^2 * 706.68^2}{102.72^2} = 371$$

The total of 408 sample size was determined and reviewed for the study after adding 10%, i.e. 37 incomplete records.

4.7. Sampling Procedures

Systematic random sampling was used for identifying the medical record cards for the survey. The sampling procedure started by assigning intervals to be taken between medical record cards to be assigned for the study using the ratio between source medical record cards of patients and actual sample size to be taken for the study. The medical register used for assigning the patient's medical record for review since it was used for identifying the medical registration number, type of illness, and the month of registration for treatment.

After the first patient medical record card was randomly identified, based on the interval determined between the study patient medical record cards and study sample size, consecutive patient medical cards was selected for review at the three mental health service provision departments of the hospital. The sampling interval taken between the patient cards reviewed was 17 (seventeen) for emergency department, 10 (ten) for inpatient department and 15 (fifteen) for outpatient department.

This sampling procedure was selected because of its simplicity, allows degree of system or process into random selection of study population and the population can be evenly sampled. The number of medical cards to be reviewed was selected based on the proportion between sample size and actual number of patients visited the hospital during the month of December 2012. The following figure indicates the samples taken from departments compared to the source population.

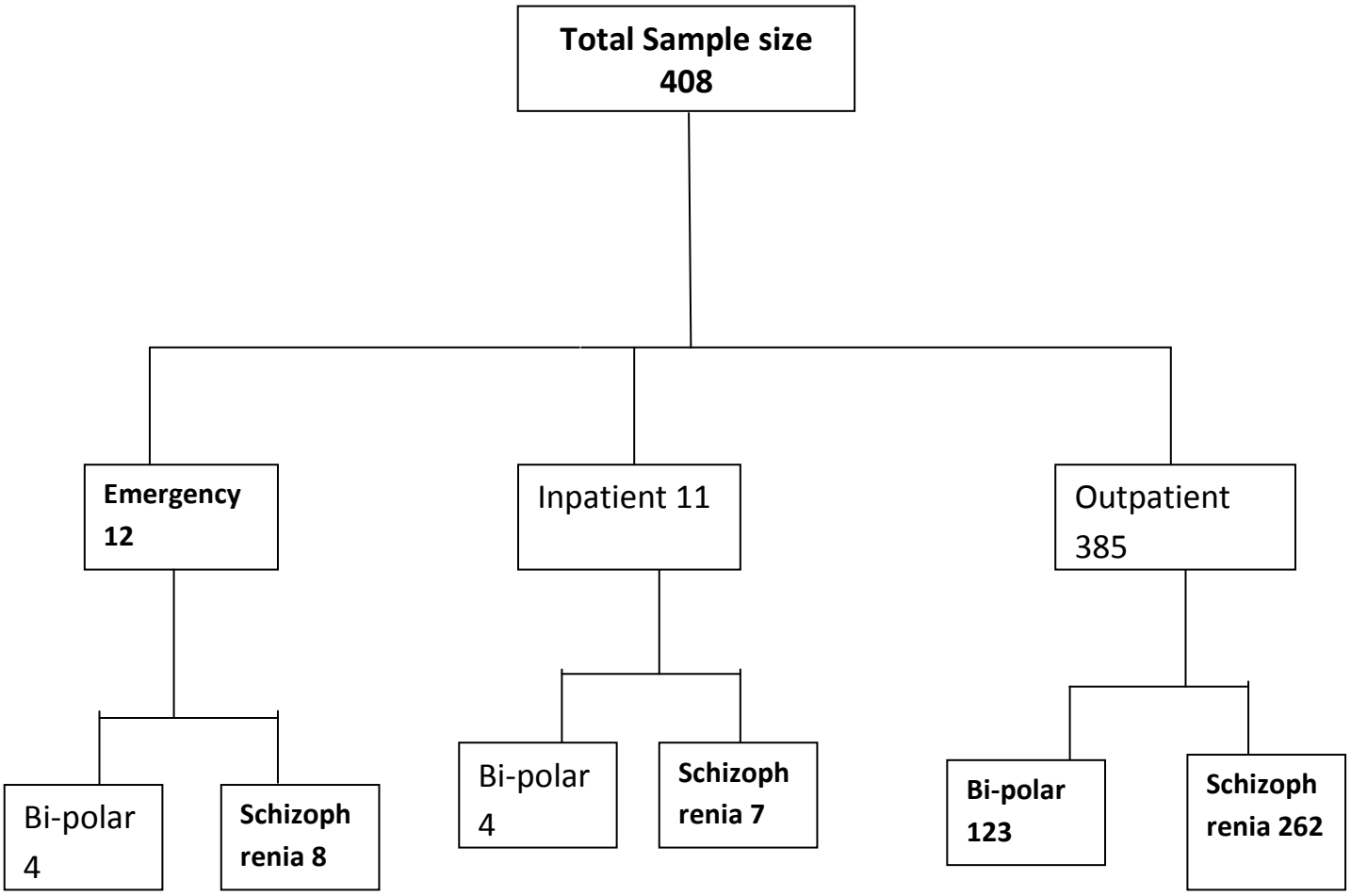

Figure 2: Sampling Procedure for the study, Addis Ababa, Ethiopia, 2013

4.8. Data Collection

Data was collected, using checklist developed by the principal investigator, for reviewing the history of patients. The checklist was prepared to accommodate the information, available on the medical record of the patients such as drug used for providing care, laboratory investigation ordered, health professionals provided the health care, number of visit or stay in the hospital and some of the socio demographic information of the patient, to be included in the survey. The checklist also used to aggregate information about the total hospital cost used for providing health service including value of the asset of the organization.

Depending on the study variables (both dependent and independent) checklist was developed and used as data collection instrument. The checklist was developed in order to capture the cost that the public health service provider i.e. the hospital incurred for providing care for schizophrenia and bi-polar disorders. The checklist was developed and organized to capture cost information from outpatient, inpatient and emergency departments and laboratory unit. The cost information was collected for the prescribed and used drugs, laboratory investigation and diagnosis, and recurrent cost incurred for service provision. The time that the health professionals spent in each department and unit for providing care, current values of the capital items of the organization was also captured by the check list. The checklist was developed by the researcher and it was pretested at St. Paul hospital psychiatry Unit before the actual data collection and corrections was made on the content of the checklist accordingly.

The data collectors were two Health Officers who had experience of working on mental health. Also there was one supervisor with the aforementioned experience. All three were trained for a day and made to be familiarized with the checklist. Training was provided on aim of the study, the contents of the checklist and how the data can be collected. Using the checklist the data collectors collected the mentioned information from the medical record of the patients and the hospital administration & finance unit also from expertise judgments made by the groups of the health professionals that are providing health care.

4.9. Identification, costing and valuing of resources

Detail of prescribed and used drugs including the frequency for which the drugs were prescribed during the mentioned period of time, medical equipment used, reagents for diagnostic tests. Type of illness identified or diagnosed, Number of Visits made to the hospital was counted and identified for the period of December 2011 to November 2012. Those listed items were collected and converted to monetary value based on the cost of the items used collected from the hospital.

Type of health professionals provided the care were identified from the medical records. Frequency of visits seen by the mentioned category of the health professionals were also identified also the visit was further identified if it included the first visit of the patient since the first visit takes more time than the following visits. The total cost for the professional time was the time taking to give care which was taken from the interview made with the group of health professions, i.e. psychiatry specialists, general practitioners, clinical nurses, psychiatry nurses, public health professionals, pharmacists and laboratory technicians and technologists, ICCMHs and Psychologist for the patients, multiplied by the salary of the given profession.

The Hospital inpatient, emergency and outpatient was the total cost of the hospital's capital items used for providing the services and also the recurrent cost the hospital incur for providing the day to day activities in each department. The method of amortizing the capital items cost per the patient follows linear method, in which the value of the capital items used were shared equally along the years. Then the annual values will be shared equally for the months of the year and then multiplied with the number of the time medical equipment used for the patient to provide the services. The life years taken for the hospital building was 30 years, medical equipment was 5 years and office equipment was 10 years. Most of the hospital's capital assets were not included in the analysis due to lack of information on assets gained by donation, lack of appropriate record and most of capital items are greater than their expected life years.

Based on the above method the hospital cost was collected and categorized into cost of salary for the health professionals and support staffs, personal payments, cost of goods and

services(which include Uniforms, clothing, Bedding, Office supplies, Printing, Educational supplies, Fuel And lubricants, Other materials & supplies, Miscellaneous equipment, Other equipment, Perdium payments, Transport Fees, Official Entertainment, Maintenance and repair of vehicles & other transport, Maintenance and repair of plant ,and machinery & equipment, Maintenance and repair of buildings, Furnishing & fixtures, Contracted professional services, Advertising, Insurance, Freight, Fees and charges, Electricity charges, Telecommunication charges and Water and other utilities), drug and reagents cost and capital assets cost. The cost of items such as drugs, reagents and salary of health professionals used was the mid-year cost to avoid variation of costs among the months of the year. Additionally the capital items included were amortized to its current value i.e. the April month of 2013.

4.10. Variables

Dependent variable: Cost of major mental illnesses per year.

Independent variables: Salary cost for health professionals and support staffs, personal payments, cost of goods and services, drugs and reagents cost and capital assets cost.

4.11. Data Analysis Procedures

Collected data was entered and cleaned using EPI info and analysis was done using statistical package for social sciences (SPSS) version 16 and Microsoft Excel 2007. Data analysis was performed by descriptive statistics using scores, frequency, percentage, mean, standard deviation and median to describe the results. Additionally non parametric tests was used to compare the distribution of the hospital cost on different groups of the independent variables i.e. Kruskal Wallis for variables which has more than two independent groups and Mann-Whitney test for variables which have only two independent groups. Groups of patients were formed based on socio demographic characteristics, type of illness identified, number of visit made to the hospital and inpatient days spent in the hospital.

4.12. Data Quality Management

Different measures were taken to maintain the quality of the data. Training was given for the data collectors and supervisor about the objective of the study and the checklist that used for data collection. The checklist was pre-tested prior to the actual data collection time and corrections were made accordingly specially on the types of health professionals to be included in the checklist, and the organization of the check list. Experienced data collectors and supervisor was employed for the data collection and supervision. The supervisor and principal investigator performed close supervision by the time of data collection. Submitted filled checklists by data collectors were checked for completeness and consistency daily by supervisor and principal investigator. The questions on the checklist were coded and data entry and cleaning was carefully conducted.

4.13. Ethical considerations

The study protocol was approved by the ethical committee of the School of Public Health. An official letter was written by the School to Amanuel Hospital. The Ethical clearance committee of the hospital also reviewed the study protocol and approved it. Discussion was held with the hospital management in order to get informed consent. Collection of data was taken place after assuring the confidentiality nature of the patient's records.

4.14. Operational Definitions

Mental Illness: - Conditions characterized by impairment of an individual's normal cognitive, emotional, or behavioral functioning, and caused by social, psychological, biochemical, genetic, or other factors, such as infection or head trauma.

Bi-polar: - a severe mental illness characterized by recurrent episodes of elated or depressed mood,

Schizophrenia: - severe universally common psychiatric illness characterized by distortions in thinking, perception and inappropriate emotions,

Cost: - Value of resources used to purchase services or other resources for treating major mental illnesses.

Direct Cost: - It is the costs of resources used by the hospital to provide health service for treating schizophrenia and bipolar mental illnesses. Costs of resources used include physician inpatient, physician outpatient, physician emergency, specialists' and other health professionals' care, personal payments, diagnostic tests, prescribed drugs, reagents used, medical equipment, other capital items and also recurrent expenditures of the hospital.

Health Service Provider: - In this research health service provider refers to the hospital as a whole not only the health professionals who are working in the hospital.

Unit Cost: - Th**e** cost incurred by a hospital to provide mental health service for one patient

Marginal Cost: - The change in total cost that comes from providing mental health service for one additional patient.

5. Results

A total of 408 patient cards were reviewed from those who had visited outpatient, emergency and inpatient departments. In this manner from outpatient department 262 schizophrenia and 123 bi-polar patient cards, from emergency department 8 schizophrenia and 4 bi-polar patient cards, and from inpatient department 7 schizophrenia and 4 bi-polar patient cards were reviewed for the study.

5.1. Socio-demographic characteristics

The mean age of the patients was 33 years. The youngest patient was 4 years while the oldest one was 81 years old. Majority of the patients whose history reviewed were within the age group of 21-30 years 152 (37.3%), 277 (56.2%) was single by marital status, 126 (35.3%) were completed high school education, Orthodox Christians 233 (57.5%) by religion, half of them were jobless, 226 (55.4%) were dwellers of Addis Ababa and Amhara's 142(35.3%) by ethnic group(Table 2).

Table 2: Socio-Demographic characteristics of the Schizophrenia and Bipolar patients, Amanuel Hospital, Ethiopia, 2013

Variables	Frequency	Percent
Sex		
Female	189	46
Male	219	54
Age group (In years)		
4-20	39	10
21-30	152	37
31-40	148	36
41-50	45	11
50-81	24	6

Table continued

Marital Status		
Married	130	32
Single	227	56
Divorced	38	9
Widowed	9	2
Educational Status		
Illiterate	63	18
1-4 (Grade)	18	5
5-8 (Grade)	82	23
9-12 (Grade)	126	35
College and above	68	19
Residence Area		
Addis Ababa	226	55
Amhara	31	8
Oromiya	89	22
SNNP	58	14
Others	4	1
Occupation		
Civil Servant	29	8
Farmer	44	13
Jobless	179	51
Merchant	31	9
Private Employment	24	7
Student	43	12
Religion		
Muslim	120	30

Table continued

Orthodox	233	58
Others	2	0
Protestant	50	12
Ethnicity		
Amhara	142	35
Gurage	81	20
Oromo	120	30
Other	47	12
Tigre	12	3

5.2. Total cost of the Hospital

The hospital incurred a cost with mean 1,204.2 ETB and median of 446.5 ETB for providing health care and related services for the Schizophrenia and Bi-polar patients (Table 3).

Table 3: Total Cost of the Amanuel Hospital, Ethiopia, 2013

	Median (ETB)	Std. Deviation (ETB)	Mean (ETB)
Total Hospital Cost	446.5	4,080.9	1204.2
Salary cost for health professionals	29.0	26.1	36.6
Personal Payments	45.0	949.9	197.2
Goods and Services	14.0	854.2	145.4
Fixed Assets	35.5	2,272.1	386.2
Cost of Drug	289.5	547.3	475.4

Out of the total budget allocated to the hospital during the aforementioned time the mean amount of cost incurred to provide health care and related services for schizophrenia patients was 1,102.7 ETB and also 1,418.7 ETB for the bi-polar patients. Resources used to provide health and health related services for the patients include human resource, goods and services, capital assets of the hospital, drugs and reagents.

Amanuel hospital incurred a unit cost of 1,204.2 ETB to provide mental health services for major mental illnesses (Table 4). The marginal cost of providing health care for each additional patient at the hospital was 118.0 ETB.

Table 4: Total Cost of the Amanuel Hospital for each specific major mental illnesses, Amanuel Hospital, Ethiopia, 2013

	Cost items	Std. Deviation (ETB)	Median (ETB)	Mean (ETB)
Schizophrenia	Total Hospital Cost	4,261.1	346.00	1102.7
	Salary cost for health professionals	22.7	30.0	35.9
	Personal Payments	990.9	46.0	194.9
	Goods and Services	890.54	14.0	143.9
	Fixed Assets	2,368.9	33.0	377.8
	Cost of Drug	504.8	220.0	385.9
Bipolar	Total Hospital Cost	3,677.0	717,0	1418.7
	Salary cost for health professionals	32.0	27.0	38.1
	Personal Payments	860.0	44.0	201.9
	Goods and Services	775.0	17.0	148.4
	Fixed Assets	2,061.0	46.0	403.8
	Cost of Drug	586.0	551.0	664.6

5.2.1. Distribution of the hospital cost

Total cost incurred by the hospital was computed as a sum of salary cost for health professionals and support staffs, personal payments, goods and services, fixed assets and drug costs. The kolmogorov-Smirnov and Shapiro-Wilk normality tests, showed that the distribution of total hospital cost was significantly differrent from normal distribution at $p<0.001$ and $p<0.001$ respectively. Therefore non parametric tests were used to compare distribution of the hospital cost on different groups of variables. For the groups which have more than two independent groups' kruskal Wallis and Mann-Whitney test for variables that have only two independent groups were used.

The non parametric tests showed that there was statistically significant difference in hospital cost by residence area of the patients ($x^2=20.5$, $P < 0.001$). Mean of hospital cost for those patients whose residence area were in Addis Ababa city was greater and followed by residence of Oromiya region, Amhara region, and SNNP regional state.

There was no statistically significant difference in the hospital cost by the educational status of the patients ($x^2=9.6$ $P < 0.06$). Hospital cost of patients whose educational level were 9^{th} -12^{th} grade were greater and followed by those educated up to college and above level, 5^{th} -8^{th} grade, and illiterate ones. The hospital cost of patient's whose educational level was from grade 1^{st} -4^{th} grade, was less of others.

There was no statistically significant difference in the hospital cost by categories of age groups of the patients ($x^2=2.8$ $P < 0.59$). Hospital cost of those patients whose age were greater than 50 years, and followed by those whose age was between 31-40 years old and between 21-30 years old ones.

There was no statistically significant difference of the hospital cost by the sex of the patients (with Man-Whitney U=20,425, $P < 0.82$). Hospital cost of those male patients was greater than that of females.

There was no statistically significant difference of the hospital cost by the marital status of the patients (with $x^2=4.3$ $P < 0.23$). Hospital cost of those patients who were single was

greater and followed by that of married ones. The hospital cost of the widowed patients was less of others.

There was no statistically significant difference of the hospital cost among the different types of employment status (x^2=4.7 P < 0.43). Hospital cost of those patients who were privately employed was greater and followed by that of Civil Servants. The hospital cost of the farmer patients was less of others.

Table 5: Total cost of the hospital for different groups of the patients, Amanuel Hospital, 2013

Categories	Variables	Mean (ETB)	P-value
Permanent Residence Area	Addis Ababa	225.1	< 0.001
	Amhara	179.3	
	Oromiya	195.7	
	SNNP	157.5	
	others	112.1	
Occupation	Civil Servant	185.5	< 0.43
	Farmer	147.5	
	Jobless	180.5	

Categories	Variables	Mean (ETB)	P-value
	Merchant	175	
	Private Employment	191	
	Student	168.3	
	Married	199.7	
	Single	208.4	
	Divorced	193.8	< 0.23
Marital Status	Widowed	130.2	
	Illiterate	152.3	
	1-4	144.7	
	5-8	176	< 0.06
	9-12	194,2	
Educational Status	College and above	188.3	

Categories	Variables	Mean (ETB)	P-value
Age Group	<=20	191.1	< 0.59
	21-30	198.4	
	31-40	210.1	
	41-50	202.2	
	>=50	234.7	
Sex	Male	205.7	< 0.82
	Female	203.1	

5.3. Emergency department costs at Amanuel Hospital

Eighty percent of the patients' cards reviewed from emergency department were for males and the remaining 20% were of females. The drugs used at Emergency department were CPZ, Arteine, Clonapine, Risperidone, Haloperidol, and Diazepam to provide treatment for Schizophrenia patients whereas CPZ, Arteine, Clonapine, Amitriptyline, Thioridazine uses to provide treatment for Bi-polar patients at Amanuel hospital.

The average drugs cost per patient for providing emergency health services for major mental illnesses at Amanuel hospital were 31.5 ETB (Table 6).

Table 6: Costs of Emergency Department, Amanuel Hospital, Ethiopia, 2013

	Median (ETB)	Std. Deviation (ETB)	Mean (ETB)
Total Hospital Emergency	224.5	21.2	229.3
Salary payment for Health Professionals	17.5	10.1	19.9
Personal payments	78.0	0	78.0
Goods and services	72.0	0	72.0
Fixed Asset	22.0	15.8	29.1
Cost of drug	31.5	5.8	30.3

Amanuel hospital incurred a unit cost of 229.3 ETB to provide emergency health service for major mental illnesses.

5.4. Inpatient department costs at Amanuel Hospital

Ninety one percent of the patients' cards reviewed from inpatient department were males where as the remaining 9% of them were of females. The drugs used at inpatient department were CPZ, Olanzapine, Fluoxatine, Arteine, Clonazepam, Lithium carbonate, Clonapine, Risperidone, Amitriptyline, Haloperidol, Sodium Valproate, and Thioridazine to provide treatment for Schizophrenia patients where as Olanzapine, Fluoxatine, Arteine, Lithium carbonate, Clonapine, Risperidone, Haloperidol, Sodium Valproate and Diazepam uses to provide treatment for Bi-polar patients.

The average drugs cost per patient for providing inpatient health services for major mental illnesses at Amanuel hospital were 220.4 ETB where as it was 3.13 ETB per patient per day (Table 7).

Table 7: Costs of Inpatient Department, Amanuel Hospital, Ethiopia, 2013

	Median (ETB)	Std. Deviation (ETB)	Mean (ETB)
Total Hospital Inpatient	21,484.0	11,231.0	23,016.1
Salary payment for Health Professionals	53.0	16.3	52.0
Personal payments	4,899.0	2,601.8	5,286.5
Goods and services	4,421.0	2,347.6	4,770.2
Fixed Asset	11,715.0	6,236.7	12,687.1
Cost of drug	209.0	108.5	220.4

Amanuel hospital incurred a unit cost of 23,016.1 ETB to provide inpatient health service for major mental illnesses.

5.4.1. Distribution of the hospital inpatient cost

Total cost incurred by the hospital was computed for the inpatient department from Salary cost for health professionals and supportive staffs, personal payments, goods and services, fixed assets and drug costs. Since the sample size taken for the study from the inpatient department was small which were eleven, normality was questionable. Therefore to compare for difference of the mean of the inpatient hospital cost for different group's (based on duration of inpatient days) Kruskal Wallis test was used since the groups among duration of inpatient hospital was categorized into more than two groups.

As per the comparison made between the mean of inpatient cost for groups based on duration of stay in the hospital for patients being admitted to inpatient department using non-parametric test, there was no statistically significant difference found with $x^2=9.5$, $p<0.06$. Mean of hospital inpatient cost for those patients who stayed in the hospital for more than a month was greater of all other groups stay less than thirty days in the hospital (Table 8).

Table 8: Hospital Inpatient cost for duration of stays in the hospital, Amanuel hospital, Ethiopia, 2013

Duration of stay in the Hospital	Mean (ETB)	P-value
1.5		
10-15		
4.0		
16-20		< 0.05
6,0		
21-25		
8.0		
26-30		
10.5		
>30		

5.5. Outpatient Department Costs at Amanuel Hospital

Fifty two percent of the Patients' whose card reviewed from Outpatient department were males where as 48.3% of them were females. The drugs used at outpatient department were CPZ, Olanzapine, Arteine, Clonazepam, Lithium carbonate, Clonapine, Flouxitne, Risperidone, Amitriptyline, Haloperidol, Sodium Valproate, Thioridazine, Diazepam, Imipramine, Sertraline, Promethazine, Mellanin, Doxycycline, and Imipramine to provide treatment for both Schizophrenia and Bi-polar patients at outpatient department of Amanuel hospital (Table 9).

The average drugs cost per patient for providing outpatient health services for major mental illnesses at Amanuel hospital were 496.6 ETB where as 89 ETB per visit.

Table 9: Costs of the Outpatient Department, Amanuel Hospital, Ethiopia, 2013

	Median (ETB)	Std. Deviation (ETB)	Mean(ETB)
Total Hospital Outpatient	452.0	596.3	611.4
Salary payment for Health Professionals	29.0	26.4	36.7
Personal payments	15.0	9.4	16.7
Goods and services	14.0	8.8	15.5
Fixed Asset	34.0	62.5	45.9
Cost of drug	316.0	555.6	496.6

Amanuel hospital incurred a unit cost of 611.4 ETB to provide outpatient health service for major mental illnesses.

5.5.1. Distribution of the hospital outpatient cost

Hospital outpatient cost was computed from salary cost for health professionals and support staffs, personal payments, goods and services, fixed assets and drug costs. By the tests of normality the results of the kolmogorov-Smirnov and Shapiro-Wilk tests show that the cost of hospital outpatient remains significantly different from normal distribution at $p<0.001$ and $p<0.001$ respectively. So Kruskal Wallis test was used for comparison of groups of number of visits for the mean ranks of hospital outpatient cost.

As per the Kruskal Wallis test done for comparison of groups based on number of visits made to the outpatient department indicated that there was statistically significant difference found among the groups of visits with $x^2=113.2$, $p<0.001$. Mean of hospital outpatient cost of those patients who visited the hospital more than sixteen times were greater of all number of visits less than sixteen times in a year.

Table 10: Hospital Outpatient cost for visits of the hospital, Amanuel hospital, Ethiopia, 2013

Number of Visit	Mean (ETB)	P-Value
1-5	140.7	< 0.001
6-10	247.3	
11-15	302.8	
16-19	370.5	

6. Discussion, Strengths and Limitations of the Study

6.1. Discussion

Providing public specialized health care for patients is costly for the government. Because the government costs for availing physical infrastructure of the institution, for salary and related payments of health care providers (professionals) and supportive staffs, for drugs and also other recurrent activities of the institution. This study produce important key findings related to the economics of mental health that contribute to better health care planning and result oriented budgeting. It shows how much major mental illnesses cost the government.

Mean age of the patients for major mental illnesses indicates that this age group were from the most economically active and productive part of the society which result in loss of productivity for the economy. This is almost similar with the study conducted in Spain on Schizophrenia patients (20) and study conducted on the Bi-polar patients under clinical follow up in Buta jira Area, Ethiopia (8).

The patients seeking mental health services in Amanuel hospital came from different parts of the country. The hospital cost distribution for the patients who are dwellers of Addis Ababa is greater of other regions. This is due to unavailability of the health facility that provides mental health care in different parts of the country. So patients who are dwellers of Addis Ababa utilize the health service frequently than others.

For the patients who visited the hospital for outpatient mental health service the cost distribution for number of visits differs. As patients frequently visit the hospital for outpatient mental health service the hospital cost increases.

The hospital incurred a unit cost of 1,204.17 ETB to provide health service for major mental illnesses per individual patient, among which the mean drug cost was 475.4 ETB where compared to a study done in Sweden this is very huge (drug cost exceeds by 35% of the total direct hospital cost) (30).

When this is disaggregated to the service provision units the hospital incurred a unit cost of 229.3 ETB to provide emergency health service, 23,016.1 ETB to provide inpatient health service and 611.4 ETB to provide outpatient health service for major mental illnesses.

Among total cost of the hospital inpatient days (23,016.1 ETB) drugs cost account about 2,424.0 ETB per patient. This indicates that admission of patients incur more other costs (accommodation costs) than medication costs as also identified by the study conducted on the predictors of the costs for individuals with severe mental illnesses in south London (23). The patients who admitted to the inpatient department stay in the hospital for the average of 24.8 days. The inpatient stay is about half of the Nigerian mental health service status report of 2006 (29).

Among the unit cost of the outpatient health service cost drugs cost accounts about 82%, which is 499.6 ETB. The hospital incurs 110 ETB per patient per visit for the outpatient mental health service of which 89 ETB is drugs cost. On average, patients have visited the hospital for outpatient mental health service 6 times.

6.2. Strengths and Limitations of the study

Strengths

- The study estimate cost from service provider perspective that enable to know how much money that the government spend on mental health service delivery,
- The result of the study can be an input for mental health service delivery plan and expansion,
- Different service provision units (cost centers) of the hospitals were analyzed separately and together as a total hospital cost.

Limitations

- The study did not take into account the patients side and insurers side cost, it is only from public health service provider (government) perspective,
- The study did not include other available health facilities that provide mental health services in the country into the study population,
- Some of the physical assets (building) of the hospital were not included in the cost study because of poor information on asset management,
- Primarily the study intended to identify cost of co-morbid diseases associated with the mental illnesses in addition to cost for providing care for mental illnesses, due to lack of information on the medical records of the patients co-morbid diseases cost is not identified by the study,
- Some of the study findings were not compared with other study findings due to lack of similar studies conducted on the government side cost for providing mental health services.

7. Conclusion and Recommendations

7.1. Conclusion

The research questions aimed to be answered by this thesis were:-

- Is there a difference in hospital cost distribution among the different groups of the patients?
- How much does providing health service for major mental illnesses cost to the hospital for individual patients?
- How much does providing emergency, inpatient and outpatient mental health service provision cost to the hospital?

Providing mental health services is very costly in countries like Ethiopia that suffer from shortage of resources and double burden of both communicable and non-communicable diseases.

Distribution of the hospital cost significantly differs for the residence area of the patients since the distance from the hospital determines utilization of the mental health service. Distribution of the hospital outpatient cost significantly differs for the number of visits made to the outpatient department of the hospital.

Providing inpatient mental health service is more costly than outpatient and emergency mental health services for the hospital since accommodation cost are very huge than the medication costs for the inpatient mental health service.

Providing mental health services cost 1,204.17 ETB to provide mental health services while 229.3 ETB, 23,016.1 ETB and 611.4 ETB to provide emergency, inpatient and outpatient health service for major mental illnesses respectively.

7.2. Recommendations

- The health facility based treatment provided for the mental illnesses should be expanded to other parts of the country (General hospitals available in regions). Because the hospital cost for patients coming out side Addis Ababa is lower than that of the Addis Ababa dwellers. This indicates, even though most of the patients live outside Addis Ababa the distance or unavailability of health facility that provide mental health service may be barrier for patients to utilize the mental health service appropriately,
- As per the new Mental health strategy of the country integration of the mental health services into the primary health care level (primary hospitals, Health centers and health posts) should be given due focus since it can solve the problem of physical accessibility to health facilities for mental health services,
- The current practice of drug budget allocation of the country should be reconsidered which is 20 ETB per bed per day only. The budget allocation should take into consideration not only the number of beds available in the health facility but also the patient flows to the outpatient and emergency department,
- The hospital should practice allocation of existing resources (budget) among the hospital's departments based on the unit cost of service provision identified for each service provision centers as identified in this study,
- Due focus should be given for the drugs prescribed for the patients at the hospital (the drugs to be used at the hospital should be cost-effective).

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Appendix

Section 1: - Socio Economic and Demographic Characteristics of the Patient

1. Sex _____ 2. Age_____ 3.Marital Status_____4. Educational Status_____5.Occupation_____6.Monthly income_____ 7.Religion_____8.Ethnicity_____

9. Permanent Residence Area_____

Section 2. Out Patient Department Cost of major mental illnesses

Type of Illness Identified_____ Number of Visits_____

	Types of care	**Yes**	**No**	**Total Costs (Birr)**	**Remark**
1	Prescribed and used drugs				
2	Medical Equipment Used				
3	Reagents for diagnostic tests				
4	Hospital Outpatient				

Section 3. Outpatient Department Time spent for treatment of major mental illnesses

	Types Professionals Provided care	Yes	No	Time spent	Total Costs (Birr)	Remark
1	Psychiatry specialists,					
2	General practitioners,					
3	Clinical nurses,					
4	Psychiatry nurses					
5	Public health professionals,					
6	Pharmacists					
7	Laboratory technicians and Technologists					
8	Psychologist					
9	ICCMH					

Section 4. Out Patient Department Cost of co-morbid disease

Type of co-morbid disease Identified_____

	Types of care	**Yes**	**No**	**Total Costs (Birr)**	**Remark**
1	Prescribed and used drugs				
2	Medical Equipment Used				
3	Reagents for diagnostic tests				
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					

Section 5. Outpatient Department Time spent for treatment (co-morbid disease)

	Types Professionals Provided care	Yes	No	Time spent	Total Costs (Birr)	Remark
1	Psychiatry specialists,					
2	General practitioners,					
3	Clinical nurses,					
4	Psychiatry nurses,					
5	Public health professionals,					
6	Pharmacists					
7	Laboratory technicians and Technologists					
8	Psychologist					
9	ICCMH					

Section 1: - Socio Economic and Demographic Characteristics of the Patient

1. Sex _____ 2. Age_____ 3.Marital Status_____4. Educational Status_____5.Occupation_____6.Monthly income_____

7.Religion_____8.Ethnicity_____

9. Permanent Residence Area_____

Section 2. Emergency Department Cost of major mental illnesses

Type of Illness Identified_____

	Types of care	**Yes**	**No**	**Total Costs (Birr)**	**Remark**
1	Prescribed and used drugs				
2	Medical Equipment Used				
3	Reagents for diagnostic tests				
4	Hospital Emergency				

Section 3. Emergency Department Time spent for treatment of major mental illnesses

	Types Professionals Provided care	**Yes**	**No**	**Time spent**	**Total Costs (Birr)**	**Remark**
1	Psychiatry specialists,					
2	General practitioners,					
3	Clinical nurses,					
4	Psychiatry nurses					
5	Public health professionals,					
6	Pharmacists					
7	Laboratory technicians and Technologists					
8	Psychologist					
9	ICCMH					

Section 4. Emergency Department Cost of co-morbid disease

Type of co-morbid disease Identified_____

	Types of care	**Yes**	**No**	**Total Costs (Birr)**	**Remark**
1	Prescribed and used drugs				
2	Medical Equipment Used				
3	Reagents for diagnostic tests				
4					
5					
6					
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Section 5. Emergency Department Time spent for treatment (co-morbid disease)

	Types Professionals Provided care	**Yes**	**No**	**Time spent**	**Total Costs (Birr)**	**Remark**
1	Psychiatry specialists,					
2	General practitioners,					
3	Clinical nurses,					
4	Psychiatry nurses					
5	Public health professionals,					
6	Pharmacists					
7	Laboratory technicians and Technologists					
8	Psychologist					
9	ICCMH					

Section 1: - Socio Economic and Demographic Characteristics of the Patient

1. Sex _____ 2. Age_____ 3.Marital Status_____4. Educational Status_____5.Occupation_____6.Monthly income_____

7.Religion_____8.Ethnicity_____

9. Permanent Residence Area_____

Section 2. Inpatient Department Cost of major mental illnesses

Type of Illness Identified_____ Duration of inpatient day's _____

	Types of care	**Yes**	**No**	**Total Costs (Birr)**	**Remark**
1	Prescribed and used drugs				
2	Medical Equipment Used				
3	Reagents for diagnostic tests				
4	Hospital Inpatient				

Section 3. Inpatient Department Time spent for treatment of major mental illnesses

	Types Professionals Provided care	Yes	No	Time spent	Total Costs (Birr)	Remark
1	Psychiatry specialists,					
2	General practitioners,					
3	Clinical nurses,					
4	Psychiatry nurses					
5	Public health professionals,					
6	Pharmacists					
7	Laboratory technicians and Technologists					
8	Psychologist					
9	ICCMH					

Section 4. Inpatient Department Cost of co-morbid disease

Type of co-morbid disease Identified_____

	Types of care	**Yes**	**No**	**Total Costs (Birr)**	**Remark**
1	Prescribed and used drugs				
2	Medical Equipment Used				
3	Reagents for diagnostic tests				
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					

Section 5. Inpatient Department Time spent for treatment (co-morbid disease)

	Types Professionals Provided care	Yes	No	Time spent	Total Costs (Birr)	Remark
1	Psychiatry specialists,					
2	General practitioners,					
3	Clinical nurses,					
4	Psychiatry nurses,					
5	Public health professionals,					
6	Pharmacists					
7	Laboratory technicians and Technologists					
8	Psychologist					
9	ICCMH					

Section 6: Cost of resources identified used during one year (Tahisas 2004 to Hidar 2005, EFY)

Account Code	Account Description	Total
Personal Payments		
6111	Salary for permanent staff excluding health professionals	24,015,089.71
6116	Miscellaneous payments to staff	3,873,224.99
6121	Allowances to permanent workers	1,489,889.67
6131	Government contribution to Permanent staff Pension	4,287,291.80
Goods and Services		
6211	Uniforms, clothing, Bedding	4,798,987.82
6212	Office supplies	2,503,369.94
6213	Printing	1,498,213.64
6215	Educational supplies	301,753.60
6217	Fuel And lubricants	3,355,424.55
6218	Other materials & supplies	4,267,145.04
6219	Miscellaneous equipment	9,455.00
6221	Other equipment	5,848.35
6231	Perdium payments	379,618.34
6232	Transport Fees	76,481.30
6233	Official Entertainment	720,325.47
6241	Maintenance and repair of vehicles & other transport	1,568,093.54
6243	Maintenance and repair of plant ,and machinery & equipment	577,084.70
6244	Maintenance and repair of buildings, Furnishing & fixtures	5,944,915.94
6251	Contracted professional services	634,765.81
6253	Advertising	350,434.61
6254	Insurance	413,978.31

Account Code	Account Description	Total
6255	Freight	90,662.32
6256	Fees and charges	170,686.45
6257	Electricity charges	1,304,789.62
6258	Telecommunication charges	826,282.45
6259	Water and other utilities	1,907,752.89
Capital Assets		
6313	Purchase of Plant, machinery and equipment	2,900,407.11
6323	Construction buildings for non-residential	5,081,302.75

Declaration

I, the undersigned, declare that this is my original work and has not been presented in this or any other University. All sources of materials used for this thesis have been duly acknowledged.

Name: Mideksa Adugna Koricho

Signature: _____

Date: _____

Place: _____

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

Name: Dr. Ababi Zergaw Giref

Signature: _____

Date: _____

Place: _____