THE SILENT EPIDEMIC IN TANZANIA: HYPERTENSION AND FACCTORS INFLUENCING HEALTH PROMOTION, PREVENTION AND TREATMENT AT PRIMARY CARE LEVEL

EMMA FRANCIS BASIMAKI

TANZANIA

50th International Course in Health Development
September 16, 2013 – September 5, 2014

KIT (ROYAL TROPICAL INSTITUTE)
Development Policy & Practice
Vrije Universiteit Amsterdam

The silent epidemic in Tanzania: Hypertension and factors influencing health promotion, prevention and treatment at primary care level

A thesis submitted in partial fulfillment of the requirement for the degree of Masters of Public Health

By Emma Francis Basimaki
Tanzania

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 department requirements.

The thesis: **''The silent epidemic in Tanzania: Hypertension and factors influencing health promotion, prevention and treatment at primary care level.''** is my own work.

Signature: .....

50th International Course in Health Development (ICHD)
September 16, 2013 - September 5, 2014
KIT (Royal Tropical Institute)/ Vrije Universiteit Amsterdam
Amsterdam, The Netherlands

September 2014

Organised by:
KIT (Royal Tropical Institute), Development Policy & Practice
Amsterdam, The Netherlands

In cooperation with:

Vrije Universiteit Amsterdam/Free University Amsterdam (VU)
Amsterdam, The Netherlands

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

DEDICATION

This thesis is dedicated to my loving parents, Francis and Scholastica Basimaki for their constant and tireless words of encouragement, spiritual and moral support throughout my study period.

ACKNOWLEDGMENT

I would like to use this opportunity to thank God for his wonderful mercies, and protection throughout my study period.

I would like to thank NUFFIC for this great scholarship offer in order to make this thesis possible.

Sincere thanks to my supervisor who has been constantly providing support with many great insightful points and advice.

KIT facilitators and all team members, I am very thankful for constant support whenever I needed it.

I would also like to thank my dear loving parents and siblings for their constant love, prayers and words of encouragement throughout my study period. Warm appreciations to my friends who have been supportive and help to proof read my work.

Lastly, my classmates the new family I had for one year, I am grateful for the opportunity I got to work with each of you. I have learnt a lot from each of you.

GLOSSARY

Non-communicable diseases- These are known as chronic diseases, are not passed from one person to another, they are of long duration and generally slow progression (WHO, 2013a).

Hypertension- Hypertension most common non-communicable disease defined when systolic blood pressure equal or above 140 mmHg and or diastolic blood pressure equals to or above 90 mmHg (WHO, 2013b).

Health promotion- Process of enabling people to increase control over the determinants of health and thereby improve their health (WHO, 2014a)

Primary prevention- Averts disease process by eliminating causes of disease or increasing resistance to disease (Davidson, 2011).

Secondary prevention- Refers to detection and management of pre-symptomatic disease and prevention to symptomatic disease (Davidson, 2011).

Tertiary prevention- Prevention progression to disability and premature death (Davidson, 2011)

Primary care-The provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients and practicing in the context of family and community (RTI, 2013)

Primary health care- First level contact of individual, the family and community with the national health system bringing health care as close as possible to where people live and work, and constitutes the first element of a continuing health care process (Lawn et al., 2008)

Primary care level- First contact of health system and the community, it includes community health post, dispensary, health centres and district hospitals (URT, 2009).

Secondary care level- Second level of provision of health services include regional hospitals (URT, 2009)

Tertiary care level- Specialized level of care includes referral and national hospitals (URT, 2009)

Health care providers- all people engaged in action whose primary intent is to enhance health (WHO, 2006)

ABBREVIATIONS

CDC	Centre for Disease Control
CHW	Community Health Worker
CVD	Cardiovascular Disease
DDH	District Designated Hospital
FBO	Faith Based Organisation
GBD	Global Burden of Disease
GOVT	Government
HCPs	Health Care Providers
HMIS	Health Management Information System
HRH	Human Resource for Health
HRHIS	Human Resource for Health Information System
HTN	Hypertension
LMIC	Low and Middle Income Country
MoHSW	Ministry of Health and Social Welfare
NCD	Non-Communicable Disease
NBS	National Bureau of Statistics
RTI	Royal Tropical Institute
SSA	Sub-Saharan Africa
TFNC	Tanzania Food and Nutrition Centre
URT	United Republic of Tanzania
WB	World Bank
WHO	World Health Organization
WMA	World Medical Association

ABSTRACT

Background and problem: The prevalence of hypertension is rapidly increasing in Tanzania in both men (31.6%) and women (29.4%). Hypertension is the most common risk factor for preventable stroke and cardiovascular disease morbidity and mortality. There are several challenges from both clients and health system at primary care level which contribute to poor health outcomes and low utilisation of health services.

Objectives and methods: To assess factors influencing health promotion, prevention and treatment of hypertension at primary care level in Tanzania to enable provision of evidence based recommendations for improved utilisation of health services and health outcomes. This study was conducted through literature review. For guidance a conceptual framework adapted from Andersen's was used to analyse factors influencing health promotion, prevention and treatment of hypertension at primary care level.

Findings: Client and health system related factors interact to influence promotion, prevention and treatment of hypertension. Findings revealed lack of hypertension policy, a critical shortage of human resources for health, poor quality of data, low level of awareness in the community and poor adherence to treatment. The interaction of these factors significantly influence the utilisation and health outcomes of hypertension.

Conclusion: Policy formulation and implementation is important in addressing and reducing the burden of hypertension at population level in Tanzania.

Recommendation: MoHSW should ensure formulation and implementation of hypertension policy, implementation of task shifting, training for health care providers, and provision of health education on life style modification to the community.

Key words: Hypertension, primary care, prevention, intervention, Tanzania

Word Count: 12,783

INTRODUCTION

As general practitioner, I worked at an emergency department in a tertiary hospital in the Southern Highlands of Tanzania. While at work, I observed an increase in the trend of admission and mortality from hypertension and hypertension related diseases that could have been prevented, if appropriate measures had been taken early. My concern and interest is at primary care level, as the first point of contact with the community to understand the challenges from both the client and health system perspectives with regard to the reduction of hypertension burden in Tanzania. .

Hypertension is a major risk factor for heart disease, stroke, kidney failure, premature deaths and disability. Globally, about 17 million people die annually from cardiovascular diseases and 9.4 million of these deaths are attributed to the complications of hypertension (WHO, 2013b). By 2025 the number of adults with hypertension are predicted to increase by (60%) to 1.56 billion people living with hypertension (Kearney et al., 2005).

Most of the deaths due to hypertension in Africa occur between the age of 30 and 69 years (Jamison et al., 2006). Hypertension is the major risk factor for cardiovascular diseases in both rural and urban areas in Sub-Saharan Africa (SSA). Surveys conducted in four SSA countries reported an age-standardized prevalence of hypertension of (19.3%) in rural Nigeria, (21.4%) in rural Kenya and (23.7%) and (38%) in urban Tanzania and Namibia, respectively with low levels of hypertension control ranging from (2.6%) in Kenya to (17.8%) in Namibia (Hendricks et al., 2012).

Non-communicable diseases (NCDs) have become a significant threat to the Tanzanian population. The prevalence of hypertension increases with age from (25 to 64) years in both men and women respectively. Prevalence of hypertension has seen to be increasing in both urban and rural areas associated with unhealthy dietary patterns and low physical activity (Mayige et al., 2012).

The focus of this thesis is to assess factors influencing health promotion, prevention and treatment of hypertension at primary care level in order to provide appropriate recommendations to improve utilisation of health services and health outcomes in those with hypertension.

CHAPTER 1: BACKGROUND INFORMATION

This chapter provides information about United Republic of Tanzania profile. It also provides information about socio cultural and economic situation, health financing, organisation of health services provision, human resource for health and non-communicable situation in Tanzania.

1.1. UNITED REPUBLIC OF TANZANIA PROFILE

Tanzania officially known as United Republic of Tanzania (URT) is located in East Africa, bordered with eight countries namely Kenya and Uganda to the North, Rwanda, Burundi, and the Democratic Republic of the Congo to the West, Zambia, Malawi and Mozambique to the South and the Indian Ocean to the East. URT is the union of Tanganyika (mainland) and Zanzibar (island). The country is politically stable and covers 940,000 square kilometers of which 60,000 are inland water. Total population is estimated to be 44.9 million (male 21.9 million and female 23.0 million), with growth rate of 2.9% and crude birth rate (CBR) of 38.1/1000 population. Total fertility rate is 5.4 children per woman and average life expectancy at birth between males and females is 59 and 62 years respectively. Literacy level among men and women is (83%) and (71%) respectively. Geographical distribution between urban and rural is (29.6%) and (70.4%) respectively (NBS, 2012a, NBS, 2012b).

1.2. SOCIAL CULTURAL AND ECONOMIC SITUATION

There are about 126 tribes in Tanzania using Swahili as a national language for communication. Tanzania has mixed type of economy, and agriculture is the most common type of productive activity undertaken. About (28.2%) accounts for the poverty headcount ratio at national poverty line. Majority of poor people are from the rural areas as compared to urban areas (NBS, 2012a; WB 2014).

1.3. HEALTH FINANCING

The total health expenditure on health as percentage of gross domestic product (GDP) is (7%). The total spending on health from the annual budget is around (11%) which is below the (15%) from the annual budget agreed in Abuja declaration. Furthermore, (62%) of health spending is externally funded (donors) and (38%) from domestic funding. Out of pocket health expenditure (percentage of private expenditure on health) is (52%). Poor financial resource allocation in the health sector has contributed shortage of equipment and medical supplies, poor infrastructure resulting in ineffective health services delivery (Kwegisabo et al., 2012a; URT, 2010a; WHO, 2011; WHO, 2012).

1.4. LEVELS OF HEALTH SERVICES PROVISION

Tanzania health system is organised in three levels of health care services that are designed in a pyramid structure.

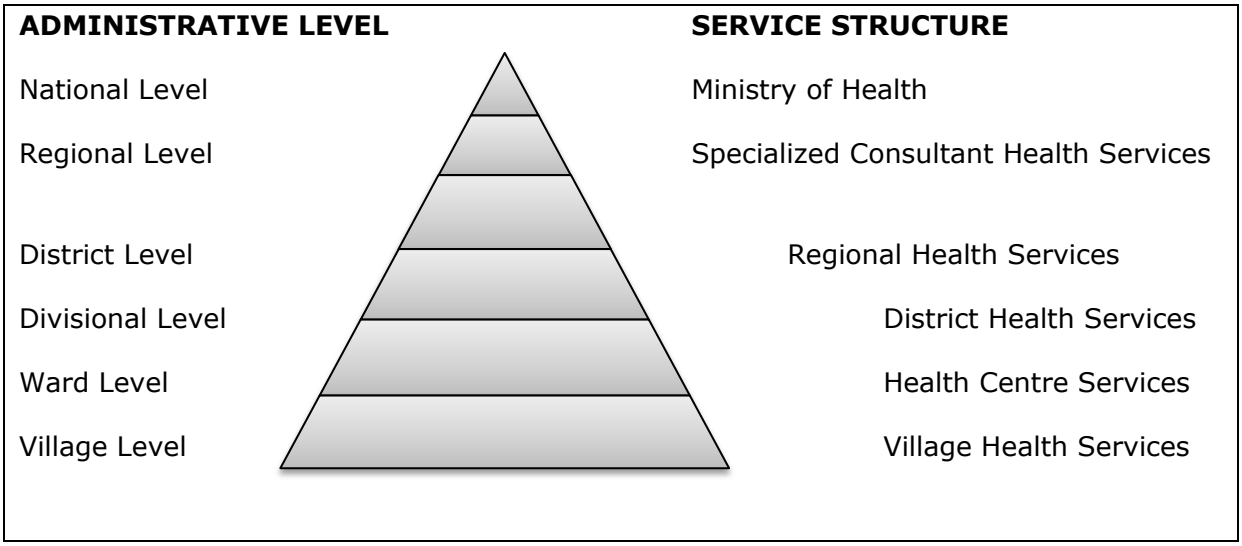
Primary care level: comprises of community health posts, dispensaries health centers and district hospitals. Community health posts comprise of two or more Village Health workers (VHWs). Dispensaries serve 6000-10000 populations and provide basic services in providing maternal and child health care such as assisting normal delivery and simple medical cases. Health centres covers to about 50, 000 populations, providing preventive care, reproductive health services through outpatient clinic and minor surgeries. District hospitals serve as referral cases from health centres and provide services to 250,000 populations. This is the fundamental of pyramidal structure of health care services provision in Tanzania. Nearly (90%) of people live within the 5 kilometers within the primary facility as recommended by World Health Organization (WHO).

Secondary level: Comprises of regional hospital which offers similar services as those offered at district hospital, however the services are provided under specialised care and it also offers additional services that are not available at district hospitals. Public health staffs are also available for organising programs preventing community from disease and injuries.

Tertiary level: This is the highest level of organisation of health services and comprises of referral hospitals offering specialised health services. Referral hospitals and teaching hospitals provide services that require complex care and high skilled personnel (Kwegisabo et al., 2012a URT, 2009).

Please refer to the figure 1 below which shows the levels of health services provision in Tanzania.

Figure 1: Levels of health services provision in Tanzania



Source: URT, 2003

1.5. HUMAN RESOURCE FOR HEALTH

Tanzania is classified by WHO among 57 countries with critical shortage of human resource. The crisis is in both public and private health facilities, however the shortage is more pronounced in rural primary care levels due to poor infrastructure and difficult working environment. A mapping survey conducted in 2006 observed doctor to population ratio to be 1:25,000, nurse to population ratio to be 1:6000; compared to WHO recommended professional per population ratio of 23:10,000 (Msuya & Shija 2004; URT, 2008a; WHO, 2006).

Furthermore, the greatest shortage of human resources for health is observed among assistant medical officers, clinical officers and laboratory technicians. It is expected that the shortages will increase in the coming years due to requirement of human resource needed for Human Immunodeficiency Virus (HIV) care and treatment. Staffing levels are higher in the urban areas as compared to rural areas, showing significant geographical imbalance (Maestad, 2006).

1.6 NON-COMMUNICABLE DISEASES (NCDs) SITUATION IN TANZANIA

Non-communicable diseases (NCDs) have become significant contributors of disease burden in Tanzania, currently accounting for (31%) of total deaths in Tanzania. Hypertension is one of the most common NCDs in the country due to increasing high-risk behaviors such as; low physical activity, alcohol consumption and overeating (Kwegisabo et al., 2012b; Mayige et al., 2012; WHO, 2014b).

CHAPTER 2: STUDY OVERVIEW

2.1 PROBLEM STATEMENT

Hypertension is a global public health issue of concern due to increases in behavioral risk factors such as unhealthy diet, alcohol consumption, low levels of physical activity and the use of tobacco. Hypertension accounts for 17 million deaths each year, with (51%) and (45%) of deaths are due to stroke and heart disease respectively. About 80% of cardiovascular diseases deaths occur in low and middle income countries (LMICs). WHO in 2013 reported an increase in hypertension prevalence in Africa and (46%) of people with hypertension are adults aged 25 years and above (WHO, 2013b).

In a systematic review of hypertension in Sub-Saharan Africa (SSA), the prevalence of hypertension was higher in urban than in rural areas. Less than (30%) of people diagnosed with hypertension were on drug treatment and less than (20%) had their blood pressure controlled (Addo et al., 2007).

According to NCDs country profile of Tanzania, estimates show prevalence of raised blood pressure by sex to be (31.6%) and (29.4%) among males and females and the probability of dying from the most common NCDs such as hypertension and cardiovascular diseases at (16%) (WHO, 2014b).

Studies observed hypertension-related diseases to be a major public health problem in Tanzania accounting for (33.9%) of all NCDs deaths. One third of the patients admitted with hypertensive stroke die before hospital discharge. Hypertension was the leading cause of deaths in patients aged 50 years and above, and most of these deaths (57%) occurred before retirement age. There is a low level of awareness about hypertension in the community despite of increase of high-behaviors risk such as poor dietary habits, low levels of physical activity, alcohol, smoking and increase in stress level (Belue et al., 2009; Mlunde, 2007; Peck et al., 2013)

There is a low level of detection, treatment and control of hypertension in both urban and rural setting of Tanzania. A study conducted by Dewhurst observed only two- sixths (29.4%) of participants were aware of hypertension, one-sixth of those who were aware being treated (16%) and one-sixth (16%) of those who were treated to be fully controlled (Dewhurst et al., 2013; Peck et al., 2014).

Findings on hypertension are alarming with important implications for public health in SSA and Tanzania where hypertension and related diseases are not accorded due attention (Peck et al., 2013).

2.2 JUSTIFICATION

Few studies in SSA have been conducted looking at factors influencing health promotion, prevention and treatment of hypertension at primary care level from both client and health system sides.

WHO reports indicates NCDs contribute more than (60%) of global deaths. Burden of hypertension is major public health challenge in both developed and developing countries. Countries reported to have at least one policy, strategy and plan for NCDs, however few of them reported to have policies, which are operational or funded to address NCDs. Major challenges observed are weak infrastructure, inadequate implementation of guidelines, poor population-based surveillance, gaps in health systems and generally weaker capacity in low-income countries (WHO, 2010a).

Reviews conducted in developing countries observed lack of basic and practical information of patient management among the health care providers. The basic information and materials required for learning among health care providers have been largely ignored for a long time, which contribute to challenges in management of diseases (Pakenham-Walsh & Bukachi, 2009).

A systematic review done in several countries including Tanzania on lay perspective for hypertension and drug adherence observed poor knowledge on hypertension among participants. This played a part on poor drug adherence where patients took drugs only when they get the symptoms believing they can control and treat hypertension on their own, also cost of treatment was another reason for non-adherence to the medications (Marshall et al., 2012).

Furthermore, there is low utilization of health services for hypertensive patients at low facilities due to poor health services provided. Reasons for low utilization were stated as cost of treatment and transport, lack of basic supplies, absence of first line of management for hypertension that is essential was seen in many primary facilities resulting in services of common NCDs like hypertension to be mainly delivered at secondary and tertiary facilities (Bovet et al., 2008).

The aim of this study is to assess to what extent factors such as policy, guidelines, availability of human resources for health, knowledge of health care providers, availability of appropriate health services knowledge and beliefs among clients influencing health promotion, prevention and treatment at primary care level in Tanzania. The findings of this study will be used to provide recommendations to stakeholders for appropriate interventions in order to improve utilisation of health services and better health outcomes for hypertension in Tanzania

2.3 OBJECTIVES

Overall objective

To assess factors influencing health promotion, prevention and treatment regarding hypertension at primary care level in Tanzania in order to provide recommendations to improve health service utilisation and better health outcomes.

Specific objectives

1. To identify the main client related factors influencing the utilisation of health services and hypertension related health outcomes.

2. To assess knowledge of health care providers, availability of health services and policy gaps towards health promotion, prevention and treatment regarding hypertension at primary care level.

3. To identify appropriate evidence-based interventions for effective promotion, prevention and treatment of hypertension at primary care level.

4. To use the research findings to make recommendations to stakeholders in order to improve health services utilisation and better health outcomes.

2.4. METHODOLOGY

This thesis was conducted through literature review. Information used on this thesis includes experience from Tanzania, Sub-Saharan Africa and relevant global information on non-communicable diseases and hypertension.

Literature search was conducted by use of Pub med, Medline, Scopus Science Direct through Google Scholar and hand searching of peer review journals and grey literature were used to identify and locate study materials. Websites including WHO, World Bank, and local Tanzania such as Ministry of Health and Social Welfare (MoHSW), National Bureau of Statistics (Tanzania Demographic Health Survey) were accessed to provide more information on the country. Free university and Royal Tropical Institute (KIT) libraries were also used for additional information regarding this thesis.

The following keywords were used to search for appropriate study materials: Non-communicable diseases (NCDs), hypertension, Tanzania, SSA, Africa, factors, determinants, effective, policy, health care services, health care providers, promotion, prevention, treatment, cost effective, interventions and primary care level.

Inclusion criteria for abstract selection were publication in English language between 2000 and 2014. Abstracts were reviewed to identify relevant studies by subsequent review of the full-text article. Literature is taken from the year 2000 as NCDs became significant contributors for burden of disease in Tanzania due to increase in risk factors.

2.5. CONCEPTUAL FRAMEWORK

A literature review was conducted to identify a conceptual framework that would fit the context of this thesis. No conceptual framework was perfect for this thesis hence modification and adaptation was done for the selected framework.

Conceptual frameworks reviewed included "Hypertension clinical action model'', ''Donabedian (1980)'' and ''Andersen's Behavioural Model''.

"Hypertension clinical action model" this framework explained on the organization factors at the clinician level and the interaction between clinician and the client. The framework explained on what the clinician has to do when delivering appropriate services but it did not include other main health system factors such as policy and guidelines, availability of resource, health care providers' knowledge, financial incentives and allocation of resources, utilisation and health outcome. Lack of these factors which influence health promotion, prevention and treatment of hypertension, it was not possible applying this framework in context of this thesis (Kerr et al., 2008).

''Donabedian (1980) framework which focuses on processes to improve quality of care''. The framework is divided into structure, process of care

and health outcome with emphasis on quality of care provided. The focus of this model was on health system and the main outcome being quality of care. The framework lacks client related factors, which is an important component that will be discussed on this thesis. Therefore, it was not possible to adapt this framework in order to fit context of this thesis (CDC, 2009).

‘‘Andersen's Behavioral model (1990)’’, this framework will be used on this thesis to provide guidance in analysis of the findings. The framework has been used several times evaluating utilisation of health services. The reason why this framework was selected over others is the fact this framework gives an opportunity to look at both client and health system factors which is the focus of this thesis. This framework has been modified and adapted and will be used to provide guidance of this work on ‘‘Hypertension and factors influencing health promotion, prevention and treatment regarding hypertension at primary care level’’. Main factors of this framework include environment, population characteristics, behavior and outcomes. Further explanation on both client and health system factors will be based on the revised version of this framework.

External environment and outcomes will not be the focus of this thesis, as they have been highlighted in chapter one and two. Arrows in this framework reflect the interaction between factors and how they influence outcomes.

Explanation of Andersen’s conceptual framework on hypertension and factors influencing health promotion, prevention and treatment at primary care level

For the current thesis, Andersen's behavioral model (1990) was adapted to provide guidance in analysing hypertension and factors influencing health promotion, prevention and treatment at primary care level in Tanzania.

The original framework is divided into the following categories: - environment, population characteristics, behavior and outcomes. Client and health related system factors and outcomes are linked by arrows to show the interconnection between these factors. Colours on health system and client related factors are brighter than the outcomes to show emphasis on this thesis.

Both health care system and client related factors play important role in improving utilisation and better health outcomes for hypertension in

Tanzania. For the purpose of this both client and health system factors were evaluated.

The environmental category includes the health care system and external environmental factors. Modification of this framework was done under the health care system factors, more factors were added in order to fit context of this thesis and hence adaptation of this framework.

Health care system looks at policy, guidelines, health system organisation, human resource for health availability, knowledge, payment and motivation, availability of health services such as health promotion, prevention, treatment, referral case management, rehabilitation. Health system organisation factors include organisation of health services, quality of health services, health management information system (HMIS) and resource allocation. Exploration of these factors was done to explain and fit the context of this thesis.

External environmental factors (physical, political and economical) were introduced in the introductory chapter of this thesis (1.1 and 1.2) and are hence not further considered in the findings section.

Client related factors are divided into predisposing, enabling and need factors.

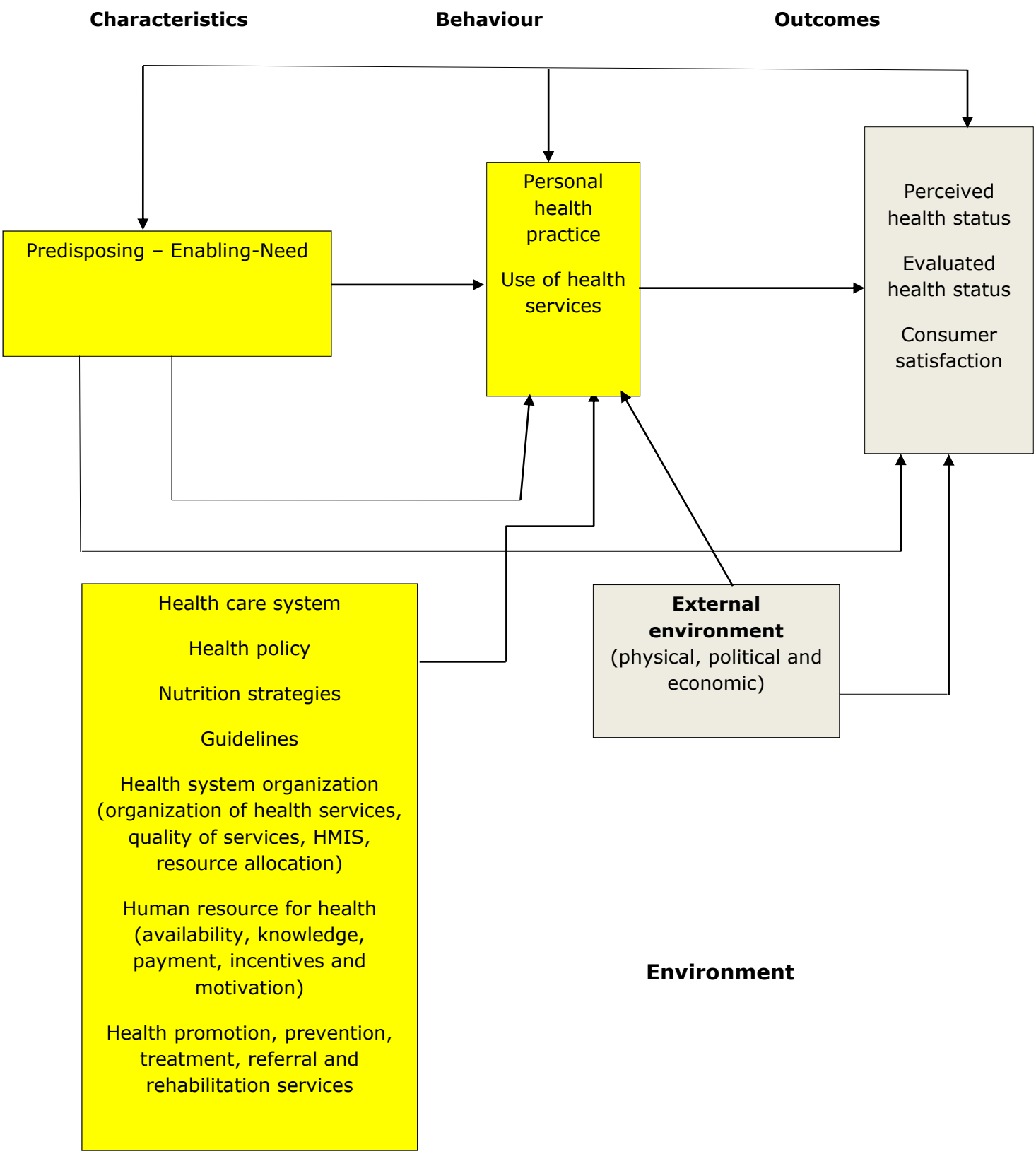
Predisposing factors: these are factors which relate to the socio-cultural characteristics of the community and they include demographic characteristics such as age, sex, social structure factors such as education, occupation, religion, residential and beliefs factors such attitude and knowledge about the disease.

Enabling factors, these explain how individual get the care needed and they include family factors such as income, insurance, access and community factors such as urban–rural characteristics, ratios of health personnel and facilities to population, price of health services.

Need factors these are factors, which make people to use the health services they include perceived need explain how people view their general health and evaluated need includes professional judgment about people health status and the need of medical care.

Outcomes are not the focus of this thesis so they are not included in the findings section as the summary of these factors have been included as part of problem statement and justification (Andersen, 1995).

Figure 2: Adapted Conceptual Framework (Andersen's 1990)



2.6. STUDY LIMITATIONS

A major limitation of this thesis is lack of specific information for promotion, prevention and treatment of hypertension from the Tanzania MoHSW. This has contributed to a large part of the study findings to be generalized from either general health problems or non-communicable diseases.

The researcher was unable to access current versions of the policy, strategies and guidelines from the MoHSW website or any other local Tanzania websites as they were not available online.

Accessing some of the original articles and current versions of the drafted policy, strategies and guidelines from the MoHSW website was challenging, as they were not freely accessible online and could be retrieved in part through contact with authorities and authors.

CHAPTER 3: CLIENT RELATED FACTORS FINDINGS INFLUENCING UTILISATION OF HEALTH SERVICES AND HEALTH OUTCOMES IN HYPERTENSION

This chapter explains findings on client related factors as guided by the Andersen's framework. These factors include predisposing, enabling and need factors. Experiences from SSA have been cited to show emphasis on this chapter. These factors will be explored on their influence on utilization of health services and health outcome for hypertension in Tanzania.

3.1. PREDISPOSING FACTORS

As introduced earlier in the problem statement, studies have shown the prevalence of hypertension to be higher in men (31.6%) compared to women (29.4%) (WHO, 2014b). Similar findings were observed in a study conducted in Sudan where prevalence of hypertension was higher in men (61%) compared females (15%) with low level of awareness. The low level of awareness of both hypertension and risk factors contributes to the increase of uncontrolled hypertension due to poor adherence to medication (Babiker et al., 2013).

A three year prospective study conducted in Tanzania observed that the most common age of hospital admission and deaths due to hypertension ranges from (43 to 69) and (48 to 72) years respectively. Furthermore, (56) and (61) years are the median ages for hospital admission and deaths respectively. Most of the hypertensive deaths occur before the retirement age (Peck et al., 2013).

According to Joho (2010) observed that, level of education was observed to be related to compliance with hypertension treatment. Although the findings were not statistically significant, participants with low educational attainment that is primary level education (59.5%) showed better treatment compliance than participants with a higher level of educational attainment (37.5%). A possible reason could be that those with low level of education trusted physicians more than those with high level of education. Married people who are living with hypertension (61%) complied with treatment due to spousal support as compared to participants without partners (46.4%). Similar findings were also observed among individuals who were employed showed compliance to treatment than unemployed individuals due to financial support.

Residence in urban areas and higher socio-economic status were associated with higher prevalence of cardiovascular risk factors such as obesity, low physical activity and unhealthy diet with high content of fat

for both men and women, respectively. This so called nutrition transition, a trend towards unhealthy diet that contains high-refined fat is considered to contributes to the high burden of NCDs (Njelekela et al., 2003; Njelekela et al., 2011). Similar findings emerged from a systematic review from Ghana (Addo et al., 2012).

A study conducted in urban and rural setting of Tanzania observed that majority of the participants from urban area (Muslims) believed stroke to occur due to which crafts or demons compared to rural area participants who were Christians and seek hospital care. This belief among urban participants led them to seek traditional healers as the first their first contact while rural participants seek the formal care first. However, in both settings people living with hypertension went to seek other alternative forms of treatment when they were not being cured or being told there was nothing wrong with them by the doctors (Mshana et al., 2008).

Furthermore, a study done by Kretchy observed that patients had high spiritual beliefs and this had negative influence on treatment, as people expected divine healing and did not adhere to their medications (Kretchy et al., 2013). Another study conducted in Nigeria by (Osamor & Owumi, 2011) observed that participants believed hypertension to be cured by both formal and traditional health care and once a patient ‘‘feels well’’ could stop using medications.

3.2. ENABLING FACTORS

A survey conducted in four urban and rural communities in Sub-Saharan Africa countries observed that individual health insurance coverage of any type was low in Nigeria (0.8%), Tanzania (1.9%) compared to Kenya where (14.8%) of households at least one household member was insured and Namibia (26%). The number of people with hypertension on treatment was low in both four countries which ranged from (7%) to (17.5%). These findings are in line with other studies conducted previously in low and middle-income countries. Reasons cited include poor access to health services especially affordability of drugs and transportation costs (Hendricks et al., 2012). Another study done by Bovet observed 15% of the people screened with hypertension did not seek health services in twelve months interval due to cost of health care and treatment (Bovet et al., 2008). Low coverage of individual health insurance in Tanzania may be attributed to the fact that nearly (28.2%) of Tanzania population live under national poverty line resulting in high out of pocket expenditure for health care (NBS, 2012; WB, 2014).

In addition, a study done by Ohene Buabeng in Ghana observed that drugs for hypertension were not affordable and this was one of the major reasons to poor drug compliance among people living with hypertension (Ohene Buabeng et al., 2004).

3.3. NEED FACTORS

(Bovet et al., 2008) assessed health care attendance for treatment of hypertension in Tanzanians participating in screening programme and observed that Tanzania observing people living with hypertension 12 months after screening observed, out of 161 participants (71.4%) did not report to have attended any health services after being screened. About (40%) of participants reported that they did not seek health care because they did not have symptoms related to raised high blood pressure. Another survey conducted in Nigeria observed out of 440 participants (11%) didn't comply with treatment and reason was they felt better and there was no need for them to take more medications (Osamir & Owumi, 2011).

In summary, age, sex, urban areas, level of awareness , level of education, lack of symptoms for high blood pressure, cost of health care and residential areas, religious and traditional beliefs, socio-economic status factors showed and influence on utilisation of health services and health outcomes on promotion, prevention and treatment of hypertension.

CHAPTER 4: HEALTH SYSTEM FACTORS FINDINGS INFLUENCING HEALTH PROMOTION, PREVENTION AND TREATMENT OF HYPERTENSION AT PRIMARY CARE LEVEL

This chapter presents findings which are based on health system factors and their influence on promotion, prevention and treatment of hypertension at primary care level. Findings will be based on the variables found on the adapted Andersen's conceptual framework (figure 2).

4.1 RECOMMENDATIONS BY WHO ON HOW PUBLIC STAKEHOLDERS CAN TACKLE HYPERTENSION

The following section elaborates WHO recommendations, which need to be considered by public health stakeholders in addressing the burden of hypertension at country level. Interventions addressed at country level should be affordable, sustainable and effective (WHO, 2013a).

WHO recommendations

Government and policy makers should address hypertension, as it is a major cause of disease burden.

Integration of all cardiovascular risk diseases should be done at the primary care level, including proper assessment and diagnostic test for hypertension related conditions. Availability of affordable drugs and early treatment to prevent further hypertension complications and cost of health care services should be ensured. Essential medicines or first line drugs for hypertension should be available at the primary care especially for people with medium to high risk.

There should be a costing tool for estimating cost of implementing integrated primary care programme to ensure coverage of the population and availability of essential medicines and basic diagnostic facilities.

Population-based approach that will require policies in addressing the risk behaviours such as unhealthy diet, physical inactivity; lifestyle modification, excessive use of alcohol and tobacco are required. Public awareness programs and increase tax in alcohol and tobacco should be done in order to reduce the burden of hypertension.

Facilitate and create environment in work place that will enable people to have healthy behaviours by reduction of unhealthy diet, physical inactivity, tobacco free areas and harmful drink of alcohol.

A country should establish national NCDs surveillance system, which is which will be collecting data and provide information on the country

concerning burden of hypertension. Data collected should be reliable to support policy and programme formulation (WHO, 2013a).

4.2. HEALTH POLICY, POLICY AND STRATEGY ON RISK FACTORS AND STANDARD GUIDELINE

National Health Policy

The national health policy provides direction towards development by ensuring sustainability of people's health, reducing morbidity, mortality. Healthy people are essential resource for economic development. Policy vision ensures responsiveness of the health system for wellbeing of its people. The role of MoHSW is to ensure at all three levels central, regional and district levels equitable, affordable and quality preventive, promotion, curative and rehabilitative health services are accessible. Policy highlighted the need to integrate cost effective interventions addressing NCDs such as hypertension due to increased burden of disease. Continued research should focus to improve management and control NCDs (URT, 2003b).

According to the reviewed version of national health policy in 2007, Strategies have been taken to ensure reduction of NCDs burden which includes hypertension; strengthening the health facilities, providing further education to health care providers on how to combat NCDs and providing health education to the community on prevention strategies of these diseases. Policy has the aim of ensure health promotion to the community on the behavioral risk factors for these diseases. However, despite of all efforts the outcome has been promising very little due to lack of appropriate infrastructure and high financial cost in providing these services (URT, 2007).

Health sector strategic paper (HSSP)

Due to increase burden of NCDs, national strategies and work plan have been developed and they are under implementation. Situational analysis was done and lists of strategies that were intended to be accomplished in order to address NCDs were outlined. These strategies include improvement of the surveillance system for NCDs, reduction of NCDs burden through health promotion, prevention and treatment of disease by engaging community. It also includes integration of health services,

improving case management at the facility level and improving home based care (URT, 2009).

Policy on NCDs

Tanzania government has shown political commitment in addressing burden of NDCs. A unit has been established responsible for formulation of different NCDs policies at the MoHSW. A national reporting system is already in place that include NCDs cause specific for morbidity and mortality but is not yet equipped to obtain data at different risk factors. To date there are no NCDs or hypertension policies due to lack of evidence based data to inform and formulate integrated and multi-sectorial policy. Lack of policy has led to poor implementation of strategies outlined under national health policy and strategic paper above hence the intended results to improve health outcomes and reducing burden of hypertension have not been achieved (Metta et al., 2014; Mfinanga et al., 2012; URT, 2009; URT, 2012).

In addition, a study conducted in Ghana by Bosu (2012) reviewing policies in NCDs related policies observed that NCDs contribute significant disease burden in the country. NCDs policies such as public health education on healthy lifestyle and improving surveillance system interventions have been initiated without effective implementation due to lack of political will, low community awareness, lack of efficiency in programme management and under-funding all have contributed to poor implementation of interventions.

Similar findings were observed in a recent study done by Omoleke in Gambia. Between the year 2008 and 2011 NCDs have contributed significant number of morbidity (19.8%) and mortality (23.4%) with male being at higher risk of dying from NCDs than women and females being at higher risk of being hospitalised due to NCDs than men. About a decade ago estimates showed national prevalence of hypertension to be (24.2%). Despite these findings there are no policies or programs addressing this huge burden of the NCDs in Gambia; due to little or the lack of reliable evidence based data for policy formulation (Omoleke, 2013).

Policy and Strategy on risk factors

Tanzania Nutrition strategy aims at attaining quality nutritional status for all Tanzanians through cost-effective interventions. Currently the strategy focuses more on under-nutrition than over-nutrition. According to the Tanzania Food Nutrition Centre (TFNC) report shows:- insufficient data on the magnitude of non-communicable diseases such as hypertension has

been an obstacle in addressing the problem and so far diabetes is the only NCD that has been addressed publicly with development of national guidelines on healthy diet and lifestyle modification. Furthermore there are insufficient funds due to the fact NCDs is not among the top priorities of the problems funded by the traditional donors and this has been one of the reason hindering the activity of on addressing NCDs at population level (TFNC, 2006).

Despite alarming findings of physical inactivity and unhealthy diet at population level, there is no policy available addressing importance of physical activities except physical education at schools (Mbalilaki et al., 2007; Metta et al., 2014).

Excessive intake of alcohol is a risk factor for hypertension that leads to stroke and rise of cardiovascular diseases. Tanzania policy for reduction in alcohol consumption is in place and it includes:- increasing tax on beer, wine, spirits, and 18 years being the national minimum legal age for alcohol serving or selling and restrictions on time of the days for the sales to be done. Currently, there is reduction in consumption of alcohol pattern as compared to 1980s years. Legally binding regulations on advertising alcohol have been taken under consideration too. All these initiatives are in place addressing burden of NCDs in the country (Parry et al., 2011; URT, 2012; WHO, 2010b).

Tobacco is another risk factor for hypertension that Tanzania has been monitored. Prevention policy on tobacco at population level includes the following; cost of health services is covered in health insurance and national health services but not at the community level. There are available bans enforced on tobacco advertising, promotion and sponsorship and there is increase in tobacco taxation. There are available health support services to stop smoking in some of health clinics and primary facilities. However, there is no legislation of smoke-free in public places and (WHO, 2013c).

Nutrition strategy is among the cost-effective interventions, which can be addressed at population level. Despite of alarming trend of poor nutrition and risk behaviors for hypertension there are no available nutritional policies to address at population level. Lack of policies on nutrition intervention which includes eating a healthy diet, life style modification, salt reduction and increase in the level of physical activity, leads to poor preventive health services for hypertension hence it affects efforts in reducing hypertension burden with poor health outcome (Srinath Reddy & Katan 2004; TFNC, 2006)

Standard Guideline

Standard treatment guidelines for hypertension on how to diagnose, looking at co-existing conditions, life style modification and prescribing drugs, criteria from referring patients to higher level of health care provision and goals of managing patients are available at MoHSW (URT, 2013a). However, a study conducted on preparedness of Tanzania health primary care facilities for hypertension observed main challenges being in public low health. These include poor distribution of copies of clinical guidelines and lack of training were observed as the main barriers in providing quality and appropriate health services for hypertension in Tanzania. Only three (13%) of facilities participated in a study had clinical guidelines for management of hypertension which are crucial where services are provided by non-medical doctor clinicians, nurses and assistants. In addition, another study conducted in Tanzania observed there was ineffective management of NCDs such as hypertension at primary care. Factors hindered were not only the lack of copies for hypertension guidelines at lower facilities levels but also lack of training on hypertension and how to use of guidelines. Only one health facilities among 24 facilities surveyed, reported of having any training on hypertension and use of guidelines for the past year (Metta et al., 2014; Peck et al., 2014; URT, 2013a).

Similar findings were observed by studies done in South Africa there was poor systematic implementation of guidelines at primary health cares. Poor implementation was associated with barriers identified as time constraints with increased number of patients and shortage of staff, lack of education about the guidelines (81.8%) of health care providers being not conversant with the content of the guidelines). Therefore, it was difficult for doctors to practically use them, as they were conflicting with local practices at primary health facilities where they see patients. Moreover, the use of guidelines was optional rather than standard care of treatment. All this points the challenge of effective management for hypertension at primary care (Daniels et al., 2000; Parker et al., 2011).

In consistent with a study conducted at North-Central Nigeria, although (93.8%) of all physicians believe hypertension as global health problem but only 57.8% sent their patients for further laboratory evaluation to rule out associated conditions and only 19% had clinical guidelines for management of hypertension which have negative influence on the management of hypertension (Adamu et al., 2014).

4.3. HEALTH SYSTEM ORGANISATION

Organisation and quality of health services

As elaborated earlier in chapter one, the Tanzanian health care system is organised into three levels of health care services provision. This level of organisation of health services is important to ensure prevention and treatment of NCDs such as hypertension are provided at the primary care level so as to reduce the burden of disease and ensure better health outcomes (URT, 2009).

Studies conducted in Tanzania observed poor provision of health services at primary health care, which make people to bypass primary facilities. Poor quality of services observed at primary health care was facilitated by shortage of diagnostic tools or facilities, poor working environment and lack of essential drugs. People were observed to be willing to travel long distance to higher facilities in order get better quality services at secondary and tertiary level. This also led people to delay seeking for appropriate health care (Kahabuka et al., 2011; Leshabari et al., 2008; Manongi et al., 2006;).

Similar findings emerged from a study conducted in Ethiopia looking at quality of care for patients with chronic NCDs. Quality of care was found to be low in health centres compared to hospital level. The poor quality of services was characterised by lack of diagnostic facilities in health centres were none of the laboratory tests were done at the health centres hence most of the required laboratory follow up tests were done at the hospital level. Level of hypertension control at the health centres was only about (38.5%), lack of clinical treatment guidelines and lack of essential medicines which are routinely prescribed were other factors for poor quality of services (Yibeltal et al., 2011).

Health management information system (HMIS)

A study done by Nyamtema (2010) observed that Tanzania HMIS is ineffective and inefficiency. Poor data collection was characterised by poor documentation, underreporting and data inaccuracy from district to national level. Poor data collection was enhanced by lack of financial, human and technological resources. There was a high proportion of health care providers (65%) with insufficient knowledge on HMIS due to a huge training gap (81%) on HMIS among the low facilities health care providers. Furthermore, data collected at the facility were not used due to poor quality. Data collection system in place that is not up to date,

resulting in unreliable information at primary care level and posing a challenge to provide the data needed for health development (URT, 2008b).

Resource allocation

Allocation of resources in Tanzania is based on equity principle including population (70%), poverty count (10%), district vehicle route (10%) and under five mortality ratio (10). Currently NCDs contributes (31%) of the total mortality in Tanzania. NCDs are among top the 13 priority areas which are taken under consideration during resource allocation. However according to Comprehensive Council Health Plans (CCHP) analysis reports, only 1.03% of the total council health budget is allocated to NCDs (URT, 2011; URT, 2013b; WHO, 2014). Poor resource allocation in the health sector affects NCDs and hypertension initiatives which to address and reduce hypertension burden in Tanzania.

4.4. HUMAN RESOURCE FOR HEALTH

Human resource for health availability

As highlighted in chapter one, there is a severe shortage of qualified human resource for health at low level facilities, particularly at primary care level. Tanzania in comparison with the rest of Africa, percentage of midwives and nurses is (27%) of the health workforce as compared to (50%) and doctors being (1.7%) compared to (2.7%) with the rest of Africa. The increasing trend in non-communicable diseases and hypertension burden together with critical shortage of human resources for health pose a danger in efficient and effective health services delivery at the community (Kwegisabo et al., 2012a; Kwegisabo et al., 2012b).

Table number 1 below shows Tanzania is experiencing severe shortage of human resource for health in all three levels of health services provision.

Table 1: Tanzania human resources for health availability by level of care

Level of care	Required	Available	Deficit
Regional and District level facilities	146,767	61,141	85,626
Zonal Referral	5,345	3,095	2,250

hospitals			
Specialized Hospitals	1,562	782	780
Muhimbili National Hospital	5,664	2,253	3,411
Total	159,338	67,271	92,067

Source: URT, 2014

Health care providers (HCPs) knowledge on hypertension

Basic essential knowledge on hypertension among 335 HCPs participated in a study was 198 (59%) and it was higher among doctors 33(97%), as compared to non-medical clinicians 58 (85%), nurses 85 (57%) and assistants 22 (27%). In all the cadres mentioned, very few health care workers were comfortable in managing hypertension apart from doctors who showed high comfort levels. Less experience in managing NCDs such as hypertension was observed more in low health facility levels (Peck et al., 2014).

Similar findings were also observed in a study conducted in South African primary care, community health workers (CHWs) had little knowledge on prevention and treatment of hypertension and they also found it difficult to counsel patients because of their beliefs towards hypertension. It contributed to poor management in efforts of reducing hypertension burden (Sengwana & Puoane, 2004).

Health care providers (HCPs) payment, incentives, motivation and quality of services

Generally, there is a low motivation among health care providers in Tanzania. A study conducted in Sub-Saharan African countries on health care providers' motivation and incentives observed that, health care providers from Tanzania complained several times that the salary being too low compared to the level of responsibility or amount of work allocated for healthcare personnel. However, Burkina Faso respondents were satisfied with the amount of wages received for the work allocated. Lack of financial and non-financial incentives was clearly reported to be a major problem in Tanzania despite of the hard work health care providers perform. Main issues of concern raised were; increase of salary, increase in rural allowance, provision of house allowance, access to training and promotion, better equipment at health facilities and possibility of attending seminars (Prytherch et al., 2013)

Furthermore, poor motivation among health care providers of low cadres was also due to severe shortage of health personnel hence available health care providers are over-worked. Lack of basic diagnostic facilities which led to treat patients by experience and this was described as gambling with patients' lives, poor planning for supervision activities with more negative than positive comments, lack of feedback after supervisory activities (Manongi et al., 2006)

Low motivation, low salary and incentives and lack of basic facilities have impact on quality of health services for provided for hypertension at low facilities level.

4.5. AVAILABILITY OF HEALTH SERVICES

Health promotion

A study conducted in Tanzania on preparedness of primary care facilities observed poor outreach activities for health promotion. Only 18 health facilities had outreach activities, seven involved in disease screening and six conducted outreach activities where by only one reported in providing health promotion services for hypertension, the rest of the facilities providing such services in Human Immunodeficiency Virus (HIV) disease. Furthermore, facilities conducted outreach activities reported main challenges being insufficient funds, insufficient time and insufficient trained staff (Peck et al., 2014).

In addition, a South Africa study assessing health promotion services for NCDs at the primary health care level observed lack of effective health promotion services provided even though health promotion services are available. Barriers such as lack of resources (time) due to staff patient ratio, space and equipment, human resource related: shortage of staffs, staffs turnover and lack of adequate training for the health care workers contributed to poor health promotion services (Parker et al., 2012).

Poor outreach activities for health promotion is a barrier in addressing burden of hypertension at primary facilities.

Prevention

A study conducted in Tanzania observed that screening services for hypertension as part of prevention were provided in the community; however only one third of the patients screened were advised to seek for further health care services at the end of twelve months interval. Findings

indicate there is poor preventive community strategy for hypertension in Tanzania (Bovet et al., 2008).

Treatment

Treatment for uncontrolled hypertension is crucial. A study done in Tanzania by Peck observed: health centers had a total of 223 visits per month, 44 visits of the outpatients visits were due to chronic diseases; 36 visits were due to HIV and hypertension had three visits only. Most of the patients (33.9%) with hypertension were treated at hospital level. Poor treatment services were due to lack of guidelines, lack of basic diagnostic facilities, drug stocks out and lack of health workers with basic knowledge on hypertension, poor compliance of the patients and cost of treatment. As highlighted in justification (chapter 2.2) it is among the reason of low utilisation of health services at primary facilities (Bovet et al., 2008; Peck et al., 2014).

Similar findings emerged from a study done in Nigeria where by two-thirds of expected hypertensive patients utilised the primary–care facilities for diagnosis and follow-up. However, the study reported that there was lack of basic diagnostic facilities for further investigations and there was an observed knowledge gap among health care workers and these were among the reasons of poor treatment services (Mendis et al., 2004).

Referral case management

Hypertension is among the most common non-communicable disease with high case fatality rate in primary facilities. Despite this huge burden, a study done analysing major health problems in 45 Tanzania districts found the referral system to be defective and non-functional. Lack of essential drugs, basic diagnostic facilities and severe shortage qualified key human resources at the low levels facilities has led to poor basic services and hence increase number of unnecessary referrals. Furthermore this poor referral system is characterised by lack of transportation, communication to organize the referrals and feedback between the health service providers from low to high level facility (poor referral chain). Poor referral system has led to increase in incidence of diseases and number of deaths in Tanzania. It also undermines users' confidence and credibility of the health sector (Magesa et al., 2001; Simba et al., 2008; URT, 2007).

The dysfunctional referral system has an implication in for hypertension services especially for clients with uncontrolled hypertension at primary

care level and, contributes to the increase in burden of hypertension related complications in the country.

Rehabilitation

Despite the goal of primary care level in delivering health care services in order to prevent and control NCDs including hypertension, rehabilitation skills for NCDs among staffs in primary care facilities were found to be very limited (URT, 2007). Poor rehabilitation services result in poor health outcomes especially to people with the uncontrolled hypertension increasing the burden of hypertension.

In summary, policy, guideline, health system organisation, human resource for health, availability of health services have showed and influence on utilization of health services and health outcomes on promotion, prevention and treatment of hypertension.

CHAPTER 5: EVIDENCE BASED INTERVENTIONS REGARDING PROMOTION, PREVENTION AND TREATMENT OF HYPERTENSION

This chapter elaborates evidence based interventions in addressing hypertension and factors influencing health promotion, prevention and treatment at primary care level. These interventions include educational intervention to people living with hypertension, role of community health workers in prevention of hypertension, dietary intervention on weight reduction, salt restriction and task shifting (nurse-led care for hypertension). Selection of the interventions is based on the recommended and cost-effective interventions by WHO guidelines and how public health stakeholders can use in addressing and reduce burden of hypertension in the country. Cost of running selected interventions is not known in figures. Implications of these interventions to Tanzania setting will be discussed further in the discussion section. In addressing these interventions, both client and supply side have to been considered.

5.1. EDUCATIONAL INTERVENTION TO PEOPLE LIVING WITH HYPERTENSION

This intervention was conducted and funded by Rhode University in South Africa. It involved about 45 participants who met the study criteria. Participants were university support staffs with low literacy levels from the following departments:- housekeeping, ground and gardens, catering and engineering. Participants were on hypertension treatment. The education intervention took place for six months and addressed nature of hypertension, drugs for hypertension, adherence and recommended diet and lifestyle modification for people living with hypertension. At the end of the study evaluation was done and observed; there was significant increase of knowledge among the participants about hypertension and increased belief in the use and importance of drugs. This is reflected by post-intervention results (77.8%) which were high compared to pre-intervention (28.9%) results. There was also significant increase in adherence level and it was measured by pill counts when participants went to take refills, also based increase in punctuality in collecting refills which increased by (80%) and self-reports (100%) (Magadza et al., 2009).

Intervention above has shown the importance of public health specialists involving community by providing appropriate health education it increases knowledge to the community on hypertension, beliefs about importance of medications and adherence to treatment.

5.2. ROLE OF COMMUNITY HEALTH WORKERS (CHWs) IN PROMOTION AND PREVENTION OF HYPERTENSION

This intervention was conducted at Khayelishta township of Cape Town with poor socio-economic and health indicators. It was organised and funded by Participatory Action Research project, public health stakeholders at Western Cape University and health department of provincial government of Western Cape. The study took place between 2001 and 2005. It involved a total of 22 CHWs from site C; training was conducted providing CHWs with necessary knowledge and skills on prevention of hypertension, promotion of healthy lifestyle especially on the importance of nutrition, physical activity and communication skills. According to authors the project was described as a success, it was able to implement the intended program and promoting healthy lifestyle to the community. About 2000 community members from site C participated in the community interventions provided by CHWs. Furthermore, after completion of the training CHWs proposed and started a Health Club with 30 members meeting weekly and providing health education on lifestyle modification. Once a month CHWs conduct screening program to the members, blood pressure measurements are taken and if necessary members are referred to primary health care facilities for further evaluation (Bradley & Puoane, 2007).

This intervention has shown how important are public health specialists to involve CHWs who are from the local community (who share the same socio-cultural and demographic background). CHWs played a major role in facilitating and engage the community members. It is important for community based initiatives to be linked with primary health care facilities (Bradley & Puoane, 2007).

5.3. DIETARY INTERVENTION ON WEIGHT REDUCTION

The dietary intervention on weight reduction is based on systematic review conducted by Cochrane, it included randomised control trial studies with duration of at least 24 weeks with the aim of reducing weight (dietary counseling, caloric restriction and reduction of fat intake). Health education was provided and close follow-up of the participants. Most of the trials were conducted in Western countries and participants were people aged (45 to 66) years .There was association between losing weight and reduction of blood pressure. Review observed outcome from the trials included average weight loss of about 4 kilograms with reduction in systolic 4.5 mmHg and diastolic 3.2 mmHg blood pressure respectively. No adverse side effects such as deaths or long term complications were reported among the participants. Dietary intervention

is the first therapeutic measure that focuses on losing weight. It is important intervention for people living with hypertension who are also overweight, it result in reduction of blood pressure which prevents further hypertension related complications (Siebenhofer et al., 2011).

The above intervention is among the WHO recommended evidence based policy and cost-effective interventions that can be addressed at population level. Increase in public awareness through media about the importance of replacing unhealthy unprocessed fat with healthy diet and to increase level of physical activity. For this intervention to be successful, it also involves change of behaviour in the community (WHO, 2013a).

5.4. INTERVENTION ON SALT RESTRICTION

This intervention was conducted in Ashanti region in Ghana and it was externally funded. The focus of the intervention was health promotion on reduction of salt intake and about 1,013 participants were involved for over 6 months. The intervention was carried out by recruited CHWs, health education was provided on salt reduction while cooking and eating. Additional advice was given on limit intake of some traditional salted food. Follow-up was conducted between 3 and 6 months. Measurements taken were blood pressure, urine (for sodium excretion measurement to measure amount of salt). There was significant relationship between reduction of salt intake and reduction in blood pressure in the intervention group systolic was reduced between baseline and at the six months of the intervention systolic blood pressure dropped from (2.17 to 2.54) mmHg and diastolic by (1.1 to 3.95) mmHg. In both control and intervention group there was no significant difference in urine sodium excreted. The intervention shows low salt intake may have small but a significant reduction of population blood pressure and a possible population based strategy in Africa setting where processed food is rare (Cappuccio et al., 2006).

In addition, another study on salt restriction intervention was conducted in Nigeria and Jamaica with 58 and 56 participants respectively. The study was externally funded and took place for about 12 weeks. The intervention involved nurses, public health stakeholders who collaborated to ensure participants received appropriate health education and nutritionists who instructed participants on type and food patterns to be taken. At the end of intervention there was successful reduction in blood pressure with average of 5 mmHg for systolic blood pressure in both groups. Western populations studies have shown that reduction of 5 mmHg can prevent (20%) chance of dying from stroke and there is a

possibility of leading to similar findings in developing populations. The study suggested efficacy of salt restriction on people living with hypertension and also in prevention of age-related increase in blood pressure especially in poor communities. In Nigeria where availability of processed food is little made it possible for participants to achieve the substantial reduction in salt intake by simply not adding salt in food as compared to Jamaican participants who were exposed to a lot of processed food. This is cost-effective intervention especially in Africa where majority of patients have no access to treatment (Forrester et al., 2004).

Salt restriction is among cost effective interventions that can be applied as population-wide strategy to reduce hypertension. The intervention has also shown if people are informed , behaviour change is possible.

5.5. TASK SHIFTING (NURSE-LED CARE FOR HYPERTENSION)

Task shifting as defined by World Medical Association is, ‘‘situation where task normally performed by physician is transferred to a health professional with different or low level of education and training’’ (WMA, 2009).

Nurse-led protocol for the care of hypertension, this intervention was successful implemented in urban and rural setting of Cameroon for the period of about 26 months. The programme was externally funded in collaboration with Essential NCDs Health Interventions Project (EHIP), Ministry of Health. Training course was provided to nurses to improve knowledge on hypertension, diagnosis and referring of clients. Measurement for blood pressure, weight and provision of health education to clients on risk factors are among services provided at the baseline visit. Nurses provided health education on risk factors and were allowed to prescribe and make treatment decisions but also physicians were available providing needed support. Close follow-up and subsequent visits measuring blood pressure were done. The intervention attracted large number of community members to seek health services and resulted in significant reduction of blood pressure, between baseline and final visits where the mean systolic blood pressure was 11 mmHg and for diastolic blood pressure was 7 mmHg. Other outcome was change in body weight which was insignificant (Kengine et al., 2009).

Furthermore, similar findings emerged from a review conducted on nurse led-care in diabetes and hypertension in SSA (Cameroon and South Africa). The outcome was promising based on successful results for control of blood pressure and turn up of the patients. This intervention fits

SSA countries, which have poor distribution and shortage of skilled human resource for health. This intervention is applied to areas with especially critical shortage of human resources for health. Task shifting has proven to be one of the effective strategies in the management of hypertension at low level facilities in SSA (Lekoubou et al., 2010).

The intervention in both settings provide information on the importance of task shifting from physicians to nurses in a setting with critical shortage of human resource for health.

CHAPTER 6: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

This chapter is divided into three sections discussion, conclusion and recommendations. Discussion will look at the factors findings and interventions and what it implies to Tanzania. Conclusion will give a summary on discussion and recommendation will be drawn based on the discussion which also reflects objectives. Recommendations will be based on the findings and evidence based interventions.

6.1. DISCUSSION

Tanzania is currently facing double burden of disease due to the tremendously increase of NCDs. Hypertension is a serious problem of public health of concern and is an important risk factor for many preventable stroke and cardiovascular diseases.

The study findings from chapters three and four showed the link between client and health related factors in influencing promotion, prevention and treatment of hypertension at primary care level.

Adapted conceptual framework from Andersen's (1990) was very useful and provided guidance on analysis of factors in chapters three and four. However, due to lack of specific information on hypertension in Tanzania some of the health system factors were taken from general health problems point of view and they will be discussed their implications in relation to hypertension. The findings based on articles which were published in English language only and it is possible there were articles in other languages such as French that would have provide useful information to this study. Most of the studies are based from Sub-Saharan Africa experiences where there is still insufficient information which has limit the information presented in findings section. Selected interventions were successful implemented and evaluated. There was no information on how much the interventions cost for their implementation. Discussion on how can Tanzania adapt and implement will provide a way forward for effective recommendations to stakeholders.

World Health Organization (2013) has outlined several basic recommendations for government and public health stakeholders on how they can tackle needs tackle hypertension at country level. Interventions addressed must be affordable, sustainable and effective. Tanzania is still struggling and has not achieved a lot of the outlined recommendations include lack of policy for hypertension, poor surveillance system and lack

of implementation of population base cost effective intervention such as promotion of healthy diet, physical activity and salt restriction.

Hypertension in Tanzania is mostly seen among adult aged 43-69 years, with mortality and morbidity being before the retirement age. Men were shown to have more uncontrolled hypertension compared to women. Low level of awareness on hypertension in the community contributes to more people being at risk of getting hypertension and its preventable complications. Urban and high social economic status were especially shown to be associated with high-risk behaviours for hypertension compared to rural areas due to differences in type of food and level of physical activities. As a consequence studies observed the majority of admitted patients arrive very late and to die before the discharge from the complication of hypertension. These findings are similar to those found in a study conducted in Cameroon (Dzudie et al., 2012).

Religious beliefs influence uptake of hypertension prevention and treatment services. Studies found clients often misinterpret the information received from health care providers, especially when a doctor does a checkup after they have complained about certain ailments and concludes nothings is wrong. Clients perceive this as a lack of attention or incompetence and may decide to avoid formal health services and use of traditional healers instead who are felt to be more empathetic.

Education level, marital status and state of being employed have shown influence in compliance to treatment. Studies have shown although there is low level of awareness on hypertension in the community but people with low level of education such as primary education show more treatment compliance compared to people with high level of education as they believe what they are being told by physicians. Having a partner showed a difference as clients felt supported by their spouses and this led to positive behaviour change and treatment compliance. Being employed and have a source of financial resource to support cost of treatment shown to influence positive uptake of hypertension treatment services.

Health policy provides direction and guidance on provision of health services with the goal of attaining health development. There has been development on integrating cost-effective interventions to address NCDs including hypertension. Health sector reforms and strategic plans have strengthened lower level facilities to ensure there is provision of appropriate health services on hypertension. However, despite of all the effort of establishing a unit for NCDs there is no evidence based information in order to design an integrated and multi-sectorial policy.

The lack of evidence based data and policy has also led to weak implementation of the strategies such as improvement of surveillance system for NCDs, improvement of case management at facility level and reduction of hypertension burden through health promotion, prevention and treatment by engaging community. Other strategies include integration of health services at primary facilities and provision of further education to health care providers on how to combat NCDs such as hypertension. Lack of policy on NCDs and specifically hypertension has contributed to the failure in reduction of hypertension burden in Tanzania.

Some components of the nutrition strategies seem to have policies such as tobacco and alcohol. There are few strategies that have put in place to ensure reduction of alcohol intake as one of preventive measure for burden of hypertension. There are promising results as alcohol intake has been reduced as compared to the 1980s years. More efforts are needed for full implementation of available aspects of policy on alcohol especially in rural areas where the production of brew is done locally. Lack of evidence based data on NCDs has led to lack of implementation of any nutritional strategy for hypertension at the population level. Reliable data on NCDs and hypertension is important for nutrition strategies to be addressed and put into practice at population level. Tobacco policy needs to address importance of smoke-free areas in public places. Population level policies on diet, salt restriction and physical activity need to be addressed in Tanzania.

Tanzania standard clinical guidelines for hypertension are available at the central level; this is a step towards provision of quality health services which will improve health outcome. However, very few primary facilities have copies of the required standard clinical guidelines for hypertension. Furthermore lack of training on the importance and how to use guidelines contributes to barrier in the use of guidelines even for those few hospital hence delivering poor services. Lack of standard guidelines at primary facilities showed to contribute to the failure of proper management for hypertension.

Primary care level facilities serve as fundamental structure of the health care system in Tanzania. Organisation of health services in Tanzania provides an opportunity of managing hypertension at lower facilities by providing health promotion, preventive and curative services. Provision of these services at lower level facilities aims at reducing the burden of hypertension at higher level facilities which provides care for uncontrolled and hypertension complicated conditions. However, there is poor quality

of care provided for NCDs at primary facilities. Shortage of basic diagnostic facilities and lack of essential drugs are the main factors that contribute to poor detection, control of blood pressure and clients to bypass the primary facilities in order to get good services at higher facilities. Poor quality of hypertension services has contributed to morbidity and mortality rate for hypertension especially in primary facilities and clients to seek health services when the condition has worsened.

Health management information system (HMIS) is in place, with the aim of providing evidence based data for proper policy formulation. However, Tanzania HMIS is ineffective especially at lower level facilities. There is poor data collection and quality of data due to lack of proper knowledge on HMIS among health care providers and have resulted to failure of having evidence based statistical data for NCDs and hypertension policies formulation and implementation of earlier mentioned strategies proposed. It contributes to poor health promotion, prevention and treatment services at low facilities level.

Generally, there is inadequate resource allocation in the health sector. NCDs receive only (1.03%) of total budget allocated on the 13 priority health areas while NCDs accounts for (31%) of total mortality in Tanzania. As highlighted in chapter one under health financing, the total health spending from the annual budget is (11%) which is below the agreed (15%) from Abuja declaration. Due to inadequate resource allocation in the health sector it has been negatively affected especially on the budget allocated for NCDs and hypertension has been low. Resulting in compromise of quality of health services provided and efforts in providing health promotion, prevention and treatment especially at the primary facilities due to lack of essential drugs and basic diagnostic facilities .

There is critical shortage of human resource for health especially in public health sector and rural areas. The shortage is partly caused by migration of human resource for health from rural to urban areas or moving out of the country and is exacerbated by low salaries, low motivation and low monetary and non-monetary incentives such as provision of house allowance, provision of rural allowance, availability of essential drugs, availability of better equipment at the facilities and access to training and promotion. Although this is general health sector problem but it also has negative influence on health care providers at low facilities and services provision for hypertension. Strategies to ensure availability and retaining

of human resource for health that will both provide services for hypertension and other health problems are needed to be addressed and implemented.

Studies observed poor health outreach activities for health promotion at primary facilities and quite a number of facilities not providing this service. Insufficient funds, shortage of staff and time and lack of basic diagnostic facilities are among the main factors exacerbating poor or lack of health promotion services at the level of primary facilities. Moreover poor preventive services are available at the community. Screening activities are done but due to knowledge gap among the health care providers at lower level facilities clients are not advised to seek health care after being screened. In addition, poor or no treatment services for hypertension are provided at the primary facilities exacerbated by lack of basic facilities and knowledge gap among the health care providers. Poor health promotion, prevention and treatment services contribute to low uptake of health services for hypertension and poor health outcomes of hypertension especially at the primary facilities. Tanzania referral health system is dysfunctional due to poor referral chain system and organisation which affect in treatment of hypertensive emergency cases. Rehabilitation services for NCDs and hypertension at lower level facilities were found to be limited which influence on treatment of people living with hypertension.

The study found five cost-effective interventions which were successful implemented in South Africa, Nigeria, Cameroon, Ghana and Jamaica.

Educational intervention to people living with hypertension, intervention was successful implemented in South Africa. The intervention showed how community can be empowered with knowledge which facilitates positive lifestyle behaviour change. This intervention can also be adapted to Tanzania context however there is need of public health specialists to involve the community providing health education and financial support from the government for the intervention to be successful implemented. Media can also be used as one source proving health education to the population.

The role of Community health workers (CHWs) in prevention of hypertension, intervention was successful implemented in South Africa. The intervention has put emphasis to empower CHWs with knowledge and involve of CHWs from the local community (with same socio-cultural and demographic background) in providing community-based interventions and linking to the primary health care. There was successful

community engagement and participation on health education and lifestyle modification. CHWs conducted screening activities and when necessary referred clients to primary health care. The intervention can be adapted in Tanzania, government will have to enroll CHWs and provide training and some incentives to motivate CHWs to go and work with the community members proving health education on hypertension, importance of healthy diet and physical activity. Challenge of sustainability of this kind of program due to financial implications in a country like Tanzania has to be taken under consideration.

Dietary intervention focuses on weight reduction and salt restriction are cost-effective interventions recommended by WHO address burden of hypertension at population level. Both of these interventions resulted into significant reduction in blood pressure and increase awareness in the community for people to live a healthy lifestyle. Although no specific Sub-Saharan country has conducted a trial on dietary intervention but according to the systematic review report, the intervention was successful implemented without adverse side effects such as deaths or long term complications due to weight loss. At the end of the salt restriction intervention in both setting (Nigeria and Jamaica) there was reduction in the blood pressure and positive behaviour of restricting salt in the food taken. If Tanzania has to adapt salt restriction intervention as one of population addressed mechanism of tackling hypertension there is need to involve stakeholders such as not only from the MoHSW but also food and drug authority, Ministry of Food and Nutrition and other stakeholders in order to regulate amount of salt added to different food products produced. Both interventions will require involvement of nurses, CHWs, nutritionists, public health stakeholders in providing health education to the community. Financial support from the government to the local districts will be of high importance for the intervention to be successful implemented. Positive behaviour change is the expected outcome which will improve the health outcome but it needs time for people adjusting and change their behaviours.

Task shifting (nurse-led care for hypertension) is among interventions recommended by WHO in a setting with poor distribution and shortage of skilled health personnel. Intervention was successful implemented in Cameroon and South Africa. Tanzania could also adapt this intervention because task shifting has been implemented in maternal and child health in rural and remote areas, the intervention has been successful implemented with increased number of institutional deliveries in combating maternal and child mortality (Nyamtema et al, 2011). Task

shifting could also be applied for NCDs such as hypertension as currently NCDs contributes (31%) of total mortality in Tanzania and prevalence of hypertension increases in both males (31.4%) and females (29.4%). Nurse-led care for hypertension in Tanzania could include taking blood pressure measurements, diagnosing and allowed to prescribe drugs. Furthermore hypertension and its related complications are preventable and number of nurses available is higher than doctors. Although exact amount of funds allocated to this program couldn't be found but it will need government commitment to support the program financially for it to be sustained in Tanzania as it will need more nurses to be recruited and provided with intensive training on hypertension, close supportive supervision and follow-up. Challenge that needs to be addressed is making sure provision of standard and quality health care is not compromised (URT, 2013c).

6.2. CONCLUSION

Prevalence of hypertension has found to increase in Tanzania. Sex has shown difference in terms of hypertension prevalence were men were shown to have more uncontrolled hypertension than women. Low level of awareness on hypertension in the community contributes poor uptake of health services and health outcomes. Residing in urban areas and belong to high socio-economic status have shown to be associated with high-risk behaviours for hypertension than rural areas.

Religious beliefs have influence on uptake of health services and health outcomes. Clients often misinterpret what they are told by doctors and may lead to avoidance of seeking formal health services.

Education level has influence on uptake of treatment for hypertension, although there is low level of awareness but clients with low level of education found to trust physicians and hence adhere to treatment than with high level of education. Having a partner showed a difference, partner support has a positive influence in uptake of health service and treatment to hypertension is adhered. Being employed show a difference due to availability of financial resource influenced uptake of health services.

Lack of policy for NCDs and hypertension has shown to play significant part in failure of implementing strategies outlined in addressing hypertension.

Partial or lack of proper implementation of nutrition polices and strategies addressing the most common risk factors such as physical inactivity, excess intake of alcohol, tobacco use, salt and unhealthy diet contributes to increase in burden and poor health outcomes of hypertension.

Standard guidelines serve as an important tool in prevention and treatment of hypertension. There is a need to circulate standard guidelines to lower level facilities, and provision of training to health care providers on how to use the clinical guidelines in order to improve the standard of health services provided.

Primary care level facilities serve as fundamental structure of the health care system in Tanzania. Organization of health services in Tanzania provides an opportunity of intervening hypertension at lower facilities by providing health promotion, preventive and curative services. Poor quality of health services was found to be high at primary facilities which were exacerbated by shortage of qualified human resource for health and lack of essential drugs and basic diagnostic facilities resulting to clients bypassing primary facilities have low uptake and poor health outcomes of

hypertension.

Ineffective HMIS in Tanzania especially at the primary facilities which is caused by poor data collected and data quality have hinder provision of evidence in order to formulate and policy and implement strategies addressing NCDs and hypertension. Provision of training to health care providers is required in order to improve data collection and quality.

Total health spending in health from the annual budget is still low (11%) compared to the agreed (15%) from Abuja declaration. It has resulted in poor resource allocation for NCDs and hypertension and hinders efforts in providing promotion, prevention and treatment services at primary care level.

Few primary facilities provide effective health promotion, preventive, treatment, referral and rehabilitation services. Insufficient funds and lack of basic facilities such as drugs and diagnostic tools have been main factors exacerbating poor quality of service provided. As a result there is low uptake of primary health services and late community seeking health services late hence poor health outcomes.

There is a critical shortage of qualified human resource for health especially at the primary facilities. This critical shortage has result into low utilisation of health services and poor health outcomes for hypertension. Health care providers play important role in health promotion, preventive and treatment of hypertension.

Educational intervention to people living with hypertension is important in order to improve their knowledge on hypertension, exacerbates positive healthy lifestyle and adherence to treatment. Financial support and community involvement is required for the intervention to be successful implemented in Tanzania.

Community Health Workers (CHWs) play important role in engaging community and providing health education on hypertension and lifestyle modification. CHWs empowered with knowledge on hypertension and preventive measures and have positive influence to the community because of same socio-cultural and demographic background. It is important for public health stakeholders and CHWs to work close and link with primary care facilities for this intervention to be successful in Tanzania.

Dietary intervention focuses on weight reduction and promote healthy lifestyle is one of the recommended interventions by WHO that can be addressed at population level. For this intervention to be successful implemented the following have be taken under consideration, Tanzania government commitment for financial support, recruitment of CHWs at

the district level and involvement of community.

Salt restriction in food taken is among cost-effective intervention addressed at population level. For this intervention to be of success in Tanzania, MoHSW and other key stakeholders need to work together addressing salt restriction in food. Involving CHWs to provide health education to the community is crucial for success of this intervention in Tanzania.

Task shifting (nurse-led care for hypertension) is an effective intervention for setting with poor distribution and shortage of skilled health personnel like Tanzania. Adapting this intervention is possible Tanzania, currently there is task shifting in maternal and child health and has found to be successful. Nurses may provide health education, measure blood pressure, diagnose and prescribe medications. Intensive training on hypertension, supportive supervision, financial support and follow-up will be required for this intervention to be of success in Tanzania.

6.3. RECOMMENDATIONS

Addressing client and health related factors influencing health promotion, prevention and treatment at primary level has the goal to improve utilisation of health services and health outcomes for hypertension. The following recommendations aim at improving provision of health services at primary facilities in order to improve utilisation and health outcomes.

Short term recommendations

- Provision of training to health care providers' especially at lower facilities on health management information system (HMIS) so as to improve data collection and quality on hypertension which will provide evidence for policy formulation. Furthermore, HMIS should be monitored and evaluated for improving quality of data collected, having an effective national HMIS will also improve data quality for hypertension

- MoHSW in collaboration with district stakeholders should ensure circulation of standard guidelines and in-service training to health care providers on how to use the guidelines at primary facilities in order to improve quality of health services provided.

- Public health specialists should collaborate with CHWs from the local areas who are able to engage the community on promotion of healthy lifestyle and link community members with primary health necessary when need arise.

- MoHSW and district stakeholders should organise health promotion activities at the community addressing population based intervention such as healthy diet focuses on weight reduction and salt reduction in food intake.

- MoHSW and district stakeholders should organize provision of health education to people living with hypertension in order to increase knowledge, promote positive behaviour change and adherence to treatment.

Long term recommendations

- Government through MoHSW, stakeholders at the district level and donors, should formulate and ensure implementation of NCDs and hypertension policies in order to have effective implementation of strategies in reducing burden of hypertension at primary facilities. The policy should clearly address strategies (such improving case

management at facility level, improving health promotion, prevention and treatment services, improving surveillance system and provision of further education to health care providers on how to prevent hypertension).

- Government should improve infrastructure at the primary facilities to ensure availability of basic diagnostic facilities and essential drugs. This will result improve health services provision for hypertension too.

- MOHWS should emphasize on implementing task shifting (nurse-led care for hypertension) because of critical shortage of health care providers where by nurses should undergo intensive training and hypertension and given a chance to see clients diagnose, provide health education and prescribe medications. Close supportive supervision and follow-up will be required at the start of the intervention.

REFERENCES

Adamu, U, Ibok, I, Abdullahi, A, Ogundele, I, Okuku, G 2014, 'Knowledge, attitude and practice of physicians in the treatment of hypertension in North-Central Nigeria', *World Journal of Cardiovascular Diseases*, vol. no 4, pp. 251-256

Addo, J, Smeeth, L, Leon, DA 2007, 'Hypertension in Sub-Saharan Africa: a systematic review', *Hypertension,* vol. 50, no. 6, pp. 1012-8.

Addo, J, Agyemang, C, Smeeth, L, de-Graft Aikins, A, Edusei AK, Ogedegbe, O 2012, 'A review of population-based studies on hypertension in Ghana', *Ghana Medical Journal*, vol. 46 (2 Suppl), pp. 4-11.

Andersen, RM 1995, 'Revisiting the behavioural model and access to medical care: does it matter?', *Journal of Health and Social Behavior*, vol. 36 (March), pp. 1-10

Babiker, FA, Elkhalifa, LA, Moukhyer, ME 2013, 'Awareness of hypertension and factors associated with uncontrolled hypertension in Sudanese adults', *Cardiovalscular J Afr,* vol. 24(6), pp. 208-12.

Belue, R, Okoror, TA, Iwelunmor, J, Taylor, KD, Degboe, AN, Agyemang, C, Ogedegbe, G 2009, 'An overview of cardiovascular risk factor burden in sub-Saharan African countries: a socio-cultural perspective', *Global Health*, vol. 5, no. 10, viewed 12 August 2014, www.ncbi.nlm.nih.gov › Journal List › Global Health › v.5; 2009

Bosu, WK 2012, 'A comprehensive review of the policy and programmatic response to chronic non-communicable disease in Ghana', *Ghana Medical Journal*, vol. 46, (2 suppl), pp. 69-78

Bradley, HA, Puoane, T 2007, 'Prevention of hypertension and diabetes in an urban setting in South Africa: participatory action research with community health workers', *Ethn Dis*, vol. 17, no. 1, pp. 49-54.

Bovet, P, Gervasoni, JP, Mkamba, M, Balampama, M, Lengeler, C, Paccaud, F, 2008, 'Low utilization of health care services following screening for hypertension in Dar es Salaam (Tanzania): a prospective population-based study', *BMC Public Health*. Vol. no. 8, pp. 407, viewed 12 August 2014, www.biomedcentral.com/1471-2458/8/407.

Cappuccio, FP, Kerry, SM, Micah, FB, Plange–Rhule, L, Eastwood, JB 2006, 'A community programme to reduce salt intake and blood pressure in Ghana [ISRCTN88789643]', *BMC Public Health, vol.* 6, no. 13, viewed 12 August 2014, www.ncbi.nlm.nih.gov/pubmed/16433927.

CDC 2009, '*Translating research into action for diabetes (TRIAD),* Viewed 4 August 2014, www.cdc.gov/diabetes/projects/pdfs/triad_fact_sheet.pdf

Daniels, A, Biemsa, R, Otten, J, Levitt, NS, Steyn, K, Martell, R, Dick, J 2000, 'Ambivalence of primary health care professionals towards the South African guidelines for hypertension and diabetes', *S Afr Med J.*, vol.90, no. 12, pp. 1206-11.

Davidson, WG 2011, *Principles of prevention: The Four Stages Theory of Prevention*, viewed 13 August 2014, www.academia.edu/.../Principles_of_Prevention_The_Four_Stages_Theo.

Dewhurst, MJ, Dewhurst, F, Gray, WK, Chaote, P, Orega, GP, Walker, RW 2013, 'The high prevalence of hypertension in rural-dwelling Tanzanian older adults and the disparity between detection, treatment and control: a rule of sixths?', *Journal of Human Hypertension,* vol. 27, no. 6, pp. 374-80.

Dzudie, A, Kengine, AP, Muna, WF, Ba, H, Mengana, A, Kouam Kouam, C, Abah, J, Monkam, Y, Biholong, C, Mintom, P, Kamdem, F, Djomou, A, Ndjebet, J, Wamboa, C, Luma, H, Ngu, KB, Kingue, S, CCS investigator group 2012, 'Prevalence, awareness, treatment and control of hypertension in a self-selected sub-Saharan African urban population: a cross-sectional study', *BMJ Open*, vol. 2(4): e001217, viewed 12 August 2014, www.ncbi.nlm.nih.gov/pubmed/22923629.

Edwards, R, Unwin, N, Mugusi, F, Whiting, D, Rashid, S, Kissima, J, Aspray, TJ, Alberti, KG, 2000, 'Hypertension prevalence and care in an urban and rural area of Tanzania', *Journal of Hypertension*, vol. 18, no. 2, pp. 145-52.

Forrester, T, Adeyamo, A, Soarres-Wynter, S, Sargent, L, Bennett, F, Wilks, R, Luke, A, Prewitt, E, Kramer, H, Cooper, RS 2005, 'A randomized trial on sodium reduction in two developing countries', *Journal of Human Hypertension*, vol. 19, no. 1, pp. 55-60.

Hendriks, ME, Wit, FW, Roos, MT, Brewster, LM, Akande, TM, De Beer, IH, Mfinanga, SG, Kahwa, AM, Gatongi, P, Van Rooy, G, Janssens, W, Lammers, J, Kramer, B, Bonfrer, I, Gaeb, E, Van der Gaag, J, Rinke de

Wit, TF, Lange, JM, Schultsz, C 2012, 'Hypertension in Sub-Saharan Africa: cross-sectional surveys in four rural and urban communities', *PLoS One*, vol. 7(3):e32638, viewed 12 August 2014, www.plosone.org/.../info%3Adoi%2F10.1371%2Fjournal.pone.0032638.

Jamison, DT, Feachem, RG, Makgoba, MW, Bos, ER, Baingana, FK, Hofman, KJ, Rogo, KO (ed.) 2006, '*Disease and mortality in Sub-Saharan Africa*, 2nd edition', chapter 21 cardiovascular disease*,* Washington (DC): World Bank.

Joho, AA 2012, 'Factors affecting treatment compliance among Hypertension patients in three districts hospitals – Dar-es-Salaam', Master's degree dissertation, Muhimbili University of Health and Allied Sciences (MUHAS), Dar-es-Salaam, viewed 14 July 2014, ir.muhas.ac.tz:8080/.../Angelina%20Joho%20Final%20dissertation.pdf.

Kahabuka, C, Kvale, G, Moland, KM, Hinderraker, SG 2011, 'Why caretakers bypass primary health care facilities for child care–a case from rural Tanzania', *BMC Health Services Research*, vol. 11:315, viewed 12 August 2014, www.biomedcentral.com/1472-6963/11/315.

Kearney, PM, Whelton, M, Reynolds, K, Muntner, P, Whelton, PK, He, J 2005, 'Global burden of hypertension: analysis of worldwide data', *Lancet*, vol. 365, no. 9455, pp. 217–23

Kengine, AP, Awah, PK, Fezeu, LL, Sobngwi, E, Mbanya, JC, 2009, 'Primary health care for hypertension by nurses in rural and urban Sub-Saharan Africa', *The Journal of Clinical Hypertension(Greenwich),* vol. 11, no. 10, pp. 564-72

Kerr, EA, Zlkmund-Fisher, BJ, Klamerus, ML, Subramanian, U, Hogan, MM, Hofer, TP 2008, 'The role of clinical uncertainty in treatment decisions for diabetic patients with uncontrolled blood pressure', *Annals of Internal Medicine*, vol. 148, no. 10, pp. 717-27

Kretchy, I, Daku-Owusu, F, Danquah, S 2013, 'Spiritual and religious beliefs: do they matter in medication adherence behaviour of hypertensive patients?', *Biopsychosoc Med*, vol. 7(15), viewed 12 August 2014, www.bpsmedicine.com/content/7/1/15.

Kwesigabo, G, Mwangu, AM, Kakoko, DC, Warriner, I, Mkony, CA, Killewo, J, Macfarlane, SB, Kaaya, EE, Freeman, P 2012a, 'Tanzania's health system and workforce crisis', *Journal of Public Health Policy*, vol. 33 (Suppl 1), pp. 35–44.

Kwegisabo, G, Mughwi, AM, Kakoko, DC, Killewo J 2012b, 'Health challenges in Tanzania: Context for educating health professionals', *Journal of Public Health Policy* vol. 33, (Suppl 1), pp. 23-34.

Lawn, JE, Rohde, J, Rifkin, S, Were, M, Paul, VK, Chopra, M 2008, 'Alma-Ata 30 years on: revolutionary, relevant and time to revitalise', Lancet vol. 372, pp: 917-27.

Lekoubou, A, Awah, P, Fezeu, L, Sobngwi, E, Kengne, AP 2010, 'Hypertension, diabetes mellitus and task shifting in their management in Sub-Saharan Africa', *International Journal of Environmental Research and Public Health*, vol. 7, no. 2, pp. 353-63.

Leshabari, MT, Muhondwa, EP, Mwangu, MA, Mbembati, NA 2008, 'Motivation of Health Care Workers in Tanzania: a case study on Muhimbili in National Hospital', *East African Journal of Public Health*, vol. 5, no. 1, pp.32-7.

Maestad, O 2006, '*Human Resources for Health in Tanzania: Challenges, Policy Options and Knowledge Gaps'*, Chr. Michelsen Institute report no. 3, Bergen, viewed 14 July 2014, www.cmi.no/publications.

Magadza, C, Radloff, SE, Srinivas, SC 2009, 'The effect of an educational intervention on patients' knowledge about hypertension, beliefs about medicines, and adherence', *Research in Social Administrative Pharmacy*, vol. 5(4), pp. 363-375.

Magesa, SM, Mboera, LEG, Mwisongo, AJ, Kisoka, WJ, Mubyazi, GM, Malebo, H, Senkoro, KP, Mcharo, J, Makundi, EA, Kisinza, WN, Mwanga, J, Mushi, AK, Hiza, P, Malecela–Lazaro, MN, Kitua, AY 2001, 'Major health problems in some selected districts of Tanzania', *Tanzania Health Research Bulletin*, vol. 3, no. 2, viewed August 2014, www.ajol.info › Journal Home › Vol 3, No 2 (2001)

Manongi, RN, Marchant, TC, Bygbjerg, IC 2006, 'Improving motivation among primary health care workers in Tanzania: a health care worker perspective', *Human Resource for Health*, vol. 4:6, viewed 12 August 2014, www.human-resources-health.com/content/4/1/6.

Marshall, IJ, Wolfe, CDA, McKevitt, C 2012, 'Lay perspective on hypertension and drug adherence: systematic review of qualitative research', *BMJ*, vol. 345:e3935, viewed 12 August 2014, www.bmj.com/content/345/bmj.e3953.

Mayige, M, Kagaruki, G, Ramaiya, K, Swai, A 2012, 'Non communicable diseases in Tanzania: a call for urgent action', *Tanzania Journal of Health Research*, vol. 13, no. 5, viewed 12 August 2014, www.ajol.info › Journal Home › Vol 13, No 5 (2011)

Mbalilaki, JA, Hellenius, ML, Masesa, Z, Hostmark, AT, Sundquist, J, Stromme, SB 2007, 'Physical activity and blood lipids in rural and urban Tanzanians', *Nutrition, Metabolism & Cardiovascular Diseases*, vol. 17, no. 5, pp. 344-8.

Mendis, S, Abegunde, D, Oladapo, O, Celletti, F, Nordet, P 2004, 'Barriers to management of cardiovascular risk in a low-resource setting using hypertension as an entry point', *Journal of Hypertension*, vol. 22, no. 1, pp. 59-64.

Metta, E, Msambichaka, B, Mwangome, M, Nyato, DJ, Dieleman, M, Haisma, H, Klatser, P, Geubbels, E 2014, 'Public policy, health system and community actions against illness as platforms for response of NCDs in Tanzania: a narrative review', *Global Health Action*, vol. 7:23439, viewed 12 August 2014, www.ncbi.nlm.nih.gov/pubmed/24848655.

Mfinanga, SGM, Kivuyo, SL, Ezekiel, L, Ngadaya, E, Mghamba, J, Ramaiya, K 2011, 'Public Health concern and initiatives on the priority action towards non-communicable diseases in Tanzania', *Tanzania Journal of Health Research*, vol. 13(5), pp. 1-16

Mlunde, L 2007, 'Knowledge, attitude and practices towards risk factors for hypertension in Kinondoni municipality, Dar es Salaam', *Dar-es-Salaam Medical Journal* vol. 14, no. 2, viewed 19 February 2014, www.ajol.info/index.php/dmsj/article/viewFile/51203/39879

Mshana, G, Hampshire, K, Panter-Brick, C, Walker, R 2008, 'Urban–rural contrasts in explanatory models and treatment-seeking behaviors for stroke in Tanzania', *Journal of Biosocial Science*, vol. 40, no. 1, pp. 35-52.

Msuya, E & Shijo, R 2004, *Harmonization of reporting requirements in Tanzania*, Dar es Salaam, viewed 17 July 2014, www.who.int/hiv/amds/tanzania.ppt.

NBS 2012a, *Tanzania Demographic Health Survey 2010*, Tanzania viewed 26 February 2014, http://www.nbs.go.tz/.

NBS 2012b, *Population and Health Census Brief Report*, Tanzania, viewed 8 August 2014, http://www.nbs.go.tz

Njelekela, M, Sato, T, Nara, Y, Miki, T, Kuga, S, Noguchi, T, Kanda, T, Yamori, M, Ntogwisangu, J, Masesa, Z, Mashalla, Y, Mtabaji, J, Yamori, Y 2003, 'Nutritional variation and cardiovascular risk factors in Tanzania – rural-urban difference', *South Africa Medical Journal,* vol. 93, no. 4, pp.295-9.

Njelekela, MA, Liu, E, Mpembeni, R, Muhihi, A, Mligiliche, N, Spiegelman, D, Finkelstein, JL, Fawzi, WW, Willett, WC, Mtabaji, J 2011, 'Socio-economic status, urbanization, and cardio metabolic risk factors among middle-aged adults in Tanzania', *East Africa Journal Public Health*, vol. 8, no. 3, pp. 216-23.

Nyamtema, AS 2010, 'Bridging the gaps in the health management information system in the context of changing the health sector', *BMC Medical Informatics and Decision Making*, vol. 10(36), viewed 12 August 2014, www.biomedcentral.com/1472-6947/10/36.

Nyamtema, AS, Senga, KP, Mbaruku, G, Rutasha, FD, Van Roosmalen, J 2011, 'Tanzania lessons in using non-physician clinicians to scale up comprehensive emergency obstetric care in remote and rural areas', *Human Resource for Health*, vol. 9, no. 28, viewed 13 August 2014, www.ncbi.nlm.nih.gov/pubmed/22071096

Ohene Buabeng, K, Matowe, L, Plange-Rhule, J 2004, 'Unaffordable drug prices: major cause of non-compliance with hypertension medication in Ghana', *J Pharm Sci*, vol. 7(3):pp. 350-2.

Omoleke, SA 2013, 'Chronic non-communicable disease as a new epidemic in Africa: Focus on The Gambia', *The Pan African Medical Journal*, vol. 14:87, viewed 12 August 2014, www.panafrican-med-journal.com/content/article/14/87/full/

Osamor, PE & Owumi, BE 2011, 'Factors associated with treatment compliance in hypertension in Southwest Nigeria', *J Health Popul Nutr,* vol. 29(6), pp. 619-28.

Pakenham-Walsh, N & Bukachi, F 2009, 'Information needs of health care workers in developing countries: a literature review with a focus on Africa', *Human Resources for Health*, vol. 7:30, viewed 12 August 2014, www.human-resources-health.com/content/7/1/30

Parker, A, Nagar, B, Thomas, G, Badri, M, Ntusi, NB 2011, 'Health practitioners' state of knowledge and challenges to effective management

of hypertension at primary level', *Cardiovasc J Afr,* vol. 22, no. 4, pp. 186-90.

Parker, WA, Steyn, NP, Levitt, NS, Lombard, CJ 2012, 'Health promotion services for patients having non-communicable diseases: feedback from patients and health care providers in Cape Town, South Africa', *BMC Public Health*, vol. 12:503, viewed 12 August 2014, www.biomedcentral.com/1471-2458/12/503.

Parry, CD, Patra, J, Rehm, J 2011, 'Alcohol consumption and non-communicable diseases: epidemiology and policy implications', *Addiction*, vol. 106, no. 10, pp. 1718-24.

Peck, RN, Green, E, Mtabaji, J, Majinge, C, Smart, LR, Downs, JA, Fitzgerald, DW 2013, 'Hypertension–related diseases as a common cause of hospital mortality in Tanzania: a 3-year prospective study', *Journal of Hypertension*, vol. 31, no. 9, pp. 1806-11

Peck, R, Mghamba, J, Vanobberghen, F, Kavishe, B, Rugarabamu, V, Smeeth, L, Hayes, R, Grosskurth, H, Kapiga, S 2014, 'Preparedness of Tanzania health facilities for outpatient primary care for hypertension and diabetes: a cross-sectional survey', *Lancet Global Health*, vol. 2(5), pp. 285-292

Prytherch, H, Kagone, M, Aninanya, GA, Williams, JE, Kakoko, DC, Leshabari, MT, Ye, M, Marx, M, Sauerborn, R 2013, 'Motivation and incentives of rural maternal and neonatal health care providers: a comparison of qualitative findings from Burkina Faso, Ghana and Tanzania', *BMC Health Services Research*, vol. 13:149, viewed 12 August 2014, www.biomedcentral.com/1472-6963/13/149.

RTI 2013, Health System and Policy Making Module, *District Health care session*, Royal Tropical Institute, Amsterdam.

Sengwana, MJ & Puoane, T 2004, 'Knowledge, beliefs and attitudes of community health workers about hypertension in Cape Peninsula, South Africa', *Curationis*, vol. 27(1): pp. 65-77.

Siebenhofer, A, Jeitler, K, Berghold, A, Waltering, A, Hemkens, LG, Semlitsch, T, Pachler, C, Strametz, R, Horvath, K 2011, 'Long-term effects of weight-reducing diets in hypertensive patients', *Cochrane Database of Systematic Reviews*, Issue (9): CD008274. doi: 10.1002/14651858.CD008274.pub2, viewed 12 August 2014, www.ncbi.nlm.nih.gov/pubmed/21901719

Simba, DO, Mbembati, NA, Museru, LM, Lema, LE 2008, 'Referral pattern of patients received at the national referral hospital: challenges in low income countries', *East Afr J Public Health*, vol. 5, no. 1, pp. 6-9.

Srinath Reddy, K & Katan, MB 2004, 'Diet, nutrition and the prevention of hypertension and cardiovascular diseases', *Public Health Nutrition*, vol. 7, (1A), pp. 167-186.

TFNC 2006, *Strategic plan 2005/2006-2009/2010*, TFNC Report no. 2006, June 2006, Dar-es-Salaam, viewed 15 July 2014, www.tfnc.or.tz/doc/Full%20strategic%20plan.pdf.

URT 2003a, *Second Health Strategic Plan (HSSP): July 2003-June 2008,* Dar es Salaam, viewed 13 August 2014, ihi.eprints.org/803/

URT 2003b, *Tanzania National Health Policy*, Ministry of Health and Social Welfare (MoHSW), Dar es Salaam, viewed 3 June 2014, apps.who.int/medicinedocs/documents/s18419en/s18419en.pdf.

URT 2007, *Tanzania National Health Policy*, Ministry of Health and Social Welfare (MoHSW), Dar es Salaam, viewed 31 July 2014, www.moh.go.tz.

URT 2008a, *Human Resource for Health Strategic Plan 2008-2013,* Ministry of Health and Social Welfare (MoHSW), Dar es Salaam, viewed 11 August 2014, www.socialserviceworkforce.org/resources/human-resource-health-strate...

URT 2008b, National Audit Office (NAO), *A performance audit report on the management of primary health care: a case of health centres*, viewed 13 April 2014, www.tanzania.go.tz/egov_uploads/documents/888_sw.pdf

URT 2009, *Health Sector Strategic Plan III: July 2009 – June 2015,* "*Partnership for delivering MDGs"*, Ministry of Health and Social Welfare, (MoHSW), Dar-es-Salaam, viewed on 15 April 2014, www.health.go.ug/docs/HSSP_III_2010.pdf.

URT 2010a, *Health spending in Tanzania, The Impact of Current Aid Structures and Aid Effectiveness, October 2010*, Dar es Salaam, viewed 17 July 2014, www.actionforglobalhealth.eu/.../PolicyBriefing2_Final1_LoRes_01.pdf

URT 2011, *Comprehensive Council Health Planning Guidelines, July 2011*, Ministry of Health and Social Welfare (MoHSW), Dar es Salaam, viewed

11 August 2014, moh.go.tz/.../20-health-sector-resource-secretariat?...comprehensive-cou

URT 2012, *In-depth training and research centres of excellence (INTREC). Tanzania country report: October 2012*, viewed 15 July 2014, www.intrec.info/Country%20reports/INTREC%20-%20Tanzania.pdf.

URT 2013a, *Standard treatment guidelines & national essential medicines list, Tanzania mainland,* Fourth Edition: July 2013*,* Ministry of Health and Social Welfare (MoHSW), Dar es Salaam, viewed 5 August 2014, www.niih.nl/.../62-tanzania-standard-treatment-guidelines-july-2013

URT 2013b, *Summary and analysis of comprehensive council health plans 2013/2014: September 2013,* Ministry of Health and Social Welfare (MoHSW), Dar-es-Salaam, viewed 15 July 2014, www.tzdpg.or.tz/.../health/.../Summary_and_Analysis_of_CCHP_2013-2..

URT, 2013c, *Analysis of policy, legal and regulatory frameworks for task shifting in Tanzania, August 2013,* viewed 22 July 2014, www.healthpolicyinitiative.com/.../1541_1_Task_Shifting__Summary_B..

URT, 2014, *Human Resource for Health Strategic Plan 2014-2019,* Ministry of Health and Social Welfare, Dar es Salaam, [Final Draft], Unpublished report.

Walker, RW, McLarty, DG, Kitange, HM, Whiting, D, Masuki, G, Mtasiwa, DM, Machibya, H, Unwin, N, Alberti, KG 2000, 'Stroke mortality in urban and rural Tanzania, Adult Morbidity and Mortality Project', *Lancet*, vol. 355(9216), pp. 1684-7

WHO 2006, *The World Health Report: working together for health*, WHO, Geneva, viewed 17 July 2014, www.who.int/whr/2006/en.

WHO 2010a, *Assessing national capacity for prevention and control of Non-communicable diseases (NCDs),* WHO, Geneva, viewed 19 February 2014, www.who.int/nmh.

WHO 2010b, *Global status report on alcohol: United Republic of Tanzania county profile,* WHO, Geneva, viewed on 23 June 2014, www.who.int/substance_abuse/publications/global_alcohol.../tza.pdf.

WHO 2010c, *Global status report on non-communicable diseases*, WHO, Geneva, viewed 20 July 2014, www.who.int/nmh/publications/ncd_report2010/en/

WHO 2011, *The Abuja declaration: ten years on*, WHO, Geneva, viewed 17 July 2014, www.who.int/healthsystems/publications/Abuja10.pdf

WHO 2012, *National Health Accounts, Tanzania profile*, WHO, Geneva, viewed 12 August 2014, www.who.int/health-accounts/en/

WHO 2013a, *Non-communicable diseases fact sheet: March 2014*, WHO, Geneva, viewed 7 August 2014, www.who.int/mediacentre/factsheets/fs355/en/

WHO 2013b, *A global brief on hypertension*, WHO, Geneva, viewed 18 February 2014, http://www.who.int/cardiovascular_diseases/publications/global_brief_hypertension/en/

WHO 2013c, *Tobacco control country profiles: United Republic of Tanzania,* WHO, Geneva, viewed on 26 July 2014, www.who.int/tobacco/surveillance/policy/country_profile/en/

WHO 2014a, *The Ottawa Charter for Health Promotion*, WHO, Geneva, viewed 12 August 2014, www.who.int/healthpromotion/conferences/previous/ottawa/en/

WHO 2014b, *Non-communicable diseases, Tanzania country profile*, WHO, Geneva, viewed 21 July 2014, www.who.int/nmh/countries/en

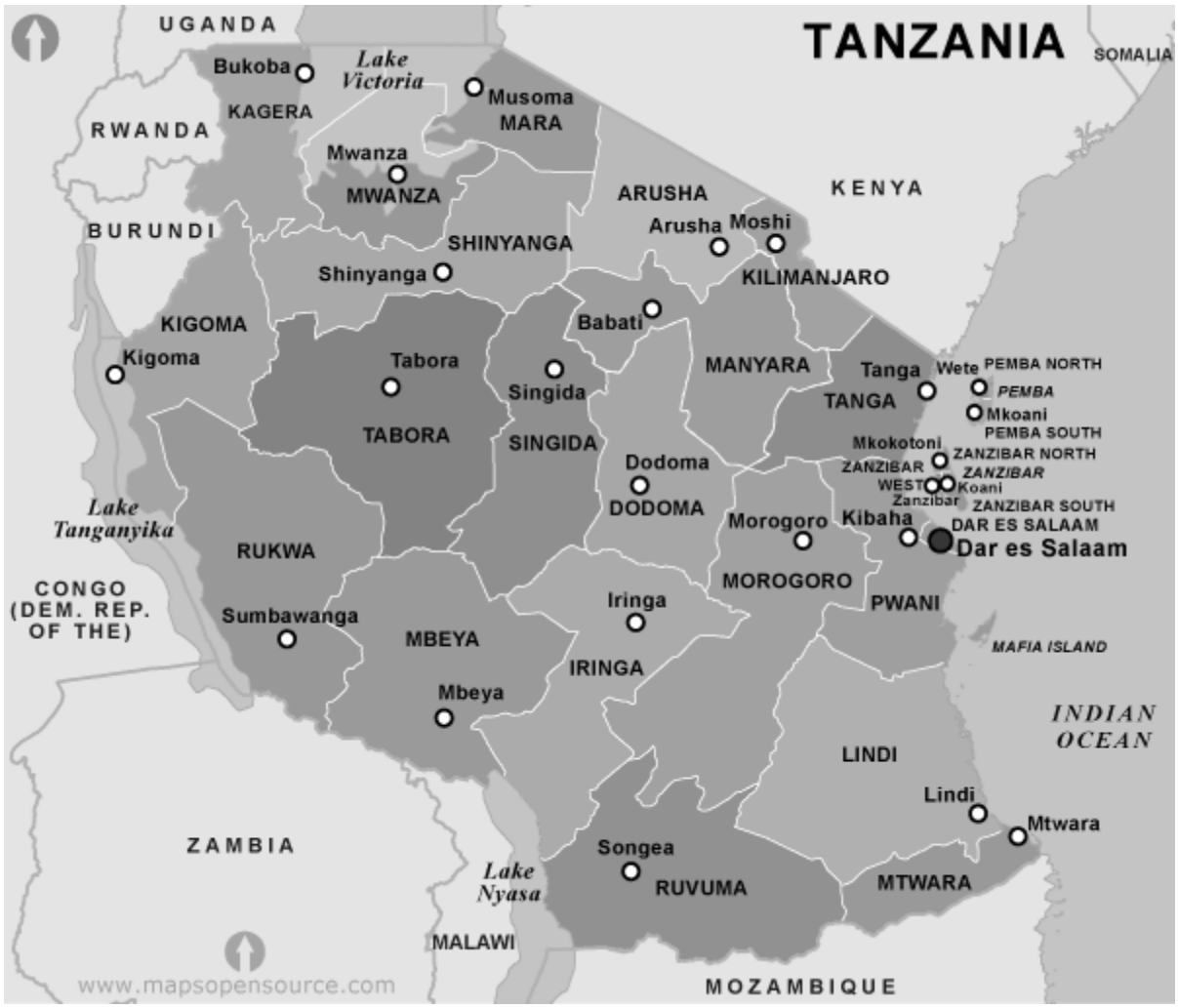
World Bank 2014, *Data Catalog, Tanzania profile*, The World Bank Group, Washington, D.C, viewed 4 August 2014, www.datacatalog.worldbank.org

WMA 2009, *Resolutions on task shifting from the medical profession*, Adopted by 60th WMA General Assembly, New Delhi, India, October 2009, viewed on 22 July 2014, www.wma.net/en/30publications/10policies/t4.

Yibeltal K, Challi J, Dereje N 2011, 'The quality of care provided to patients with Chronic Non-communicable diseases: a retrospective multi-setup study in Jimma Zone, Southwest Ethiopia', *Ethiopia J Health Sci*, vol. 21(2), pp.119-30

ANNEXES

Annex 1: Map of Tanzania



Source: Tanzania map, viewed 12 August 2014, http://www.mapsopensource.com/tanzania/ ,