ADDIS ABABA UNIVERSITY COLLEGE OF DEVELOPMENT STUDIES
CENTER FOR REGIONAL AND LOCAL DEVELOPMENT STUDIES
DEPARTMENT OF URBAN DEVELOPMENT AND MANAGEMENT

# Demographic and Socioeconomic Determinants of Mental Health Disorder in Adult Residents of Addis Ababa

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## Declaration

Here with, I declare that this thesis prepared for the partial fulfillment of the requirements for the degree of Master of Art in Urban Development and Management "Demographic and Socio-Economic Determinants of Mental Health Disorders in Adult Residents of Addis Ababa" is prepared by my own independent effort and under the supportive supervision and guidance of my advisor.

Eyob Firdawok Heye Signature _____

Date 22/12/17

## Certification

Here with I state that Ato Eyob Firdawok Heye has carried out this thesis work on the topic entitled "Demographic and Socio-Economic Determinants of Mental Health Problems in Adult Residents of Addis Ababa" under my supervision. This work is original in nature and has not presented for certification in any university and it is sufficient for submission for the partial fulfillment and award of MA degree in Urban Development and Management.

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Date _____

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## Abstract

Rapid urbanization and high population growth is the most prominent phenomena of the contemporary world particularly in the developing countries. As the urbanization process of the third world countries is attributable with complex socio-economic and demographic adversities there is a need to elicit the different aspects of the unhealthy urbanization. Mental health is one of the most pressing development issues particularly in association with rapid growth of urbanization.

Addis Ababa, the capital of Ethiopia is the third fast growing cities of the world in terms of physical expansion and demographic facts. These phenomena coupled with lack of institutional capacity in the provisions of basic social services create several socio-economic calamities of which the prominent one is the prevalence of mental health disorder and psychological distress. Therefore, this cross-sectional survey was intended to analyze and describe the demographic and socio-economic determinants of mental health illness and psychological distress among adult residents of the city.

In order to address this issue, the methods utilized were that three sub cities of the capital were selected targeting the mental health clinics of their respective health centers. The interview was conducted by psychiatric nurses for purposively selected patients (n=300) who were diagnosed for mental health disorders. The collected demographic and socioeconomic data were entered in SPSS-20 window software and analyzed using descriptive and econometric methods. The dichotomous variables of mental illness and relevant demographic and socioeconomic predictors were cross tabulated to measure association using chi-square tests at significant level 0.05. Logistic regression model was also utilized and their odd ration (OR) is identified to measure the degree of association between the occurrence of mental illness and demographic-socioeconomic determinants controlling level of urbanization.

The respondents were diagnosed for seven categories of mental illnesses; depression was the modal (35%) mental disorder followed by general anxiety disorder (14%) and any psychological disorder (10%). Of all the total patients (n=300) 68% were female and the mean age was 29-39 yrs. 67% of the respondents were below high school level and non-married and about 62% of them responded as they have lived for less than 5 yrs in the city. Regarding socioeconomic determinants, about 77% of the respondents live in houses that are neither theirs nor rented from the government and and about 67% of them earn monthly income less than or equal to 600 birr. The occurrence of mental illness is found to be associated with most demography and

socioeconomic determinants at 0.05 significant levels regardless of the level of urbanization except religion and family size.

According to the findings partly discussed above, we can conclude that the prevalence of mental illnesses is determined by age, education level, years in the city, individual's role in the family and marital status. MHD is more prevalent among young adults than old adults, among those who are below high schools and the non-married one and lower socioeconomic status is found to increase the vulnerability to different mental health disorders. The occurrence of mental illness in the adult residents is determined by their demographic and socioeconomic characteristics than the level of urbanization of the city.

**Key words**

Mental Health, Urban Livelihood, Adult Residents, Cross-Sectional Survey, Socioeconomic Determinants.

## Abbreviations and Acronyms

AIDS: Acquired Immune Deficiency Syndrome

AIMS: Assessment Instrument for Mental Health System

CDC: Center of Disease Control (USA)

CIDI: Composite International Diagnostic Interview

CSA: Central Statistics Agency

FMoH: Federal Ministry of Health

GENIES: German National Health Interview and Examination Survey

GNI: Gross National Index

GTP: Growth and Transformation Plan

HDI: Human Development Index

HH: House Hold

HIV: Human Immune Deficiency Virus

HMIS: Health Management Information System

ICT: Information Communication Technology

LDCs: Least Developed Countries

LICs: Low Income Countries

LMICs: Low and Middle Income Countries

LR: Logistic Regression

MDGs: Millennium Development Goals

MH: Mental Health

MHD: Mental Health Disorder

mhGAP: Mental Health Gap Action Program

OR: Odd Ratio

UHE: Urban Health Extension

UNDP: United Nations Development Program

WHO: World Health Organization

## Table of Contents

**List of Figures**



**List of Tables**

# Chapter 1

# Introduction

## 1.1 Background of the study

According to the World Health Organization's (WHO) definition, "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". This classical definition of health conspicuously describes that mental health is an important dimension in the complete essence of human health (WHO, 1946). Despite the prominent role that Mental Health (MH) plays to the socio-economic development of a country in general and to the health sector in particular; it is the most neglected area of focus in most development programs at global, continental, regional, national and local levels especially in low and middle income countries (LMICs) (UN (DESA), 2010).

Moreover in recent literatures of development, the acronym "HDI" (Human Development Index) appears quite frequently as it is the best possible accredited tool of labeling the development stages of countries. Even though the health status of a country makes up significant weight in HDI, the mental health aspect is not accounted explicitly except implicitly by far as that it may be elicited only in the measurement of life expectancy. The mere fact that there is an inverse relationship between the prevalence of MH illness and life expectancy doesn't exhaustively explain the importance of MH problem; rather, it downsizes the wider range of adversities of MH disorder and psychosocial distresses in the entire process of development in a country (UNDP, 1990).

In addition to this, the ever growing rate of urbanization especially in the Least Developed Countries (LDCs) which is mainly accompanied by the immense socioeconomic problems which are associated with demographic factors such as the high rate rural-urban migration and unemployment, urban poverty, poor housing and environment situations, the absence of social security schemes, scarce provision and access to infrastructure and

to other public facilities, etc are the main feature of urbanization in developing world and these have a lot to do with MH problems (Michelle Funk et al, 2010).

In response to these socioeconomic calamities, the common coping mechanisms and strategies mostly taken by the urban poor are found to be commercial sex, begging, child labor, street life, social crime, migrating to overseas countries (mostly to the Middle East countries) and informal petty ventures etc. And those poor portions of people who are urged to get involved in these undesirable responses to urban poverty apparently suffer from mental distresses merely because, most of the coping mechanisms listed above drain self esteem, productive capacity, future aspirations and long visions of the front line actors and the public. Thus, the cumulative result ends with emotional distress to the people at large. The aggregate effects of these urban phenomena further come up with other socioeconomic adversities. All these reactions in turn put the urban communities in a cyclic poverty crunches. Therefore, public mental illness is both the cause and effect of the poor urban socioeconomic status (WHO, 2012).

On top of that, the emergence of the cyber world which has been formed along with the ever growing advancement in Information and Communication Technologies (ICT) across the world is another issue that worth attention. Though such technological incidents are supposed to be in favor of socioeconomic development, they might be at odds as far as the MH statues of a society is concerned. A great many of scholars like the Gold Brothers, Joel, a psychiatrist at New York University are investigating technology's potential effect on people's mental health and have come to conclude that the contemporary digitized world may support even more extreme forms of mental illnesses and some digital selves should be counted as a legitimate psychopathologies like multiple personality disorder (multiple dissociative identity disorder). Furthermore, a team of researchers at Tel Aviv University has studied an "internet related psychosis" and concluded that the growing habit of using internet and its potential risk to psychopaths are new consequences of the new digital technology (News Week, July, 2012).

In a nut shell, Addis Ababa is one of fast growing cities of the world where by most features of unhealthy urbanization that are common to LDCs have been manifesting in

the city. These undesirable characteristics of urbanization like the prevalence of urban poverty and the adverse effects of the new phenomena of globalization coupled with the facts that MH issues have not yet been considered in the agendas of urban socioeconomic development might worsen the situations of public MH related problems in urban livelihood (Emebet, 2008).

The multiple folds of demographic and socioeconomic factors intermingled with urban livelihood would supposedly have a lot to do with the psychosocial wellbeing of the public. Therefore, this particular research project was intended to describe more on the issues of MH in the context of urban. MH per se could worth the attention of any junior researcher, this particular title is partly precipitated by my background in Psychiatry Nursing and somehow by the interest to pose a glimpse of inspirations to the multi-disciplinary approach of urban development study.

## 1.2 Statement of the problem

According to the World Health Organization's definition, "Mental health is a state of well-being in which an individual can realize his or her own abilities, interact positively with others, cope with the stressors of life and study, work productively and fruitfully, and contribute to his or her family and community." In the key terms of the definition, there it needs to be noted that the whole, exclusively to the absence of "mental illness", but also addresses the concept of "mental wellness" (WHO, 2005).

As the famous motto coined first by the UN Secretary General, Ban Ki-moon goes, "There can be no health without mental health", profoundly signifies that MH and development have a strong link in one or another way (WHO, 2007). It represents not only a critical indicator of Human Development (health and education) but also it is a key determinant of well-being, quality of life and hope. MH has an impact on a range of outcomes and a far reaching impact of development such as poor MH leads to poverty, unemployment, poor educational and health statues. Therefore, as poor MH is both a cause and consequence of poverty, there is a need for wider recognition of MH and emotional well-being as a core indicator of human development (Mental Health Atlas, 2011).

According to the description of WHO's policy analysis and quest of integrating MH in international development, people who suffer from mental and psychosocial disabilities represent a significant proportion of the world's population. Millions of people worldwide have poor mental health conditions. It is estimated that one in four people globally will experience a poor MH condition in their lifetime. Almost one million people die due to suicide every year and it is the third leading cause of death among young people.

Depression is the leading cause of years lost due to disability worldwide. MH problems, including alcohol abuse, are among the ten leading causes of disability in both developed and developing countries. In particular, depression is ranked third in the global burden of disease, and is projected to rank first in 2030. Even now, depression is the leading cause of disease burden for women in high, low and middle-income countries. The economic cost of mental health problems is vast, while reasonable investment in mental health can contribute to better mental health for people (WHO/MSD/MER, 2006).

In any set of measurements, the level of emphasis given to this crucial issue in low-income countries is much less than that it ought to be. The will of the government vis-à-vis; the policy environment, national plan, MH legislation, budget and financing, care delivery, medicine for MH and behavioral disorders, human resource and information system; in all respects, MH is the most neglected issue in the development agendas at different level of LICs (ibid).

Another indicator that shows the level of concern given to the MH problem in LICs is the number and diversity of researches conducted under the topic of MH and it's found to be very limited. As the result of a mapping project of WHO global forum for health research narrated, in 31 (27.2%) out of 114 LMICs, no mental health researcher was identified and only five or less researchers were identified in another 22.8% of countries. Almost one third of the 4633 mental health researchers identified are resided in only three countries: China, India and Brazil. While only 215 researchers could be identified in African countries, 1724 were identified in Asia (Michelle Funk et al, 2010)

It is this gap that has initiated the researcher to conduct a thesis on the demographic and socio-economic factors of MH problems in Addis Ababa city focusing on analyzing and describing what urban livelihood has got to do with MH and psychosocial disabilities. To

the best of the researcher's knowledge and information, in Ethiopia most studies which dealt with similar topics have never addressed the MH issues in a wider context of urban socioeconomic development. According to the WHO-AIMS report, 18% of all health publications in the country are on MH and the researches are mainly focused on epidemiological studies, public perception of MH illness, clinical samples, drug trials and genetics. However, no report is produced on MH and transmitted to the government health department (WHO and FMoH).

## 1.3 The Objectives of the study

The general objective of the thesis is to describe the current status of mental health and psychosocial problems in association with urban livelihood in the wider contexts of urban development of Addis Ababa city.

The specific objectives of the study are:-

- ✓ To examine the relationship of specific demographic and socio-economic variables with the occurrence of MH disorders in the adult residents of Addis Ababa city.
- ✓ To compare the effects of urbanization with the demographic and socio-economic determinants of MH disorders.
- ✓ To assess and describe the impacts of MH disorders and psychological distresses in urban livelihood of the city.

## 1.4 Significance of the study

Addis Ababa is one of the most fast growing cities and the urbanization process can be characterized with a lot of resettlement programs and construction of buildings and roads which automatically creates instability in the livelihood of different communities, disruption of people's mobility i.e. high traffic congestions and car accidents which in effect worsen the psychosocial problems in urban environment. As the resettlement and zonal rehabilitation is not planned rigorously which mainly disregards the socioeconomic realities prevailed for a century; it disintegrates the neighborhoods and social networks of different communities. Moreover, the rampant rural-urban migration has been

breeding street life and flourishing the informal settlements which are not yet entitled for basic infrastructure and public facilities (Yoseph E. et al, 2010).

The high rate of unemployment and immense level of urban poverty coupled with macroeconomic instability such as the recent persistent inflation especially on food items and the lack of social welfare program triggered a number of social calamities. For instance, it is quite common to see a great many number of beggars: mainly retired elders and little school age children along the streets of the city. And many youngsters who might have productive capacities are urged to abuse drugs, alcohol and to commit crime and violence. All these socioeconomic and environmental adversities definitely yield stressors and MH disorders to the urban dwellers. Therefore urban planners should integrate community MH programs to prevent and treatment public MH problems (ibid).

This research has made an attempt to describe the magnitude psychiatric disorders in the adult residents of the city and analyze in association with their socio-economic, social environment and demographic factors. This paper has assessed the level of public awareness towards MH problems and the health burden of it in the larger context of urban development. Hopefully, the report of this research will be disseminated through health journals published domestically and worldwide such as Ethiopian Public Health association, AAU, WHO so that it would reach different stakeholders in the health system of the city.

The frontline beneficiaries of this study are people who are mentally challenged and their families who suffer from stress and burnout syndrome in the process caring mentally ill members of the families. The health management of the city, the civic society, MH students, societies of public MH and other interested groups will get additional knowledge to integrate MH in the broader sense of community development studies.

## 1.5 Scope/ delimitation of the study

1. It is difficult (time taking study) to differentiate the magnitude of mental health problems that are directly caused by socio-economic factors from those which are caused by other causes such as personality traits, hereditary and/or other organic causes.

2. Those adult residents who visit other alternate solutions of MHDs such as prayers, holy water (churches) and other traditional practices are not captured in the study.

3. As the nature of mental health problems is complex (subjective), it is difficult to pin point on a single demographic, social or economic variable to establish a cause and effect relationship with it.

## 1.6 Basic assumptions

1. It is assumed that as we go from the center to periphery of the city along the different sub-cities of Addis Ababa, population density would decrease to the level that it downsizes the effects of urbanization significantly.

2. The socioeconomic and demographic statues of adult residents of the city are proportional with those patients who have visited mental health units of health centers in the survey month.

3. Factors like personality traits, hereditary and/or other organic causes that may make a person susceptible to MH illness are difficult to be captured, controlled and ruled out in the study.

# Chapter 2

# Review of literature

## 2.1 Introduction

Different literatures that are related to the research topic were reviewed and summarized in this chapter. The theoretical background of abnormal psychology and the course of progress in identifying, classifying and treating MH illness in the history of human history are presented briefly. Empirical studies that were conducted on mental health and related issues are reviewed. The essence of socioeconomic development in the context of urban livelihood and what mental health and psychological distress has got to with urban poverty are also covered in the subsections of the chapter.

The situation of mental health and the level of concern given to it in the development agendas of middle and low income countries in general and in the context of Ethiopia in particular are also covered. In order to have the clear picture of the research topic, a conceptual framework that demonstrates the cyclic interplay between MH and socioeconomic development is also addressed. Factors that affect the MH status of public positively and negatively are summarized in the chapter.

## 2.2 Defining Mental Illness

Little is known about the perception and handling of abnormal behaviors in prehistoric or ancient societies. However, referring to the historical records of Chinese, the Egyptians, the Greeks and Hebrews, most literature disclose that like most other things, our early ancestors assumed that deviant behavior as the curse of supernatural power, the movement of stars, the vengeance of gods, the plot of demons. The Bible mentions devilish control of persons in many places and even in the New Testament, Jesus is said to have set people free from devils. (Bootzin & Richard R., 1972)

The earliest evidence of the evolution of naturalistic approach to abnormal psychology is found in the scriptures of the Greek physician Hippocrates (460-360 B.C). Unlike his contemporary supernatural theories, Hippocrates supposed that mental illnesses were caused by natural causes. He believed that different personality disorders are due to an imbalance among the vital fluids in the body. His contributions were in the area of theory and methodology and his treatment includes: rest, exercise, bland diet, abstinence from sex and alcohol and he often escort patients into his home to watch them.

This kind of dignified treatment was supported by Hippocrates' younger contemporary, the philosopher Plato (429-347 B.C) who insisted that the care of mentally ill people should be a family responsibility and they should not be accountable or be punished in any way for their irrational acts. This thought of Plato promoted the establishment of retreats and special temple as asylum where the mentally ill could recover with the help of rest, exercise, music and other therapeutic facilities. (Ibid)

It was in the medieval age when the attribution of abnormal psychology to devilish occupancy got restored in western community. The treatment to the mentally ill people ranged from prayer and holy water to starvation and flogging. In the Renaissance, a great many of people who exhibited abnormal behavior were executed as witches mixed with other people who rioted pursuing of socioeconomic reform against the Christian church. Though in the 18$^{th}$ and 19$^{th}$ Centuries, the supremacy of science hospitalization of the insane became more common, little was made to improve treatments until the late 19$^{th}$ reform in Florence, in a Paris asylum and America which advocated moral therapy or improving the moral of the mentally ill via peaceful living, useful employment and dignified therapy. This markedly successful therapy declined partly because of the rise in medical model in the time. (Ibid)

May be, by the virtue of its insubstantiality and complex nature, putting a clear demarcation between the normal and abnormal psychology has been a tough challenge since the age of science and enlightenment. Moreover, defining abnormal behavior is a complex task, the explanation of its causes are problematic in terms of reaching a single perspective which the scientific community might be agreed up on. Wilhelm Wundt and

his student Emil Kraepelin were the first in applying scientific methods and biogenic model to analyze human thought and behavior. The work of Franze Anton Mesmer came up with the psychogenic theory at the same time and later the rival Paris school under Jean-Martin Charcot and his student Sigmund Freud became convinced that mental disorders were caused by "unconscious" conflicts that one revealed under hypnosis could be resolved. (Ernest R. Hilgard, 2000, introduction to psychology)

There are quite a number of perspectives and psychological school of thoughts and it is from these thoughts that different views on the causes of abnormal psychology are emanated from. Though these views often abnormal psychology conflict with one another, all of them offer a comprehensive and multidimensional view of contemporary MH and psychosocial abnormalities. In the contemporary study of abnormal psychology, MH disorder is described based on one or more of the following four points:-

1. **Deviation from Statistical Norms-** abnormal behavior is statistically infrequent or deviate from the norm. But extremely intelligent or happy person would be classified under abnormal. Thus we have to consider other points.
2. **Deviation from Social Norms-** as every society has certain standards and norms for socially acceptable behavior; acts that deviate markedly from those norms are considered abnormal.
3. **Mal-adaptiveness of behavior-** most importantly many social scientists accept how the behavior affects the wellbeing of the individual or the social group rather than the deviation either from statistical or social norms.
4. **Personal distress-** this criterion gives more emphasis to the person's subjective feelings of distress than his behavior. Though most people exhibit normal behavior to the observer, they are diagnosed as mentally ill feel acutely miserable, anxious, depressed, and agitated and suffer from insomnia, pain and aches.

Therefore, none of these criteria fulfill an exhaustive description of abnormal psychology. Thus, in most circumstances all the four definitions are considered in stating abnormal psychology or mental illnesses. (Ibid)

Regarding the factors that put people into MH problems, there are different approaches of analyzing it and each of these perspectives has something important to propose about MH disorders but none of them has a complete and exhaustive answer. Therefore, the well accepted approach in the current time is integrative view of "nature-nurture" model or "Vulnerability-stress" model which considers the interaction between predisposing factors which makes a person vulnerable for having a particular illness, and the stressful environment conditions encountered by that person. Having a predisposing factors (genetic factors) for a particular mental illness alone doesn't guarantee that the person will develop the disorder rather the actual occurrence of a mental illness depends of the kind of stressors that individual encountered such as poverty, malnutrition, conflict, frustration and traumatic events. (Ibid)

As far as the underlined cause/s of psychiatric disorders is concerned, there are different perspectives in different schools of psychological thoughts. However, the contemporary practice in MH follows the theories in eclectic approach which is known by Bio-psycho-social model. As the term indicates, this model views the causes of MH problems from the multidimensional and disciplinary perspectives. The "bio" part of this model refers to the genetic make-up and other organic causes of MH illness. Here, because it is more attributable to human beings, the most important element of this particular model is the psycho-social one. It is the psycho-social aspects of mankind that makes us (human society) peculiar from other animal species. The known risk factors of MH include: family environment, housing problems, poverty or economic difficulties, Physical health, nutritional status, stress level, social environment and activities, exposure to trauma, alcohol and drug use, environmental toxins or other pollutants and the availability, accessibility and cost of health services. (R. Bootzin & Richard R., 1972)

## 2.3 Urban Socioeconomic Development

Socioeconomic development is a hybrid term which inseparably refers the economical and societal aspects in a wider range of the concept "Development". It mainly deals with

the social and economic statues interdependently at local, community, regional, urban, rural and national level. It encompasses three major aspects of a society;

i. **Social and community development** which constitutes social capital/cohesion, health and social security, education, vulnerability and inequality issues and

ii. **Economic development** which includes promotion of small scale business, integration of skill training and local business, income, employment, credit access and tax, market.

iii. **Other crosscutting issues** which are relevant to the urban socioeconomic development are macroeconomic stability, urban governance, environmental issues and other contextual situations.

Therefore, the ultimate goal of urban socioeconomic development endeavors is to improve the livelihood quality and living standard of the urban dwellers sustainably.

"The incidence of urban poverty, or the share of poor as a proportion of the urban population, is highest for South Asia and Sub Saharan Africa." (World Bank, Urban Poverty, January, 2008)

As it has been witnessed in a number of literature, the statues of urban socioeconomic development in the context of the developing world like Ethiopia is very low. Therefore, there is a serious pursuit of directions and strategies of poverty alleviation and improving the living standard of people in urban settings. Ethiopia is one of the developing countries in sub-Saharan region where the socioeconomic status of the people is low and urban poverty is immense and more prevalent.

For urban poverty is extremely deep and it is the major challenge of socioeconomic development, a thorough formulation of urban socioeconomic development policy is indispensably important and mandatory task of any governments in the region. As it is well stated in most development studies literature, though the urban poor are quite

diverse across regions, countries and even within cities, they tend to face a number of common deprivations which affect their day to day life. The main issues raised in literatures include:

- limited access to income and employment,
- inadequate and insecure living conditions,
- poor infrastructure and services;
- vulnerability to risks such as natural disasters, environmental hazards and health risks particularly associated with living in slums,
- spatial issues which inhibit mobility and transport; and
- Inequality closely linked to problems of exclusion. (Ibid)

## 2.4 Mental Health and Urban Socioeconomic Development

The prevention and control of public MH in urban settings is part and parcels of the entire urban socio economic development activities. The pursuit of urban socioeconomic development policy or poverty reduction strategies is not only because urban poverty is undesirable and bad phenomena but poverty reduction is also important for the entire urban development in several respects. Urban poverty is both the cause and effect of other urban development activities including public MH illness prevention. Hence the reduction of poverty through purposive urban socioeconomic development policy will serve in reducing inequalities and social crisis within the urban community. On the other hand, supporting the poor portion of urban dwellers utilize their own potential through the provision of basic needs (food, house, health, education and/or income generating employment) will boost urban growth and its potential of prosperity.

Therefore, the incorporation of public MH issues in urban socioeconomic development policy is pursed for its double edge sword effect. On one hand it recognizes and addresses the right to basic needs as a desirable aspect of development and it capacitate the poor and vulnerable groups to consume from the local market, inspire the poor for development, creates the fertile ground for the poor to participate in the local

development activities such as paying taxes, vote in local elections and etc. the facts that the poor people become proactive in the local economy thereby encourage saving, investment and further employment in the economic sector of urban and facilitates an efficient provisions of basic social services to the destitute communities in a city.

In general, one socioeconomic success breeds other successes and to the contrary socioeconomic failure also breeds other failures as there are number of complex multiplier effects and other crosscutting variables play significant role in the process urban development. The purpose of urban socioeconomic development have a positive impacts not only within a particular urban area but also it trickles down to the localities in the hinterlands and then to nationwide. Considering MH problems in the entire urban socioeconomic development is pursued not for the mere sake of moral justice but also it is an entry point to every aspects of development in the country.

## 2.5 Conceptual Framework

Most evidences indicate that the relationship between mental ill-health and poverty is cyclical; poverty increases the risk of mental mental disorder and having a MH disorder increases the likelihoods of descending into poverty. People living in poverty lack financial resources to maintain basic living standards, have fewer educational and employment opportunities are exposed to adverse living environments and are able to access good quality of health care. These stressful living conditions place people at higher risk of developing a mental disorder. People who develop a mental disorder may not be able to work because of their illness. Others, because of discrimination, may be systematically denied work opportunities or may lose their existing job.

Lack of employment drives people deeper into poverty and people are unable to pay for the treatment that they need. In other cases a great deal of money is spent on ineffective and inappropriate mental health care, which means that people not only end up out of pocket but also fail to get better.

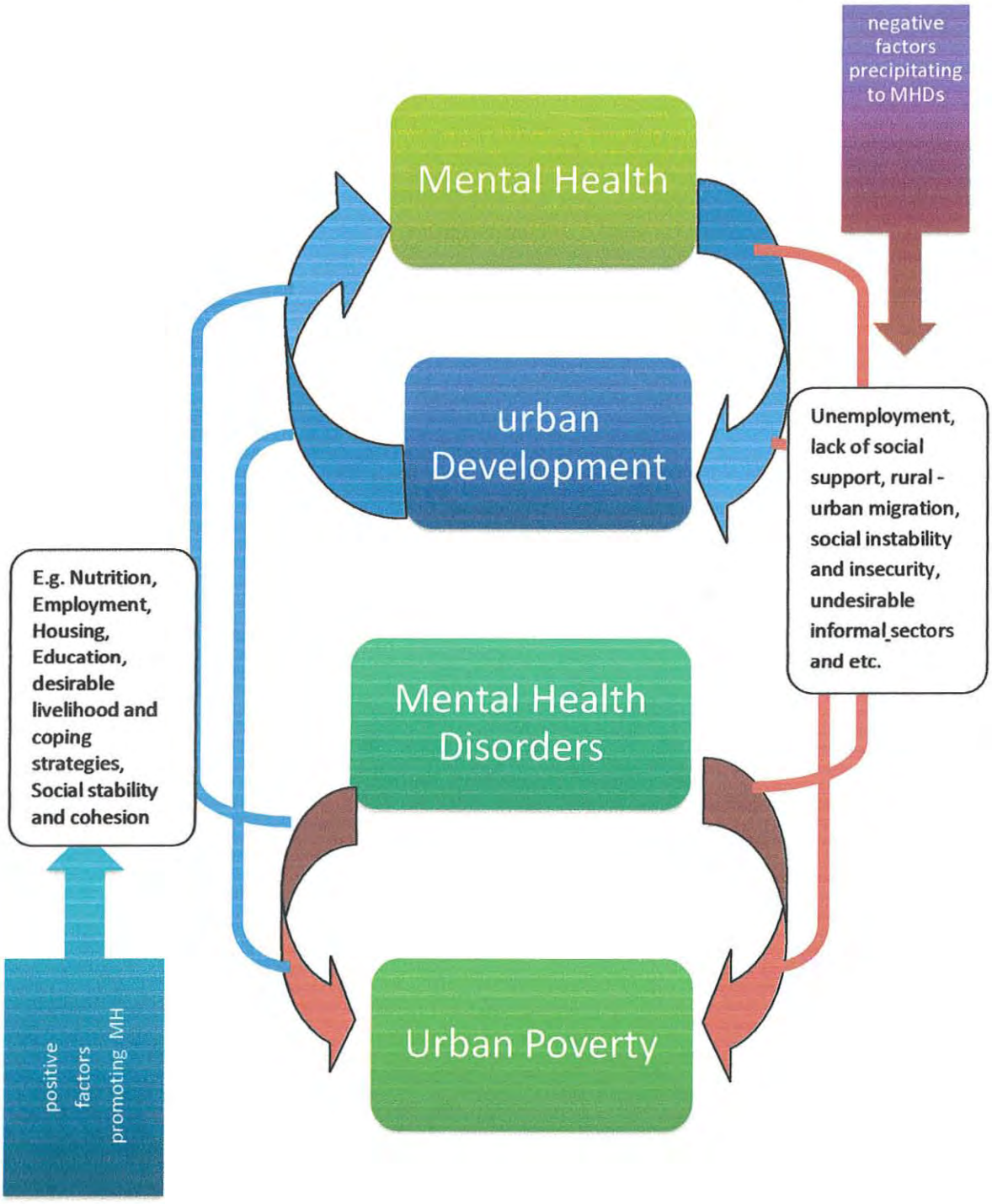



**Figure 2.1 - Conceptual framework of the research**

Supportive community networks help to protect against the adverse effects of illness and poverty. But for people with MH disorders social support systems often disintegrate as the stigma and discrimination that they face leads to their marginalization, social and human rights violations. All the factors further worsen their condition and perpetuate the negative cycle between poverty and MH. (WHO, Geneva, 2007)

## 2.6 Conclusion to Literature Review

Exploring "public mental illness in a wider context of urban socioeconomic development" involved a review of expansive literature. The history of mental illness as a distinct public health problem in the long journey of medical science and technology was important as this review has been fundamental to set the focal area of the research and has facilitated the development of useful research questions that served as guidelines in the process of carrying out this research project. Passing through this literature review has also led to the exploration of a range of methodological and theoretical perspectives and enabled the recognition of the most suitable methodological framework and the methods to be utilized.

There are lots of publications of reports, epidemiological surveys, consortium conferences and literature on how to project the effects of unhealthy rapid urbanization on the range of socioeconomic and physical environment and the implications of this on mental health of the public at large. It has been identified that the issues of mental health is the most disadvantaged area even though it is crucial in determining the productivity and quality of life of urban dwellers. In order to improve the quality of urban livelihood, mental health has to be mainstreamed in the entire activities of urban development.

The main question that is raised from this is "what are the demographic and socioeconomic determinants of mental health disorders in urban livelihood?" And "what are the burden of mental illness and psychological distress on the development of urban dwellers?" In order to get a clear insight on these points, one must identify and measure the association between the problem at hand and socioeconomic determinants and the burden of the problem to the already poor urban residents.

# Chapter 3

# Research Methodology

## 3.1 Introduction

This chapter addresses the methodology followed during the study time of the thesis. In order to have the clear image of the study area, the historical background and the current situation of the capital is briefly presented in the first section of the chapter. The methods that are used in most of similar public health researches were reviewed; the options available to undertake the study and the reasons why a particular method was selected are explained in the subsequent subsections. The research approach and sampling technique, data collection method and the variables involved in the data instrument are discussed. The data sources, model specification and methods of data analysis are also summarized in the chapter.

## 3.2 Facts About the Study Area

### 3.2.1 History and Demography

Addis Ababa was first conceived and born as city by empress Tayitu in 1886 and celebrated her 125$^{th}$ anniversary in 2011. The city was primarily found in the form of indigenous settlement without any formal urban management. The settlements advanced randomly around the palace of the emperor proximal in accord with the ranks and dignity of his officials and other significant personalities separated from low ranked or ordinary people by the vacant spaces. These spaces apparently occupied by the people from lower classes and the settlement pattern gradually came to be characterized by the mixed residential (the riches and the rages live in neighborhood). [8] Though these kinds of settlement patterns are pertinent with the least urbanized

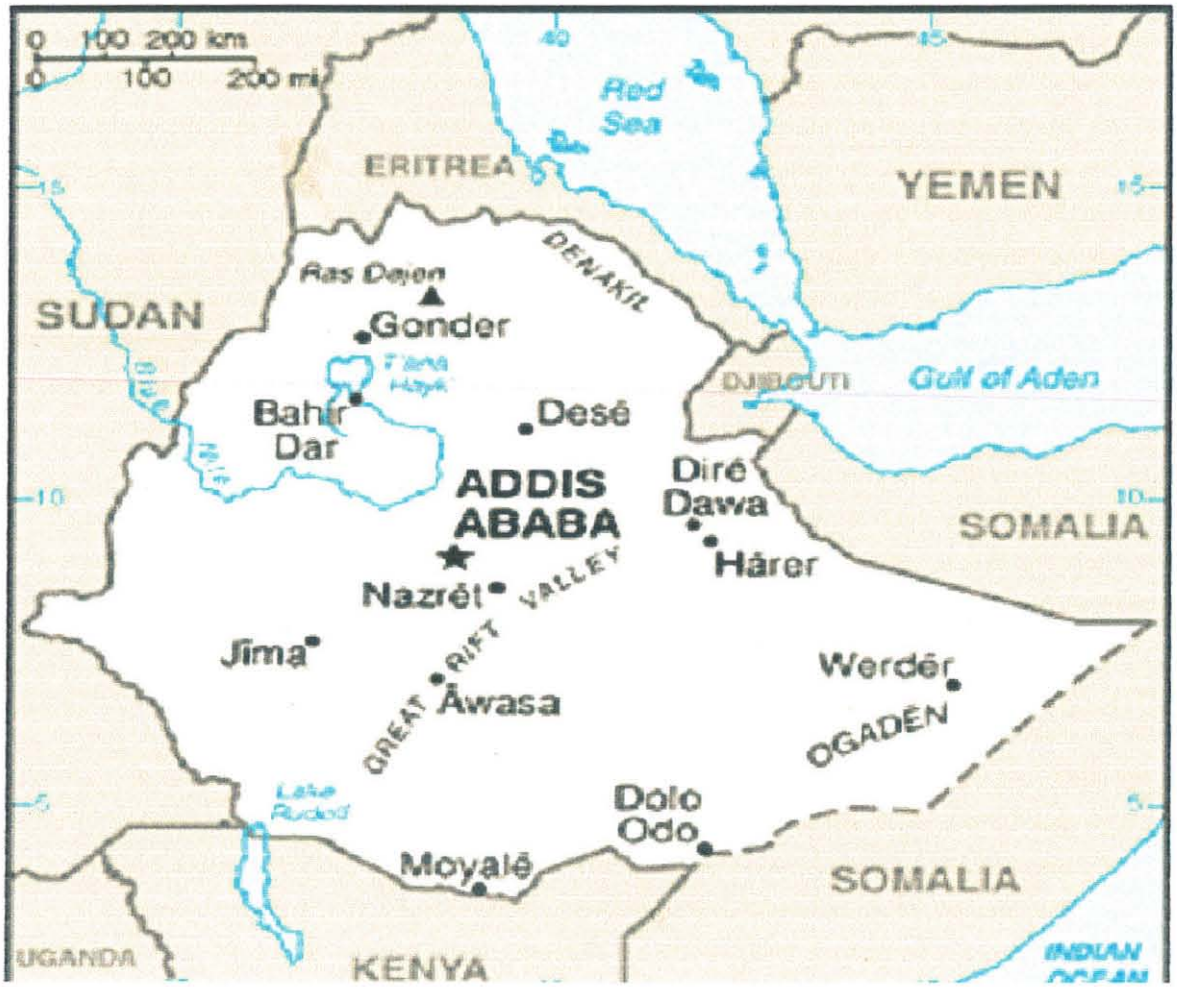
countries, Addis Ababa is currently showing one of the world fastest rates of urban growth which is 5% annually on national average (CSA, 2007).

Today, the city is not only the seat of the Ethiopian government, the head quarter of the African Union, the Economic Commission for Africa and other international organizations but also Addis Ababa is the most important center of the economic, social and political development of the country. Based on the 2007 Census reported by the Central Statistical Agency of Ethiopia, Addis Ababa has a total population of 3,059,000 living in 655,118 households with 2.4 average numbers of rooms and 4.2 people per household. All of the populations are urban inhabitants of which 47.6 % are rural-urban migrants. By the virtues that almost all religions and ethnicities of the country are represented, the city has been endowed with the meta-ethnic color and cultural mosaic of the country (Shibeshi Abera, 2013).

### 3.2.2 Administration

Currently, the administration of the city is clustered into 10 "Kifle Ketemas" (Sub-cities) and 116 "Woredas" (districts), the lowest functional unit in the structure of the city administration. Again, based on the CSA reports and other literatures, 80% of the people are living in slum and 51% are engaged in the informal sector. However, in the last three decades, a few high-income and upper middle class portions have emerged in a certain residential areas and managed to build high rise buildings at the fronts of the main streets that masks the poor standards of most housing units in the behind neighborhoods (Yoseph E. et al, 2010).

17.5% rate of urban unemployment and 25.7% of urban poverty head count indices and inequality reported in 2010/2011 witness the socioeconomic statuses of residents in the city. The total number of adult people with mental health problems accounts 27 in 10,000 people (CSA, 2007). With the ambition of making an internationally competent city, the current government of Ethiopia has been displacing several neighborhoods to bring in more revenue and in favor of business centers, high- rises which is at the expense of thousands of uprooted people who don't have a defined means of resettlement. Though the government has initiated a massive condominium projects to



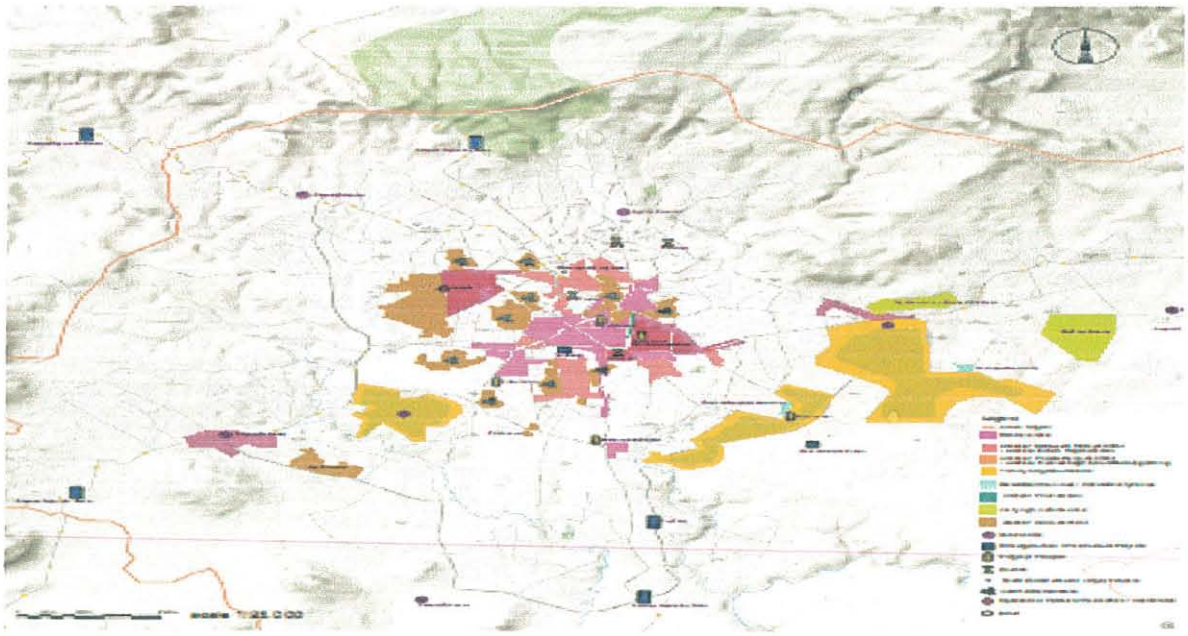



**Figure 1.2 Maps of Ethiopia and Addis Ababa (Source: Inauria, 2010)**

counter the problem, most residents are poor by far to afford the subsidized housing scheme (Yoseph E. et al, 2010).

In addition to that, the then existed neighborhoods were meant much more than housing to the uprooted households; these neighborhoods where communities might have lived for 2 or 3 generations were meant a lot for them. It is their market for the petty informal businesses they might venture, social insurances for the risks they might encounter along the urban livelihood and above all, it is a psychological safeguard for the emotional distress they might encounter in life. Even though the psychosocial costs of this resettlement program need its own study, it is observable that the livelihood of the displaced poor is inseparably mingled with their neighborhoods and the government has a little account for it (Mara Gittleman, 2009).

The macroeconomic effects of the fast growth and vigorous expansions of the city are typically elicited by the ever decreasing farm lands and employment opportunities in urban agriculture. When the government expands to the periphery of the city, the agrarian communities are displaced with certain amount of compensation but without any skills of allocating the money to sustain the future of the households. They simply put off their farm lands and migrate to the center where the rate of urban unemployment is already high. It also negatively affects the food supply that aggravates the prevailing price inflation on food items in the city. In addition to it, urban agriculture activities in the central vicinities of the city are disrupted because plots of land are allocated for other businesses and the irrigable rivers of the city are severely polluted (ibid).

Although it could be assumed that all these situations pose psychological distresses primarily on portions of the people in the frontline, the problem would radiate to the public at large. Moreover, the lack of transparency, public participation and inter-sectoral integration among the different governmental institutions which operate development projects; adversely disrupt the provisions of basic social services (water, power, telecommunication) and mobility of the people and environmental health of the city. The scarcity of green areas, increment in motor vehicles, population growth, the poor conditions of roads and the undergoing infrastructural works are adversely affecting the quality of life in the city. All these sprawls and hustles, traffic accidents and congestions

have a lot to do with the mental health of the public along the urban livelihood (Ontario College of Family Physicians, *An information series*, 2005).

## 3.3 Research Approach

Research is a scientific and systematic course of activity in the process of searching propositions about social or natural phenomena based on a predefined inquiry on a certain subject. Hence, the approach to be followed in a research primarily depends on its objective. For a research that intends both to portray the characteristics of a particular group and analyze the interplay between certain factors, like that of this thesis which is intended to explain and analyze the socioeconomic and demographic determinants for the occurrence of mental health disorder and psychological distress in adult residents of Addis Ababa; the appropriate approach is the mix of analytic and descriptive research. The major purpose of mixed research approach is both to elicit the state of a subject as it exists at present and analyze the interaction as well. The typical feature of this approach is that it optimizes the mix of both ways and utilizes where either of them may be relevant and appropriate to a set of data (Kothari, 2004).

Therefore, attempts were made to discover important demographic and socioeconomic variables that are supposedly associated with the occurrence of MH disorders through variable association methods. As far as the theoretical model is concerned (based on the review of literature), most similar surveys follow the bio-medical and psychosocial model in general but in this thesis the psychosocial aspect of the model is developed due to time and budget constraints faced in the research project.

Though this partial model was adequate to address the intended objectives of the research, it falls through in capturing some important bio-physical factors such as history of family, birth (delivery), chronic illnesses, accidents that involve head injuries and other incidents happened to be in war or natural disasters. By overlooking these important elements of MHD knowingly, the research based on

demographic and socioeconomic aspects of the model on which both the data collection and analysis were formed. The first attempt made during the research was to have the overall picture of the research area. According to most literatures reviewed, the statues of public mental health have been viewed as it is a function of certain demographic, socio-cultural and economic factors (CDC, 2011 and Dekker et al, 2008).

The target population of this thesis, adult residents of the capital Addis Ababa was believed to be a prominent area to empirically test the assertions that the occurrence of MHD is determined by the demographic and socioeconomic factors. Since the last two decades, the city has been shown several socioeconomic events in a multidimensional way. However, the negative aspects of rapid urbanization seem to outweigh the benefits gained from the physical growth and expansion undergone in the city (Mara Gittleman, 2009).

The effects of cultural and technological globalization, the vigorous expansion and resettlement projects that disintegrate neighborhoods and impoverish the social cohesions which in effect demolishes the sense of security and trust among the community members and increases the rate of social crimes and instability. The high level of housing problem and the prevalent urban poverty coupled with the high rate of rural-urban migration lead to be engaged in undesirable informal sectors like commercial sex work and substance abuse (Yoseph E. et al, 2010).

The cumulative effect of these phenomena is supposed to have a lot to do with the occurrence of MH disorders and psychological distress along the urban livelihood in the city. It is from this theoretical assertion and empirical observations that the researcher was intended to describe and analyze the topic of the research. In order to answer the enquiries research, a variety of strategies have been utilized.

This research is one of inductive enquiry and this has informed the development of the research process. A predominately quantitative approach was chosen, however elements of qualitative research were considered to be appropriate, forming a mixed method of research structure. The first one involved a number of preliminary

interviews with the front line actors of Mental Health service provision in the health system of the country so that relevant issues which exist with mentally ill people were identified. Next to this, a review of literature and content analysis of documentations were undertaken. This was found to be indispensable in providing direction to the current research project.

Primary quantitative and qualitative data collection was done for a number of weeks. This included semi-structured interviews with ten psychiatric nurses serving in the mental health clinics of the health centers of Addis Ababa Health Bureau. Telephone calls were also there with psychologists and social workers of Amanuel Mental Health Specialized Hospital to get further information on the issues. The completion of survey was done at the three selected health centers for 300 adult residents who were diagnosed for different MH disorders in the study year. The data analysis techniques involved coding and categorizing the quantitative and qualitative data and statistical analysis was undertaken on the results. The research was concluded by discussing the findings in relation with addressing the specific objectives and developed insights on the research topic.

## 3.4 Research Method

This thesis is basically based on one year cross-sectional survey of adult patients in the psychiatric units of purposively selected health centers in Addis Ababa city. In order to address the intended objectives and test hypotheses effectively and efficiently, both qualitative and quantitative methods were used.

Quantitative research methods: collect numerical data (data in the form of numbers) and analyze it using statistical methods.

Qualitative research methods: collect qualitative data (data in the form of text, images, patient charts, key informant interviews and documents are used for narrative analysis (Kothari, 2004).

As a matter of facts, MH problems are subtle and complex in nature that most people do not perceive and recognize it as a public health problem especially, those MH

disorders other than the full blown major psychosis. Most people not only lack insights to the psychosocial distresses and emotional disorders but also they might conceal well manifested MH disorders due to different beliefs and misconceptions prevailed in the culture. Therefore, it is impossible to relay on a single research method that the need to compare findings with the relevant reports and literatures for it was a valuable task to maximize the analysis and description of the research topic (WHO and FMoH, 2006).

## 3.5 Sample Design

A sample is said to be representative when it should be selected in such a way that generalizations could be made about an issue for a country, region or some other population at an aggregate level (Kothari, 2004). As the lesson learned from similar public health surveys such as that of the CDC of USA and GNHIES of German, the method of data collection of this particular research project should have been an interview conducted to the randomly selected adult residents of Addis Ababa city. However, this kind of data collection method would have been infeasible by far. This is because of the budget and time limitations in one hand and most cases of the of the H/Hs are not familiar with most questions that were intended to explore the types and levels of Mental Health Disorders and Psychological Distress (Teferra S. and Shibre T, 2012) .

The data tool and sample design were adopted in such a way that the necessary socioeconomic and demographic variables should be captured and the selected sample would represent the target population. The survey has focused on adult residents who have visited psychiatric units of the health centers and already diagnosed for certain mental health disorders in the year. the data inquiry was restructured in a way that vital demographic and socio-economic variables could be generated.

Therefore, out of the 10 sub-cities of Addis Ababa city, 3 sub-cities were purposively selected in accord with their population density as a measure of urbanization level in 3 categories (center, middle and periphery). Kirkos, Nifas Silk Lafto and Akaki-Kality

sub-cities were selected representing high, medium and low level of urbanization respectively. (The researcher had selected the south-east direction (Addis Ababa-Debrezeit rout) for the sake of convenience in carrying out the study). Furthermore, 3 health centers were targeted from their respective sub-city i.e. kirkos, Nifas Silk and Akaki Health Centers and the psychiatry units of each health center were the source of survey data. Of all the patients who have visited the clinics in the interview month (April 9, - May 9, 2014/ Miyazia 1- Ginbot 1, 2006) patients who fulfill the following criteria were interviewed: -

- The current address of a patient must be in the same sub-city where the health center is under.
- The patient must be adult (≥18 yrs.) depending on the recent birthday.
- The first onset of his/her mental health problem must be in the survey time (July, 2013/2005 – May, 2014/2006).
- The patient must be diagnosed for at least one defined mental health illness other than Epilepsy and/or any kind of psychosis (schizophrenia).
- The patient must be in a good state of mood/ mental integrity (as assessed by the psychiatric nurse) and give an informed consent for the interview.

Any patient who fulfilled the above criteria was supposed to be legible for the interview. In the selected 3 health centers, the number of patients flowed to the mental health clinics ranged from 15-25 per day and in the month (April 9 - May 9, 2014) when the interview was conducted within 21 working days, a total of 467 patients were reported from the selected clinics. Out of this 300 patients were found to be legible for the interview. The interview was conducted by the psychiatric nurses who have been serving at the mental health clinics in the respective health centers. They had conducted the survey in accord with their convenience (time and work load). Therefore, 300 patients who fulfilled the above criteria were considered as the sample size of this cross sectional survey.

## 3.6 Data Sources and Method of Data Collection

As it is commonly known, diagnostic process of medical and/or surgical problems mostly depend on physical examination, medical instruments, laboratory examinations and other radiological findings. Unlike to this, the task of identifying MH problems is done mainly through psychiatric interview techniques. This tool encompasses wider range of bio-psychosocial inquiries in relation to the MH problem of an individual. Therefore one could extract the basic demographic and socio-economic data of a patient registered there in the patient's chart. This was a good opportunity for this research particularly in easing the data collection process.

The data were collected from the patients' chart with which basic demographic data, present history of illness and the type of mental health illness that a particular patient has been diagnosed for could be extracted. However, the main source of data was the semi-structured questionnaire which encompassed the identification number of data numerators and address of a respondent. The questionnaire was adopted from CIDI in such a way that most questions would suit the specific objectives of the thesis. CIDI was intended for the use in epidemiological, clinical, research studies and mental illness surveillance among adults in the United States by CDC (CDC, 2011).

Therefore, the questionnaire was the main tool of generating the necessary data for this survey. The demographic and socio-economic status of adult patients in the selected mental health clinics were filled along with the diagnosis of mental illness and psychological distress. The questionnaire was structured in five sections: - demographic variables, social network variables, economic variables, MHD diagnosis and the health burden of a patient. In order to get the data collectors (Psychiatric nurses) oriented with the tool, a brief discussion was held with them. The questioner was translated in to Amharic for the sake of simplicity in the data collection process and it was this version that the nurses had used through face-to-face interview technique (Annex-1).

The collected data was checked for completeness, clarity and coded to be entered into SPSS-20 window software program; the findings and interpretation are presented in the coming chapters.

## 3.7 Method of Data analysis

In order to address the objectives of the study described above in chapter one, the conceptual framework has an inherent character to encompass all variables that have direct and indirect influence on the issue of mental health and psychosocial disorders of adult urban residents in the study area. Thus, both descriptive and econometric analysis has been employed in this research.

### 3.7.1 Descriptive and Econometric Method

#### 3.7.1.1 Descriptive method

Descriptive method was employed to explain the demographic and socioeconomic variables in relation with MH problems of adult residents of the city. According to the related literature reviewed, different theories of abnormal psychology and empirical studies have justified that the occurrence, precipitation and aggravation of mental health and psychosocial disorders are associated with a number of demographic and socio-economic variables. Moreover the situation is severe and has a lot to do with the high level of urbanization. Descriptive statistics particularly the frequency distribution, percentage, cross tabulation and chi- square test were computed for different variables.

#### 3.7.1.2 Econometric method

According to a similar survey which was conducted by a group of researchers in Germany, the econometric model that is relevant for the analysis is logistic regression (Dekker et al, 2008). But as all of the respondents of this particular survey (n=300) were known to have at least one MHD, it is impossible to state the

occurrence of MHD as a dependent variable. Therefore, all the seven categories of MHD were dichotomized into "Yes" or "No" groups i.e. those cases who were diagnosed for any MHD other than substance abuse were labeled as "Yes" or took a value = 1 and those cases who have diagnosed for substance abuse were labeled as "No". The category "substance abuse" was chosen to take value = 0 or as if they had no MHD because there might be substance addiction without any major MHD.

Therefore, after the dependent variable "MHD" was recorded into a dummy variable, all the socioeconomic and demographic predictors were entered into binary logistic regression model (SPSS-20). The significance level of the socio-economic factors was determined for any MHD other than substance abuse. For the sake of simplified summary and interpretation, the predictor variables were also dichotomized in to their extreme categories. Then, the binary outcome of the dependent variable (MHD) was analyzed as it was explained by the independent variables (demographic and socio-economic determinants).

The different forms of Chi-square test was computed to measure association and conditional independence at 0.05 significant level and test of homogeneity at 0.1 significant levels. And also using the data collected from 300 adult patients who visited mental health clinics in the year 2013/14 was analyzed to specify and estimate the degree of association by their respective odd ratios (ORs) for the occurrence of MHDs other than substance addiction in different socioeconomic and demographic categories using logistic regression model.

## 3.8 Variables Definition, Model Specification and Hypotheses

### 3.8.1 Variables Definition

The dependent variables used in the research were the binary outcome variable explaining the occurrence of any MHD and psychosocial disorders in purposively selected adult patients in the psychiatric clinics of 3 health centers in Addis Ababa city. Regarding the criteria for choosing explanatory variables, there are a number of demographic and socioeconomic factors that clearly dictate the manifestations of

one or more symptoms of MH problems as repeatedly stated in similar studies. Based on these prior literatures, the factors that affect the incidence, relapse and intermittence of MHD which were categorized as the following:

**Demographic Variables** (level of urbanization, age and sex of the respondent, marital status, years stayed in the study area, education level, Patient's role in the family, the family size of a patient)

**Economic Variables** (employment statues, monthly income of a patient, house ownership of a patient, source of finance for health service fee, financial worry of the patient)

**Social variables** (number of neighborhoods a patient has changed in the last five years, how long a patient has lived in the current area, level of social network, importance of religion in patient's life, patient's habit of personal problems to others, the level of membership in formal/informal associations and/or participation in community activities) (Pat Pridmore et al, 2008).

### 3.8.2 Model Specification and Hypotheses

The mere facts that all respondents in the survey were diagnosed for one or more mental illness or psychological distress, it was impossible to analyze the data without putting a dichotomy in the dependent variable (MHD). And the suitable model for the dummy dependent variable is the one chosen for analyzing the data in this study, logistic regression. Since the probability of AMHD to occur must lie between 0 and 1, linear regression method wouldn't be practical for it allows the dependent variable to take any integer other than 1 or 0. Therefore, the quantitative analysis of the research findings were done through logistic regression particularly using the binary logistic model (BLR). The logistic regression model is a type of generalized linear model that extends the linear regression model by linking the range of real numbers to the 0-1 range. The odd-ratio (OR) of AMHD is computed for each explanatory variable (demographic and socioeconomic).

To begin with the model, let's consider the existence of an unobserved categorical variable, $\eta$ which can be thought as the "propensity towards" the event of interest, in this case $\eta$ represents a patient's propensity to be diagnosed for any MHD other than substance abuse (AMHD), with larger values of $\eta$ corresponding to greater probability of being diagnosed as AMHD.

The logistic regression model assumed a dichotomous dependent variable *Y* (AMHDs other than substance addiction) with probability π for each case of the different categories of demographic and socioeconomic determinants, the relationship between $\eta$ and the probability of AMHD (π) is described in the algorithm at Annex 2-A as:

$$\pi_{i=}\frac{\exp(\eta_i)}{1+\exp(\eta_i)} = \frac{e^{\eta_i}}{1+e^{\eta_i}} = \frac{1}{1+e^{-\eta_i}} \quad \textbf{Or } \eta_i = \ln\left(\frac{\pi_i}{1-\pi_i}\right) = \beta x_i \ldots\ldots\ldots\ldots\ldots \textbf{(6.1)}$$

The regression coefficients are estimated through an iterative maximum likelihood method and its algorithm is also found in Annex 2-C.

$$\pi_{i=}\frac{\exp(\eta_i)}{1+\exp(\eta_i)} = \frac{e^{\eta_i}}{1+e^{\eta_i}} = \beta x_i$$

$$\pi_i = \frac{e^{(\beta_0+\beta_1 x_1+\cdots+\beta_3 x_3+\beta_4 x_4+\cdots+\beta_n x_n)}}{1+e^{(\beta_0+\beta_1 x_1+\cdots+\beta_3 x_3+\beta_4 x_4+\cdots+\beta_n x_n)}}$$

$$=\frac{e^{\beta_0}}{1+e^{\beta_0}}+\frac{e^{\beta_1 x_1}}{1+e^{\beta_1 x_1}}+\cdots+\frac{e^{\beta_3 x_3}}{1+e^{\beta_3 x_3}}+\frac{e^{\beta_4 x_4}}{1+e^{\beta_4 x_4}}+\cdots+\frac{e^{\beta_n x_n}}{1+e^{\beta_n x_n}}$$

The dependent variable of this model is the binary outcome of the variable explaining the occurrence of AMHD other than substance addiction in 300 adult patients. The details of demographic explanatory variables or determining factors affecting the incidence, relapse and intermittence of AMHD are hypothesized as follows:

1- **Level of urbanization ($X_1$):** this variable was a proxy to measure the effects of urbanization to the risks of MH problems. According to previous studies it is believed that the likelihood of of MH disorders increases among adult residents who live in highly urbanized area than relatively less urbanized

areas. And it is assumed that the more a resident is located away from the center the less the level of urbanization s/he is living in.

2- **Gender ($X_2$)**: being female is more prone to certain MHDs such as depression and being male is prone to General anxiety disorder. Therefore, the aggregate effect of gender on the MHDs could increase or decrease the likelihood of AMHD.

3- **Patients Age ($x_3$):** as young and mid-adult age people are actively involved in the ups and downs of urban livelihood, they are highly prone to be exposed to emotional stressors and the old age adults may be exposed to different MHDs that are associated with other chronic medical illnesses. Therefore, the aggregate effect of this variable could increase or decrease the chance to AMHD.

4- **Marital status ($X_4$):** being single or not married was assumed increase the chance to ill MH. A possible explanation of this is that marriage is often concurrent with better psychological health as a result of good interpersonal relationships while divorced or unmarried people have more difficulty in building enduring and stable intimate relationships.

5- **Literacy level of a patient ($X_5$):** this variable explains the level of access to information and problem solving capacity in the process of urban livelihood; it supposedly decreases the likelihood to suffer from AMHD. However, in this era of information technology and the associated adverse effects of the digitized world to the psychological wellbeing of urban dwellers, literacy level may increase or decrease the likelihood of the occurrence of MH related problems.

6- **Patient's role in the family($X_6$):** being a mere member of a household or taking other responsibilities like being a parent would have different effect on the outcome variable. Hence, the likelihood of being diagnosed for AMHD was expected to increase in parents than those residents who have family role other than parent.

7- **Number of years a patient lived in Addis Ababa (Migration) ($x_7$)**: This variable affects the outcome variable as it explains the level to which a patient

acclimatized him/her self to the socioeconomic environment in urban livelihood. Therefore, fewer years in the community was expected to increase the likelihood of the occurrence of AMHD.

8- **Household size ($X_8$):** as the association between household size and the occurrence of MH problems was assumed to be dependent on the aggregate level of social network among the family members, large household size was expected to increase or decrease the likelihood of the occurrence of AMHD and psychosocial disorders.

And by the same token, the details of socioeconomic variables affecting the incidence, relapse and intermittence of AMHD are hypothesized as follow

1. **Number of neighborhoods a patient has had in the last 5 years ($X_9$):** this variable measures the how frequent a patient is urged to change his/her neighborhoods in the city. changing neighborhoods more frequently would increase the likelihood of AMHD as a result of social instability.
2. **Number of years a patient has lived in the current community ($X_{10}$):** This variable affects the outcome variable as it explains the level social instability, rural-urban migration and neighborhood situations of a resident. The more the number of years a patient has stayed in a particular community, the more socially stable s/he is and the less the risk of being mentally ill.
3. **The level of social network ($X_{11}$):** this variable accounts how often a patient makes contact with his friends or groups of his/her peers and poor social network was supposed to increase the the chance to the occurrence of MH disorders.
4. **Level of participation in the community ($X_{12}$):** being a member of any formal/informal associations and/or active participant in other forms of voluntary activities was supposed to decrease the occurrence of AMHD.
5. **Importance of religion in patient's life ($X_{13}$):** similar to the above two social predictors, as a patient gets involved in religious activities, s/he supposedly diversify his/ her social network and the effect would be the same.

6. **Employment statues($X_{14}$):** regardless of the amount of income, employment status of a patient is associated with chance to the occurrence of MH and psychosocial disorders that unemployment increases the likelihood.
7. **Level of income($X_{15}$):** regardless of the source, a relatively higher level of income a patient might earn decreases the likelihood of the occurrence of MH problems.
8. **House ownership ($X_{16}$):** because of its multiple socioeconomic effects, being the owner of a house or rented from government was assumed to be a positive factor to MH. Hence, rented from private owners was assumed to increase the likelihoods of emotional stress and MHD to occur in adult urban residents.
9. **Source of finance for medical service ($X_{17}$):** this variable accounts how a patient covers the costs of medical service fee and medications. Those who can afford by themselves, free access or health insurance were supposed to be associated negatively with the likelihoods of outcome variable.
10. **Level of financial worry in the year ($X_{18}$):** this variable measures how much a patient worries financially to cover the basic costs of life (food, house rent, transport, school fee) in the last 12 months. Those who worried to a higher level are highly prone to suffer from psychological distresses and MHDs.

In order to test these hypotheses data of the listed predictors were entered into logistic regression model in stepwise method. From step to step, the improvement in classification indicated how well the selected model performed. As a better model should correctly identify a higher percentage of the cases, 82.6 percent of 300 cases were correctly classified by the model. This suggests that, overall; the model is in fact correct about four out of five times. In the analysis odds ratios were calculated for each demographic and socioeconomic variables listed in the hypotheses. Of course, the variables were dichotomized in to their extreme ends for simplified interpretation and the reference category of each variable is explained in the analysis part. The forthcoming chapters focused on the description, analysis and interpretation of the findings in the methods and the model.

# Chapter 4

# Research Findings

## 4.1 Introduction

In this chapter, the results from the methods of data collections: survey conducted in adult patients of the selected health centers, and documentary analysis: reports, publications and strategic plans of WHO and FMoH is provided. The chapter focuses on describing the type of mental health disorders that adult patients were diagnosed for, the demographic and socioeconomic characteristics of adult respondents and the health burden of MH problems. And also, it considers the current prevalence of MH disorders worldwide and particularly in Ethiopia in urban settings. The findings from the key informants on MH problem issues and the triangulation of the survey with different documents are summarized in the chapter.

## 4.2 Prevalence of Mental Illness

All psychiatric units of the health centers under the Health Bureau of Addis Ababa city administration follow the same manual (DSM-IV) for the diagnostic criteria of any psychiatric illness. According to the data collected from the patients' chart in the month when the survey was conducted, there were a total of 300 patients who had been diagnosed for different MHDs in the selected three health centers. These MHDs were found to be in seven categories as they were labeled by the psychiatric nurses and the labels are also similar with the HMIS format which serves for recording and reporting Mental Health illnesses in the health system of the city/country.

As it is elicited below, in table 4-1, the modal MH illness is "Depression" (35.2%) followed by "General anxiety disorder" which accounts 14.8% of the total MHDs in the survey. Other disorders such as "Any psychological distress" and "Substance addictions" prevail in equivalent rate (10.3%). The types of MHD which prevailed

minimally are "Any mental illness other than epilepsy" and "Co-morbidity", both accounts 8.5% on average.

**Table 4.1 Mental health illnesses that Patients were diagnosed for**

| count | Type of Mental Health Disorder Patients are diagnosed for | | | | | | | Valid | Missing | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | GAD | MDD | Any MH dist. | Drug addiction | UMD | Any MHD ≠ Epilepsy | Co-morbidity | Total | system | |
| N | 49 | 116 | 33 | 35 | 11 | 29 | 27 | 300 | 30 | 330 |
| % | 14.8 | 35.2 | 10 | 10.6 | 3.3 | 8.8 | 8.2 | 90.9 | 9.1 | 100 |

**Source: survey data**

As one of the purposes of this research is to describe the MH problem of adult residents in the city, the detail explanation of these disorders may take the study off the topic. However, the last two categories in the above table need some sort of briefing. "Any mental illness other than epilepsy" refers to those patients who have manifested some psychiatric symptoms but these symptoms do not fit to any type of defined diagnosis in DSM-IV manual then the clinicians put them as it is. Though epileptic patients are treated in the psychiatric units, Epilepsy is excluded from the MH illness report because it is dealt in the stream of Neurology. And the last category, co-morbidity accounts the number of patients who suffer from more than one MHD. It may describe the severity of the illness and control a double count problem as well.

## 4.3 Demographic Characteristics of Patients

As per the variable definition in the previous chapter, ten basic demographic variables were incorporated in the questionnaire of the survey conducted to adult patients. These variables were simply found from a patient's chart which includes age, gender, marital status and education. The current address of a patient which in particular helps to capture the level of urbanization where a respondent was to be labeled and other demographic variables which were found to be important for the research but not found in patients' chart were extracted from the interview which include the role of a patient in the family, number of years a patient has lived in the study area and the size of patient's family. Exceptionally, two demographic variables, religion and ethnicity will be treated in

the next chapter for these variables have many categories that would make the summary bulk. Hence, eight demographic variables were considered in the report summary. A total of 300 patients were interviewed and some of the variables are missed in certain cases. The report is summarized in the form of tables and charts below.

### 4.3.1 Gender, Age, Level of Urbanization and MHDs

The three prominent demographic variables that were supposed to have determining effects on the occurrence of MHD are summarized in Table 4-2 below. According to the findings from the survey, there is no significant difference in number of patients between the three categories of urbanization level (central, middle and peripheral). The numbers of patient-flow in the survey month were almost similar (AVE. 33%) at each level of urbanization across the ten years interval age groups and gender categories.

Among the age categories, MHD is seen in a bimodal dispersion; the age groups 30-39 and 40-49 years each constitute 32 % of the total patients and both account more than 50% of the total. In a simplified summary, when the age variable is regrouped further in to two, young adults (≥18 ≤49 Yrs.) and old adults (>49 yrs.), it depicts that 70.3% of the total patients are young adults and the remaining 29.7% are old adults. This result goes with the same pattern across the gender groups i.e. there is no marked difference in the proportion of female to male young adults and the same is true for old adult patients. However, there is a significant difference among the two gender groups regardless of their age. The ratio of female to male patients is 3:1. This difference might not necessarily imply that females are more susceptible to MHDs than males. This is because equivalent proportion of gender is reported in other non-gender based departments such as in adult Out Patient Departments (OPDs). Another possible explanation for this is the fact that most of the services given in primary health care facilities focus on Mothers and Children Health (MCH) which almost involves female adults thus it may increase their demand for other services for it is a one-stop shopping at least virtually.

**Table 4.2 Age, gender and MHDs**

| Gender | Level of urbanization | Pt's age in years | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | | 18-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 | |
| Male | central | 4 | 10 | 11 | 6 | 3 | 0 | 34 |
| | | 4.3% | 10.6% | 11.7% | 6.4% | 3.2% | 0.0% | 36.2% |
| | middle | 1 | 10 | 9 | 6 | 5 | 1 | 32 |
| | | 1.1% | 10.6% | 9.6% | 6.4% | 5.3% | 1.1% | 34.0% |
| | peripheral | 3 | 12 | 11 | 1 | 1 | 0 | 28 |
| | | 3.2% | 12.8% | 11.7% | 1.1% | 1.1% | 0.0% | 29.8% |
| | Total | 8 | 32 | 31 | 13 | 9 | 1 | 94 |
| | | 8.5% | 34.0% | 33.0% | 13.8% | 9.6% | 1.1% | 100.0% |
| Female | central | 4 | 24 | 22 | 12 | 8 | 6 | 76 |
| | | 1.9% | 11.7% | 10.7% | 5.8% | 3.9% | 2.9% | 36.9% |
| | middle | 3 | 23 | 22 | 11 | 8 | 1 | 68 |
| | | 1.5% | 11.2% | 10.7% | 5.3% | 3.9% | 0.5% | 33.0% |
| | peripheral | 5 | 20 | 22 | 9 | 6 | 0 | 62 |
| | | 2.4% | 9.7% | 10.7% | 4.4% | 2.9% | 0.0% | 30.1% |
| | Total | 12 | 67 | 66 | 32 | 22 | 7 | 206 |
| | | 5.8% | 32.5% | 32.0% | 15.5% | 10.7% | 3.4% | 100.0% |

**Source: survey data**

By the same token, the implication of the marked difference seen among the two age categories (Young and old adults) wouldn't lead us to a conclusion that MHDs are more prevalent in young adults than their old counterparts. This is because there is a need to deal with other important cross sectional issues such as the age pattern of patient in other departments of the centers other than psychiatric units. And also one has to know the age pattern of mentally ill adults served in other health facilities like in district, regional and referral hospitals other than health centers and other setups like private clinics, faith based and traditional outlets of MH problems.

More importantly, the type of MHD that patients were diagnosed for vary in gender though all MHDs are more common among the young adults than old adults in both sex. As the graph below (chart 4-1) depicts, General Anxiety Disorder is more prevalent in male patients of both age groups (young & old adults) but the occurrence of Depression disorder shows a diametrically opposite pattern to GAD. This testifies that the survey

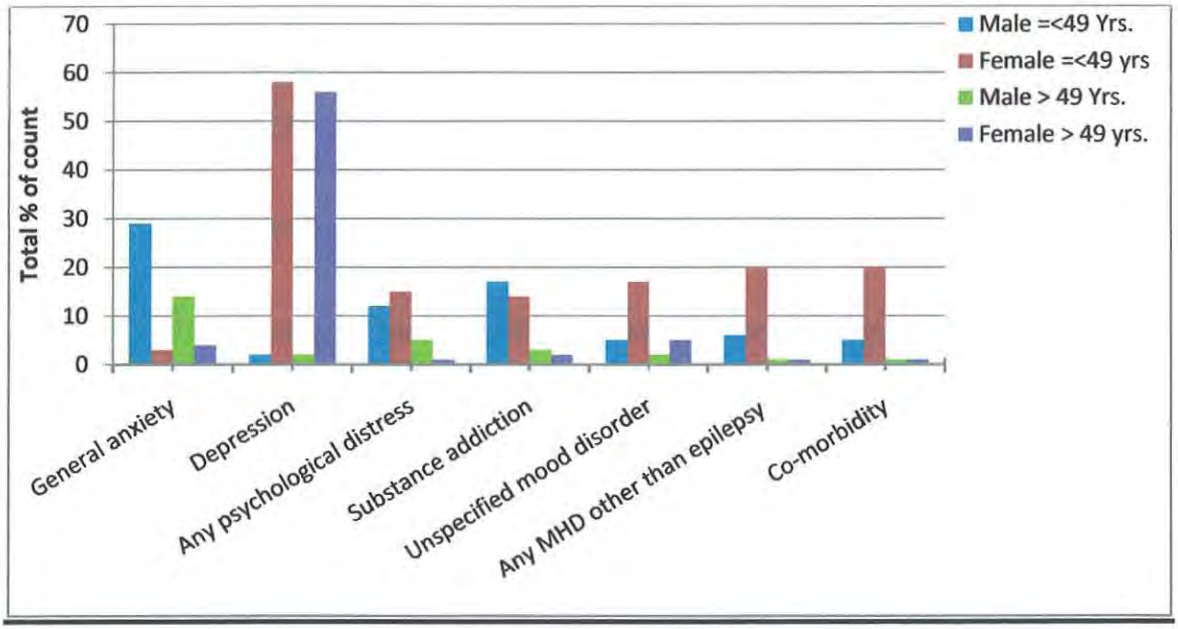



**Figure 4.1 the prevalence of MHDs in young and old adults across gender (Source: survey data)**

data is in line with facts reported in most literature of WHO and other researches of public MH. According to these researches MDD in female is 3 folds of male and GAD in male is found to be 2 times of female counterpart (UN (DESA), 2010). Regarding the remaining categories of MHD, almost all disorders don't show significant differences in gender except Substance addiction which was more common problem among male adult residents.

### 4.3.2 Other Demographic Determinants of MHD

Other demographic variables incorporated in the survey include marital status, level of education, number of years a patient has lived in the city, the role of a patient in the family and family size. The determinants were considered in the survey as the susceptibility to MHDs of a person can be varied depending on these predictors. For instance, keeping other things constant, a person who is not married is more vulnerable to certain emotional imbalance than those who have got married. The same fact holds true among those who are newly migrated to the cities than those who lived relatively longer and acclimatized themselves to the city life. Regarding the role a patient has taken in the family, parents and other members like elder siblings seemed to have more stressors as they take additional responsibilities in the network of their household.

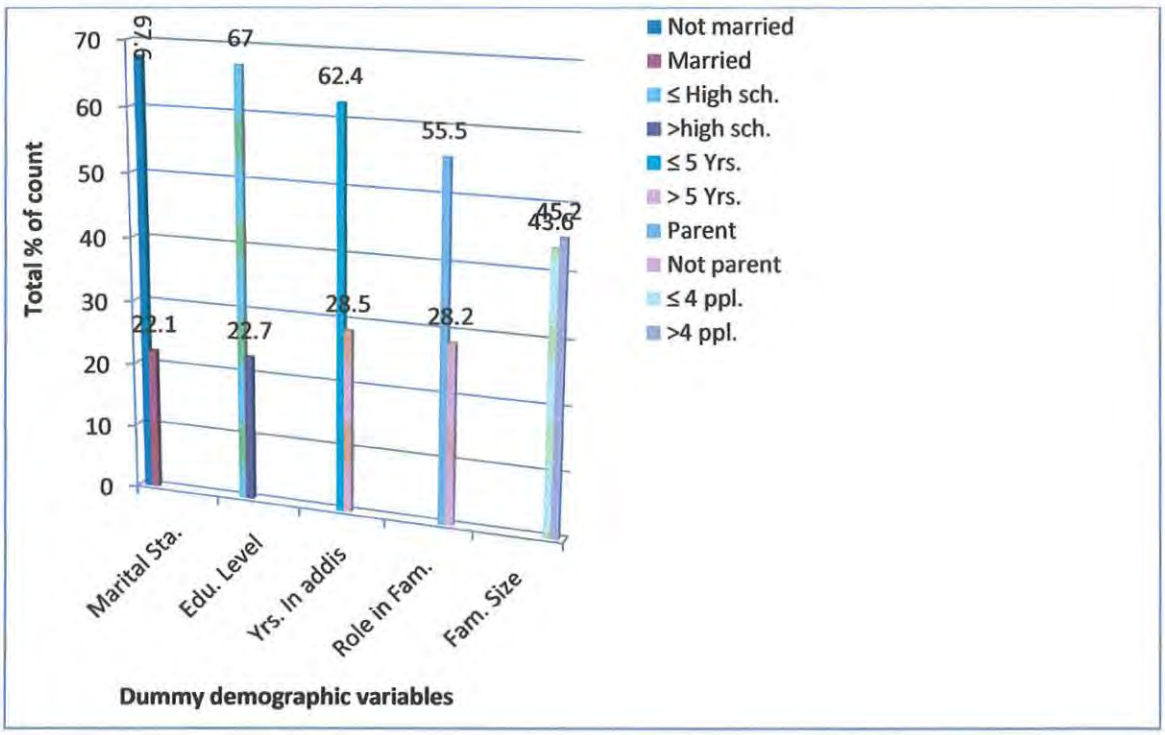



**Figure 4.2 Demographic determinants MHDs (Source: Survey data)**

These five important demographic variables are summarized above in chart 4-2. For the sake of simplified comparison all variables are dummied in to their respective extremes of categories under each variable. Therefore, marital status is dichotomized in to married and non-married (single, divorce, widowed, separated); education level is also transformed in to below and above high school level. Similar arrangement was done for the remaining three variables. Some of the cutoff points that were used in dummying the variables were set arbitrarily. For instance for the number of years that a respondent has lived in the city is "below and above 5 Yrs" because it is difficult to know how long would it take for a person feel at home in a city where s/he migrated to and the same thing was done for family size.

Of these binary groups in each variable, the values that are supposed to be risk factors were assumed to be the reference categories. As it is depicted in chart 4-2, MHDs is seen in the first categories more commonly than the second in the survey. Regardless of the different categories under MHD, it is prevalent among the non-married (67.6%) than married. As to the level of education, 67% were below the high school level and concerning the number of years that patients has lived, 62.4% of the total were the

newly migrated patients (≤5 yrs) to the city. In the categories labeled under family size, there is no significant difference between patients who live in households with ≤4 members and >4. The counts remained after the sum of the binary values in each variable is non respondents (user missing).

## 4.4 Socioeconomic Determinants and MHD

This section focuses on the summary of findings regarding the variables that describe the social capital and economic statues of respondents (n=300) who are diagnosed for different MHDs and respond for the survey questionnaire. The measure of responses in most questions that inquire the social network and economic status of patients were categorized in ordinal manner and of course, some of the measures were series of scales with equal intervals. In describing socioeconomic situations of MH patients, ten variables were utilized in the survey.

Again for the sake of simplicity in the process of data summary, all of the variables were dichotomized and took values like (Yes=1 & No=0). The ordinal measures divided into equal parts to take either of the values. For instance, the question that asked, "How often in the past 12 months would a patient were worried or stressed about having enough money, to buy nutritious meals, to pay his/her house rent or school fee?". Six responses were provided, "always, most of the time, sometimes, rarely, never and other (unknown)" and the first three took value = 1 (yes) and the last three took zero (No).

As the bar graph (figure 4-3) depicts, all of socioeconomic variables that were dummied into Yes/No categories, more than 60% of MH patients in the survey fall in the first category (Yes=1). Meanings, the socioeconomic status of most patients were found to be low or they were in the situations that may deprive their mental health and emotional wellness. More than 80% of the patients were worried or stressed about having enough money, to buy meals, to pay house rent or school fee in the past 12 months. About 78% of these patients don't have their own or government rental houses and 75% of them

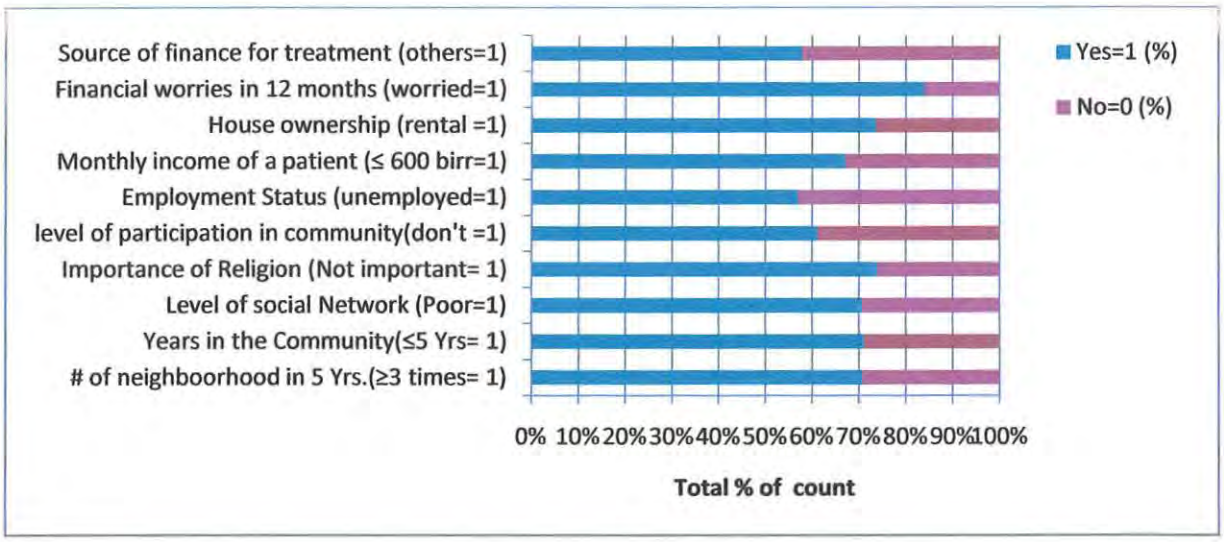



**Figure 4.3 socioeconomic determinants of MHDs in binary form (Source: Survey data)**

have poor social network, changed their neighborhoods more than three times in the last 5 Yrs and lived in the community for less than 5 yrs. Those patients who responded as unemployed, monthly income less than 600 birr/month and have low participation in the community counted 60% of the total on average. The same percent was counted under the source of finance for the treatment as other than self and health insurers.

## 4.5 The Burden of Mental illness

According to the literatures reviewed in this research, the burden of all physical and mental illnesses to the socioeconomic development of a country is measured by two methods, fatal and non fatal. The later one was assumed to be convenient and feasible for this survey. It measures the total years lived in disability (YLD). As reported in several researches, of all the burden of chronic and acute diseases worldwide, Mental illness comprised 13% globally in 2000. Mental illnesses in general and depression in particular are the leading non-fatal burden today as compared to all other illnesses. In Ethiopia, mental illness is the leading non-communicable disorder in terms of burden (11%) which out-ranked HIV/AIDS (WHO-FMoH, 2010).

In order to have a glimpse of insight on the burden of mental health illnesses in the survey, certain variables were incorporated in the data instrument. These include the average number of sick-leave days that employed patients were given by the psychiatric

nurses of the selected health centers. Other variables involved to describe the issue were like the inquiry, "what was the most pressing burden of the patient's illness and the extent of a burden" in the survey year. Questions that check "if a patient ever has suicidal ideation and/or attempts or not" are also there to indicate the health burden. Moreover, the question that required who did escort a patient to the clinic: "self or others" help to describe the burden of Mental illnesses to others (friend, family etc of a patient) and the level that a patient was aware of his/her MHD or it was recognized by others.

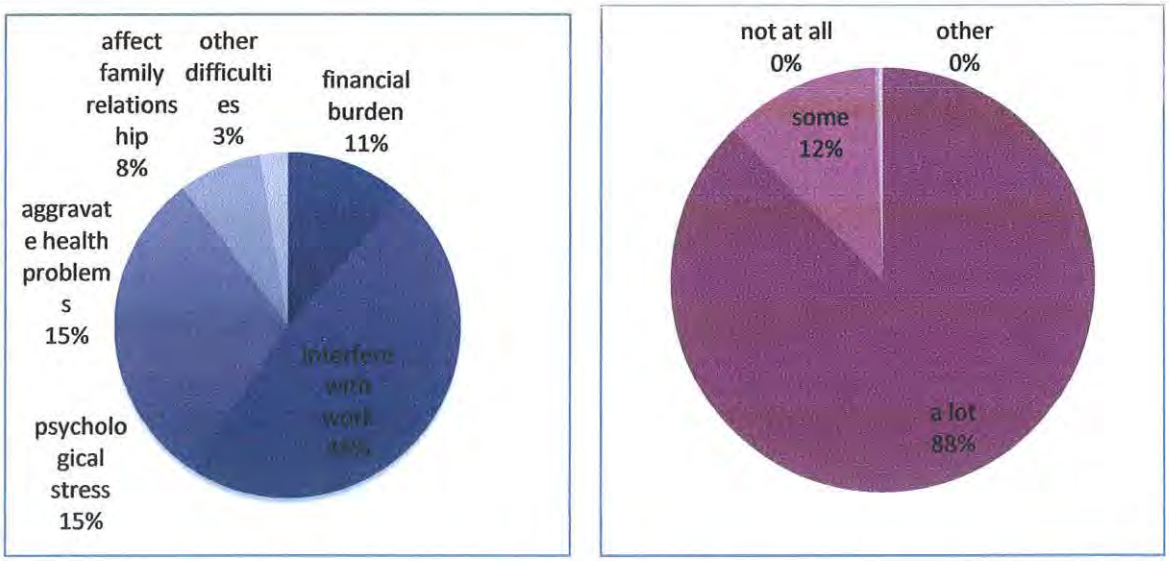



**Figure 4.4 graphs showing the most pressing burden of MHD to the patient and its level (source: survey data)**

the couple of graphs above in figure 4-4 display two related issues: the most pressing burden that mentally ill patients have experienced in the survey year secondary to the MHD they have been suffering from and the level of the burden. Accordingly 48% of patients responded, the facts that they are mentally challenged interferes with their work and it is the most pressing health burden. This means, they might have loss of motivation to carry out their tasks or they might have lack harmonious work relationship with their employers and colleagues. For 15% of the patients in the survey the most pressing burden of their mental health illnesses is psychological distress and the fact that it aggravates their physical illnesses. Financial burden and the effect on family relationships also account 11 % and 8% respectively. Parallel to this the pie diagram

(right) elicits the level of these burden and 88% of patients graded their burden as it was "a lot".

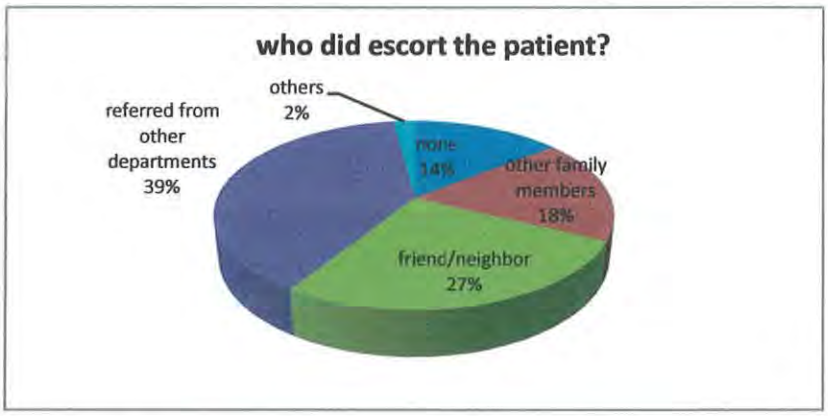



**Figure 4.5 pie graph shows who did escort a patient first to a mental health clinic (source: survey data)**

The above graph (figure 4.5) elicits that who did escort a patient to the psychiatric clinic when s/he visited the clinic first. The particular variable describes three major mental health related issues: the level of insight that a patient has about his/her mental health problem, service seeking behavior of patients for mental illnesses in primary health care facilities and the burden of mental illnesses to other people other than the patients. Accordingly, 39% of the patients were referred from other departments in health centers (mostly adult OPDs).

This may indicate that most mentally ill people somatisize (to believe mistakenly that an emotional pain is a physical symptom) their MHDs. 35% of patients were escorted by either their friends or family members; this may again indicate the burden of MHDs on other people indirectly. Only 14 % of the patients came by their own; this also indicates that there is low level of awareness about mental health issues in the public.

Another indicator of burden in mental illnesses included in the survey was the count of patients who experienced suicidal ideations and attempts in the study year. Table 4-2 below, summarizes that 23 (7.7 %) of patients in the survey had thoughts of killing themselves. The method of suicide a patient had contemplated indicates the strength of the suicidal thought. 10 patients had a well defined method but 13 patients had simply the idea and 6 patients out of those who had the thought had attempted of committing

**Table 4.3 Suicidal ideation, the method and attempts (source: survey data)**

| Suicidal ideation | N | % | Methods of Suicide a patient contemplated | | | | Attempted | |
|---|---|---|---|---|---|---|---|---|
| | | | Drug overdose | poisoning | strangulation | None | Yes | No |
| Yes | 23 | 7.7% | 2 | 4 | 4 | 13 | 6 | 4 |
| No | 277 | 92.3 | | | | | | |

suicide at least once, which means 0.02% of the total patients have the attempt and it is much less than the national burden (3.2%) in 2010, as it was reported by FMoH (ibid).

# Chapter 5

# Mental Health Disorder and its Determinants

## 5.1 Introduction

In the previous chapter attempts were made to address some of the specific objectives of the research through descriptive methods of data analysis. In this chapter the survey data is computed in cross tabulation method. The data analysis in this chapter would explain facts about mental illness and related issues in such a way that it supplements the descriptive analysis. Moreover this chapter would serve as a preliminary analysis for the forthcoming chapter in identifying important variables to be entered in the econometric model.

As it was explained in chapter three, there was no variability in the dependent variable (MHD) across the different categories of the explanatory variable (demographic and socioeconomic). Hence, the seven categories of MHD under the dependent variable were dichotomized in to any mental illness other than substance addiction (AMHD) and substance addiction only (No MHD). The binary outcome of AMHD was considered as the occurrence of MHD is present and absent otherwise.

Therefore, this chapter goes through the quantitative analysis utilizing cross tabulation method with different statistics depending on the measures of predictors. For the explanatory variables which are purely nominal such as religion (Orthodox, Muslim, Catholic etc) and ethnicity (Oromo, Amhara, etc) the relationship between column-row counts is measured using chi-square tests. Whereas, for the predictors measured in ordinal and scale, a 2 X 2 cross tabulation is used after predictors were transformed into dichotomous variable. Different forms of chi-square tests were utilized to measure the significance of association with the occurrence of mental illness (AMHD) and degree of association through their respective odd ratio (OR).

## 5.2 Mental illness and Demographic Determinants

Before going through the 2 X 2 cross tabulation of the dichotomies of MHD and ordinal demographic socioeconomic variables, it is better to check if there is any association between the predictors measured nominally (religion, place of birth, urbanization level) and the occurrence of MHDs.

**Null hypothesis:** - is that the two classifications, MHD in adult residents occurs independent of the different demographic and socioeconomic variables. (Alternative hypothesis is that MHD occurs in association with the differences in demographic and socioeconomic categories).

In order to test this hypothesis, the Chi square test is calculated for each demographic and socioeconomic determinants of MHD given the equation,

$$Expected\ value = \frac{(Raw\ Total)X(Column\ Total)}{Overall\ Total} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (5.1)$$

The algorithms in Annex 2-A shows the computations of observed actual data of the survey and the table below depicts the chi-square test of three nominal demographic variables assuming a significant level of 0.05.

**Table 5.1 chi square variables and significance level**

| Cases with AMHD and substance addiction | Cases | | | | Chi-square | | Nominal by nominal | |
|---|---|---|---|---|---|---|---|---|
| | Valid | | Missing | | | | | |
| | N | % | N | | value | Sig. | Cont.coff. | Sig. |
| Level of urbanization | 300 | 91% | 30 | 9% | 2.832 | 0.266 | 0.097 | 0.266 |
| Pt's place of birth | 291 | 88% | 39 | 12% | 17.802 | 0.017 | 0.240 | 0.017 |
| Religion of the Pt. | 291 | 88% | 39 | 12% | 7.210 | 0.204 | 0.155 | 0.204 |

**Source: survey data**

In the table three demographic variables are computed, the the count and percent of the categories in each variable is annexed in a case summary table, (Annex 2-A). As

the chi-square test measures the discrepancy between the observed cell count and what would be expected if the demographic variables and the occurrence of AMHD other than substance abuse were unrelated at the given level of significance (0.05), the patients' place of birth which was incorporated in the interview to measure the ethnic group of cases (not necessarily) is associated with mental health disorder (sig. 0.017) while level of urbanization where adult patients reside and religion assumed the null hypothesis.

Another measure of association utilized in the analysis was contingency coefficient based on chi-square in the last column of the table. Its value ranges from o and 1 value indicating that as the contingency coefficient of a demographic variable get closer to unit value of one, the degree of association between a variable and the occurrence of mental health disorder is strong and vice versa. Of the three variable in the above table, place of birth has a higher degree of association with mental health disorders (value=0.240) but religion and level of urbanization scored values = 0.155 and 0.097 respectively. This further indicates that level of urbanization and religion assumed the null hypothesis whereas place of birth proofed the alternative hypothesis true. In the following sections the occurrence of MHD is analyzed in relation with other demographic and socioeconomic variables.

As the data analysis goes with measuring the degree of association between the occurrence of MHD and demographic factors, the binary outcome of any MHD was computed controlling other risk factors such as level of urbanization. The level of urbanization is selected as a risk factor for the occurrence of MHDs because several studies witnessed that there is significant positive relationship between these variables. For instance a research conducted by Bio-medical institute of Germany has come to conclude that the prevalence of MHD is high in the highly urbanized residents of Germany. These empirical findings go in line with the theoretical assertions that urban way of life which is mostly coupled with the adversities of the digitized world precipitate and aggravate the incidence of mental illness of urban residents (IBM, SPSS Statistics, 2010).

Therefore, in this section, the dichotomous dependent variable (the occurrence of AMHD but substance addiction) and the dichotomized demographic and socioeconomic variables are cross-tabulated with the control variable, level of urbanization. By doing so, the research measured the level of association and addressed the fourth research question stated in chapter one; "What determines the occurrence of mental illness most; level of urbanization or socioeconomic factors?" The appropriate method for this purpose is descriptive analysis in cross-tabulation specifically the Cochran's and Mantel-Haenszel statistics with the help of SPSS-20 widow software. (The algorithms of this computation is found in Annex 3-B).

**Null hypotheses: -** are those,

**A).** the occurrence of AMHD and a demographic variable are independent and the alternative hypothesis is that these variables are dependent.
**B).** the common odd ratio (OR) of a demographic variable to the occurrence of any MHD other than substance addiction is equivalent at each level of urbanization and the alternative hypothesis is that the OR of a demographic variable is not equivalent across the stratum of urbanization.

Cochran's and Mantel-Haenszel statistics (MH) test the independence of a demographic variable and AMHD controlling level of urbanization at significant level 0.05. And the Breslow-Day statistics test the homogeneity of the odd ratio for each factor variable across categories of urbanization level (Center, Middle and Peripheral) significance level 0.10.

And in this survey, since the event of interest is the occurrence of AMHD controlling the level of urbanization, the value of the odd ratio is assumed as a good estimate of measure. The table below summarizes three important points on the associations between the occurrence of AMHD and seven demographic determinants controlling the level of urbanization. The column under the conditional independence tests whether there is a significant association between MHD and the respective predictors in the rows.

**Table 5.2 Chi square test of OR, conditional independency and homogeneity and significance level**

| Demographic variables | | parameter | Estimated common OR (MH) | | Test of conditional independence (C) | | Test of homogeneity (B) | |
|---|---|---|---|---|---|---|---|---|
| | | | $\Lambda$ $\theta$ | Asympt. sig. (2sided) | $\chi^2$ | Asympt. sig. (2sided) | $\chi^2$ | Asympts ig. (2-sided) |
| 1. | Gender | F | 0.606 | 0.147 | 2.177 | 0.140 | 10.176 | 0.006 |
| | | M | | | | | | |
| 2. | Age | <=49 | 10.018 | 0.000 | 18.831 | 0.000 | 0.590 | 0.745 |
| | | >49 | | | | | | |
| 3. | Marital statues | unmarried | 1.795 | 0.031 | 2.198 | 0.028 | 2.173 | 0.337 |
| | | Married | | | | | | |
| 4. | Education | <= G-8 | 1.147 | 0.041 | 0.210 | 0.035 | 7.933 | 0.419 |
| | | > G-8 | | | | | | |
| 5. | Yrs. in A/A | <= 5 Yrs. | 2.210 | 0.031 | 4.755 | 0.029 | 1.873 | 0.392 |
| | | > 5 Yrs. | | | | | | |
| 6. | Family Size | <=6 people | 0.987 | 0.964 | 0.02 | 0.964 | 1.078 | 0.583 |
| | | >6 people | | | | | | |
| 7. | Role in the family | Parent | 0.525 | 0.040 | 4.334 | 0.037 | 1.068 | 0.586 |
| | | Non-parent | | | | | | |

**Source: Survey data**

This tests the hypothesis-A above. The column under the test of homogeneity tests the role of difference in level of urbanization to the occurrence of MHD with respect to the categories of demographic variables. The first column, the common odd ratio $(\frac{\Lambda}{\theta})$ measures the degree to which the occurrence of the dependent variable is determined by the demographic predictors.

Accordingly most demographic variables are significantly associated with the occurrence of MHDs (significant level < 0.05) with the exceptions of religion and family size. As far as test of homogeneity is concerned, these five predictors (age, marital status, education level, and years in Addis and role in the family) are associated with MHD regardless of the level of urbanization for all of which the test for homogeneity is greater than 0.1 except for gender and level of education. The degree of association of these demographic predictors varies that patient's age scored the highest degree of association, marital statues and years in Addis are

associated with MHD in a medium degree while education level and patient's role in the family scored the least.

## 5.3 Mental Health disorder and Socioeconomic Determinants

By utilizing the same method of data analysis with the above section, the association between MHD and socioeconomic predictors is also summarized in the table below (Table-5.3). The table follows the same fashion with what has been done in the analysis of demographic predictors. Ten socioeconomic variables were selected for the test of association with MHD controlling level of urbanization. In this cross tabulation analysis, the dummy variables MHD other than substance addiction as dependent variable and list of socioeconomic predictors are dichotomized in to their extreme orders for simplified interpretation.

For instance the variable that inquire the number of years a patient has lived in the community, the responses were labeled in to > 5 yrs and ≥5 yrs, and similarly other socioeconomic predictors were dichotomized for simplified interpretations.

The null hypotheses to be tested are the same with what has been explained in the above section except that demographic variables are substituted by socioeconomic variables. Therefore, the table measures the conditional independence at significant level ($p < 0.05$) and the degree of association between the occurrence MHD and different socioeconomic factors were tested through their respective odd ratio (OR). It also tests their homogeneity across the three strata in level of urbanization at a significant level ($p<0.1$). The alternative hypotheses of it state that the dependent and independent variables are associated controlling level of urbanization and the degree of their association is homogenous across the level of urbanization.

Table 5.3 – Cross tabulation of MHD Socioeconomic predictors across the level of urbanization

| | | | Estimated common OR (M) | | Test of conditional independence (C) | | Test of homogeneity (B) | |
|---|---|---|---|---|---|---|---|---|
| | | | $\Lambda$ $\theta$ | Asym. sig.2-sided) | $\chi^2$ | Asym. sig. (2-sided) | $\chi^2$ | Asym. sig (2-sided) |
| 1. | # of neighborhood | few / Many | 0.685 | 0.047 | 1.80 | 0.044 | 3.196 | 0.202 |
| 2. | Yrs. In the community | >5 yrs. / ≤5 yrs. | 0.457 | 0.042 | 4.211 | 0.040 | 3.907 | 0.142 |
| 3. | Level of social network | Good / Poor | 0.593 | 0.034 | 2.891 | 0.031 | 4.591 | 0.101 |
| 4. | Importance of Religion | important / not important | 0.608 | 0.212 | 1.577 | 0.209 | 3.087 | 0.214 |
| 5. | Lev. Of Comm. participation | High / Low | 0.415 | 0.012 | 6.552 | 0.010 | 0.299 | 0.861 |
| 6. | Employment statues | Employed / Unemployed | 2.358 | 0.009 | 7.084 | 0.008 | 0.634 | 0.728 |
| 7. | Monthly income | > 600 birr / ≤600 birr | 1.983 | 0.023 | 3.878 | 0.029 | 0.961 | 0.618 |
| 8. | Housing | Those have / don't have | 0.281 | 0.007 | 7.995 | 0.005 | 3.846 | 0.146 |
| 9. | Financial worries | No / Yes | 1.320 | 0.047 | 0.518 | 0.042 | 1.921 | 0.383 |
| 10. | Source of finance for treatment | Self/ insurer / others | 1.055 | 0.861 | 0.030 | 0.861 | 0.985 | 0.611 |

As it is depicted in the table specifically in the most right column, the homogeneity test shows the significant values greater than 0.1 for all socioeconomic variables. This confidently confirmed that the occurrence of mental illness varies across all socioeconomic factors incorporated in the survey regardless of urbanization level where adult patients reside in. Therefore, it falsified the null hypothesis that states level of urbanization is the underlined factor in determining the occurrence of AMHD

in different categories of socioeconomic predictors. Rather, it proved the alternative hypothesis true i.e. level of urbanization is not a factor behind the occurrence of AMHD across the ten socioeconomic determinants.

Regarding the conditional independence of AMHD and socioeconomic determinants, the occurrence of AMHD is significantly associated with all predictors but the two determinants: importance of religion in a patient's life (Important/Not important) and source of finance for treatment (self/others). The remaining eight socioeconomic predictors are found to be associated significantly with AMHD with marked difference in the degree of dependency. The highest degree of association was scored with the ownership of house (own/rent) at (0.005) followed by employment statues (employed/unemployed) (0.008).

Four variables: - Level of patient's participation in community activities (high/low), the number of years a patient has lived in the community (> 5 yrs/≤5 yrs), monthly income (>600 birr/≤600 birr) and the level that a patient has worried for finance necessary for basic items in the last 12 months (financial worries, (low/high)) showed medium degree of association with AMHD. Number of neighborhoods a patient has changed in the last five years (few/many) and patient's level of social network (good/poor) scored the least degree of association with the dependent variable in the analysis.

In general, the findings in the above table lead to make a statement about the null hypothesis "there is no association between the occurrence of AMHD and socioeconomic determinants" came to be false except for importance of religion in patient's life and source of finance for the treatment. Instead, the alternative hypothesis "state there is significant association between the occurrence of MHD and socioeconomic determinants" is acceptable. The further explanation and interpretation of these findings will be presented in the coming chapters, data analysis with logistic regression model.

# Chapter 6

# Econometric Data Analysis

## 6.1 Introduction

Extending the data analysis in the previous chapter, this chapter computes the variables in an econometric model for further explanation of the research topic. As it was mentioned in the research methodology in chapter-3, the survey data was analyzed using logistic regression model in particular the binary logistic. In general, last two chapters have dealt with the presentation and analysis of research findings, the association between the prevalence of mental health disorders and psychological distresses and different demographic and socioeconomic determinants. And in this particular chapter, the chance for the occurrence of any mental illness and psychological distress with respect to the risk categories of demographic and socioeconomic determinants are measured with logistic regression model.

## 6.2 MHD and Demographic Variables

Level of urbanization (the reference group is center), age (the reference group is younger than 49 years of age), gender (the reference group is women), for marriage (the reference group is not married), household size (the reference category is >4 people) education (the reference group is junior level and below), role in the family (reference group is Parent) and years in Addis (the reference group is =>5 yrs.). In all cases, the group named first was the reference group. Logistic regression (stepwise method) was used to calculate the odds ratios (OR's). The OR's are presented for the significant risk factors for the occurrence of AMHD diagnosis categories other than substance addiction. Only significant predictors were kept in the last step of the model ($p < .05$).

The table below (Table 6.1) is the parameter estimate table that summarizes the effect of each demographic predictor in the final step of the model. In the table, the ratio of the

coefficient, its standard error, the Wald statistic and its significance are depicted in the columns. The ratio of the coefficient to its standard error, squared, equals to Wald statistics. If the significance level of the Wald statistic is small (less than 0.05) then the parameter is different from 0. Parameters with significant negative coefficients decrease the likelihood of that response category with respect to the reference category. Parameters with positive coefficients increase the likelihood of that response category.

**Table 6.1 Logistic Regression model parameters estimate the effect of each demographic predictor.**

| Demographic predictors | | parameters | β | SE | Wald | Sig. | Exp(β) | 95% C.I for Exp(β) | |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Gender(X2) | Female<br>Male | 0.890 | .441 | 4.070 | .044 | 2.434 | 1.026 | 5.776 |
| 2. | Age(X3) | <=49 Yrs.<br>>49 Yrs. | 1.547 | .618 | 10.72 | .012 | 4.697 | 2.335 | 9.159 |
| 3. | Mar. sta. (X4) | Not married<br>Married | 1.594 | .627 | 6.469 | .011 | 4.923 | 4.016 | 8.989 |
| 4. | Edu. Lev. (X5) | <= G-8<br>> G-8 | 0.997 | .440 | 5.125 | .024 | 2.710 | 1.143 | 6.424 |
| 5. | Yrs. in A/A (X6) | <= 5 Yrs.<br>> 5 Yrs. | 1.09 | .538 | 4.171 | .041 | 3.000 | 1.045 | 8.610 |
| 6. | Fam. Role (X7) | Parent<br>Not parent | 0.820 | .368 | 4.960 | .026 | 2.270 | 1.214 | 6.906 |
| | Model constant | Constant | -4.016 | 2.231 | 3.241 | .072 | .018 | | |

The meaning of a logistic regression coefficient is not as straightforward as that of a linear regression coefficient. While β is convenient for testing the usefulness of predictors, Exp (β) is easier to interpret. Exp (β) - represents the ratio of changes in the odds to the event of interest for a unit change in a predictor. In this case, Exp (β) signifies the ratio of changes in the odds to the occurrence of AMHD a unit change in the demographic and socioeconomic predictors. For instance, in the 1st row in the table above, the Exp(B) of gender is equal to 2.434; this means, the odds of AMHD for a female is 2.434 times the odds of AMHD for a male patient all other things being equal. What this difference means

in terms of probability depends upon the original probability of AMHD for a female patient, assumingly it is equal to 0.5 and the odds she will fall in AMHD are related to the probability by:

$$odds(AMHD) = \frac{p(AMHD)}{P(No\ AMHD)} \quad \text{..... (6.2)}$$

$$= \frac{p(AMHD)}{1-P(AMHD)}$$

$$= \frac{0.5}{1-0.5} = 1$$

Thus, her corresponding odds of AMHD are 1 and the odds of AMHD for a patient who is female are 1 x 2.434 = 2.434, so the corresponding probability of AMHD increases to 0.70.

$$\text{P (AMHD)} = \frac{odd(AMHD)}{1+odd(AMHD)}$$

$$= \frac{2.434}{1+2.434} = 0.70$$

By the same logic, the relationship between the probability of AMHD to occur and the six demographic predictors listed in the table [Gender ($x_2$), Age ($x_3$) Marital status ($x_4$), Educational level ($x_5$), Years in A/A ($x_6$), Family Role ($x_7$)] can be summarized in linear form (equation 6.1 & 6.4 of Annex 2-B)

$$\pi_i = \frac{\exp(\eta_i)}{1+\exp(\eta_i)} = \frac{e^{\eta i}}{1+e^{\eta i}} =$$

$$= \frac{e^{-4.016}}{1+e^{-4.016}} + \frac{e^{0.89}}{1+e^{0.89}}x_1 + \frac{e^{1.547}}{1+e^{1.547}}x_2 + \frac{e^{1.594}}{1+e^{1.594}}x_3 + \frac{e^{0.997}}{1+e^{0.997}}x_4 + \frac{e^{1.09}}{1+e^{1.09}}x_5 + \frac{e^{0.82}}{1+e^{0.82}}x_6$$

$$\pi_i = 0.154 + 0.708x_2 + 0.824x_3 + 0.831x_4 + 0.730x_5 + 0.75x_6 + 0.69x_7$$

The relationship between the probability of AMHD to occur (dependent variable) and the demographic predictors (independent variables) as they were selected by the model in the final step is expressed in the equation above. The interpretation of it is straightforward; assuming the original probability of AMHD for the reference category of each demographic predictor is 0.5. it shows that the occurrence of AMHD increase to the indicated

coefficients in the equation above for the respective reference categories Gender, Age, Marital status, Educational level, Years in A/A, Family Role. Therefore, the hypotheses that state the likelihood for the occurrence of AMHD increase with respect to the reference categories (risk factors) of demographic predictors hold true for the indicated determinants except for level of urbanization and household size.

## 6.3 MHD and Socioeconomic Variables

Following the same method of analysis, the hypotheses on the relationship between the occurrence of AMHD and socioeconomic determinants are dealt in the following section.

In order to test the hypotheses given in the variable definition section, data of the listed predictors were entered into logistic regression model in stepwise method. The same model performed correctly that 81.4 percent of 300 cases classified by the model. In the analysis, odds ratios were calculated for each socioeconomic variables listed in the hypotheses. Similarly, the variables were dichotomized in to their extreme ends for a simplified interpretation. The socioeconomic variables of the survey and their respective reference categories entered in the model are listed below.

Number of neighborhoods in in the last 5 years (the reference group is >2 times), number of years in the community (the reference group is < 5 years), level of social network (the reference group is poor), level of Community participation (the reference group is poor), importance of religion in patient's life (the reference group is not important), current employment statues (the reference group is unemployed), monthly income (the reference group is =<400 birr/month) ,house ownership title(the reference group is rented), financial worries (the reference group is "Yes") and source of finance for treatment (the reference group is others). In all cases, the group named second was the reference group as they were assumed to be risky categories to AMHD.

Logistic regression (stepwise method) was used to calculate the odds ratios (OR's). The OR's are presented for the significant risk factors for the occurrence of AMHD diagnosis categories other than substance addiction. Only significant predictors were kept in the last step of the model ($p < .05$). Similar with what was done in the above section, the table

below (Table 6.2) is the parameter estimate table that summarizes the effect of each socioeconomic predictor in the final step of the model and the ratio of the coefficient, its standard error; the Wald statistic and its significance are columned in the table. If the significance level of the Wald statistic is small ($p< 0.05$) then the parameter is different from 0. Parameters with positive coefficients increase the likelihood of that response category with respect to the reference group.

**Table 6.2 Logistic Regression model parameters estimate the effect of socioeconomic predictors**

| Socioeconomic Determinants | | Parameters | $\beta$ | SE | Wald | Sig. | Exp($\beta$) | 95% C.I for Exp($\beta$) | |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Neighborhood # in 5 yrs. (X9) | =<2 times | 1.090 | .538 | 4.171 | .041 | 2.974 | 1.045 | 8.610 |
| | | >2 times | | | | | | | |
| 2. | Yrs. In the community. (X10) | >5 yrs | 1.097 | .470 | 5.450 | .020 | 2.996 | 1.050 | 8.827 |
| | | <=5 yrs | | | | | | | |
| 3. | Level of social network. (X11) | Good | 1.281 | .582 | 4.856 | .028 | 3.600 | 1.191 | 9.672 |
| | | Poor | | | | | | | |
| 4. | Lev. Of Community participation . (X12) | Good | .820 | .368 | 4.965 | .026 | 2.270 | .214 | .906 |
| | | Poor | | | | | | | |
| 5. | Employment statues. (X14) | Employed | 1.132 | .441 | 6.591 | .010 | 3.101 | 1.022 | 8.931 |
| | | Unemployed | | | | | | | |
| 6. | Monthly income. (X15) | > 400 birr. | 1.460 | .640 | 5.203 | .023 | 4.305 | 1.292 | 9.868 |
| | | <= 400 birr | | | | | | | |
| 7. | Housing (ownership) (X16) | own | 1.677 | .843 | 3.957 | .010 | 5.349 | 1.449 | 10.31 |
| | | rented | | | | | | | |
| 8. | Financial worrie. (X18)s | no | 0.950 | 0.454 | 4.378 | .034 | 2.585 | 0.451 | 2.679 |
| | | yes | | | | | | | |
| | Constant | | 0.572 | 0.415 | 1.899 | .005 | 1.771 | | |

The relationship between the probability of AMHD to occur (dependent variable) and the socioeconomic predictors (independent variables) as they were selected by the model in the final step are summarized in equation as follows:

$\pi_i$=$\mathbf{0.64} + \mathbf{0.75}x_9 + \mathbf{0.75}x_{10} + \mathbf{0.78}x_{11} + 0.69x_{12} + 0.76x_{14} + 0.81x_{15} + 0.84x_{16} + \mathbf{0.72}x_{18}$

Assuming the original probability of AMHD for the reference categories of each socioeconomic predictor is 0.5, the interpretation of the equation is as simple as that the probability to the occurrence of AMHD increase to the indicated coefficients in the equation for the respective reference categories of number of neighborhoods in the last 5 years, number of years in the community, level of social network, level of Community participation, current employment statues, monthly income, house ownership title(the reference group is rented), financial worries.

For instance, the probability of AMHD to occur among the employed/unemployed patients was assumed to be equal originally but it increases to 76% for the reference category, unemployed. This means the chance to suffer from AMHD for unemployed adult urban residents is about 6 times of the employed residents and similar interpretation can be derived for other socioeconomic predictors. Therefore, the hypotheses that state the likelihood for the occurrence of AMHD increases with respect to the reference categories (risk factors) of socioeconomic predictors hold true for the indicated determinants except for importance of religion in patient's life and source of finance for treatment. Finally, the summary and conclusion of the research will be presented in the coming last chapter.

# Chapter 7

# Summary and conclusion

## 7.1 Introduction

***"There is No Health without Mental Health"***, famous motto first coined in 2007 by his Excellency Ban Ki-moon, the UN secretary general is boldly seen in most literature and different publications that advocate and promote mental health development. This motto could standalone to profoundly summarize the importance of mental health and related issues in the development of a country. Despite the facts that mental health disorder has been realized as the cause and effect of poverty since long time, it is not yet well recognized and incorporated in development agendas set at different level. As it is explained in the introductory section of this paper, mental health is the most neglected part of health issues, for instance in MDG of UNDP and the five years' GTP of the Ethiopian government. This research has strived to reflect the significant problems in convergence with the context of the fast growing urbanization and livelihood in the city.

This chapter recapitulates the entire insights drawn from the process of carrying out this research project. This is more of presenting the summation and implication of findings and discussions elaborated in the previous chapters. Therefore, the summary part is done by recalling the research hypotheses back in chapter three and for the conclusion part, the specific objectives of the research are recalled to reflect a clear insight about mental health disorders in adult residents of Addis Ababa and issues with the demographic and socioeconomic status of the city dwellers.

The general inquisition of this research underlies in the distinct questions and hypotheses raised to serve as guidelines for the analysis and description process of psychiatric illness in urban residents in general and in relations with different demographic and socioeconomic situations of urban residents in particular. In addition

to the general objective, the research has set three specific objectives which are reviewed and evaluated in conclusion section.

## 7.2 Summary

The summary goes on addressing the hypotheses and research questions in as follows:

**Question 1: - Which mental health disorders are commonly seen in adult residents of Addis Ababa in the study years?**

There are several types of psychiatric illness listed in the DSM-IV. Some of these disorders are common worldwide and some are rarely seen among atypical sections of the world population. The prevalence of a mental illness also varies in different groups depending on their age, gender and race. The severity of mental illness ranges from major psychosis to psychological distress. The severity any illness could be measured by its chronic nature, complications, the health burden and its public health implications. Referring mhGAP, Ethiopia, as it was qoated by FMoH, 2010, the incidence and prevalence of mental illness in Ethiopia is depicted in table 1-1 and the most common ones are Schizophrenia, Depression and Bipolar Mood disorder which prevail 0.5% each.

In this survey, mental illness which the respondent patients were diagnosed for are identified in seven categories: Depression, General Anxiety Disorder (GAD), Any Psychological Distress, Substance Addiction, Unspecified Mood Disorder, Unspecified Mental illness other than Epilepsy and others (diagnosed for co-morbidity). These illnesses prevailed in different rate in the survey year. Major psychosis (Schizophrenia) is not registered here in the health centers though it is as prevalent as depression at the national level. This may be because its treatment needs hospital admission that psychiatric units in the health centers provide the service at OPD (Out Patient Department) level and also may be it is accounted under Unspecified Mental illness other than Epilepsy because all patients who were diagnosed for it were referred to hospitals .

**Hypothesis 1:- the occurrence of MH and psycho-social problems of adult residents of Addis Ababa is a function of socioeconomic and demographic factors/determinants.**

The descriptive and econometric data analysis reported in the previous three chapters (4, 5 and 6) confirm that the occurrence of mental illness is associated with list of demographic and socioeconomic determinants. Mental illness occurred more in young adults and not-married than old adults and married residents. As the number of years that an adult patient has lived in the area increases the chance of suffering from any mental illness decrease. Similar relationship was seen between level of education and the occurrence of AMHD. The role of a patient in the family (parent or other) also matters the occurrence of mental illness and parents are more vulnerable. Gender and religion are demographic factors that don't play any significant role to the occurrence of mental illness in adult residents.

Socioeconomic determinants that are highly associated with the occurrence of AMHD include the ownership of house (own/rent), employment statues (employed/unemployed). And level of patients participation in community activities (high/low), the number of years a patient has lived in the community (> 5 yrs/<= 5 yrs), monthly income (>300 birr/=<300 birr) and the level that a patient has worried about finance necessary for basic items in the last year (low/high) are associated with AMHD in a medium level. Number of neighborhoods a patient has changed in the last five years (few/many) and patient's level of social network (good/poor) scored the least degree of association but significantly.

**Hypothesis 2:- The occurrence of MH problems is determined by socioeconomic and demographic factors than the level of urbanization.**

As it was frequently mentioned in similar literatures, urbanization was linked to a higher prevalence of MH disorders among people with lower socioeconomic status. This is because of environmental stressors; these include the scarcity of social cohesion and/or control, limited living space, over-stimulation, a lot of low-quality homes, and a higher rate of criminality. This research question was intended to test whether the finding of this research concurs with this hypothesis or not.

It is repeatedly addressed in different ways of data analysis. The occurrence of any mental illness was similar at each level of urbanization and the association between them was found to be insignificant. Furthermore the binary outcome of mental illness across the different demographic characteristics and socioeconomic statuses controlling level of urbanization was tested to be homogenous. Therefore, this research question could be answered right as demographic and socioeconomic factors matter most and level of urbanization doesn't matter at all for the occurrence of MHD in adult residents of Addis Ababa.

The possible explanation of it might be that there is no significant difference in level of urbanization among the three clusters (center, middle and periphery) or in the research, the parameter used to measure urbanization level (distance from the geographical center of the city) might not be the exact one. Another possible explanation, there might be high rate of mobility among the residents of the city and/or migration from rural to the extents that the aggregate effect set off the difference in the level of urbanization.

**Question 2:- What is the burden of mental health problems in adult residents of the city to the public at large?**

In order to answer this research question, four entries were there in the data instrument of the survey. The burden of mental health illness is informed through the average number of sick-leave days, the most pressing burden in a patient's view, the presence of suicidal ideation and/or attempts and who escorted a patient to the clinic (self or others). Accordingly, the modal health burden of MHD was that its interference in the works of patients (48%) and for 15% of the patients in the survey the most pressing burden of their mental health illnesses is psychological distress and the fact that it aggravates their physical illnesses. As to the extent of the burden, 88% of patients graded their burden as it was "a lot". Only 14% of patients came to the clinic by themselves and 39% of the patients were referred from other departments. 7.7 % of patients in the survey had thoughts of killing themselves. In order to provide a response to the overall research objective, the interactions between the findings of the four research questions summarized above are further evaluated collaboratively in the following section of Conclusion.

## 7.3 Conclusion

Following the descriptive and econometric data analysis which enabled the research to effectively identify information and evidence, answers to the four guiding research questions are provided. By considering the combined implications of these findings, the research has successfully addressed the objective set out at the onset of this research project; a conclusion of this is provided under in this section. These findings have various practical implications: suggestions for the incorporation of mental health issues in the entire urban socioeconomic development activities of the city. The lessons learned from this survey which has the potential to be applied in other urban settings of the country are explained in this section. This also includes the overall evaluation of the research project and areas that have been identified for possible future research as an outcome of this research process are highlighted.

The overall objective of this research was to develop an understanding of the interplay between the demographic and socioeconomic situations and the occurrence of mental health disorder and psychological distress among adult residents of urban, with reference to the fast growing city, Addis Ababa. This research project has found that mental illness occurs in certain risky groups of demographic and socioeconomic categories more prevalently than their counterparts regardless of the level of urbanization where adult residents are dwelled currently.

As this research was undertaken in an area of rapid urban growth, it is pertinent to remember that this conclusion is specifically relevant to areas experiencing intensive urban sprawl and rapid population growth. However, the similarities identified between these findings and findings in other literature suggest that elements of these findings are transferable to other areas experiencing high rural urban migrations and scarce provisions of basic social services, high level of social instability and housing problem, high rate of unemployment and lower level of income.

The prominent premise for the conclusion of this thesis is the interpretation of exponents of the odd ratio (exp.$\beta$) for each dichotomized categories of demographic variables such as gender (female/male), age (young adult/old adult), migration (<=5 yrs/>5 yrs) and marital status (unmarried/married) etc and categories of

socioeconomic variables such as level of social network (poor/good), number of neighborhoods in 5 yrs. (many/few), housing, employment and level of income etc. the conclusion derived from this interpretation is that mental health illness occurs more likely among adult residents of urban who are female, young adults, relatively new migrants, unmarried, those who have parental role in the family. And regarding socioeconomic factors, mental health illness has a lot to do with those adult residents who were found to be in lower socioeconomic status like those who have changed many neighborhoods, don't have their own house, unemployed, and lower monthly income and those who have been worried for finance to cover their basic needs.

The aggregate health burden of mental health illness further imposes another psychosocial problem that ranges from interfering with the routine activities to the ideation and attempt of suicide. The implication of this is that mental health problem and urban socioeconomic development interact in a kind of vicious cycle. As it was displayed in the conceptual framework of this research, urban socioeconomic problems lead to the high prevalence of mental health disorders and the health burden of mental illness affects adversely the socioeconomic status of a person and family in turn.

In order to cease this undesirable phenomenon and break the vicious cycle, there is a desperate need to integrate issues of mental health in the wider context of urban socioeconomic development. This includes the provision of economic opportunities and the social and physical environment to promote the indigenous formation of such opportunities that highly influences the quality of life for urban residents. Generalizations from the survey are that people predominately relocate to the city for lifestyle purposes and migrate elsewhere for enhanced economic opportunities. Balanced provisions of basic services such as housing, sanitation, social security and health services are vital to the development of the city.

# Chapter 8

# Recommendation

## 8.1 Introduction

Having stated the findings from the research process and come to formulate certain conclusions; it is expected to forward certain recommendation as it may initiate policy makers, development stakeholder and interested groups to give due considerations to public MH issues and play their part in ameliorating the problem. Similar efforts that the FMoH has been doing since the last five years are promising and worth acknowledgment. Most prominently the "National Mental Health Strategy" is an indispensable document which would serve as a national roadmap for the combined and coordinated activities of all stakeholders. Therefore, the recommendation part of this research is in line with the national health policy and strategy.

As it is well known, the intervention process of most public health problem encompasses three stages: primary, secondary and tertiary. The first (primary) stage concerns the prevention of a problem before it comes to be a public health issues. It includes the dissemination of accurate and adequate information, education and communication to the public at individual and community level. This stage also considers surveying the cause and magnitude of a problem. The secondary stage refers to activities that might be done to solve a certain health problem; it includes treatment, hospitalization and drug supply. And if this stage fails to solve the problem, then the tertiary stage comes i.e. an intervention done to minimize the impacts and socioeconomic costs of a public health problem.

Though these interventions vary in terms of cost incurred to the society, they are not mutually exclusive. What matters most is the optimal combination of these interventions in the context of the problem, socio-cultural, economic and demographic facts. Therefore, this chapter focuses on forwarding recommendations depending on the above intervention model and in accord with the findings of the research.

## 8.2 Recommendation

### i. Primary intervention

As most public health problems prevalent in developing countries are preventable and there is also lack of infrastructure and trained man power, primary intervention is assumed to be relevant to developing countries. The national health policy of Ethiopia is also characterized by this intervention. However, MH is not incorporated at any level of prevention. Therefore, the following points need to be considered:

- Improve the socioeconomic status of the residents through employment creation.
- Consider the MH impacts of development projects such as housing, city rehabilitation etc.
- Better to have political commitment from the city administration to take the initiative for planning, coordinating, implementing, monitoring and guide the overall development of mental health service in the city.
- Strengthen participation of partner with community-based organizations (CBOs), especially with faith-based institutions and non-governmental organizations (NGOs) to reach out to individuals with mental disorder and / or substance abuse problems.
- Involve community-based (Urban Health Extension workers) to play roles in empowering communities in relation to prevention and promotion activities such as to increase awareness about mental illness in order to reduce the time taken until a person seeks help, to assist individuals in making informed decisions in relation to their mental health.
- Prepare and launch support campaigns via the printed, audio, and video media to educate residents of the city about the causes and treatments of mental diseases.
- Integrate a mental health training component in maternal and child health, in health promotion, prevention, clinical and psychosocial interventions. And in services for persons living with HIV/AIDS. Integrate mental health promotion

and prevention, including school interventions and school counselors, adolescent counseling centers,

- Involve and train traditional healers and faith-based organizations, who account for a significant extent of mental health care to improve their skills and services.
- Better to educate teachers so that they can provide social skills training and basic counseling in their schools. They would play a crucial role in recognizing developmental and mental health problems, as well as indicators of potential abuse, in children and helping the families to seek appropriate care.
- Establish inter-sectoral collaboration among schools, prisons, housing, and development activities to deliver effective mental health care. And integrate mental health in basic human right to protect the rights of persons with mental disorders and their families.

## ii. Secondary intervention

- Community care has proven to be more effective than institutional treatment. It is in line with recommendations from the WHO and international health experts, and evidence-based research from Low and Middle Income Countries (LMIC) that has shown this model of service delivery to improve health and social outcomes and decrease costs.
- Give emphasis to encourage the establishment of support groups for patients and care-givers, for example, peer support programs for persons with mental illnesses
- Provide facilities for mergency, short-stay, in-patient stabilization that provid within dedicated wards, stated by specialist mental health workers.
- Designate a mental health focal person in district health bureaus and who would play a crucial role in coordinating and supporting delivery of mental health care in health centers and through the health extension service.

- Monitor the supply chain of psychiatric medications, and ensure the proper use is in place to facilitate procurement and distribution of essential medications.
- Expand specialist mental health units in general hospitals which provide crisis intervention, short-stay, in-patient psychiatric treatment, and out-patient reviews of complex cases.

### iii. Tertiary intervention

- Provide necessary backup for general hospital short-stay units and out-patient clinic services provided by specialist mental health workers. In these regional referral centers, a multi-disciplinary team, provide care for patients requiring more than short-stay in-patient stabilization.
- Establish and facilitate programs that address skill development that leads to improved functioning and employment opportunities for individuals with mental illnesses with a focus on improving the quality of life.
- Support researches with an aim to improve the delivery of effective mental health services to the residents of the city.

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## Annex 1-A: Survey Questionnaire (English Version)

**Sample identification**

**Address: - *Sub-city-* _____ *Woreda-*_____ *Name of the Health Center-* _____**

***Interviewer's name*_____ *ID*___ ___ ___ ___**

***Sample ID*___ ___ ___ ___ ___ ___ _ *DATE DAY*___/___*MO*___/___*YR*___/___**

This questionnaire is structured to capture the demographic and socio-economic variables of patients who have visited the psychiatric clinics of three health centers in the current fiscal year.

1. **Level of urbanization of the pt's address**

(1) Center (Kirkos sub City) (2) Middle (Nifas Silk Lafto Sub City) (3) Periphery (Akaki-Kality Sub-city)

2. **Age of the patient**

(1) 18-29 (2) Age 30-39 (3) Age 40-49 (4) Age 50-59 (5) Age 60-69 (6) Age 70-79 (7) Age 80 + (99) unknown

3. **The gender of the patient.**

0. Male 1. Female

4. **Marital status of the patient**

(1) Never married (2) Married (3) Divorced (4) Separated (5) widowed (6) member of couple living together (77) other (99) Unknown

5. **Patient's role in the family**

(1) Father (2) Mother (3) Care taker (4) Elder Son/daughter (5) just a family member (77) other (99) Unknown

6. **Patients place of birth**

1.tigray 2.afar 3. Amhara 4.oromia 5. Somali 6. Benishangule7. SNNP 8.Gambela 9. Harari 10. Dire Dawa 11. Addis Ababa 77. Other 99. Unknown

**7. Pt's religion**

1. Orthodox 2. Catholic 3. Muslim 4. Protestant 5. Adventist 6. Undefined Christian 77. Others 99. Unknown

**8. Pt's education level**

(1) None (2) 1-6 (3)7-8 (4) 9-12 Diploma (6) degree (7) above degree (77) Others (99) Unknown

**9. The size of the family the pt. live in**

(1) 1-2 (2) 3-5) (3) 6-8 (4) 9-11 (5) >11 (99) unknown

**10. Number of years the pt. has been living in Addis _____**

(1)< 1 yr (2) 1-4 yrs (3) 5-9 yrs (4) 10-15 (5) >15 yrs (6) lifelong (age) (77) others (99) unknown

**11. How many neighborhoods the pt. has changed since the last 5 yrs _____**

(1) None (2) 1-3 times (3) 4-6 times (4) >6 times 99. Unknown

**12. How long the pt. has been living in the community _____**

(1)<1 yr) (2) 1-3 yrs (3) 4-6 yrs (4) 7-9 yrs (5) 10-12 yrs (6) above 12 yrs (7) lifelong (age) (77) others (99) unknown

**13. Level of pt's social network (contact with others)**

1. Always 2. Most of the times 3. Some times 4. Rarely 5. Never 99. Unknown

**14. Pt's habits of sharing his/her personal problems to others**

1. always 2. Most of the times 3. Some times 4. Rarely 5. Never 99. Unknown

**15. In general, how important are religious or spiritual beliefs in your daily life?**

(1) Very important (2) somewhat 3) rarely (4)not very important (5) not at all important (99) Unknown

**16. Pt's level of participation in community activities**

1. Always 2. Most of the times 3. Some times 4. Rarely 5. Never 99. Unknown

**17. Pt's employment statues**

(1) Employed (2) self-employed (3) looking for work (4) temporarily laid off (Unemployed) (5) retired (6) a homemaker (7) a full-time or part-time student (8) Disabled (77) other (99) Unknown

**18. Monthly income of the pt. (best estimate)**

1. <400 birr 2. 401-600 3. 601-900 4. 901-1200 5. 1201-1500 6. 1501-1800 (7) 7. 1801-2100 8. >2100 77. Others 99. Unknown

**19. House ownership of the pt.**

1. Own house 2. Rented from government 3. Rented from private owner 4. Dependent on others 77. Others (99) unknown

**20. How often in the past 12 months would the pt. were worried or stressed about having enough money, to buy nutritious meals, to pay his/her rent/mortgage or school fee?**

(1) Always (2) Usually (3) Sometimes (4) Rarely (5) Never (99) Don't know

**21. The type of mental illness that a pt. was diagnosed for**

(1)General anxiety disorder (2) Depression (3) any psychological distress (4) any substance addiction disorder (5) Unspecified mood disorder (6) any other unspecified MH other than epilepsy (77) others (diagnosed for co-morbid mental illness) (99) unknown

**22. Source of finance for medical service fee**

(1) Free (2) self (3) employer's insurance (4) family (5) help from others (77) other (99) unknown

**23. Pt. was escorted to the mental health clinic by**

(1) None (2) other family members (3) friend/neighbor (4) referred from other departments (77) other (99) unknown

**24. What is the most difficult impact of the mental illness on the pt's life?**

(1) No difficulty (2) Financial burden (3) Interferes with work (4) psychological stress (5) aggravates health problems (6) Affects family relationships (77) Other difficulty (99) Don't know

**25. What is the level of the impact?**

(1) A lot (2) somewhat (3) a little (4) not at all (77) others (99) unknown

**26. Have you ever had an idea of killing yourself in the last 12 months? (If "yes" proceed to Q-27)**

(1) Yes (2) No (99) unknown

**27. Have you ever made an attempt of killing yourself in the last 12 months? (If "yes" proceed)**

(1) Yes (2) No (99) unknown

**28. Which method of did you use to kill yourself?**

(1) gun/pistol (2)drug overdose (3)Poisoning (4) strangulation (5) drowning (6) falling from high places (77) others (99) unknown

**Annex 1-B: Survey Questionnaire (the Amharic Version)**

ይህ መጠይቅ በአዲስ አበባ ከተማ ውስጥ በተመረጡ ጤና ጣቢያዎች ወደ አዕምሮ ህክምና ክፍል ለሚመጡ ህመሞን የተዘጋጀ ነው። መጠይቁ በያዝነው ዓመት ውስጥ የአዕምሮ ጤንነት ችግሮች እና ስነ-ልቦናዊ ጫና ያጋጠማቸውን ህመሞን የስነ-ህዝባዊ፣የማህበራዊ ግንኙነትን/መስተጋብር፣ ኢኮኖሚያዊ ጉዳዮችን እና የአዕምሮ ህመምነ ተከትለው የሚመጡ ችግሮችን መዳሰስ ተብሎ የተዘጋጀ ነው።

*የናሙና መለያ*

*ክ/ከተማ* *ወረዳ* *የአካባቢው ስም*

_____

*የ ጠያቂው ስም* *ቁጥር*

_____

*የናሙና ቁጥር* *ቀን*

_____/_____/_____

ስህ-1. ታማሚው ግለሰብ የሚገኝበት አድራሻ

ቂርቆስ ክ/ከ (መሀል ከተማ ) ☐ ንፋስ-ስልክ ላፍቶክ/ከ (መለስተኛ ከተማ) ☐ አቃቂ-ቃሊቲ (ዳር ከተማ) ☐

ስህ-2. የታማሚው ግለሰብ ፆታ (ጠያቂው በራሱ መለየት ይችላል)

ወንድ ☐ ሴት ☐

ስህ-3. በቤተሰቡ ዉስጥ የእርስዎ ሚና ምንድን ነው?

አባት ☐ እናት ☐ ሞግዚት ☐ ታላቅ ልጅ ☐ የቤተሰብ አባል ☐ ሌላ ☐

_____ (ይገለፅ)

አላውቀውም /ይለፈኝ

ስህ-4. ዕድሜዎ ስንት ይሆናል?

ማህ-14. በጠቅላላው ኃይማኖት ወይም መንፈሳዊ ህይወት በእርሶ ህይወት ውስጥ ምን ያህል አስፈላጊነት አለው ብለው ያስባሉ?

በጣም አስፈላጊ ☐ በመጠኑ አስፈላጊ ☐ ብዙ አያስፈልግም ☐ ምንም አያስፈልግም☐
አላውቀውም/ይለፈኝ ☐

ማህ-15. አብረው ከሚኖሩት ጎረቤቶችና የሠፈር ነዋሪዎች ጋር ምነ ያህል ይቀራረባሉ?

በጣም እንቀራረባለን ☐ በመጠኑ ☐ ብዙም አንቀራረብም ☐ ፈፅሞ ቅርበት የለንም ☐
አላውቀውም/ይለፈኝ ☐

ማህ-16. የወረዳው አመራር በሚያዘጋጃቸው በአካባቢ የልማት ዙሪያ የሚደረጉ የማህበረሰብ ውይይቶችና ህዝባዊ ስብሰባዎች ወይም የስፖርትና ሌሎች ተመሳሳይ በፈቃደኝነት የሚመሰረቱ ማህበራት ውስጥ ላይ ምን ያህል ይሳተፋሉ?

ሁል ጊዜ ብዙ ጊዜ ☐ አልፎ-አልፎ ☐ አንዳንዴ ☐ በፍፁም ☐ አላውቀውም /ይለፈኝ ☐

ኢኮ-17. አሁን የሚገኙበት የስራ ሁኔታ ምንድን ነው?

ተቀጣሪ ☐ በግል ስራ ☐ ስራ ፈላጊ ☐ ለጊዜው ስራ አጥ ☐
ጡረተኛ ☐ የቤት እመቤት ☐ የሙሉ ጊዜ ተማሪ ☐ የህክምና ዕረፍት ☐ መስራት ☐
የተሳነው ☐ ሌላ(ይገለፅ)_____
አላውቀውም/ይለፈኝ ☐

ኢኮ-18. አጠቃላይ የርስዎ የወር ገቢ (ከደሞዝ፣ ከጡረታና ከሌሎች ምንጮች ተደማምሮ በትክክለኛ ግምት ስንት ይሆናል? _____ብር/በወር
አላውቀውም/ይለፈኝ ☐

ኢኮ-19. የመኖሪያ ቤትዎ ይዞታ የማን ነው?

የግል ☐ ከመንግስት በክራይ ☐ ከግለሰብ በክራይ ☐ ከሌሎች ተጠግቼ ☐
ሌላ(ይገለፅ)_____ አላውቀውም/ይለፈኝ ☐

ኢኮ-20. የህክምና ወጪዎችን ለመሰፈን የገንዘብ ምነጭዎ ምነድን ነው?

የነፃ ታካሚ ☐ በግል ☐ የቀጣሪ ዋስትና ☐ ከቤተሰብ ☐ ሌሎች ረድተውኝ ☐
ሌላ(ይገለፅ)_____ አላውቀውም/ይለፈኝ ☐

18-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60-69 ☐ 70-79 ☐ 80 + ☐
አላውቀውም/ይለፈኝ

ስሀ-5. የተወለዱበት ቦታ የት ነው?_____ ☐
አላውቀውም/ይለፈኝ

ስሀ-6. ኃይማኖትዎ ምንድን ነው? _____ ☐
አላውቀውም/ይለፈኝ

ስሀ-7. አሁን ያሉበት የጋብቻ ሁኔታ ምንድን ነው?

ያላገባ ☐ ያገባ ☐ የተፋታ ☐ የተለያየ ☐ የትዳር ጓደኛው በሞት የተለየ ☐

አብረው የሚኖሩ ጥንዶች ☐ ሌላ(ይገለፅ)_____
አላውቀውም/ይለፈኝ ☐

ስሀ-8. የዚህ ቤተሰብ አባላት (ከሌላ የሚወለዱትን፣ በማደጎና በዝምድና የሚኖሩት ጨመሮ) በሞት የተለዩትን ሳይጨምር ስንት ይሆናሉ?_____ ☐ አላውቀውም/ይለፈኝ

ስሀ-9. እስከ ስንተኛ ክፍል ተምረዋል?

ምንም ☐ አንደኛ ደረጃ መ/ሀ/ ደረጃ ☐ ሁለተኛ ደረጃ ☐ ዲፕሎማ ☐ ዲግሪ ☐

ከዲግሪ በላይ ☐ አላውቀውም/ይለፈኝ ☐

ስሀ-10. ወደ አዲስ አበባ ለመኖር ከመጡ ስንት ዓመት ይሆናል? _____
አላውቀውም/ይለፈኝ ☐

ማሀ-11. አዲስ አበባ ውስጥ በአጠቃላይ ለስንት ሰፈሮችን ቀይረዋል? _____
አላውቀውም/ይለፈኝ ☐

ማሀ-12. እዚህ ሰፈር መኖር ከጀመሩ ምን ያህል ዓመት ይሆናል?_____
አላውቀውም/ይለፈኝ ☐

ማሀ-13. በግል ህይወትዎ የተለየ ችግር ወይም አስጨናቂ ጉዳይ ሲገጥሞት፤ ለትዳር ጓደኛዎ ወይም ለሌላ ሰው ምን ያህል ይወያያሉ?

ሁል ጊዜ ☐ ብዙ ጊዜ ☐ አልፎ-አልፎ ☐ አንዳንዴ ☐ በፍፁም ☐
አላውቀውም/ይለፈኝ ☐

ኢኮ-21. ባለፈው አንድ አመት ውስጥ፣ ለቀለብ፣ ለቤት ኪራይ ወይም ለልጆች ት/ት ክፍያ ስለሚሆን በቂ ገንዘብ ምን ያህል አስጨንቆት/ውጥረት ፈጥሮቦት ያውቃል?

ሁል ጊዜ ☐ ብዙ ጊዜ ☐ አልፎ አልፎ ☐ በፍፁም አልተጨነኩም ☐ አላውቀውም /ይለፈኝ ☐

ቤ.ጫ-22. ከሚከተሉት ጫናዎች መካከል ቤተሰቡ በጣም ከባድ ነው የሆነው ችግር የትኛው ነው?

የገንዘብ ☐ የጊዜ ☐ የጤና ችግሮችን ማባባስ ☐ የሥራ መስተጓጎል ☐ ስነ-ልቦናዊ ጫና ☐
የቤተሰቡን ሠላም ማወክ ሌሎች ችግሮች_____
አላውቀውም/ይለፈኝ ☐

ቤ.ጫ-23. ከላይ የተጠቀሱት የጤና ችግር ጫና ምን ያህል ነው ማለት ይቻላል?

በጣም መጠን☐በመጠኑ ☐ በጥቂቱ ☐አላውቀውም /ይለፈኝ ☐

ቤ.ጫ-24. ባሳለፍነው አንድ አመት ውስጥ የህክምና አገልግሎት ማግኘት ፈልገው በገንዘብ ችግር ምክንያት ወደ ሃኪም ሳይሄዱ የቀሩበት ጊዜ ነበር? አዎ ☐ የለም ☐ አላውቀውም/ይለፈኝ ☐

ቤ.ጫ-25. ለመጀመሪያ ጊዜ ወደዚህ የአዕምሮ ህክምና ክልኒክ የመጡት በማን ዕገዛ ነው?

በራሴ ☐ በቤተሰብ ☐ ጎደኛ/ጎረቤት ☐ ከሌላ ክፍል ተልኬ
ሌላ(ይገለፅ)_____ አላውቀውም/ይለፈኝ ☐

ቤ.ጫ-26. ባለፉት 12 ወራት ውስጥ ራስን የማጥፋት ስሜት/ሀሳብ ተሰምትዎት ያውቃል?

አዎ ☐ አይደለም ☐ አላውቀውም/ይለፈኝ ☐

ቤ.ጫ-27. ባለፉት 12 ወራት ውስጥ ራስዎን ለማጥፋት ሙከራ አድርገው ያውቃል?

አዎ ☐ አይደለም ☐ አላውቀውም/ይለፈኝ ☐

ቤ.ጫ-28. ሙከራ አድርገው የሚያውቁ ከሆነ፣ በምን አይነት መንገድ ነበር?

በመሳሪይ ☐ ብዙ መድኃኒት በመዋጥ ☐ በመርገ ☐በመታነቅ ☐ወሃ ውስጥ በመግባት ☐

ከከፍታ ቦታ በመወርወር ☐ አላውቀውም/ይለፈኝ ☐

## Annex 2-A: Survey Data of Demographic Variables

| Demographic predictors , | | parameters | All MHD | | Substance abuse | |
|---|---|---|---|---|---|---|
| | | | N | % | N | % |
| 1. | Level of Urbanization | Central | 98 | 32.7% | 12 | 4.0% |
| | | Middle | 87 | 29.0% | 13 | 4.3% |
| | | Peripheral | 80 | 26.7% | 10 | 3.3% |
| 2. | Gender | Female | 192 | 64.0% | 14 | 4.7% |
| | | Male | 73 | 24.3% | 21 | 7.0% |
| 3. | Age | <=49 Yrs. | 184 | 61.3% | 32 | 10.7% |
| | | >49 Yrs. | 81 | 27.0% | 3 | 1.0% |
| 4. | Marital Statues | Not married | 149 | 57.1% | 46 | 17.6% |
| | | Married | 57 | 21.8% | 9 | 3.4% |
| 5. | Level of Education | <= G-8 | 167 | 92.3% | 14 | 7.7% |
| | | > G-8 | 93 | 81.6% | 21 | 18.4% |
| 6. | Number of years in Addis Ababa | <= 5 Yrs. | 132 | 49.3% | 46 | 17% |
| | | > 5 Yrs. | 78 | 29.4% | 11 | 4.3% |
| 7. | Number of family members | >4 people | 109 | 41.7% | 29 | 11.0% |
| | | <=4 people | 95 | 36.7% | 27 | 10.6% |
| 8. | Role of a patient in the family | Parent | 138 | 55.9% | 29 | 11.7% |
| | | Not parent | 56 | 22.7% | 24 | 9.7% |

## Annex 2-A: Survey Data of Socioeconomic Variables

| Socio economic Variables | | Categories | All MHD | | Substance abuse | |
|---|---|---|---|---|---|---|
| | | | N | % | N | % |
| 1. | Number of neighborhood in the last 5 years. | =<2 times | 68 | 85.0 % | 12 | 15 % |
| | | >2 times | 155 | 79.9 % | 39 | 20.1 % |
| 2. | Number of years in the community | >5 yrs | 74 | 88.1 % | 9 | 11.9 % |
| | | <=5 yrs | 162 | 78.3 % | 45 | 21.7 % |
| 3. | Level of social network | Good | 64 | 75.3 % | 21 | 16.4 % |
| | | Poor | 168 | 83.6 % | 33 | 24.7 % |
| 4. | Importance of Religion in patients life | Important | 59 | 89.4 % | 7 | 10.6 % |
| | | Not important | 195 | 88.2 % | 26 | 11.8 % |
| 5. | Level of Community participation | Good | 98 | 88.3 % | 13 | 11.7 % |
| | | Poor | 134 | 76.6 % | 41 | 23.4 % |
| 6. | Employment statues | Employed | 130 | 76.0 % | 41 | 24.0 % |
| | | Unemployed | 114 | 88.4 % | 15 | 11.6 % |
| 7. | Monthly income | > 400 birr/month. | 91 | 94.8 % | 5 | 5.2 % |
| | | <= 400 birr/month. | 168 | 85.7 % | 28 | 14.3 % |
| 8. | House ownership | own | 73 | 96.1 % | 3 | 3.9 % |
| | | rented | 182 | 85.4 % | 31 | 14.6 % |
| 9 | Financial worries for basic expenses | no | 37 | 77 % | 11 | 27 % |
| | | yes | 207 | 82 % | 45 | 18 % |
| 10 | Source of finance for treatment | Self /insurer | 104 | 86.7 % | 16 | 13.3 % |
| | | others | 155 | 89.6 % | 18 | 10.4 % |

## Annex 3-A: Chi-square Algorithm

$$\chi_p{}^2\,(Obs) = \sum_{ij} \frac{(f_{ij} - E_{ij})^2}{E_{ij}}$$

**the degree of freedom are** $(R-1)(C-1)$

Where

$f_{ij}$ is the sum of weights for cases in MHD and a demographic determinants

$C_j \sum_{i=1}^{R} f_{ij}$ **is the j[th] column sub total of AMHD and substance addiction (no AMHD).**

$r_i \sum_{j=1}^{c} f_{ij}$ **is the i[th] row sub total of a cathegory of a demographic predictor.**

## Annex 3-B: Algorithm of 2 X 2 crosstab

$$(\chi_{MH}{}^2) = \frac{\sum_{k=1}^{k}(f_{ijk} - E_{ijk})}{\sqrt{\sum_{k=1}^{k} w_k \overset{\wedge}{p}_k \left(1 - \overset{\wedge}{p}_k\right)}}$$

Where

K is the number of categories in urbanization level =3 in this case.

$f_{ijk}$ is the sum of weights for cases in MHD and a demographic determinants in $k^{th}$ **strata.**

$C_{jk} \sum_{ik=1}^{R} f_{ijk}$ **is the j[th] column of k[th]sub total of AMHD and substance addiction (no AMHD)**

$r_{ik}$ $\sum_{j=1}^{c} f_{ijk}$ **is the i[th] row of k[th]sub total of a cathegory of a demographic predictor**

$n_k \sum_{j=1}^{C} c_{jk} = \sum_{i=1}^{R} r_{ik}$ **the grand total of the k[th] strara**

$E(f_{ijk}) = \frac{r_{ik} c_{jk}}{n_k}$ **, the expected cell count of a demo. category andMHD in k[th] strata**

$\overset{\Lambda}{p}_{ik} = \frac{f_{ijk}}{r_{ik}}$ , the expected probability- sum of weights for MHD-cases and demographic determinants in $\mathbf{k^{th}}$ **strata** . And $w_k = \frac{r_{ik}r_{jk}}{n_k}$ is grand total of a category in $\mathbf{i^{th}}$ row and $\mathbf{j^{th}}$ **column of** $\mathbf{k^{th}}$ **strata.**

For K strata of 2 X 2 tables, the true odd ratio is stated as,

$$\theta_k = \frac{p_{1k}(1-p_{2k})}{(1-p_{1k})p_{2k}}$$

For k=1 ..., K. and assuming that the true common odd ratio exists,

$\theta = \theta_i = \ldots\ldots\ldots = \theta_k$, MH's estimator of this common OR

$$\overset{\Lambda}{\theta}_{MH} = \frac{\sum_{k-1}^{k} \frac{f_{11k}f_{22k}}{n_k}}{\sum_{k=1}^{k} \frac{f_{12k}f_{21k}}{n_k}}$$

If every stratum is such that $f_{12k} = 0 \; or \; f_{21k} = 0$ then $\overset{\Lambda}{\theta}_{MH}$ is undefined. The (natural) log of the estimated common odds ratio is asymptotically normal.

Given the Mantel-Haenszel common odds ratio estimator ($\overset{\Lambda}{\theta}_{MH}$) statistic the Breslow-Day statistic is used as follows:

$$B = \sum_{k=1}^{k} \frac{\left\{f_{11k} - \overset{\Lambda}{E}\left(f_{11k} \middle| c_{1k}; \overset{\Lambda}{\theta}_{MH}\right)\right\}^2}{\overset{\Lambda}{v}\left(f_{11k} \middle| c_{1k}; \overset{\Lambda}{\theta}_{MH}\right)}$$

Where

$\overset{\Lambda}{E}\left(f_{11k} \middle| c_{1k}; \overset{\Lambda}{\theta}_{MH}\right) = \overset{\Lambda}{f}_{11k}$ Satisfies the equation

$$\overset{\Lambda}{\theta}_{MH} = \frac{\overset{\Lambda}{f}_{ijk}\left(n_k - r_{ik} - c_{ik} + \overset{\Lambda}{f}_{ijk}\right)}{\left(r_k - \overset{\Lambda}{f}_{ijk}\right)\left(c_{ik} \overset{\Lambda}{f}_{ijk}\right)}$$

Breslow-Day's statistic is asymptotically distributed as a chi-squared random variable with *K*-1 degrees of freedom under the null hypothesis of a constant odds ratio.

## Annex 3-C: Logistic Regression Model Algorithm

$$\pi_{i=}\frac{\exp(\eta_i)}{1+\exp(\eta_i)} = \frac{e^{\eta i}}{1+e^{\eta i}} = \frac{1}{1+e^{-\eta i}} \text{ Or } \eta_i = \ln\left(\frac{\pi_i}{1-\pi_i}\right) = \beta x_i$$

Where

$\pi_i$ - is the probability the $i^{th}$ patient to be diagnosed for AMHD

$\eta_i$ - is the value of the unobserved categorical variable for the $i^{th}$ patient

The model also assumes that $\eta$ is linearly related to the predictors

$$\eta_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \cdots + \beta_p x_{ip}$$

Where

$x_i$ - is the $j^{th}$ predictor for the $i^{th}$ patient (case)

$\beta_i$ - is the coefficient for the $j^{th}$ parameter

**P** - is the number of predictors

If $\eta$ were observable, a linear regression would be fit for it and be done but as it is unobserved, the predictors must be related to the probability of a patient to be in AMHD by substituting for $\eta$ in equation $\pi_i$ above.

$$\pi_i = \frac{1}{1+e^{-(\beta_0+\beta_1 x_{i1}+\beta_2 x_{i2}+\cdots+\beta_p x_{ip})}}$$

Hence, the likelihood function *l* for *n* observations $\eta_1,\ldots,\eta_n$, with probabilities $\pi_1, \ldots, \pi_n$ and case weights $w_1\ldots..w_n$, can be written as:

$$l = \prod_{i=1}^{n} \pi_i^{w_i \eta_i} \ (1 - \pi_i)^{w_i (1-\eta_i)}$$

$$\ln(l) = \sum_{i=1}^{n} (w_i \eta_i \ln(\pi_i) + w_i(1 - \eta_i) \ln(1 - \pi_i))$$

And the derivative of $L$ with respect to $\beta_i$ is

$$L_{x_i} = \frac{\partial L}{\partial \beta_j} = \sum_{i=1}^{n} w_i(\eta_i - \pi_i) X_{ij}$$

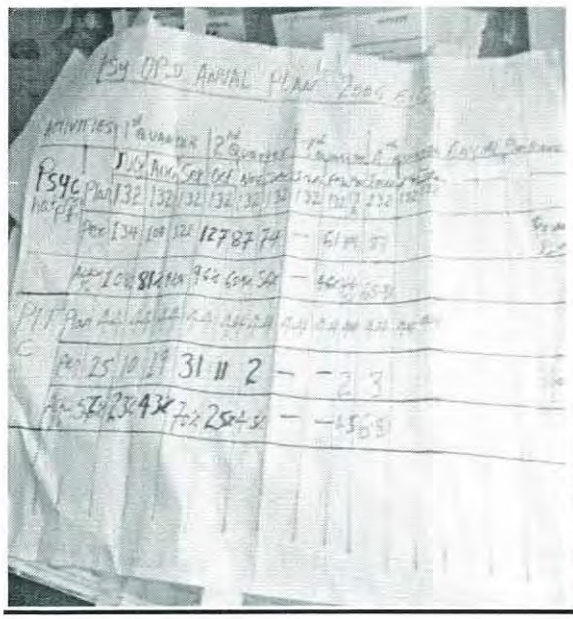
Let $\hat{\beta}_i$ be the vector of maximum likelihood estimates associated with the $m-1$ dummy variables, and **C** the asymptotic covariance matrix for $\hat{\beta}$. The Wald statistic was calculated for the variables in the model to determine whether a variable is significant to the model, if it is a categorical variable, the Wald statistic is computed as:

$$\mathbf{Wald_i waldi} = \hat{\beta}_j \ C^{-1} \ \hat{\beta}_j$$

## Annex 4: Some pictures of the survey


Entry to a health center and mental health clinic (Akaki Health center)

A Mentally ill patient on the waiting area and a psychiatric nurse inside (Kality Health Center)



Sample report sheet and a nurse clerking a psychiatric patient (the store room may indicate the concern given to mental health)