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DEPARTMENT OF GEOGRAPHY AND RESOURCE DEVELOPMENT

**VULNERABILITY TO HYPERTENSION: EXAMINING THE ROLE OF LIFESTYLE
AND ENVIRONMENTAL FACTORS IN GREATER ACCRA METROPOLITAN AREA**

(GAMA)

BY

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**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN
PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MPhil
GEOGRAPHY AND RESOURCE DEVELOPEMT DEGREE**

JULY, 2018

Dedication

This work is dedicated to my Dad, Alfred Ohene Amponsah, my Mum, Rosina Amponsah and my dear Uncle, Kojo Ohene-Kyei, for their unflinching support towards my education, love and encouragement throughout my life.

Declaration

I declare that, I single handedly undertook this study and that all information in this document are as a result of my own studies under the supervision of Prof. Jacob Songsore and Prof. Martin Oteng-Ababio. All other secondary sources of information in this work are duly acknowledged. I am hereby responsible for any shortcomings.

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Acknowledgement

I would like to first express my heartfelt gratitude to God Almighty for his unmerited favour, grace and mercies throughout my education. There are also a number of people without whom this thesis may not have been written and to whom I am greatly indebted. I am most grateful to Professor Jacob Songsore and Professor Martin Oteng-Ababio who made this work possible and successful through their priceless contributions. Their constructive comments and valuable advise helped me complete this study. I am grateful to Mr. Emmanuel Abindau, Miss Juliet Buabeng, and Miss Fidelia Amihere of Legon for their assistance throughout my data collection. I am also grateful to Mr. Eric B. Boakye-Danquah, Mr. Louis Frimpong, Mr. Godwin Asiedu and Mr. Daniel Sey for their guidance and advice throughout this work.

Special thanks to the Ethical Committee of the Ghana Health Service, the staff of the Greater Accra Regional Health Directorate and the Accra Metropolitan Health Directorate (especially Dr. Turkson Coffie) for their assistance in providing me with ethical clearance, available data on hypertension as well as some valuable information. I am also very grateful to Doctors, Nurses and some health workers in various hospitals within my study area for their time and contribution towards the success of this work. I also thank Periperi-U Project for the financial support towards the successful completion of this work. Lastly, I acknowledge my family and friends especially Peter Kyei Boamah, and Isaac Bondzie for their love, encouragement and spiritual support.

Abstract

Hypertension has become an issue of public health concern in Ghana like most parts of the world presently. The condition has taken a new trend in prevalence other than what it used to be. In recent time, the available data suggest the disease has been affecting people mostly of low-income communities. Greater Accra Metropolitan Area (GAMA) is a cosmopolitan area,, which encompasses people from diverse backgrounds that makes it ideal for a study of this nature which sought to establish the geographical prevalence of the disease quite relevant.

The research employed the triangulating method making use of sequential exploratory strategy. Person-Chi square, binary logit regression model and excel were used to analyse the data. The findings from the study reveal that gender (being a woman) and old age are the most important predisposing factors to hypertension. Incidence of hypertension points in the direction of recent literature which finds higher prevalence in low-income communities. There is generally low level of detection and self-report owing largely to low knowledge of the condition and its risk factors. The results from stakeholder engagements reveal that the health sector is currently making efforts with respect to education on the condition and other chronic diseases to patients who patronize various health facilities.

The study reveals that most predisposing factors to hypertension do not exist in isolation but rather combine with one or more predisposing factors to bring about hypertension. The study concurs that lifestyle changes are necessary to reduce its vulnerabilities since it is generally a lifestyle disease. More rigorous campaigns are needed to increase awareness on best management practices and prevention even among the control/non hypertensive population.

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LIST OF ABBREVIATIONS AND ACRONYMS

AHA	American Heart Association
AMA	Accra Metropolitan Area
ARA	Airport Residential Area
BMC	BioMed Central
BP	Blood Pressure
HBP	High Blood Pressure
SBP	Systolic Blood Pressure
DBP	Diastolic Blood Pressure
mm Hg	millimeters of mercury
CKD	Chronic Kidney Disease
CODESRIA	Council for the Development of Social Science Research in Africa
CPTD	Crime Prevention through Environmental Design
CVA	Cerebrovascular Accident
CVD	Cardiovascular Disease
GAMA	Greater Accra Metropolitan Area
GDP	Gross Domestic Product

GHS	Ghana Health Service
GMJ	Ghana Medical Journal
GSS	Ghana Statistical Service
MEPI-CVD	Medical Education Partnership on Cardiovascular Disease
MMDAs	Metropolitan, Municipal and District Assemblies
MoH	Ministry of Health
PHC	Population and Housing Census
WHO	World Health Organization

CHAPTER ONE

THE STUDY BACKGROUND

1.1 Introduction

Cardiovascular disease (CVD) has emerged as the single most important cause of death worldwide in the past decade. Historically, the disease has been a chronic problem associated mostly with affluent countries, a condition that has received volumes of academic attention and research (AHA, 2004; Abdullahi and Amzat, 2011; Rahman et al., 2015). In recent times however, studies indicate that the disease has now spread to almost every part of the world with developing countries now bearing the brunt of the problem (Mpe, 2010; Olack et al., 2015). World Health Organization (WHO) estimates indicate that since 2002, about 16.7 million people die annually of cardiovascular diseases, which is 1/3 of all global deaths (AHA, 2004).

Hypertension is known to be the largest risk factor for cardiovascular diseases, growing in prevalence and accounting for a greater proportion of morbidity and mortality around the globe (Kayima et al, 2015; AHA, 2017). It is the commonest non-communicable disease in the world with important public health challenges in both developed and developing countries. Hypertension, which was formally known as “asikafo yare” in our local parlance literally meaning ‘the rich man’s sickness’, is now a major cause of death in sub-Saharan Africa, including Ghana. This may be due to globalization which is today virtually bridging the gap between the rich and poor by making available to poor countries, foods and lifestyles which were hitherto mostly found in high income countries. Lu et al., (2015) in their study “Lifestyle and risk of hypertension: follow up of a young pre-hypertensive cohort”, found out that higher BMI, frequent alcohol use and short duration of sleep contributes to a higher risk of hypertension while on the other hand BMI of 18.5-24.9kg/m²

and sleep duration of 6-8h/day were associated with lower risks to hypertension. Deliberate attempt to reduce BMI is therefore necessary to prevent hypertension among pre-hypertensives. According to Beilin et al., (1999), factors such as excess body fat, alcohol consumption, physical activity, and a variety of dietary constituents including salt, potassium, and a complex of fruits, vegetables, among others, have been found to directly influence blood pressure level.

Currently, about 80 percent of all hypertension related deaths occur in low and middle-income countries (WHO, 2012; Olack et al., 2015). The emerging issue of high prevalence among the poor has become a major concern. This is due to increased total deaths and economic burden for both individuals and government as hypertension prevalence increases (Mpe, 2010; Aikins et al., 2012).

The global prevalence of cardiovascular diseases has been increasing (Kayima et al, 2015; AHA, 2017). It is estimated that by 2030, there will be 23 million cardiovascular deaths, with 85 percent occurring in low and middle-income countries (Okwuonu et al., 2014). As at 2010, the global cost of CVD was estimated at US\$ 863 billion (averaging US\$ 125 per capita cost) and is estimated to rise by 22% in 2030 putting the figure at US\$ 1,044 billion (Bloom et al., 2011). In view of the fatality and prevalence of cardiovascular diseases, research has far advanced in the developed or high-income countries while there is limited research in developing countries like Ghana. The reason for my interest in this area of research is therefore to bring much clarity to the discourse on the role of lifestyle and environmental factors to this emerging pandemic.

In Ghana, key causes of death have shifted from principally communicable diseases over the last few decades to a blend of communicable and chronic non-communicable diseases such as hypertension, diabetes, stroke and cancers. (Agyei-Mensah and Aikins, 2010). Demographically, Ghana faces rapid unplanned urbanization, a process which has resulted in creation of several

slums in and around urban centres (Grant and Oteng-Ababio, 2016). Urban areas in Ghana such as Accra are characterized by three different economic groups; namely high-income, middle and low-income strata. High-income areas such as Airport Residential Area are characterized by high economic power associated with both high social and political influence. They have good physical development and provision of infrastructure along with good water supply that aids their sanitation. This reduces as one descends the economic ladder to middle and low-income areas with low-income areas being the worse affected. La, like many low-income areas, is characterized by high population density and overcrowding with little physical and infrastructure development. Residents have low economic power with more socio-environmental stressors such as low supply of potable water with its accompanying sanitation problems as well as poor diets (Songsore, 2009; Songsore, 2017). People living in slum areas usually live below the poverty line, adopting unhealthy lifestyles like poor diets and eating habits, smoking, intense alcohol consumption coupled with lack of access to healthcare. Nevertheless, not much research has been done on the dynamics of hypertension considering these economic differences which I seek to do. This present study aims at examining lifestyle and environmental factors that impact on the high prevalence of hypertension in Ghana and propose measures to curb it.

1.2 Statement of Problem

Recent epidemiological studies have identified hypertension as a risk factor for chronic diseases such as Chronic Kidney Disease (CKD), stroke, damage of the brain, vascular and other organs which eventually increase mortality rates by great margins both globally and in sub-Saharan Africa (Bruce et al., 2009; AHA, 2004; Reyes-Gibby and Aday, 2000). Hypertension contributes 13 percent to all deaths making it the leading risk factor worldwide (Tadevosyan, 2013). Lifestyle factors such as old age, increased body weight, excess body fat, high consumption of dietary

sodium, excessive consumption of alcohol, smoking and physical inactivity have been implicated in hypertension prevalence (Beilin et al., 1999; Sarki et al., 2015). Knowledge of causes, prevention and control of hypertension is generally low and even much lower in low-income countries according to literature (Ibrahim and Damasceno, 2012).

Hypertension, historically, has been a disease of affluence and was mostly found in the developed world hence most of the studies were done in the advanced countries with little in developing countries (Abdullahi and Amzat, 2011). However the disease is now emerging among the poor in low and middle income countries, especially the poor in urban slums (WHO, 2012; Olack et al., 2015). This issue does not fit into the old model and hence needs to be empirically tested. Earlier studies, particularly from the behavioral science literature indicate that the environments in which individuals reside and work have immense consequences on their socio-psychological and physiological wellbeing (Bruce et al., 2009; Songsore et al., 1998; Owusu-Sekyere et al., 2016).

Most studies carried out in Ghana on hypertension have centered mainly on assessing public knowledge of the disease, comparison of prevalence among rural people and urban residents (Agyei-Mensah and Aikins, 2010; Addo et al., 2012). For instance, studies show that there has been an increase in hypertension (about two fold) among rural dwellers over the last four decades (Addo et al, 2006). However, there has been limited studies on the relationship between environmental characteristics and hypertension (Addo et al., 2012), an issue the current study seeks to interrogate. This study will focus on three different communities within Greater Accra Metropolitan Area with different environmental factors and socio-economic characteristics to ascertain who is more vulnerable to hypertension. The results from this study will contribute to

existing knowledge on environmental health risks and help decision makers in policy formulation in an attempt to curb the constant rise in hypertension.

Hence this study dwells on social science and social epidemiological literature to demonstrate how exposure to social environmental stressors (poverty, poor sanitation, lack of basic social amenities) and individual lifestyle can adversely impact on physiological functioning of individuals and expose them to the risk of hypertension and its further complications. Results from field survey will also give more insight to this emerging health threat.

1.3 Literature Review

This segment gives an overview of global prevalence of hypertension and reviews some of the available literature. It particularly examines how the trend in Africa and Ghana explains the gender dynamics of the disease and examines the role of life styles and geographical factors accounting for the disease.

1.3.1 Global prevalence of hypertension

A study done by Lucini et al., (2007) on stress and hypertension points out that psychosocial factors have a profound influence on cardiovascular mortality and morbidity, predisposing the affected persons to acute myocardial infarction in which work related stress seems to play a critical role. Approximately, 1 billion or 25 percent of the world's adult population are hypertensive and this ure is expected to rise to 1.56 billion which amounts to 29 percent in 2025 (Drenjancevic-Peric et al., 2011). Diseases of the heart displaced tuberculosis as the leading cause of death in the United States in 1910 (Bukhman, 2007). Mortality from non-communicable diseases and injury are expected to rise from 33 million to 58 million annually between 1990 and 2020 with a corresponding increase in years of life lost worldwide. It is projected that by 2020, cardiovascular

diseases, injury, and mental illness will account for about 50 percent of all deaths and 50 percent of all healthy life years lost globally according to American Heart Association. Eighty percent of the burden is in low and middle income countries affecting men, women and children. CVD is responsible for over 1.5 million deaths in most European countries each year, making it the leading cause of death in this region. More than 238,000 deaths in the UK in 2002 was accounted for by CVD. A Canadian dies of heart disease and stroke every 7 minutes. “CVD costs the Canadian economy about \$18.4 billion annually” (American Heart Association, 2004).

A 2015 WHO report on global health risks also affirms the fact that CVDs are among the top 10 diseases that account for 33 percent of deaths worldwide. Hypertension is among the leading five risk factors in this category together with tobacco use, high blood glucose, physical inactivity, and overweight and obesity. These are responsible for raising the risk of chronic diseases such as heart diseases and cancers. High systolic blood pressure accounts for 51 percent of stroke and 45 percent of ischaemic heart disease deaths globally (WHO, 2015). Developing countries’ experiences of epidemiological transition with the emergence of non-communicable diseases can be attributed to increase in life expectancy at birth, unplanned accelerated urbanization together with poor health habits, and vast changes in nutrition (WHO, 2014). It is estimated that there were 36 million deaths from non-communicable diseases in the world in 2008 of which 48 percent were caused by cardiovascular disease; 80 percent of these cases occurred in developing countries (Doulougou et al., 2014; Olack et al., 2015). Since most parts of Africa fall within developing countries, it is a clear indication that prevalence of hypertension with its associated complications is very high in Africa especially in sub-Saharan Africa. Prevalence varies between 20-34 percent in adult populations and seems to be on ascendancy and is comparably high in urban areas (WHO, 2014).

1.3.2 Trend of hypertension in Africa

It is estimated that developing countries carry more than half of the world's non-communicable disease burden which tends to be diseases of lifestyle. Between 1997 and 2004 heart disease and stroke were known to be the number one killers with about 195 deaths per day in South Africa, due to some form of heart and blood vessel disease (Mpe, 2010). According to Mpe, high salt intake that is discretionary salt added to food during preparations, food industry addition of salt, excessive alcohol use, overweight and obesity are risk factors associated with hypertension. By this analysis, South Africans have a high salt intake that exceeds the WHO guidelines of $< 5\text{g}$ salt/day whereas they fail to meet the potassium intake of $\geq 90\text{mmol/day}$ (Mpe, 2010).

According to Mpe (2010), hypertension had a huge impact on mortality in 2000 alone resulting in 41.7 percent deaths of ischemic heart disease, 49.6 percent of stroke deaths, 71.5 percent of hypertensive disease deaths and 21.6 percent of deaths caused by other cardiovascular diseases in South Africa. A study done in the formal and informal settings of Ouagadougou reveals that even though hypertension is common in Ouagadougou, prevalence appears to have been stable over the past decade. With respect to differences in age, there were no significant differences in prevalence between the formal and informal settings. However, the most vulnerable people were rural urban migrants and unmarried women in these urban West African settings (Doulougou et al., 2014). In this study, old age, illiteracy, coming from an area of Burkina outside Ouagadougou, physical inactivity were found to be risk factors for hypertension in both formal and informal setting given its area specific analysis. Undernourishment and frequent consumption of alcohol are associated with hypertension in formal settings.

1.3.3 Age as a risk factor to hypertension

According to researchers, age is of essence when it comes to the discussions on hypertension (Kayima et al., 2015; El-Hay and El Mezayen, 2015). A recent study reveals that, over 50 percent of deaths caused by chronic diseases, including heart disease occur before the age of 65 years (Doulougou, et al., 2014). These premature deaths affect the workforce and greatly impact the economy of the country. Untimely mortality caused by heart and blood vessel diseases in people of working age (35 – 64) is expected to rise by 41 percent between 2000 and 2030 in Ouagadougou with its enormous negative impact on the economy (Doulougou et al., 2014). Tens of millions of people were killed by non-communicable diseases in 2008 and a large percentage of these losses occurred before age 60, during the most productive period of life. There is a continual rise in these diseases and hypertension prevalence in both sexes especially in low and middle income countries (Nelson et al., 2015).

A study that looked at prevalence of hypertension among the periurban youth population of Uganda (18 – 40) found that hypertension was significantly associated with old age group, male sex and being overweight (Kayima et al., 2015). The age range studied by this research like that of Doulougou et al., (2014) are in the active productive age group (18 – 40) which is much younger than the age group in Ouagadougou (35 – 65). Both affirm that hypertension is age related and the current trend is taking a heavy toll on the young and economically active population. Nevertheless, within these age brackets, hypertension is found to be significantly associated with older age.

1.3.4 Gender as a risk factor to hypertension

Again, there exists some significant relationship between gender and hypertension prevalence. In one study, 14.2 percent of respondents admitted to hypertension with higher prevalence in women

(17.4 percent compared to 11.3 percent for men) and highest in 70 – 79 year group, 18.4 percent (WHO, 2014). This is affirmed by a high prevalence of hypertension among unmarried women in Ouagadougou according to Douougou et al., (2014). However, this contradicts reports by Kayima et al., (2015) where males had higher prevalence than females. Differences in these study reports could be attributed to the time frames, study locations and methodologies employed since societies differ in many things across the world. Traditional African society frowns on singlehood at a certain age especially for women. An unmarried woman who is 30 years or above begins to receive all kinds of comments and scolding from family, friends and the society at large. There is constant pressure on one having to answer the question “when are you getting married?” almost every now and then. According to classic social science, an individual’s well-being is affected by social relationships and the social support he/she has (Bruce et al., 2009). Again, some unmarried women, who are also single mothers, are faced with the pressure of taking care of their child (children) alone with little or no support from the father (Calves, 1999). These are possible reasons why a higher percentage of women will have hypertension in the African environment like Ouagadougou as reported by Douougou et al., (2014).

1.3.5 The role of lifestyle in hypertension prevalence

Earlier studies have abundantly revealed that the amount of salt or sodium intake has been associated with development and maintenance of hypertension. It is strongly believed that high dietary sodium intake plays a vital role in elevated blood pressure (Houston, 2014; Drenjancevic-Peric et al., 2011). Based on this knowledge, it is easy to draw inferences on existing behaviours in the urban setting on Accra and disease burdens especially hypertension. Westernization and globalization have brought high content sodium diets to the doorsteps ranging from already made foods and easy to prepare foods to fast food joints almost in every corner of the country making

the nation susceptible to chronic diseases (diabetes, kidney diseases, hypertension, cancers, coronary heart diseases etc.) which otherwise did not exist here. Most of these high sodium diets provide variety, are cheap and easily accessible, convenient to use, quick to prepare and very attractive (Baraldi et al., 2018). This offer of new taste has strongly influenced people's lifestyle and choices of food most of which impact negatively on them in terms of disease burdens. Rahman et al, (2015) also reported on similar causes where respondents who were hypertensive mentioned high salt intake, stress, and alcohol consumption as factors responsible for hypertension.

Another important lifestyle identified by prior studies is physical activity/exercise (Sikiru and Okoye, 2014). Studies have shown that people who have sedentary work and lifestyle are more likely to have high blood pressure compared to those with very active work and lifestyle of exercise. For instance in a study, three hundred and fifty seven patients (all male) with mild to moderate systolic blood pressure (SBP) between 140 – 180 and diastolic blood pressure (DBP) between 90 – 109 mmHg were age matched and grouped randomly into continuous and control groups. The continuous group was placed on an eight-week continuous training of between 45 to 60 minutes thrice weekly whereas the control grouped remained sedentary. Findings of this study showed that SBP and DBP of continuous group reduced significantly portraying the importance of moderate intense continuous exercise in hypertension management, loosing of body fat and reduction in body size (Sikiru and Okoye, 2014).

Again, people's perception of health, severity of disease conditions, perceived benefits of a treatment option informs their decision towards which kind of anti-hypertensive treatment to go for as seen in the health belief model (Janz and Becker, 1984). Traditional healers are an integral part of the healthcare system particularly in Africa and Ghana. It is believed that most of these

traditional healers give patients the needed attention and solace which are often non-existing in the western hospitals. They also take the time to explain the causes of their patients' condition and the course of treatment to them making them a better option for a lot of people. Some people also have the belief that natural herbs used by the traditional healers are safer compared to the toxicity of the western medicine hence these traditional healers receive a relatively high patronage in Africa (Meli et al., 2009).

1.3.6 Economic impact of heart disease

Treatment and control of CVD comes with a substantial cost, an expenditure which could have been directed towards another developmental project such as industrialization to boost an economy. For instance South Africa incurred the cost of about R5.035 billion in the treatment of CVD in 1991 alone. This figure reflects 2–3 percent of their gross domestic product (GDP) or approximately 25 percent of all health-care expenditure (Mpe, 2010). Again, this work posits that South Africa is losing more people in the work force between the age of 35 and 64 years to premature deaths due to CVD which has a major impact on the economy. According to Mpe 2010, cardiovascular deaths are projected to rise by 41 percent in this age group between 2000 and 2030.

The economic impact of heart diseases as seen in the case of South Africa shows how these conditions drain the economic fortunes of the world. However, it does not mean the same trend exists in Ghana and by extension, other countries within the world. The extent of the economic impact could be higher or much lower than that of South Africa due to differences in environmental conditions, per capita incomes, and lifestyle or cultural differences that exist within different countries. Despite similarities in the lifestyle of people of different countries within the world

today due to globalization, there still exist peculiar differences which could affect CVDs among the countries and hence their economic impacts.

Also, budgetary allocations could affect healthcare spending and directly or indirectly have an influence on the economic impact of CVDs. Nevertheless, public health response by governments in African countries has been and is still low leading to low awareness of the condition by even hypertensive patients in Africa (Adeloye and Basquill, 2014).

1.3.7 Prevalence in Ghana

Ghana has not been spared of this worldwide epidemic of chronic diseases despite the continuous existence of infectious and communicable diseases such as cholera, chicken pox, and measles among others. According to Agyei-Mensah and Aikins (2010), Ghana is currently suffering from a double burden of diseases since the nation has not successfully transitioned from the age of receding pandemics but has also been burdened with the age of degenerative and man-made diseases (as seen in Omran's epidemiology transition model, 1971). There has been significant increase in the key chronic non-communicable diseases over time which has contributed immensely to Ghana's disease burden. The high cost of treating chronic conditions like hypertension, diabetes, and stroke, among others, which affects both the wealthy and the poor worsens the plight of the poor. Lack of policies on chronic diseases, weak health systems, lack of knowledge of prevention and treatment of these diseases, lack of coherence between key stakeholders (researchers, policy makers, industry, patient groups, civil society, government and development partners), to mention but a few, accounts for the growing risk of morbidity and mortality which takes a heavy toll on the nation's development (Aikins et al., 2012).

Also, earlier studies in 2004 indicate that hypertension prevalence in Ghana was 29.4 percent; men had higher prevalence (31.0%) compared to women (28.0%) as seen in (Bennin and Essuman, 2014). Again, this contradicts the global statistics as put out by WHO (2014). It was also noticed that prevalence was higher in urban setting (31.1%) compared to that of the rural setting (27.0%) and so are risk factors such as stroke and obesity. According to Bennin and Essuman, (2014), studies have shown that prevalence of hypertension has been increasing since 1972 (25.5%), to 28.3 percent in 1991-2000 and 29.1 percent in 2001-2010. The above mentioned statistics were put out by different studies over different time periods using different research methods probably accounting for the existing incoherencies. Treatment and effective response to care is still quite low (Bennin and Essuman, 2014; Cappuccio et al., 2004). These increases are consistent with Bosu (2010) in his study; “epidemic of hypertension” in Ghana which found out that new reported cases of hypertension in outpatient public health facilities in Ghana increased more than ten fold from 49,087 in 1988 to 505,180 in 2007. Hypertension ranks as the fifth most common cause of outpatient morbidity in most regions in Ghana but moved from fourth to second to malaria as leading cause of outpatient morbidity in the Greater Accra Region in 2007 (Bosu, 2010).

There exists discrepancies in the prevalence rates of hypertension put across for Ghana by the different researches consulted. This may be as a result of differences in time the various studies were conducted and the different methodological approaches used.

1.3.8 Hypertension Outcomes

A study which looked at various forms of hypertension and grouped them under resistant hypertension (RH), non-resistant hypertension (non-RH), controlled resistant hypertension (cRH), and uncontrolled resistant hypertension (uRH) came up with disease outcomes such as ischemic

heart event (IHE), congestive heart failure (CHF), cerebrovascular accident (CVA), and end stage renal disease (ESRD). Among these groups, uncontrolled resistant hypertension appears to demonstrate the greatest risk particularly for CVA and ESRD whereas these risks were reduced in controlled resistant hypertension (Sim et al., 2013; 2015).

According to Sikiru and Okoye (2014), hypertension is capable of causing damage to the kidney's infiltration ability, thus hypertension-associated renal dysfunction is manifested primarily by increases in serum creatinine level. It also postulated that the occurrence of creatinine kinase (CK) activity in the black population is twice that of the white, explaining why hypertension risk observed among the blacks is greater. This study's findings showed that hypertensive patients who were made to discontinue taking their antihypertensive medication and put on continuous exercise training experienced a significant change in their systolic blood pressure and diastolic blood pressure over the period as well as a significant reduction in creatinine production as compared to the control group.

Some hypertensive patients studied in Asia, Taiwan, Philippines and other parts of the world highlighted stroke, paralysis from stroke, and heart attack as some severe consequences of hypertension and called it names such as "*the silent killer*" "*a time bomb waiting to explode*" and "*the traitor in my body*" (Rahman et al., 2015).

However, some previous studies such as Lo et al, (1998) who examined the effects of a 12-week exercise program on blood biochemistry in thirteen patients undergoing continuous ambulatory peritoneal dialysis (CAPD) reported a contradictory finding of no significant changes in serum creatinine. Likewise, a non-significant effect of aerobic training on chronic kidney disease (CKD)

was reported by Rahnama et al, (2007) in their study where twenty male students were randomly assigned to either control or aerobic training groups.

1.4 Conceptualizing one's susceptibility to hypertension

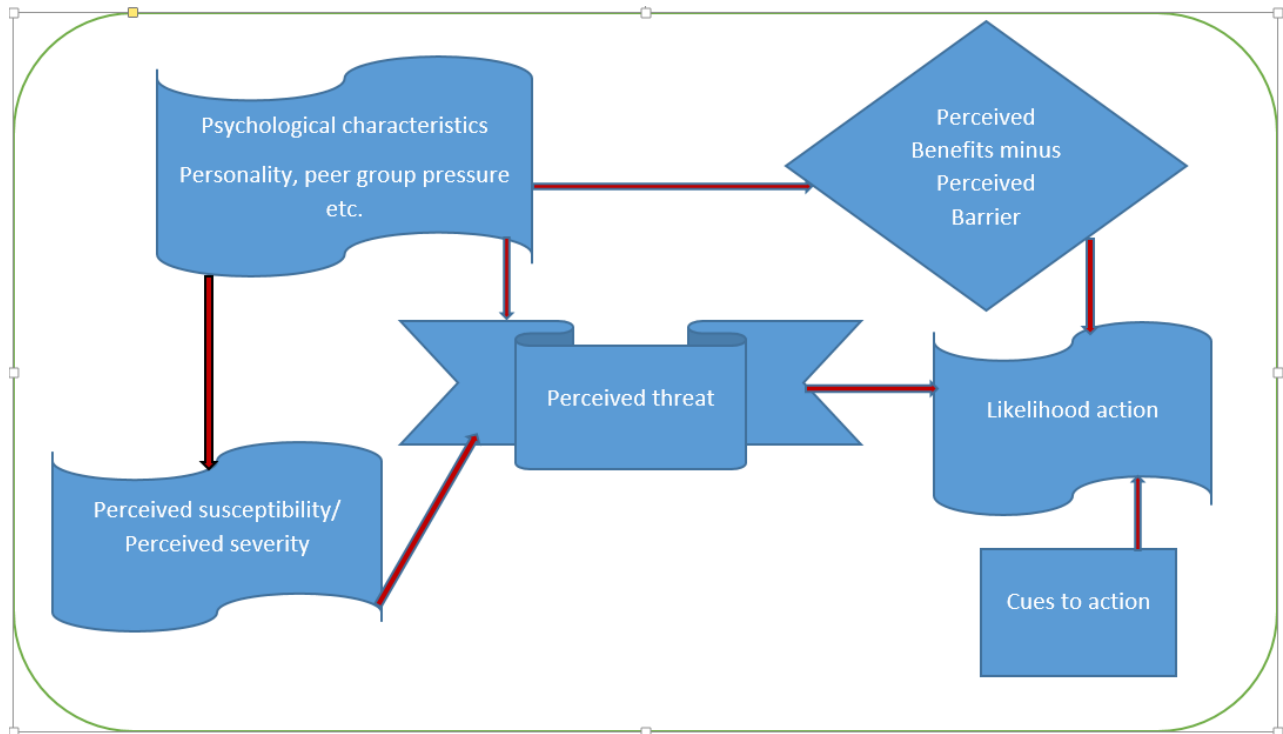
The consistent growth of lifestyle-related health problems has inspired a shift from treatment-and-prescription centric (reactive) healthcare system to a patient-centric (proactive) system that is based on prevention and promotion of healthy behaviour globally (Orji et al., 2012). It is therefore necessary to identify core issues concerning diseases (in this case hypertension) in order to adopt a patient-centric approach of healthcare locally to be able to fit well into the global healthcare system.

According to the health belief model (HBM) posited in the 1950s, fundamental to health behaviour is perceptions about an ailment and the available approaches to reduce its occurrence (Hochbaum, 1958). This theory posits that human behaviour is determined by two main variables, these are (i) the value placed by an individual on a particular goal; and (ii) the individual's estimate of the likelihood that a given action will achieve that goal. The reasons for conceptualizing these variables in health-related behaviour were: (i) the desire to avoid illness (or get well if ill); and (ii) the belief that a particular health action will prevent illness (Janz and Becker, 1984).

This theory is based on four perceptions namely; perceived susceptibility (one's subjective perception of the risk of contracting a condition), perceived severity (feelings concerning the seriousness of contracting an illness or leaving it untreated), perceived benefits (believed feasibility or efficacy of health action), and perceived barriers (weighing health actions against cost, danger, side effect and efficiency among others) which may prevent one from taking the recommended actions as seen in Figure 1.1 and Table 1.1 below.

These scenarios can be linked to vulnerability to hypertension where individual's circumstances or levels of susceptibility and severity provide the energy and force to act and the perceived benefits or barriers then provide a preferred path of action to achieve optimum health outcome. The cue for action may be born from internal factors (symptoms) or external factors (mass media communications, interpersonal interactions and reminders from health care providers as seen in Figure 1.1, (Janz and Becker, 1984).

Figure 1. 1: Key Concepts of the Health Believe Model



Source: Adapted from the health believe model (Janz and Becker, 1984)

According to Figure 1.1, information is important in addressing issues of health risk. One's knowledge of a particular disease or health risk informs his/her health behaviour. A positive health behaviour that is borne out of one's knowledge or perception of a health risk goes a long way to reduce his/her vulnerabilities while enhancing his/her capacity against this risk. For instance it is expected that given knowledge in the factors that account for hypertension or a worsening condition in already hypertensive patients, one would take the necessary precaution to prevent or properly manage it for optimum health outcome. These concepts are also seen in both Table 1.1 and Figure 1.2.

Table 1. 1: Precepts of the Health Belief Model

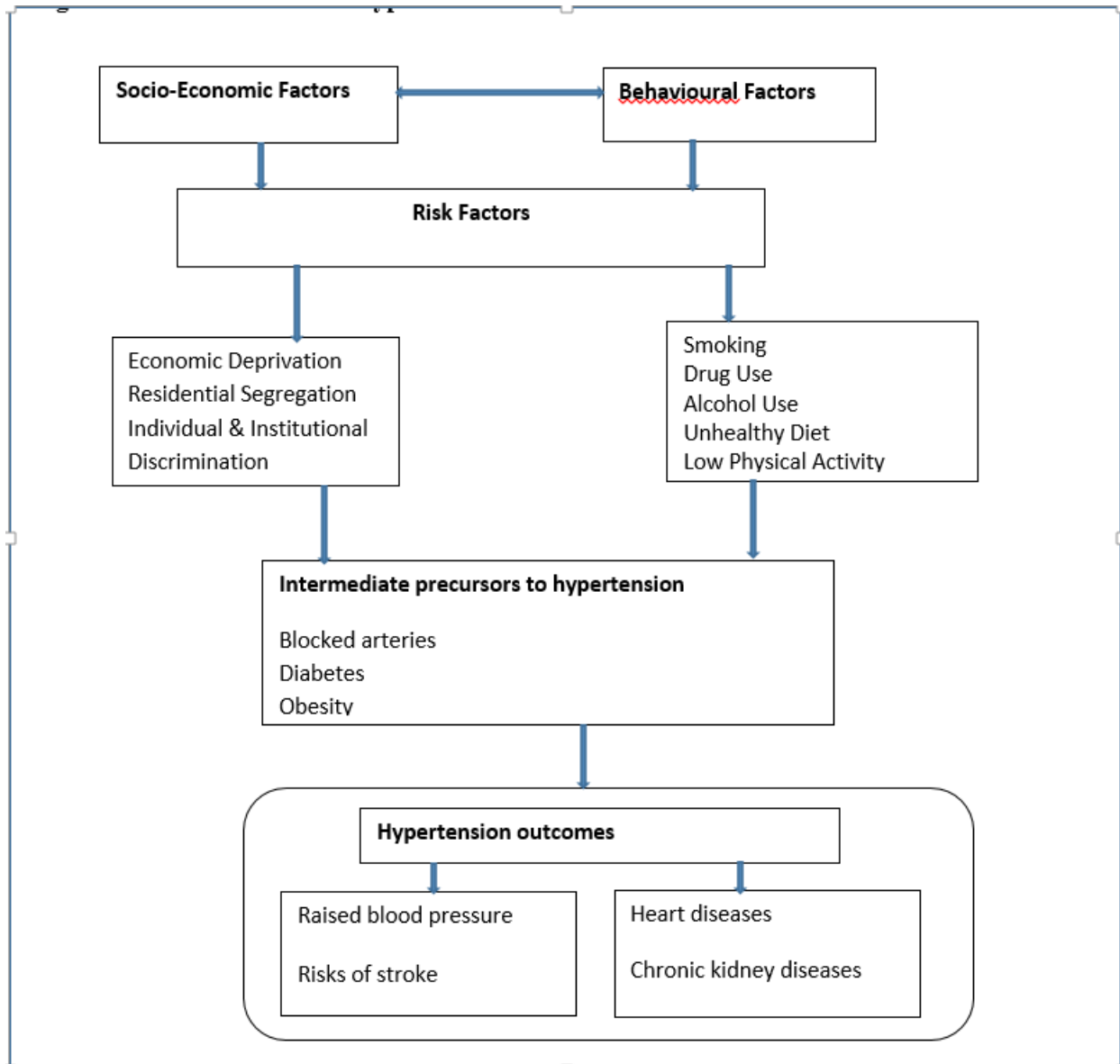
Category	Description
Perceived susceptibility	An individual's assessment of his or her chances of getting the disease
Perceived benefits	An individual's conclusion as to whether the new behaviour is better than what he or she is already doing
Perceived barriers	An individual's opinion as to what will stop him or her from adopting the new behaviour
Perceived seriousness	An individual's judgment as to the severity of the disease
Modifying variables	An individual's personal factors that affect whether the new behavior is adopted
Cues to action	Factors that will start a person on the path to behavioral change
Self-efficacy	Personal belief in one's ability to do something

Source: Janz and Becker, 1984

Hypertension is mostly a lifestyle disease and thus its risk factors stem from man's daily activities.

One's environment and other social factors have their own role in this disease outcome (Janz and Becker, 1984; Bruce et al., 2009) as depicted in diagram below.

Figure 1. 2: Risk to Hypertension



Source: Adapted from the heuristic model of the associations between social environment, psychosocial factors, behavioral factors, hypertension risk factors, and progression and complications (Bruce et al., 2009).

As indicated in the diagram above, hypertension has several risk factors, major among them are social environment (economic deprivation, residential segregation, individual and institutional discrimination), psychosocial (anger, anxiety, depression, stress, social relations) and behavioural factors (smoking, drug use, alcohol use, unhealthy diet, and low physical activity). These can lead

to the development of intermediate precursors to hypertension such as blocked arteries, diabetes and obesity. Uncontrolled or poorly managed intermediate precursors can lead to raised blood pressure (Bruce et al., 2009; Deaver et al., 2015; Senterfitt et al., 2013). Untreated hypertension can also lead to risks of stroke, heart diseases, peripheral arterial disease and chronic kidney diseases as seen in the diagram above (AHA, 2016)

Studies reveal hypertension prevalence is higher in urban settings as compared to rural settings and have also pointed to the fact that rapid unplanned urbanization in most developing countries including Ghana is by far a great contributor to this menace in urban settings (Doulougou et al., 2014 and Kayima et al., 2015). This urbanization is closely associated with westernization in many areas, including but not limited to poor choice of diet, alcohol intake, high sodium intake due to high consumption of processed food, increased sedentary lifestyle, and smoking (Drenjančević-Perić et al., 2011; Aikins et al., 2012; Bennin and Essuman, 2014; Nelson et al., 2015). Given these behavioural factors, one important risk factor for hypertension is obesity. An obesity and systematic hypertension study in Accra communities corroborate this by finding a positive relationship between body mass and hypertension (Escalona et al., 2004). According to Ford et al., (2009), hypertensive status of women is influenced by both personal and environmental factors.

Westernization and poor choices of food have led to the proliferation of fast food joints in the Ghanaian urban settings especially Accra. Most of these fast food joints serve foods that are processed, quick to serve, high in calories, all kinds of fats and sodium, most of which lack essential nutrients like minerals, proteins, vitamins and the like and are unhealthy. Social lifestyles in the urban settings also lead to much intake of alcohol and smoking. Sedentary lifestyle of most working class people who drive to work, sit in the office a whole day and drive back home as a

daily routine, without making a conscious effort to exercise, all contribute to the current chronic disease burden in Ghana especially the capital city of Accra. Songsore et al., (1998) have indicated the importance of one's environment in his or her health outcomes citing water, sanitation, hygiene, housing problems, among others, as proxy indicators for health or otherwise ill health. Also, socio-environmental factors such as the culture of a people thus a group of people coming together for a ceremony like "Kpojiamor" (meaning outdoor of a new baby) by the Gas (a traditional group in Ghana) may amount to some social pressures for the low-income people who per their desire to be included will go any length to borrow clothes and other items necessary for the ceremony while their children suffer for their daily meals. This and many other socio-environmental pressures may impact on one's vulnerability to hypertension (Sparrenberger et al., 2009; Senterfitt et al., 2013). The framework however concentrated more on lifestyle dimensions and socio-environmental factors but failed to highlight the physical environment.

1.5 Objectives of the Study

The main objective of the study is to examine how socio-economic factors and lifestyle can make one susceptible to hypertension. The specific objectives are to:

- i. Examine the relationship between one's residential location and his/her susceptibility to hypertension
- ii. Assess how economic levels and family burdens of respondents relate to hypertension
- iii. Assess lifestyle as a risk factor for hypertension.
- iv. Assess the perception of risks to hypertension among respondents

1.6 Hypothesis

HO: Socio-economic conditions do not play a vital role in susceptibility to hypertension

HA: Socio-economic conditions do play a vital role in susceptibility to hypertension

HO: Lifestyle does not play a vital role in susceptibility to hypertension

HA: Lifestyle plays a vital role in susceptibility to hypertension

1.7 Research Questions

- i. What kind of social environment do people live in in Accra?
- ii. What are the economic situations of people living in Airport residential area, North Kaneshie and La?
- iii. What is the prevalence rate of high blood pressure in these neighbourhoods?
- iv. What lifestyle choices can impact hypertension?
- v. What are the risk perceptions to hypertension among respondents?

1.8 Research Design

Research design is the general plan employed in this research to answer the research questions. This includes the strategies and methods by which data was collected and analyzed. A mixed method approach was used for this study. In this approach, both quantitative and qualitative data were collected and analyzed accordingly. Though some researchers have used only qualitative methods while others have gone the quantitative way, this research chooses to combine both approaches. This choice lies in the relative strength of this approach as it addresses the weaknesses inherent in both the quantitative and qualitative approaches (Hall and Howard, 2008; Teye, 2012; Atieno, 2009; Creswell, 2014). By this, the qualitative data provide much insight on the quantitative data. In this triangulation method, a sequential explanatory strategy was employed where quantitative data was first collected from the field survey. This data was coded, entered, analyzed and discussed. The identified gaps became the basis for in-depth and stakeholder

interviews to explain into detail some pertinent issues that were raised during the quantitative survey. Some challenges associated with this approach are but not limited to resource constraints and coordination, widening of research scope beyond original plans, and problems of how to integrate findings (Teye, 2012).

1.8.1 Sampling Design for Questionnaire Survey

A multi-stage sampling procedure was used for the survey. First, a purposive sampling of three different socio-economic neighbourhoods within the Greater Accra Metropolitan Area was carried out. These communities are Airport Residential Area (ARA), North Kaneshie and La. This selection was guided by literature on residential classification of Accra (Songsore et al., 2014; Yankson, 2012; Agyei-Mensah and Owusu, 2010). Thereafter, a stratified random sampling approach was used to draw a representative sample of the population so that the results can be generalized for the total population and also allow subgroups to be studied in detail (Marshall, 1996). A total of 340 questionnaires were administered to the various households within the communities under study based on the 2010 Population Census. In every five houses in a row, one was selected and any person who falls in the age bracket under study and willing to participate after the purpose of the study has been read and explained to him/her was admitted to participate. The study considered people of age fifteen years and above since high blood pressure is usually associated with age (Johnson et al, 2016). Ghana's youth population is between fifteen to thirty five years according to the National Youth Policy (2010), hence that formed the youth bracket in this study. In the light of this, the sample size was stratified proportionally to the population of the communities to give equal representation as seen in Table 1.2 based on the formula below;

$$n = \frac{P}{TP} \times S$$

Where n = number of sampled respondent, P = Population, TP = Total Population of the three communities and S = Sample size. Per the formula above, sample size for Airport residential area is supposed to be 15.4, North Kaneshie (26.4), and 298.3 for La. This formula may be a good guide to inform a researcher about appropriate sample size for individual communities under study but may not necessarily be a good fit in the Ghanaian context of communities. This is because it was developed in the advanced world with well-planned and stratified communities to which the opposite is true in Ghana. Hence it will be erroneous to completely adopt it for this study.

Again, this survey discovered that La is highly congested with several people in one household sometimes as many as nine people occupying one room in a compound house with several other tenants in most cases. Some houses are closely packed together with no clear demarcations and spaces in between, making it difficult to determine the part of a building which constitutes one household. Due to this, I realized during field testing and early stage of data collection that most of the responses were being repetitive hence the need to cut the numbers and redistribute to the two other communities to get a good number to represent each of them giving each the optimum number necessary to make valid inferences about the population (Marshall, 1996; Robinson 2006) resulting in the new figures in Table 1.2.

Also apart from Airport residential area, which is well planned, buildings in the other two communities are not properly planned. Blocks were therefore created and households selected from these blocks to ensure a fair representation. (See study area map, Figure 2.2).

Table 1. 2: Distribution of respondents in selected communities

Community	Airport Residential Area	North Kaneshie	La	Total
Population	5,079	8,719	98,683	112,481
Sample size	32	108	200	340
(Stratified)				
Men	8	30	50	88
Women	8	30	50	88
Youth ; Male	8	24	50	82
Female	8	24	50	82

Source: Ghana Statistical Service, 2014

The questionnaire was made up of both open and close-ended questions for the survey. Respondents were sampled from blocks created in the three communities. For La and North Kaneshie, there are already existing sub units in the communities such as La Adiembra, Apaapa, Logotsueshi, Abese, Abafum and Kowe among others and St. Theresa's, and Swanlake among others in North Kaneshie. These sub-units or sub-communities were used by sampling people from each unit. For Airport Residential Area however, the well demarcated streets and buildings made it easy to divide the community into north, east, south and west for the purpose of having a wide coverage for the selection. This ensured that most parts of each community were covered in the survey. The research information was given to those who could read to read and ask all necessary questions and was read and explained to those who could not read to understand. All questions were adequately answered. Respondents who agreed to participate in the survey signed consent forms and had the liberty to either complete or withdraw at any time. Blood pressure of the respondents was taken with their consent by the researchers at the time of data collection as part

of the exercise to support the analysis. Ethical clearance was obtained from the Ghana Health Service in order to carry out this exercise with the help of a trained nurse.

1.8.2 Qualitative Research Methods

1.8.2.1 Focus Group Discussion

Focus group discussion, a qualitative data collection method, was used to explore general information and further insights which otherwise would have remained concealed (Ho, 2006). A group of five individuals were brought together in each community with the help of community leaders to form the groups needed for the discussions. Typically, each discussion lasted between 30 – 45 minutes. The researcher moderated the discussions based on a series of planned topics. Respondents were encouraged to speak freely by the researcher to ensure maximum participation.

1.8.2.2 In-depth Interviews

In-depth interviews were conducted to get deepened insights from stakeholders. Key informants were selected among community residents based on their experience and expertise in the subject matter to give detailed information on the causes, control or management and prevention of hypertension. Selected stakeholders like heads of health facilities, nurses, and environmental health experts were also made to answer questions on for instance, why women have been identified with higher prevalence of hypertension and what government's commitment is towards nipping hypertension in the bud. This was necessary to enhance the survey data since the questionnaire sample is often not enough to allow stakeholder participation (Marshall, 1996).

1.8.2.3 Direct Observation

During the data collection exercise, personal observations were employed at different points of the process using observational checklist on environmental characteristics. Pictures of some important

elements were also taken. These facilitated the collection of data on the characteristics of the various communities under study. Identified issues include those on sanitation, waste management, drainage systems, types of residential facilities, spatial organization of each of these communities, among others, to complement information in order to enrich subsequent discussions.

1.8.3 Secondary source of data

Existing hospital data on hypertension prevalence was obtained from the Greater Accra Regional Health Directorate of the Ghana Health Service to complete field data. A number of publications were also consulted and these include articles from peer reviewed journals, reports, books among others. Some health facilities visited include Adabraka Polyclinic, Danfa Health Centre, Kaneshie Polyclinic and La General Hospital.

1.9 Data Analysis

With respect to data analysis, quantitative data were analyzed using the Statistical Program for Social Science (SPSS) version 23 and Stata. Chi-square was used to test some relationships as well as the hypothesis and binary logit regression was used to analyze the effects of socio-economic factors on hypertension. Microsoft Excel was also used to generate graphs for graphical presentations and statistical computations. However, the qualitative data were transcribed from the audio version, coded, categorized and analyzed according to the themes relative to the research questions and objectives of the research.

1.9.1 Binary Logit Regression Model

The binary Logit regression model estimates the relationship between a binary response variable and one or more predictor variables, which may be either discrete or continuous. This model with dichotomous (or binary) dependent variable was used as a framework to examine explanatory

variables associated with hypertension prevalence. Although least square estimates can be computed as binary models, the error terms are likely to be heteroscedastic leading to inefficient parameter estimates; thus classical hypothesis tests, such as the t-ratios are inappropriate (Pindyck and Rubinfeld, 1981). The application of the conventional OLS techniques result in bias by over estimation and inconsistency (Maddala, 1986) and it has been shown both theoretically and empirically that a Logit or Tobit analysis is more appropriate in such cases (Maddala, 1986, p149-194).

The use of Logit, which gives the maximum likelihood estimates, overcome most of the problems associated with linear probability models and provides estimators that are asymptotically consistent and efficient so that the analogue of the regression t-test can be applied.

$$P_i = \frac{e^{\alpha + \beta X_i}}{1 + e^{\alpha + \beta X_i}}$$

In this notation, e represents the natural logarithms, which is approximately equal to 2.718. P_i is the probability that an individual is diagnosed with hypertension, given X_i , where X_i is set of independent variables and β is the coefficients of the explanatory variables (Pindyck and Rubinfeld, 1998). The dependent variable in this regression equation is the logarithm of the odds that a respondent is diagnosed with hypertension. However for this model the coefficients do not show the extent to which the explanatory variables affect the dependent variable, but instead the marginal effects does.

Empirical Model Estimation

To identify the statistically significant factors that influence hypertension, binary logit model elaborated above is operationally as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \epsilon$$

Table 1. 3: Binary Logistic Regression Model

Symbol	Variable	Description	Measurement	Expected sign
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Y	Hypertension	Incidence of Hypertension	1= Yes 0=No	Not applicable
X ₁	Community	Respondents area of residence	1= Labadi 0=Kaneshie or Airport	+
X ₂	Age	Age of respondent	1=Above 36 years 0= 15-35years	+
X ₃	Gender	Gender of respondent	1=Male 0=Female	±
X ₄	Marital status	Marital status of respondent	1=Married 0=Otherwise	±
X ₅	Income	Monthly income of respondent	Ghana cedis	-
X ₆	Dependents	Dependents in HH	Number of people	+
X ₇	Household debt	Household in debt	1=Yes 0=No	+
X ₈	Occupational anxiety	Encountering occupational anxiety	1=Yes 0=No	+
X ₉	Diastolic blood pressure	Respondents DBP level	Units	±
X ₁₀	Systolic blood pressure	Respondents DBP level	Units	±
X ₁₁	Pulse	Respondents pulse level		±

Source: Author's Computation from Field Data, 2018

1.10 Organization of the study

This study is organized into six chapters. The premier chapter discusses the general background of the study. This includes introduction, statement of problem, literature review, conceptual framework, hypothesis and research questions which guide the study, objectives and methodology. The second chapter looks at the profile of the study areas (Airport Residential Area, North Kaneshie and La) considering the regional outlook. Chapters three, four and five analyze and discuss results from both quantitative and qualitative data obtained from household, community and the health sector. Chapter six summarizes all findings, conclusions and makes recommendations for policy and certain lifestyle changes in an attempt to reduce hypertension prevalence and also for future study directions.

1.11 Study Limitations

This study does not take into consideration the genetic aspect of vulnerability to hypertension since it is not a physical science discipline and as such one cannot measure genetically acquired hypertension per the instruments being used in this study.

Again ethnographic studies can be pursued by future researchers where investigators can live among the communities under study for a reasonable amount of time in order to know how ethnicity can play a role in disease outcomes which this study couldn't do due to time constraints.

Body Mass Index of individuals were not considered in the selection of participants, thus people of all sizes and weights who were willing to participate were recruited.

CHAPTER TWO

DESCRIPTION OF THE STUDY AREA

2.1 Greater Accra Regional Characteristics

This study focuses on Greater Accra Metropolitan Area (GAMA), which for the purpose of this study, is encapsulated to include Accra Metropolitan Area (AMA) and La Dade-Kotopon where the three communities under study are found. Accra, the national capital, has a total population of 4,010,054 (16.3% of Ghana's population) with a male population of 1,938,225 and female population of 2,071,829 (GSS, 2014). Greater Accra region covers a total land area of 3,245 square kilometres. About 31.3 percent of the population is between 0 – 14 years (CPBR Report, 2014). The region has the highest population density owing to reasons such as in-migration, high population growth rate (intercensal growth rate of 3.1 according to GSS, 2014) among others. The region has a coastline of 200km making tourism a major industry in Accra. About 80 percent of the households in Greater Accra have access to a health facility (less than 30 minutes to reach the nearest facility), yet persons in households that access health services are quite low (Akpor et al., 2006).

Situated in a low middle-income country, GAMA is faced with environmental problems such as inadequate potable water supply, poor waste management, crowding and shelter poverty, uncontrolled garbage, insect infestation and unsanitary conditions (Songsore et al., 2001; 2006; Benneh et al., 1993). The Greater Accra Metropolitan Area comprises the Accra Metropolitan Area (AMA), Tema Municipal Area (TMA), La Dade-Kotopon, Ga West District and Ga East District. GAMA is the largest metropolitan area in the country with a population of about four million (GSS, 2014). For the purpose of this research, selected communities in the AMA and La Dade-

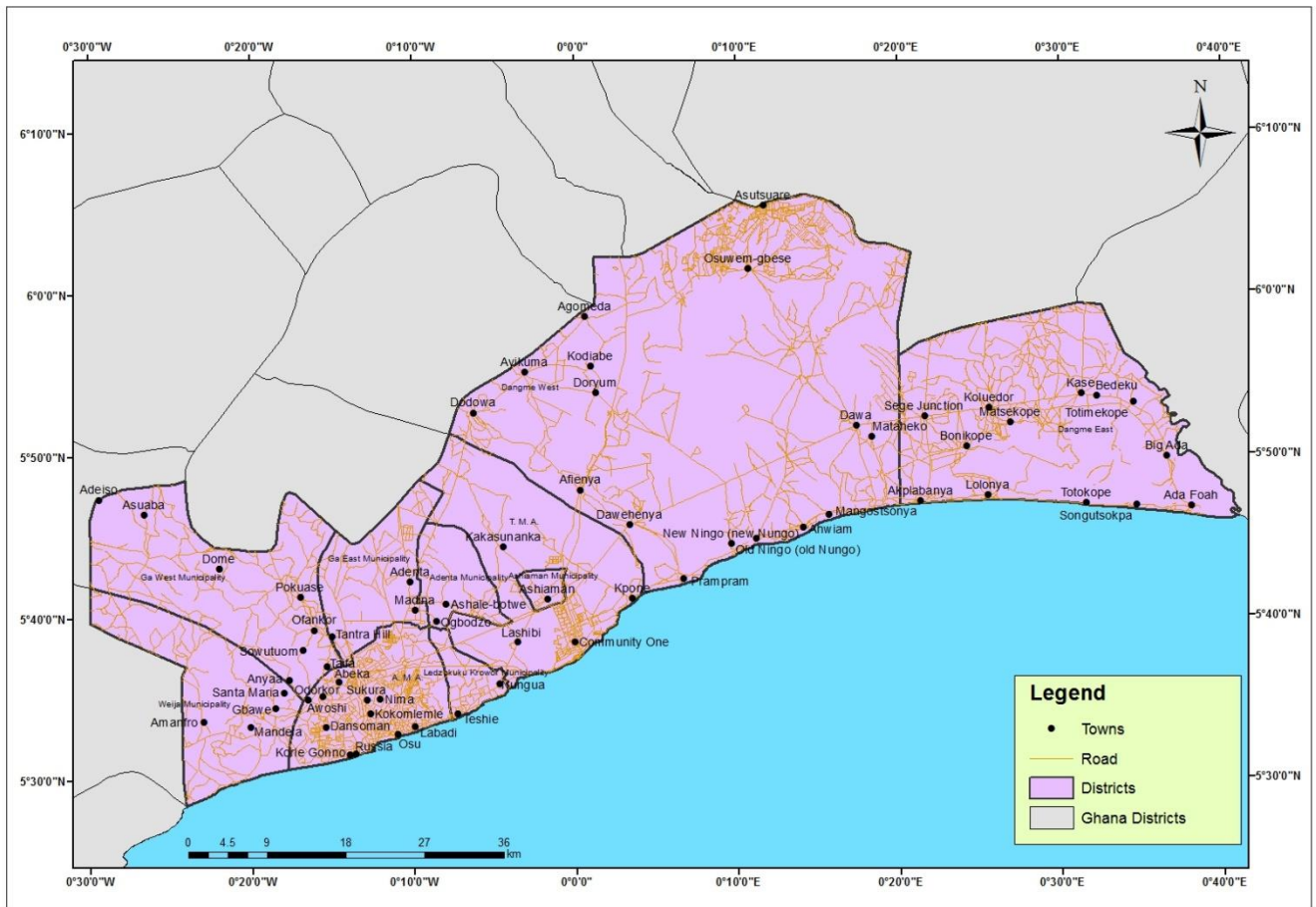
Kotopon both fall within the GAMA. Therefore the discussion for the Study area will be focused on GAMA and the selected communities within AMA and La Dade-Kotopon. Below is a map of selected districts within Greater Accra Region.

2.2 Accra Metropolitan Area

2.2.1 Economy

AMA is the economic hub of Greater Accra Region and Ghana as a whole. It is the home for a number of manufacturing companies, banking and financial institutions, oil companies, health institutions, tourism, education, telecommunication facilities, and several other important institutions like ministries and government agencies. All these institutions provide employment to the population in Accra and several others, attracting many from all parts of Ghana and yonder to come and take advantage of the business opportunities. Most people residing in the city engage basically in any of the three sectors of the economy being primary, secondary and tertiary. They are engaged in occupations such as trading, construction, fishing, farming, manufacturing, and services to mention a few. Until recently, the indigenous people were mostly engaged in fishing and farming, thus taking advantage of the coastline (GSS, 2014)

Figure 2. 1: Selected districts in Greater Accra Region



Source: Author's construct, 2018

2.2.2 Population Size and Distribution

According to the 2010 population census, the total population of Accra Metropolis is 1,665,086 with females constituting 51.9 percent while males comprise 48.1percent. The population peaked at the age group 20-24, representing 12.4 percent followed by 25-29 age group with 11.5 percent. For every 100 females, there are 93 males as per the sex ratio within the Metropolis. The sex ratio of the Metropolis is lower than that of the national (95.2) which can be ascribed to higher male mortality than that of females or male out-migration from the Metropolis (GSS, 2014). Again, dependency ratio in the Metropolis is 48.5 which is lower than that of the regional (53.4) meaning there are fewer non-working people being catered for by the economically active-age population in the Metropolis than the region.

Among the population in the Metropolis, 47 percent were migrants out of which 27.8 percent had migrated from the Eastern Region while those from the Upper West Region were the least (1.2%). Among the migrant group, 14.5 percent had resided in the Metropolis for less than a year, 26.1 percent had lived there between 1-4 years whereas 21.4 percent had lived there for over 20 years. The highest proportion of international migrants had stayed between 1-4 years.

Table 2. 1: Population of AMA, 2010

Age Group	Both Sexes		Male	Female	Sex ratio
	Number	Percent	(Number)	(Number)	
All Ages	1,665,086	100	800,935	864,151	92.7
0 – 14	477,577	28.7	234,976	242,601	96.9
15 – 34	709,949	42.6	338,928	371,021	91.3
35 – 59	379,896	22.8	182,693	197,203	92.6
60 and above	97,664	5.9	44338	53,326	83.1

Source: GSS, 2014

The population trend in AMA reflects the national population where women (51.9) are more than men (48.1) in almost all age groups. Overall sex ratio of male to female in AMA is 92.7.

2.2.3 Socio-Economic Characteristics

Residents of AMA are made of different household compositions, structures and sizes. There are households composed of head (28.2%), spouse (11.1%), child (35.5%) and the next dominant is other relatives (8.5%) while the least proportion is adopted or foster children (0.3%). It is common to find households with male headship (37.5%) compared to female headship (19.6%) in the Metropolis owing to the Ghanaian cultural settings which put men as the heads of households. Females could only become heads of households under given circumstances such as when she is not married, widowed, separated, divorced or when her husband has migrated (Tanle, 2010; GSS, 2014).

Out of the total population of AMA as seen above, 1,275,440 were 12 years and older. About 49 percent of this group were single (never married), 36.3 percent were married (either by customary, church or ordinance) whereas 2.6 percent were separated (GSS, 2014). Majority of married people were employed. A third (38.5%) of the employed population, 15 years and older for both sexes are engaged in service and sales work out of which the greater proportion (52.5%) are women. This is in accordance with the Ghanaian tradition where more men than women are found in heavy duty manual works. The main avenue for employment in the Metropolis is the private informal sector, covering 74.0 percent.

2.3 Profile of Airport Residential Area (ARA), North Kaneshie and La

2.3.1 Introduction

The three communities chosen for this study are based on their socio-economic classifications spanning from high-income community (Airport Residential), middle-income (North Kaneshie), and La being the low-income (Songsore et al., 2006; Yankson, 2012; Agyei-Mensah and Owusu, 2010). La used to be part of AMA until the establishment of the La Dade-kotopon Municipal Assembly in 2012 (Agboklu, 2013). Figure 2.2 shows a map of the study area.

By observation, each of these communities have their various characteristics in terms of environment, sanitation, pattern of building structures, economic activities, level of education, among others. Airport Residential Area is well planned compared to the other two communities followed by North Kaneshie with La as the least. The picture below is the structure of buildings and general environmental conditions of La.

Plate 2. 1: Nature of households and environment in La



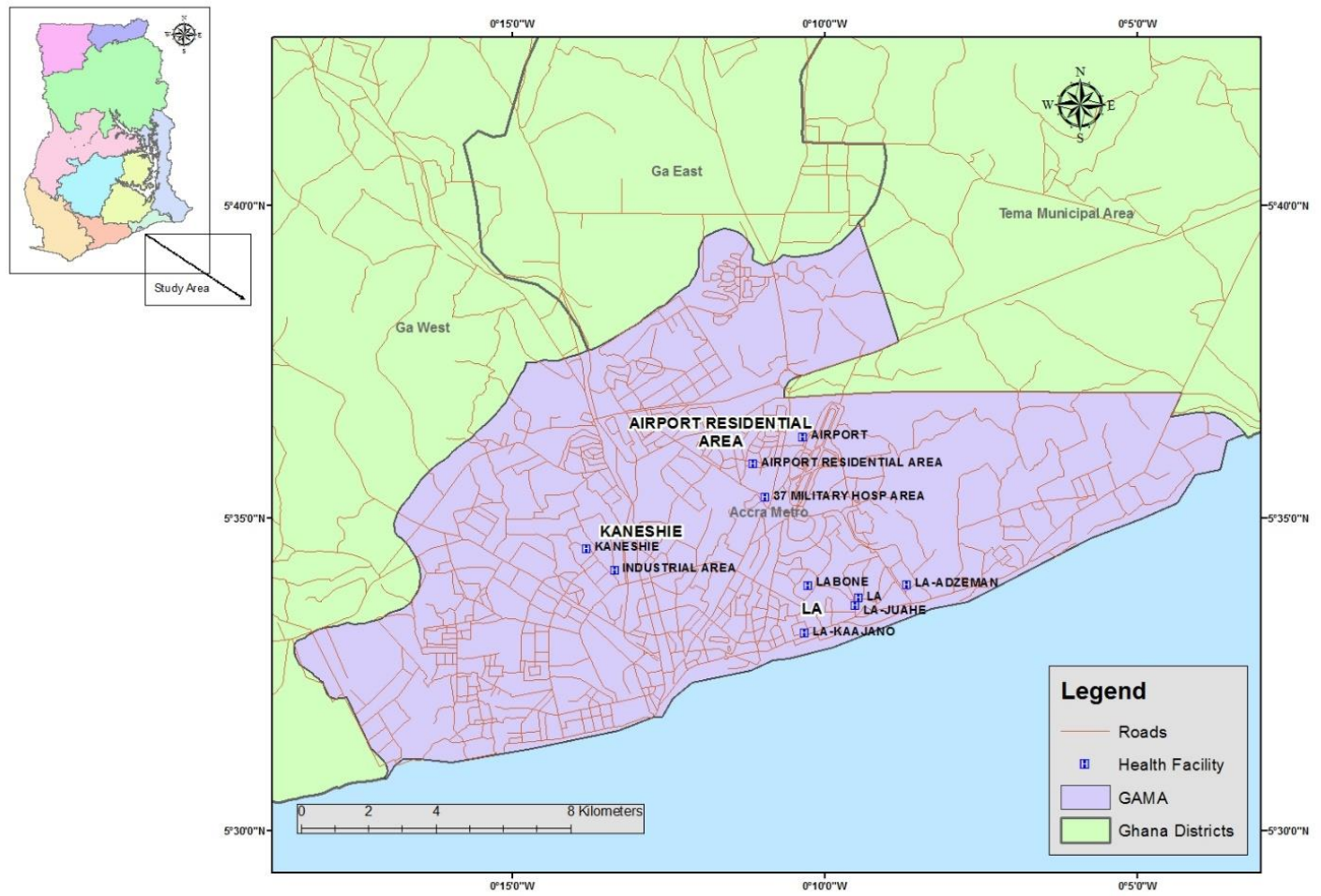
Source: Field survey, 2018

All three communities put together have a total population of 112,481. La is the community with the largest population (98,683), followed by North Kaneshie (8,719) and Airport Residential, Area the least (5,079) according to GSS 2014. Airport Residential Area is the most developed, followed

by North Kaneshie and La being the least developed. Rapid population growth and urbanization unmatched with proper community planning has led to several environmental and social problems especially in the middle and low-income communities (Parks et al., 2014). La is highly overcrowded with as many as 10 or more occupants per room in some households. Due to lack of toilet facilities in most homes in La, most people in the community use public the toilet which is common in the area. It was observed that most gutters found there were choked with rubbish giving out very serious stench all times of the day. North Kaneshie on the other hand has only a few public toilets and baths for the people who do not have them at home to use. In Airport Residential Area however, not a single public toilet was seen in the entire community, meaning almost all residential facilities in ARA have toilet facilities. The environment was generally clean with well demarcated buildings, road networks and drainage systems.

Walking through these communities, another thing worth noting is the proliferation of fast food joints within short intervals especially in North Kaneshie and La. Both La and North Kaneshie experience inadequate supply of potable water for domestic use. Most residents need to fall on public stand pipes or pipes in neighbouring households for their daily water supply. There are some people who live in kiosks, shops and other wooden structures, accommodating as many as seven to ten people in one structure. Below is a map of the study locations as discussed above.

Figure 2. 2: Study communities within GAMA Administrative Area



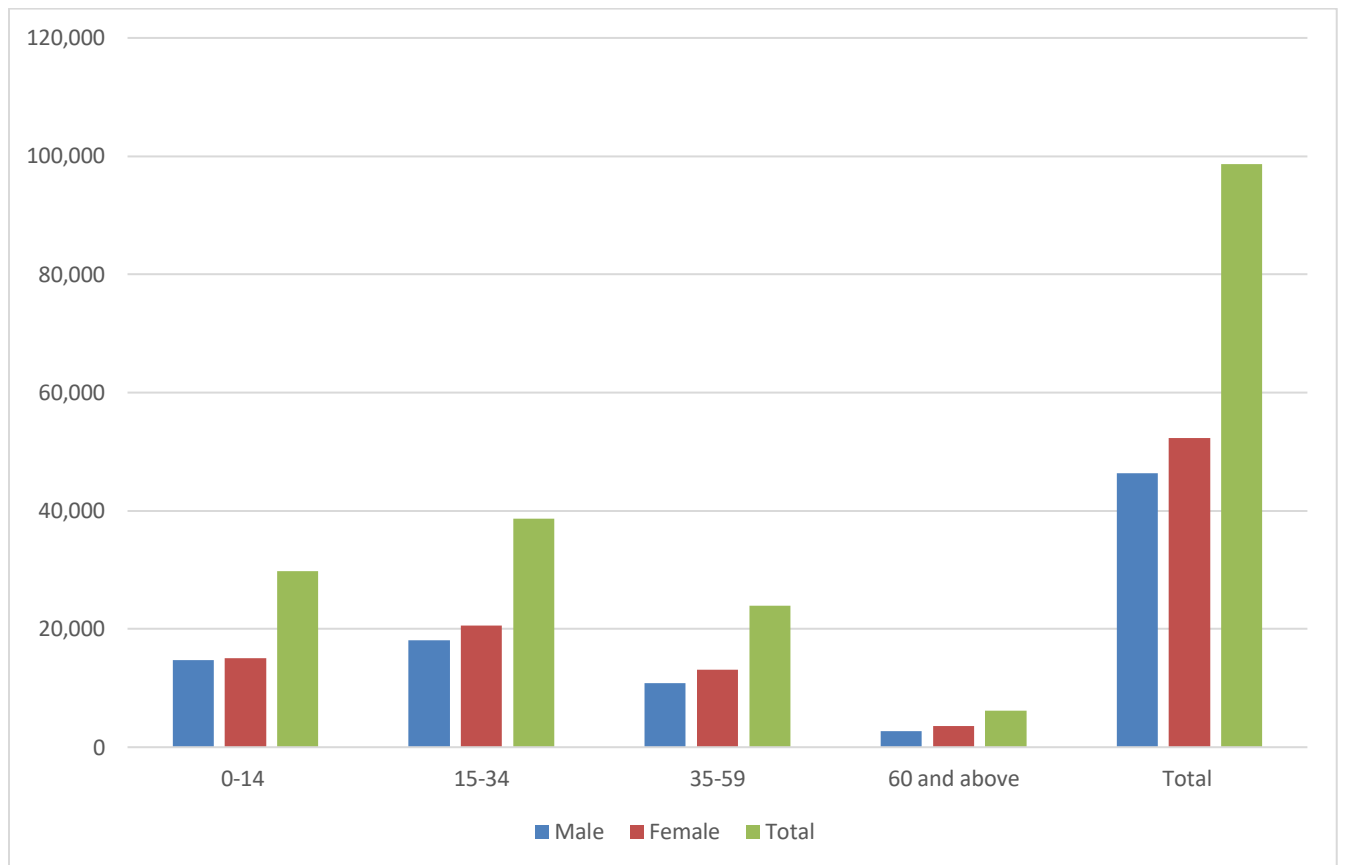
Source: Author's construct, 2018

2.3.2 Demographic Dynamics of the study communities

Administratively, Greater Accra is the most urbanized with more than eighty percent of its total population living in urban areas with much concentration in the GAMA for reasons such as economic boom, existing better facilities, among others (Songore, 2009; Oteng-Ababio & Arguello, 2014). This rapid urbanization is unmatched with proper planning and adequate supply of basic social amenities resulting in a number environmental challenges among others (Songsore 2013; Oteng-Ababio, 2014; Oteng-Ababio, 2013).

The population of La has risen from 81,684 with 39,726 males and 41,958 females in 2000 to 98,683 with 46,353 males and 52,330 females in 2010. Most people living at La are Ga/Adamgbe indigenes with fishing and petty trading as their major economic activities.

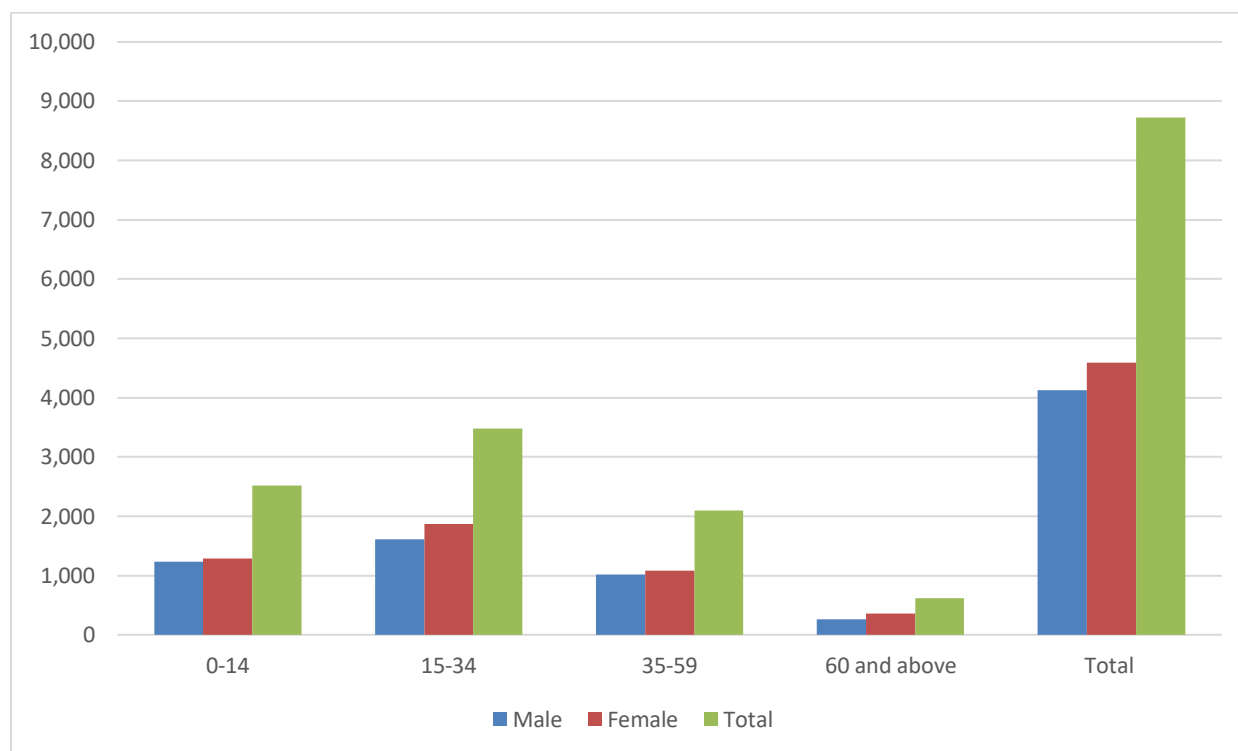
Figure 2. 3: Population by Age and Sex distribution, La, 2010



Source: GSS, 2012 (PHC, 2010)

According to the Population and Housing Census (2010) as seen in Figure 2.3, children below 15 years constitute 30.2 percent of the population of La. Those within the youth bracket thus 15 to 34 constitute 39.2 percent, the age bracket of 35 to 59 constitute 24.2 percent while age 60 and above constitute the least (6.3%). In all the age categories, it can be identified that women are more than the men, resulting in a total of 53.03 percent as against 46.97 percent of men. This shows that La has a very youthful population and women, being the majority, play a very vital role in their economic development.

Figure 2. 4: Population by age and sex distribution in North Kaneshie



Source: GSS, 2012

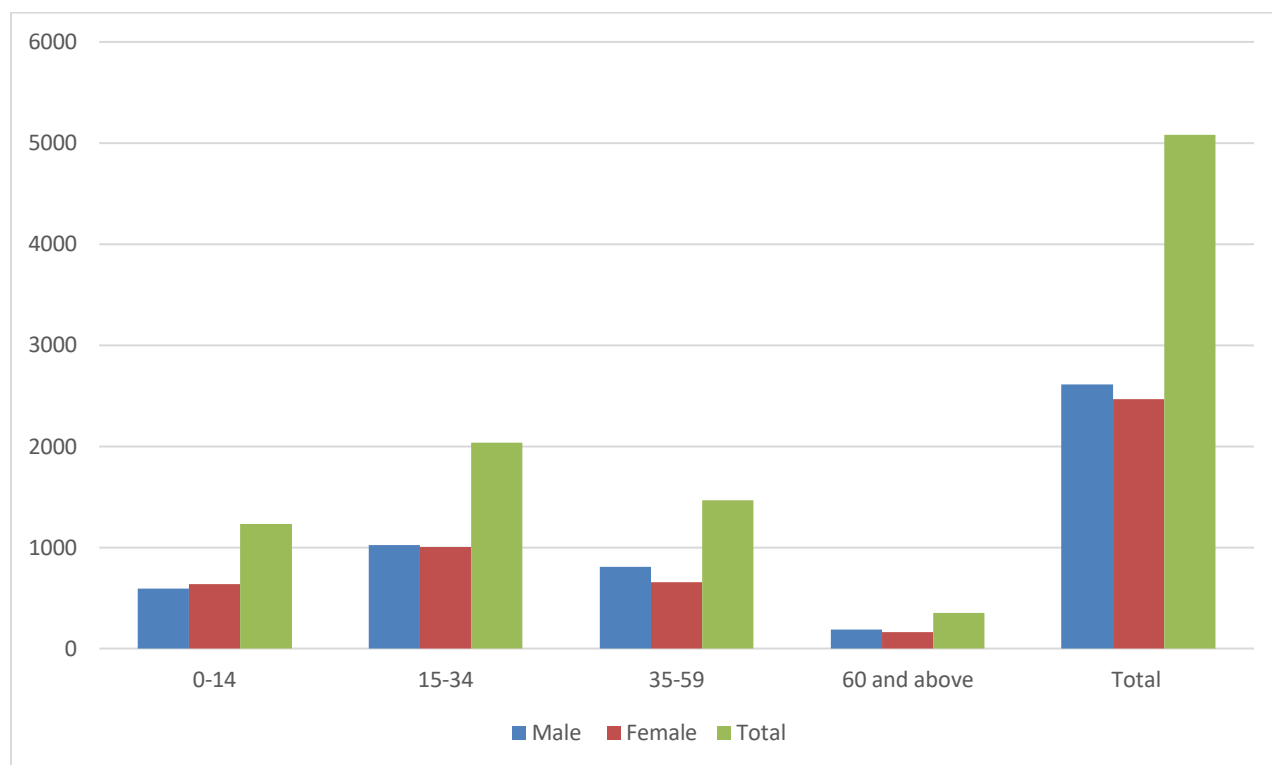
North Kaneshie exhibits similar population dynamics as La, where women have higher population in all age groups, bringing the percentage of women to 52.7 percent while that of men is 47.3 percent. Again, the youth from 15 – 34 is the highest (39.9%) followed by children from 0 – 14 (28.9%), then age 35 – 59 (24.1%) and the least, 60 and above (7.1%) as seen in Figure 2.4. The youth and economically active group is very high compared to the dependents group, thus children and the aged. The nature of the physical environment at North Kaneshie is shown in the field picture below (Plate 2.2).

Plate 2. 2: Nature of households and environment in North Kaneshie



Source: Field Survey, 2018

Figure 2. 5: Population by age and sex distribution, ARA



Source: GSS, 2012

Airport, on the other hand, has a different population dynamics with respect to women as seen in Figure 2.5. With the exception of children (0 – 14 years), all age groups have higher male population as against women. Overall, men have a higher population (51.5%) as compared to women (48.5%) in contrast to the first two communities discussed. Age group 15 – 34 top the chat with 40.0 percent, followed by age group 35 – 59 with 28.8 percent, then children (24.2%) and the least as usual, 60 and above (6.9%). Some factors that may have accounted for this population dynamics include higher education, late marriage and choice of smaller family sizes by giving birth to very few children. Below is the nature of physical environment at ARA as shown in Plate 2.3.

Plate 2. 3: Nature of households and environment in ARA



Source: Field Survey, 2018

2.4 Summary

Two main districts were the focus for this study; Accra Metropolitan Assembly and La Dade-Kotopon. Three communities in all were studied for the purpose of this research; ARA, North Kaneshie and La being high-income, middle and low-income areas respectively. They exhibit different socio-economic characteristics. Percentage of people who have attained higher education is highest in the high-income area and lowest in the low-income area. Physical environment deteriorated as one descends the income ladder. The low-income community however, has the

highest population size followed by the middle-income and then the high-income having the least population size.

CHAPTER THREE

THE GEOGRAPHIES OF HYPERTENSION

3.1 Introduction

This chapter examines the demographic characteristics of the study population and their relationship with the prevalence of hypertension in the study location. The inquiry developed in this chapter attempts to answer the question regarding the relationship between one's socio-economic and physical location and one's susceptibility to hypertension. The main focus is on how an individual's physical environment as well as socio-economic position militate or facilitate his/her vulnerability to hypertension. In the socio-environmental assessment, people's belief and culture are part of the key factors why one will live in a certain environment and act in a particular way, for instance, the decision to access health care, the kind of social organizations and activities one is involved in among others.

While this chapter focuses on the relationship between one's physical and socio-economic environments and one's vulnerability to hypertension, the next chapter analyses/assesses the effects of lifestyle and the general respondents' perception on hypertension.

3.2 The Demographic Characteristics of the Respondents

A total of 340 respondents were sampled for this study. The research investigated how age, gender, educational background, marital status, occupation, ethnicity and religious background help provide a good picture of the socio-economic conditions of households in the research locations. Table 3.1 presents the results of the study. There is a gender balance among the respondents (50% each) and this was purposefully done in conformity with the overall population of the study area as captured by the 2010 population and housing census (GSS, 2012). Thus the study targeted adult

population, with a minimum age being 15 years as stipulated by Ghana Statistical Service (GSS). Consequently, for the purpose of this study, the age range 15 – 35 was designated as ‘the youth’ while 36 and above formed the adult group. The result is particularly interesting since it will be very useful when discussing the effects of lifestyle on one’s susceptibility to hypertension.

Table 3. 1: Demographic Characteristics of Respondents

Demography	Variable	Percentage Distribution		
		Airport Residential Area (N=32)	North Kaneshie (N=108)	Labadi (N=200)
Gender	Male	50	50	50
	Female	50	50	50
	Subtotal	100	100	100
Education	None	0	11	1
	Basic	6	36	60
	Second cycle	13	38	27
	Tertiary	81	15	12
	Subtotal	100	100	100
Age	15 – 35 years	50	50	50
	36 years and above	50	50	50
	Subtotal	100	100	100
Religion	Christian	94	83	97
	Islamic	0	15	2
	Traditional and others	6	2	1
	Subtotal	100	100	100

Demography	Variable	Percentage Distribution		
		Airport Residential Area (N=32)	North Kaneshie (N=108)	Labadi (N=200)
Marital status	Never married	44	43	46
	Consensual/ Cohabitation	0	2	2
	Divorced/ Separated	0	6	5
	widowed	0	3	5
	Married	56	46	42
		100	100	100

	Subtotal			
Ethnicity	Akan	67	56	24
	Ga/Adamgbe	6.5	13	51
	Ewe	20	7	13
	Others	6.5	24	12
	Subtotal	100	100	100
Household Income	GHS 1-500	6.5	37	70
	GHS 501-1000	27	37	15
	GHS 1001-1500	20	12	7
	GHS 1501-2000	6.5	4	5
	GHS 2001-2500	0	0	1
	Above GHS 2500	40	10	2
	Subtotal	100	100	100

Source: Field Survey, 2018

Out of the 340 respondents, a total of 310 (91.2%) were Christians, 20 (5.9%) were Muslims, 2 (0.6%) were traditionalists, 4 (1.2%) had no religion and 2 (0.6%) said they belonged to zehatir, a religion that combines both Muslim and Christian beliefs. The results is equally not surprising because though Ghana is a secular state, Christians overwhelmingly dominate all others particularly in the southern part of the country (see GSS, 2012).

With respect to ethnicity, even though Accra belongs to Ga/Adangbe, 37.6 percent of the respondents were Akan, 11.8 percent were from Volta, 10.6 percent were northerners, while 34.7 percent were Ga/Adangbe. About 4.7 percent of the sampled population spoke one of other Ghanaian languages not captured here. The results confirm the cosmopolitan nature of the study area and Accra as the economic hub of the country.

The data shows that, 14 (4.1%) had no formal education, 26 (7.6%) completed primary education, with 134 (39.4%) having completed JHS/JSS/Middle School, and 98 (28.8%) completing SHS/Vocational/Technical School. In all, 66 (19.4%) of the sampled population had tertiary education. It is obvious that majority (95.2%) had had at least some form of formal education out

of which basic education predominates but the story is totally different looking at it from the perspective of individual study locations. ARA for instance had no one without formal education or one who had only completed primary school. The least education attained there was JHS/JSS/Middle School (6.3%) while tertiary education had the highest (81.2%).

Finally, occupation is an important tool for economic activity, economic growth and general lifestyle of a population. Sales and services topped the chart of the respondents' current livelihoods with 124 (36.5%), followed by skilled manual workers (artisans, hairdressers, seamstresses among others) with 97 (28.5%), professional/technical followed with 60 (17.6%), then 32 (9.4%) unemployed, followed by 14 (4.1%) unskilled manual, 12 (3.5%) pensioners and lastly 2 (0.6%) were unaccounted for. One's occupation can influence his/her lifestyle choices which can in turn influence his/her disease outcomes.

3.3 Current Environmental Characteristics

This section examines the general characteristics of the three research locations. This covers the type of dwelling, occupancy, the availability and accessibility of social services (water, sanitation, electricity, and waste management among others). All three localities fall within the larger metropolis which is AMA. It is important therefore to get the broader picture of environmental characteristics of AMA and then go on to look at the variations in each community. Ghana Statistical Service has defined a household as "a person or group of persons who live together in the same house or compound and share the same house-keeping arrangement and recognize one person as the head" (GSS, 2014). According to this report, there were 501,903 households in the Accra Metropolis in 2010. Majority of them were living in compound houses (67.7%), followed by those living in separate houses. The least were tent and hut buildings (0.2%). Most houses were

owned by other private persons followed by houses owned by a member of the household. About 65 percent of households in the Metropolis occupy only one sleeping room whereas one fourth have two sleeping rooms suggesting overcrowding in sleeping rooms in the Metropolis which comes with some health implications (GSS, 2012).

About 93.8 percent of households in the Metropolis were connected to the national grid as against 87.1 percent in the region. Inside dwelling pipe-borne water (31.8%) and outside dwelling pipe-borne water (28.0%) were the main sources of drinking water and other domestic use followed by sachet water (27.9%). Other sources of water discovered nationally and regionally include rain water, unprotected spring, unprotected well, and dugout pond/lake/dam/canal but most of these other sources are not in use in the Metropolis. Types of bathing facilities available in the Metropolis include shared separate bathroom in the same house, shared open cubicles and public bathroom. The main toilet facility in the Metropolis is the community based toilet open to the public (41.9%), followed by in-house flush toilet (33.0%). Majority of households (59.4%) had their solid waste collected, 33.0 percent disposed through public dumping and the least (0.3%) buried their waste as a method of disposal (GSS, 2014). Given this general background in the Metropolis, location specific or individual communities exhibit peculiar characteristics based on their socioeconomic variations as presented below.

About 43.75 percent of respondents in ARA lived in flats, 50 percent of the people had at least two rooms (thus a chamber and a hall) available to their households, 50 percent were renting their current accommodation while 37.5 percent were living in their own houses, 100 percent were connected to the national electricity grid, 100 percent had access to sanitation facilities at home which are in-house flush toilets, 87.5 percent do not queue to use any facility. About 68.7 percent

of them have access to water supply at home, 100 percent have their solid waste collected by waste collectors, 93.7 percent have good drainage systems and well demarcated routes in the community, 62.5 percent of them experience traffic on their way to and back from work, the minimum time spent in traffic being 30 minutes while the maximum is 60 minutes.

About 75.9 percent of respondents in North Kaneshie live in compound houses, 57.4 percent had at least two rooms to their household, 55.5 percent were renting their current accommodation while 16.6 percent were living in their own houses. 92.6 percent were connected to the national electricity grid, 92.6 percent had access to sanitation facilities at home (64.8 percent of them are in-house flush toilets), 27 percent of them queue to use either pipe water, toilet facility or public bath. About 55.5 percent of the respondents have access to water supply at home, 96.3 percent have their solid waste collected by a waste collectors 55.5 percent have good drainage systems in their neighborhood, 66.6 percent have well demarcated routes, 40.7 percent experience traffic daily to and from work with the minimum being 5 minutes and the maximum an hour and half.

Quite similar to North Kaneshie, 82 percent of respondents in La live in compound houses, unlike any of the two communities above, 45 percent of respondents in La have only one room to their households, 35 percent were living in family houses while 8 percent were living in other structures such as wooden/containers among others all with rent free status, 47 percent were renting while only 9 percent lived in their own houses. About 91 percent were connected to the national electricity grid, 60 percent did not have access to sanitation facilities at home and hence make use of the public toilet as their main toilet facility as seen in Plate 3.1 below. About 72 percent queue to use facilities such as public toilet, stand pipe, bath house among others. Below are some pictures of community public toilets that are normally used in La.

Plate 3. 1: Community Public Toilets in La



Source: Field Survey, 2018

About 57 percent of the sampled population have access to water supply at home, 91 percent have their solid waste collected by waste collectors, usually individual tricycle operators. However, it was observed that a number of challenges exist here such as tricycle operators not being regular and sometimes collected waste not properly disposed at appropriate places. Some of these waste collectors tend to dump waste collected from individual households at other parts of the community causing so much pollution. Again, 76 percent have gutters which are mostly choked with silt, solid and liquid waste, 82 percent have well demarcated routes, 36 percent experience traffic daily to and from work with the minimum being 5 minutes and the maximum 2 hours. An account by a 42 year old trader who was a key informant is presented below:

This place is always filthy due to activities of people around here, I try my best to sweep and keep the place tidy but sometimes I am so tired I wish I could pay someone to do that

for me but I do not get anyone. When you sit here to sell, the stench coming from the gutter is too bad sometimes you cannot stand it. This is because people throw all sorts of things into it, ranging from rubbish, waste water from catering services, urine and sometimes their children's faecal matter and in the afternoon you cannot stay here. When it comes to the waste collectors, we usually deal with those using tricycles who move from community to community. Over here they are supposed to come on Monday mornings but sometimes they do not come and at times after paying them to collect the garbage, they refuse to take them to the appropriate place and instead wait till evening to re-dump them around under parked vehicles especially bigger trucks so by the time drivers come to move their cars in the morning the whole place will be messy. (A woman, 38-year old trader at La Abese, March 18, 2018)

Below are some packed tricycles usually used to collect garbage in the community and filthy gutters as described above.

Plate 3. 2: Parked Tricycles for Solid Waste Collection at La



Source: Field Survey, 2018

Plate 3. 3: A rubbish filled gutter



Source: Field Survey, 2018

3.4 Existing relationship between location and susceptibility to hypertension

This section seeks to determine whether or not where one lives and/or works has an impact on hypertension outcomes taking into consideration the economic class of the particular locality. This research is as a result of findings from previous studies that show that one's place of abode and/or work has impact on their health outcomes making him/her susceptible (or otherwise) to some type of diseases (Bruce et al, 2009; Songsore et al, 1998; Owusu-Sekyere et al, 2016). From Table 3.2 below, 70 out of 338 of the sampled population admitted to ever being diagnosed of hypertension

by a medical doctor out of which 4 (5.7%) were in ARA, 26 (37.1%) were in North Kaneshie, while 40 (57.1%) were in La. It is seen that La, a low-income community had the highest prevalence, followed by North Kaneshie, a middle-income community and ARA, a high-income community had the least prevalence. This is in agreement with recent literature which posit that low to middle-income countries (in this case, communities) bear the huge burden of hypertension now (Doulougou et al, 2014; Olack et al, 2015). What has accounted for this paradigm shift of a disease which was once famous among the rich is yet to be unfolded.

However, when subjected to statistical test, there is no significant relationship between location and the incidence of hypertension since out of those who had not been diagnosed of hypertension 59 percent lived at La, 30.6 percent lived at North Kaneshie and 10.4 percent at ARA. This is due to the great differences in the numbers sampled for each community. Even though these figures are representative of the respective communities given their population sizes, comparatively they are not a fair distribution and this is due to the fact that communities in Ghana are not well planned and evenly structured. This has influenced the high figures from La and North Kaneshie both for diagnosed and not diagnosed, making it statistically not significant which shows that models and survey methods that work for one nation may not necessarily work for other countries across the world because they all have their peculiar conditions (Robinson, 2006).

Table 3. 2: Community based hypertension prevalence

Respondent Status	Airport Residential Area	North Kaneshie	Labadi	Overall
Ever diagnosed of High Blood Pressure	4 (12.5%)	26 (24.1%)	40 (20%)	70 (20.7)
Never diagnosed of High Blood Pressure	28 (87.5%)	82 (75.9%)	158 (79%)	268 (79.3)

Source: Field Survey, 2018

3.4.1 The Gender Dynamics

Overall prevalence of hypertension is 20.7 percent out of which women had a higher prevalence of 68.6 percent as against 31.4 percent for men. A Chi square test of ($p= 0.001$) shows there is a significant relationship between sex and hypertension. This means that women are more vulnerable to hypertension than men as confirmed by the Ghana Health Service data below and earlier studies (Cappuccio et al., 2004). According to health experts, women go through a lot of emotional and stressful activities and entertain a lot of anxieties all of which could predispose them to the condition.

Nevertheless, the overall prevalence of 20.7 percent in this study is by far lower than prevalent rates for Ghana found by other researchers (WHO, 2014; Addo et al., 2012; Addo et al., 2006) but higher than the prevalence reported in other African cities around the same period, like Ouagadougou (Doulougou et al., 2014). This huge difference may have resulted from differences in methodological approach, sample population and the time period these surveys were conducted. This could also be as a result of low detection and self-report emanating from the fact that most Ghanaians do not have the attitude of visiting the hospital for regular checkups unless they have symptoms of an ailment (Olack et al., 2015; El-Hay & El Mezayen, 2015).

Again it was identified during the field survey that a number of people had both systolic blood pressure (SBP) and diastolic blood pressure (DBP) higher than the normal range and were in the range where they could be considered hypertensive but had no idea of their situation until their blood pressure (BP) levels were taken by the research instruments. Majority of this situation existed in North Kaneshie and La, middle and low-income communities respectively with comparably lower levels of education than their counterparts in ARA. What this means is that

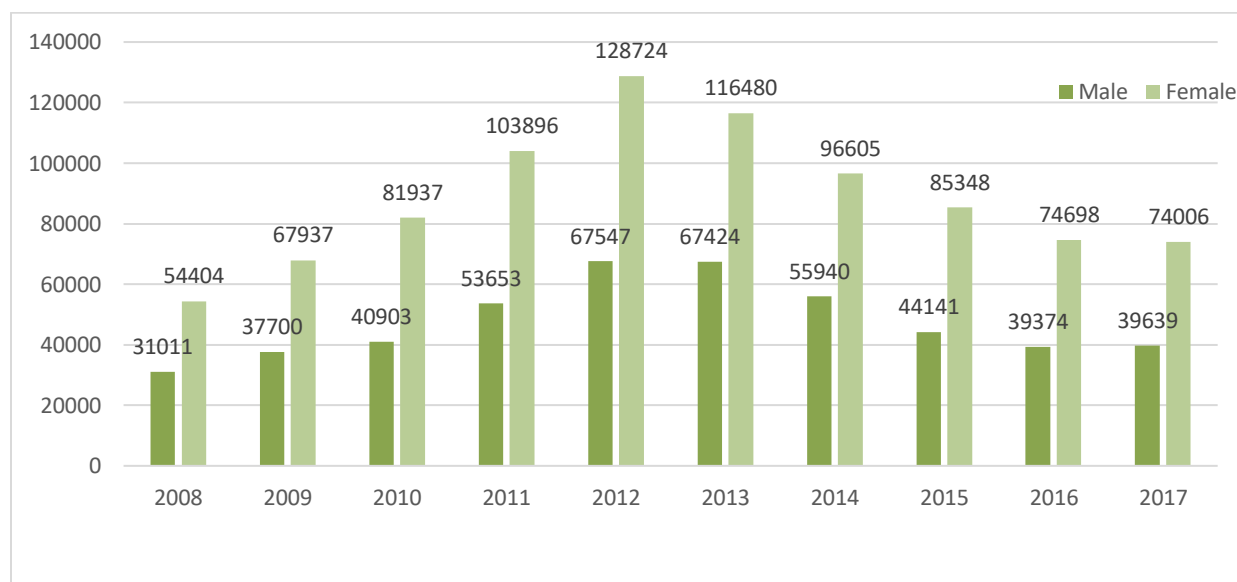
knowledge and accessibility (in terms of distance, money, among others) could prevent people from knowing their health status and this could influence the outcome of a survey depending on where it is conducted, taking into consideration the characteristics of the people. These arguments raised could be a basis for future research considerations.

It is obvious from the discussion above that field surveys alone may not be enough to determine prevalence, rise or probable decline of hypertension cases. Therefore there is a need to back this with secondary data from the health service which is being depicted and discussed below.

3.5 Trends of reported cases in Greater Accra Region.

There continues to be high reported cases of hypertension although much effort is being put in place to avert the menace as seen in the hospital data in Figure 3.1. Even though the results show that there has been a decline in reported cases from the year 2013 till 2017 in Greater Accra, the difference is not good enough.

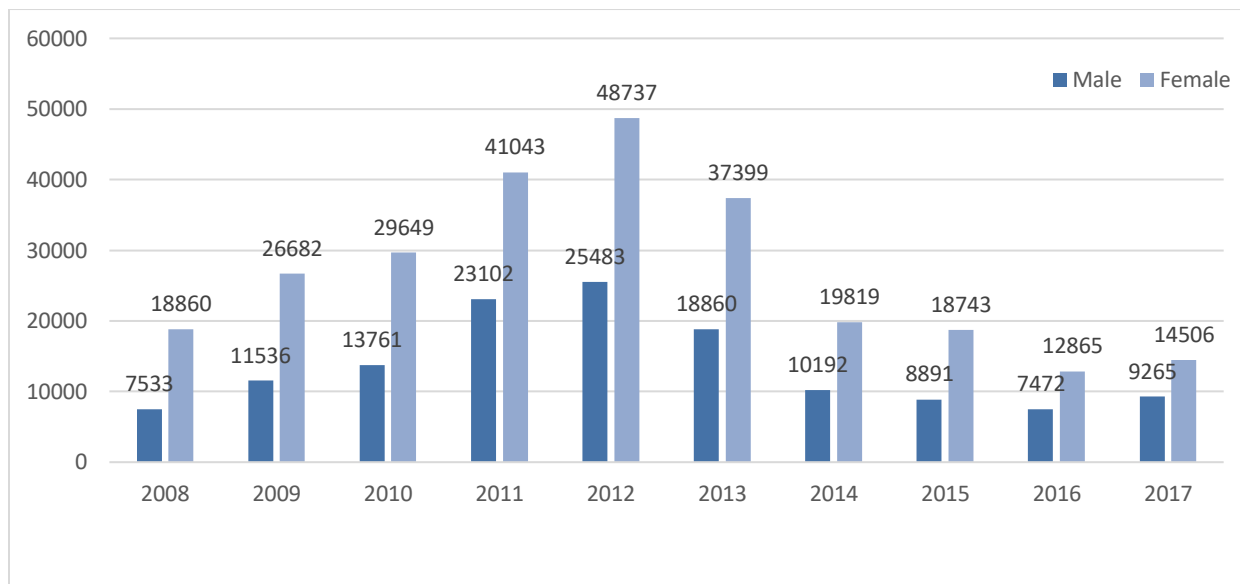
Figure 3. 1: Hypertension cases recorded in Greater Accra Region by sex from 2008 to 2017.



Source: GHS, 2018

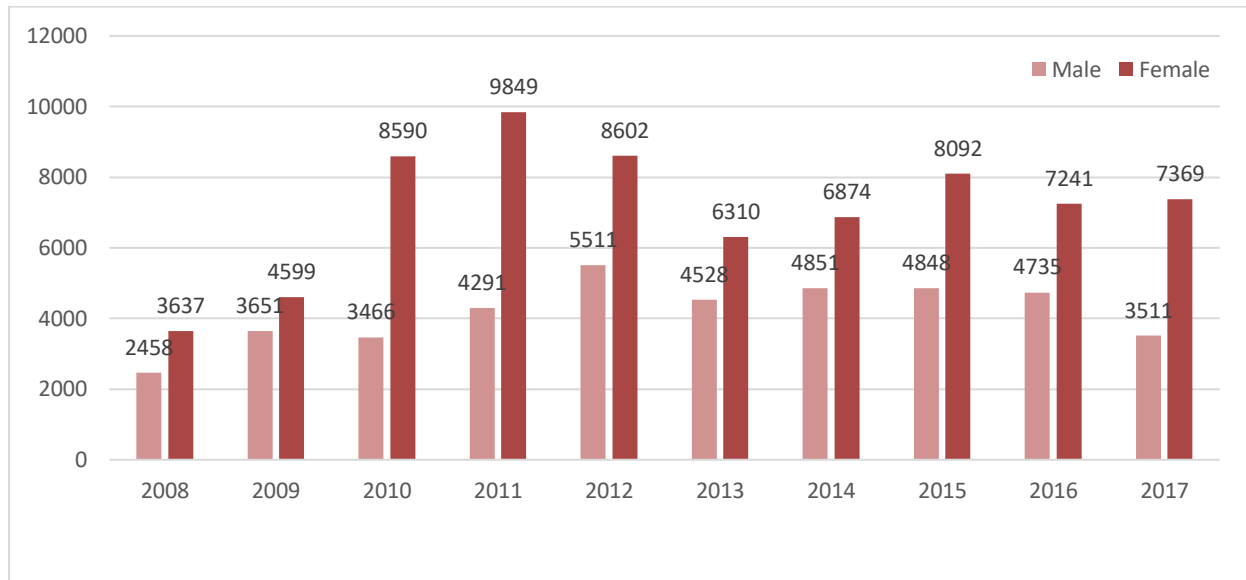
Meanwhile, the trend in the two study districts in Figures 3.2 and 3.3 seem to tell a different story from the overall picture. Recorded cases peaked at 2012 and have since been fluctuating, showing a rise in the most recent year 2017. In all cases, women are leading as the most affected.

Figure 3. 2: Hypertension cases in Accra Metro



Source: GHS, 2018

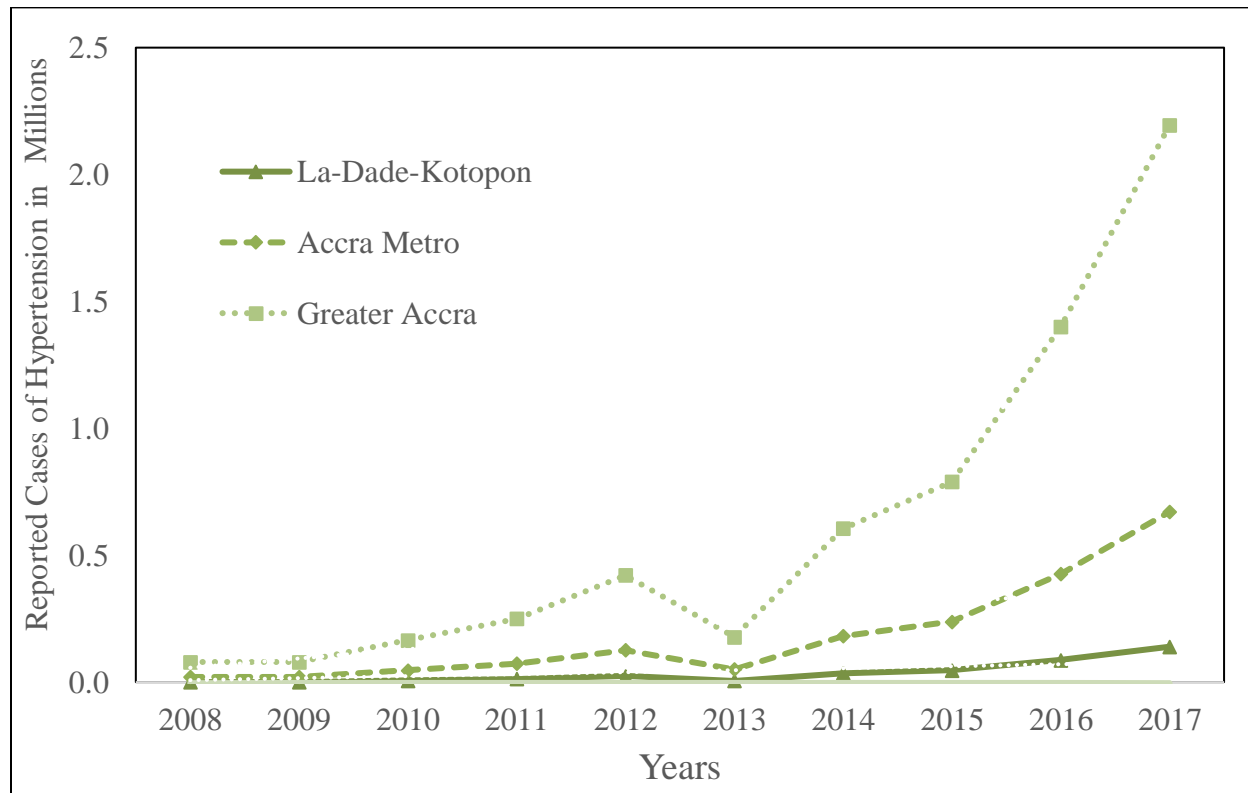
Figure 3. 3: Hypertension cases recorded in La Dade-Kotopon



Source: GHS, 2018

Generally, Figures 3.1, 3.2 and 3.3 above exhibit a steady growth of reported cases in hypertension in La Dade-Kotopon, Accra Metro and Greater Accra as a whole with slight variations across time. This is best displayed in the comparative trend analysis in Figure 3.4.

Figure 3. 4: Comparative trend analysis of reported cases of hypertension in La-Dade-Kotopon, Accra Metro and Greater Accra Region



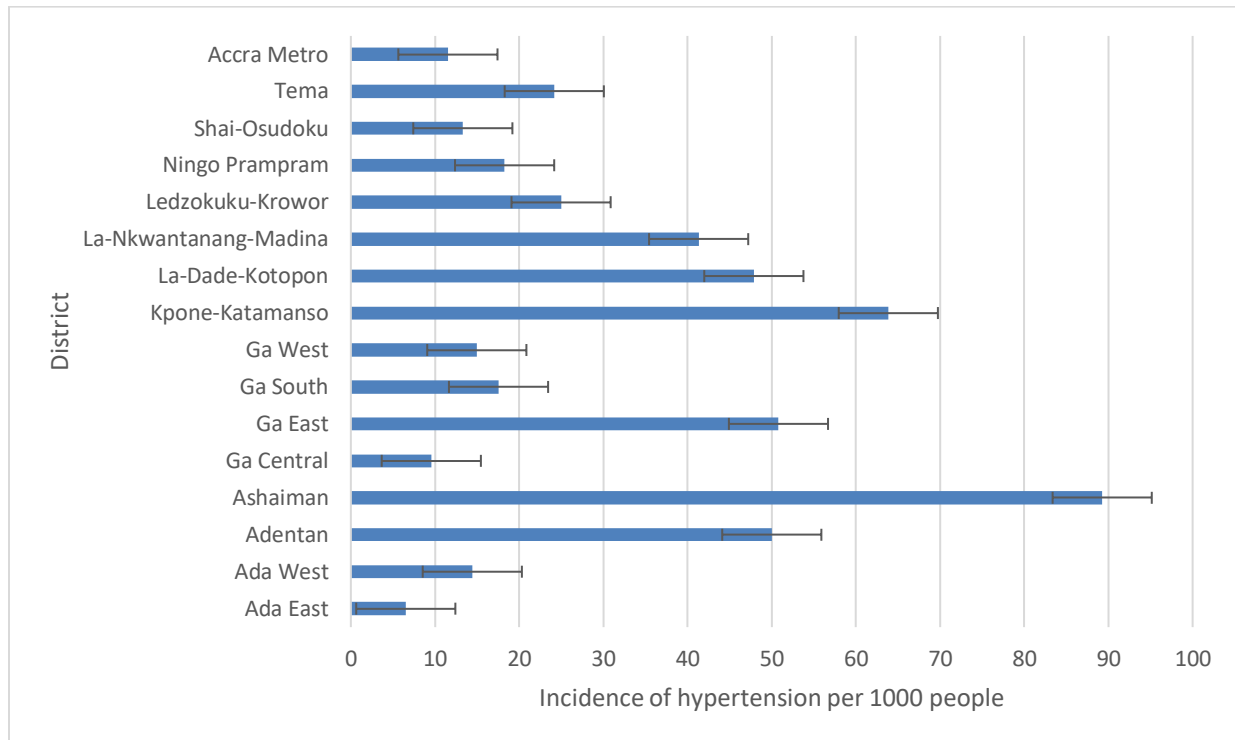
Source: GHS, 2018

Comparing the trend of hypertension in the two municipalities, it is obvious that Accra Metro has more reported cases across the period under study owing to the fact that it is a bigger municipality with higher population than La Dade-Kotopon. However, they both rise steadily from 2008 and peak at 2012, descend in 2013 and begins to rise again till 2017. This means the number of people being affected by the condition keeps increasing in Accra and the earlier necessary measures are taken to arrest this trend the better.

It is also seen that women are the most affected by the menace in all the districts displayed and in Greater Accra Region as a whole. Over the nine year period captured in Figure 3.3, 37 percent of

hypertension cases in La Dade-Kotopon were men with 62.9 percent women. About 66.3 percent of hypertension cases in Accra Metro over the same period were women with 33.6 percent men (Figure 3.2). Again, for the same period, Greater Accra Region has 65.1 percent cases of women with 34.9 percent cases of men (Figure 3.1). This confirms the higher prevalence rate of women over men in this study and means that women in Greater Accra Region are a little more than twice as vulnerable as men when it comes to hypertension. From the survey and in depth interviews, pregnancy came out as one of the top causes of hypertension in women and this to a large extent explains the variation of prevalence between men and women since pregnancy is exclusive to women.

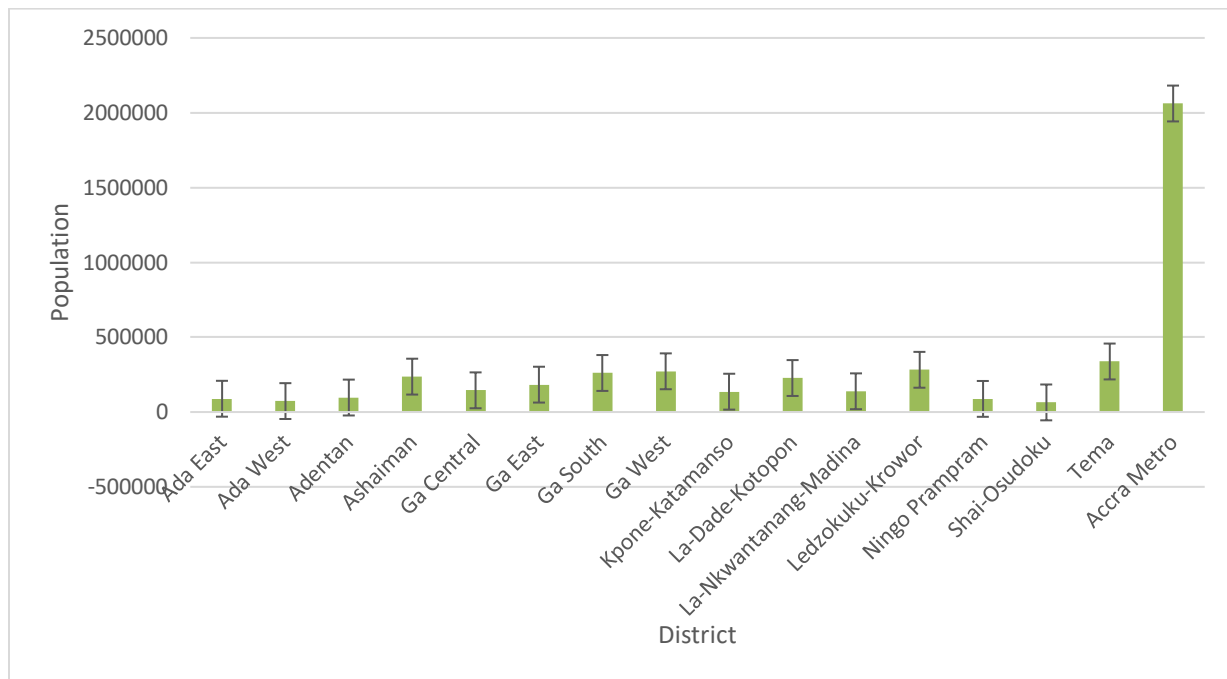
Figure 3. 5: Incidence of hypertension per 1000 people in GAMA, 2017



Source: GHS, 2018

Results from Figure 3.5 show that, Ashaiman has the highest prevalence per population size followed by Kpone-Katamanso and several others with Accra Metro being one of the least in prevalence compared with other districts within GAMA. Although Accra Metro has by far the highest population size among its cohorts as seen in Figure 3.6. This trend identified is interesting and requires further investigation into why districts like Ashaiman among others with very little population sizes have such high prevalence of hypertension.

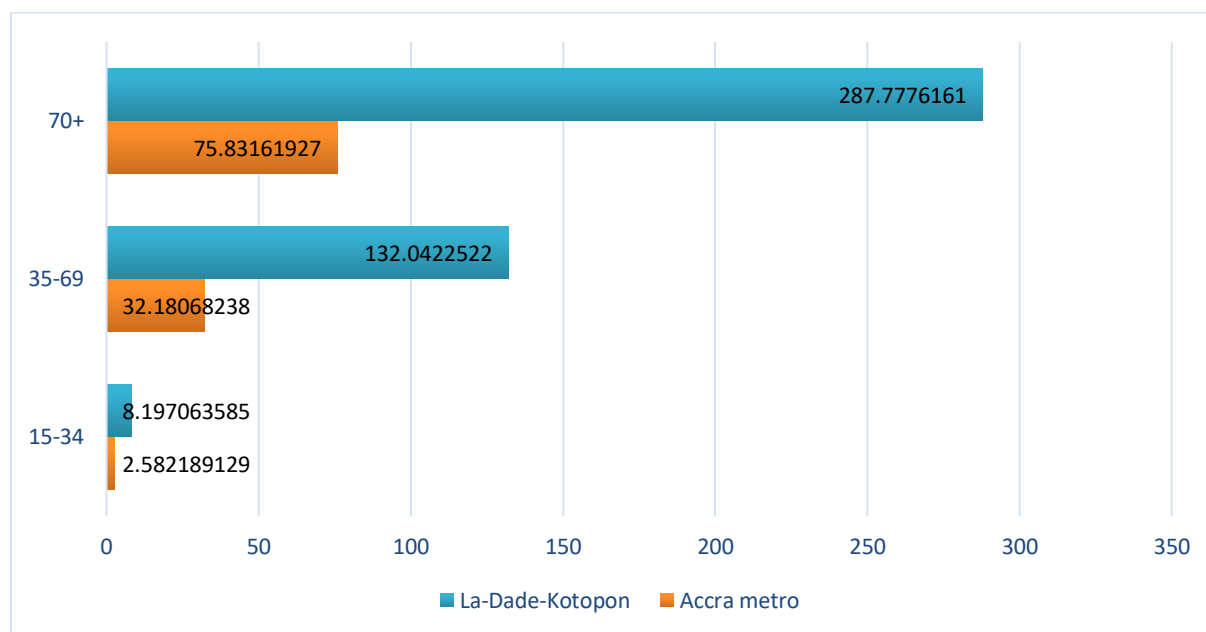
Figure 3. 6: 2017 population of selected districts in GAMA



Source: GHS, 2018

Another interesting discovery is the high prevalence in La Dade-Kotopon as against Accra Metro in all ages. This confirms the assertion by recent literature that low-income communities bear a huge burden of hypertension (Mpe, 2010; Olack et al., 2015). Figure 3.7 also shows that hypertension is higher in the older ages compared to younger ages, affirming the importance of age and lifestyle in its prevalence (El-Hay and El Mezayen, 2015). This means that the older one lives the higher his/her chances of becoming hypertensive.

Figure 3. 7: Age and incidence of hypertension per thousand population in AMA and La



Source: GHS, 2018

3.6 Economic strength and family burden

Stress is a known risk to hypertension and this can result from a number of situations including but not limited to employment status of individuals, family burdens and income levels, occupation, and one's environment. This chapter analyzes factors such as household size, employment status, household income, type of residential facility occupied and ownership status, and number of children/dependents all of which contribute to economic burden or socioeconomic status.

3.7 Household size, employment status and income levels

Most respondents (86.2%) are actively employed engaging in one economic activity or the other with only (12.9%) unemployed. The field data displayed in Table 3.3 presents household sizes and their respective average monthly income.

Table 3. 3: Average monthly income and household size

Household income categories (GHS)	Household size categories			
	1-3	4-6	7-10	Overall
1-500	76	73	8	157
501-1000	31	33	5	69
1001-1500	12	12	6	30
1501-2000	8	6	0	14
2001-2500	2	0	0	2
Above 2500	6	14	6	26
Overall	135	138	25	298

Source: Field Survey, 2018

Overall, 43.8 percent of respondents who fall within household bracket 1 – 6 earn an average income of GHS 1 – 500 monthly. About 18.8 percent of respondents who fall within the same household bracket earn an average income of GHS 501 -1000. About 7.1 percent of them earn 1001 – 1500. About 4.1 percent of them earn GHS 1501 – 2000, only 0.6 percent earn between 2001 – 2500, and 5.9 percent earn above GHS 2500. These amount to 80.3 percent with about 5.6 percent falling in household bracket 7 – 10 and earning up to GHS 1500. The remaining 14.1 percent are unaccounted for since a good number of respondents were reluctant to disclose their income. A total of 37.4 percent have up to three persons in a household and earn GHS 2000 or less, 36.5 percent have between 4 – 6 persons in a household and earn GHS 2000 or less. This shows that majority of the respondents 73.8 percent fall within the household bracket of 1 – 6 and earn less than GHS 2000. Household sizes were largely determined by the number of children a couple had with a trend of nuclear family system.

Results from Table 3.4 show that, only 15.3 percent of respondents within the 1 – 6 bracket who earn less than GHS 2000 have other sources of income ranging from about 100.00 to 1000. Other sources of income given by respondents included petty side business, support from working

children, friends and relatives abroad. Some of these incomes are not regular for all of them, especially those from friends and family abroad which comes in unspecified times of the year.

About 44.6 percent of respondents thought their income levels were low while 48.6 percent thought they had average income and a few thought they had high income. Cumulatively, 52.7 percent of different household sizes ranging from 1 – 10 persons depend on GHS 500.00 or less for a month, 23.2 percent live on up to GHS 1000 monthly and only 8.7 percent, most of which are found in the high income area, live on income above GHS 2,500.00 monthly.

Table 3. 4: Average monthly income and other sources of income

Household income categories (GHS)	Have other sources of income	Have no other sources of income	Overall
1-500	32(21.3%)	118(78.7%)	150(100%)
501-1000	12(16.7%)	60(83.3%)	72(100%)
1001-1500	6(20.0%)	24(80.0%)	30(100%)
1501-2000	2(14.3)	12(85.7)	14(100%)
2001-2500	2(100.0%)	0(0.0%)	2(100%)
Above 2000	12(50.0%)	12(50.0%)	24(100%)
Overall	66(22.6%)	226(77.4%)	292(100%)

Source: Field Survey, 2018

From Table 3.4, only 22.6 percent out of the 292 sampled population of all income levels said they had other sources of income. The majority (77.4%) said they had no other sources of income. According to Table 3.5, 46.1 percent of respondents who earn above GHS 2,500 were in ARA, 38.5 percent were in North Kasneshie while 15.4 percent were in La. Meanwhile, among those who earn between GHS 1 – 500, the least (1.3%) were in ARA, followed by North Kaneshie with 23.7 percent and the majority (75%) came from La. This confirms the economic differences in these communities. However, P-value of 0.000 shows there is significant relationship between one's location and his/her income level.

Table 3. 5: Household income per community

Household income categories (GHS)	Name of Community			
	ARA	North Kaneshie	La	Overall
1-500	2(6.7%)	38(37.3%)	120(69.8%)	160(52.6%)
501-1000	8(26.7%)	38(37.3%)	26(15.1%)	72(23.7%)
1001-1500	6(20.0%)	12(11.7%)	12(6.9%)	30(9.9%)
1501-2000	2(6.7%)	4(3.9%)	8(4.7%)	14(4.6%)
2001-2500	0(0.0%)	0(0.0%)	2(1.2%)	2(0.7%)
Above 2500	12(40.0%)	10(9.8%)	4(2.3%)	26(8.5%)
Overall	30(100%)	102(100%)	172(100%)	304(100%)

Source: Field Survey, 2018

Pearson Chi-square test

Parameter	Value
Number of valid cases	304
Chi-square value	89.136
Degrees of freedom	10
Significance	0.000

According to Table 3.6, more men have higher income than women as the percentage of men increases while that of women decrease as one climbs the income ladder. This may result from the proportion of educated men as against women in this context and the kind of economic activity that either of the sexes usually engage in. This difference in economic status may also account for why women have higher prevalence than men. The P-value of 0.002 in the chi-square test results below shows significant difference between gender and household income.

Table 3. 6: Relationship between gender and household income

Household income categories (GHS)	Name of Community		
	Male	Female	Overall
1-500	66(41.3%)	94(58.7%)	160(100%)
501-1000	40(55.6%)	32(44.4%)	72(100%)
1001-1500	16(53.3%)	14(46.7%)	30(100%)
1501-2000	12(85.7%)	2(14.3%)	14(100%)

2001-2500	2(100%)	0(0.0%)	2(100%)
Above 2500	18(69.2%)	8(30.7%)	26(100%)
Overall	154(100%)	150(100%)	304(100%)

Source: Field Survey, 2018

Pearson Chi-square test result

Parameter	Value
Number of valid cases	304
Chi-square value	18.862
Degrees of freedom	5
Significance	0.002

Again, results from Table 3.7 show that, the adult population generally earns higher income compared to the youth population but the adult population also tends to have more family responsibilities than the youth. This may also help explain the high prevalence in the adult population since people of higher income can afford highly processed foods which may contain high sodium over time compared to people with less income (Menyanu et al., 2017). However, chi-square test in the table below shows there is no significant relationship between level of income and age.

Table 3. 7: Relationship between household income and age

Household income categories (GHS)	Age groups		
	15 - 35	Above 36	Overall
1-500	82(51.3%)	78(48.7%)	160(100%)
501-1000	38(52.8%)	34(47.2%)	72(100%)
1001-1500	14(46.7%)	16(53.3%)	30(100%)
1501-2000	4(28.6%)	10(71.4%)	14(100%)
2001-2500	2(100%)	0(0.0%)	2(100%)
Above 2500	8(30.8%)	18(69.2%)	26(100%)
Overall	148(48.7%)	156(51.3%)	304(100%)

Source: Field Survey, 2018

Pearson Chi-square test result

Parameter	Value
Number of valid cases	304
Chi-square value	31.120
Degrees of freedom	15
Significance	0.008

3.8 Type of residential facility, ownership, and household income

3.8.1 Relationship between Household income and type of residential facility occupied

A huge number of households who have debt (81.1%) fall within the income bracket GHS 1 – 1,000 with the remaining 18.9 percent earning above GHS 1,000. It was observed from interactions with respondents that many of those who earned less than one thousand borrowed money from family, friends and other individuals to pay their wards’ school fees, take care of medical bills or purchase food for the household while those of higher income bracket especially those earning above GHS 2,500 borrowed from banks and other corporate bodies to do business and make profit. Due to the borrow and consume nature of the low income people, it is usually difficult for them to pay back their debts, thus increasing their economic pressure as compared to the higher income business men.

About 12.9 percent of the respondents live in self-contained houses, 4.1 percent in bungalows, 71.1 percent in compound houses, and 8.2 percent in other structures such as shared apartments, metal containers, office buildings, shops and wooden structures. Plate 5.1 below shows some wooden structures which serve as both shops in the day and home to occupants at night.

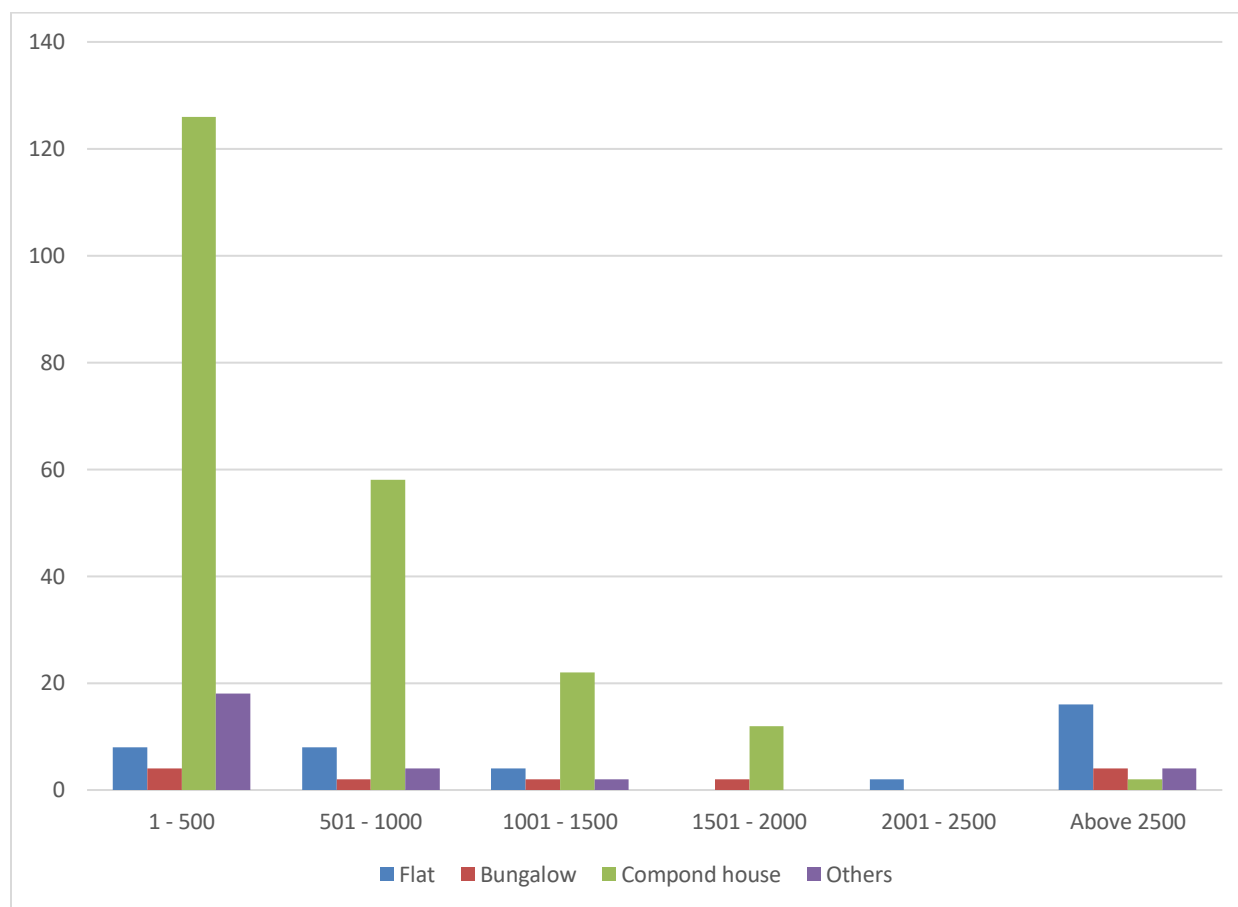
Plate 3. 4: Some wooden structures habited by some people in La



Source: Field Survey, 2018

A chi-square analysis ($p=.000 < 0.05$) shows a significant relationship between monthly income and type of residential facility occupied as seen in Figure 3.4 below. However, there is an inherent social aspect to this phenomena. The indigenes of Ga Adangbe are attached to their traditional families, hence some who are well to do still prefer to live in family houses and places close to their family.

Figure 3. 8: Household income and type of residential facility occupied



Source: Field Survey, 2018

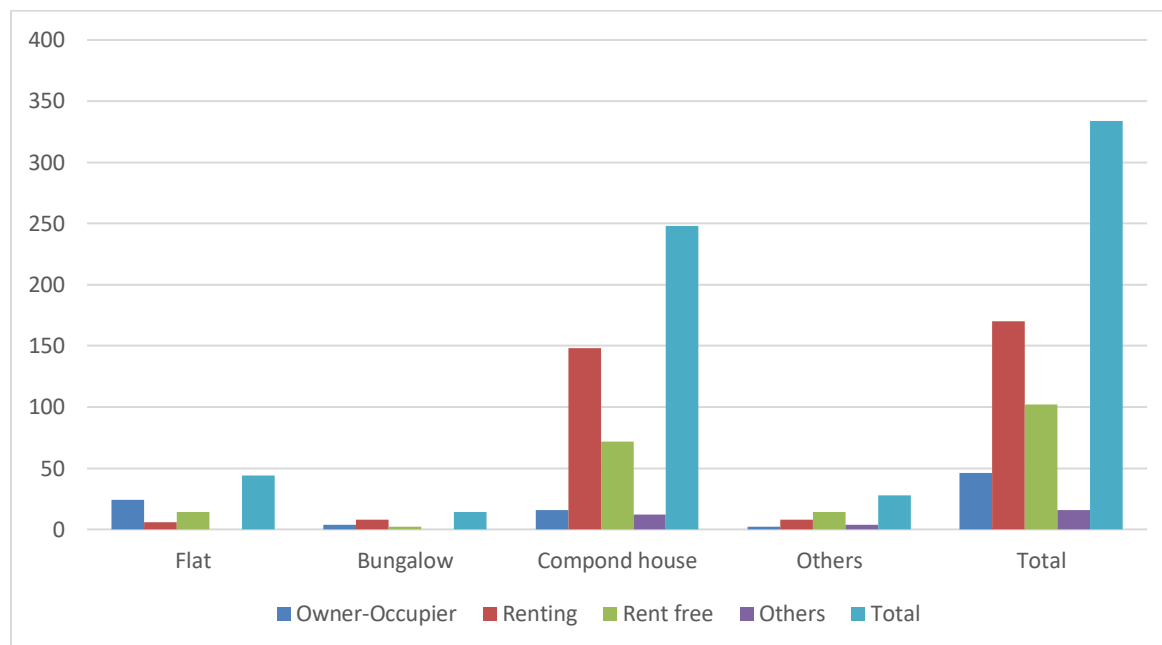
3.8.2 Type of residential facility and ownership

A greater portion of respondents, 50.0 percent, are renting their current places of abode, followed by those who have free occupancy (30.0 percent), then people owning their place of abode (13.5 percent) and (4.7 percent) who are either perching or living in some other structures outside of a normal house structure with a few others (1.8 percent) missing as displayed in Figure 3.5.

Figure 3.5 shows that majority of people living in flats own the facility while majority of people living in compound houses are renting. Only a few people rent flats while a few others own

compound houses. Quite a good number of people enjoy free occupancy with majority being in family compound houses followed by those in flats. Much of these free occupants are from La. This is because they are indigenes and also believe in the external family system and so most of the family members live together in houses built for them by an ancestor or in close proximity.

Figure 3. 9: Type of residential facility and ownership status



Source: Field Survey, 2018

3.9 Household income and hypertension vulnerability

Almost half of hypertensive patients receive a monthly household income of GHS 500.00 or less, followed by those who receive a monthly income between GHS 501 and 1000 with those who receive GHS 1,500 and above bearing the minimal burden according to Table 3.7a. This corresponds with the findings of a study done in Egypt which posits that insufficient household income contributes to higher HBP levels (El-Hay & El Mezayen, 2015). Another study that looked

at socioeconomic determinants of hypertension in South Africa saw a relationship between household income and increased BP levels (Cois and Ehrlich, 2014).

Table 3. 8: Relationship between household income and incidence of hypertension (Percent)

Income	Diagnosed with hypertension (%)	
	Yes	No
< GHS 500	34(21.5%)	124(78.5%)
GHS 501-1000	12(16.7%)	60(83.3%)
GHS 1001-1500	8(26.7%)	22(73.3%)
GHS 1501-2000	0(0.00%)	14(100%)
GHS 2001-2500	0(0.00%)	2(100%)
> GHS 2500	6(23.1%)	20(76.9%)

Source: Author’s computation from field survey, 2018

Pearson Chi-square test result

Parameter	Value
Number of valid cases	302
Chi-square value	5.740
Degrees of freedom	1
Significance	0.332

Source: Author’s computation from field survey, 2018

Chi-square test in Table 3.8b shows that, there is no significant relationship between income and being diagnosed with hypertension. It is however observed that as household income increases the probability that a member of that household would be diagnosed with hypertension decreases

though not significantly. Again, statistical test has proven this model unfit for the Ghanaian context. This means that lack of money alone may not be the cause of elevated blood pressure in Ghana but in combination with other factors.

3.10 Logistic regression analysis for the socio-demographic effects of hypertension

The study examined the role of lifestyle and environmental factors that make a person susceptible to hypertension in the Greater Accra Metropolitan Area (GAMA). This section presents findings from the regression analysis on the variables; community, age, sex, household debt, occupational anxiety, systolic blood pressure, diastolic blood pressure, pulse, income and marital status. These results have been presented in Table 3.9 below. The Pseudo $R^2 = 0.2185$ indicates that 22 percent of the variations in the dependent or outcome variable is explained by the covariates or independent variables. Also, the fitness of the overall model recorded a value of 0.000, indicated by the Prob > Chi 2. This implies that we are 95 percent confident in the predictive power of the model or goodness of fit of the model. However, because of missing values in the data and collinearity issues encountered in the analysis, the total sample size drastically reduced. Hence, in the regression analysis, the sample size of 280 was used for the analysis. Some of the reasons why the logistic (double log) model was chosen as an estimation technique over both linear and semi-log models is because of the following; first, with the double log model, the presentation of regression coefficients is treated directly as elasticity estimates (Fasakin, 2000). Secondly, there is a better estimate of the explanatory variable because the logit model translates the skewness of the frequency to a normal one (Fasakin, 2000). Further, the heteroscedasticity problem as much as possible is reduced to the minimum. And finally, because the stability and significance of the implied relationship is ensured, the explanatory power of the coefficient of multiple determinations becomes better (Fasakin, 2000; Arimah and Adinnu, 1995).

Table 3. 9: Logistic regression model for Household Hypertension

Explanatory variable	Odds Ratio	Marginal effects	P>z
Community (Base= Airport Residential Area)			
North Kaneshie	1.465517 (1.003)	0.0452933 (0.078)	0.577
La	1.339387 (0.8970)	0.0339516 (0.0744)	0.663
Age (Base = 15-35)			
Above 36	2.104083 (1.0573)	0.0899483 (0.0591)	0.139
Sex (Base = Female)			
Male	0.3542478 (0.1443)	-0.1290751 (0.0491)	0.011*
Household debt (Base = No)			
Yes	1.275778 (0.5358)	0.0305433 (0.0535)	0.562
Occupational anxiety (Base = No)			
Yes	1.331012 (0.526)	0.0347894 (0.0473)	0.469
Systolic blood pressure	1.033025 (0.01700)	0.004008 (0.0020)	0.048*
Diastolic blood pressure	0.9719021 (0.0243)	-0.0035156 (0.0031)	0.254
Pulse	1.025146 (0.0179)	0.0030635 (0.00213)	0.154
Income (Base = Below 500)			
501-1000	0.9358466 (0.065)	-0.0142585 (0.0131)	0.279
Above 1000	0.9982424 (0.120)	-0.0004186 (0.029)	0.988

Marital status (Base = Single)			
Married	4.025899 (2.383)	0.1465631 (0.055)	0.019*
Divorced	7.819472 (6.536)	0.2646296 (0.136)	0.014*
Widowed	32.70918 (29.337)	0.5714208 (0.1527)	0.000**
Consensual cohabitation	8.525777 (9.211)	0.2820275 (0.202)	0.047*
Constant	0.0008447 (0.0016)	- -	0.000**

Source: Author's own computation, 2018

N = 280

Pseudo R² = 0.2185

Pro > Chi 2 = 0.0000

Robust Standard errors in parenthesis

* *p*<0.05; ** *p*<0.01

The regression results in table 3.9 above shows the role played by environmental and lifestyle factors in making a person become vulnerable to hypertension. Using individuals who reside in airport residential area (ARA) as the base reference, residents of North Kaneshie are 0.466 more likely to be hypertensive than residents of ARA. This is, however, statistically insignificant. Likewise, residents of La are 0.339 (1.339387-1) more likely to be hypertensive with regards to their environment and lifestyle than residents of ARA. This is also statistically insignificant. This implies that, although the location or the community resided by the individual is not significant in explaining the environmental factors influencing hypertension, a positive relationship is seen. These findings are in consonance with studies conducted by (Bruce et al., 2009; Songsore et al., 1998; Owusu-Sekyere et al., 2016).

Age is also a factor determining whether the individual becomes hypertensive or not. Using the age range of 15-35 as reference, people who are 36 years and above are twice more likely to be hypertensive compared to individuals who are within the age range of 15-35. Although a positive relationship exists between the age of the individual and hypertension, it is not statistically

significant. This implies that, as one gets older, the likelihood of he/she becoming hypertensive is high. Similar finding is seen in the study by Kayima et al., (2015).

With regards to the sex of the individuals, using females as a reference, males are 0.646 (1-0.3542478) less likely to be hypertensive compared to females. The hypertensive level of the individual is likely to reduce by approximately 13 percent for males than for females. This is statistically significant at 5 percent alpha level but a negative relationship exists. This means that women are more vulnerable to hypertension and this is consistent with obtained secondary data from Ghana Health Service (GHS 2018, p 60 and 61).

Economic status has a dire impact on the individual's health. Corollary, the income level of a person also influences their health status. The income level of the individual is statistically insignificant across all three income levels. Using individuals who earn below Ghc 500 as the base reference, individuals who earn between Ghc 501-1000 and above Ghc 1000 are 0.0642 (1-0.9358466), and 0.0018 (1-0.9982424) less likely to be hypertensive. Another variable that influences the likelihood of being hypertensive is the household debt status. The household debt level although not significant in determining whether one is hypertensive or not, has a positive relationship with the level of hypertension. Thus, relative to households that are debt free, which is the base, households that are in debt are 0.27577 (1.27577-1) more likely to be hypertensive than their counterpart households who are debt free. This is likely to cause the hypertension level of debtors to increase by approximately 3 percent. This is consistent with studies such as El-Hay and El Mezayen, (2015) who found that insufficient household income has the potential to increase one's vulnerability to hypertension.

The scientific literature has established a relationship between the job/work of the individual with their level of hypertension. Usually, occupational anxiety is related with hypertension level. Individuals that have works or jobs that are stressful are 0.331 more likely to be hypertensive compared to their counterparts who have a stress-free work/job which is the base reference in this case. Thus, one's environment and conditions of work may influence his/her blood pressure (Oyunbileg et al., 2015; Lucini et al., 2007).

A very important factor influencing hypertension is the blood pressure and the pulse, which is the rate at which the heart beats. The blood pressure is measured by systolic and the diastolic blood

pressure. From the regression results, above, the systolic blood pressure is statistically significant at 5 percent alpha-level. While, the systolic blood pressure is 0.33 more likely to make the individual become hypertensive and has a positive relationship with the hypertension status of the individual, the diastolic blood pressure of the individual and the hypertension level is unrelated and statistically insignificant. Thus, the diastolic blood pressure is 0.0281 less likely to result into hypertension. Perhaps, this is so because the diastolic blood pressure and the hypertension level are negatively related. So, for any proportional increase in the systolic blood pressure, hypertension level increases. The rate at which the heart beats, given as the pulse, is 0.025 more likely to result into hypertension which is statistically significant. Thus, individuals with higher pulse rates or heart beats are more probable of being hypertensive.

Deducing from the above results, only three variables are significant to hypertension development. These are gender, marital status and systolic blood pressure, although many other variables have positive relationship with hypertension. This means that most of the known risk factors for hypertension development do not work in isolation but work in combination with others to bring the outcome.

3.11 Summary

The Greater Accra Metropolitan Area is a central business area which is saturated by a great number of businesses and economic activities both formal and informal. This has resulted in the influx of people especially the youth from all parts of Ghana and even abroad to take advantage of the business opportunities it presents. La is largely an indigenous community with petty trading, commercial driving and fishing as some of their main economic activities. It is characterized by poor environmental conditions such as inadequate water supply, poor solid and liquid waste management, and lack of in-house toilet facilities, inadequate planning, overcrowding and lack of social amenities, all of which are vulnerability indicators. North Kaneshie and ARA are both cosmopolitan with variations in number of indigenous people and migrants as well as environmental conditions. All three communities have different socioeconomic backgrounds,

degree of resilience and vulnerabilities to hypertension. Prevalence in hypertension is highest in the low-income community and lowest in the high income community. This is also affirmed by existing hospital records across the various districts and the entire region. Higher prevalence in women has been attributed to emotional experiences and amount of daily experiences of stress by medical experts as well as pregnancy. From the existing health data from GHS (2018), there has been a steady growth of hypertension year on year from 2008 with some fluctuations after 2013 to date in both Accra Metropolitan Assembly and La Dade-Kotopon. However, hospital records show that Ashaiman, Kpone-Katamanso, Ga East among other districts with comparably lower population sizes than Accra Metro beat Accra Metro by far in incidence per thousand population analysis. There is therefore the need for a quick public health response in these vulnerable communities to avert the risks that come with the condition.

Majority of households in this survey fall in the household sizes 1 – 3 and 4 – 6 respectively. Household sizes were largely determined by the number of children a couple has. Majority of households earn GHS 500.00 or less followed by those who earn up to GHS 1,000.00. The minority have higher income with some earning beyond GHS 2,500.00. Most people didn't have any other source of income and perceive their income levels as either low or average. This connotes insufficient household income for most households. Many households especially those within the lower income range borrow to supplement their livelihood worsening their economic burden. There is a significant relationship between household income and one's location; while majority of high-income earners were found in ARA the majority of low-income earners were found in La. It was also identified that majority of people lived in compound houses where a set of different households dwelled together with next door neighbours in the same open compound mostly on rental basis. This is followed by those who lived in flats where only one household occupied a

home with their own compound usually in a gated house and mostly occupied by the owners with a few others renting. Amidst other facility types are containers and wooden structures occupied by a fraction of the respondents. Lastly, most hypertensive patients were found in the low income bracket of GHS 1 – 500 and 501 – 1000 respectively confirming the report by El-Hay & El Mezayen (2015) that insufficient household income predisposes individuals to elevated BPs. Although statistical test reveals there is no significant relationship between incidence of hypertension and household income, a trend is established in this study where the higher one earns, the less likely he is to be diagnosed with hypertension. However, it can be concluded that insufficient household income alone does not determine one's susceptibility to hypertension but does combine with other factors to bring the outcome. Results from the binary regression model shows that with the exception of SBP, gender and marital status, all other variables tested do not independently affect increases in blood pressure levels but in combination, they positively affect elevated blood pressure.

CHAPTER FOUR

ASSESSING LIFESTYLE AS A RISK FACTOR

4.1 Introduction

Risk is part of life, which can only be managed but not banned. Risk management involves reducing hazardous risks to optimally achieve safety or a state of security for even unmanageable risks. Man is faced with enormous risks daily in most of his actions and inactions such as the choice of food/drink to take, the choice of work, physical activities to undertake, duration of sleep and how one chooses to spend his leisure time. All of these choices individuals make daily have consequences on their health. Knowledge of such hazards and potential risks to our health offers one with the option to make healthier choices to avoid ill health in this case hypertension as the Health Believe Model (HBM) posits. These are being discussed in this chapter.

4.2 Fast Food Consumption

Globalization and rapid urbanization has enormous benefits such as bringing the world market closer to individual's doorstep which has made available to everyone, even the poor, all kinds of processed and fast foods. Results from this study as seen in Table 4.1 show that, 20.5 percent of sampled participants who have been diagnosed of hypertension said they take at least one processed/fast food daily ranging from biscuits, pizzas, burger noodles, canned fish/meat, fried foods (rice, potato, yam, chicken etc.), among others. It is obvious that accessibility and high patronage of these foods are major contributors to hypertension prevalence in the society today. Health experts interviewed in this survey confirmed that, high salt consumption is a predisposing factor to hypertension. A study that looked at salt use behaviour among both Ghanaians and South

Africans found out that there is high dietary salt intake in both rural and urban areas in Ghana and also named processed foods as the main culprits (Menyanu et al, 2017).

Table 4. 1: Relationship between Fast food intake and incidence of hypertension (Percent)

Do you take Fast food	Has any medical doctor diagnosed you of hypertension	
	Yes	No
Yes	64(20.5%)	312(79.5%)
No	4(16.7%)	20(83.3%)

Source: Author’s computation from field survey, 2018

Pearson Chi-Square test result

Parameter	Value
Number of valid cases	336
Chi-square value	0.204
Degrees of freedom	1
Significance	0.651

Source: Author’s computation from field survey, 2018

Results from Table 4.1 above show that, 20.5 percent of the sampled population who claim to have been diagnosed with hypertension by a medical doctor do take fast food and also 79.5 percent of those not diagnosed with hypertension also take fast food. Statistically, there is no significant relationship between consumption of fast food and being diagnosed as hypertensive as seen in Table 4.1b above. This also does not fit into the existing model where fast food consumption has an influence on elevated BPs. This is because, even though Ghanaians do take processed/fast

foods, they do not solely depend on them like exists elsewhere. In more advanced countries like America, people may depend on processed/ fast foods for the whole day for most part of the week owing to cultural differences as retorted by a 67 year old African American woman based in the USA;

“In America no women cook except African women who have moved there not long ago. We don’t cook, we just call the restaurants and place order for food and it will be served at our door steps”.
(67-year old woman, A Cameroon National based in the USA, April 8, 2018)

Ghanaians on the other hand combine fast foods with home cooked food. Even though a lot of respondents admitted taking fast foods, most of them do that once in a blue moon, sometimes during occasions like parties and Christmas because most people cannot afford them every day. A 65-year old woman in North Kaneshie had this to say;

“Yes I take the fried rice and all that, I like them but only when someone buys it for me. Once in a while my working daughter will buy some for me to eat” (A pensioner in North Kaneshie, March 15, 2018).

Again, culturally most people are trained to cook their own food so if one is seen buying food outside most of the time, they are said to be lazy, especially the women. Hence the amount and frequency of fast food intake alone cannot be the cause of hypertension in Ghana but may combine with other predisposing factors.

4.3 Physical Activity

Physical activity here is the deliberate aerobic training or exercise done for health reasons and to keep fit. Generally, most respondents (54.7 percent) do not have the habit of exercising. About

52.4 percent of sampled population within income bracket of GHS 1,501 – 2,500 and above do exercise while only 44.3 percent of those in income bracket GHS 1 – 1,500 do exercise. According to Tables 4.2 and the chi-square test result, level of education has an influence on exercise hence it is identified that those who have tertiary education have a higher tendency to exercise compared to other levels of education. Those with no formal education have the least interest in exercise.

Table 4. 2: Level of education and exercise

Do you exercise?	Highest level of education				Total
	None (No formal education)	Basic school	SHS/Vocational/ Technical	Tertiary	
Yes	2	75	38	39	154
No	12	85	60	27	184
Total	14	160	98	66	338

Source: Author’s computation from Field Survey, 2018

Pearson Chi-square results

Parameter	Value
Number of valid cases	338
Chi-square value	18.578
Degrees of freedom	4
Significance	0.001

Source: Author’s computation from Field Survey, 2018

About 68.7 percent of respondents from ARA do exercise, 38.9 percent of those from North Kaneshie do exercise while 45 percent of respondents from La also claim to exercise. This means that aerobic training or exercise is associated mostly with high income earners and people in high-income community compared to low-income earners and people of low to middle-income communities. Majority of respondents from middle and low income communities are involved in petty trading while those in high income community are in white colour jobs, all of which lead to

daily sedentary lifestyles. Most of them claim their occupation required extended periods of sitting. About 68.6 percent of hypertensive patients also said their occupation required extended periods of sitting. Results from Table 4.3 shows that, more than half of hypertensive patients (52.9%) claim they do not exercise. Among those who exercise, 47.1 percent of them consider mere daily movement and their work as exercise so very few engage in actual aerobic training. This study has revealed a high prevalence of hypertension among people of sedentary lifestyle as seen in other studies (Sikiru and Okoye, 2014; Adisa et al, 2017).

Table 4. 3: Physical activity and vulnerability to hypertension

Household income categories (GHS)	Do Exercise (%)	Do not exercise (%)	Overall
Incidence of hypertension	47.1	52.9	100
No incidence of hypertension	44.4	55.6	100
Overall	44.9	55.1	100

Source: Field Survey, 2018

Peasron Chi-Square results

Parameter	Value
Number of valid cases	336
Chi-square value	12.166
Degrees of freedom	2
Significance	0.002

A Chi-Square test of ($p=.002$) in the table above, shows a significant relationship between exercise and susceptibility to hypertension. The type of exercise one engages in is equally important, showing a significant relationship of ($p= 0.000$). Continuous intense aerobic training is essential for low blood pressure levels since it also burns up fats and bad cholesterol stored up in the body to allow free and easy blood flow, thus reducing the stress with which the heart pumps blood through the respective veins and arteries. This is in line with Olack et al, (2015) who mentioned

physical inactivity as one of the important risk factors to hypertension in their study. It was identified that previous injuries in any part of the body played a role in the low physical activity since about 57.1 percent had had at least one form of injury before, though some said it wasn't a reason for their not exercising.

4.4 Alcohol consumption and smoking

Results from Table 4.4 show that, less than half of the sampled population who claim to have been diagnosed of hypertension (37.1 percent) take alcohol, and only 7.7 percent admitted taking it daily while 38.5 percent took it occasionally. About 46.2 percent have been taking it for more than ten years while the least (7.7 percent) have been taking it for less than a year. Only two of them admitted to smoking both of whom smoke daily and have smoked for more than ten years. As per findings in this study, alcohol consumption and smoking also play a role in susceptibility to hypertension although they are not in the majority. According to Okwuonu et al, (2014) alcohol reduction and physical activity have in the long-term led to a reduction in blood pressure.

Table 4. 4: Relationship between alcohol in-take versus incidence of hypertension (Percent)

Do you take Alcohol	Has any medical doctor diagnosed you of hypertension (%)	
	Yes	No
Yes	37	35
No	63	65
Total	100	100

Source: Field Survey, 2018

Pearson Chi-square test results

Parameter	Value	
Number of valid cases	336	
Chi-square value	0.159	
Degrees of freedom	1	
Significance	0.690	

Source: Field Survey, 2018

According to Table 4.4b above, there is no significant relationship between alcohol intake and being diagnosed with hypertension. Only 37 percent of the respondents who have ever been diagnosed with hypertension do take alcohol. However, Chi-square test for how often one takes alcohol is ($p= 0.001$) showing a significant relationship between regular consumption of alcohol and incidence of hypertension.

4.5 Summary

The risk of hypertension has been associated mostly with lifestyle choices such as food, alcohol consumption, physical inactivity, social life, number of hours one is able to rest among others (Houston, 2014; Farquhar et al, 2015; Sikiru & Okoye, 2014). Long high intake of dietary sodium has become an issue of concern as long as hypertension is concerned, hence reducing intake of dietary sodium has taken the front as a new direction to lowering BP in hypertensive patients and reducing the number of hypertensive patients in the future (Drenjančević-Perić et al, 2011; WHO, 2017; Menyanu et al 2017). Nevertheless, there was no significant relationship between fast

food/high dietary sodium intake and incidence of hypertension in this study owing to the fact that Ghanaians depend more on home cooked foods than processed/fast foods. Again, physical activity or otherwise inactivity plays an important role in susceptibility to hypertension. Results from this study show low physical activity especially deliberate aerobic training and more sedentary lifestyle contributing to the high prevalence of hypertension. There is a significant relationship between lack of exercise and incidence of hypertension as well as type of exercise undertaken and incidence of hypertension as identified in some earlier studies (Sikiru & Okoye, 2014; Adisa et al. 2017). A fraction of hypertensive patients consume alcohol. While there is no significant relationship between alcohol consumption and incidence of hypertension, there is a significant relationship between how often alcohol is consumed and the incidence of hypertension as seen in other studies (Okwuonu et al, 2014).

CHAPTER FIVE

ASSESSING RISK PERCEPTION AMONG RESPONDENTS

5.1 Introduction

To assess the knowledge on predisposing factors to hypertension, perception of people about who is more vulnerable to hypertension and prevention was undertaken by this research. The goal was to find out experiences of respondents and what they have already learnt about hypertension in general and whether or not this knowledge is informing their way of life. These are analyzed and discussed in this section.

5.2 Awareness of causes and prevention of hypertension

It is identified from Table 5.1 that less than half of the respondents (34.4%) were aware of hypertension and some of the causes. What this means is that these people have the advantage to make positive health behaviour choices to prevent hypertension or better manage and keep it under control if they already have it as suggested by the HBM, (Janz & Becker, 1984). Some causes allotted to hypertension by this group include poor dietary options, abuse of alcohol and tobacco, stress and excessive thinking. More than half (55.9%) had no idea at all of what causes hypertension while (4.7%) did not respond to this variable. Lack of knowledge makes these people more vulnerable to hypertension compared to their counterparts with good information of the condition.

Table 5.2 also shows similar results when it comes to knowledge of prevention of the condition with the highest (54.7%) not having any clue as to how to prevent hypertension, (37.1%) had ideas

of prevention which includes avoidance of alcohol and tobacco use, less stress and thinking, good dietary options among others and non-respondents were (8.2%). When asked who they considered more vulnerable to hypertension, those who had knowledge about it attributed vulnerability to obesity, joblessness, the aged, diabetic patients, people who took too much salt among others. A 47 year old woman, an office clerk in North Kaneshie had this to say;

I think the high rate of unemployment in this nation is a contributing factor to increases in high blood pressure especially among the youth. Someone will spend so much time studying in school making use of resources provided by his/her parents. Once you are out of school, it is expected of you to work and also bring some form of support home but some people have been at home for more than three years without employment and this jobless situation causes them to think a lot which is not good for their health. Again, drug users and people who abuse alcohol stand a higher chance of having elevated blood pressure as well as those who take too much salt. (A 47 year old clerk, February 24, 2018. North Kaneshie)

Table 5. 1: Knowledge of hypertension per community

Communities	Knows the causes of hypertension	Do not know the causes of hypertension	Total
Airport Residential Area	24	8	32
North Kaneshie	44	60	104
Labadi	66	122	188
Total	134	190	324

Source: Field Survey, 2018

Generally, it was identified that knowledge of the condition is low corroborating findings from similar studies in Africa (Olack et al, 2015; Adeloje and Basquill, 2014; Ibrahim and Damasceno, 2012). The lack of knowledge deepens as one moves from higher socioeconomic communities to lower socioeconomic communities which could be attributed to wide differences in educational

backgrounds as seen in Table 5.1. A cross-sectional study done among rural Chinese to assess knowledge of the condition including 665 hypertensive and 854 non-hypertensive respondents revealed very low knowledge levels which is similar to the low income community studied in this research (Li Xia et al, 2013).

Overall, only 20.7 percent knew they were hypertensive instead of a total of 39.5 percent who had blood pressure levels above the normal (120/80). As many as (18.8%) respondents who responded “no” to ever been diagnosed of high blood pressure discovered upon field testing that they had SBPs and DBPs equal or higher than 140/90 by which one can be said to be hypertensive (AHA, 2016; Drenjančević-Perić, et al., 2011). Respondents within this group recorded very high blood pressure with the highest SBP being 200 and DBP being 139. It is dangerous for people of such high blood pressure (others recording between 157/99 – 189/104) not to know of their condition because this could lead to very serious CVAs and CVDs and at worse unannounced deaths (Sim et al., 2015). There is therefore low detection, treatment and control of hypertension as also identified by Cappuccio et al (2004) in their study. Mbewu, (2009) has attributed low hypertension detection to high proportion of hemorrhagic cerebrovascular accidents (CVAs), while most CVAs occur in older people in developed countries. A 59 years old man in La gave an account of how one of his relatives died;

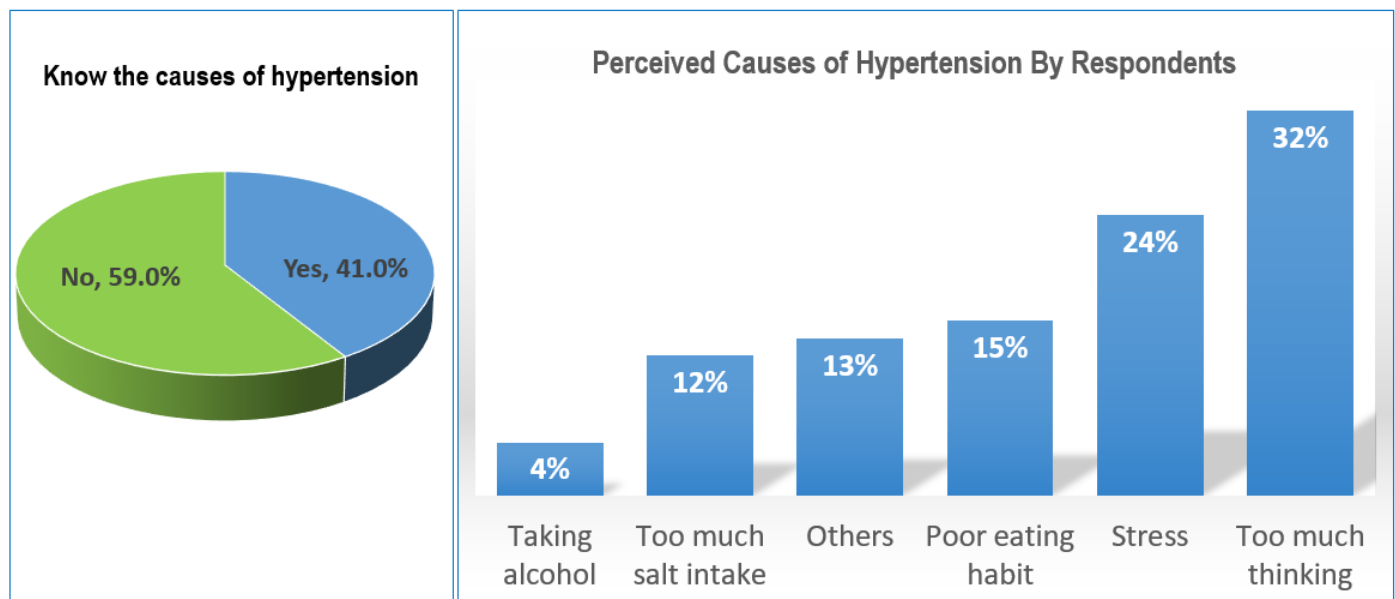
“He did not know he was hypertensive, he was just not feeling well in his body so he went to the hospital for a normal checkup and it was discovered his BP was very high and he was admitted but he never came back home. The one time discovery of his BP condition killed him”. (A 59 year native of La, March 17, 2018).

Table 5. 2: Knowledge of prevention/control per community

Communities	Knows the preventive/control measures of hypertension	Do not Knows the preventive/control measures of hypertension	Total
Airport Residential Area	20	12	32
North Kaneshie	46	52	98
Labadi	60	122	182
Total	126	186	312

Source: Field Survey, 2018

Figure 5. 1: Knowledge and perceived causes of hypertension by respondents



Source: Field Survey, 2018

Most of the respondents do not know the causes of hypertension. However, among those who claim they know, about 32 percent of them perceive hypertension is caused by too much thinking, followed by those who think it is caused by stress (24%) and the least being perception of alcohol intake (4%).

5.3 Hypertension control and management

Overall, 65.7 percent of hypertensive patients are on medication to manage their condition. A Chi-square test of ($p=.000$) shows there is a significant relationship between hypertensive patients and hypertension management. About 54.3 percent of them adhere to the medication, only 26.1 percent of them affirmed treatment is helpful and keeps their condition under control while 17.4 percent said they experience no impact at all from the medication hence their conditions were persistent. The remaining 56.5 percent just take the medication as a normal routine without knowing what it does for them so they are usually not consistent. It was realized that some hypertensive patients hold certain myths about their antihypertensive medication such as;

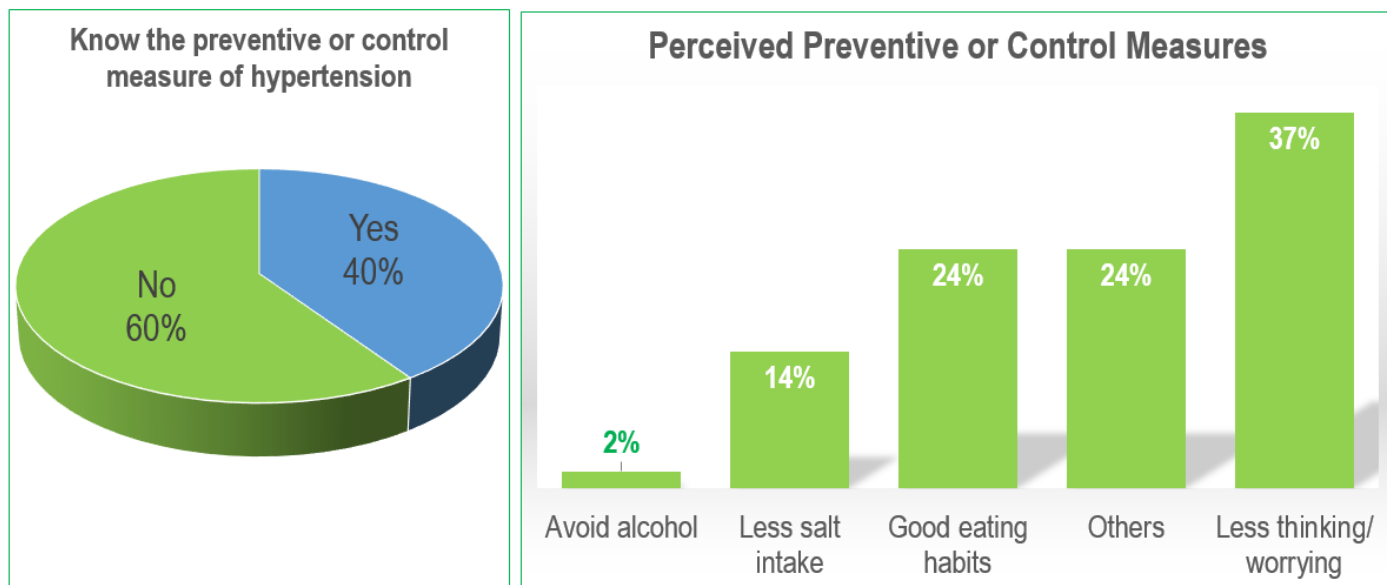
“Once you begin to take orthodox medicine for hypertension treatment, you will continue to take it until you die, there is no cure for hypertension, and the medication worsens the condition so it is better to control it by desisting from certain habits rather than taking drugs”. (A 52 year old security man, March 20, 2018, ARA)

Another person also said taking antihypertensive medication causes her to panic so she would rather not take it while others claim taking too much medication in general causes their hearts to beat faster. Low knowledge of hypertension and behaviour towards its management by victims is a true reflection of the HBM. This is what a nurse had to say as part of the myths patients hold;

The men usually don't like taking their antihypertensive drugs because they claim it renders them impotent in the long run. This idea is born from the fact that the drugs help relax one's nerve and heart vessels and since affected people may be aging already and cannot perform as they used to in their younger age, they say adding antihypertensive

drugs worsens their plight in bed so they will rather not take them. (From a nurse at Kaneshie Polyclinic, March 22, 2018)

Figure 5. 2: Knowledge and perceived preventive/control measures.



Source: Field Survey, 2018

Most of the respondents do not know the preventive or control measures for hypertension. However, among those who claim to know, about 37 percent of them perceive hypertension can be mitigated by less thinking and the least being avoidance of alcohol consumption.

5.4 Summary

A few people had ideas about what hypertension is and attributed some of the causes to poor dietary options, abuse of alcohol and tobacco, stress and excessive thinking. More people had no idea about the condition making them more vulnerable according to the HBM. Vulnerability to hypertension was associated with age, diabetic patients, obesity, high intake of dietary sodium and alcohol and tobacco abuse among others. There is low detection and self-reporting because people

scarcely walk to the hospital voluntarily for checkups. Low detection has been attributed to the occurrence of high CVAs (Mbewu, 2009). However, results from this study shows that most hypertensive patients are on treatment and adhere to the treatment. A few others hold some myths about the antihypertensive drugs and would rather prefer other forms of treatment other than taking the drugs.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter presents the results of the study which includes summary of the findings with respect to differences in socio-environmental conditions of the communities and their prevalence, socioeconomic differences and susceptibility, the role of lifestyle as a risk factor and perception of risk of hypertension. Generally, this section draws conclusions and makes recommendations of the research. Effort at proposing future research areas were also considered.

6.2 Summary of findings

6.2.1 Socio-environmental conditions and prevalence

The findings from both quantitative and qualitative survey suggest a higher prevalence of hypertension in low-income communities compared to their counterparts in high-income communities. Inadequate planning, poor environmental conditions coupled with lack of certain basic social amenities are causes of environmental stresses which directly or indirectly affect people's health.

6.2.2 Higher prevalence in women

From both the field survey and existing data from GHS, women are more vulnerable than men, taking as much as two thirds of the disease burden. According to health experts, this is because women are too emotional, worrying themselves about so many things both important and trivial,. Again, pregnancy induced hypertension contributes to their menace together with a lot of lifestyle related issues.

6.2.3 The role of lifestyle in elevated blood pressure

Lifestyle and choice of diet are major contributors to hypertension development. Poor choices of diet such as high consumption of fatty foods, dietary sodium and late night eating cannot be over emphasized. Abuse of alcohol greatly influences elevation of blood pressure. Physical inactivity or lack of exercise also plays an important role in making people vulnerable to hypertension.

6.2.4 Age and level of education.

Old age, as seen in several studies, has been confirmed by the results of this study as an important indicator for hypertension vulnerability. Illiteracy is another culprit to hypertension vulnerability as found in the study that majority of hypertensive patients had either low level of formal education or no formal education at all.

6.2.5 Economic burden

Both insufficient household income and number of dependants are economic burdens which predispose people to hypertension even though not significantly related to the incidence of hypertension. There is a significant relationship between household debt and incidence of hypertension. A trend established from this study is that chances of one being diagnosed of hypertension reduces as one moves up the income ladder.

6.2.6 Awareness and control of hypertension

There is low detection, management and control of hypertension in general. This is because most people have little or no knowledge of the condition and also do not visit the hospital for regular checkups. Due to this, some live with the condition till it gets to a deplorable state before they find out or until it has caused another disease condition like stroke or other CVAs. Also, adherence to

antihypertensive medications is low due to factors such as low accessibility, wrong perceptions and individual unwillingness to adhere, among others. This makes treatment and control difficult.

6.3 Conclusions

Prevalence of hypertension is still high but most precarious in low-income communities, aged and women. As much as it can come as a result of family history, it is largely a lifestyle disease with accumulation of such lifestyle choices making the aged more vulnerable. Insufficient household income makes people more vulnerable to elevated BPs. Low detection and self-report makes the condition more dangerous due to the tendency of it developing into more complex outcomes as CVAs. Knowledge and accessibility to healthcare may influence one's health behaviour as seen in the HBM. There is a need for improvement in our environmental conditions as a nation to help reduce some environmental pressures. There is a need for government intervention in terms of policy formulation, mass education and necessary steps to prevent it through lifestyle changes.

6.4 Recommendations

Campaigns and health education on vulnerabilities to hypertension based on the Health Belief Model may be useful to address some lifestyle practices to reduce hypertension vulnerabilities. This is because more knowledge may help improve peoples' behaviour for better health outcomes.

Ghanaians should inculcate the habit of undergoing regular health checkups to know their health status at all times in order to help improve level of detection, treatment and control. This will also reduce incidents of CVAs and pre-mature deaths due to hypertension.

People should carry out a 24 hour urinary sodium excretion test to know their current level of dietary sodium intake to be advised by that for better BP outcomes. Conscious efforts to reduce dietary sodium intake is also necessary for healthier lives.

There is the need for specific policy on hypertension prevention and its control measures to curb this public health issue. A special attention will help policy implementers to assess progress and to be able to report on it effectively to achieve the needed goal.

6.5 Future Research Suggestions

Existing data on hypertension from GHS shows that women are highly vulnerable compared to men. Future research should critically look into why women have higher prevalence of hypertension than men in Greater Accra Region (Ghana). Findings from proposed studies will inform women and help them to reduce their vulnerabilities and increase their capacities.

Future research should find out the average Ghanaian intake of dietary sodium and advise policy formulation. It is necessary for Ghanaians to have basic knowledge of the required amount of dietary salt intake and how it impacts on health outcomes especially hypertension. This can help people to make better food choices especially processed ones.

Further research should look strictly into alcohol and tobacco users in Ghana with the appropriate machinery to measure differences in hypertension outcomes in them and a control group to ascertain their real contributions to elevated blood pressure. This can also help people to make better lifestyle choices to aid their health.

Future research should look into the high prevalence of hypertension in districts like Ashaiman, Kpone-Katamanso, La Dade-Kotopon among others and suggest remedy to curtail further rise. This is because, although population in these districts are lower compared to Accra Metro, they have higher prevalence of hypertension per thousand population which is alarming.

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APPENDIX 1: HOUSEHOLD SURVEY QUESTIONNAIRE FOR LIFESTYLE AND ENVIRONMENTAL VULNERABILITIES TO HYPERTENSION IN GAMA.

Please tick/state the appropriate response in the space provided.

SECTION A.

BACKGROUND INFORMATION

- 1 Location:**
- 2 Age** (as of your last birthday):..... years
- 3 Sex:** [i]. Male [ii]. Female
- 4 Household size:**
- 5 Occupation:**
[i] Professional/Technical/Manager [ii] Sales/Services [iii] Skilled manual
[iv] Unskilled manual [v] Unemployed [vi] Others [please specify].....
- 6 Marital status:**
[i] Married [ii] Single [iii] Separated/Divorced [iv] Widowed
- 7 Ethnicity:**
[i] Akan [ii] Northern extraction [iii] Ga/Adangbe
[iv] Ewe extraction [v] Other [please specify]
- 8 Religion:**
[i] Christian [ii] Moslem [iii] Traditionalist [iv] Others [please specify]
- 9 What is your average monthly household income? (in - GH¢)**
[i] 1 – 500 [ii] 501 – 1,000 [iii] 1,001 – 1,500

[iv] 1,501 – 2,000 [v] 2,001 – 2,500 [vi] Above 2,500

10 What is your highest level of education completed?

[i] None [ii] Primary/Middle/JHS [iii] SHS/Vocational/Technical

[iv] Tertiary [v] Others [please specify]

SECTION B.

HOUSEHOLD ECONOMIC SITUATION

1. **What is your current profession?**
[i] Civil/public servant [ii] Accountant [iii] fisherman [iv] Farmer
[v] Trader [vi] self-employed [v] Student [vi] Others [please specify].....
2. **How long have you been in your current profession?**
3. **Do you have any other source of income? [i] Yes [ii] No**
4. **List and state appropriate income.....**
5. **How would you rate your monthly earnings?**
[i] Very high [ii] High [iii] Average [iv] Low
6. **How many children do you have?**
7. **How many of them are working?**
8. **How much support do you receive from working children?**
9. **How many people do you support apart from your children?**
[i] Relatives [ii] House help [iii] Friends [iv] Others [please specify].....
10. **Do you have any social capital/benefits/remittances? [i] Yes [ii] No**
11. **Do you receive any support from family members? [i] Yes [ii] No**
12. **List and state the amount**
13. **Does your household have any debt? [i] Yes [ii] No**

14. **How much has your household borrowed in total?**
15. **How many people did you borrow this money from?**
16. **What type of residential facility do you currently occupy?**
[i] Flat [ii] Bungalow [iii] Compound house [iv] Others [please specify]
17. **What number of rooms are available to the family?**
18. **What is your present occupancy status?**
[i] Owner-occupier [ii] Renting [iii] Perching
[iv] Rent free [v] Other (Please specify)
19. **Are you connected to the national electricity grid?** [i] Yes [ii] No

SECTION C.

ENVIRONMENTAL CONDITIONS

1. **Do you have access to sanitation facilities at home?** [i] Yes [ii] No
2. **If yes how many people use that facility?**
3. **What is the main type of toilet facility used by the household?**
[i] In-house flush toilet/WC [ii] In-house pit latrine [iii] In-house KVIP
[iv] In-house pan latrine [v] Public toilet (flush bucket/KVIP/WC)
[vi] Toilet in another house [vii] No toilet facility (bush/beach
[viii] Other (*Please specify*)
4. **If you do not have in-house toilet facility, what is the average time spent travelling to the nearest toilet facility?**
5. **What is the average time spent waiting at nearest toilet facility?**
6. **Do you queue to access any facility?** [i] Yes [ii] No
7. **What facilities do you normally queue to use?**
8. **How often do you do this?**
[i] Daily [ii] Weekly [iii] Twice a week [iv] Monthly
9. **Does this stress you?** [i] Yes [ii] No

10. **What is the main source of water supply for this household?**
[i] Indoor plumbing [ii] Inside standpipe [iii] Pipe in neighboring household
[iv] Water truck/Tanker service [v] Others [please specify]
11. **On the average, what is the maximum time you spend to access water for your household in a day?** [i] For drinking [iii] For general use
12. **How does your household dispose of refuse?**
[i] Collected [ii] Public dump [iii] Dumped elsewhere [iv] Burned by household
[v] Buried by household [vi] Other [please specify]
13. **Do you have a good drainage system in your neighborhood?** [i] Yes [ii] No
14. **Do you have good tarred roads or well demarcated access routes to and from home?**
[i] Yes [ii] No
15. **Do you experience traffic on your way to and from work?** [i] Yes [ii] No
16. **How much time do you normally spend in traffic on your way to work?**
17. **How do you feel about the situation?**
18. **What other environmental challenges do you face here?**
19. **How do all these challenges impact on your lifestyle daily?**

SECTION D.

LIFESTYLE

1. **Do you take fast/processed foods?** [i] Yes [ii] No
2. **How often do you take fast/processed food?**
[i] Daily [ii] Weekly [iii] Monthly [iv] Once in a while
3. **What are your reasons for taking fast food?**
[i] Easy to prepare [ii] Convenient [iii] Saves time [iv] Cheap
[v] Offers variety [vi] Others [please specify]

4. **Do you take alcohol?** [i] Yes [ii] No

5. **How often do you take alcohol?**
[i] Daily [ii] Weekly [iii] Monthly [iv] Occasionally

6. **How long have you been taking alcohol?**
[i] Less than a year [ii] 1 – 5 years [iii] 6 – 10 years [iv] More than 10 years

7. **Do you smoke?** [i] Yes [ii] No

8. **How often do you smoke?**
[i] Daily [ii] Weekly [iii] Monthly [iv] Occasionally

9. **How long have you been smoking?**
[i] Less than a year [ii] 1 – 5 years [iii] 6 – 10 years [iv] More than 10 years

SECTION E.

PHYSICAL ACTIVITY

1. **Does your occupation require extended periods of sitting?** [i] Yes [ii] No

2. **Does your occupation require extended periods of repetitive movement?**
[i] Yes [ii] No

3. **What do you understand by exercise?**

4. **Do you exercise?** [i] Yes [ii] No

5. **How often do you exercise?**
[i] Daily [ii] Weekly [iii] Twice a month [iv] Monthly

6. **What kind of exercise do you normally do?**

7. **Why do you exercise?**

8. **Have you ever had any pain or injuries (ankle, knee, hip, back, shoulder, etc.)?**

[i] Yes [ii] No

9. **Have you ever had any surgeries?** [i] Yes [ii] No
10. **Has your doctor ever said that you have a heart condition and that you should only perform physical activity recommended by a doctor?** [i] Yes [ii] No
11. **Do you know of any other reason why you should not engage in physical activity?**
[i] Yes [ii] No

SECTION F.

CHRONIC DISEASE BACKGROUND

1. **Has a medical doctor ever diagnosed you of high blood pressure?** [i] Yes [ii] No
2. **How long ago?**
3. **Are you currently taking any medication?** [i] Yes [ii] No
4. **Do you adhere to the medication?** [i] Yes [ii] No
5. **How do you feel about the medication?**
6. **Were you given any lifestyle guidelines to follow concerning your situation apart from the medication?** [i] Yes [ii] No
7. **In what way has high blood pressure affected your life?**
8. **Do you have any other disease condition apart from hypertension?** [i] Yes [ii] No
9. **What is this disease?**
10. **How long have you been diagnosed of it?**
11. **Blood pressure?**
12. **Does anyone in your family have hypertension?** [i] Yes [ii] No
13. **Has any member of your family died of hypertension in the past 10 years?**

[i] Yes [ii] No

14. How old was the person?

15. Do you know of any causes of hypertension? (If yes, list them) [i] Yes [ii] No

16. In your opinion who is more vulnerable to hypertension?

17. Do you know of any preventive/control measures? (If yes list them) [i] Yes [ii] No

THANK YOU

APPENDIX 2: HOUSEHOLD INTERVIEW GUIDE

SECTION A

BACKGROUND INFORMATION

1. **Name of Community**
2. **Gender**
3. **Age**

SECTION B.

KNOWLEDGE OF HYPERTENSION

1. **What do you know about hypertension vulnerability?**
2. **What are the symptoms of hypertension?**
3. **Who do you think is more vulnerable to hypertension?**
4. **What are some of the factors that account for hypertension in men and women?**
5. **Why do women have a higher prevalence of hypertension than men?**

[Objective: to establish general knowledge about hypertension prevalence and vulnerabilities.]

6. **Does where one stay and work play a role in their hypertension susceptibility?**

[Objective: assessing knowledge on environmental susceptibility]

7. **Why do a lot of people fail to realize they are hypertensive until they are tested or it has probably caused another health condition like stroke and other heart diseases?**
.....

[Objective: assessing knowledge on accessibility to healthcare and reasons for low detection rate]

8. Which aspects of our lifestyle contributes most to hypertension vulnerability?

[Objective: examining knowledge on the role of lifestyle choices]

9. What risks are hypertensive patients pre-disposed to?

[Objective: ascertaining risk perceptions]

10. How did you hear about hypertension?

[Objective: assessing sources of and awareness creation level of awareness in the populace]

11. Do you know of anyone in your family who is currently dealing with hypertension?....

12. Do you know of anyone who has died of hypertension in your family in the past 10 years?

[Objective: assessing family history]

THANK YOU

APPENDIX 3: STAKEHOLDER INTERVIEW GUIDE

SECTION A.

BACKGROUND INFORMATION

1. **Name of institution**
2. **Position**
3. **Location**
4. **Area of expertise**

SECTION B.

STAKEHOLDER VIEW ON PREVAILING ISSUES

1. **What do you know about hypertension vulnerability?**
2. **What are the symptoms of hypertension?**
3. **Who do you think is more vulnerable to hypertension?**
4. **What are some of the factors that account for hypertension in men and women?**
5. **Why do women have a higher prevalence of hypertension than men?**
- [Objective: to establish general knowledge about hypertension prevalence and vulnerabilities.]*
6. **Does where one stay and work play a role in their hypertension susceptibility?**
- [Objective: assessing knowledge on environmental susceptibility]*
7. **Why do a lot of people fail to realize they are hypertensive until they are tested or it has probably caused another health condition like stroke and other heart diseases?.....**
[Objective: assessing knowledge on accessibility to healthcare and reasons for low detection rate]

8. Which aspects of our lifestyle contribute most to hypertension vulnerability?

[Objective: examining knowledge on the role of lifestyle choices]

9. What risks are hypertensive patients pre-disposed to?

[Objective: ascertaining risk perceptions]

10. How did you hear about hypertension?

[Objective: assessing sources of and awareness creation level of awareness in the populace]

11. Do you know of anyone in your family who is currently dealing with hypertension?

12. Do you know of anyone who has died of hypertension in your family in the past 10 years?

[Objective: assessing family history]

13. How much resources are currently being committed to treatment, prevention and awareness creation?

14. Do you think healthcare has been and still is a top priority for both previous and current governments?

15. Does Ghana Health Service have any policy on hypertension?

[Objective: to establish the kind of needed attention hypertension is currently receiving from stakeholders and Government as a whole and to find out about existing policy and what it says as long as this public health issue is concerned]

THANK YOU