

**DETERMINANTS OF HYPERTENSION AND
HEALTH SYSTEM RESPONSES TOWARDS
HYPERTENSION IN ETHIOPIA**

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Ethiopia

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DETERMINANTS OF HYPERTENSION AND HEALTH SYSTEM RESPONSES TOWARDS HYPERTENSION IN ETHIOPIA

A thesis submitted in partial fulfilment of the requirement for the degree of
Master of Public Health

by:

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ETHIOPIA

Declaration:

Where other people's work has been used (either from a printed source, internet or any other source) this has been carefully acknowledged and referenced in accordance with departmental requirements.

The thesis '**Determinants of hypertension and health system responses towards hypertension in Ethiopia**' is my own work.

Signature: 

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List of Abbreviation

AAU	Addis Ababa University
AOR	Adjusted Odds Ratio
ARIC	Atherosclerosis Risk in Communities
ARR	Annual Reduction Rate
BMI	Body Mass Index
BP	Blood Pressure
CBHI	Community Based Health Insurance
CDC	Centre for Disease Control
CSA	Central statistics agency
CVD	Cardiovascular diseases
DASH	Dietary Approaches to Stop Hypertension
DBP	Diastolic Blood Pressure
EDHS	Ethiopia Demographic and Health survey
EPHI	Ethiopia Public Health Institute
ESH	European Society of Hypertension
FBO	Faith Based Organizations
FMoH	Federal Ministry of Health
GBD	Global Burden of Disease
GSGDA	Ghana Shared Growth and Development Agenda
GTP	Growth and Transformation Plan
HCF	Health Care Financing
HEP	Health Extension Programme
HEW	Health Extension Workers
HGTP	Health Growth and Transformation Plan
HO	Health Officers
HP	Health Post
HSDP	Health Sector Development Plans
IEOS	Integrated Emergency Obstetric and Surgery

JNC7	Seventh Report of Joint National Committee Prevention, Detection, Evaluation, and Treatment of High Blood Pressure
MDG	Millennium Development Goal
mm Hg	Millimetre of mercury
MoE	Ministry of Education
MOFED	Ministry of Finance and Economic Development
MoH	Ministry of Health
NCDs	Non-communicable diseases
NIH	National Institute of Health
OOP	Out of Pocket
OR	Odds Ratio
PCS	Per Capita Spending
SADHS	South African Demographic and health survey
SBP	Systolic Blood Pressure
SDG	Sustainable Development Goal
SHI	Social Health Insurance
SSA	Sub-Saharan Africa
TVETs	Technical and Vocational Education Training
U5MR	Under Five Mortality Rate
UN	United Nation
URRAP	Universal Rural Road Access Program
USD	United State Dollar
USDOHAHS	United State Department of Health and Human Services
VU	Vrije University
WB	World Bank
WHO	World Health Organization

Glossary

Hypertension: The average of casual systolic blood pressure readings ≥ 140 mmHg and/or diastolic pressure readings ≥ 90 mmHg

Kebele : the smallest administrative unit in Ethiopia which has a population of 5000.

Khat: (*Catha edulis*) is a flowering plant native in horn of Africa which contain monoamine alkaloid called Cathinone and Ampethamine like stimulant.

Wereda : The third level administrative division of Ethiopia which compose of a number of kebeles

Abstract

Background: Prevalence of hypertension has increased over time in urban areas of Ethiopia with the highest rate of 31.5%.

Objective of study: To assess the main determinants and health system response toward hypertension. To assess best practice for hypertension prevention and control in Sub-Saharan Africa countries to recommend possible interventions for hypertension prevention and control in Ethiopia.

Methodology: The study carried out a literature search. The study adapted and used the framework for analysis of non-communicable diseases (NCDs) policy for Jamaica by the World Bank.

Findings: Modifiable risk factors such as tobacco use, alcohol abuse, overweight and physical inactivity together with poor access and utilization of health services, absences of health insurance schemes and rapid urbanization are the major determinants of hypertension in urban Ethiopia.

Conclusion: Despite the fact that in Ethiopia's health system there are policies, protocols and guidelines for comprehensive hypertension prevention and control, implementation and availability of services is too limited and is not included in the health extension program (HEP).

Recommendations: Include prevention of hypertension in HEP and train human resources for hypertension prevention and control with especial focus for health extension workers. Strengthen health promotion and education for risk factors. Introduce new regulations that ban khat, tobacco and alcohol use, promotion and advertisement. Increase tax on unhealthy foods and subsidize the health foods. Work in collaboration with other actors. Introduce social health insurance and community based health insurances. Finally strengthen surveillance and screen program for evidence based decision making and for further researches.

Key words: hypertension, health system policy, sub-Saharan Africa, determinant, and Ethiopia.

Word count: 12,658

Introduction

My name is Wondimagegn Taye. My academic background is economics and I have worked at different public health projects like the Global Fund HIV/AIDS prevention and control (HAPCO) project as district coordinator, PCV-10 Vaccine research project as project district coordinator, and as an economic strengthening specialist for Ethiopian Kale Hiwot church HIV/AIDS prevention and control program for the past seven years.

Non-communicable diseases (NCDs) are the leading global causes of death, causing for 38 million (68%) of the world's 56 million deaths in 2012. More than 40% (16 million) of them were premature deaths under age 70 years. Almost three quarters of all NCD deaths (28 million), and the majority of premature deaths (82%), occur in low- and middle-income countries. (World Health Organization (WHO), 2014). Annual NCD deaths are projected to continue to rise worldwide, and the greatest increase is expected to be seen in low- and middle-income countries like Ethiopia. While popular belief presumes that NCDs afflict mostly high-income populations, the evidence tells a very different story. Nearly 80% of NCD deaths occur in low-and middle-income countries. NCDs also kill at a younger age in low- and middle-income countries, where 29% of NCD deaths occur among people under the age of 60, compared to 13% in high-income countries (WHO, 2010).

Estimates from WHO indicated that the non-communicable disease (NCD) related annual death rate is 34% in Ethiopia (WHO, 2010). In this report, cardiovascular diseases (CVD) account for 15%. Some of the known risk factors for hypertension like age, heredity, and gender are non-modifiable. However, the majority of the other risk factors like smoking; drinking alcohol, unhealthy diet, physical inactivity, being overweight, and obesity can be successful prevented. It is responsible for a host of other disease such as stroke and heart attack (WHO, 2014). Currently hypertension prevention and control needs attention from the Ethiopian health system because of different reasons such as it having been a neglected public health issue for the past decades, its prevention interventions for risk factors are cost effective and there is a rapid urbanization in Ethiopia, which leads to behavioural, diet and life style changes.

“The heart pumps blood through the blood vessels, the blood pushes against the walls of blood vessels. This creates blood pressure. The body needs blood pressure to move the blood throughout the body, so every part of our body can get the oxygen it needs. Healthy arteries (the blood vessels that carry oxygen-rich blood from the heart to the rest of the body) are

elastic. They can stretch to allow more blood to push through them. How much they stretch depends on how hard the blood pushes against the artery walls. For arteries to stay healthy, it's important that our blood pressure be within a healthy range'' (American Heart Association, 2014).

Hypertension is commonly referred to as high blood pressure (WHO, 2013a). According to the seventh report of the joint national committee for prevention, detection, evaluation, and treatment of high blood pressure (JNC7) it is categorized into four categories for adults of age greater than or equal to 18 years (USDHHAHS, 2004). Normal blood pressure is systolic blood pressure (SBP) less than 120 mm Hg and diastolic blood pressure (DBP) less than 80 mm Hg. Pre hypertension is for patients on the cusp of developing hypertension and defined as an SBP of 120-139 mm Hg or a DBP of 80-89 mm Hg (European Society of Hypertension (ESH), 2013). Hypertension is defined as a systolic blood pressure equal to or above 140 mm Hg and/or diastolic blood pressure equal to or above 90 mm Hg. However, it is divided as stage I with the SBP 140-159 mm Hg or DBP 80-89 mm Hg and stage II with SBP \geq 160 mm Hg or DBP of \geq 100 mm Hg (ESH, 2013). Normal levels of both systolic and diastolic blood pressure are particularly important for the efficient function of vital organs such as the heart, brain, and kidneys and for overall health and wellbeing (ESH, 2013).

CHAPTER ONE

1. BACKGROUND INFORMATION ON ETHIOPIA

1.1 Country Profile

Ethiopia is the second most populous country in Africa next to Nigeria. It has a unique cultural heritage with a diverse population mix of ethnicity and religion. More than 80 languages are spoken within a country. It served as a symbol of African independence during the colonial period, and was a founder member of the United Nations (UN) and the African base for many international organizations.

1.2 Geography and Climate

Ethiopia is a country located in northeast Africa, which is also known as the Horn of Africa. It is surrounded by six countries, Eritrea to the north, Kenya to the south, Sudan and South Sudan to the west and Djibouti and Somalia to the south.

1.3 Demographic situation

According to the Central Statistics Agency (CSA, 2015) of Ethiopia's projection using the 2007 housing and census estimate, the population of Ethiopia in 2015 was estimated to be 90 million. The average family size of a household is 4.7.

The pyramidal age structure shows a predominately young population: 45% under age of 15 years. More than half of the population (52%) are within the age group of 15 and 65 years. The population above 65 years accounts for only 3% of the total population. There is an almost equal sex proportion among male and female. Women in the reproductive age group constitute 23% of the population. The average fertility rate is 4.1 per woman (Ethiopian Demographic Health Survey (EDHS) 2014)).

1.4 Education

Education is one of the key instruments for socio-economic development in countries like Ethiopia. It is also considered as a basic human right. In Ethiopia 48% of females and 37% of males have never attended school. 3% of females and 4% of males completed primary education and did not attend secondary school. Only 5% of females and 6% of males have attended but not completed secondary education, and an additional 3% of females and 5% of males have completed secondary or higher education.

The gender gap in education is more obvious at lower levels of education, and this in turn leads to the small proportion of males and females attending higher levels of education with the highest share being female (EDHS,2014).

According to the EDHS report, there has been a marked improvement in the educational attainment of women. It shows that the proportion of females with no education has declined significantly, from 98% among those ages 65 and over to just 18% among females age 10-14. Similarly, among males 88% of men age 65 and older had no education, compared with 19% of males age 10-24. The report also shows that educational attainment is much higher among the urban population than the rural population. In urban areas 27% of females and 15% of males have no education, compared with 53% of females and 41% of males in rural areas.

41% of women are literate. Literacy among women in the reproductive age group has doubled in the last fifteen years. Literacy among women varies widely by age, increasing sharply from 18% among women age 45-49 to 70% among women age 15-19. Literacy is much higher in urban areas than rural areas. About 71% urban women are literate compared with about one-third or 32% of rural women (EDHS, 2014).

1.5 Health Situation

According to WHO, Ethiopia has achieved MDG 4 target reducing under-five mortality by 67% from the 1990 estimate. The report shows that Ethiopia's under-five, infant and neonatal mortality rates were 68, 44 and 28 per 1,000 live births, respectively. From 1990 to 2000, the average Annual Reduction Rate (ARR) of under-five mortality rate (U5MR) was 2%, which has accelerated to 5% since 2000. The achievement of under-five, infant and neonatal mortality is not impressive since 190,000 children are still dying each year (Federal Ministry of Health (FMoH), 2014). The major causes of under-five mortality in Ethiopia are acute respiratory infection (ARI) (18%), diarrhoea (9%), prematurity (11%), sepsis (9%), birth asphyxia (14%), meningitis (6%), injury (6%), measles (3%) and others (21%). Malnutrition underlies nearly 50% of under-five deaths. Prematurity (37%), infection (28%), and asphyxia (24%) are the most common causes of death in neonates (WHO, 2014).

Ethiopia has so far reduced maternal mortality by 69% from the 1990's estimate with annual reduction rates of 5% and more. According to a WHO estimate, the proportion of mothers who were dying to give 100,000 live births declined to 420 in 2013 compared to 1,400 in 1990. Haemorrhage, hypertension in pregnancy, abortion and sepsis are the leading causes of maternal deaths (WHO, 2013 b).

In Ethiopia, the estimated average life expectancy at birth is 64 years. The probability of dying between 15-60 years of age per 100,000 populations (Adult mortality rate) has decreased by more than 42% in females and 47% in men based on the 1990's estimate (FMoH,2014).

The majority of the health system resources are invested for improvement of maternal and child health. The primary focus of the Ethiopia health extension program is improvement of maternal and child health but still it needs additional efforts. The public health intervention for NCDs, especially for hypertension, is lacking due attention but its exposing risk factors are increasing overtime.

1.6 Health System

Over the past two decades, Ethiopia has made great improvements in its health system. through the well-coordinated, extensive effort and intensive investment of the government, partners and the community at large in primary care through the Health Extension Program (HEP) and expansion of Primary Health Care (PHC) units (FMoH, 2014).

According to Ethiopia Ministry of Health, the country health care system has three levels

First level: The PHC at woreda (district) includes a primary hospital for population coverage of 100,000 people, health centres for 25,000 people, and their satellite health posts for 5,000 people connected to each other by a referral system. Health centres and health posts form a primary health care unit with each health centre having five satellite health posts.

Second Level: a general hospital with population coverage of one million people.

Third level: a specialized hospital that covers a population of five million. Private sectors also play a vital role in the Ethiopian PHC. Offices at different levels of the health sector, from the FMoH to Regional Health Bureaus (RHB) and woreda health offices share decision-making processes, powers, and duties while FMoH and the RHBs focus more on policy matters and technical support and woreda health offices focus on managing and coordinating the operation of a district health system that includes a primary hospital, health centres, and health posts under the woreda's jurisdiction.

HEP has 16 health packages that are implemented at the community level by Health Extension Workers (HEW) but hypertension prevention is not included in them.

FMoH has developed and implemented a health care financing strategy since 2005. This strategy focuses mainly on improving the efficiency of allocation and utilization of public sector health resources with funds originating and flowing through several sources such as government taxes, grants and loans from bilateral and multilateral donors, and private contributions. Although health care financing has improved significantly over the years as a result of the health care financing strategy, inadequate health care financing remains a major challenge for the health system of the country (FMoH 2010).

In Ethiopia, health care financing Out of Pocket (OOP) spending accounts for 37% of health sector spending, there is no health insurance service for the past year but currently there is a legal framework, and operational manuals have been developed at the federal level. The government is trying to launch the national health insurance scheme at the federal level. (Ethiopian Public Health Institute (EPHI), 2014a)

CHAPTER TWO

2. PROBLEM STATEMENT, JUSTIFICATION, OBJECTIVE, METHODOLOGY AND CONCEPTUAL FRAMEWORK

2.1 Statement of the problem

Hypertension is estimated to cause 7.5 million deaths or 12.8% of all deaths globally. It is a major risk factor for cardiovascular disease. The prevalence of hypertension is similar across all income groups, though it is generally lowest in high-income populations (WHO, 2010).

A systematic review in Ethiopia for the epidemiology of major non-communicable diseases shows that global burden of disease (GBD) studies estimate age-standardized death rates of 800 per 100,000 population for non-communicable diseases in Ethiopia, of which high death rates of approximately 450 per 100,000 were attributed to cardiovascular disease and its major risk factor is hypertension (Misganaw A. et.al 2014).

Research work related to NCDs in low and middle-income countries like Ethiopia is poor. Analysis of available data between 2000 and 2012 suggests that deaths by communicable disease have been decreasing while deaths due to NCDs especially cardiovascular disease (CVD) like hypertension have been rising in Ethiopia (WHO 2015).

Ethiopia is one of the fastest growing countries in Africa and is facing epidemiological, demographic, economic, and nutritional transitions. These changes pave the way for chronic NCDs like hypertension. The projection of the Central Statistics Authority (CSA) of Ethiopia indicates that the proportion of people living urban areas and older ages will significantly increase over the coming two decades. This report shows that the proportion of population living in urban area will increase from 15% to 23% during 2025-2030. Life expectancy is expected to rise from the current 53 to 65 for males and 56 to 68 for females in the same period of time (CSA 2007).

In Ethiopia, the prevalence of hypertension has been observed to increase over time (Mulugeta 2015, Kibret and Mesfin, 2015). For example, a meta-analysis study to determine the pooled prevalence of hypertension in Ethiopia shows that the prevalence of hypertension in Ethiopia was estimated to be 19.6% among adult populations, of which 23.5% were in urban populations and 14.7% in rural population. A similar report shows that the prevalence among males is 20.6% and females is 19.2% (Kiberet and Mesfine, 2015). A quantitative epidemiological systematic literature review conducted in Ethiopia on publications between

January 2000 and April 2015 shows that rate of hypertension varied widely, with the highest rate of 31.5% in males and the lowest rate of 0.8% in females but most literatures shows the prevalence in Ethiopia between 20% to 30%. The systematic review study found a high prevalence of hypertension in urban residents with the highest of 31.5 in males and 28.9 in females in Addis Ababa city (Mulugeta M. 2015).

A number of small-scale studies conducted in different parts of the country show that the prevalence is higher among urban residents (Mulugeta M. 2015, Fikadu and Lemma, 2016). In addition to the above systematic literature review and meta-analysis different studies in different part of Ethiopia show different prevalence of hypertension. Different study results in different parts of Ethiopia also show high prevalence of hypertension. A study in the southwest of Ethiopia shows that prevalence of hypertension in Jimma was 21.3% (22.2% in males and 19.6% in females) (Sisay et.al 2012). Another study conducted in Bahir dar town in northwest Ethiopia shows that the prevalence of hypertension was 25.1% (Anteneh et.al, 2015). A research study on socio-economic status and hypertension among teachers and bankers in Addis Ababa town indicates that the prevalence is 19.13% and 21.8% for bankers and teachers, respectively (Fikadu and Lemma, 2016).

The result from a systematic review conducted in Ethiopia indicates that there are different associated risk factors for hypertension in Ethiopia. Evidence shows that different associated factors include being overweight, having a family history of hypertension, age, sex, sleeping for less than five hours, oral contraceptive use, alcohol intake, physical inactivity, eating vegetables three or fewer days per week, salt use, obesity, higher education, and vigorous recreational activities were identified as risk factors for hypertension (Mulugeta M. 2015). Hypertension cannot be cured but it can be managed very effectively through lifestyle changes and when needed, medication. (American Heart Association, 2014).

A study in Addis Ababa, the capital city of Ethiopia, investigated cause of death using verbal autopsies showed that 51% of deaths were due to non-communicable diseases. In the same study, amongst the non-communicable diseases, cardiovascular disease (CVD) was the leading cause of death which accounted for 24% and hypertension is the major risk factor for CVDs such as heart failure, stroke and others (Misganaw A, Mariam DH, Araya T, 2012).

2.2 Justification

Ethiopia has made significant progress towards improving the health of women and children but the country neglects prevention and control of non-communicable diseases like hypertension. Ethiopia is one of the countries that signed the United Nation (UN) sustainable development goal (SDG) 2016 – 2030. Therefore, it is a country that is expected to achieve target 3.4, which says “by 2030. Reduce by one third premature death from non-communicable diseases”

The country has no operational unit within the Ministry of Health for non-communicable disease, no national policy or guideline for management of non-communicable disease at the primary health care approach and no national surveillance and monitoring system that enables it to report against nine global non-communicable disease targets (WHO 2014). National representative surveys on NCDs and their risk factors in Ethiopia are not available (Misganaw A, Mariam DH, Araya T, 2012, Misganawu et.al 2014). The second five-year (2016-2020) Health Growth and Transformation Plan (HGTP) indicates that, recognizing the growing burden of non-communicable diseases, the Ethiopian Ministry of Health has developed a comprehensive prevention and control strategic action plan of NCD including hypertension and risk factors focusing on reduction of risky behaviours. The plan also indicates that about three-quarters (73%) of all health facilities excluding health posts offer services for cardiovascular diseases including hypertension (FMoH 2015). But still the health Extension workers who are close to the community are not trained on how to screen hypertension at health post level and prevention of hypertension and other NCDs are not included in health extension program package.

According to a report of the FMoH the per capita spending (PCS) on health is steadily growing (FMoH, 2014). The total health expenditure in Ethiopia has increased but there is still a persistent budget deficit. There is no social health insurance (SHI) scheme in Ethiopia (FMoH, 2014). Poor health care financing leaves households vulnerable to impoverishment from catastrophic health expenditures, and slows progress towards health improvements by limiting access to essential health services among the poor (EPHI,2014a).

Hypertension is one of the most modifiable risk factors for CVD but the prevention and control has not received due attention in Ethiopia during the MDG period. In addition to this awareness about prevention, treatment and control of hypertension is very low in Ethiopia. In

Ethiopia, the health care resources are overwhelmed by other priorities like malaria, HIV/AIDS, and tuberculosis.

This study assessed the policy response toward hypertension prevention and control interventions at the policy makers' macro level, primary health care meso level and individuals at micro level needed to address the Sustainable Development Goal (SDG) 3.4 to reduce premature mortality from non-communicable disease by one third by 2030.

2.3 Study question

- What are the main factors that are associated with hypertension in Ethiopia?
- How does the health system respond to the burden of hypertension in Ethiopia?
- What are good practices for hypertension prevention and control in Sub-Saharan African countries?

2.4 Objective of the study

2.4.1 General objective

The general objective of this study is to assess the health system response towards hypertension in Ethiopia and to provide recommendations for prevention and control of hypertension in Ethiopia.

2.4.2 Specific objectives

- A.** To assess the main factors associated with hypertension in Ethiopia.
- B.** To identify the health system response toward hypertension prevention and control in Ethiopia.
- C.** To assess best practice for hypertension prevention and control in Sub-Saharan Africa countries.
- D.** To suggest possible interventions for hypertension prevention and control in Ethiopia to concerned bodies.

2.5 Method

For achieving the objective of this paper, a literature search was conducted in seven different data sources, i.e. EMBASE, PUBLINE, Global Health library, African journal online, Google scholar, VU database, Pub med, Google scholar, and the Addis Ababa University (AAU) electronic library. Key words used for search were “hypertension”, “cardio vascular disease”, “health system”, “policy”, “Ethiopia”, “ salt ”, “ tobacco ”, “alcohol”, “Sub-

Saharan Africa”, “South Africa”, “Interventions”, “health service” and “health financing”
 These words were searched separately and in combination.

In addition, grey literature from different sources like EDHS, FMOH, MOFED of Ethiopia, and WHO was sourced. For analysis of factors affecting hypertension and policy response in Ethiopia a conceptual framework model is used. In addition to this personal observations will be taken into account for analysis process. The conceptual framework will be discussed in the following section.

Table 1: Search Table

Sources	Search words used for objectives		
	Objective 1	Objective 2	Objective 3
EMBASE PubMed Google scholar VU e-library AAU e-library	Age, sex, obesity, obesity, alcohol, tobacco, physical activity, diet	Access to health care, Health care financing, Hypertension prevention policy, strategy, Ethiopia	Sub-Saharan Africa, Salt reduction, Tobacco ban, Smoking ban, Regulation, Tax, Policy, Strategy, Risk factors, Diet
Websites NDH South Africa, Ghana, Nigeria EPHI, FMOH, MoFED, CSA	Tobacco Salt Exercise Sub-Saharan Africa, Ethiopia	Access to health care, Health care financing, Health policy, prevention policy, strategy, Ethiopia	Sub-Saharan Africa, Salt reduction, Tobacco ban, Smoking ban, Regulation, Tax, Policy, Strategy, Risk factors, Diet
Website of UN agencies	Ethiopia Hypertension	Access to health care,	Sub-Saharan Africa, Salt reduction,

WHO, CDC, WB		Health care financing, Hypertension health system policy, Ethiopia	Tobacco ban, Smoking ban, Regulation, Tax, Policy, Strategy, Risk factors, Diet
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2.6 Inclusion and exclusion criteria

Only literature presented in English was used. Only literature which could be applied in the context of adult hypertension was used. Literature that published before 2000 was not included except for cross checking. All other literature that did not meet these criteria excluded. Articles that only present abstracts without access to full text versions were also not used. Literature for interventions from Sub-Saharan Africa countries such as South Africa, Ghana and Uganda, Nigeria and other are used because they are have made good progress in hypertension prevention and control.

2.7 Conceptual frame work

For achieving the objectives of this study, the conceptual framework for analysing policy response for prevention and control of NCD in Jamaica (see annex, 1) was adopted (World Bank 2008). There are reasons why this model is adapted from Jamaica:

1. The demographic transition is the same as Ethiopia as there is a declining 0-14 age group and an increasing working age group (15-64) and the above 60 age groups is growing, which is fast growing segment of the population. The population growth rate is decreasing and there are equal proportions of male and female. There is also an epidemiological transition with a reduction in mortality and illness from infectious diseases that has increased life expectancy in both countries. A long-living population will have greater lifetime exposure to risk factors such as limited physical activity, tobacco use, alcohol abuse, and fatty foods, which contribute to hypertension.
2. Both countries face a double burden of disease: communicable diseases were the greatest contributor to the burden of disease in both countries for past three decades but were surpassed by chronic diseases in current and coming decades. These epidemiological

transitions occur through urbanization and lifestyle changes as living standards improve, education levels rise, access to health services increases, and morbidity and mortality patterns change with people living longer lives.

3. Communities in poorer segments of the population are more likely to be at risk of NCDs. Such peoples with low incomes are uninsured or underinsured, and cannot afford preventive screenings for hypertension. In both countries the prevalence of hypertension is between 20 - 30%.

I have seen some other frameworks like the proceed-proceed model of health education, and the HiHi model adapted from Green & Kreuter and Hill which is used for analysis of health care service for hypertension. Most of them are used for other reasons like health education toward hypertension and hypertension treatment but this adapted from Jamaica framework, which is used for analysis of policy responses towards NCDs.

Analysing the policy response towards hypertension in Ethiopia has evolved from understanding the associated risk factors from individual behaviour at the micro level to policy response at the macro level. This is because of different reasons. First, the determinants of hypertension lie in behaviour and social conditions. Second, hypertension is not a one-off or episodic event, it builds up over long periods of time leading to disease progression that is accelerated with aging or cumulative exposure to risk factors. Third, people who are acquire multiple risk factors and disease need lifelong disease management. Fourth, the complexity of preventing and managing hypertension requires intervention at multiple levels from different actors ranging from behaviour change to tertiary care. (WB, 2008).

An adopted conceptual framework will be used to help identify the major associated risk factors of hypertension in Ethiopia, to clarify the relationship among different factors and examine the limitations of existing health system policy responses to suggest possible solutions from best intervention practicing sub Saharan Africa countries. This will be illustrated in figure 1 below. In this adopted conceptual framework, both health profile and health policy can be seen to directly affect the use of health services for hypertension prevention and control, which in turn influences health outcomes for individuals. The organization of primary health care setting determines the responsiveness of country policy to hypertension, yet this relationship can be modified by the social, environment, personal health practices.

The World Bank conceptual framework for Jamaica is build based on a different previous analysis of non-communicable diseases and pathways through which individual, social and environmental factors influence health outcomes. The conceptual framework for this study builds upon a vast amount of literature that has been developed in recent years on the determinants of health (Evans,et al. 2001, Lurie and McLaughlin 2003, Solar and Irwin 2007). The role of individual and social determinants and the interactions between them have been identified. The impact of different determinants has been further distinguished by the role of structural and intermediary determinants (Solar and Irwin 2007) and primary and secondary determinants. Primary determinants include socioeconomic and demographic factors while secondary determinants encompass biological and lifestyle factors (Kosteniuk and Dickinson 2003). Sassi and Hurst, in their Economic Framework for the Prevention of Lifestyle-related Chronic Diseases, emphasize the importance of interactions between individual factors and specific socioeconomic environmental influences; the framework they developed focuses on preventing lifestyle-related NCDs (Sassi and Hurst 2008).

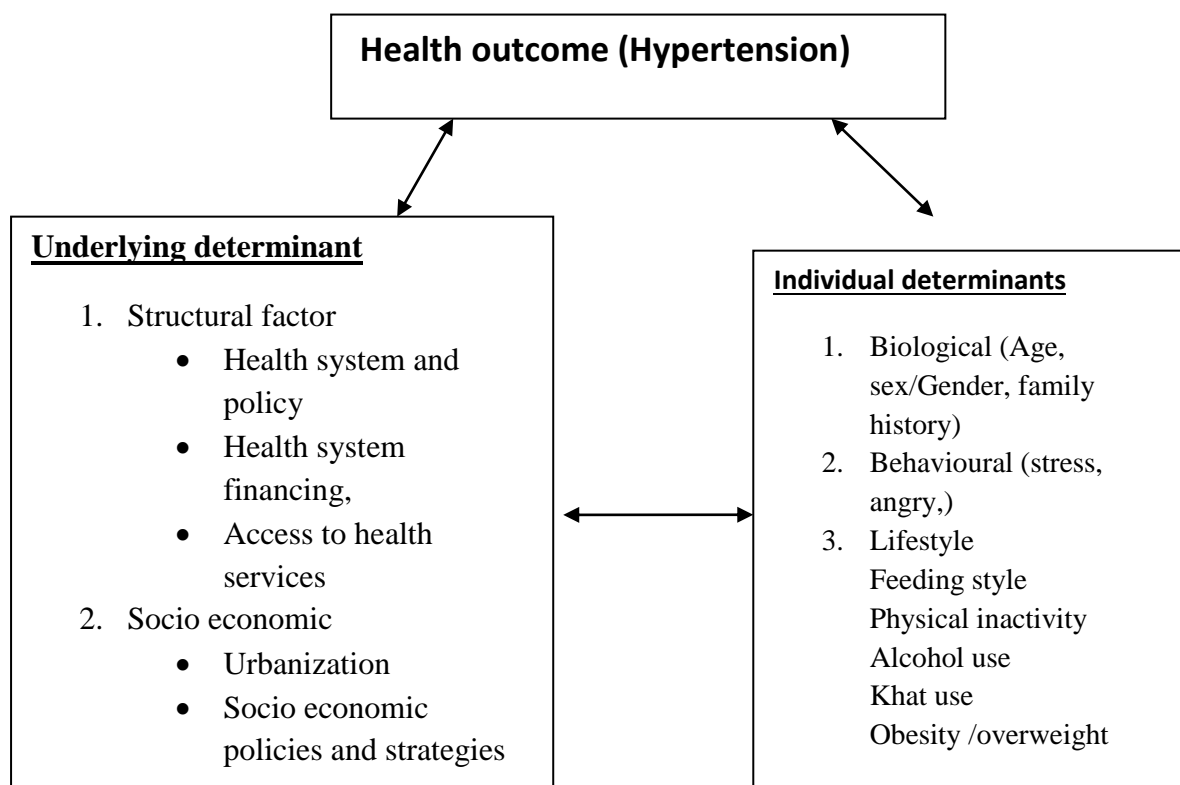


Fig1: Conceptual framework for analysing determinants of hypertension and health system response in Ethiopia adapted from World Bank conceptual framework for analysis of NCD determinants and policy response for Jamaica.

This study adopts a framework that groups the factors into “underlying” and “individual” determinants. Underlying determinants affect the health of the population at the macro level and structural determinants at the meso level and individual determinants affect individual health at the micro level. This distinction highlights the role that individuals can play in the prevention and control of hypertension while identifying the socioeconomic environment that influences individual behaviour and which can be changed by policy interventions. The aim of this framework is not to capture the comprehensive relationships between the determinants of hypertension nor to test these relationships, but rather to raise awareness of them for a better understanding of the pathways that lead to hypertension.

2.8 Limitation

Only articles published in English were used in this study and relevant literature in other languages or requiring purchase were left out. The absence of national surveillance data for hypertension in Ethiopia could result in under-reporting of data on hypertension used in the literature. Few studies on hypertension have been done in different parts of a country which limits this literature search in terms of triangulation using multiple sources of. The literature search had more access to literature online than literature that is not online; this might lead to data biases since much part of the review used online literature. The limited number and differing methodologies might influence generalisation of the results.

The above limitations were addressed during the analysis by using multiple sources of data with similar contexts especially from Sub-Saharan Africa countries to triangulate. Since there was limited nationwide data, multiple studies done across parts of the country were used to present evidence and to triangulate by using similar studies from either within the country or outside the country. The quality of studies used for this literature search was ensured by considering the methodologies implored in such studies. Studies published in peer reviewed journals were mostly used.

CHAPTER THREE

3. STUDY RESULTS/FINDINGS

This section presents findings on determinants of hypertension and the health system policy response towards hypertension in Ethiopia. Hypertension prevention and control experience from Sub-Saharan Africa countries have been highlighted to link with risk factors.

3.1 Individual Determinants

This section presents individual determinants mentioned in adapted framework as biological factors, which includes age, sex, and family history of hypertension, behavioural factors, which include stress and anger, lifestyle factors, which includes diet, physical activity, alcohol use, tobacco use, and obesity.

3.1.1 Biological factors

Among the non-modifiable factors age, sex and family history of hypertension are strongly associated with hypertension.

3.1.1.1 AGE

Aging is a biological process with a decline in the performance of most organs. Less activity as a result to ageing also causes hypertension. Impaired ability of the arteries to expand when blood is pumped can be attributed to hardening of the structure of the arteries. Hormonal changes as a result to ageing can also cause high blood pressure. Changes such as decrease in oestrogen production, underactive or overactive thyroid can also influence the rise in the blood pressure (Janet, 2011).Hypertension was positively associated with age in both men and women and also there is positive trend of increasing prevalent hypertension with increasing age. This is mainly due to arterial stiffness as one gets older.

When ages were higher, the chance of hypertension increased by 4% per 10 years. So, older persons have four times higher risk of hypertension than younger persons. Evidence about hypertension indicates that the prevalence of hypertension in adults older than 25 years of age was about 40% in 2008 and contributed to 12.8% of the deaths in the world (WHO 2013a). Different research studies in Ethiopia show ageing is one of the major associated risk factors in Ethiopia. A study conducted in northwest Ethiopia (Gondar) indicates that the likelihood of hypertension increased with advancing of age. This study implies that hypertension was 9% higher among those aged 45–54 years than those 35–44 years old, while it increased by 20% in those 55 years or older compared to those 45-54 years of age (Awoke et.al 2012).A hospital based cross sectional study in southwest Ethiopia shows that an increasing

prevalence of hypertension with age has been detected. The study shows that only 3.8% of adults younger than 35 years old were hypertensive. The prevalence rate of hypertension in those between the ages of 35 years to 55 years of age was 16.3%, whereas 19.4% of adults older than 55 had hypertension (Esayas et.al, 2013). This hospital based study is biased on selection and select respondents only from the outpatient department of Jimma university hospital. A study on the prevalence of hypertension and diabetes on Ethiopian adults' shows that the 35-45 age-specific prevalence estimates of hypertension was greater (22%) among men than among women (14.9%) (Nshisso et.al 2012).

Similar to other studies, it was found that the highest rate (50%) was reported at age 60 – 64 years (Janet 2011). A cross-sectional study result from northwest Ethiopia, Bahir dar town shows that the odds of developing hypertension among respondents aged 41–50 years and greater than 50 years were more than two- and seven-times as likely compared to respondents aged less than 40 years, respectively (Anteneh et.al, 2015). Thus during ageing the chance of developing hypertension is higher since people are less physically active and their body organ performance declines.

3.1.1.2 Sex

Men and women are equally likely to develop hypertension during their lifetimes. However, before age 45, men are more likely to have hypertension than women. After age 65, the condition is more expected to affect women than men. Also, men younger than 55 are more likely to have uncontrolled hypertension than women. Women have a lower prevalence hypertension than men before menopause, but a higher prevalence thereafter due to hormonal change (Janet 2011, Pemu and Ofili, 2008).

Different research studies in Ethiopia shows sex is a major determinant of hypertension in Ethiopia. A systematic meta-analysis study in Ethiopia shows that the prevalence of hypertension is 31.5% in males and 28.9% in females in age group ≥ 25 , 26.2% in males and 19.4% in females in age group ≥ 31 years and, 26% in males and 30.3% females ≥ 35 years (Kiberet and Mesfine, 2015). A study conducted on University of Gondar students showed a positive association between sex and hypertension in which the risk of hypertension increases three times with being men (Takele and Henok, 2014). This study is biased with selection of respondents from a total of 610 college students aged ≥ 18 years who were screened for hypertension the majority, 453 (74.4%), of the students were male and 157(25.6%) female (Takele and Henok, 2014). Therefore, men are at greater risk for hypertension than age-

matched ≥ 18 years, premenopausal women. Recent studies using the technique of 24-hour ambulatory blood pressure monitoring have shown that blood pressure is four times higher in men than in women at similar ages. After menopause, however, hypertension is higher in women than in men. Hormone replacement therapy in most cases does not significantly reduce blood pressure in postmenopausal women, suggesting that the loss of oestrogen may not be the only component involved in the hypertension in women after menopause (Pemu and Ofili, 2008). In contrast, androgens may decrease only slightly, if at all, in postmenopausal women. Androgens may increase hypertension (Pemu and Ofili, 2008).

3.1.1.3 Family hypertension history

Family history is an important non-modifiable and consistent risk factor for hypertension (WHO, 2013a). The hereditary nature of hypertension is well established by numerous research studies in Ethiopia which demonstrating associations of hypertension among siblings and between parents and children. Evidence from Northwest Ethiopia indicates that the prevalence of hypertension is three times higher among people with family history of hypertension than those of their counter parts. A similar study shows that hypertension is four times higher among self-reported diabetic patients (Awoke et.al, 2012).

A study in southwest Ethiopia Hospital based at Jimma University indicates that a family history of hypertension was found to be a strong risk factor of hypertension (odds ratio [OR]: 30.79; 95% confidence interval [CI]: 11.18–84.78) (Esayas 2013). A study from southern Ethiopia, Durame shows that people who had family history of hypertension were also found to be four times higher risk of hypertension (Helelo et.al, 2014). This is due to the fact that family members may share similar lifestyle and genetic factors which cannot be easily distinguished. Therefore among various mechanisms proposed to explain the relation between hypertension and positive family history of hypertension, are the increased renal proximal sodium reabsorption, genetic traits related to hypertension such as high sodium-lithium counter-transport, low urinary kallikrein excretion, elevated uric acid level, high fasting plasma insulin concentrations, high-density LDL sub-fractions, fat pattern index, oxidative stress and body mass index, as well as shared environmental factors such as sodium intake and heavy metal exposure (Ranasinghe et al. 2015).

3.1.2 Behavioural (stress, angry)

3.1.2.1 Stress

Major lifestyle changes, lack of sleep, exercise, and job or a combination of things all can lead to stress. These lead to increased blood pressure, changes in heart rate, increased cholesterol level, increased triglyceride level, fat deposition around waist, and metabolic syndrome (Gasperin et.al 2009). Those who are living in poor society are frequently exposed to unexpected stress since they are exposed to risk factors because of the socio-economic condition surrounding them. The ability to control and manage stress is a determining factor in the development and progression of hypertension. It should be noted that blood pressure response to an abnormally high and uncontrollable level of stresses can be life threatening and can even exhibit resistance to drug therapy (Nozoe and Munemoto 2002).

A cohort meta-analysis study shows that the effect of psychological stressful tasks on blood pressure increases in adults aged between 18 and 64 years. Individuals with high increases of blood pressure during stressful tasks (reactivity) and those with high blood pressure in the recovery period after the tasks (recovery) showed greater odds of developing hypertension or increased blood pressure (Gasperin et.al, 2009).

Research studies found that students who slept ≤ 5 hours per day were about four times at risk of being hypertensive compared to a group sleeping 7 hours (Despres J et.al 2001, Tadesse and Henok, 2014). In Ethiopia currently there has been rapid urbanization and social changes which therefore lead people to stressful life and this also exposes them to hypertension.

3.1.3 Lifestyle factors

The prevalence of hypertension was found to be higher in urban dwellers than in rural dwellers. Evidence shows that it is because of changes in feeding style, physical inactivity, and lifestyle changes as explained below.

3.1.3.1 Diet (feeding style)

High sodium intake is an important determinant of hypertension and hypertension-related complications. Evidence shows that high dietary salt consumption is associated with an increase in the mean population blood pressure (BP), as well as the prevalence of hypertension (Alderman, 2000 and WHO 2013 b).

A study from southern Ethiopia Durame shows that adults who did not eat vegetables for more than three days on their weekly menu were about two times likely to be hypertensive than those eat daily (Helelo et.al, 2014). Another study in Bahirdar town shows that

respondents who added salt to food in addition to the normal amount that was added to the food during cooking were more than three-times as likely to have hypertension compared to those who did not added additional salt (Tadesse and Henok, 2014). These studies were conducted on urban areas, which didn't include rural communities of Durame and Bahirdar which used vegetables and crops as their daily meal and did not use salt more.

In Ethiopia, traditionally people believe that eating meat rather than vegetables and fruits is a sign of a good living standard but in reality, the reverse is true since using more fatty foods like raw meat exposed them to hypertension. I personally observe that the majority of diets in Ethiopia has more than normal amount of salt.

3.1.3.2 Physical activity

Regular exercise reduces the risk for many diseases, including hypertension and has reported to lower blood pressure even in people who have normal blood pressure (Kelley et.al, 2005) but people who are over the age of 40 or who have a history of heart disease should consult a healthcare professional before beginning an exercise regime. Evidence shows that there is strong association between physical activity and hypertension. Large cross-sectional and longitudinal studies in London have shown a direct negative correlation between habitual physical inactivity and hypertension (American Heart Association, 2014).

A study in India shows that sedentary people have a 20–50% increased risk of hypertension compared to more active people (Blair et.al 2004). A study from northwest Ethiopia shows that people who do not walk for at least 10 minutes continuously on daily basis were about three times highly likely to be hypertensive (Awoke et.al 2012). Another study from southern Ethiopia Durame showed that people who did not walk at least for 10 minutes continuously on a daily basis were about eight times more likely to be hypertensive (Helelo et.al 2014). There is a big difference between these study results because Durame is a capital city of Kambata zone which has urban residents who uses different mode of transportation but the study done in Northwest Ethiopia is at semi-urban area where transportation with in a city is not easily accessible.

According to WHO, guidelines and the American College of Sports Medicine there are two types of physical exercises, which are moderate physical exercises like brisk walking, tennis, weight lifting (<20kg), dancing, etc. for at least 30 or up to 60 minutes per day to a total of 150–300 min/week and vigorous physical exercises like gymnastic, volleyball, football, basketball, running, swimming, weight lifting (>20kg), riding bicycle, etc. for at least 20–30

min/day to a total of 75–150 min/week (Wojtek et.al 2009, WHO 2014). People who do not take enough exercise are more likely to have or to develop hypertension (American Heart Association, 2014). However because of urbanized and modernized people are not engaged in daily physical activity such as walking as a means of transport rather they prefer to use motorcycles or cars. In addition to this, most of the occupational jobs in urban area are done by sitting for long hours. This type of physical inactivity exposed the urban rich communities to hypertension.

3.1.3.3 Alcohol use, Khat use and Smoking

Different evidence in Ethiopia shows that alcohol consumption and cigarette smoking were significantly associated with hypertension (Awoke et.al 2012, Gudina 2013, Tesfaye et.al 2008).

Alcohol use: For many people, moderate drinking is possibly safe. Moderate drinking is one drink a day for women or anyone over 65 and two drinks a day for men under 65. Anything more than moderate drinking can risk development of hypertension (CDC, 2016). Despite the fact that drinking alcohol itself is not necessarily a problem, but drinking too much can cause a range of consequences, and increase risk for a variety of problems. A number of studies have recognized a close association between alcohol consumption and increased hypertension, which is a risk factor for CVD. Intake of more than 30 g alcohol (more than 2 drinks) per day is associated with an increased risk for hypertension (Fuchs, 2004). The Atherosclerosis Risk in Communities (ARIC) Study determined that the effect of alcohol consumption in increasing hypertension is more pronounced among men of African ancestry, such that the consumption of alcohol was a risk factor in black men (Fuchs et.al,2002,Fuchs et.al,2004,Steffens,2006).

A community based cross-sectional study in the Rukungiri district of Uganda reported that factors found to be associated with hypertension included: past alcohol use, Odds Ratio (OR)=2.28, [1.42 - 3.64], and present alcohol use OR=1.64 [1.12 - 2.43] (Wilder 2004). Another study done in Uganda reported that alcohol users were three times likely to be hypertensive compared to participants reporting to have never used alcohol (Wamala et.al, 2009). Studies in Ethiopia show that the daily alcohol consumption among adults in Addis Ababa is two times higher than the nationwide estimate of 2.1% for in school and out-of-school youth (Kebede, 2009). Heavy alcohol intake is frequently seen among adults in Addis Ababa, with approximately 10% of men consuming 5 or more standard units of alcohol on 1

or more days during a week. The World Health Survey reported an amount of alcohol use is approximately 7.6% among men and less than 1% among women (Fikru et.al, 2009, Thadhani, 2002).

I personally observe that in Ethiopia, there is large number of alcohol producing factories compare to other product producing factories. The rapid expansions of these factories increases the easy access to alcohol use in turn these expose the urban communities to hypertension if they use alcohol inappropriately.

Smoking and Khat : Tobacco use is one of the modifiable risk factors for hypertension. The immediate noxious effects of smoking are related to sympathetic nervous over activity, which increases myocardial oxygen consumption through a rise in blood pressure, heart rate, and myocardial contractility (Najem et.al 2006).

A study of the association of smoking and khat (*Catha edulis* Forsk) use with high blood pressure among adults in Addis Ababa showed that about 13.5% of the males and less than 1% of the females were cigarette smoker currently and 11% of the males were daily smokers. Males (18.6%) and females (2.1%) reported current khat (*Catha edulis* Forsk) chewing. Close to 16% of males chewed khat one or more days per week. This study shows that smoking cigarettes and chewing chat increase three times higher than those non-smokers and not chewing khat. (Tesfaye et.al 2008).A study in Bahirdar town shows that the odds of developing hypertension among smokers was more than three-times as likely compared to their counter parts, who never smoked cigarettes (Anteneh et.al, 2015).

Smoking, affecting arterial stiffness and wave reflection this have a significant effect on central blood pressure, which is more closely related to target organ damage than brachial blood pressure this will exposed people to develop hypertension and hypertensive smokers develop severe forms of hypertension, including malignant and Reno vascular hypertension. This effect is due to an accelerated atherosclerosis (CDC, 2016).

In Ethiopia, especially the poor is more exposed for smoking and chewing chat since chewing chat in group is considered as a social life and there is high unemployment so the poor urban residents pass their time in chewing chat together with smoking. In addition to this, there is no age limit to buy or sell cigarette and khat in Ethiopia. It is a well-known informal business around the streets of Ethiopia. In rural Ethiopia, peoples are also smoking different local cigarettes, which are not well studied.

3.1.3.4 Obesity/ over weight

Body Mass Index (BMI) is calculated from weight and height. As suggested by the NIH and WHO, the normal weight for an adult over 18 years is less than or equal to 18.5-24.9. BMI that is greater than this puts one at risk of obesity related diseases such as hypertension. Being overweight and obesity are the most important public health problems, one of which is causative factors to hypertension (Janet 2011). Evidence shows that obesity multiplies the risk of developing hypertension about fourfold in men and threefold in women (American Heart Association, 2014). A study in Uganda showed the prevalence of being overweight to be 18% (25.2% of women; 9.7% of men) while prevalence of obesity was 5.3% (8.3% of women; 2.2% of men). Factors associated with being overweight included being female, peri-urban residence and higher socioeconomic status, and increasing age (Mayega et.al 2012).

According to an Ethiopian demographic and health survey report of Addis Ababa, around 20% of women and 12.4% of men are obese and overweight (BMI ≥ 25 kg/m²) (EDHS, 2012). Research studies in Ethiopia show that obesity is an increasing risk factor for hypertension in Ethiopia. A cross-sectional hospital based study report in Jimma indicates that BMI over 25 kg/m² was found to be a strong predictor of hypertension since the chance of getting hypertension is eight times higher for obese people (Esayas, 2013). A similar study in Addis Ababa indicates that being obese is significantly associated with hypertension compared to having normal BMI with AOR 5.5 this implies that obese people have a 5.5 times higher risk of hypertension compared to those with normal BMI (Tesfaye et.al 2008). Even though genes can put one at risk of gaining weight, the balance of energy intake and exercise is an important determinant (Janet, 2011).

3.2 Underlying Determinants

This section presents underlying determinants mentioned in the adopted framework such as structural factors which includes health system policy, health care financing and access to health care for hypertension prevention in addition to these socio-economic factors such as urbanization will be discussed below.

3.2. A. Structural factor

Structural factors such as health policy, health care financing and access to health care will be explained in the next section.

3.2.1 Health system

The FMOH launched a new health care plan, which accelerated Expansion of Primary Health Coverage over the whole country through a comprehensive Health Extension Program (HEP), through providing quality promotive, preventive, and selected curative health services in an accessible and equitable manner to reach all segments of population, with special attention to mothers and children. (FMOH, 2005).

According to FMOH as a preventive program, the HEP promotes four areas of care: Disease Prevention and Control, Family Health, Hygiene and Environmental Sanitation, and Health Education and Communication.

Health service extension program introduced 16 packages in four main areas that include.

A. Hygiene and Environmental Sanitation having seven packages:

- Proper and safe excreta disposal system;
- Proper and safe solid and liquid waste management;
- Water supply safety measures;
- Food hygiene and safety measures;
- Healthy home environment;
- Arthropods and rodent control;
- Personal hygiene;

B. Disease Prevention and Control having four packages:

- HIV/AIDS prevention and control;
- TB prevention and control;
- Malaria prevention and control;
- First AID;

C. Family Health Services having five packages:

- Maternal and child health;

- Family planning;
- Immunization;
- Adolescent reproductive health;
- Nutrition;

D. Health Education and Communication

The HEP Program is implemented in the following modalities:

- For the community based outreach program a one-year vocational training for HEWs, involving two females per Kebele, and construction and equipping of health posts (HP).
- A community health volunteer from the kebele working under the guidance of HEWs and providing support to households for behavioural change such as breast feeding, complementary feeding, immunization, use of bed nets, clean delivery, etc.
- A programme providing some clinical care services such as treatment of diarrhoea, malaria in children, assisted institutional delivery, early referral for mothers and children with danger signs, and HIV testing and counselling (FMoH, 2005).

As a result of government investment for implementation of HEP, Ethiopia decreased child mortality by two-thirds from 77 to 31 deaths per 100 births between 2000 and 2011 (CSA, 2013) and increased the use of modern contraceptive methods among currently married women from 6.3% to 40.4% between 2000 and 2013 (EDHS,2014a).

According to a WHO report, the health system of Ethiopia has a good achievement in prevention and control of infectious disease, maternal and child health, HIV/AIDS, TB and malaria control but it did not give much attention for prevention of hypertension and other NCDs at the primary health care level (WHO, 2014). The HEWs are not trained in counselling for prevention of risk factors of hypertension and hypertension prevention is not included in the HEP package. Therefore, the lack of attention for prevention of risk factors that expose for hypertension will increase the mortality and morbidity of hypertension and hypertension related complications like diabetes, heart failure, stroke, and others.

3.2.2 Access to and utilization of health care

According to the WHO, in order to realize the right to health, countries are required to ensure availability; non-discriminating physical, economic, and informational accessibility; cultural and ethical acceptability; and quality of health care (WHO 2012).

The Ethiopian health care system is faced with problems related to human resources and access to health facilities. Evidence shows that the stock of health workforce currently is 0.8/1,000 and the staff attrition rate 6.6% (FMOH, 2014). In addition to this a report from an Ethiopia Service Provision Assessment Plus (SPA+) Survey 2014 by the Ethiopia Public Health Institute (EPHI (b)) indicated that about three-quarters of all health facilities (excluding health posts) offer services for chronic respiratory diseases (76%) and services for cardiovascular diseases (73%). Six out of every ten-health facilities excluding health posts offer services for diabetes and chronic renal diseases. This report also indicates that the number of health facilities offering services for non-communicable diseases are two referral hospitals, seven general hospitals, three primary hospitals, 182 health centres (HC), 13 higher clinics, 37 medium clinics, and 119 lower clinics (EPHI,2014b). Therefore, inadequate human resources and health facilities are the major determining factor in Ethiopia health care to provide quality service for hypertension control. As evidence indicates above the majority of health facilities offer service for NCDs are health centres and medium clinics. In the Ethiopian health system health centres are not staffed with specialists and medical doctors. As a report indicates above currently a large number of HCs offer services for NCDs but there is problem of human resources. The medium clinics are private for profit health facilities and their cost for services is higher for hypertension treatment. In addition to this a small number of referral hospitals and general hospitals which are staffed, by specialists and medical doctors offer services for NCDs. This problem will increase the double burden of disease due to hypertension and other NCDs.

3.2.3 Health Insurance

One of the essential elements of the right to health is ensuring economic access to health care services, which means that without effective financial protection for health care expenditures the fundamental human right cannot be ensured. The high out of pocket (OOP) expenditures for health care lead to economic, psychosocial and medical consequences. This catastrophic expenditure aggravates the level of poverty (Norman and Thomas, 2009). According to a WHO guideline the direct OOP payments should fall to less than 15-20% of the total health expenditure (THE) (WHO 2014). According to the national health account (NHA) reports of

Ethiopia the OOP expenditure as a percentage of THE is 34% (WHO 2015). The report from FMoH shows that the per capita spending (PCS) on health is steadily growing. The per capita spending in 2003 was only \$4.09, but it increased steadily to \$5.6, \$7.14 and \$16.1 in 2008, 2012, and 2015 respectively even if the level of spending is increasing still it is far from adequate to buy good health care specially for poor and poorest (FMoH, 2014). The NHA shows that percentage of total government budget for health is 5% as compared to Abuja declaration of 15%. The report of FMoH also shows that the total health expenditure in Ethiopia increased from \$1.2 billion to \$1.6 billion in 2007 and 2011 respectively. But there is a persistent budget deficit in fiscal year 2012/13. The budget allocated for different health strategy objectives was 30% less than the required budget (FMoH, 2014).

A report from the Ethiopia Public Health Institute (EPHIa) shows that poor health care financing remains a major challenge for the health system of Ethiopia. It causes catastrophic health expenditure for households and limits access to essential health services for poor (EPHI, 2014a). This report also indicates that important barriers to improved health care financing are: low government spending on the health sector, strong reliance on OOP, inefficient and inequitable utilization of resources, and poorly harmonized and unpredictable donor funding.

In Ethiopia, health care clients are paying for health services. Health facilities collect revenue and internally channelled to the central treasury of government and receive their operational fund in the form of government budget. The budget allocated from government does not cover non-salary expenditures and is mostly depleted before the first quarter (EPHI, 2014a). In Ethiopia the majority of the health care resources are overwhelmed by MCH and prevention and control of HIV/AIDS, malaria, and TB priorities and therefore the poor health care financing and high OOP which lead people not to check their blood pressure for early treatment and detection. In addition to this it also affects the health care seeking demand of people with hypertension. These will lead to exposure of severe stage of hypertension and related complications.

3.3 Socio-economic factors

Ethiopia has achieved rapid and stable economic growth over the past decade. The Real Gross Domestic Product (GDP) average growth of 10.9% is contributed to by service sector accounts for 5.4%, followed by agriculture 3.6% and industry with 1.7% in 2004–2014. The recent rise of industry is due to a construction boom and not because of a rise in the

manufacturing sector which remains very small at about 4 per cent of GDP. Real GDP growth per capita averaged 8.0% per year raising the country from being the 2nd poorest in the world in 2000 to the 11th poorest in 2014 (World Bank, 2016). A similar report by the government of Ethiopia shows that over the last decade (2003/4 -2013/14), Ethiopia's economy registered rapid growth with a 10.9% annual average GDP growth rate. In the last five years of the Growth and Transformation Plan (GTP) implementation periods (2010/11 – 2014/15), the economy also registered robust growth with an annual average GDP growth of 10.1%. The Industry, Service and Agriculture sectors had 6.6%, 20.0%, and 10.7% annual average growth rates respectively (MOFED, 2014).

Ethiopia has made a remarkable change on expansion of primary, secondary and tertiary level of education. This changes the educational status of the citizens. There were 21.2 million children in 30,800 primary schools and 2,333 secondary schools in the 2013/14 academic year (MoE 2014). As the result net primary school enrolment (Grade 1-6) reached 99% in 2014, this is a fivefold increase from the 1990 rate of 19% (Ministry of Education (MoE), 2014). According to a report of the MoE, in 2014 more than 1.7 million youth were attending higher education in 1,312 technical and vocational education training (TVETs) institutes and 33 universities. More than 3.5 million adults benefited from the adult education program and 6.6 million are currently in the program. The proportion of girls enrolled in primary and secondary education exceeded 45% in 2014 (MoE, 2014) and because of economic growth people are observed to have different attitudes towards health seeking behaviour, access to health, exposure to health risk factors, and health status because of their difference in educational background (MOE, 2014).

According to the Ethiopia poverty assessment, Ethiopian households have experienced a remarkable reduction in poverty rate from 56% of the population living below \$1.25 PPP a day 1990 to 29% in 2010 (UN Rio+20, 2012). The government of Ethiopia has spent up to 40% of its capital budget for road construction. As a result, the length of roads has reached 105,000 km and about 10,765 rural kebeles are connected with the Universal Rural Road Access Program (URRAP) providing better access to health care to millions of mothers and children. Similarly, the rural electrification program is benefiting more than 5,100 rural and urban kebeles, paving way to a better life. Connectivity of citizens through modern communication means is showing a prominent stride evidenced by 32 million mobile phone subscribers and a rise in telecom penetration to 37%, making Ethiopia one of the top six countries in Africa (MOFED, 2014).

The above socio-economic progress is the result of effective implementation of different policies and strategies. In Ethiopia the rapid economic growth, expansion of education and expansion of the transport and communications sectors has had positive contributions for urbanization and globalization. Urbanization has both positive and negative effects. The positive effect of urbanization makes life easy in communication, transport, access to information and globalization. In reverse urbanization paves the way for risk factors of hypertension through changing behaviour, lifestyle and feeding style of a people.

3.4 Best practice for prevention and control of hypertension in Sub-Saharan Africa

Evidence shows that chronic NCDs like hypertension can be prevented and controlled through comprehensive and integrated actions. According to WHO there are cost effective ‘best buy’ interventions for NCDs. Among these interventions, the following are best for prevention of major risk factors for hypertension. For Tobacco use, raise taxes on tobacco; protect people from tobacco smoke, warn about the dangers of tobacco, enforce bans on tobacco advertising. For harmful use of alcohol, raise taxes on alcohol, restrict access to retailed alcohol and enforce bans on alcohol advertising. For unhealthy diet and physical inactivity, reduce salt intake in food, replace trans fat with polyunsaturated fat, and promote public awareness about diet and physical activity via mass media (WHO, 2010). Some of cost effective actions such as regulations and taxes, involving youth, families, schools, communities, and intersectoral collaboration for prevention of hypertension and surveillance and screening programmes are mentioned below as a good practice from Sub Saharan African countries.

3.4 1 Taxes and Legislation

According to the WHO, national level taxes and legislation are the best buy for creating an environment to protect adults from harmful behaviour. These include raising the purchasing age for alcohol and tobacco, taxing unhealthy substances, and mandating that school and public congregation places be 100% free from smoke and alcohol (WHO 2014). Despite the effectiveness of such measures, progress in addressing hypertension and other NCDs is constrained by weak regulatory capacity in many Sub-Saharan African countries, underscoring the importance of supporting governments to improve public outreach, coordination among responsible agencies like tax authorities, police and municipality, and enforcement of laws and regulations (Naik and Kaneda, 2015).

Some Sub-Saharan Africa countries have implemented the WHO ‘best-buy’ interventions with measurable success and other without measurable successes but recommended by WHO in recognition of the growing of risk factors for hypertension,

Some African countries have achieved a good lesson to learn. Some illustrative examples are described below. I selected any Sub Saharan African countries, which implement WHO ‘best buy’ regardless of their success since there is shortage of literature on best practice for hypertension prevention and control.

Tobacco

In South Africa, total taxes including excise and sales on cigarettes increased from 32% to 52% of the retail price between 1993 and 2009. In that same period, cigarette sales declined 30% and the rate of smoking among adults dropped by 25%. At the same time, government revenue from tobacco taxes increased by 800% (American Cancer Society, 2012). Increasing taxes like excise and sales are effective for adults in low and middle-income counties like Ethiopia whose purchasing of products is particularly sensitive to price increases.

Alcohol

Several Sub-Saharan African countries including South Africa, Ghana, Botswana, Kenya, Gambia, Zimbabwe, and Tanzania have implemented measures to reduce alcohol consumption. Measures vary and countries like Botswana levy alcohol tax as high as 45%, restrict trading days and hours, require health warnings in advertisements, and bans the sale of traditional brews in unregulated places like homes.

In Gambia, alcohol advertising is banned on national television and radio. This is a designed to address the broader population (Naik and Kaneda, 2015). Such measures can work well to reduce drinking among adult people, who are highly susceptible to alcohol marketing and who often begin drinking in environments where alcohol is easily accessible.

Salt

The Minister of Health in South Africa signed ground-breaking legislation in 2013 to mandate salt reductions in the food industry. Maximum sodium content limits will gradually decrease in two waves with deadlines in 2016 and 2019 (WHO Africa 2013a). This legislation reduces sodium consumption among adults who tend to eat convenient, processed foods high in salt, such as snack chips, cereals, and breads.

Diet

According to National Department of Health (NDH) of South Africa the government of South Africa introduced a cost-effective intervention for addressing risk factors related to hypertension with taxes on unhealthy food (foods high in fats and sugar) and food subsidies on healthy food (fruits and vegetables) in collaboration with departments of Agriculture, Trade and Industry, the tax authority and municipalities (NDH, 2013).

In Ghana, civil societies help to encourage peoples to make healthy food choices through raising awareness to bring about efforts in improving partnership work across agencies, to achieve the MDGs (NDH, 2013).

3.4.2 Involving Youth, Families, Schools, and Communities

Some African nations have begun to implement multisectoral responses to address the risk factors for hypertension among young and adult people. Some of these are as follows: Youth Development link of Kampala. Uganda implemented an intervention to curb alcohol and drug use among those in secondary and higher education. Using schools in 14 schools as a plate form, social workers facilitated talk shows, peer discussions, group discussions, and talks at assemblies and debates. They also provided printed materials with message about alcohol and drug abuse. This intervention brought some changes in fostering positive peer learning and influence, and also raising awareness among teachers, students, and the community about the situation of alcohol and drug use and abuse (Kacwamu, 2010).

According to Nigeria Tobacco control program report, Nigeria's cost effective tobacco control intervention is a health campaign that uses social media to advocate for comprehensive tobacco control laws in a country that has no national restriction on advertisement and promotion of tobacco use. This campaign uses different mechanisms such as developing catchy songs, hosting events like dancing competitions and uses a number of youth friendly social media outlets like Facebook, Twitter, Instagram, and others. This intervention strategy brings behavioural change among adults of Nigeria (Tobacco control Nigeria website).

3.4.3 Intersectoral Collaboration for Prevention of Hypertension

According to South African Demographic and health survey (SADHS) report, 56% of the population lives in urban areas, with rapidly increasing urban population due to urbanization. This rapid urbanization has become accompanied by large shift in the health pattern of South Africans (Steyn et.al 2006).

It is very difficult for obese and overweight peoples to change their behaviour through education by health promoters or practitioners unless healthy foods are accessible and available and facilities for exercising are within reach. In South Africa, there is a shortage of healthy low-fat food and little fresh fruit and vegetables in most townships and in many rural areas and the majority of local shops sell cheap fatty foods rather than healthy goods (NDH, 2013). In addition to improving access to healthy foods, the government coordinated with Higher Education, Youth and Sport department, NGOs and the private sector to address obesity through physical activity (NDH, 2013). This intervention will encourage overweight people to access healthy food and facilities for physical exercise, which in turn reduce the exposure to hypertension (NDH, 2013).

3.4.4 Surveillance and screening programmes

Ghana is the second leading country in Africa for blood pressure related mortality and the prevalence of hypertension is a 54.6% (Addo et al., 2012). The government of Ghana has a good experience to prevent hypertension. The government-integrated ideas around surveillance, screening programmes for hypertension, promoting the availability of medicines, as well as technologies (NDH, 2013).

WHO suggests three broad areas that should be at the top of a research agenda for Sub-Saharan Africa on NCDs. These include, surveillance: addressing the need for better data, Treatment: improving the efficiency and effectiveness of currently expended resources, and Prevention: the research challenges of primordial and primary prevention (Unwin et.al 2001).

CHAPTER FOUR

4.1 DISCUSSION

The rapid economic growth in Ethiopia brings changes in behaviour; lifestyle and feeding style that pave the way for risk factors of hypertension. It is an opportunity for expansion of health facilities, which improve the health status of people of all age groups and increase average life expectancy. When the people start to live longer because of prevention and control of infectious disease and the socio-economic changes they exercise different risk factors for hypertension (CSA,2007), such as starting to use unhealthy processed food, fatty foods and alcohol. They also use different modes of transport like cars and motorcycles rather than walking and cycling. This is further aggravated by being overweight and the absence of facilities for physical activity. Exclusion of prevention of risk factors in the health extension package, inability to train the health extension workers how to counsel and advise for risk factors of hypertension, and the absence of surveillance data for risk factors of hypertension are the challenges for prevention of risk factors for hypertension. The cumulative effect exposes people to hypertension and related complications.

In urban areas of Ethiopia, the major determinants of hypertension are diet, physical inactivity, tobacco use, alcohol abuse and obesity due to urbanization but not in rural Ethiopia. In rural Ethiopia the major determinants of hypertension is not studies well but the communities in rural Ethiopia use local tobacco and home made alcoholic drinks more, which expose them for hypertension. Poor access and utilization of health services together with absence of health insurance scheme is a challenge for hypertension prevention and control in both in rural and urban Ethiopia.

In Ethiopia NCD treatment, including hypertension is mostly conducted at health centres, medium clinics, and very small number of referral, general and primary hospitals offer services (EPHI, 2014b). Health centres in Ethiopia follow the self-financing health care system through cost sharing with their clients and this, together with absence of social health insurance schemes, absence of hypertension screening program, the lack of human resources, and geographical inaccessibility of health centres and the profit maximization nature of medium clinics make access to health care for hypertension unaffordable and inaccessible. These results high mortality and morbidity due to hypertension and related complications such as stroke, heart failure and diabetes.

Despite the rapid increase of economic growth in a country, which leads to urbanization there is an increasing prevalence of hypertension in urban areas up to 31.5% (Mulugeta M. 2015). The Ministry of Health has a policy and strategic framework for hypertension prevention at the federal level (FMoH, 2015, EPHI, 2014b.). Hypertension prevention and control is the most neglected public health problem in Ethiopia (Tesfaye, 2007 and WHO, 2014). The HEP in Ethiopia deployed two HEW in each urban and rural kebele at community level this is an opportunity for surveillance of hypertension risk factors with minimum cost. In addition to this, the community volunteers can play a vital role in behavioural change. The lack of attention from the Ministry of Health is a challenge for collaboration and coordination of other stakeholder like Ministry of Agriculture, Ministry of Trade and Industry, the Tax Authority, and Municipality and non-governmental actors including private sectors to put their efforts for hypertension prevention.

One of the challenges that the Ethiopian health system faces for improving equitable access to health care is the problem related with health care financing (HCF). The country HCF is strongly reliant on direct out of pocket payment (OOP). The high OOP together with low government spending on the health sector, inefficient and inequitable utilization of resources, and poorly harmonized and unpredictable donor funding toward health sector puts the health system at risk (EPHI, 2014a). The per capita spending is USD \$16.10 which is very low compared to the Sub-Saharan Africa average which was USD \$93.65 in 2014 and this figure is very low compared to WHO's recommended USD \$86 per person to cover essential health care (EPHI, 2014a; FMoH 2014 and WHO,2014). These barriers create delays in health care for hypertension treatment among the urban poor who are more exposed to behavioural and lifestyle risk factors. In addition, this unaffordable price for health care affects the health seeking behaviour of the urban poor and this lead them to hypertension related complications.

Sub-Saharan Africa countries implement different cost effective intervention strategies for prevention and control of hypertension, which can be adapted as a good lesson for Ethiopia. This study found that South Africa's increasing taxes on cigarettes is a best practise that Ethiopia could adapt for khat use, tobacco use and alcohol use. Increasing taxes on these products reduces the regular use of these products which are risk factors for hypertension and simultaneously increase government revenue for health care financing.

The legislation that bans advertising cigarettes on national TV and radio in Gambia and bans smoking at public congregations in South Africa is a good lesson for Ethiopia to use TV and

radio advertisement for addressing the majority of the community who are sensitive to advertising on TV and radio. In its part using TV and radio, advertising for health promotion and education Ethiopia can address the majority of the communities. TV and radio plays an important role for awareness creation about risk behaviours such as alcohol use, tobacco use, salt use, physical inactivity and obesity that exposes for hypertension. There is a good opportunity to address the majority of rural and urban population since a number of radio stations that transmit message at different local languages and TV stations are available in all regional states of Ethiopia.

The experience of South Africa shows that subsidizing health foods (fruit and vegetables) and taxing unhealthy food (fats) reduces the risks exposure for hypertension. This intervention is effective when different governmental and non-governmental actors collaborate with the FMOH for implementation. The revenue gained from taxing unhealthy foods can subsidize the healthy ones and this encourages people to develop the habit of eating healthy foods. In addition to this, the government of South Africa has legislation reducing salt in processed food. Currently Ethiopia is in rapid urbanization this will shift dietary habit from unprocessed to processed foods.

Addressing youths through peer education, debates, talk shows and other means is a good lesson from Uganda. Nigeria also uses social media and events to address youth. School clubs and social media are an effective strategy to address the youth and adults who are under productive age group. They play a vital role for awareness rising about risk factors and prevention and control mechanisms to curb alcohol and tobacco use and abuse.

One of the challenges in hypertension prevention in Ethiopia is the absence of surveillance and screening programs for hypertension. Experience from Ghana shows that there is strong surveillance and screening program for hypertension in their country, which is important for evidence-based decision making at the national level. In addition to this the experience of Ghana shows that civil societies help empower people to encourage them through raising awareness and information education communication, such as food based dietary guidelines to educate the public about healthy eating, the need for regular physical exercise, and partnership work with other stakeholders like police, the tax authority, municipalities and others for tobacco, alcohol and khat control and regulation.

The World Bank framework for analysis of NCDs policy response in Jamaica has been adapted and the modified framework used for this study has been very helpful for answering

the research objectives through reflecting the finding what I think. I chose the Jamaican framework because of how it is done on policy reposes for NCDs. The adapted framework simplifies the reality for analysis and it is also flexible and enables the study to explore policy and strategies for prevention and control of hypertension from best practicing Sub-Saharan African countries. However, the challenges were the limited literature on policy practice in Ethiopia and the limited nationwide surveillance data on NCDs, especially hypertension and did not include the epidemiological patterns of NCDs, cultural and social norms as a determinant.

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATIONS

5.1 CONCLUSION

5.1.1 Modifiable risk factors related

Diet, physical activity, tobacco use, alcohol abuse and obesity are the major determinants of hypertension in urban Ethiopia rather than others. In rural area physical activity and obesity is not the determinant rather local tobacco use and homemade alcohol are the major determinants. Urbanization is a determinant in urban area that expose people for hypertension but not in rural one. Access to health system and health care financing is a major determinant in rural area than urban one.

Diet: Nutrition is one of the modifiable risk factor for hypertension. Scientific evidence indicates that as the lifestyle of individuals changes their feeding style also changes. Hypertension is linked to high consumption of energy dense foods of animal origin and of foods processed or prepared with added fat, sugar and salt.

Physical activity: Physical inactivity is associated with increased levels of obesity, stress, anxiety and depression. Physical inactivity is one of the major modifiable risk factors for hypertension in Ethiopia. In Ethiopia especially in urban area because of urbanization, physical activity is not at moderate amount. Peoples in urban are uses taxis, motor cycles to move from place to place.

Tobacco and inappropriate alcohol use: Tobacco and alcohol use is one of modifiable risk factors for hypertension. There is no regulation that limits age to buy and sell cigarette, khat and alcohol in Ethiopia. Large numbers of alcohol industries are expanded in Ethiopia. In addition to this in rural are there different type of local tobaccos and home made drinks which expose for hypertension.

Obesity: In Ethiopia, traditionally people believe that being overweight is the sign of living a good life but it is one of modifiable risk factor for hypertension. People who have high income are their dietary habit is mostly fatty foods. Delicious traditional foods in Ethiopia have high amount of salt. These all are risk factors together with minimal physical activity are possible explanations for higher hypertension in urban populations of Ethiopia.

Urbanization and globalization; - Urbanisation is one of the major underlying risk factors for hypertension in Ethiopia. As economies of a country grow and become modernised the populations migrate from rural to urban areas for better life. In Ethiopia in rural areas, the consumption food items are unprocessed and organic. Evidence shows that urbanisation leads to dietary changes towards adoption of the so-called ‘western diet’, which is high in animal proteins, fat, and sugar. These also supported by lifestyle changes including cigarette smoking, alcohol consumption and physical inactivity increase the population’s risk for hypertension.

5.1.2 Health System Policy related conclusions

Prevention and control of hypertension and other NCDs is an unfinished agenda, which needs special attention during SDG era of 2015 to 2030. The health extension program developed and implemented by the Ethiopian Ministry of Health has been play a major role in successful achievement of MDG. The primary health care system especially the health extension program did not give special attention for prevention of risk factors for hypertension and other NCDs. The government of Ethiopia excluded prevention and control of hypertension and other NCDs in health extension program. In addition, the health extension workers are not trained on identification and screening of hypertension and other NCDs.

Ethiopian Federal Ministry of Health has to take the leadership responsibilities for ensuring that appropriate institutional, financial and service arrangement are provided for the prevention and control of hypertension. Prevention and control of NCDs like hypertension is one of the targets for the UN SDG. There is no multi-stakeholder engagement, such as individuals, families and communities, intergovernmental organizations, religious institutions, civil society, academia, the media, policy-makers, voluntary associations and the private sector and industry in hypertension prevention in Ethiopia.

There is no social health insurance scheme for hypertension patients and others in Ethiopia and there is no national surveillance data for hypertension to make evidence based decisions. The hypertension situation in rural area is not studied well.

5.2 RECOMMENDATIONS

For achievement of SDG target and universal health coverage for hypertension in Ethiopia based on the above conclusion the following recommendations are given:

For modifiable risk factors

- Introduce legislations that limit age to buy and sell tobacco, khat and alcohol. In addition to this ban alcohol promotion and advertisement in national TV and radio, and enforce alcohol and tobacco industries to put warning message on packaging.
- Adopt Dietary Approaches to Stop Hypertension (DASH) eating plan. That means consumption of a diet rich with vegetable and fruits and reduction of dairy fat products and saturated fat. In addition to these adequate intake of dietary potassium and reduced dietary sodium intake.
- Strengthen health education and promotion using national and local TV and radio stations, encourage civil societies to use social media for awareness creations and establish school and non-school clubs who create awareness for behavioural change.
- Strengthening the capacity of individuals and populations to make healthier choices and follow lifestyle patterns that foster good health such as subsidizing fruits and vegetables, establishing public sport areas with sport equipments

For health system

- Include prevention of risk factors for hypertension in HEP.
- Train HEW and community volunteers how to counsel and advise the community for behavioural change for risk factors of hypertension.
- Strengthen the surveillance and screening of risk factors for hypertension.
- Distribute brochures, flyers and leaflets that has message for the prevention of risk factors of hypertension.
- Improve prevention, early detection, treatment and sustained management of people with or at high risk for hypertension in order to prevent complications,
- Introduce health insurance schemes such as Social Health Insurance (SHE) and Community Based Health Insurance (CBHI).

Partnership and collaboration

- FMOH work in collaboration with other health and non health actors such as Regional Health Bureau (RHB), Ministry of Agriculture (MoA), Tax Authority, Sport Department, Municipality, Police and Ministry of Trade and Industry (MoTI).
- Research institutes like EPHI should conduct researches on hypertension prevention and control in Ethiopia to sound evidence based decisions for policy makers.
- Encourage donors, bilateral organization and international NGOs to work on interventions for prevention of risk factors of hypertension.

Further research

- How is health care treatment for hypertension in Ethiopia?
- What are cultural and community norms that determine hypertension in Ethiopia?
- The prevalence of hypertension related risk factors in rural Ethiopia.

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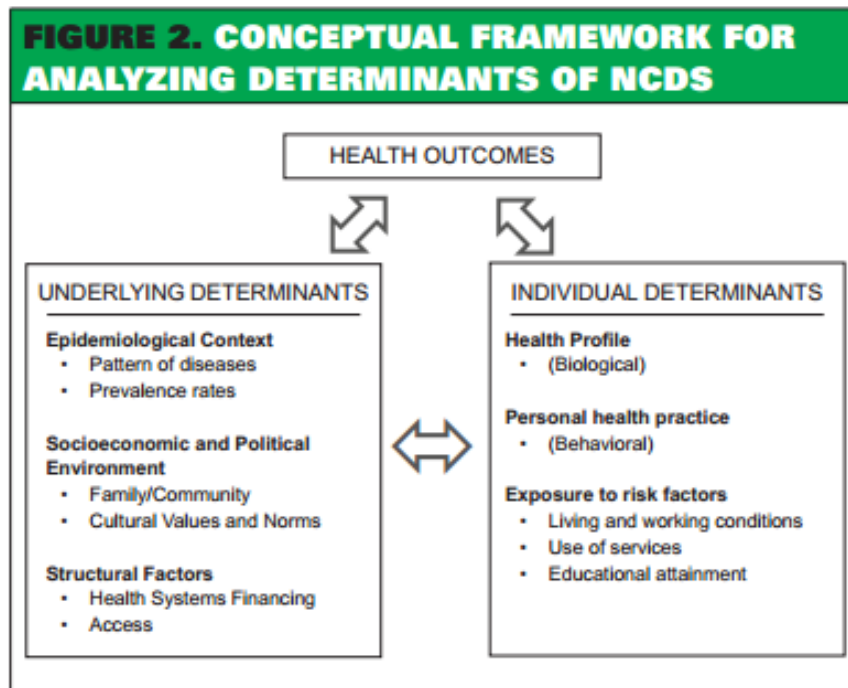
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Annex 1: Conceptual framework for analysis of NCDs in Jamaica.



Source: World Bank, 2008