

**FACTORS INFLUENCING CHRONIC ILLNESSES AMONG  
OLDER PERSONS IN KENYA**

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UNIVERSITY OF NAIROBI**

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# DECLARATION

This research project is my original work and has not been presented for a degree in any other university.

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Date: 18/11/2010

This research project has been submitted with our approval as university supervisors.

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Date: 18 November 2010

## DEDICATION

*I dedicate this work to my wife Everlyne Keya Kundu and my two children Bruce Terrence and Anita Stacey.*

## **ACKNOWLEDGEMENT**

The compilation of this research project was made possible through the guidance of my supervisors at the Population Studies and Research Institute (PSRI) namely; Dr. Alfred Agwanda and Mr. Ben Obonyo Jarabi. I would also like to acknowledge my employer, the National Coordinating Agency for Population and Development (NCAPD), for giving me time from my work in order to undertake the research required to produce this project. In particular, I am grateful to the Chief Executive Officer, Dr. Boniface K'Oyugi, the Deputy Director Technical Services, Dr. Paul Kizito, and the Manager, Research and Policy Mrs. Vane Lumumba for their continued encouragement during the duration that I was a student at PSRI. Members of staff at PSRI under the leadership of the Director, Dr. Lawrence Ikamari, were also instrumental in ensuring that my studies at PSRI are fruitful thus resulting in this project whose development largely benefited from the knowledge and skills acquired at the institution.

## ABSTRACT

Older people are the fastest growing segment of the population today. Over a period of 50 years between the year 2000 and 2050, the number of older persons is projected to increase from 600 million to over two billion. The ageing of individuals and populations is usually accompanied by a growing burden of age-related, chronic diseases that drastically increase health care costs and mortality levels. In connection to this, the objective of this research project was to assess the health situation of older persons in Kenya with regard to chronic illnesses. The study also sought to determine the factors that influence the chronic illnesses status of older persons. This assessment used the 2005-06 Kenya Integrated Household and Budget Survey (KIHBS) dataset.

The analysis of the health situation of older persons in Kenya was done using the following three methods; univariate analysis using frequencies and means to describe the study population and estimate prevalence of chronic illnesses, bivariate analysis using the Chi-square test to identify significant associations between variables, and multivariate analysis using logistic regression to determine variables that have a significant influence on chronic health status. The dependent variable was 'presence of a chronic illness' while the independent variables were; sex, age, education, residence, disability status, poverty status, and marital status. From the findings, the health situation of pre-elderly persons (55-59 years) was compared to that of elderly persons.

Study findings showed that 17.6 percent of the pre-elderly and 26 percent of the elderly persons were living with chronic illnesses. Their respective mean morbidities (average number of chronic illnesses) were 0.20 and 0.29 for the pre-elderly and elderly persons. Among the elderly, the disability status, sex, age cohort (except 65-69 years), education, and poverty status were found to have a significant influence on their chronic illnesses status. For the pre-elderly, only disability status and sex were found to have a significant influence on chronic illnesses status. Females were found to have a higher prevalence of chronic illnesses among both the pre-elderly and elderly persons. These findings have implications for policy, programmes. Areas for further research were also identified by the study.

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# CHAPTER 1: INTRODUCTION

## *1.1 Background*

Today, there is no universally agreed definition of 'older persons' or 'elderly persons'. While the definition of older persons is somewhat arbitrary, it is many times associated with the age at which one can begin to receive pension benefits. In most developed countries, the chronological age of 65+ years has been accepted as the definition of older persons. However, the UN (2002) agreed cutoff of 60+ years is widely used in developing countries to define older persons.

In recent decades, population ageing has become a global area of concern, culminating in two world assemblies on ageing; the 1982 Vienna and 2002 Madrid conventions (UN, 1983, 2002). In Africa, ageing has become recognized as a focal issue at continental and national levels only in the last few years (AU/HAI, 2003). The main reason for the increased interest in population ageing is the fact that older people are the fastest growing segment of the population and their contribution to the burden of disease and mortality levels is fast increasing. In addition, it is estimated that by the year 2050, the number of people aged 60 years and over will outnumber people aged below 14 years (HAI, 2002). Sub-Sahara Africa (SSA) is projected to experience an increase in the number of older persons from 37.1 million in 2005 to 155.4 million in 2050, representing a more rapid increase than in any other world region (UNDP, 2007).

Growing old was once the sole prerogative of the developed countries but is now a shared benefit of development worldwide. This can be ascribed to sustained advances in medicine, public health, and sanitation which have reduced mortality levels and increased the expectancy. Decline in fertility levels has also contributed significantly to the increase in the proportion of older persons in the population. Contrary to misconceptions, older people in Africa will on average live many years beyond age 60. In 2006, the United Nations estimated that life expectancy at age 60 in SSA was 15 years for men and 17 years for women. This does not differ markedly from similar ones in other world regions. While increased life expectancy should be counted as a major success, the fact is that older people generally live on or below the poverty line and face a future of deprivation that may affect their health status and longevity (HAI, 2002).

The ageing of individuals and populations in SSA is accompanied by a growing burden of age-related chronic illnesses, especially non-communicable diseases (NCD), which contribute to high levels of mortality among the elderly. The World Health Organization (WHO) estimates that by 2020, chronic diseases along with mental disorders and injuries will make up 70 percent of the health care needs in developing and newly industrialized countries. Older people will form a significant part of this caseload. If unchecked, chronic diseases might pose a serious threat to the future solvency of health care and social protection systems. Already a sizeable proportion of older persons in SSA suffer from multiple, mostly preventable or manageable, non-communicable conditions such as osteo-arthritis, visual impairments, hypertension and cardiovascular disease, and consequent impaired functional ability. Among these, heart disease and stroke are the leading causes of mortality in old age in SSA and other developing regions (WHO, 2006).

In Africa, research on the increasing health needs of older persons has been given low priority because populations in African countries are largely youthful. This has led to little interest in the analysis of the population segment aged 60 years and above (Gachuhi, Kiemo, 2005). Due to this state of affairs, there have been very few quantitative studies on the health status and needs of older persons. In Kenya, hardly any quantitative studies on the health status of older persons have been undertaken.

With regard to the above, this study will estimate the proportion of elderly (60+ years) and pre-elderly (55 -59 years) persons in Kenya who are living with a chronic disease. It will also estimate the mean number of chronic illnesses per person among both the elderly and pre-elderly persons in addition to exploring the factors that influence the presence of chronic illnesses in old age.

## ***1.2 Problem Statement***

Globally, there is a shifting trend in the burden of disease from infectious diseases to NCDs. According to WHO, about 34 percent of deaths worldwide are due to NCDs and this is projected to increase by 17 percent before 2015. The greatest increase in the proportion of deaths due to

NCDs will be in Africa where it is projected to increase by 27 percent. This trend has been identified as one of the main development challenges that will be faced globally during the 21<sup>st</sup> century primarily due to the high cost of caring for patients with NCDs. Developing countries are expected to bear the biggest burden of NCDs due to their relatively poor economic status both at the national and household levels. This situation underscores the need to put in place concerted efforts to tackle the growing burden of NCDs.

A look at data on the main causes of death in Kenya shows that infectious diseases such as HIV/AIDS, tuberculosis, and malaria take the lead. Non communicable diseases such as ischemic heart diseases and cancers contribute to about one-fifth of the total recorded deaths. However, among older persons, over half of the deaths are due to chronic illnesses that are non-communicable. In this age group, compared to those aged less than 1 year, infectious diseases are a less significant cause of death. Health projections for Kenya for the period 2010 to 2030 indicate that the proportion of deaths due to NCDs such as cancer and ischemic heart diseases will continue to increase while the proportion due to infectious diseases will decrease. By the end of this period, it is expected that the proportion of deaths due to NCDs will be higher than that due to infectious diseases. Since chronic illnesses, especially NCDs, are a leading cause of death among older persons, it is expected that the contribution of older persons to the overall mortality level of Kenya will increase over the coming years.

Estimates of morbidity and mortality in Kenya are mainly from the following three sources; Health Management Information System (HMIS), Vital Registration System, and World Health Organization (WHO) estimates. Mortality data from these sources over the 2000 to 2008 period indicate that the proportion of deaths of males aged 55+ years is about 15 to 30 percent of all male deaths recorded annually. For females aged 55+ years, the proportion of deaths is about 12 to 28 percent of all annual female deaths. For both males and females, estimates from the Vital Registration System show that the age group 55+ years contributes the highest proportion of all deaths recorded annually followed by those aged less than 1 year. The WHO estimates also show that these two age groups have the highest proportion of deaths compared to all other age groups.

The health status of older persons in Kenya, and the factors that influence this status have hardly been studied quantitatively. This study therefore sought to fill this knowledge gap by providing

information on the prevalence of chronic illnesses among older persons in Kenya. In addition to this, the study investigated the significance of factors that are thought to influence chronic illnesses among older persons.

### ***1.3 Research Questions***

This study sought to answer the following research questions in a bid to provide insight into the health situation of older persons in Kenya with regard to chronic illnesses;

1. What is the prevalence of chronic illnesses among pre-elderly and elderly persons?
2. What factors influence the chronic illnesses status of pre-elderly and elderly persons?

In answering the above questions the study also sought to highlight differentials between the pre-elderly and elderly persons.

### ***1.4 Objectives of the Study***

The general objective of this study was to assess the health situation of older persons in Kenya. In connection with this, the specific objectives of the study were;

1. Estimate the prevalence of chronic illnesses among the pre-elderly and elderly persons.
2. Determine factors that influence the chronic illnesses status of pre-elderly and elderly persons.

### ***1.5 Study Justification***

Between the year 1900 and 2000, the world population nearly quadrupled. However, the number of older persons increased ten times during the same period. Over a period of 50 years between the year 2000 and 2050, the number of older persons is expected to increase from 600 million to over two billion. This growth in the number of older people will be faster than the growth in the number of children (HAI, 2002). Kenya will also have its share of increase in the number of older persons whose proportion of the total population is expected to double over the 2000 – 2050 period. This will translate into increased demands for health care and other social services for older persons. In order to effectively mitigate the anticipated strain on the country's health

care system by older persons, there is need to better understand their health situation and factors that influence their health and functional capacity. Such an understanding will contribute to the development and implementation of appropriate policies and programmes that will improve the well being and quality of life of older persons thereby reducing the morbidity and mortality levels. This will entail the adaptation of the health care system in the country to cater for the health needs of the elderly. Better health for the older persons will also reduce the use of family and public resources on health care.

The 2002 International Plan of Action on Ageing recommends action on the part of Governments to advance the health and wellbeing of older persons (HAI, 2002). In recognition of the unique health needs of people in different age cohorts, Kenya's second *National Health Sector Strategic Plan* (NHSSP II) that covers the period 2005 to 2010 identifies older persons as one of the age cohorts to be targeted by specific health services under the *Kenya Essential Package for Health* (KEPH). Though the plan acknowledges that older persons largely suffer from chronic conditions that negatively affect their welfare, it appreciates that specific information on these conditions is lacking. This fact is also reflected in Kenya's *National Policy on Older Persons and Ageing* which lacks information on the extent to which older persons suffer from chronic conditions. Given the above, this study is relevant as it will provide information that will strengthen the implementation of the mentioned policies.

### ***1.6 Scope of Study and Limitations***

This study sought to determine the factors that influence chronic illnesses among older persons in addition to estimating the prevalence of these diseases. In undertaking the research, some limitations were identified. First, the KIBHS did not collect information about the lifestyles of the respondents. If this information were available, it could have been used to explore the link between individual lifestyles and chronic illnesses. Second, no similar researches had been undertaken in Kenya and Africa in general. The study findings could not therefore be compared within the continent so as to corroborate, contradict, or bring out differentials with other findings. Lastly, KIBHS was a cross sectional study and therefore the chronic illnesses status of the respondents was not followed up to measure changes over time. A longitudinal approach to the study would have helped to relate the health status with changes in the influencing factors.

# CHAPTER 2: LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

## 2.1 *Introduction*

Approaches to assessing the health of a population are varied. Some of the commonly used approaches are measurements of mortality levels and malnutrition status. These methods have the following two advantages; methods of collecting mortality and nutrition data have been developed, and there are internationally accepted cut-offs and threshold levels that make their interpretation possible. However, these two methods only provide a concise picture of the health situation when applied to children aged less than 5 years because childhood mortalities and nutrition status of this age cohort are good proxies for the general health of the population (UN, 2010). Another approach to measuring health status is the Disability Adjusted Life Years (DALYs). This is a composite indicator of the time lived with a disability, and time lost due to premature mortality. The disadvantages of the above methods are that they cannot be fully applied in settings where data collection coverage is low and resources to implement the same are lacking (Barker, Green, 1996). The 2005-06 Kenya Integrated Household and Budget Survey assessed the health of the population using data on malnutrition status of children under 5 years in addition to data on recent illnesses, disability, and chronic illnesses status. For the purpose of this study on the wellbeing of older persons, chronic illnesses status has been used to assess the health situation of older persons in Kenya.

## 2.2 *Review of Literature*

Two factors have been identified as being mainly responsible for population ageing. These factors are mortality and fertility levels. A decline in mortality levels increases the probability of surviving to old age thus increasing the number of older people. On the other hand, the proportion of older people in a population increases noticeably when fertility levels decline. Migration affects population ageing most by what older people do not do i.e. they do not migrate very much. Because older people now represent the fastest growing segment of the world's population, it is important to understand the causes and consequences of the growth in their number and the increase in their proportion of the total population (Weeks, 1999).

In Africa and other developing countries around the world, the rise in the number of elderly persons has significantly increased the number of people living with and dying from chronic diseases such as cardiovascular ailments, diabetes, Alzheimer's, and others at a time when these countries must continue to contend with acute, communicable diseases such as HIV and AIDS, tuberculosis, and malaria that still affect a large part of the population. Given the projected increase in the number of elderly persons in developing countries, it is quite obvious that the burden of chronic diseases common among the elderly will become very large. This in turn will translate into increased demands and costs for health care (CDC, 2003).

In 1999, Weeks observed that the demographic interest in older populations stems from the fact that as the number and proportion of older people increases, changes are wrought in the organization of society. These changes are the result of the process of individuals ageing which has both a biological and social component. The biological component refers to those physical changes that are the defining aspect of the ageing process. The social component refers to the way that social systems react to these physical symptoms of growing old. A decline in physical viability due to old age is usually accompanied by a rise in vulnerability to diseases. However, there exist differences in the way individuals age and therefore their vulnerability to diseases. Efforts have been made to account for these differences using the 'wear and tear' theory of ageing which likens humans to machines that eventually wear out due to the stresses and strains of constant use.

Researchers in different parts of the world have tried to explain the reasons why there are differences in susceptibility to illnesses among older persons. Through research, they have attempted to link illnesses in old age with various factors in an individual's life. These factors include; sex, age, place of residence, education, disability status, eating habits, life style, marital status, and economic status.

In a research article entitled '*Economic Well-being and Morbidity of the Elderly in Malaysia*' published in the '*Journal of Modern Accounting and Auditing*' in April 2010, three researchers sought to find out if the economic wellbeing of persons aged above 60 years had an association with morbidity. This was a cross-sectional study with a sample of 1,410 elderly respondents. The multiple regression model used in the analysis included education, marital status, locality, age,

gender, and ethnicity among other factors that may influence income and morbidity. Results of the study indicated that the mean morbidity, i.e. average number of illnesses per individual, among the older persons in the urban areas was 0.81 compared to their rural counterparts who had 0.73 illnesses. Elderly females were found to have a higher mean morbidity (0.82) compared to the elderly males (0.72). Generally the mean morbidity increased with age cohort from 0.55 among those aged 60 – 64 years to a high of 1.14 among those aged 75+ years. The study also established that the higher the number of health problems one has, the lower the economic wellbeing. This finding confirmed the findings of other studies by Merkin, et. al. (2007) and Krop, et. al. (1999) which showed that an older person afflicted with higher morbidity has a lower economic status mainly due to health care expenditures. From the regression analysis, education ( $Beta = 0.110$ ) was found to be the most positive significant variable that influences economic wellbeing and morbidity.

A study on '*Morbidity and related factors among elderly people in South Korea*' published in January 2007 by *BioMed Central Public Health* used a sample of 2,767 elderly people to assess morbidity and comorbidity, and to determine the relationship of these variables with socio-demographics and health characteristics of elderly persons. Intergroup comparisons of the socio-demographic variables and health risk factors were performed using Chi-square test for distribution and the unpaired Student *t*-test for continuous variables. The significance of various risk factors for the presence of morbidity was assessed using multiple logistic regression analysis. Values of  $p < 0.05$  were considered to be significant. The results from this study showed that 78 percent reported a diagnosed disease and 47 percent had been diagnosed with more than two diseases. Mean morbidity among elderly Koreans was found to be 1.62 (SD = 1.35) with women having a significantly higher average number (1.84) of diseases per person compared to men (1.33). A total of 57 morbidities were reported in this study, the most prevalent being hypertension (37.5%), arthritis (15.6%), diabetes mellitus (14.9%), and osteoporosis (14.1%). From the logistic regression of the dependent variable (i.e. presence or absence of morbidity) and the independent variables (i.e. socio-demographic characteristics), the study found that women had a significantly higher odds ratio than men. Unemployment and lower income were associated with higher risk of morbidity. Interesting enough, the study found that



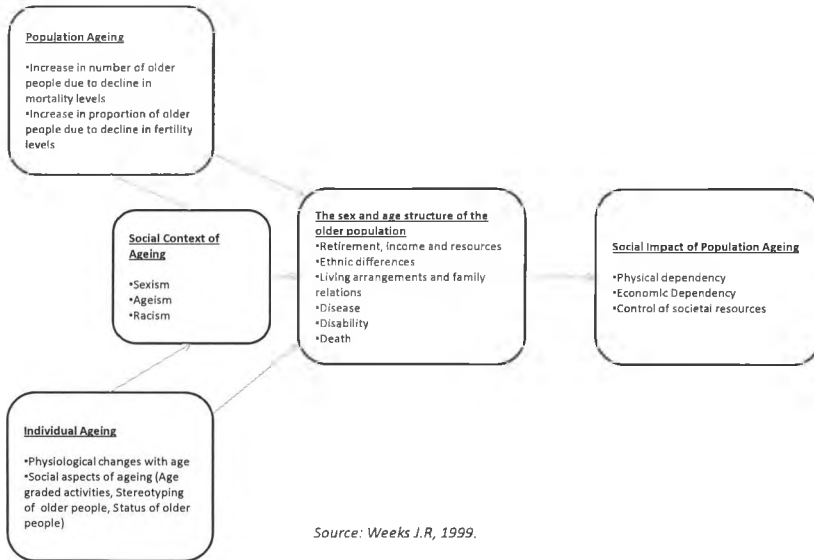
subjects who had no education or who were current smokers were more likely to have a decreased risk of morbidity compared with their counterparts.

A review of various researches on *Socioeconomic Status and Health Disparities in Old Age* published in Population Reference Bureau's *Today's Research on Ageing* journal of June 2008 observed that research had shown that individuals with low incomes or less education are more likely to be physically impaired, to suffer from diseases, and to experience a greater loss of functioning than those who are financially better off or who have higher education. It cites as an example the *White Hall Study* of British civil servants led by Sir Michael Marmot. In this study, civil servants were ranked by job classifications and pay levels. Findings showed that health disparities exist across the entire socioeconomic spectrum, not just between those at the bottom and everyone else. The study further confirmed that lower socioeconomic status is associated with higher occurrence of coronary heart disease (CHD) and diabetes. Another example cited by the journal is the one by Pamel Herd et. al. (2007) which used data from the *Americans' Changing Lives Study* (1986 through 2001/2001). Herd and her colleagues examined the effects of education and income on different stages of health problems. They found that education is a stronger predictor than income of whether an individual develops health problems such as functional limitation or chronic conditions. Income, however, has a stronger effect than education on whether the condition worsens.

### **2.3 Conceptual Framework**

In 1999, Weeks discussed a conceptual framework which showed the outcome of both population and individual ageing. According to Weeks, as shown in Figure 2.1, both population and individual aging affect the sex and age structure of the older population. The social context in which ageing takes place can also influence the sex and age structure of the older population especially if there are discriminatory practices that are based on sex, age, and race. In the long run, the sex and age structure of the older population brings about a social impact that is manifest through physical and economic dependency, as well as the level of control of resources by the elderly person. Weeks' framework has been modified and adopted for this study.

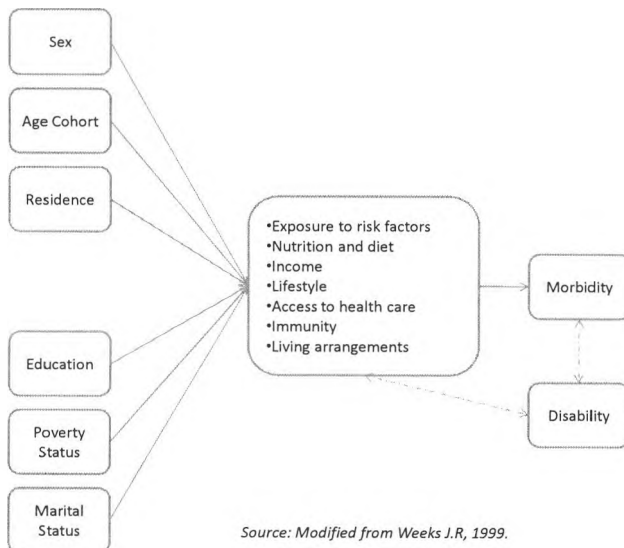
Figure 2.1: Population Ageing and Individual Ageing Combine to Produce Change in Society



## 2.4 Operational Framework

Figure 2.2 shows the operational framework for the old age morbidity status study. According to the framework, sex, age cohort, residence, education, poverty, and marital status affect the morbidity status of an individual through nutrition and diet, income, lifestyle, access to health care, body immunity, and living arrangements. It also shows that morbidity can lead to disability and vice versa.

Figure 2.2: Operational Framework for Old Age Morbidity Status



## **CHAPTER 3: DATA SOURCE AND RESEARCH METHODS**

### ***3.1 Introduction***

This section discusses the sources of data for this study as well as the methods of analysis that were used. A description of the variables used in the study is also presented.

### ***3.2 Data Source***

This study utilized data from the 2005-06 Kenya Integrated Household and Budget Survey (KIHBS). The main objective of KIHBS was to collect baseline data on a wide spectrum of socio-economic indicators required to measure, monitor and analyze progress being made in improving the living standards of Kenyans. Some of the information collected was; household characteristics, Education characteristics, Health characteristics, Household income, and Household social amenities. With regard to health characteristics, information on morbidity and disability were collected.

KIHBS was conducted in 1,343 randomly selected clusters across all districts in Kenya and comprised 861 rural and 482 urban clusters. A total of 13,480 randomly selected households provided the required data that is representative at the national, provincial, and residential (i.e. rural and urban) levels. The total sample sizes in rural and urban areas were 8,610 and 4,820 households respectively. A total of 66,728 individuals were found in the sampled households. These comprised of 32,918 males and 33,725 females.

For this study, the analysis focused on a total of 4,854 pre-elderly and elderly persons who were captured by the survey. Out of this total, 3,528 people were elderly persons comprising 1,716 males and 1,812 females. The remaining 1,326 people were pre-elderly persons (55–59 years) comprising 667 males and 659 females. A comparison of the pre-elderly and elderly persons was undertaken in the analysis of the data.

### ***3.3 Methods of Data Analysis***

At the initial stage of analysis, a univariate analysis of key background characteristics of the study populations was undertaken to provide a description of the study subjects. This included

the computation of the mean number of chronic illnesses. In analyzing the association between the chronic illnesses status of the pre-elderly and elderly persons (dependent variable) and the influencing factors, first a bivariate analysis of the chronic illness statuses and each of the seven independent variables being studied (i.e. Sex, Age cohort, Place of Residence, Education status, Disability status, Marital Status, and Poverty status) was done using the *Chi square test* in order to test the significance of the association between the dependent and independent variables. Thereafter, a multivariate logistic regression analysis was used to examine the significance of the influence of the seven variables on the chronic illnesses status of the pre-elderly and elderly persons. This method of analysis was chosen because the dependent variable is dichotomous and the independent variables are all categorical. For each independent variable, the odds ratio of its categories over a specified reference category was estimated from the multivariate logistic regression.

### **3.4 Variable Description and Specification**

The analysis of factors that influence the chronic illnesses status of pre-elderly and elderly persons used a total of eight (8) variables which are described below;

1. **Presence of a chronic illness (d27)**: This variable in the KIHBS dataset was recoded into the Chronic Illness Status (CIS) variable with the following categories; ‘presence of a chronic illness’ was given code 1 while the ‘absence of a chronic illness’ was given code 0. The Chronic Illness Status was the dependent variable.
2. **Sex (b04)**: This variable was used as it is in the KIHBS dataset where Males had code 1 and Females had code 2. Sex was an independent variable.
3. **Age Cohort (AC)**: This variable was computed by recoding the Age (b05a) variable in the dataset into the following six age groups; 55 – 59, 60 – 64, 65 – 69, 70 – 74, 75 – 79, and 80+ years. These age groups were coded as follows; 55 – 59 years Code 1, 60 – 64 years Code 2, 65 – 69 years Code 3, 70 – 74 years Code 4, 75 – 79 years Code 5, and 80+ years Code 6. Age Cohort was an independent variable.
4. **Residence (rururb)**: This variable was used as it is in the KIHBS dataset. The categories for this variable were; Rural with Code 1 and Urban with Code 2. This variable was an independent variable.

5. **Education Status (ES)**: This variable was computed from two variables in the KIHBS dataset namely; 'Ever attended school (c03)' and 'Grade completed (c04a)'. Education Status had the following categories; No education, Primary education, and Secondary (+) education which were Coded 1, 2, and 3 respectively. This variable was an independent variable.
6. **Disability Status (d19)** variable was used as it is in the KIHBS dataset. The categories for this variable were 'Yes' and 'No' with codes 1 and 2 respectively. This variable was an independent variable.
7. **Current Marital Status (CMS)** was created from the variable 'marital status (d27)' in the data set. This new variable had two categories i.e. 'married' and 'not married' with codes 1 and 2 respectively. This was an independent variable.
8. **Poverty Status (fpl)**: This variable was used as it is in the KIHBS dataset. It refers to the ability of a household to meet the basic daily nutritional needs of its members. The categories for this variable were 'Poor' and 'Non-poor' with codes 1 and 2 respectively. This variable was an independent variable.

# CHAPTER 4: FACTORS INFLUENCING CHRONIC ILLNESSES AMONG OLDER PERSONS IN KENYA

## 4.1 Introduction

The objective of this study on the factors influencing the wellbeing of older persons is to assess the health situation of older persons in Kenya. Specifically, the study seeks to estimate the prevalence of chronic illnesses among pre-elderly and elderly persons and the average number of illnesses per individual in these populations. In addition, the study set out to determine factors that have a significant influence on the chronic illnesses status of pre-elderly and elderly persons. This chapter presents the results of the study. It begins by looking at the characteristics of the study populations after which the findings on the prevalence of chronic illness, the significance of the association between the dependent and independent variables, and the regression analysis of factors thought to influence chronic illnesses status are presented.

## 4.2 Background Characteristics of Study Population

The total number of people in the study population was 4,854. This population consisted of 2,383 males and 2,471 females. The population of elderly and pre-elderly persons was 3,528 and 1,326 respectively. Table 4.1 provides more information on the study population by sex and age cohort.

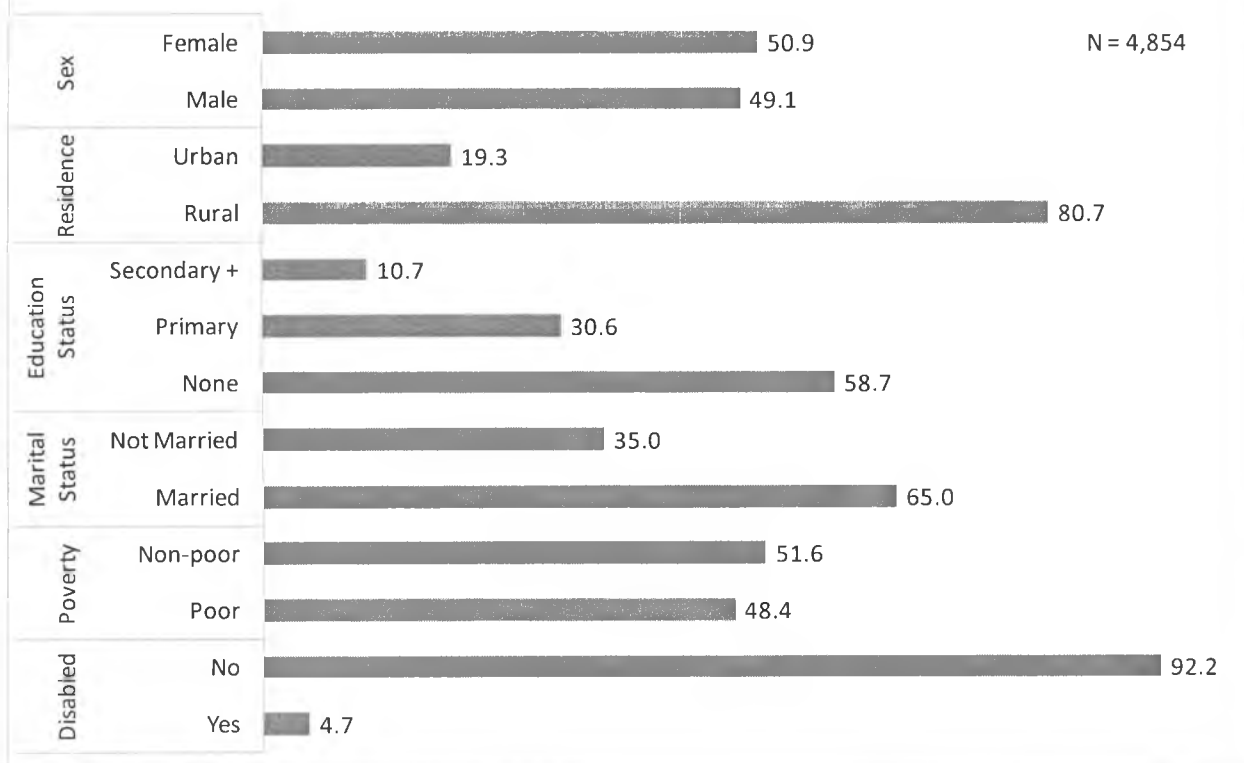
**Table 4.1: Population Aged 55+ Years by Sex and Age Cohort**

Age Cohort	Sex		Total	Cumulative Total
	Male	Female		
55-59 Years	667	659	1,326	1,326
60-64 Years	482	527	1,009	2,335
65-69 Years	410	414	824	3,159
70-74 Years	290	292	582	3,741
75-76 Years	212	244	456	4,197
80+ Years	322	335	657	4,854
<b>Total</b>	<b>2,383</b>	<b>2,471</b>	<b>4,854</b>	

Figure 4.1 gives information on the study population by sex, residence, education, disability, poverty, and marital status. Over 80 percent of the study population was living in rural areas while slightly less than half of this population (49 percent) was male. Over half of this population (59 percent) had not received any education and about 10 percent had reached

secondary school level or above. With regard to marital status, about two-thirds of this population was currently married.

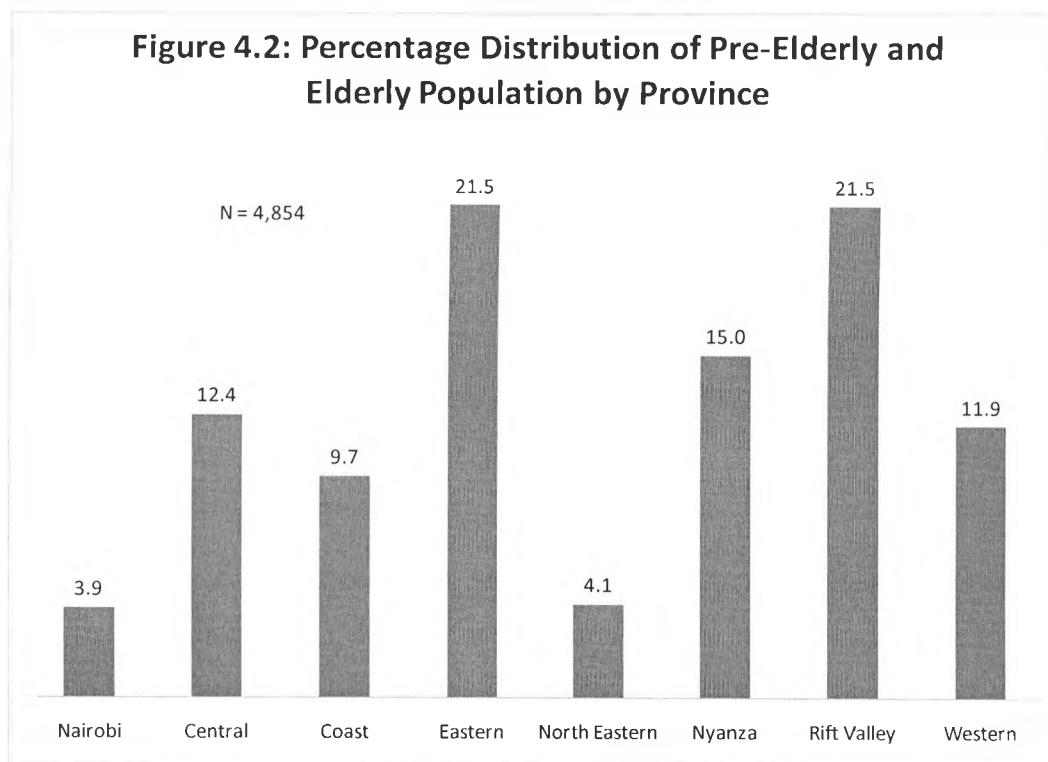
**Figure 4.1: Percentage Distribution of Pre-elderly and Elderly by Background Characteristics**



About one in every twenty people in the study population had a physical handicap. Those who were handicapped had one or more of the following difficulties; use of hands and/or legs, speech impairment, hearing impairment, sight impairment, and paralysis. Close to half (48 percent) of the study population was poor. This segment of the study population comprised those who were absolutely poor, the food poor, and those who were hardcore poor.

Figure 4.2 shows the distribution of the elderly and pre-elderly persons by province. Eastern and Rift Valley provinces had the highest proportion of this population at 23 percent each. This was followed by Nyanza and Central provinces at 15 and 12 percent respectively. Nairobi and North Eastern provinces had the least proportion of elderly and pre-elderly persons at about 4 percent each.

**Figure 4.2: Percentage Distribution of Pre-Elderly and Elderly Population by Province**



### **4.3 Prevalence of Chronic Illness**

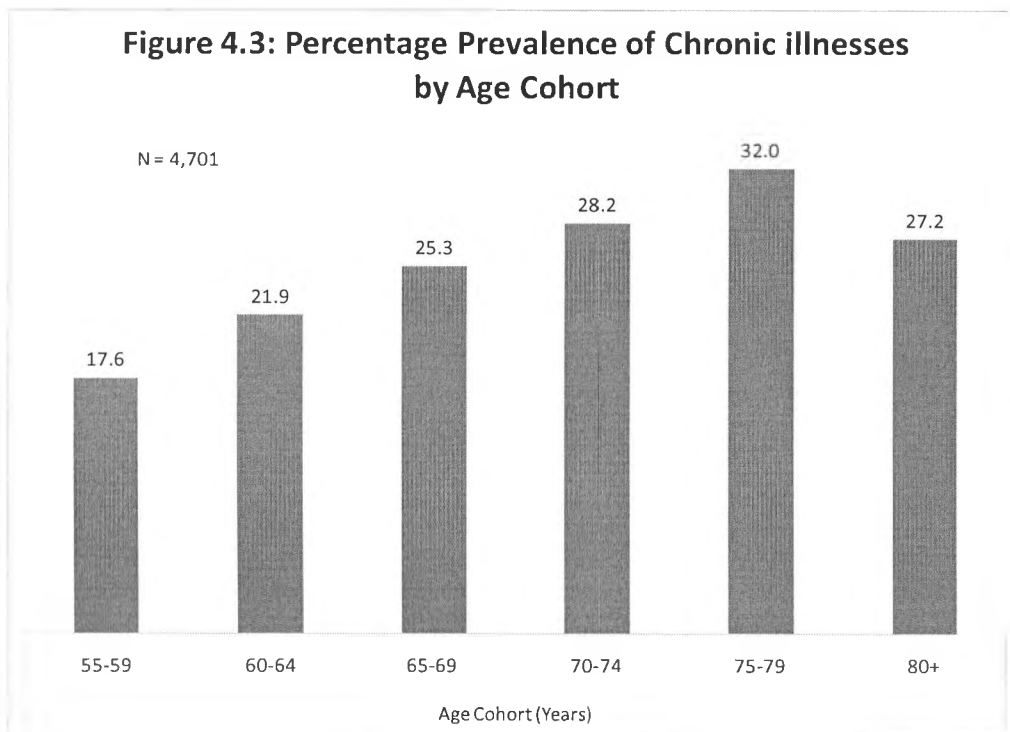
About 97 percent of the respondents in the study population reported on their chronic illness status. Table 4.2 provides a summary of the number and proportion of people with a chronic illness by elderly status. Overall, 23.7 percent of those who reported on their status had a chronic illness. The pre-elderly (17.6 percent) had a lower proportion of people with a chronic illness compared to the elderly (26 percent). Table 4.2 also presents the proportion of people in the study population by no. of chronic illnesses and elderly status. The proportion of pre-elderly and elderly persons with only one chronic illness was 15.5 percent and 23 percent respectively. Those who had at least two chronic illnesses were 2.1 percent and 3 percent of the pre-elderly and elderly persons respectively. Overall, 20.9 percent of the study population had only one chronic illness while 2.7 percent had at least two chronic illnesses.



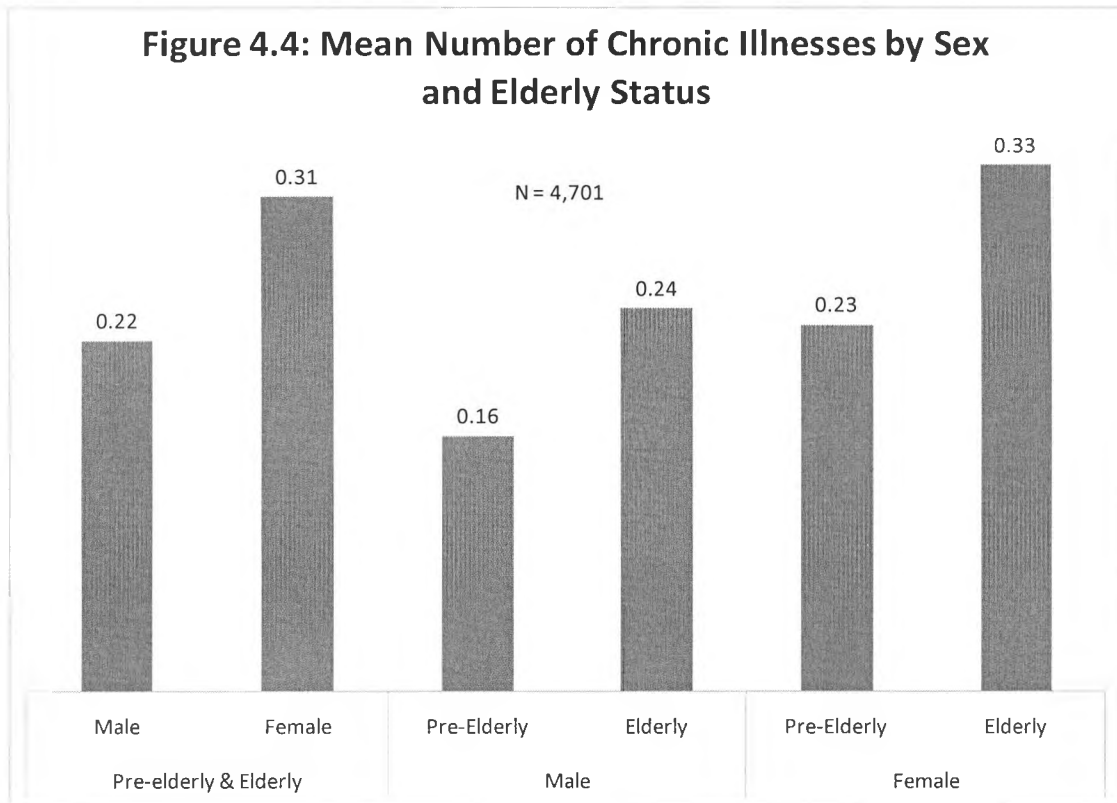
**Table 4.2: Number and Proportion of People with Chronic Illnesses by Elderly Status**

	Pre-Elderly		Elderly		All	
	No.	Percent	No.	Percent	No.	Percent
<b>Have Chronic Illness</b>						
<i>No</i>	1,069	82.4	2,519	74.0	3,588	76.3
<i>Yes</i>	228	17.6	885	26.0	1,113	23.7
<i>Total</i>	1,297		3,404		4,701	
<b>No. of Illnesses</b>						
0	1,069	82.42	2,520	74.03	3,589	76.35
1	201	15.50	783	23.00	984	20.93
2+	27	2.08	101	2.97	128	2.72
<i>Total</i>	1,297		3,404		4,701	

Figure 4.3 shows that the age cohort 75-79 years has the highest prevalence of chronic illness at 32 percent while the pre-elderly (55 -59 years) have the lowest prevalence at 18 percent. The prevalence of chronic illness increases gradually from the age cohort 55 – 59 years and peaks at age cohort 75 -79 years before declining to 27 percent in the age cohort 80+ years.



The mean number of chronic illnesses in the study population was found to be 0.26. In the pre-elderly and elderly populations, the mean number of chronic illnesses was 0.20 and 0.29 respectively. Figure 4.4 shows the mean number of chronic illnesses in the study population by sex and elderly status. Generally, females have a higher mean number of chronic illnesses compared to males both in the whole population and in the pre-elderly and elderly populations. The elderly females have a mean of 0.33 chronic illnesses which is much higher than that of pre-elderly females that stands at 0.23 illnesses.



#### 4.4 Association between Dependent and Independent Variables

Table 4.3 presents the results of the Chi-square test that was used to determine the significance of the relationship between the dependent variable, i.e. chronic illnesses status, and the independent variables. The results show that in both the pre-elderly and elderly populations, the following three variables have a highly significant association ( $p < 0.01$ ) with the chronic illnesses status of an individual; sex, disability status, and current marital status. Age cohort and poverty status was also found to have a highly significant relationship with the chronic illnesses

status of elderly persons. Among the pre-elderly, education and poverty status (food, absolute, and hardcore) do not have a significant relationship ( $p > 0.05$ ) with the chronic illnesses status. However, among the elderly, education has a significant relationship ( $p < 0.05$ ) with the chronic illnesses status. For both the pre-elderly and elderly persons, place of residence was not found to have any significant ( $p > 0.05$ ) relationship with chronic illnesses status.

**Table 4.3: Proportions for Association between the Chronic Illnesses Status and the Independent Variables**

Independent variables	All	Pre-elderly	Elderly
	Proportion with chronic illness	Proportion with chronic illness	Proportion with chronic illness
Sex			
<i>Male</i>	19.8**	14.1**	22.0**
<i>Female</i>	27.4**	21.1**	29.7**
Age Cohort			
55-59	17.6**	17.6	
60-64	21.9**		21.9**
65-69	25.3**		25.3**
70-74	28.2**		28.2**
75-80	32.0**		32.0**
80+	27.2**		27.2**
Education Status			
<i>No Education</i>	23.3	18.9	24.5*
<i>Primary</i>	24.1	15.7	28.4*
<i>Secondary+</i>	24.3	18.4	29.0*
Disability Status			
<i>Yes</i>	45.4**	31.4**	48.1**
<i>No</i>	22.6**	17.0**	24.7**
Marital Status			
<i>Married</i>	21.6**	15.9**	24.3**
<i>Not Married</i>	27.7**	23.5**	28.6**
Food Poverty Status			
<i>Poor</i>	20.1**	16.8	21.4**
<i>Non poor</i>	27.1**	18.4	30.3**
Absolute Poverty Status			
<i>Poor</i>	20.6**	16.8	21.9**
<i>Non poor</i>	27.1**	18.3	30.8**
Hardcore Poverty Status			
<i>Poor</i>	19.2**	16.7	20.0**
<i>Non poor</i>	25.2**	17.8	28.1**
Residence			
<i>Rural</i>	23.3	17.4	25.4
<i>Urban</i>	25.6	18.4	29.1

\*  $p < 0.05$ , \*\*  $p < 0.01$

## 4.5 Factors Influencing Chronic Illnesses

Table 4.4 provides a summary of the regression analysis output for the prediction of chronic illnesses. According to the results, primary education has a highly significant influence ( $p < 0.01$ ) on ones chronic illnesses status at the age of 60 years and above. The findings indicate that elderly persons with primary education have a higher chance of being chronically ill compared to those with no education. Interestingly, education status has no significant influence on the chronic illnesses status of pre-elderly persons.

Disability status of individuals in both the pre-elderly and elderly population has a highly significant effect ( $p < 0.01$ ) on their chronic illnesses status. The results in Table 4.4 show that individuals with no disability are less likely to have a chronic illness compared to those with disabilities. The study also found that poverty status (i.e. food, absolute, and hardcore) does not have a significant influence ( $p > 0.05$ ) on the chronic illnesses status of both the pre-elderly and elderly persons.

Sex is a significant determinant ( $p < 0.05$ ) of an individual's chronic illnesses status both for the pre-elderly and elderly persons. The results in Table 4.4 show that for both populations, females have a higher chance of living with a chronic illness in old age compared to their male counterparts. Among the elderly persons, age cohort is a highly significant factor ( $p < 0.01$ ) that influences the chronic illnesses status with the exception of the age cohort 65-69 years ( $p > 0.05$ ). The results indicate that those in the age cohorts 70-74 years, 75-79 years, and 80+ years have a higher probability of living with chronic illnesses compared to those in the 60-64 years age cohort.

Among the factors that have a significant influence on the chronic illnesses status, disability status and sex have the strongest influence in the pre-elderly population. In the elderly population, the strongest factors are disability status, age cohort 75-79 years, and sex in that order. With regard to residence and marital status, the results in Table 4.4 show that these two factors have no significant influence ( $p > 0.05$ ) on the chronic illnesses status of both the pre-elderly and the elderly persons.

**Table 4.4: Coefficient estimates from logistic regression model predicting chronic illness status of pre-elderly and elderly persons in Kenya**

<b>Covariates</b>	<b>Pre-elderly</b>	<b>Elderly</b>	<b>All</b>
<b>Education Status</b>			
<i>No Education<sup>R</sup></i>			
<i>Primary</i>	-0.085 (0.174)	0.342** (0.096)	0.240** (0.084)
<i>Secondary+</i>	0.201 (0.244)	0.297 (0.156)	0.269* (0.131)
<b>Residence</b>			
<i>Rural<sup>R</sup></i>			
<i>Urban</i>	0.37 (0.189)	0.168 (0.107)	0.135 (0.093)
<b>Disability Status</b>			
<i>Yes<sup>R</sup></i>			
<i>No</i>	-1.018** (0.334)	-1.058** (0.158)	-1.039** (0.143)
<b>Marital Status</b>			
<i>Married<sup>R</sup></i>			
<i>Not Married</i>	0.316 (0.178)	-0.074 (0.097)	0.005 (0.085)
<b>Food Poverty Status</b>			
<i>Poor<sup>R</sup></i>			
<i>Non Poor</i>	0.078 (0.206)	0.237 (0.123)	0.202 (0.105)
<b>Absolute Poverty Status</b>			
<i>Poor<sup>R</sup></i>			
<i>Non Poor</i>	0.055 (0.215)	0.202 (0.116)	0.168 (0.102)
<b>Hardcore Poverty Status</b>			
<i>Poor<sup>R</sup></i>			
<i>Non Poor</i>	-0.039 (0.227)	0.099 (0.127)	0.076 (0.111)
<b>Sex</b>			
<i>Male<sup>R</sup></i>			
<i>Female</i>	0.415* (0.170)	0.530** (0.097)	0.494** (0.084)
<b>Age Cohort</b>			
<i>55-59 Years<sup>R</sup></i>			
<i>60-64 Years</i>			0.304** (0.108)
<i>65-69 Years</i>		0.203 (0.114)	0.494** (0.112)
<i>70-74 Years</i>		0.369** (0.125)	0.649** (0.123)
<i>75-76 Years</i>		0.544** (0.133)	0.819** (0.132)
<i>80+ Years</i>		0.352** (0.128)	0.610** (0.126)
<b>Number of respondents</b>	<b>1,326</b>	<b>3,528</b>	<b>4,854</b>

Notes: <sup>R</sup> Reference category; Standard errors are in parentheses; \*p<0.05; \*\*p<0.01

Overall, disability status, age cohort (except 65-69 years), and sex in that order are the factors that have the strongest effect on the status of chronic illnesses in the combined population of pre-elderly and elderly persons. Residence, poverty, and marital status were found not to have any significant influence on chronic illnesses in this combined population.

# CHAPTER 5: SUMMARY, CONCLUSION, AND RECOMMENDATIONS

## 5.1 *Introduction*

This study set out to examine the health situation of older persons in Kenya with regard to chronic illnesses. Specifically the study wanted to establish the prevalence of chronic illnesses and the factors that influence that influence these diseases. In this chapter, a summary of the main findings of the study are presented alongside conclusions and recommendations. The recommendations that have been made touch on policy, programmes, and research.

## 5.2 *Summary of Findings*

This study on the factors that influence chronic illnesses among the pre-elderly and elderly persons used data on 4,854 individuals from these two population groups. In terms of the background of the study population, 51 percent were female and 49 percent were male. About 80% of this population was resident in the rural areas, about half were food poor, and two-thirds were currently married. Out of every 5 respondents, only 2 had at least attended school at primary level or above.

Overall, the prevalence of chronic illness in the study group was 23.7 percent. The pre-elderly had a prevalence of 17.6 percent while the elderly had a prevalence of 26 percent. Generally, the study found that the proportion of the population with chronic illnesses increases with the age cohort. Females, in all the age cohorts, were found to have a higher risk of living with chronic illnesses compared to males. Majority of the respondents who had chronic illnesses had only one illness. Those who had more than one illness were less than 20 percent of those who had chronic illnesses. The mean number of chronic illnesses among the pre-elderly and elderly was 0.20 and 0.29 respectively.

The Chi-Square test that was done to establish if there are significant associations between the dependent variable and the independent variables showed that for both the pre-elderly and the elderly, the variable ‘presence of a chronic illness’ had a significant association with sex, disability status, and marital status. In addition to this, among the elderly education, poverty status, and age cohort also had a significant relationship with the chronic illnesses status. Save

for marital status, the regression analysis model for predicting chronic illnesses status corroborated the findings of the Chi-Square test by establishing that sex and disability status significantly influence the chronic illnesses status of both pre-elderly and elderly persons while education and age cohort (except 65-69 years) have a significant influence on the chronic illnesses status of elderly persons. One's residence was not found to have any significant association with or influence on the chronic illnesses status of both the pre-elderly and the elderly.

In summary, the following were the main findings in line with the objectives of the study;

1. About 17.6 percent of the pre-elderly persons and 26 percent of the elderly persons are living with chronic illnesses.
2. The mean number of chronic illnesses among the pre-elderly and elderly persons was found to be 0.20 and 0.26 respectively.
3. Factors that have a significant influence ( $p < 0.05$ ) on chronic illnesses status of the pre-elderly persons are disability status and sex. Among the elderly, the significant factors are disability status, age cohort (except 65-69 years), sex, and education.

From the above findings it is evident that there exist differentials in the health situation of the pre-elderly and elderly persons in terms of the proportion of people living with chronic illnesses, the average number of chronic illnesses per individual, and the factors influencing chronic illnesses status. Generally, the chronic illnesses status of the pre-elderly persons is better than that of the elderly persons with regard to their health situation.

### **5.3 Conclusion**

The findings from this study show that the prevalence of chronic diseases among both the pre-elderly and elderly persons in Kenya is low when compared to countries in Europe and Asia where similar statistics are available. For example, the mean number of chronic illnesses per elderly persons in Malaysia and South Korea were found to be 0.77 and 1.62 respectively. In addition to this, 78 percent of elderly South Koreans were found to be living with a chronic illness compared to 26 percent of elderly Kenyans. Kenya therefore has a good opportunity to



ensure that the prevalence of chronic illnesses does not increase to the levels of Asian and European countries.

Gender disparities in health among older persons are not unique to Kenya. In Malaysia and South, Korea where similar studies on chronic illnesses among older persons have been done, it was found that women had a much higher risk of living with chronic illnesses than men. In this study the findings were similar thereby indicating that males and females have unique health care needs even in old age.

From the findings of this study, it is evident that susceptibility to illnesses increases with age. This is in agreement with the conclusion drawn by Weeks in 1999 to the effect that 'a decline in physical viability due to old age is accompanied by a rise in vulnerability to diseases'. The implication of this is that the onset of chronic illness in old age, though it can be delayed, it cannot entirely be prevented. Measures will therefore need to continue being put in place to control the incidence of chronic illnesses.

This study also emphasizes the vulnerability of persons living with disabilities. The findings indicate that older persons living with disabilities have a higher risk of also living with a chronic illnesses compared to those who have no disabilities. The implication of this is that the prevalence of chronic illnesses among older persons can be curbed to some extent by preventing disabilities and giving proper attention to the needs of persons living with disabilities.

Though education has a significant effect on the chronic illnesses status, this effect appears paradoxical in that those with no education have a lower chance of living with chronic illnesses in old age compared to those with primary education. This is an issue which requires further investigation to explain the reasons behind this phenomenon.

While it is tempting to conclude that poverty has a significant effect on the chronic illnesses status of older persons, the study has shown that this is not the case. Instead, the effect of poverty on chronic illnesses status can largely be attributed to chance. The same is true about the effect of residence and marital status on the chronic illnesses status of older persons.

## **5.4 Recommendations**

Based on the findings of this study, and in view of the fact that the population of older persons in Kenya is bound to increase over the coming years, the following recommendations are made with a view of improving the health status of older persons;

### **5.4.1 Policy and Programme recommendations**

This research found that both pre-elderly and elderly females have a higher risk of chronic illness compared to their male counterparts. These results reinforce the need for continued efforts in addressing gender inequalities with regard to health. The Gender Commission in conjunction with the Ministries of Health should tailor their activities to address the health needs of older women. These will include advocacy for the preventive and curative services, training of health personnel on the health needs of older persons, and provision of the necessary medication and supplies needed to serve elderly persons.

Older persons with disabilities were found to be more susceptible to chronic illnesses compared to those without disabilities. This implies that more efforts need to be put in place to reduce the incidence of disabilities in old age. These disabilities include blindness, hearing impairment, paralysis, lameness, speech difficulties, and mental disabilities. In this regard, the National Council for Persons with Disabilities (NCPWD) should take a lead in bringing together stakeholder to strategize on how to addresses disabilities among older persons. This will entail preventive services, medical checkups, treatment, and rehabilitative services. The provisions of the Persons with Disabilities Act of 2003 should also be amended where necessary and implemented with a focus on older persons.

The implementation of the above policy and programme recommendations will help to reduce the susceptibility of older persons to chronic illnesses which will in turn reducing the prevalence of these illnesses.

### **5.4.2 Recommendations for Further Research**

From the findings of this study, there are five areas for further research that are recommended. These are;

- a. Establish the reasons why elderly persons with no education are less likely to have chronic illnesses when compared to elderly persons who have at least attended primary school.
- b. Determine why age does not have a significant effect on the chronic illnesses status of elderly persons in the 65-69 years age cohort. This is very different from the effect of age on the chronic illnesses status of elderly persons in other age cohorts.
- c. Find out if there is any relationship between the 'onset of chronic illnesses' or 'duration of chronic illnesses' and the risk factors that influence one's health status in old age.
- d. Given the factors that influence the chronic illnesses status in old age, there is need to determine their effect on specific of chronic illnesses such as heart diseases and cancers.
- e. The 2005-06 KIHBS data on health status of the respondents was based on self reporting and not actual testing. Future surveys should include self reporting and actual testing of respondents' chronic illnesses status. The findings of self reporting and actual testing should then be compared to find out if there are any differentials occasioned by the difference in data collection methods.

Findings from the above areas recommended for further research will enhance the knowledge and understanding of the chronic illnesses status of older persons which will in turn be used to improve their overall wellbeing.

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