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ASSESSING HEALTH INEQUALITY AMONG THE ELDERLY IN GHANA

BY

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DECLARATION

I, Fonta, Lum Cynthia, declare that this work is the result of my own original research and that this dissertation, either in whole or in part has not been presented elsewhere for another degree. Where reference has been made to the work of others, they have been duly acknowledged. I have no conflict of interest in this research.

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DEDICATION

I dedicate this work to all the elderly adults in Africa who like my parents and mother-in-law, face social, economic and health challenges as they grow old.

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I wish to extend my heart felt gratitude to my supervisors Professor Moses Aikins, Dr. Genevieve Aryeetey and Dr. Justice Nonvignon for their consistent support and guidance throughout this work. They have been with me every step of the way from the time I was given this topic to the completion of the project. For this, I am highly honored. I would also like to thank the Head of Department of Health Policy, Planning and Management, Dr Reuben Esena and all the lecturers of the department for the exposure they gave us in class and the field practice experience we obtained. It was a dedicated department as I and my colleagues were followed up closely not only by our supervisors, but by all the lecturers in the department.

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DEFINITION OF TERMS

Determinants of health: Factors that contribute to a person's current state of health

Health disparity: Type of difference in health that is closely linked with social or economic advantage

Health equity: Opportunity for everyone to attain their full health potentials and no one is disadvantaged

Health inequality: Differences, variations and disparities in health achievement of individuals and groups of people

Health inequity: Disparity in health outcome that is avoidable, unjust and unfair

Social determinants: Complete integrated and overlying social structures and economic systems that is responsible for most health inequities

Socioeconomic status: Composite measure that incorporates economic, social and work status. Economic status is measured by income, social status is measured by education and work status measured is by occupation

Self-Reported Health: Indicator of morbidity measured on a five point scale of health rated as very good, good, fair, poor and very poor

LIST OF ACRONYMS

AD	Absolute Difference
CI	Concentration Index
CSDH	Commission on Social Determinants of Health
DRR	Disease Rate Ratio
GPRHS	Growth and Poverty Reduction Strategy
HH	Household
LEAP	Livelihood Empowerment against poverty Programs
MIPAA	Madrid International Plan of action on Aging
MMYE	Ministry of Manpower, Youth and Employment
NCD	Non-Communicable Disease
NHIS	National Health Insurance Scheme
NSPS	National Social Protection Strategy
OR	Odd's Ratio
PAF	Population Attributable Fraction
PAR	Population Attributable Ratio
SAGE	Study on Global Ageing and Adult Health
SES	Socioeconomic Status
SRH	Self-Reported Health
SSNIT	Social Security National Insurance Trust

ABSTRACT

Background

The existence of health inequality across people of all age groups, including the elderly, has been proven to exist by many studies done across the world. However, in Ghana, very little is known about the extent of health inequality among the elderly. Social, economic and demographic factors have been shown to affect the health of the elderly. This study attempts to measure health inequality among the elderly in Ghana and explore factors associated with such inequality.

Methodology

Data was taken from the World Health Organization (WHO) Study on Global Ageing and Adult Health (SAGE Wave 1) and data was analyzed using STATA Version 12. Health inequality was measured across the population of the elderly using a concentration curve and calculating the concentration index (CI). Secondly, a binary logistic regression was conducted to assess factors that contribute to health inequality and determine the relationship between these factors and Self-Reported Health (SRH) which was used as the outcome measure of morbidity.

Findings

In total, out of 2845 respondent, 579 (20.4%) rated their health status as poor, 1,211 (42.7%) as moderate and 823 (28.9%) as good. The concentration index (CI) for poor SRH was -0.06 indicating that poor health was concentrated among the poor. The multivariate analysis showed that the odds of reporting poor health were 1.6 times and 2.5 times higher among the middle old and old-old respectively. The elderly with one or more than one chronic condition had increased odds of 1.5 times and 2.5 times respectively, in reporting poor health. In the same way, residents of Western and Volta region were 1.5 times and 1.9 times respectively, more likely to report poor health. On the other hand, the odds of reporting poor health was 75% and 34% less among respondents in the high and highest wealth quintiles respectively, and 20% less among those in the private sector.

Conclusion

Health inequality exists among the elderly in Ghana and the study found poor health to be concentrated on the poor and rich health concentrated among the rich.

CHAPTER 1

1.0 INTRODUCTION

1.1 Background

The population of the elderly globally has been projected to increase currently from 800 million to about 2 billion by 2050 (Yasamy et al., 2013). The same projection has been made in Ghana where the population of the elderly in Ghana will increase currently from 6.0% of its national population to about 11.9% by same year 2050. Four censuses have been conducted in Ghana from 1960 to 2000. These have repeatedly shown an exponential increase in the general population from 6.7 million to about its current population of 24 million. The population growth over the years has also been associated with a corresponding increase in the population of the elderly from 4% to about 6% (Ghana Statistical Service., 2003). The growth trend could be associated with a demographic transition whereby, decrease in fertility and mortality rates from advancement in medical technology and improved living standards, leads to an increase in life expectancy and hence an increase in the population of the elderly (Mba, 2010).

The elderly are one of the most vulnerable groups in the society. Age in itself is already a risk factor for Non-Communicable Diseases (NCDs) like hypertension, diabetes, arthritis, stroke etc. They are also susceptible to communicable diseases like pneumonia, tuberculosis due to their weak immune system leading to the issue of double burden of disease where they may experience the burden of NCDs and communicable diseases at the same time. Again, old people are faced with many challenges especially declines in sensory, cognitive and physical functions particularly mobility. This makes them dependent on their family and other caregivers for support. The stress alone of daily living can lead them to ill health. This has led to the development of a branch in science known as gerontechnology whereby old people are provided

with better technologies to improve their living environment and hence integrate better in the society (Bouma et al., 2007).

Social and economic factors have been shown to contribute to ill health among the elderly. These are collectively referred to as the social determinants of health. These determinants are defined according to the WHO's conceptual social determinant framework as "*circumstances in which people are born, grow, live, work*" (World Health Organization., 2010a). This in essence means that different conditions people find themselves throughout life will result in for example different health outcomes among the general population, the elderly inclusive. In other words, this represents a life-long unavoidable inequality that may lead to health outcomes that are unevenly distributed across the population. The social determinant framework is often used to understand health inequality and how these social determinants are associated with health outcome (Cowling, Dandona, & Dandona, 2014)

It is of importance to know what policies have been put in place for the elderly and how well these policies have been implemented. The government is recommended to work in collaboration with the elderly commission, to adopt a policy framework that will serve as a guide to promote and maintain the health of the elderly (Issahaku & Neysmith, 2013). The journey so far in Ghana has been slow and not so rewarding.

1.2 Problem statement

The problem of population ageing has been envisaged in the developed world and appropriate interventions and support structures have been put in place to address their needs. This is yet to happen in the developing countries especially in Ghana. With the growing population of the elderly in Ghana, the burden of morbidity is expected to increase with a shift from

communicable diseases to NCDs. There is the need to plan for the future of the elderly and make policies that will be of interest to their health as well as their general wellbeing.

Unequal distributions of social determinants across a group of people can lead to health inequality later in life. In general, the conditions in which people live, work etc. have influence on their health outcome. People with low income, low educational status, and poor working conditions may reach old age in poor health states experiencing some challenges in terms of social, economic and general wellbeing (Falkingham et al., 2011). In some rural areas in Ghana, functional limitations, age and sex have been shown to be significant predictors of poor health among the elderly (Debpuur et al., 2010). However, lack of data on the elderly makes it difficult to monitor the trend and social policies on the health status of this group of people.

Most of the elderly live in the homes of their children. The cultural setting in Ghana (i.e. the extended family system) provides the situation whereby the elderly are taken care of by their children and grandchildren (Aboderin, 2004). With the increasing level of economic hardship, it is becoming challenging for family members to cater for their needs alongside their own immediate family needs (Mba, 2004). Hence the elderly may lack emotional and financial support to cater for their needs. Other challenges include lack of social support, poor nutritional status, poor housing conditions, poor sanitation and difficulties in mobility with little or no aid. Furthermore, the formal social security pension scheme covers just a few proportions of the elderly (i.e. those who were in the formal sector), hence most of them have little or no financial security to take care of their needs. All these difficulties can worsen inequalities in health leading to poor health outcomes.

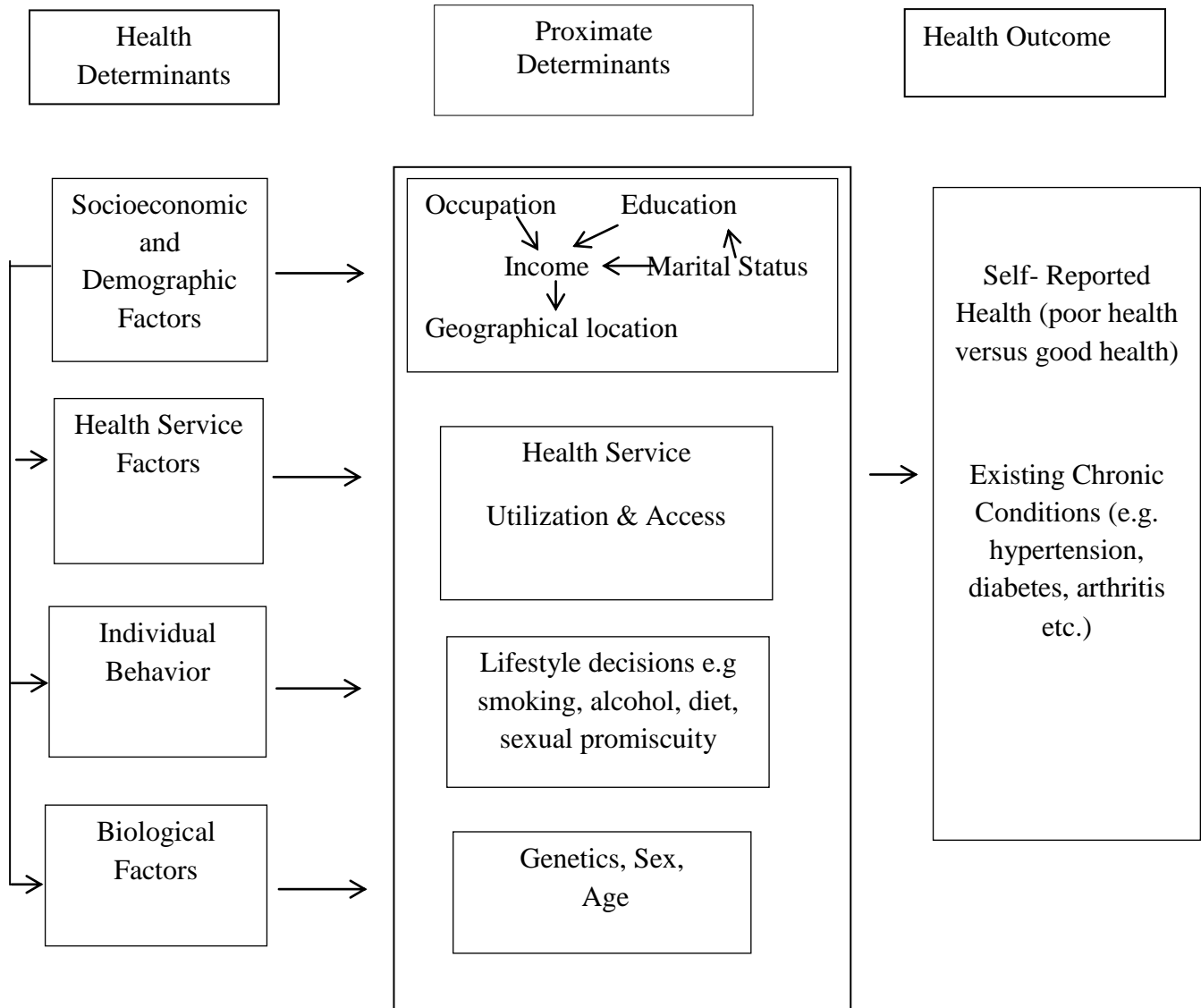
As a result of limited studies on inequality among the elderly in developing countries, especially in Ghana, this study intends to close the gap of research on the elderly, to clearly understand to what extent inequality in health exists among the elderly in Ghana and assess the factors associated with such inequality.

1.3 Justification

It is important to note that health inequality exists in every age group not just among the elderly. The focus here is on them because they have been a much neglected population in terms of health interventions and therefore, it is a fundamental right of everybody to be healthy not just the mothers, children and other more widely researched groups. Most public health intervention programs are on maternal and child health, HIV/AIDs, fertility control etc. and little is known about the elderly. Older adults should be on the priority lists in target interventions especially as they are vulnerable to so many health conditions as much as HIV infected patients, pregnant women and children. Therefore, establishing the extent of health inequality among the elderly in Ghana will give an insight on what social factors affect the health of people as they age. This will pave the way for further research and inform policy makers to target health policy goals that will improve conditions under which people grow and live.

1.4 Conceptual framework

The conceptual framework for this study is based on reviews from literature on determinants of health inequality and how they contribute to health outcome. Health determinants (Socioeconomic factors, health service factors, Individual behaviors and biological factors) as shown on the framework, contribute to an individual's state of health. Each of these health determinants acts through intermediates that directly affect the health outcome of the elderly.

Figure 1.1: Conceptual framework of factors related to health inequality among the elderly

(By author)

The intermediates can also be referred to as the proximate determinants. Studies have shown that unequal distribution of these proximate determinants across a population, can lead to unequal health outcome. For example, the health status of a person with poor income, education, poor healthcare utilization may be different from someone with a good income and good educational

background and good access to health care. Individual behavior can influence a person's health in the future. Risky behaviors like smoking, excessive intake of alcohol and sexual promiscuity can lead to poor health in the future. An individual with a disciplined lifestyle may have a better health outcome compared to someone with poor life choices. People with genetic abnormalities have a different health status from people with no genetic abnormalities. The conceptual framework also demonstrates the inter relationships that exists between the determinants. For example, an individual with a good educational background is more likely to have a good job and hence possess a better income to an uneducated person. In the same way, high income can predispose one to having a better diet and a more affluent lifestyle compared to someone with low income. An individual's income, educational status or geographical location could also influence access and utilization of healthcare services. Summarily, unequal distribution of these determinants can cause disparities in health across a population.

1.5 Objectives

1.5.1 General objective

The general objective is to:

1. Estimate health inequalities and assess the factors affecting such inequalities among the elderly

1.5.2 Specific objectives

The specific objectives are to:

1. Estimate health inequality among the elderly using concentration index
2. Assess factors that influence health inequality among the elderly
3. Determine an association between the factors that influence health inequality and health outcome (i.e. self-reported health).

1.6 Research questions

The research questions are:

1. What is the extent of health inequality among the elderly in Ghana?
2. What factors influence health inequality among the elderly?
3. What is the association between these factors and health outcome (i.e. self-reported health)?

CHAPTER 2

2.0 LITERATURE REVIEW

2.1 Introduction

This section focuses on the review of relevant literature on health inequality specifically among the elderly and the factors influencing health inequality. The World Health Organization social determinants of health framework will guide this review process in identifying the determinants of health inequality. Further review of the literature on measurements of health inequality will also be conducted. The review will be organized as follows: Definition of health inequality, pattern of global ageing, challenges and support systems, health inequality in Sub Saharan Africa (SSA), pattern of ageing in Ghana, Policy environment on Ageing in Ghana, the determinants of health and health inequality, the relationship between socioeconomic/demographic factors and health outcome and lastly, measures of health inequality.

2.2 What is health inequality?

Inequality in health among certain groups in a population remains a challenge in public health (Mackenbach et al., 2008). Inequality in mortality and morbidity may be attributable to certain socioeconomic characteristics. Various studies have been carried out on inequality but little interventions and policies have been put in place to reduce this challenge. This study seeks to address consequences of social determinants of health inequality among the elderly and health outcome (good or poor health). Knowledge of health inequality can lead to its minimization so that the elderly would live their lives in good health and not in suffering.

Health inequality can therefore be defined as differences, variations and disparities in achieving health among individuals in a population (Kawachi, Subramanian, & Almeida-Filho, 2002). It

can also be defined as any difference in health status or health determinants among a group of people (Royal College of Nursing., 2012). This terminology is sometimes used interchangeably with the term inequity. I make a distinction between the two phenomenon as follows: Inequity is an ethical concept in which there is unfair disparity in health in a population, and as a consequence leads to underlying social advantage or disadvantage (Braveman & Gruskin, 2003). In other words, inequity is inequality that is unjust and unfair. Moral judgment is often ascribed to inequity and therefore, equality in health status across a group of people is the highest dimension of equity (Low, Ithindi, & Low, 2003). Sometimes, unequal distribution of health may be unavoidable. For example, breast cancer is commoner in females than in males likewise prostate cancer is a disease of men and not women. In the same way, the elderly are more susceptible to infections because of their weak immune systems. These circumstances are often unavoidable.

Health inequality is influenced by certain determinants which fall within the capacity of individuals and the society to moderate (Reidpath & Allotey, 2007). Inequity exists when these determinants are not moderated fairly by the society causing an increase in the burden of health. It is important to note that, the burden of health could be determined by a country's state of wealth. Wealthy countries tend to have a better investment in healthcare services, social services as well as infrastructure. All these tend to improve morbidity and mortality. On the other hand, it can be said that poorer countries face a greater health burden than richer countries and therefore experience worst health consequences.

2.3 Pattern of global ageing, support systems and health challenges

In the developed world, it has been projected that life expectancy will increase from 68 years in 2005-2010 to 76 years by 2050 (Bloom et al., 2011). The same projection has been made in the

least developed world, whereby life expectancy though low will increase from 57 years in 2005-2010 to 69 years by 2050 (United Nations., 2011). The population of the elderly has shown an increasing pattern from 8% in 1950 to 11% in 2009 and has been projected to reach 22% by 2050. This in other words means that the population of the elderly is growing at an annual rate of 2.6% faster than the rate of the general population as a whole (United Nations Population Fund., 2011).

In some low and middle income countries, the declining fertility and mortality rates have led to demographic transitions in the elderly population. In view of this, it has been projected that the population of the elderly in Africa will rise from 5.4% to 10.7% by 2050 (Ng et al., 2010). Darkwa and colleagues explained this phenomenon using Caldwell's wealth flow theory to understand the relationship between population ageing and fertility. In this theory, parents are more likely to give birth to more children if the children provide them with some income or financial assistance of any form. Such is not the case nowadays where people use the little resources they have to cater for their children's welfare. The expenditure incurred in raising children will lead to an incentive to have fewer children. Fewer children will mean less number of children to support their older parents in the future (Darkwa, Mazibuko, & Candidate, 2002). Furthermore, with the increasing number of youths and young adults dying from HIV/AIDs in developing countries, the elderly are left behind with little or no family to support them emotionally and financially (Schatz & Ogunmefun, 2007). Caldwell's theory therefore implies that the rising population of the old and fewer informal caregivers will to some extent affect the health of the elderly.

The immense implication of this growing population of the elderly is the provision of shelter, healthcare and social support. This is due to the fact that the expenditure on health care needs for

the elderly has been projected to increase in the future as a result of their growing population, thereby increasing the prevalence of disability and other NCDs and as such reinforcing the need to plan for their future. There is increasing evidence of support structures for the elderly in the western world as compared to developing countries, where their independence is being maintained, and by so doing reduce unnecessary hospital admission. In support of this, a policy on long term care of the old was developed by some European nations to address three key issues on different options for non-medical funding for those with disabilities and the mentally ill. First, it assessed the need for long term care services across the population of the elderly, second the benefits for using public funds for funding long term health plans and lastly the funding system that can be used to ensure an equitable and efficient health system (Fernandez et al., 2009). This is yet to happen in most African countries including Ghana.

A study carried out in Ireland showed that a good number of elderly persons by the age of 65 years and above would have experienced some form of abuse whether physical, psychological, sexual, financial abuse as well as neglect (Lafferty et al., 2012). Therefore, emotional support structures and policies are recommended to protect elderly people who experienced such mistreatment and abuse, which will form the basis of achieving good health status among such victims. Another study carried out in Europe, developed a consortium for integration of health and social support for older people by developing ten good approaches to improving their health status (Santini & Miller, 2014).

Despite these support systems in the developed countries, the elderly still face health challenges as in the developing world. In America for example, about 25% of Americans die in nursing homes as a result of lack of palliative care and poor emotional support (Asada, 2005). Studies carried out in China a middle income country has shown that the population of the elderly will

increase to about 27% by 2050. This will raise the incidence of NCDs and hence the burdens of health care provision in the future meaning that '*China will grow old before it grows rich*' (Wang et al., 2012). This burden of NCDs is explained by the epidemiological transition theory which illustrates, the transition from the infectious causes of diseases to non-infectious chronic or degenerative NCDs (Omran, 1971). This is a growing health challenge faced by the elderly globally. The prevalence of NCDs, may be due to lifetime exposure to detrimental health determinants and modifiable causes of diseases (Aboderin, 2010). Although NCDs are discussed in general, specific emphasis is being made on diseases like cancers, cardiovascular diseases, diabetes and chronic respiratory tract diseases which account for 80% of NCDs globally (Di Cesare et al., 2013).

In 2006, out of the 36 million deaths that occurred from NCDs globally, 80% of these deaths were from low and middle income countries (Hosseinpoor et al., 2012). In most Sub Saharan countries, the burden of NCDs is a challenge in terms of mortality and disability adjusted life years leading to social, economic and developmental decline in most countries. For this reason, the United Nation (UN) General Assembly held a conference in New York in 2011 with the aim of prioritizing NCDs as well as its associated risk factors like tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol (Mensah & Mayosi, 2013). It is hoped that laying emphasis on these diseases and risk factors will prevent the development of NCDs and hence reduce its burden in the future. Risk factors for NCDs have both developmental and degenerative origins (Miranda et al., 2008). This is based on previous studies done which found that babies of low birth weight have an increased risk of developing cardiovascular diseases as a result of the poor SES of their mothers (Godfrey & Barker, 2000).

Variations in utilization of health services is not uncommon among the elderly and as such, can lead to variations in health outcome (Kehusmaa et al., 2012). For example, the old with social service support utilized health services more than those without social service. Other studies done found that older people with mental illness accessed health services less due to social stigmatization associated with it (Hartlaub et al., 2014). All these differences will lead to variations in health outcome.

As a result of these challenges faced by the elderly, statutory residential homes have been set up in most developed countries to secure good living standards, through provision of quality care, good environment and a good managerial system to cater for the needs of the elderly by formal caregivers. Again, despite these support structures, the elderly still depend on other individuals collectively known as informal caregivers for their daily task performance (Elawam & Abdelrahman, 2013). The informal caregivers could be a spouse, children or close friends. These caregivers are often faced with psychological distress such as anxiety, depression, loneliness in caring for the elderly especially the terminally sick persons (Bevans & Sternberg, 2012). There is therefore a need for financial and social security for there to be effective provision of care for the elderly by both formal and informal caregivers especially in the developing countries.

2.4 Health inequality in Sub Saharan Africa (SSA)

The growing population of the elderly in Africa has led to a growing need to bridge the gap in research in understanding the issues that affect the health of the elderly, and raise awareness of these issues for possible interventions (Suzman, 2010). Inequalities in health have been shown to exist between the disadvantaged and those of high social class. Poor individuals experience worst health outcomes than the rich. There has been some consistent pattern with the literature across some African countries that highlight inequality in health among the elderly. Self-reported

health has been identified in literature as a good proxy for determining the health status of the elderly (Mora et al., 2008). A study carried out in Nigeria found that self-reported health (SRH) was worst among those with low socioeconomic status compared to those of high SES (Eme Ichoku, Fonta, & Thiede, 2011). A similar study carried out in Burkina Faso showed that poor SRH was strongly associated with functional abilities among the elderly particularly those with low educational background (Onadja et al., 2013). A limitation in using SRH as a measure of health status is that it offers a subjective measure of health status as individuals may not have knowledge of pre-existing morbid conditions (Tolonen et al., 2014) .

In Kenya, a study done to assess the inequalities that exist in the society found that water supply, solid waste management, food environments, housing and health care services and transportation were the main determinants of health inequality (Muchukuri & Grenier, 2009). Similarly, a study carried out in South Africa revealed that the predictors of functional disabilities which can be used as an outcome measure for health inequality among older men and women were age, existing chronic conditions, lack of education (Phaswana-Mafuya et al., 2013) . In other African countries, lack of social support, depression and low socioeconomic status which are evidence of psychological stress, have been shown to increase the risk of heart conditions which worsens the state of being healthy (Haley et al., 2010).

In view of this, some African countries like South Africa have a social welfare program for the elderly and have to some extent reduced the burden of poverty and improved access to health care. About 80% of elderly South Africans above the age of 60 for women and 65+ for men receive about a \$100 per month (Deaton & Paxson, 1997). However, despite this social grant program, income inequality still exists in the general population in South Africa from high unemployment rate and wide wage disparities. This poses a high burden to the elderly with this

monthly allowance as some of them have to support unemployed relatives, pushing them further to poverty (Klasen & Woolard, 2009). This in other words means that social security grants have to be complimented with other programs to improve the wellbeing of the elderly and the population in general.

Sub-Saharan Africa bear the burden of health inequality especially when related to the social exclusion concept (Rispel, de Sousa, & Molomo, 2009). This concept operates along unequal cultural, economic, social and political relationships. It also highlights the unjust distribution of resources and unequal rights needed to create basic necessities accessible to all persons irrespective of culture or political affiliation. The three recommended policies to address this issue include cash transfers, provision of free social services and specific institutional arrangements. In order to make such policies, social determinants form the basis for which health inequality is measured. For example, old people who live alone may have poorer health outcome than those who live in the company of others. Poor nutritional status, bad lifestyle decisions, loss of loved ones can all contribute to one's state of health. Thus understanding the social determinants and other factors that lead to unequal health outcome will enhance the development of policies to address the issues of inequity and inequality.

2.5 Determinants of health inequality among the elderly in Ghana

Statistics from the population and Housing Census in Ghana show that the population of the elderly constitutes 1.2 million of the total population (National Population Council., 2007). This population increase could be explained by declining fertility rate and can be seen as a positive public health achievement through improvement in the living conditions, increasing life expectancy and better wellbeing of the elderly (Population & Housing Census Report., 2010). Despite these interventions made by the government to the general population, the specific needs

and wants of the elderly population are yet to be met. It is therefore important for policy makers to prioritize their interventions taking into consideration the vulnerable population which in this case are the elderly in order to acquire an efficient and equitable health system (Jehu-Appiah et al., 2008).

Disparities in health outcome in Ghana can be associated with the living conditions under which people find themselves (Weeks et al., 2012). Those with low SES status usually live in close proximity to each other. They face problems in terms of methods of sewage disposal, lack of clean portable water and poor housing conditions. They are more likely to report poor health than those who live in good housing conditions with readily available water, electricity and do not share amenities with neighbors.

Literacy level is another determinant of health inequality in the elderly and has been shown to be an indicator of general well-being of individuals. It prevents social exclusion and provides benefits from the media for information and recreation. Education therefore to a large extent has been used as an indicator of financial status of an individual as well as access to certain basic amenities like safe drinking water, health service and better living conditions (Ghana Statistical Service., 2003).

In Ghana, it has been estimated that every 2 out of 5 persons above the age of 60 years in Ghana are literate. The proportion of males that are educated in Ghana is about 45%, two times that of females which is about 16.3% (Population & Housing Census Report., 2010). In addition, the three Northern states in Ghana are the least educated states with females contributing more to this inequality (Senadza, 2012). Low level of education in addition to gender differences has been shown from previous studies to be a determinant of unequal health across a group of people

(Broder et al., 2014). Therefore, as a result of lack of exposure and ignorance, sick individuals would usually associate their medical conditions to a supernatural force leading to late presentations and rapid disease progression at the time of diagnosis (de-Graft Aikins, Boynton, & Atanga, 2010). Despite the fact that women have a longer life expectancy than men, they experience poorer health consequences as a result of their low level of education, income and social status (Wrigley-Asante, 2008).

Social security and pension schemes have a role to play in terms of poverty reduction among the elderly. The Social Security Act was set up in 1965 and provided a framework for the Ghanaian Scheme. In 1972, the social security decree formed, set up a social security and national insurance trust (SSNIT). This scheme is responsible for Old Age Pensions, Survivor Benefits and Disability Pensions (Darkwa, 1997). However, just a few proportions of the elderly are under a pension scheme mainly those in the formal sector, and quite a few from some private sectors. This is because a predominance of 9 out of 10 elderly women and men in Ghana are employed in the informal sector. Their major activities include agriculture, forestry and fishing (62.6%), wholesale and retail, repair of motor vehicles and motor cycles (13.5%), manufacturing (6.9%), accommodation and food service activities (3.3%) (Population & Housing Census Report., 2010). It can clearly be seen that most elderly men and women have no form of financial security as they age and hence rely on personal savings and family support.

According to Osei (2011), despite the reduction in poverty level in Ghana from 35.2% in 1991/1992 to 28.5% in 2005/2006 (based on the Ghana Living Standard Survey in 1991 and 2006), a great percentage of people living in the rural areas remain poorer (68.3%) than those living in the urban areas (10.8%). This increases the old age dependency ratio particularly among

those in the rural areas who in the long run are seen as economic burdens to their families (Elawam & Abdelrahman, 2013).

Poor health care access and utilization have been shown to lead to poor health outcome (Saeed et al., 2013). Free access to health service seems to be a challenge among the elderly in Ghana. Studies done in Ghana have shown that the elderly above the age of 70 years and within the rich quintile group access health care service more than their poor counterparts (Jehu-Appiah et al., 2011). This may be due to the fact that a great number of the poor elderly were either self-employed or in the informal sector and cannot afford the basic minimum premium.

Studies carried out that seek to evaluate the influence of socioeconomic status on health often neglect environmental and physical conditions and its implications on health. A study carried out in Accra metropolis revealed that 46% of the population in Accra live in the most low cost areas (Fobil, May, & Kraemer, 2010). Such areas accommodate people with low standards of living. These poor living conditions may affect the health and general wellbeing of the people, particularly the elderly, exposing them to parasitic and other infections especially as they are known to have a low and weakened immunity. These societal norms and interactions have been shown to influence the health of a population (Solar & Irwin, 2007).

2.6 Ageing policy environment in Ghana

The first World Assembly on Ageing was held in Vienna, Austria 1982. This assembly recommended countries to adopt initiatives for the elderly in the aspects of employment, income security, health, housing, education and social welfare. The second one was held in Madrid, Spain 2002, about twenty years later to address the challenges of demographic transition. Ghana took part in the conference and adopted the Madrid International Plan of Action on Ageing

(MIPAA). The plan called on governments to adjust successfully to an ageing society by improving the quality of life for older persons and ensuring that services that improve the living standards of the old are improved and sustained (MIPAA, 2007). A revised plan of action also known as, international strategy for action to member states was set up to assist policy makers in decision making concerning the changing demographic pattern.

In 1992, the Fourth Republican Constitution of Ghana article 37 (2b) states that the state will ensure that a law is passed to protect and promote the right of every citizen in Ghana, including the elderly. In support of this, the national population policy called for enactment of laws pertaining to the elderly and reinforcing already existing ones (Government of Ghana., 1994). In 2005, the ministry of manpower, youth and employment (MMYE), came up with a national social protection strategy with the aim of protecting the most vulnerable groups (the poor, the pregnant women and the elderly) through the Livelihood Empowerment against Poverty (LEAP) Program. They ensured monthly grants to targeted households and recognized the fact that integrated inputs such as collaborating with other stakeholders, was better than a single intervention. However the program covers just a section of the population, and has not yet had maximum political support. Another challenge is for the program to move from the pilot phase to a long term sustained social protection program (Sultan, 2008).

In 2006-2009, the Growth and Poverty Reduction Strategy (GPRS II) under the social policy framework, has as one of its objectives to outline the needs of the older person as they are a vulnerable group and have been excluded in human resource development. It also outlines measures for strengthening the family by providing for its members, especially older persons. Other policies include Ghana National Disability policy and National Health Insurance Scheme (NHIS) which provide healthcare to some elderly persons.

These policies sound good to be mentioned in writing but the question is how well are they implemented? Quite a number of them are still yet to be implemented. A study on the elderly will pave a way to officially inform policy makers and analysts on the need to understand the problems of the elderly.

2.7 Determinants of health and health inequality

This section will be discussed based on the conceptual framework on page five. Determinants of health are factors that contribute to one's state of health. These factors range from socioeconomic, healthcare services, individual behavior and biological factors. A declaration on social determinants of health passed by WHO, stated the need of “*delivering equitable economic growth through resolute action on social determinants of health across all sectors and at all levels*” (World Health Organization., 2010b). In May 2012, the World Health Assembly made a resolution to consider social determinants of health as a predictor to assessing the health status of a population. One way of assessing the health status of individuals is by self-reported health (SRH) which has been shown to be a good indicator for morbidity and mortality. Disparities in health determinants can lead to variations in the way individuals perceive their health. However, a good primary health system is associated not only in improving people's perception of health but in reducing those health disparities (Shi et al., 2002).

The assembly also aimed at supporting member states that implemented the Rio Political Declaration of social determinants of health. They were to work closely with the UN system on advocacy, research and capacity building. Another commission was set up to address these social determinants by improving daily living conditions, reducing inequitable distribution of power and resources and finally measuring and understanding these social determinants as well as assessing its impact on health (Muntaner, Borrell, et al., 2009). All these commissions set up by

WHO aimed at targeting interventions to minimize the inequalities in the distribution of social determinants and its impact on health.

Based on the conceptual framework in the first chapter, the first health determinant is the social factors also known as social determinants. According to the WHO Commission on Social Determinant of Health (CSDH), social determinants are circumstances through which people are born, grow, live and work and all these are shaped by economic social and political policies (Commission on Social Determinants of Health CSDH, 2008). The social factors include availability of resources to meet daily needs such as education, health food, social support and social interactions, socioeconomic conditions such as poverty, occupation, residential segregation, social norms and attitudes. Physical factors include environmental factors such as weather or climate change, housing conditions, exposure to toxic hazards, physical hazards especially those with disabilities.

The second determinant of health is, access and quality of health service. There is an interplay of factors that inhibit access and utilization of health service such as transportation, insurance, social and family support, poverty and an inefficient health system (Horton & Johnson, 2010). Other barriers to accessing health services include, non-availability of health services, high cost of health services and sometimes limited language access. In Ghana, over 33% of the population are active members of the National Health Insurance Scheme (NHIS) and about 4.9% of the active members are above 70 years (National Health Insurance Authority., 2011). Hence a great percentage of the elderly especially those who are socially excluded enroll less in the insurance scheme (Parmar et al., 2014). A cross country study carried out in six countries by (Peltzer et al. (2014)) found that the largest proportion of older men that reported not getting healthcare services when needed last, was in Ghana and China. This may have resulted from financial

difficulties, lack of transportation to facility or lack of insurance coverage. These access barriers can lead to increase hospital admissions from unmet health needs and worsening health status that could have been prevented (Kehusmaa et al., 2012). Other barriers of access to quality health among the elderly include lack of health insurance, low income and the absence of a regular primary healthcare provider. In addition to these, cultural practices (characteristics associated with one's place of origin) such that people in a particular area may treat themselves at home when sick with local herbs before presenting to the hospital facility. Furthermore, lack of communication may also cause disparities in access to healthcare. The health professional must be ready to communicate to all clients irrespective of the social status in a manner that is acceptable to the community. Once the community member feels at ease with the health worker, both parties can listen to each other for an effective communication to be established (Hartley, 2004). It is interesting to note that some elderly persons may access certain health facilities more often because of good social interaction with the health workers.

The third health determinant is the lifestyle decisions or behavior an individual displays throughout adult life. This goes a long way to determine the health outcome in the future (Campbell et al., 2014). Smoking, excessive alcohol consumption, sexual promiscuity predispose an individual to certain chronic diseases later in life (Uddin et al., 2014). Some of these health consequences are reversible when the individual is no longer exposed to these bad habits. Sedentary lifestyle and lack of exercise can predispose one to stroke, cardiovascular diseases like hypertension, myocardial infarction and other diseases of the heart.

Fourthly, biological and genetic factors affect the health of some individuals. Circumstances through which people are born and grow affect their health later in life. In view of this, poor early experience and slow growth becomes embedded in the biological process of development

which affects the individual all through life. For example, low birth weight babies have been shown to develop cardiovascular disorders later in life (Barker, 1999). They may also develop poor cognition, less readiness for school or poor performance in school and then become school drop outs. Such people go through life with low self-esteem. They might continue in this trend through life and later on develop medical complications from repeated stress or poor feeding habits due to their low socioeconomic status (SES) (Sanchez et al., 2014).

In addition, old age predisposes the elderly to infectious diseases like pneumonia, tuberculosis and gastroenteritis. This could be associated to their weak immune system. The same goes for genetic predisposition to certain traits like sickle cell anaemia. Babies born to HIV/AIDs mothers may become infected with HIV infection if adequate interventions are not put in place to prevent transmission. It is expected that persons with predisposed genetic or health conditions will report worst health than those free from these condition.

Lastly, the type of policies made at every level of governance influences the health of that country. If for example there are policies that provide financial assistance to the elderly monthly, this will obviously have a positive impact on the health status of the old. Health system reform is recommended especially at the primary healthcare level, to reduce the burden of NCDs among the elderly (Miranda et al., 2008). Resources have to be allocated based on health care needs in order to achieve any policy goal (Mercuri, Birch, & Gafni, 2013).

The interrelationship among the health determinants determines the health outcome of an individual. Understanding these health determinants and how they inter-relate with each other is the key to achieving a healthy population and reducing disparities among a population.

2.8 The relationship between socioeconomic/demographic factors and health outcome

Many studies conducted across the world have shown a significant association between determinants of health and health outcome. Health outcome can be measured by life expectancy from birth, condition-specific changes in life expectancy and self-reported status as well as functional or experiential status of health (Parrish, 2010). Other studies have been carried out to study the mechanisms underlying social inequalities that lead to chronic health outcome. Carreras et al. (2015), found that people who smoke have a high chance of dying from one of the following medical conditions: Ischaemic heart disease, lung cancer, stroke and coronary heart disease. There is increasing socioeconomic inequality in mortality and morbidity such that those with poor SES often rate their health as poor (Lee & Jeon, 2005). The challenge here is to understand these determinants and make policies to reduce them in order to achieve a better health in the population (Krumeich & Meershoek, 2014). Inequality exists in the determinants of health among the elderly. As the level of inequality increases, the level of becoming disadvantaged also increases (Albrecht & Albrecht, 2007). This will lead to poor health consequences. This section will explore the determinants of health and the level of inequality that exists due to these determinants.

A report by the European Union examined the extent of inequality between two groups by looking at the relationship between Self-Reported health and levels of education, income and deprivation. Those with high educational status and high income reported better health (Marmot, 2013). Similarly, a study done in Sweden showed a high mortality ratio due to income inequality (Edvinsson, Lundevaller, & Malmberg, 2013). Low income earners have worst health outcome due to lack of resources to access health services. In support of this, other authors have found that those with better social status have better health and longevity (Lynch et al., 2004). These

people known as the upper class live under favorable conditions and have frequent access to health care when the need arises, without falling into poverty. A review done by Wilkinson and Pickett showed a strong correlation between income inequality and the health of the population (Wilkinson & Pickett, 2006). There are however some counter arguments as some schools of thought argue that if the area where the social stratification is small, then other factors may affect inequality and not necessarily income as stated.

Some studies have shown that there is a strong relationship between poverty and health (Grundy & Holt, 2001). Such people live in poor housing conditions, having little or no education and go through life with a feeling of less self-worth. A good number of poverty stricken individuals face nutritional difficulties. Such people go through life with the wrong diet and may eventually develop poor health conditions such as chronic kidney disease (Gutiérrez, 2015). It can be said that the inequality that exists between the rich and the poor are unjust and unfair because of the fact that the poor are faced with constraints and lack of opportunities to make choices based on their needs (Wagstaff, 2002). However, several international organizations have sought to improve health outcome by making efforts to reduce poverty especially in developing countries.

In general, circumstances in life may cause some to become more violent and have homicidal tendencies. These actions or tendencies when explored deeply, are often powerful behavioral and psychological consequences of depression (Wilkinson, 2004). Depression may be from financial hardships, lack of love and support or insufficient food. The reality of not having enough to satisfy one's needs may lead to unwanted behaviors. In all, the rate of these social vices tend to be higher when the level of inequality is high and people within such society become old with depressive illness.

Insomnia has been shown to be another health implication of inequality. Ogunbode et al. (2014), carried out a study in Ibadan where they found that the prevalence of insomnia was more among the females, the widowed, low cadre workers and those living below the poverty line of below US \$1.25 per day. In addition, insomnia is equally associated with other commodities like angina, depression, metabolic diseases etc. Several studies conducted have found out that most of the elderly who suffer from insomnia rate their health as poor (Lima-Costa et al., 2003) (Maniecka-Bryla et al., 2013). Pain has also been shown to be associated with SES. A study carried out in Ghana assessed the effect of socioeconomic determinants on degree of pain found that Ghanaian elderly men were more likely to experience pain than women. In addition, those who were self-employed expressed worst degree of pain than those in the private sector (Annin et al., 2014). This can lead to increase financial burden as a result of increase health service utilization, decreased quality of life and increased dependency rate due to limited mobility.

There are other theories on inequality. One of them is the interaction between SES, physical and environmental factors and the health risk of the individuals (Curtis & Rees Jones, 1998). The authors refer to this as the ecological and epidemiological theory where health differences result from the impact of pollution. In other theories, social scientists are interested in the aspect of inequalities in different areas of residence among urban residents (Weeks et al., 2007). Some neighborhoods are made up of the more advantaged in the society, whereas other areas are slumps and contain the more disadvantaged people. The question often asked is whether this discrepancy has an impact on health. Some studies claim that area-based intervention may reduce inequalities and hence improve the health outcome of individuals in that area (O'Dwyer et al., 2007).

Studies carried out in an Australian research center found an association between low education level and poor health outcome. Lack of education or low education level can lead to unemployment or poorly paid jobs. Poverty is said to set in and access to health care services and utilization becomes a problem (Brackley & Penning, 2009). Inequality in Australia between those of high SES and low SES especially in the aspect of education are not uncommon (Argy, 2007). This is because the government doesn't spend enough money on education such that the disadvantaged group access education less. Those with very low levels of education usually have more chronic conditions or perceive their health status as poor (Afable-Munsuz et al., 2013; Krokstad, Kunst, & Westin, 2002). This may be associated to having poorly paid jobs and as such poor access to health facilities from insufficient money to pay health bills. This is worst in countries where just a few section of the population are insured.

Some researchers examined the Neo-Marxian social class measure and found a higher mortality rate among men of lower social class, compared to men of higher social class (Muntaner, Sridharan, et al., 2009). A model known as the Nordic model relates to the fact that social class discrepancies are less in countries which have a good social welfare system as well as a reduced unemployment rate (Shaw, Benzeval, & Popham, 2014). From the previous discussions, it has been shown that financial insecurity and unemployment are risk factors to poor health. Therefore, countries or states that address these issues will inhabit a healthy population. This however is a debate as there is still a persistence of health inequality in western welfare countries despite the availability of material needs and good welfare policies (Mackenbach, 2012). The author goes further to review certain theories that could explain the gap in inequality. There is the mathematical theory that states that inequality in health will increase when the overall health outcome falls. This is criticized as a broad conceptual theory. Another theory is the "fundamental

causes” which states that it is the social stratification that causes inequality, not necessarily the proximal determinants of health such as smoking, psychosocial stress or working conditions. Contrary to this view, there is an established relationship between coronary heart disease and social class by level of employment. Ramsay et al. (2009), found that those who were classified as professionals had less coronary heart disease than the low skilled workers. Other theories include life course perspective; social selection, personal characteristics and others.

Gender inequality in health outcome has been shown to exist in the aspect of job placement among females. Most studies carried out relate health outcome and job specialty to men and neglect the health outcome in females. Clougherty et al. (2009), came to the conclusion that hourly jobs for females increased the risk of acquiring hypertension compared to men. This effect was stronger among women with low SES. Having a job gives one a better opportunity of achieving better health. However, on the other hand, some jobs may be more stressful than others and can lead to poor health outcomes like chronic back pains, hypertension and stroke as well as psychological disorders.

A poor psychosocial environment has been shown to be health damaging and hence contribute to inequalities (Egan et al., 2008). An example of poor psychosocial stress is lack of emotional or social support. Those who have lost a spouse for example or divorced may have poor health outcome compared to those emotionally stable. Social support can be defined as emotional, financial and instrumental aid obtained from an individual’s social network (Şener, 2011). This network could be family members, the community members, or friends. Other studies have shown that the elderly with strong emotional support have better psychosocial wellbeing compared to those without support and are predictors of quality of life in the elderly population (Gureje et al., 2008). Psychosocial wellbeing in the sense of having family support, living with

people around, having aid when the need arises, all leads to a better health outcome. Psychosocial wellbeing can also depend on the extent of preparedness by individuals for their future care needs. People prepare for their future needs differently. This may be due to differences in resources, the instability of the system or personal characteristics (Sorensen & Pinquart, 2000). In effect, the longer people live in social and economic stressful situation, the less likely they are to enjoy good health in old age (Momtaz et al., 2011).

2.9 Measures of health inequality

It is important to know how to measure health inequality before one can actually say it exists. There are five main measurement techniques (Ontario Agency for Health Protection and Promotion., 2013) namely: Health concentration index (HCI), Population attributable fraction (PAF), Range, Slope index of inequality, Relative index of inequality.

For the purpose of this work, we shall use the concentration index for the measurement of health inequality. The advantage of this and the reason why it was the preferred option was that the concentration curve gives a visual representation of health inequality by first glance at the graph. It also provides a means of comparing inequalities between two groups in a population, by means of which takes dominance over the other (O'Donnell & Wagstaff, 2008). Descriptions of the other measures of inequality are also provided.

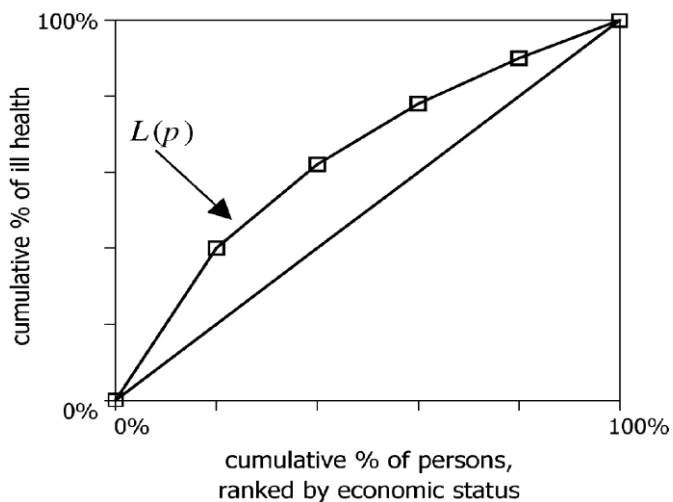
2.9.1 Health concentration index

This measurement of health inequality is borrowed from income inequality measurement (Wagstaff, 2002) . It is a summary measure used to measure the degree of distribution of health outcome across the populations ranked by socioeconomic status from lowest to highest. It is derived from the Gini coefficient but differs from it in that the ranking variable and the variable of interest are different. It is therefore said to be a bivariate measure of inequality as one variable

is measured against the ranking of the other (Doorslaer & Koolman, 2004). To measure inequality, data for the health status of the study participants is needed as well as their socioeconomic status. This is because, what may be reported as an increase in health inequality may just be a reduction in income inequality (Brekke & Kverndokk, 2012). This could mean that other factors could cause health inequality and not necessarily income.

In this method of measurement, there is the transfer of health from individuals whose health are above average to those whose health are below average to achieve equality (Regidor, 2004). The cumulative share of health outcome is plotted against the cumulative share of the socioeconomic status of the population, ranked from the lowest to the highest using the concentration curve. This curve is compared to the line of equality which is a diagonal line on which the cumulative percent of the population on the x-axis is equal to the health outcome on the y-axis. The health concentration index is calculated as twice the area under the concentration curve and the line of equality. The CI can take on values between -1 and 1. This can be shown on the graph below. The reference point is at point zero. If the health outcome is at point Zero, then equality is said to exist. If the concentration of health outcome is less than 0, it means health outcome variable is concentrated in the lowest socioeconomic group. The concentration curve will be above the line of equality and the CI will be negative.

On the other hand if the health outcome is above 0, the health outcome variable is concentrated among the rich and as such the curve will lie above the line of equality. The concentration index will be positive. Therefore it can be said that when the CI is largely negative, there is high level of inequality among poor. If it is largely positive, there is high level of inequality among the rich.

Figure 2.1: Health concentration curve

The CI method of measuring inequality is however not free from setbacks. One of the setbacks includes the fact that the comparison of a population with different mean value is problematic. Secondly, inequalities in ill health are used rather than inequalities in health leading to different rankings. Lastly, the value of the health index is arbitrary if a qualitative health variable is used. As a result of these setbacks, Erreygers (2009) in one of his published papers tries to justify the use of a revised concentration index using four points. First, the issue of health transfers. This means that, health is transferred from the rich to the poor to achieve equality. Secondly, the level independence states that increasing the health of each individually evenly does not affect health inequality. Thirdly, the concept of cardinality whereby, the linear transformation of a health variable does not affect the measure of health inequality, and lastly, the mirror factor which holds that the applied measure to the health variable and ill health should give results equal in absolute number but of opposite signs.

2.9.2 Population attributable fraction (PAF)

The Population attributable fraction also known as attributable fraction (AF), is the difference between overall average risk of the entire population (both exposed and unexposed people) and average risk in the unexposed, expressed as a fraction of the overall average risk (Levine, 2007). PAF is calculated by summing the potential reduction rates for all the socioeconomic groups taking into consideration the size of the lower SES group and the proportion of the population in each group. If the calculated PAF is significantly different from 0, then inequality is said to exist. When the value of PAF is high, the level of inequality is equally high. When the PAF is multiplied by the total population of those with the outcome variable, the total number of outcome or risk in the population with relation to the socioeconomic status can be determined.

This method is easier to use and attributes the burden of disease to socioeconomic status. It also considers all socioeconomic groups, not just the extremes as in the case of HCI. The disadvantage with the use of this method is that it ignores information about the association between SES and frequency of health outcome (Pampalon et al., 2012).

2.9.3 Range

The third measure is the **Range** which just measures the difference in health outcome between individuals with the lowest socioeconomic status and highest socioeconomic status. This is known as the absolute difference (AD). When AD is equal to 0, equality is said to exist. If away from 0, then one can say there is inequality. The second way is by using the disparity rate ratio (DRR). The socioeconomic gap is measured by dividing the health outcome of the least advantaged to the health outcome of the more advantaged. If value is equal to 1, equality is said to exist but if greater than 1, inequality is said to exist (Ontario Agency for Health Protection and Promotion., 2013).

2.9.4 The slope and relative index

The slope index and relative index are more complicated measures of inequality. It uses the linear regression coefficient to show the level or frequency of health problems in each of the socioeconomic group (Regidor, 2004). It determines the degree of inequality in the population. The health outcome is compared to the population socioeconomic group ranked from lowest to highest. The cumulative population is assigned to each group and is ranked according to socioeconomic status from lowest to highest. This is known as the relative rank which is an independent variable.

In summary, health inequality is a public health problem that has to be addressed not just among the elderly but in all the age group (Rule et al., 2014). The challenge here is that, there is a gap of knowledge to what extent health inequality exists among the elderly in Ghana and how these health inequalities can be minimized. From the literature, factors such as education, employment income, marital status and other social determinants of health affect the health of the population through varying pathways from previous studies. Therefore, it is important to understand these factors and how they contribute to inequality in health in order to make recommendations for future interventions.

CHAPTER 3

3.0 METHODOLOGY

3.1 Study design

Secondary data was used for this study and data was taken from a study on Global ageing and adult health (SAGE) Wave 1 conducted in Ghana in 2007. SAGE is a multi-cross-country study across six countries (China, Ghana, India, Mexico, Russian Federation and South Africa). In Ghana, a cross sectional study was done involving all ten regions. It studied the same population of adults over a period of three years. The study assessed the health and wellbeing of the adult population of these six countries. For the purpose of this work, the data obtained for this SAGE study was used to measure health inequality and assess what factors are associated with such inequality among the elderly in Ghana.

3.2 Study location

Ghana is located on the West African's Gulf Coast of Guinea. It is bounded to the north by Burkina Faso, East by Cote d'Ivoire and west by Togo. It has a population of about 24 million inhabitants and a total land area of 238,540km². The population of the elderly in the country is about 1.643,381 million, which constitutes about 6.7% of Ghanaians. Ghana is made up of 10 administrative regions and 170 districts. This study involved areas in all the ten regions of Ghana.

3.3 Variables measured

The variables used for this study were the following;

3.1 Dependent variable

Health outcome: Self- Reported Health within the last 12 months. Literature has it that Self- Reported Health is a good predictor of morbidity. Respondents were assessed based on their response, rated on a 5-point likert scale (very good, good, fair, poor and very poor). They were recoded into three groups – good, fair and poor. Very good and good health responses were recoded as three, fair health as two, poor and very poor responses were recoded as one.

3.3.2 Independent variables

Socioeconomic status: Education, work status, marital status, income and health insurance.

Demographic characteristics: Age, sex, locality and regions. Description of the variables for this study is shown on table 3.1

3.4 Study population

The SAGE study involved 5573 respondents of elderly persons from the age of 50 and above. For this project, respondents of 60 and above were eligible for inclusion. Four incomplete responses were dropped in the data set as well as respondents below 60 years. This reduced the sample size to about 2845 observations.

3.5 Sampling

From the SAGE 2008 report in Ghana, the sample was stratified by 10 administrative regions and then by locality into urban and rural areas. A total of 20 strata were identified. In the urban and rural areas, census enumerated areas were used as the sampling frame. A total of 251 census enumerated areas were identified. Enumerated areas were then selected from each stratum based on the size of the population of the elderly in that area. Twenty households were randomly selected from each enumerated area. A 50+ adult was taken from each household and 4

individuals from age 18-24 were taken as proxies. A total of 5000 adult respondents and 1000 proxy respondents were selected. One enumerated area was not used and the total sample size was reduced to 5571.

Table 3.1: Variable description table

Variable name	Measurement
Dependent variable	
Self-reported health	Very good, good, moderate, poor and very poor
Independent Variables	
Age	60- 69 (young old), 70-79 (middle old), above 80 (old-old)
Sex	Male/female
Marital status	Not married, married/cohabiting, divorced, widowed
Education	No formal, primary, secondary and tertiary
Employment	Not employed, private, public and informal
Income	Highest, high, average, low, lowest
Health insurance	Insured or not insured
Locality	Urban or rural
Chronic conditions	Diabetes, hypertension, stroke, arthritis, depression, asthma, chronic lung disease
Regions	Eastern, Western, Ashanti, Northern, Brong Ahafo, Upper East, Upper West, Central, Greater Accra, Volta

3.6 Data collection techniques

Based on the SAGE 2008 report, the data was collected by face to face questionnaires administered to each household and individual respondent. The questionnaires were divided into

household and individual questionnaires. Each of the questionnaires were further divided into several sections that assessed for different characteristics of the elderly such as socio-demographic characteristics, work history and benefits, health state descriptions and so much more. If a respondent was incapable of answering, a proxy questionnaire was to be completed. The questionnaires were written in English and then translated into the 3 local languages (Akan, Twi and Ga) and these questionnaires were used in training the interviewers. A team consisted of 4 interviewers and one supervisor assigned to a primary sampling unit. The interviewer was to complete about two interviews per day. He was expected to look for the respondent if he was not available, a maximum of 3times per day. Instruments were provided for measuring the blood pressure, height, weight, waist circumference measures, visual acuity. A spirometry test was also done. Blood was taken by thumb prick to screen for certain ailments.

3.7 Quality control

Response rates are commonly used to assess quality control. Proxy interviews were done when respondents were not able to answer the questions either because of their ill health or mental incapacity. According to the SAGE Ghana report, to ensure proper recording and consistency of information, two respondents were randomly selected for retest and this was done after every 7th day. A total of 214 interviews were retested. The response rates were high for the households and were between 97.1% for females and 99.7% for males. The response rate for the individuals were equally high, 92.1% for females and 97% for men.

Secondly, the problem of age heaping is a common phenomenon in demography especially when dealing with the old. It is simply a misstatement of age. Myer's blended index was used in calculating age heaping. In this index, there is a comparison of the expected proportion of people within a particular age bracket to the reported proportion of people within the same age bracket.

It is reported from 0-99. 0 means no age heaping and 99 meaning very high age heaping and hence poor data quality. For this study, Myers index was about 11.9%, not far from 0, indicating that the data quality was good.

3.8 Data process and analysis

Data analysis was divided into four parts namely; a summary of the characteristics of the population, a descriptive statistic on SRH by socioeconomic and demographic determinants, a concentration curve and concentration index calculation and a regression analysis.

3.8.1 Description of data and data cleaning

The study used secondary data from WHO study on ageing and adult health. As a result of this, the data was cleaned for analysis. The two datasets used for the SAGE study were the household (HH) data set and the individual data set which in this project, the master dataset. The individual data set contained 5573 observations and 1684 variables. The respondents' identity number and the variables region, locality, age sex, marital status, education level, education status, work status, job employer, chronic conditions, and health today were selected from the individual dataset. The rest of the variables that were not needed were dropped. The inclusion criteria for this project were respondents aged 60 and above. The HH data set contained 608 variables and 5,269 observations. The respondents' identity number, asset and health insurance variables were selected from the HH dataset and merged with the individual dataset.

Cleaning was done by removing some data that was incomplete and not needed for the study, recoding and labeling the variables, generating new variables and converting some string variables to numeric variables. A composite index was generated for chronic conditions. Having no chronic condition was coded as 0, one chronic condition was coded as 1 and two or more

chronic conditions were coded as two. Three groups were generated and the total index summed up to 16. An index of 8/16 implied respondent had none of the chronic conditions. Respondents with one chronic condition had an index of 9/16. Those with two or more chronic conditions had an index of $\geq 10/16$.

3.8.2 Descriptive analysis

The data was taken from SAGE wave 1. Table 4.1 was used to describe the characteristics of the study population in frequencies and percentages. The age variable was categorized into three groups, young old (60-69), middle old (70-79) and old-old (above 80). Education was categorized into four groups namely no formal education, primary, secondary and tertiary education. Respondents were grouped into those who had never worked and those who had worked in one of the following sectors; public, private and informal sector. The income variable was grouped into five quintiles from the lowest to the highest.

The respondents' educational level was classified into four levels. No formal education, primary education, secondary education and tertiary education.

Marital status was grouped into four groups, never married, married, separated/divorced and widowed.

The respondents were classified into those who were insured and those who were not insured. Chronic conditions assessed were arthritis, diabetes, stroke, depression, hypertension, angina, chronic lung disease and asthma. They were divided into three categories. No chronic condition was coded as one, one chronic condition as two and more than one chronic condition as three.

Respondents were also classified in terms of place of residence. That is, the proportion of the elderly living in urban or rural areas as well as the proportion of respondents residing in any of

the ten regions (Upper East, Western, Central, Ashanti, Brong Ahafo, Northern, Eastern, Upper west, Greater Accra and Volta region).

Table 4.2 represents a descriptive statistic on SRH by socioeconomic and demographic factors. This was used to assess the proportion of the elderly in each of the health categories. A cross tabulation was done to reveal a significant statistical relationship between SRH and the explanatory variables.

3.8.3 Concentration index analysis

Socioeconomic status was assessed using the income quintiles. The measuring domains were grouped into five quintiles with one as the lowest and five as the highest. SRH was used as health variable of interest. The cumulative proportion of the various categories of self-reported health (poor, fair and good health) represented on the Y-axis, were plotted against the cumulative proportion of the SES ranked from the lowest to the highest represented on the x-axis, to get the various concentration curves for poor, fair and good health. There is a diagonal line across the graph known as the line of equality. It represents equality across all groups in the population. If the curve lies above the line, it implies that the health variable is concentrated among the more deprived. If below the line of inequality, it implies that the health variable is concentrated among the most advantaged. The advantage of this curve was to provide a visual representation of health inequality.

The next step was to find the concentration index (CI) defined as twice the area between the curve and the diagonal line with values ranging from -1 and 1. A negative or positive sign indicates that the health outcome is concentrated among those with low SES (low and lowest income quintiles) or high SES (high and highest income quintiles) respectively. The ado file was

downloaded from the internet into STATA and a series of commands were used to calculate the various concentration indices.

The formula for calculating concentration index is as shown below,

$$C = \frac{2}{\mu} \text{cov } h, r$$

where C represents the overall index, μ represents the mean weight of the sample, h is the health variable and r the fractional rank by income (O'Donnell et al., 2008).

This equation makes it clearer to understand the relationship between the health variable and the ranked income distribution. In summary, it is the covariance between these two variables, scaled by two and divided by the mean of the health variable.

Table 4.3 represents the concentration indices of the various health states and their respective standard errors.

3.8.4 Regression analysis

SRH was used as an indicator of morbidity to determine the relationship between health status and socioeconomic determinants (income, education, occupation, sex, marital status and locality). This indicator was measured from the question, 'how do you rate your health today? The options were very good, good, moderate, poor and very poor. For this study, three categories were created, good, moderate and poor. A dichotomous variable was created (moderate and poor =poor health=1 and good health =0). Previous studies have shown similar classification of the health variable and some authors have come to the conclusion that dichotomization of SRH does not make a difference in the results obtained (Bourne & McGrowder, 2009). This was confirmed by testing for sensitivity in which the key analysis was repeated without dichotomizing the health variable but using the three health states, good, moderate and poor. An ordinal logit model was

used and it produced different figures but the same findings for interpretation as with the binary model.

Table 4.4 in the results section represents this relationship between SRH and the socioeconomic/demographic variables. A multivariate analysis (binary logistic regression) was done to test the association between socioeconomic/ demographic characteristic and SRH. These factors represented on the conceptual framework as intermediate determinants of health, are known from literature to have an effect on SRH. The probability of reporting poor health among the disadvantaged (those with low income, low educational status, and more chronic conditions) is greater compared to the advantaged (high income, good educational background, good work status etc.). Odd's ratio (OR) will be used to measure the effect of each determinant on reporting poor health. The level of significance was set at a 95% confidence interval with a p-value of 0.05. An Odd's ratio of one implies that the socioeconomic and demographic characteristics have no effect on poor SRH. If the OR is above one, there is a positive effect of SES/demographic characteristics on reporting poor health and if below 1, there is a negative effect of SES/demographic characteristics in reporting poor health.

In the same way, if the confidence interval includes one or P-value is greater than 0.05, we will fail to reject the null hypothesis that says there is no effect of socioeconomic and demographic factors on SRH across the population of the elderly. On the other hand, if the confidence interval does not contain one and P-value is less than 0.05, we will reject the null hypothesis that says there is no effect of socioeconomic and demographic characteristics on SRH among the elderly.

STATA Version 12 was used to analyze the data.

3.9 Ethical consideration/ issues

The proposal for this study was reviewed by the Ethical Clearance Committee of the Research and Development Division of the Ghana Health Services for permission to proceed with the research which will be using open-source, secondary data from the WHO web database.

3.9.1 Description of subjects involved in the study

The study population will be the elderly population (i.e. those aged 60 and over) of Ghana as at 2007/2008.

3.9.2 Potential risk and benefits

This study seeks to be beneficial to its study population and the general society at large. The study design employed for the study poses no risk to either the study population or the society, since the study will be utilizing secondary data and will not be involving actual individual participants. It also seeks to contribute to the aim of the SAGE Study by providing useful information on the health utilization and inequalities present among the increasingly important elderly population of Ghana.

3.9.3 Confidentiality

The use, processing and analysis of the dataset will be done with the intention of assuring confidentiality to all data points will be anonymous by number-coding any personal information in the data set.

3.9.4 Data usage and storage

Despite the fact that this study will be using open-source secondary data, the data set would be kept as soft copy in an encrypted and password-protected folder on a personal laptop with access

to it limited strictly to only the researcher and the supervisor, who will provide advice on data analysis.

3.9.5 Declaration of conflict of interest

The researcher hereby declares that there is no conflict of interest in the study design, methods and potential finding

CHAPTER 4

4.0 RESULTS

The results will be presented as follows; a descriptive analysis of the population, concentration index showing the concentration curves and a multivariate analysis using a binary logistic regression.

4.1 A summary of the characteristics of the study sample

Overall, out of 2845 respondents 579 (20.4%) reported poor health, 1,211 (42.6%) reported moderate health and 823 (28.9%) reported good health. This is represented on figure 4.1.

Figure 4.1: Overall level of self-reported health

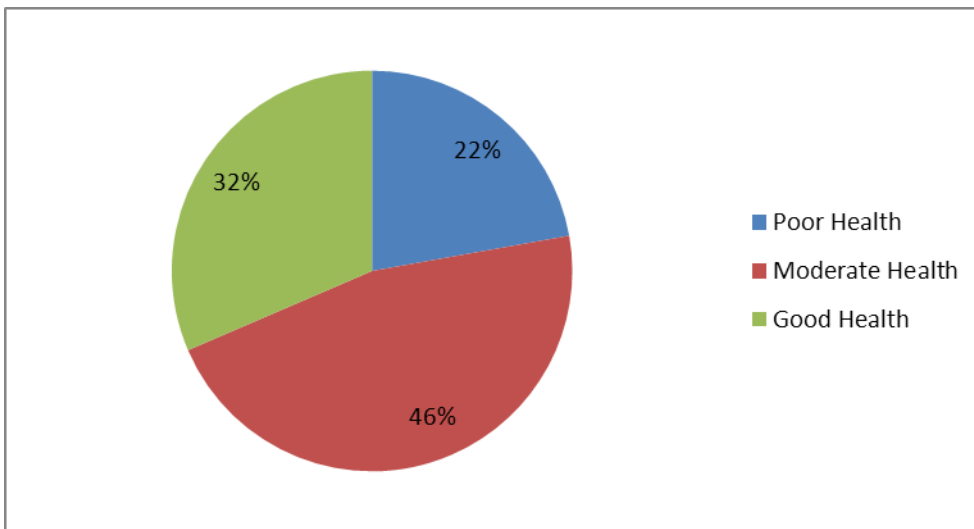


Table 4.1 shows a descriptive statistics of the characteristics of the study population. The study population was nationally representative involving all ten regions of Ghana. The sample population was made up of adults above the age of 60 years. They were classified into three groups as the young old (60-69 years) representing 1,305 (45.9%) of respondents, middle old

(70-79 years) representing 1,071 (37.4%) of respondents and old-old (above 80 years) representing 465 (16.3%) of the study respondents. One thousand three hundred and fifty eight respondents (47.7%) of the population were males and 1,483 (52.1%) were females.

In classifying the respondents by marital status, 32 (1.1%) of the elderly have never been married, 1,401(49.9%) were married or cohabiting, 363 (12.8%) were either separated or divorced and 1,026 (36%) were widowed. More than half (56.7%) of the elderly were not insured while 1,226 (43%) were insured. One thousand seven hundred and twenty seven respondents (60.7%) had no formal education while 876 (30.8%) respondents had either a primary, secondary or tertiary education.

The highest proportion of respondents who were employed were from the informal sector, 2,256 (79.3%), followed by 219 respondents (8.4%) in the public sector and 82 respondents (3.2%) in the private sector. Forty seven respondents (1.8%) had never worked. About 61.4% of the respondents lived in the rural areas compared to 38.5% who lived in the urban areas.

One thousand six hundred and sixty five respondents (59%) did not report any of the eight chronic conditions that were assessed in the questionnaire (Diabetes, hypertension, arthritis, chronic lung disease, asthma, angina, stroke, depression), while 620 (21.8%) reported one chronic condition and (320) 11.3% respondents reported more than one chronic condition. Income was classified into five quintiles. There were 619 respondents (21.8%) in the lowest quintiles, while 520 (18.3%) respondents were in the highest quintiles. The highest number of respondents were from Ashanti region 411 (14.4%) and the lowest from the Upper West 47 (3%). A summary of the characteristics of the study sample is as shown on Table 4.1.

Table 4.1: Summary of the characteristics of the study population

Variables	Frequency (n)	Percent (%)
Age		
60-69	1,305	45.9
70-79	1,071	37.6
Above 80	465	16.3
Sex		
Male	1,358	47.7
Female	1,483	52.1
Marital Status		
Never married	32	1.1
Married/co-habiting	1,401	49.2
Separated/divorced	363	12.8
Widowed	1,026	36.1
Health insurance		
Uninsured	1,615	56.8
Insured	1,226	43.1
Education Level		
No formal education	1,727	60.7
Primary	444	15.6
Secondary	359	12.6
Tertiary	73	2.2
Employment		
Never worked	47	1.7
Public	219	7.7
Private	82	2.9
Informal	2,256	79.2
Locality		
Urban	1,096	38.5
Rural	1,748	61.4
Chronic		
Chronic condition	1,665	59
One chronic condition	620	21.8
More than one condition	320	11.3
Income quintile		
Lowest	619	21.8
Low	585	20.6
Middle	580	20.4
High	536	18.8
Highest	520	18.3
Region		
Eastern	389	13.6
Western	310	10.9
Central	289	10.2
Ashanti	411	14.5
Brong Ahafo	273	9.6
Northern	265	9.3
Upper East	222	7.8
Upper West	87	3.1
Greater Accra	285	10.0
Volta	314	11.0

4.2 Self-reported health (SRH) by socioeconomic/demographic characteristics

Table 4.2 represents a descriptive statistics of SRH in percentages against the explanatory determinants of health with their corresponding CHIRS.

A comparison made between reporting poor and good health showed that, most of the respondents, 1305 (39.5%) in the young old category (60-69) reported good health, compared to 465 (16.9%) in the same category who reported poor health. Among the middle old, 221 (22.5%) reported less poor health compared to reporting good health 267 (27.2%). The old-old reported poor health more (36.2%) compared to reporting good health (18.8%). Clearly, reporting good health reduced as age increased, from 39.5% to 18.8%.

Males, 467 (36%) reported good health more compared to reporting poor health 242 (18.6%). However, females reported poor health more 337(26.7%) compared to males. A higher proportion of respondents who were married or cohabiting 457 (36%) reported good health more compared to reporting poor health 234 (18.45%). Also, among those who were divorced or separated, 113 (32.2%) reported good health compared to reporting poor health 82% (23.4%). In the same way, 251 (26.4%) of the widows reported poor health while 242 (25.5%) reported good health. Out of one thousand seven hundred and twenty seven respondents with no formal education (60.7%), 414 (24%) reported poor health and about 818 (30%) reported good health. A few proportion of the elderly, 8 (11%) with tertiary education, reported poor health while 30 (41.1%) reported good health. A total of 16 (34%) of the elderly who had never worked before reported poor health, while 8 (17.02%) reported good health. Most respondents, 693 (76.4%) had been employed in the informal sector and reported good health compared to 512 (42.6%) reporting poor health. Two hundred and twenty seven (22.4%) of the elderly who live in the urban areas reported poor health compared to reporting good health 322 (31.8%).

Out of the elderly who were insured, 258 (22.8%) reported poor health, while 336 (29.7%) reported good health. Respondents with one chronic condition 171 (27.6%) reported poor health compared to 162 (26.2) reporting good health. In the same way, 99 (30.9%) of those with more than one chronic condition reported poor health while 62 (19.4%) reported good health. Among those in the lowest income quintiles, 150 (26.4%) of them reported poor health while 166 (29.2%) reported good health. A greater proportion of the elderly in the highest income quintile 178 (37.2%) reported good health compared to those reporting poor health 96(20%). Most respondents in all ten regions reported good health compared to reporting poor health except for 66 (24.81%) respondents in the Volta region, and 87 (29.7%) in the Western region who reported poor health compared to 57 (27.3%) and 77 (21.2%) reporting good health in the respective regions.

Pearson's chi-square test showed that most variables except the health insurance and locality variables were significantly related to SRH. This is represented on table 4.2.

Table 4.2: Self-reported health by socioeconomic/demographic characteristics

Variables	Poor health (%)	Fair health (%)	Good Health (%)	Pearson's χ^2
Age				
Young old (60-69)	204(16.9)	23 (48.9)	8 (17.0)	0.000
Middle old (70-79)	221 (22.5)	110 (50.2)	72 (32.9)	
Old-old (≥ 80)	154 (36.2)	27 (32.9)	42 (51.2)	
Sex		1,049 (81.1)	693 (76.4)	
Male	242 (18.6)			0.227
Female	337 (25.7)	674 (45.5)	487 (32.9)	
Marital Status		537 (47.5)	336 (29.7)	
Never Married	9 (33.3)			0.000
Married/Cohabiting	234 (18.5)	761 (45.7)	595 (35.7)	
Divorced/Separated	82 (23.4)	286 (46.2)	162 (26.2)	
Widowed	251 (26.4)	159 (49.7)	62 (19.4)	0.889
Education Level				
No formal education	414 (24.0)	463 (45.8)	322 (31.8)	0.006
Primary Education	91 (20.5)	748 (46.7)	501 (31.2)	
Secondary Education	64 (17.8)			
Tertiary Education	8 (11.0)	253 (44.5)	166 (29.2)	
Employment		269 (50.1)	152(28.3)	
Never Worked	16 (34.0)	245 (46.2)	160 (30.2)	0.000
Public Employer	37(17.0)	238 (48.2)	165 (33.4)	
Private Employer	13 (15.9)	205 (42.8)	178 (37.2)	
Informal	512 (42.6)	23 (48.9)	8 (17.0)	
Health Insurance		110 (50.2)	72 (32.9)	0.227
Uninsured	321 (21.7)	27 (32.9)	42 (51.2)	0.000
Insured	258 (22.8)	1,049 (81.1)	693 (76.4)	
Chronic Condition				
No chronic condition	309 (18.6)	674 (45.5)	487 (32.9)	0.000
One chronic condition	171 (27.6)	537 (47.5)	336 (29.7)	
More than one condition	99 (30.9)			
Locality		761 (45.7)	595 (35.7)	
Urban	227 (22.4)	286 (46.2)	162 (26.2)	0.889
Rural	352 (22)	159 (49.7)	62 (19.4)	
Income Index				
Lowest	150 (26.4)	463 (45.8)	322 (31.8)	0.006
Low	116 (21.6)	748 (46.7)	501 (31.2)	
Middle	125 (23.6)			0.000
High	91 (18.4)	253 (44.5)	166 (29.2)	
Highest	96 (20.0)	269 (50.1)	152(28.3)	
Region				
Eastern	97 (26.9)	163 (45.3)	100 (27.9)	0.000
Western	87 (29.6)	130 (44.2)	77 (26.2)	
Central	60 (21.4)	128 (45.6)	93 (33.1)	
Ashanti	89 (22.8)	148 (39)	153 (39.2)	
Brong-Ahafo	53 (21.0)	131 (52)	68 (27.0)	
Northern	42 (17.0)	113 (45.8)	92 (37.3)	
Upper East	16 (9.20)	101 (58.1)	57 (32.8)	
Upper West	11 (14.7)	32 (42.1)	33 (43.4)	
Greater Accra	97 (26.9)	163 (45.3)	100 (27.9)	
Volta	87 (29.6)	130 (44.2)	77 (26.2)	

4.3 Concentration index analysis

The overall CI for poor health in the study data set was -0.06 (SE=0.02) calculated using the covariance method in STATA. The negative index implies that poor health was concentrated more among the low income group.

Figure 4.2 shows a concentration curve which gives a visual representation of such health inequality. The cumulative per cent of the poor health outcome variable was plotted against the cumulative per cent of the income quintiles ranked from the lowest to the highest. The curve lies above the line of equality indicating that poor health is concentrated more among the poor.

Figure 4.3 represents the concentration curve for moderate health which is almost on the line of equality. The index takes on a negative value of -0.01 (SE=0.01) since it tilts slightly above the line of equality. This implies that moderate health is almost equally distributed across the population but more towards the poor.

Figure 4.4 shows a concentration curve on good health with a concentration index of 0.06 (SE=0.02). The curve is seen to lie below the line of inequality indicating that good health was concentrated among those in the highest income quintiles. It can be seen here that the index of good health is a mirror image of poor health. According to Erreygers (2009), this is one of the properties of a concentration index in which one measurement is the mirror image of the other.

Table 4.3: A representation of concentration indices for self-reported health

Variable	Concentration Index	Standard Error
Poor Health	-0.06	0.02
Moderate Health	-0.01	0.01
Good Health	0.06	0.02

Figure 4.2: Concentration curve for poor health

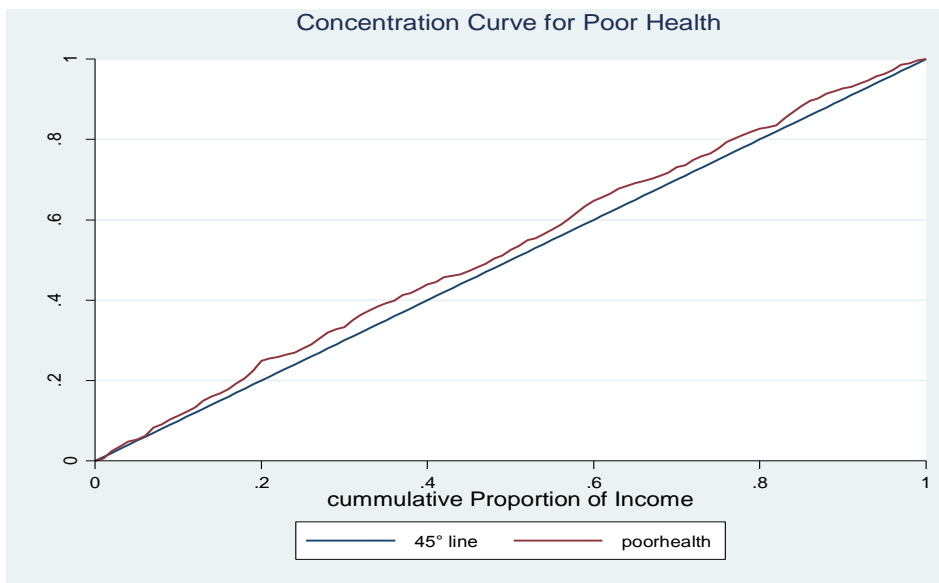


Figure 4.3: Concentration curve for fair health

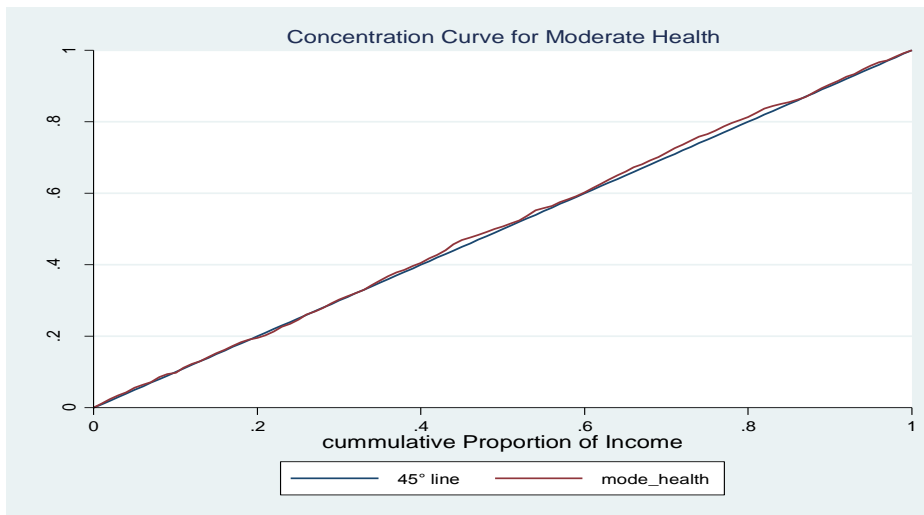
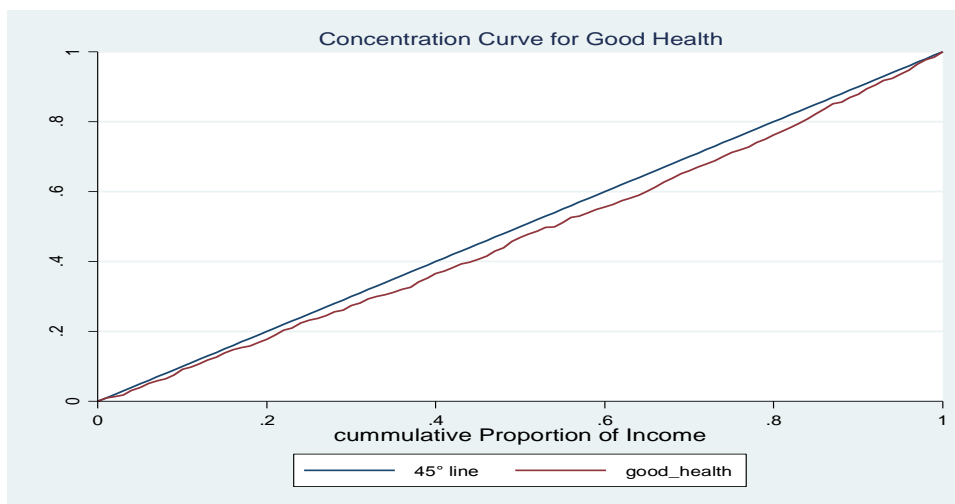


Figure 4.4: Concentration curve for good health

4.4 The relationship between SRH and determinants of health

Table 3 shows the effect of each intermediate determinant (socio-economic and socio-demographic characteristics) on reporting poor health using a binary logistic regression and reporting the adjusted Odd's Ratio (OR).

After controlling for all life-course exposures, there was a statistically significant association between age and poor SRH. As age increases by one unit, the odds of reporting poor health was 1.6 times more among the middle old [OR=1.6 at 95% CI (0.59-0.83)] and 2.5 times among the old-old [OR=2.5 at 95% CI (1.90-3.38)]. This in other words means that the odds of reporting poor health increased as the elderly grow older.

Being employed in the private sector decreased the odds of reporting poor health by 75% [OR= 0.25 at 95 % CI (0.10-0.61)] compared to those who had never worked before. This relationship was statistically significant at $p < 0.05$. Those in the high and highest income quintile, were 27% [OR=0.73 at 95% CI (0.54-0.99)] and 32% [OR=0.68 at 95% CI (0.49-0.95)] respectively, less

likely to report poor health compared to those in the lower income quintiles. As income increases, the chance of reporting poor health reduces.

Respondents with chronic conditions were 1.5 times [OR= 1.54 at 95% CI (1.24-0.78)] more likely to report poor health if they had just one chronic condition and 2.3 times [OR= 2.29 at 95% CI (1.67-3.15)] more likely to report poor health if they had more than one chronic conditions. This comparison is made to those without any of the eight chronic conditions. The more medical conditions an individual has, the more likely it is to report poor health.

Geographical regions were shown to have a significant relationship with SRH. In comparing the nine regions of Ghana to the Northern region which is known to be one of the poorest regions, the odds of reporting poor health was 1.5 times higher in the Western region [OR= 1.60 at 95% CI (1.07-2.38)], and 1.89 times in the Volta region (OR=1.9 at 95% CI (1.25-2.88)] compared to the Northern region.

There was no statistical difference in reporting poor health among males and females [(OR=1.15 at 95% CI (0.91-1.46)]. The results are similar among those who are married with or without education. Also, there was no statistical significant relationship between respondents working in the public and informal sector, being insured, belonging to the low and middle income quintile, living in an urban area and reporting poor health. Those who resided in the following regions; Central, Ashanti, Brong Ahafo, Upper East, Upper west regions, Eastern, Greater Accra did not show any significant difference in reporting poor health compared to those in the Northern region.

Table 4.4: Binary logistic model on poor SRH and socioeconomic/demographic factors

Variables	Adjusted Odd's Ratio (Conf. Interval)	P-value
Age		
Young old (ref)		
Middle old (70-79)	1.57 (1.29-1.90)	0.000
Old-Old (Above 80)	2.53 (1.90-3.38)	0.000
Sex		
Male (ref)		
Female	1.15 (0.91-1.46)	0.232
Marital status		
Never married (ref)		
Married/Cohabiting	0.64 (0.25-1.68)	0.367
Divorced/Separated	0.59 (0.22-1.57)	0.291
Widowed	0.73 (0.28-1.91)	0.518
Education Level		
No formal education (ref)		
Primary	0.95 (0.73-1.22)	0.679
Secondary	0.80 (0.60-1.08)	0.142
Tertiary	0.73 (0.28-1.91)	0.518
Employment		
Never worked (ref)		
Public	0.57 (0.24-1.33)	0.191
Private	0.25 (0.10-0.61)	0.003
Informal	0.47 (0.21-1.04)	0.061
Income quintile		
Lowest (ref)		
Low	0.96 (0.73-1.27)	0.801
Middle	0.93 (0.70-1.23)	0.6
High	0.73 (0.54-0.99)	0.041
Highest	0.68 (0.49-0.95)	0.023
Health Insurance		
Not insured (ref)		
Insured	1.04 (0.86-1.26)	0.660
Chronic conditions		
No chronic condition (ref)		
One chronic condition	1.54 (1.24-1.92)	0.000
More than one condition	2.29 (1.67-3.15)	0.000
Locality		
Urban (ref)		
Rural	0.96 (0.73-1.27)	0.687
Region		
Northern (ref)		
Western	1.60 (1.07-2.38)	0.022
Central	1.10 (0.74-1.61)	0.645
Ashanti	0.84 (0.59-1.21)	0.358
Brong Ahafo	1.40 (0.93-2.10)	0.106
Eastern	1.41 (0.96-2.08)	0.079
Upper East	1.14 (0.74-1.76)	0.555
Upper West	0.75 (0.43-1.29)	0.295
Greater Accra	1.17 (0.76-1.79)	0.475
Volta	1.89 (1.25-2.88)	0.003

CHAPTER 5

5.0 DISCUSSION

This study analysed the determinants of health inequality among the elderly in Ghana. Based on the conceptual framework, the proximate health determinants assessed in the study were sex, age, marital status, education, occupation, locality, health insurance, presence or absence of any of the chronic conditions (diabetes, hypertension, arthritis, stroke, angina, depression, chronic lung disease, and asthma). These determinants were used to assess inequality in health status among the elderly, using SRH as a measure of health status which have been shown from previous studies to be a good predictor of health among the elderly as it is perceived to comprise the three aspects of health: social, mental and physical well-being (Pfarr, Schmid, & Schneider, 2012).

5.1 Summary of key findings

From this study, health inequality has been shown to exist among the elderly in Ghana. A concentration index (CI) of a negative value (-0.06) indicates that poor health was concentrated among the poor or those in the low income quintiles. In the same way, a positive index of 0.06 implies good health was concentrated among the rich or those in the high income quintiles. On the other hand, moderate health had a very small CI of -0.01 indicating that fair health was almost evenly distributed across the population with a slight tilt towards the poor.

In assessing factors that affect health inequality and how these factors are related to SRH (outcome variable), age, employment type, income quintiles, existing chronic conditions and some regions (Western and Volta region) were shown to have an effect on SRH among the population of the elderly.

Age was seen as a significant predictor of health. Respondents in the middle old (70-79) and old-old categories (80 and above) reported poor health more compared to those in the young old category (60-69).

Another predictor of health was employment type and it was shown to have an effect on reporting good health. The results in this study showed that having a job in the private sector were less likely to report poor health compared to respondents who had never worked.

Income was used as a measure of SES and it showed that respondents belonging to the high SES were more likely to report good health compared to those in the middle and low SES. Also, respondents with one or more than one chronic conditions reported poor health more compared to those without any of the chronic conditions. Respondents in the Volta and Western regions were more likely to report poor health compared to those in the Northern region.

Marital status, education, having a health insurance, locality and residing in any of the ten regions apart from the Northern, Volta and Western regions, were not significantly related to reporting poor health.

5.2 Supportive findings from literature

Many studies done have shown inequalities in reporting health across the population of the elderly (Fernandez-Martinez et al., 2012). The concentration index has been the standard measure of health inequality and ranges between 1 as maximum and -1 as minimum. Similar studies have used SRH as a measure of health inequality and found poor health to be associated among the poor (Sözmen et al., 2012). It could be seen from this study that health inequality though to a small extent, exists among the elderly in Ghana. The health index showed little health disparity in the study population. This may have resulted from the fact that income, which

is not usually a good measure of SES in developing countries, was used in place of wealth. Most individuals do not often disclose their true source of monthly income unlike in the developed countries.

The biological process of ageing explains the inequality in SRH among the elderly. However, the young old are more likely to report better health because they are still physically active and as such, may still be in work service. A similar study carried out in Thailand found old age among other determinants to contribute to health inequality (Haseen, Adhikari, & Soonthorndhada, 2010). They found that the old-old are more likely to report worst health compared to the young old. This could be associated to declining mobility and activities as they get older.

Having an existing chronic condition was found to be positively associated with reporting poor health. In other words, few of the respondents with chronic conditions reported good health. This could be from lack of access to health care or infrequent visits to health facilities by respondents, resulting in poor management of medical conditions. It has been shown from previous studies that lack of access to healthcare services may be from insufficient cost of transportation to a health facility for treatment, lack of family support both financial and emotional and poverty or an inefficient health system (Horton & Johnson, 2010). Studies have shown that those with chronic conditions report poor health more compared to those without these conditions (Alves & Rodrigues, 2005; Debpuur et al., 2010; Mavaddat et al., 2014). The implication of this is an increase in healthcare needs for the elderly, and therefore cost implications in the future from a rise in healthcare utilization (Vogeli et al., 2007). As the demand for healthcare increases among the elderly, there will be a corresponding increase in supply of medications, technologies and

health workers for the sick. This will cause additional expenditure to public and private institutions as well as the family members.

A majority of the elderly respondents, 2,256 (79.2%) had worked in the informal sector. However, respondents who worked in the private sector were less likely to report poor health compared to those not employed. This could be from the fact that working and earning a wage increases the chance of taking care of health needs better than not working at all. Similar studies done have shown higher risk of low perceived health among the unemployed compared to the employed (Kaleta, Makowiec-Dabrowska, & Jegier, 2008). In this study, there was no significant difference in reporting good or poor health among those in the public sector and informal sector.

Income was shown to contribute to health inequality. Respondents of the high and highest income quintile were shown to report good health more compared to reporting poor and moderate health. Tajvar, Arab, and Montazeri (2008), carried out a study in Iran among the elderly and found that most Iranians who were poor and lived under poor conditions with little or no earnings, perceived their health to be poor. It is known from literature that people in the high income groups can easily afford healthcare and as such, take care of their healthcare needs better and live longer (Demakakos et al., 2008; Lynch et al., 2004). Fink, Weeks, and Hill (2012), carried out a study in Accra Ghana and found contrary findings. There was no significant association between income and health status. This however, was not a nationally representative study.

In this study, respondents from Volta and Western regions reported poor health compared to those in the Northern region who reported good health. In other words, most of these respondents rated their health to be poor. This is surprising considering the fact that the Western region which

is one of the most economically active regions in the country provides employment in the private sector to more than 80% of its residents. It is expected that the residents may rate their health better compared to the impoverished Northern parts. This may be explained from the fact that urbanisation and industrialisation influences the health of individuals. Those in the North may engage more in farming and have a more disciplined lifestyle (less alcohol intake as well as tobacco intake). Food security and avoidance of risky behaviours can improve the health status of a region or a nation.

Studies have shown an association between marital status and SRH. Being a widow increases the chance of reporting poor health compared to good health (Maniecka-Bryla et al., 2013). This is contrary to Bós and Bós (2007), who found that widows are 20% more like to report better health than the married women. This is surprising giving the fact that being single at old age increases the chances of loneliness and depression. On the other hand, reporting good health among widows could be associated to protective effects from family members. However, this study found no association between marital status and SRH.

In studying health inequalities among the elderly, it is important to take into consideration gender inequalities which have been shown to exist. Many studies have shown disparities in health among men and women. Studies done in Latin America have shown that the odds of reporting poor health in women were higher compared to men (Hirve et al., 2010; Zunzunegui et al., 2009). Women are often seen to be giving care to their spouse and supporting the family at that age. Others have argued that reporting poor health among women is often based on their sensitive nature and not necessarily from reality. There was no significant difference in SRH among men and women in this study, and findings are similar to a five year longitudinal study done in Finland, which showed no statistical difference in SRH despite the fact that women

repeatedly reported worsening health state and the men good health (Leinonen, Heikkinen, & Jylhä, 1998).

More than half of the elderly in Ghana had never been to school (66%) and as such, it is expected that poor health may be associated with low education status as supported by literature (Molarius et al., 2007). In this study however, there was no significant association between reporting poor health and education.

5.4 Study limitations

Income was used as a measure of SES. This may not be a good measure of SES in most African countries. According to Doocy and Burnham (2006), some of the drawbacks of using income as measure of SES include the following; First, they are often self-reported and as such respondents may be biased in reporting monthly income in hope of receiving financial aid. Secondly, seasonal differences in agricultural settings for example may exist when reporting monthly income. Thirdly some communities still practice barter and have no idea of monthly income. Lastly, rapid inflation over an extended period may lead to recall bias as individuals may find it difficult to estimate their income. This will definitely have an effect on the concentration curve and in calculating the CI, which in this study, was very narrow. Secondly, the study sample was limited to those aged 60 and above. In measuring health inequality, it would have been interesting to conduct a health inequality on the entire population and not only on this small group given limited evidence in the entire country. Thirdly, SRH may not capture people's experiences and thinking. In addition, there is the issue of heterogeneity in which individuals may be biased in reporting their health states. Women are often seen as being sentimental in reporting their health. However, it has been done in 70 different countries with robust findings (Salomon et al., 2004). Fourthly, based on the fact that this study is a cross sectional study, a

causal conclusion cannot be established between the influence of socioeconomic and demographic factors on SRH (Ng et al., 2010). However, this study will serve as a baseline for conducting further studies using a longitudinal data for a causal effect to be established.

CHAPTER 6

6.0 CONCLUSION

The population of the world is aging including the population of Ghana at a faster rate than expected; therefore, the health of the elderly should be of growing concern. The health status might be better in individuals who experienced a better childhood compared to those who lived in poverty. Educational status, poverty, income are other social and demographic factors connected to each other in one way or the other and influence the health outcome of an individual. Therefore, the issue of health inequality has to be addressed from birth through adulthood so that old age should be reached with less ill health.

Generally, the health status of the elderly is reduced significantly from the biological process of aging. SRH used in this study to evaluate the health status of the elderly, was found to be significantly related to age, employment, presence of one or more than one chronic condition, income and geographical location. These determinants have been shown to cause disparities in health status among the elderly. Notwithstanding, although gender, education status and marital status have been shown to affect SRH in previous studies, this study did not find a significant association between these determinants and SRH.

In conclusion, health inequality is a growing problem in Africa and has been shown to exist in Ghana though not to a large extent. It therefore means that if more efforts are made by government, the relatively small distribution of inequality can be reduced further. Understanding factors that are associated with an individual's health will go a long way to improving health differences in future. As one grows old, the likely hood of reporting poor health is high and this

depends on the circumstances through which we grow and live. Addressing these circumstances will reduce disparities in health in the future, reduce the burden of poverty and improve the quality of life lived by most people, the elderly included. It is hoped that an equal or near equal state of health would be reached by Ghanaians when they grow old and that in the nearest future, the health and wellbeing of the elderly will be prioritized by policy makers, to provide a better environment for the old, so that the few years spent will be in comfort and in good health.

6.1 Recommendations

- Health disparities have been shown to exist among the elderly in Ghana and socioeconomic/demographic factors contribute to such inequality. To minimize such health disparities, the government of Ghana is recommended to act through its ministries to improve these social determinants of health particularly in the education sector, employment sector, health sector, and housing and transportation sectors. In this study, over 70% of the elderly in Ghana had no formal education and were employed in the informal sector. Improving access to education will increase the number of professionals in the country, and as such increase the number of people in the public and private sectors. These will improve the income level of Ghanaians and their health status as well. Most people will contribute to the affairs of the country and also benefit from pension funds when retired.
- The government of Ghana is called upon to adjust to an ageing society where the burden of NCDs will increase. This will cause a rise in government expenditure on health from increase in healthcare access and utilization. Their increasing number will require the provision of special health services as well as special home centres for those who are too sick or cannot be catered for by their family members, those who are abandoned or have

some health complications that require facility care than homecare. This may be too much cost for the government and therefore, Non-Governmental Organizations (NGOs), churches and donor agencies can collaborate to build homes for the elderly. These homes can serve as a source of employment for the youths. Also, the teaching hospitals and health authorities should encourage doctors to specialize in geriatric medicine, so that the elderly could be managed better.

- Efforts should be made by policy makers and stakeholders to reduce health inequality which is a growing public health issue of concern. It should be minimized by carving out well-structured strategic plans for the general wellbeing of the population.

Everyone will grow old someday and no one knows how it will look like until we get there. The way we want it to be for everyone including the children will depend on the decisions and policies made today. These policies should ensure an equitable distribution of health across all age groups and SES by first addressing social determinants of health. This will create a near equal society and thus a healthy one in future so that old age will be embraced in grace, and good health, not in suffering.

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APPENDIX:

GHANA HEALTH SERVICE ETHICAL REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted

*My Ref. :GHS-ERC: 3
Your Ref. No.*



Research & Development Division
Ghana Health Service
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Hannah

23rd March, 2015

Fonta Cynthia
School of Public Health
University of Ghana
Legon, Accra

ETHICAL APPROVAL - ID NO: GHS-ERC: 69/02/15

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol titled:

"Assessing Health Inequality among the Elderly in Ghana"

This approval requires that you inform the Ethical Review Committee (ERC) when the study begins and provide Mid-term reports of the study to the Ethical Review Committee (ERC) for continuous review. The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Please note that any modification without ERC approval is rendered invalid.

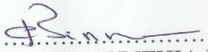
You are also required to report all serious adverse events related to this study to the ERC within seven days verbally and fourteen days in writing.

You are requested to submit a final report on the study to assure the ERC that the project was implemented as per approved protocol. You are also to inform the ERC and your sponsor before any publication of the research findings.

Please note that this approval is given for a period of 12 months, beginning March 23rd 2015 to March 22nd 2016.

However, you are required to request for renewal of your study if it lasts for more than 12 months.

Please always quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
DR. CYNTHIA BANNERMAN
(GHS-ERC CHAIRPERSON)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra