

**SOCIAL DETERMINANTS OF STROKE AMONG STROKE PATIENTS  
ATTENDING MEDICAL OUTPATIENT CLINIC AT KENYATTA NATIONAL  
HOSPITAL**

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## DECLARATION

I, Jackline Kerubo Gichana, do hereby declare that this research is my original work and has not been presented to any other institution for the purpose of obtaining a degree.

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## **DEDICATION**

This dissertation is dedicated to my husband, and our children, Gongera, Gichana and Mandela.

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## LIST OF ABBREVIATIONS

BP	Blood pressure
CSDH	Commission on social determinants of health
CT	Computed tomography
CVA	Cerebrovascular accident
CVD	Cardiovascular vascular disease
DM	Diabetes Mellitus
D.O.P.C	Diabetic outpatient clinic
H.C.W	Healthcare Worker
H.H.D	Hypertensive Heart Disease
HTN	Hypertension
KDHS	Kenya demographic Health survey
KNH	Kenyatta National Hospital
MMHG	Millimetres of mercury
MOPC	Medical Outpatient Clinic
MRI	Magnetic Resonance Imaging
NCDs	Non-communicable diseases
SDH	Social determinants of health
SPSS	Statistical products and services solutions
SSA	Sub-Saharan Africa
TIA	Transient ischaemic attack
W.H.O	World Health Organization

## OPERATIONAL DEFINITIONS

**Hypertension:** is an elevated blood pressure consistently at or above a systolic of 140 millimetres of mercury or diastolic at or above 90 millimetres of mercury.

**Hypertensive:** is a patient who is on antihypertensive drugs or non-pharmacological therapy for elevated blood pressure based on World Health Organization, criteria ( $BP \geq 140/90$  mmHg) and is being followed up at medical or diabetic outpatient clinic.

**Diabetic:** Known case of diabetes mellitus and is on follow up at diabetic outpatient clinic.

**Risk Factor:** a characteristic statistically associated with, although not necessarily causally related to, an increased risk of morbidity or mortality.

**Social determinants of health:** social determinants of health are the conditions, in which people are born, grow, live, work and age. These circumstances are shaped by the distribution of money, power and resources at global and local levels.

**Stroke/cerebral vascular accident:** is a focal (or at times global neurological impairment of sudden onset, and lasting more than 24 hours (or leading to death) and of presumed vascular origin.

**Health equity:** is defined by World Health Organisation as the absence of unfair and avoidable or remediable differences in health among population groups defined socially, economically, demographically or geographically

**Healthy inequities:** These are health differences that are socially produced, systematic in their distribution across the population and unfair.

**Intermediary determinants:** These are individual level influences, including health related behaviours and physiological factors, and they flow from the configuration of underlying social stratification and, in turn, determine differences in exposure and vulnerability to health compromising conditions. The main categories are psychosocial circumstances: behavioural factors; and the health system itself.

## ABSTRACT

**Introduction:** Almost half of the disease burden in low-and middle income countries is now from Non communicable diseases. Globally stroke is the leading cause of death. It's a disease which predominantly occurs in the adult and the elderly in 2001 it was estimated that cerebral vascular diseases, stroke included, accounted for 5.5 million deaths worldwide. Two thirds of these deaths occurred in the developing countries and 40 % of the subjects were aged less than 70 years. Many patients who suffer stroke are disabled and need help in daily activities which is often provided by family members, or the health system. Established risk factors for stroke are; hypertension, diabetes mellitus, tobacco use, hyperlipidemia, micro-vascular rupture, male gender, age and co morbidities such as sickle cell disease, HIV/AIDS infection and cerebral malaria.

**Objective:** To describe the social determinants of stroke among stroke patients attending medical outpatient clinic at Kenyatta National Hospital.

**Subjects:** Patients with recorded diagnosis of stroke/cerebral vascular accident and health care workers working at clinic.

**Setting:** Kenyatta National Hospital medical outpatient clinic.

**Methodology:** The design of the study was descriptive cross sectional. Consecutive sampling was used to select respondents. Data was collected using a pretested semi structured questionnaire, and Key Informant Interviews guide (KII guide).

**Data analysis:** The data was analyzed using SPSS version 20. Descriptive data was summarised into means, frequencies and percentages and was presented in the form of tables, bar charts and pie charts.

**Study application:** This study is expected to be used by the ministry of health, to develop public health policies using the social determinants of health approach, in partnership with other sectors, which will lead to equitable management of stroke in the country.

### Results

A total of 66 stroke patients were recruited, 44 (66.7%) were female and 33 (33.3%) were male. The mean age at experiencing first stroke was 53.7 and ranged 22-85 years. Majority of the respondents were of low household income bracket, 12 (18.2%) were past smokers, 4 (6.1%) were passive smokers, 2 (3%) were taking the recommended portions of fruits and vegetables. Overall 60 (90.9%) had co morbidities and of these, 52 (78.8%) had hypertension, 6 (9.1%) had diabetes mellitus, 45 (66.6%) had less than secondary level of education, 12 (18.2%) were employed, 17 (25.8%) unemployed and not able to work. 37 (56.1%) did not know how long they were going to be on take medication. 25 (37.9%) were not taking their

medication daily. Drug availability and affordability were some of the main reasons cited for not taking medication daily.

The main challenges the respondents were facing was not being able to work as before 24 (46.2%), walking and financial difficulties at 19 (28.8%) each. 5 (7.6%) were taking herbal or traditional remedy for their stroke. 21 (31.8%) had family member suffering stroke. 62 (93.9%) paid cash for the services rendered at the facility and only 35 (54.7%) had their CT scan done within the WHO recommended 24 hours. Only 34 (51.5%) of the respondents received all the services.

### **Conclusion**

Overall majority of patients were female, the respondents had low education background low monthly household income and experienced stroke at younger age. The risk factors observed were; hypertension, diabetes mellitus, cigarette smoking, inappropriate diet and physical inactivity. The health system was ill prepared for management of stroke as evidenced by out of pocket payments, lack of a stroke register and stroke team in management of stroke patients, inadequate qualified staff. Risk factors were also not uniformly communicated to the respondents.

### **Recommendations**

A national strategy for stroke should be developed, spearheaded by the ministry of health and all stakeholders, to include national stroke register, national stroke team, stroke unit in major hospitals, policies for prevention of modifiable risk factors.

The management of Kenyatta National Hospital should have a stroke unit and ensure there is continuous patient education.

# **CHAPTER ONE**

## **LITERATURE REVIEW**

### **1.1 Background Information**

The four major non communicable diseases (NCDs); cardiovascular disease, cancers, Diabetes Mellitus and chronic respiratory diseases are currently the world's biggest killers causing an estimated 35 million deaths each year, that is, 60% of all deaths globally, with 80% of these deaths occurring in low and middle income countries. These diseases are preventable, through eliminating or reducing the shared major risk factors that is tobacco use, unhealthy diet, physical inactivity and the harmful use of alcohol (WHO, 2002).

World Health Organisation predicts that deaths due to NCDs will increase by 17% over the next 10 years, and the greatest increase will be in Sub Saharan Africa at 27% and the East Mediterranean region at 25%. In recognition of the burden of NCDs, the WHO has developed a number of strategies including; the WHO Framework Convention on Tobacco Control, the global strategy for Diet, Physical Activity and Health, the global strategy to reduce harmful use of alcohol, sustainable health financing structures and universal coverage and the 2008-2013 Action plan for NCDs (WHO, 2008). Kenya in recognition of the NCDs burden has enacted a number of strategies, namely; the Tobacco act 2007; the Alcoholics' drinks act 2010, the constitution 2010 (right to highest attainable health care), The Kenya National Diabetes Strategy 2010-2015. However more needs to be done in health promotion, prevention and rehabilitation in order to reduce the burden of stroke.

The established risk factors for stroke are hypertension (HTN), diabetes, cigarette smoking, hyperlipidemia, micro vascular rupture, male gender, age and observed co-morbidities such as sickle cell disease, HIV/AIDS infection and cerebral malaria are increasingly being encountered in the tropics (Jowi & Mativo, 2008)

### **1.2 Epidemiology**

Every year 15 million people worldwide experience stroke, 5 million die, and 5 million get permanent disabilities. Stroke is the second leading cause of death and leading cause of disability in the world (WHO, 2002). Majority of the morbidity and mortality are in the low and middle income countries (Bonita et al, 2004). In meta-analysis of 19 studies from 10 African countries in the year 2009, the prevalence of stroke in sub-Saharan (SSA) was 317.3



per 100,000 population (Adeloye, 2006). Kenya has not been spared of this burden. In a hospital based study of stroke in Nairobi, the prevalence of stroke was higher than the rest of Africa at 3042 per 100,000 (Jowi & Mativo, 2008).

Stroke is a focal or at times global neurological impairment of sudden onset, and lasting more than 24 hours or leading to death and of presumed vascular origin (WHO, 2006). The major signs and symptoms are; sudden weakness and numbness of one side of body, confusion and difficult in speaking, disturbance of vision in one or both eyes, sudden difficulty in walking, dizziness and loss of balance or coordination, and severe headache (Memon et al , 2010). Stroke is a costly disease which causes premature deaths and disability among survivors. Stroke is a clinical diagnosis (WHO, 2006).

Due to the demographic changes, urbanization and increased exposure to major risk factors, stroke incidences are set to increase and by 2025, four out of five stroke cases will be from low and middle income countries (Truelsen et al, 2007). Stroke incidences in developing countries is underestimated because of limited health services (Lloyd-sherlock, 2009) and stroke incidences need to be recorded both in outpatient and in-patient set ups (Truelsen & Bonita, 2002).

### **1.3 Types of stroke**

Stroke can be divided into three major subgroups; ischemic stroke, intracerebral haemorrhage and subarachnoid haemorrhage

**Ischemic stroke** is due to sudden occlusion of arteries supplying the brain, either due to thrombus formed directly at the site of occlusion (thrombotic ischemic stroke) or thrombus formed at another part of circulation and follows blood stream till it obstructs arteries in the brain (embolic ischemic stroke) (WHO, 2006). It accounts for around 80% of all strokes (Lloyd-sherlock, 2009). In a study of 22 countries it accounted for 78% (O'Donnell et al, 2010) and in a hospital based study in Nairobi it accounted for 85% of all stroke cases (Jowi & Mativo, 2008).

**Intracerebral haemorrhage** Is a bleeding in one of the brains arteries into the brain tissue (WHO, 2006). This type of stroke was found in 22% of patients in study in 22 countries (O'Donnell et al, 2010) and in 8.8% of patients in Nairobi, Kenya (Jowi & Mativo, 2008)

**Subarachnoid haemorrhage** Is arterial bleeding in the space between the two meninges: pia mater and arachnoidea, characterised by sudden onset of headache and impaired consciousness (WHO, 2006)

#### 1.4 Causes of stroke

The causes of stroke can be divided into modifiable and non-modifiable risk factors and these are presented in Table 1.1.

**Table 1.1:** Causes of Stroke.

<b>Modifiable risk factors</b>	<b>Non modifiable risk factors</b>
Hypertension,	Age
Tobacco use	Sex
Physical inactivity	Race
Inappropriate diet(low fruit and vegetable consumption)	Family history(genetics)
Passive smoking	
Access to medical treatment	
Diabetes mellitus	
Harmful use of alcohol	
Previous stroke	
Transient ischemic attack	

Source; WHO STEPS stroke manual, 2006

#### 1.5 Prevention of stroke

Prevention of stroke can be done in three levels, namely, primary, secondary and tertiary.

**Primary prevention** is aimed at reduction of occurrence of stroke in the first place. It targets lifestyle and behavioural risk factors, such as smoking and obesity, identification of individuals at high overall risk of stroke or CVD (WHO, 2006). Vehicles of primary prevention are public health education campaigns on a wide range of NCDs (Lloyd-sherlock, 2009). Such as population wide initiatives to increase physical activity, legislation to control tobacco and alcohol use. Kenya has enacted the Tobacco act, 2007, in order to control tobacco use. The country has also enacted the Alcoholics drinks act, 2010, in order to reduce harmful use of alcohol. According to the England stroke association , approximately 20,000 cases of stroke, in England could be avoided by preventive work on high blood pressure, irregular heartbeats, smoking cessation and wider statin use (Stroke association, 2013).

**Secondary prevention** is aimed at reducing impact of stroke in people who have already suffered from stroke or transient ischemic attack (TIA) for example intensified reduction of major cardiovascular risk factors, anti-platelets and antihypertensive treatment (WHO, 2006)

**Tertiary prevention** is aimed at reducing consequences of damages in stroke patients for example treatment of infections in acute stage, management of co morbidities and improved rehabilitation (WHO, 2006).

### **1.6 Theoretical framework**

Non-communicable diseases, including stroke are the end result of exposure to risk factors that may have been present for several decades. However in contrast to the long latency period (time from exposure to development of disease) there may be a relatively rapid reverse in incidence once exposure to the risk factors is reduced ( Truelsen et al., 2001) this can be achieved through multi-disciplinary approach for management of stroke and its risk factors (Jowi & Mativo, 2008).

Using, the WHO framework for social determinants of health, the theoretical framework in table 1.2 shows how context creates social stratification and assigns individuals to different social positions. Social stratification in turn engenders differential exposure to health damaging conditions and material resource availability. Social stratification also determines differential consequences of ill health (WHO, 2010). The framework identifies determinants in three levels; Structural determinants which include socioeconomic political context in areas of macroeconomic policies, governance, social policies, public policies, societal and cultural values. Social, economic and political mechanisms give rise to a set of socioeconomic positions (SEP) whereby populations are stratified according to income, education, occupation, gender, race/ethnicity and other factors. These SEP in turn shape specific determinants of health status (intermediary determinants) reflective of people's place within social hierarchies based on their respective social status, individuals experience differences in exposure and vulnerability to health compromising conditions leading to differential health outcome (Solar & Irwin, 2010).

Throughout the life course, inequalities in access to protection, exposure to risks and access to care are the cause of major inequities in the occurrence of NCDs (WHO, 2008)

The socioeconomic political context should address mainly modifiable risk factors contributing to development of stroke. That is tobacco use, excessive use of alcohol, physical inactivity, and inappropriate diet. This can be done through policies, legislation and strategies. Policies should be in sectors which directly and indirectly affect risk factors for stroke, such as roads, traffic, security, education, health, labour and nutrition.

**Table 1. 2: Theoretical framework.**

STRUCTURAL DETERMINANTS		INTERMEDIARY DETERMINANTS		
<u>SOCIOECONOMIC POLITICAL CONTEXT</u>	<u>SOCIOECONOMIC /CLASS POSITION</u>	<u>MATERIAL CIRCUMSTANCES</u>	<u>Health conditions</u>	<u>Outcome</u>
<p><b>1.Macroeconomic policies.</b> Budget allocation to NCDs prevention and promotion</p> <p><b>2.Governance</b></p> <ul style="list-style-type: none"> <li>Welfare state</li> <li>Community participation.</li> <li>Social orientation in development</li> </ul> <p><b>3.social policies</b></p> <ul style="list-style-type: none"> <li>Universal coverage</li> <li>Road policy</li> <li>Security policy</li> <li>Traffic policy</li> <li>Building policy</li> <li>Food policy</li> <li>Labour security policy</li> </ul> <p><b>4. public policies</b></p> <p><b>Health</b></p> <ul style="list-style-type: none"> <li>universal screening</li> <li>health information</li> </ul> <p><b>Education</b></p> <p><b>5. cultural and societal values.</b></p> <ul style="list-style-type: none"> <li>Cultural Beliefs</li> <li>Religion beliefs</li> </ul>	<ul style="list-style-type: none"> <li>Ethnicity/race</li> <li>Education</li> <li>Occupation</li> <li>Income(individual and household)</li> <li>Gender roles and responsibilities</li> </ul>	<ul style="list-style-type: none"> <li>urban infrastructure</li> <li>Urbanization</li> <li>Local food environment</li> <li>Environment promoting tobacco and Alcohol use.</li> </ul> <p><b>Behaviours</b></p> <ul style="list-style-type: none"> <li>Tobacco use</li> <li>Harmful use of alcohol</li> <li>Eating unhealthy food</li> <li>Physical inactivity.</li> <li>Health seeking behavior.</li> </ul> <p><b>Biological factors</b> Aging population Genes(family history) Sex(more in male)</p> <p><b>Psychosocial factors</b> Stress</p> <p><b>Health system</b> Building blocks</p>	<p>Hypertension</p> <p>Diabetes mellitus</p> <p>Atrial fibrillation</p> <p>Hyperlipidemia<sup>a</sup></p> <p>Carotid stenosis</p> <p>Prior transient ischemic attack</p> <p>Sickle cell disease.</p>	<p>Stroke</p>

Source: Diderchsen's and Hallqvist's 1998, in (WHO, 2010). The Commission on Social Determinants of Health.

### **1.6.1 Social demographic characteristics of stroke patients**

The high in social class have more in terms of knowledge, money, power, prestige, and social connections and are able to avoid risks and adopt the protective strategies. The stratifiers for SEP include; education, occupation, income, gender, race/ethnicity (Solar & Irwin, 2010).

#### **Education level**

Education is a determinant of employment and income. It reflects material, intellectual and other resources of the family of origin, it begins at early ages, and it is influenced by access to and performance in primary and secondary schools. The knowledge and skills attained through education may affect a person's cognitive functioning, make them more receptive to health education messages, or better enable them to communicate with and access appropriate health services (Solar & Irwin, 2010).

Education also influences health care seeking behaviour of individuals. It also influences involvement in high risk behaviours. The Kenya Health Demographic Survey (KDHS) 2008/2009 showed that men with secondary and higher education are less likely to smoke than men with less education (KDHS,2008). In this study the researcher described the highest level of education attained.

#### **Occupation**

Occupation is strongly related to income. Occupation reflect social standing and maybe related to health outcomes because of certain privileges such as easy access to better health care, access to education and residential facilities. Occupation may reflect social networks, work based stress, control and autonomy, and, thereby, affect health outcomes through psychosocial processes. Occupation may also reflect environmental and work exposures such as physical demand. Some occupations determine food consumed, involvement in physical activities, smoking and excessive use of alcohol (Solar & Irwin, 2010). Some occupations which are highly stressing may lead to one being involved in some risky behaviour for example smoking.

Some occupations are health protective, for example, those involved in religious activities are not allowed to smoke and take alcohol. Some religions prohibit meat consumption. Some treatment, survival and rehabilitation may differ according to employment status (WHO,

2006). In this study the researcher described the main work done over the past twelve months, prior to study.

### **Income**

Income is indicator of social economic position that measures the material resources component. It has a dose response association with health. It can influence a wide range of material circumstances with direct implications for health. Income is a measure of material living standard. Income affects health through the following mechanisms; Buying access to better quality material resources such as food low in cholesterol, fruits and vegetables, blood pressure machine and glucometer for self-monitoring at home, house in place with provisions for physical activities, allowing access to services, which improve health directly e.g. leisure activities, or education, health selection, medication (Solar & Irwin, 2010).

In systemic review of 19 studies conducted in 10 countries SSA up to 70% of stroke patients had low income background (kengne et al, 2006). According to Tawa et al (2011) on their study in Mombasa, their results showed that, the poorest people possessed the worst risk factor profile compared to their privileged counterparts (Tawa et al, 2011). In this study the researcher described household monthly income.

### **Gender**

The roles and responsibilities are assigned to biological sex groups and differ from one community to another. Gender norms and assumptions define differential employment conditions for women and men and fuel differential exposures and health risks linked to work (Solar & Irwin, 2010). Male suffer more from stroke compared to their female counterparts (Jowi & Mativo, 2008). Several studies have shown higher prevalence of risk factors such as smoking, alcohol intake in men. Males are in most cases are involved in extreme and stressful working conditions; in order to cope, they engage in health damaging behaviour like smoking and alcohol intake.

Men are expected by the society to be bread winners; in case they are unemployed or the income does not meet family needs they get stressed and indulge in risky behaviour such as smoking and harmful use of alcohol. In this study it was difficult to clearly get the roles and responsibilities of gender due to modernisation and adaption of western culture.

## **Race/ ethnicity**

Stroke varies substantially across racial groups. Studies in the UK showed people of African Caribbean background had twice the risk of suffering stroke to Caucasians (Abbott & Sim, 2010). Similar studies in South Africa found out that black population face a substantially higher risk of stroke at younger ages than the white population (Connor et al., 2005). Further studies in Kenya show variations in prevalence of risk factors for stroke in people from different communities. A study in Nakuru Kenya showed higher prevalence of hypertension, obesity, diabetes and high cholesterol were higher among Kikuyus compared to Kalenjins (Mathenge et al, 2010).

### **1.6.2 Intermediary determinants**

Intermediary determinants are individual level influences, including health related behaviours and physiological factors. The intermediary determinants create health inequalities (Solar & Irwin, 2010). This study looked at the material circumstances, behaviours which were health damaging, family history of stroke, biological factors, physiological factors and health system related factors.

Environments determine whether individuals take up tobacco, use alcohol, have poor diets and engage in physical activities. Housing and its location, consumption potential (healthy food) physical working and neighbourhood environments provide resources for health and health risks (Solar & Irwin, 2010). Motorised transport has led to physical inactivity. Urban infrastructure don't have provision for walkways and pavements for people to do physical activities like jogging, cycling. There's insecurity in most neighbourhoods so people are not able to engage in physical activities. Most estates do not have recreation facilities.

#### **1.6.2.1 Living environment**

Living environment determines the diet of the individuals, if the local food available is rich in cholesterol and sodium it will lead to inappropriate diet thereby increasing chances of development of stroke. Informal settlements make tobacco products and alcohol easily accessible. Due to poor and stressful living environment in informal settlements, people get easily involved in smoking and harmful use of alcohol. In a study in Tanzania, the incidences of stroke was higher in urban areas compared to rural areas (Walker et al, 2010)



In the informal settlements it is difficult to enforce the Tobacco Act, 2007 on protection of people from passive smoking. According to England stroke association, 3500 deaths from stroke in the United Kingdom are due to passive smoking (Stroke association, 2013). CVD risk factors are higher in urban areas than rural (Mathenge et al, 2010).

#### **1.6.2.2 Working environment**

Working environment at times can be stressful. Bad relationship between employers and employees leads to stress. If policies are not in place for stress management people indulge in risky behaviours to overcome the same (Solar & Irwin, 2010). Working in the informal sector leads to exposure to passive smoking where implementation of the free smoking zones is not possible.

#### **1.6.2.3 Stress**

Stress is an imbalance between environmental demands and an individual's ability to meet them. Stress is likely to have indirect effects by influencing harmful health behaviours associated with high blood pressure (WHO, 2002). In response to stress an enzyme renin is released which reacts with angiotension and causes constriction of blood vessels, leading to increase in blood pressure (Mundan et al,2013) This includes psychosocial stressors e.g. negative life events and job strains. Stressful living circumstances e.g. high debts and lack of social support.

A study in the armed forces showed that soldiers who were deployed to peace missions had higher prevalence of hypertension, tobacco and excessive alcohol use, and carbohydrates dense diets, which were attributed to means of coping with difficult circumstances (Mundan et al, 2013). Stress and work related factors, as well as unemployment and job insecurity are associated with higher rates of chronic illness for all family members (Solar & Irwin, 2010)

#### **1.6.2.4 Behavioral, Lifestyle, Biological and Physiological factors**

A wide range of lifestyle and behavioral factors influence the incidence of stroke, either directly or by affecting other risk conditions, such as blood pressure or diabetes. Examples are tobacco use, harmful use of alcohol (Lloyd-sherlock, 2009).

Four of the prominent non communicable diseases; cancer, chronic obstructive pulmonary disease and type 2 diabetes-are linked by common and preventable biological risk factors,

notably high blood pressure, high cholesterol and overweight, and by three related major behavioral risk factors, namely unhealthy diet, physical inactivity and tobacco use (WHO, 2002)

Physical inactivity, hypertension, overweight and obesity were the most common risk factors found in an epidemiological study in Mombasa (Tawa et al, 2011)

### **Tobacco use**

Nicotine in cigarettes causes stimulation of autonomic ganglia in the central nervous system resulting in increased release of catecholamines, which in turn elevate heart rate and blood pressure (Mundan et al, 2013). According to the stroke association of England, smoking doubles risk of stroke and is particularly dangerous if one has high blood pressure, it increases risk five times (Stroke association, 2013). In a study in 22 low and middle income countries (which included Mozambique, Nigeria, South Africa, Sudan and Uganda from Africa) smoking contributed to 18.9%, of the stroke cases (O'Donnell et al, 2010). In Kenya, less than 1% of women smoke, compared to 19% male (KDHS, 2008).

In a study in south Africa, 9% of stroke patients were found to be smoking cigarettes (Connor et al, 2005). The risk of stroke reduces to that of non-smokers five years after stopping (Abbott & Sim, 2010). In the World health Report 2002 tobacco use caused 4.4% disease burden (WHO, 2002). Several epidemiological studies have demonstrated that the risk of stroke decreases rapidly in smokers who quit smoking (Truelsen et al, 2001)

### **Inappropriate diet**

A balanced diet is one that provides adequate energy and nutrients for maintenance of body functions. It should contain carbohydrates, proteins, vitamins, fats, minerals, fibre and water in correct proportions (Mundan et al, 2013). Eating fruits and vegetables reduce risk of stroke and WHO recommends five portions each every day (WHO, 2002). In the UK, 13% of men and 15% of women eat the recommended five portions per day (Abbott & Sim, 2010). Inappropriate diet is at times influenced by general availability of foods due to the system as a whole. It can also reflect a person's inherent preferences modified by both cultural and family influence (eating meat in large portions). It also reflect the person's financial and political freedom to exercise those preferences (WHO, 2002). Eating high amounts of fruits and vegetables has been shown to reduce the risk of stroke by 30%. Higher intake of salt

increases the risk of stroke. Daily recommended salt intake is 5g (WHO, 2002) In a study in 22 countries 18.8% of stroke cases were attributed to inappropriate diet (O'Donnell et al, 2010). Further a study in Nakuru, Kenya showed 21.1% of the study population had high cholesterol (Mathenge et al, 2010) In this study inappropriate diet was measured using WHO steps instrument for surveillance of risk factors for chronic diseases

### **Physical inactivity**

According the World Health Organization, opportunities for people to be physically active exist in the four major domains of their day lives; At work, (especially if the job, involves manual labour) for transport (for example walking, or cycling to work) in domestic duties (for example, house work or gathering fuel or in leisure time (for example, participating in sports or recreational activities). Physical inactivity is defined by World Health Organization as doing very little or no physical activity in any of these domains. Physical activities reduce risks of CVD. Physical activity improves glucose metabolism, reduces body fat and lowers blood pressure leading to reduction in CVD and Diabetes. Physical inactivity was estimated to cause 1.9 million deaths and caused 22% of ischemic heart diseases.

Majority of the people are leading sedentary lifestyles. The urban infrastructure and motorised transport as greatly contributed to physical inactivity. In this study physical inactivity was described using WHO steps instrument for surveillance of risk factors for chronic diseases.

### **Harmful use of alcohol**

Alcohol in small amounts provides protection from coronary disease, stroke and atherosclerosis but in larger amounts increase blood pressure. The large amount increases cardiac output and heart rate, possibly as a consequence of increased sympathetic nerve activity. Alcohol also alters cell membrane and allows more calcium to enter the cell, leading to inhibition of sodium intake. Recommended alcohol intake for women is 1 drink per day and 2 drinks per day for men. High concentration of alcohol has been shown to constrict blood vessels. It also augments the vasoconstriction caused by catecholamine and vasopressin and inhibits endothelium dependent vasodilatation (Mundan et al,2013). The World Health Report 2002 estimates that alcohol caused 4.0% disease burden (WHO, 2003).

Consuming high amounts of alcohol increase risk of stroke threefold (Stroke association, 2013). Consuming more than two alcoholic drinks a day increases stroke risk by 50% (Lloyd-sherlock, 2009). A study in South Africa showed that 20% of stroke patients were using alcohol (Connor et al., 2005)

### **Obesity**

According to WHO,  $BMI \geq 30.0$  KGS /M<sup>2</sup> is obese, while 25-29.99 kg/m<sup>2</sup> is overweight and that of 18.0-24.99 kgs/m<sup>2</sup> is normal. Central obesity is defined as  $WHR \geq 0.85$  in women and  $\geq 0.95$  in men (WHO, 2002). Obesity increases the risk of high blood pressure, high blood cholesterol, diabetes and stroke (Abbott & Sim, 2010) Once considered a problem in high income countries obesity is on the rise in low and middle income countries (WHO 2013). The KDHS 2008 showed that 4.2 of the Kenyan population is obese (KDHS, 2008). While a study in Nakuru, Kenya showed 13% of the study population was obese (Wanjiku et al 2010).

Obesity is associated with higher morbidity and mortality. Excess body fat increases the risk of developing high blood pressure (WHO, 2003). Obesity arises from energy imbalance. The weight gain is mainly due to the energy intake from the diet being more than the energy expended from physical activity (WHO, 2002).

The World Health Report 2002, indicated that there are more than one billion adults worldwide who are overweight and at least 300 million are clinically obese, among these half a million of them will die of obesity related disease (WHO, 2003). Being overweight and obese increases risk of stroke (Stroke association, 2013). Obesity has a significant effect both directly and through predisposing conditions such as hypertension and diabetes leading to stroke (Lloyd-sherlock, 2009).

### **Family history**

Genes are traits that are passed from generation to generation hence hereditary. Therefore; they occur independently without any physical or physiological influence and cannot be manipulated (Mundan et al, 2013). Stroke is likely caused by different genes whose individual effects are determined by certain environmental triggers (Norris & Hachnski, 2001). In this study the researcher looked at family history of stroke in the immediate family members that is grandparents, parents and siblings.

## **Age**

Age is the strongest determinant of stroke. Old age is a significant risk factor for stroke, with the risk doubling in each successive decade for people aged 55 years and above and majority of stroke occur in persons older than 65 years (Norris & Hachinski, 2001). The average age of experiencing stroke is 15 years younger in low and middle income countries compared to high income countries (Kengne, et al, 2006). In a study in five low and middle income countries the mean age was 64.2 (Truelsen et al, 2007). while in a hospital study in Nairobi, the mean age of stroke was 61.3 years (Jowi & Mativo, 2008) in Zimbabwe 51% were below 54 Years (Matenga, 1997). In this study the researcher described the number of years lived, and the age the respondents experienced their first stroke.

## **Sex**

Stroke incidence is greater for men than women, with rates about 25%-30% greater for men (Norris & Hachinski, 2001). There are few age adjusted sex data for stroke and fatality rate in developing countries (Lloyd-sherlock, 2009). In a study in five low and middle income countries 45% of cases were women (Truelsen et al, 2007), which concurred with a study in Nairobi, Kenya (Jowi & Mativo, 2008). However in a community based study in Harare, it was found that the women experienced stroke more than men (Matenga, 1997).

## **Health seeking behaviour**

The value citizens' place on health is reflected on their health seeking behaviour. Beliefs and myths also play a role in the health seeking behaviour of individuals. A study in Tanzania showed more stroke incidence in urban areas compared to the rural areas. The researcher attributed this to health seeking behaviour, many people in the urban were seeking care in private pharmacies and hence delaying care (Walker et al., 2010). In this study the researcher looked at visiting traditional healer, taking herbal medicine, taking medication daily and missing scheduled appointments.

## **Hypertension**

Hypertension is the most powerful risk factor for stroke (Norris & Hachinski, 2001). Hypertension is persistent elevated systolic  $BP \geq 140$ mmHg or diastolic  $BP \geq 90$ mmHg. Awareness and control of hypertension are very low in Africa leading to a burden of complications which include; stroke, coronary heart disease, heart failure, peripheral vascular disease, renal impairment, retinal haemorrhage and visual impairment (Lopez,et al, 2006)

Hypertension was found in 80% of stroke patients in a study in Nairobi (Jowi & Mativo, 2008) and in south Africa, hypertension was found in 55% of the patients (Connor et al., 2005). Blood pressure control reduces incidences of stroke (Truelsen et al, 2001). The treatment of high blood pressure can reduce stroke by 40% (Lemobunmi, 2007). Lack of early diagnosis of HTN in low income African countries has led to higher incidences of stroke, which in most cases are more severe (Adeloye, 2014). Lifestyle changes such as weight loss, increased physical activity, limited alcohol consumption, reduction in salt intake can reduce blood pressure and risk of cardio-vascular disease (Lemogoum, et al, 2005).

### **Diabetes Mellitus Type II**

Diabetic patients have twice risk of suffering from stroke than non-diabetes (Stroke association, 2013). A study in Nairobi showed 33.7% of stroke patients were diabetic (Jowi & Mativo, 2008) and 12% were diabetic in a study in South Africa (Connor et al., 2005)

#### **1.6.2.5 Health system related factors**

It is the responsibility of the government to take care of the vulnerable. Health is a basic human right (Constitution 2010). The government should provide universal health coverage for the citizens. Irrespective of the source of financing for the health system selected, equitable prepayment and pooling at population level, and the avoidance, at the point of delivery, of direct payments that results in financial catastrophe and impoverishment, are basic principles for achieving Universal health coverage (WHO, 2010). The absence of effective health insurance and lack of allocation of adequate resources for prevention and management of NCDs has affected health seeking behaviour of many (Adeloye, et al, 2005). Prevention, diagnosis and treatment of stroke in Sub Saharan Africa is minimal (Lemogoum et al, 2005). The lack of functional stroke units, neurologists, health workers, CT/MRI machines and high cost of medicare care has led to increased burden of stroke in SSA (Chin, 2012)

The health system can directly address differences in exposure and vulnerability. Not only by improving equitable access to care, but also in the promotion of inter-sectorial action to improve health status. For example food supplementation, transport policies, health system can also facilitate sick people's reintegration in programmes for chronically ill, to support their reinsertion to workforce as well as models for health care financing to prevent people from being forced to deeper poverty, by the cost of Medical care (Solar & Irwin, 2010). In

order to do all the above enough budgetary allocation should be provided. Currently the budgetary allocation to the ministry of health is way below the Abuja declaration of 15%. Although there's a department in the ministry of health for NCDs, there is little funding for NCD prevention, health promotion, surveillance, monitoring and evaluation (WHO 2011).

The existing healthcare infrastructure needs to be oriented to meet the emerging rise in NCDs, while empowering community through health education. The community health workers need to be empowered in terms of knowledge to enable them carry out health campaigns. Health ministry has an essential responsibility of coordinating and facilitating the contribution of other ministries and government institutions responsible for policies on food, agriculture, youth, recreation, sports, education, commerce and industry, finance transportation and media, social affairs and urban planning (Waxman, 2005). A study in Ghana showed that adequate treatment of hypertension was very low in Ghana and that there was urgent need for preventive strategies on hypertension (Cappuccio et al, 2004).

The health system has a major role in assessing and monitoring morbidity and mortality attributable to stroke, and the level of exposure to risk factors and their determinants in the population, by strengthening health information system (Waxman, 2005). The World health organization recommends a stroke register to be filled for each country (WHO, 2006). Good primary health care coverage in rural Tanzania led to reduction of stroke incidences compared to urban areas (Walker et al., 2010)

The World Health Report (2002) urges member states to communicate the risks clearly and openly to the public (WHO, 2003). Service delivery good communication between health care workers and people with stroke is essential, and should be tailored to a person's need. The management should be culturally appropriate, and should be accessible to people with dysphagia or additional needs such as physical, sensory and learning disabilities (Practice, 2009).

Stroke is a clinically defined disease, WHO recommends a stepwise approach to collecting data, which will allow different countries with different resources and capacity in their health system to collect useful information for their policy ( Truelsen et al., 2001) This role should be spearheaded and coordinated by the Health ministry.

Establishment of stroke units for all stroke patients and administration of aspirin to all patients with ischemic stroke are the most inexpensive and cost effective interventions. However primary prevention of the risk factors is the key which leads to large reduction in stroke events ( Truelsen & Bonita, 2002)

The main technology for management of stroke is magnetic resonant imaging (MRI) and computerized tomography (CT) scan and in secondary prevention to prevent ischemic stroke reoccurrence is aspirin. Limited access to health services in the developing world leads to high mortality of stroke patients (Lloyd-sherlock, 2009). In this study the researcher described the mode of payment, patient staff ratio, availability of medicine and conducting CT/MRI scan, stroke register and comprehensive services and patient involvement, these variables have an impact on prevention of stroke.



## 1.7 Conceptual framework

For the purpose of this study the following variables will be measured as shown in the conceptual framework (fig 1.1).

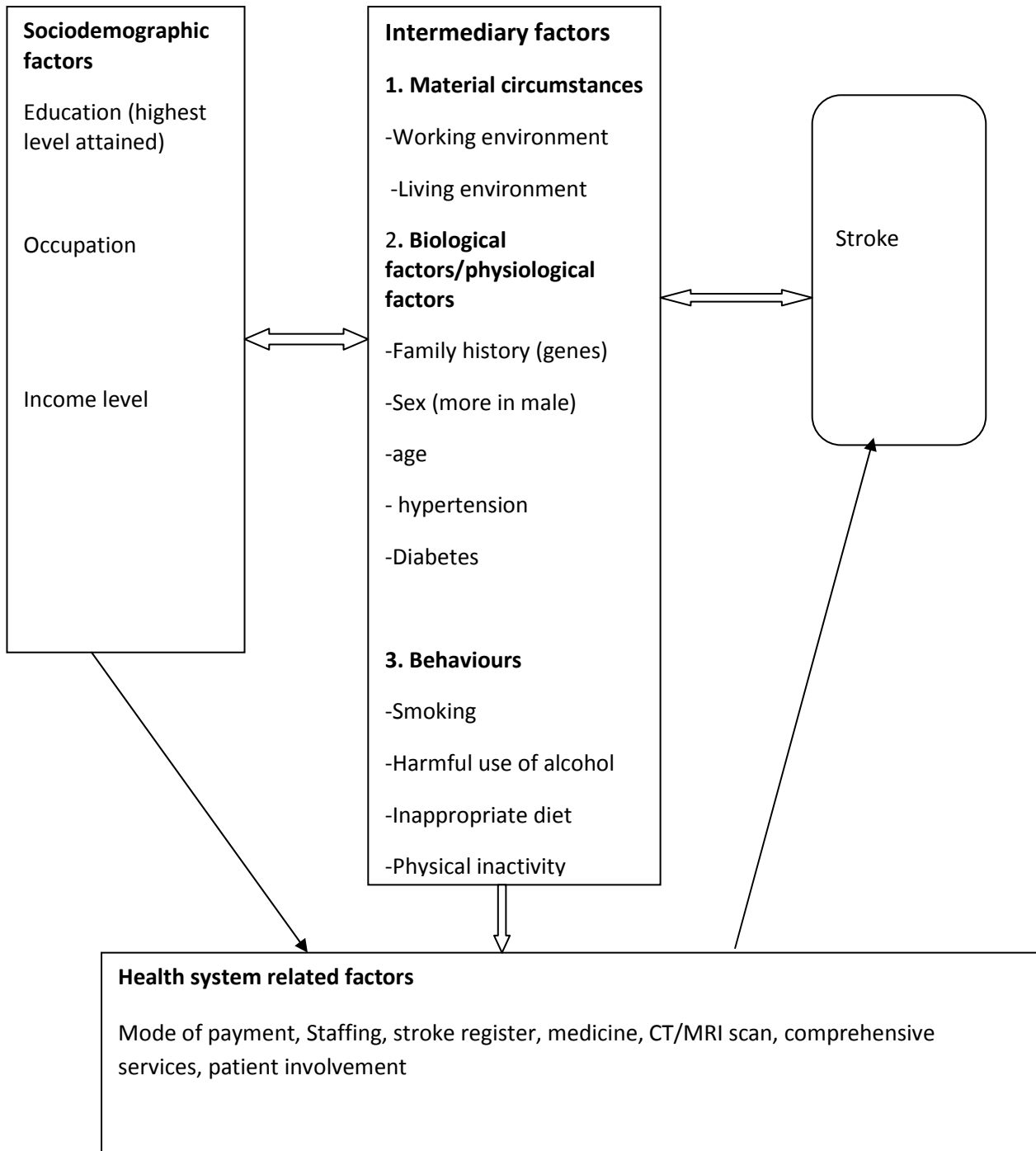


Fig 1.1 Conceptual framework

## CHAPTER TWO

### 2.1 Problem Statement

The burden of NCDs has risen sharply in the recent years and the rate of increase is set to accelerate. Stroke is no longer a disease of the rich developed world (Lloyd-sherlock, 2009) WHO estimates that from 2001, the low and middle income countries accounted for 80% of global deaths due to stroke. In terms of total disability life years (DALYS), the burden for low and middle income countries was seven times higher than the high income countries.

NCDs have created a double burden of disease in developing countries, in addition to the unconquered infectious diseases (WHO, 2002). In 2001 cardiovascular diseases (CVDs) accounted for 5.5 million deaths worldwide that is 9.6% of all deaths, two thirds of these deaths occurred in developing countries and 40% of subjects were below 70 years of age with stroke being the leading cause of disability. Many survivors of stroke require other people to survive (Truelsen, et al, 2001).

Kenya has not been spared of this burden. In a hospital based study of stroke in Nairobi, the prevalence of stroke was higher than the rest of Africa at 3042/100,000 (Jowi & Mativo, 2008) the prevalence in 19 studies in 10 African countries was 317.3/100000 population (Kengne, et al, 2006).

Most people survive stroke and about half are disabled, placing an enormous burden on the survivors, their families and the community (Connor et al., 2005). Projections to the year 2020 show that 61 million DALY are likely to be lost due to CVD each year and of these 52 million (84%) will be in developing countries (Truelsen, et al, 2001). Poor control of hypertension and diabetes increases the chances of suffering stroke (Jowi & Mativo, 2008). The demographic transition in many countries with more people reaching the age where NCDs occur, threatens to overwhelm already stretched health service. Stroke is to a large extent preventable and may be used as an indicator for the effect of public health initiatives (Truelsen & Bonita, 2002). The number of stroke patients is set to increase because of demographic changes and inadequate control of risk factors (Bonita et al, 2004)

### Research gaps

Several studies on stroke have been conducted in different parts of the World; however few studies have been done in Sub-Saharan Africa, including Kenya. The ones which have been

done as highlighted above have been retrospective and prospective focusing on types of stroke, outcome of acute stroke and risk factors of stroke. The studies have also highlighted the limited and unreliable data from Sub-Saharan Africa. These called for a study focusing on the social determinants of stroke.

## **2.2 Justification**

In many countries, stroke is not a priority compared to other diseases despite its public health impact. One of the issues is due to lack of data to help in development of strategies (Thrift et al, 2014). Stroke has a serious impact on the economy due to disability, reduced productivity, absenteeism and overstretched healthcare budget to families, health system and the nation. Significant numbers of individuals' are undiagnosed and, among those diagnosed, treatment is frequently inadequate. Stroke is preventable and may be used as an indicator of the effect of public health initiatives (Bonita, 2004) This study sought to get data on the social determinants of stroke, from the patients and the health care workers, which will contribute in influencing and guiding the development of policy for prevention, promotion, control and rehabilitation of stroke.

## **2.3 Study Objectives**

### **2.3.1 Broad Objective**

To describe the social determinants of stroke among stroke patients attending medical outpatient clinic at Kenyatta National Hospital.

### **2.3.2 Specific Objectives**

Specific objectives are to:

1. Describe the socio-demographic characteristics of stroke patients.
2. Describe material circumstances of stroke patients.
3. Determine biological and behavioural risk factors among stroke patients.
4. Describe health system related factors associated with management of stroke at Kenyatta National Hospital.

## **2.4 Research questions**

1. What are the socio-demographic characteristics of stroke patients attending clinic at Kenyatta National Hospital?
2. What are the material circumstances of stroke patients?
3. What are the biological and behavioural risk factors?
4. What are the health system related factors associated with management of stroke at Kenyatta National Hospital?

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Study Design**

This was a descriptive cross-sectional study conducted at the Medical Outpatient Clinic at Kenyatta National Hospital.

#### **3.2 Study Site**

The study was conducted at Kenyatta National Hospital, Nairobi County. The hospital is situated in the capital city of Kenya and it's the largest referral hospital in country. It is also a teaching hospital for the University of Nairobi and the Kenya Medical training College. This is a public institution and receives referrals; mainly complications from all health facilities in the country. The hospital has specialized outpatient clinics, located at Medical Outpatient Clinic (MOPC) number 17. The MOPC runs from Monday to Friday with different clinics each day as shown in the table 3.1. The files for patients are retrieved from central registry and brought to the records office at MOPC a day before each clinic. There's neither clinic specifically for stroke nor a stroke register. Majority of stroke patients were seen in the Neurology clinic on Monday few on cardiology and general medicine clinic and very few during diabetic clinic. The patients were booked from the wards upon discharge and others referred from other facilities around the country. The health care workers working at the clinic were; consultant physicians, registrars (students doing postgraduate training in internal medicine), nurses, nutritionists, health records and information officers. The stroke patients who had other complications and needed other services, apart from attending MOPC were referred to relevant departments within the hospital with majority being referred to physiotherapy and occupational therapy department.

**Table 3. 1: KNH Medical outpatient clinic time table**

<b>Day of the week</b>	<b>Morning</b>	<b>Afternoon</b>
Monday	Neurology clinic	Neurology clinic
Tuesday	Cardiac clinic	General medicine clinic
Wednesday	Endocrinology clinic, thyroid clinic	General medicine clinic
Thursday	General medicine clinic	Gastroenterology clinic Rheumatology clinic
Friday	Diabetic clinic	Diabetic clinic

Source; medical records office, MOPC clinic, 17.

### **3.3 Study Population**

The study population included all stroke patients attending medical outpatient clinic at Kenyatta National Hospital and health care workers involved in care of stroke patients who were the key informants.

#### **a)Inclusion and exclusion criteria of Patients**

##### **Inclusion criteria.**

1. All stroke patients with recorded diagnosis of stroke/cerebral vascular accident by their respective doctors and were  $\geq 18$  years.
2. Patients who gave informed consent for the study.

##### **Exclusion criteria**

1. Very sick patients.
2. Patients who had recoded diagnosis of transient ischaemic attack.
3. Patients who were unable to talk not talk.

#### **b) Inclusion and exclusion criteria of Health Care Workers**

##### **Inclusion criteria**

Health care workers who gave informed consent.

### Exclusion criteria

Health care workers who were not available for interview during the study period.

### 3.4 Sampling and Sample size determination

#### a) Stroke patients

The sample size was determined using the following formula (Dobson, 1984)

$$n = \frac{Z^2 P(1 - P)}{d^2}$$

Where:

**n**= desired sample size

**Z**= critical value at 95% level of significance (that is 1.96)

**P** estimated proportion of stroke patients. (Proportion of stroke patients in a hospital study at Nairobi was 0.03042 (Jowi & Mativo, 2008)

**1-p** is the target population estimated not to have stroke (1-0.03042)

**d** is the margin of error set at  $\pm 0.05$

Substituting values in the above formulae:

$$n = 1.96^2 \times 0.03042(1 - 0.03042) / 0.0025 = 45$$

To cater for non-respondents, the following formula was used

$$n^1 = \frac{n}{(1 - R\%)}$$

$n^1$  = adjusted sample size;  $n$  = calculated sample size;  $R\%$  = non response rate at 10%

Substituting in the above formula;  $n^1 = 50$

A total of 66 subjects were recruited for the study.

#### a) Selection of stroke patients

The files of all patients attending MOPC were obtained from the records office. The researcher perused the files and the patients who had recorded diagnosis of stroke from their respective doctors were selected, the files were then numbered, and a list made. The following day when the patients came to the clinic the list was given to the research assistants by the record officer. The researcher/researcher assistant called out the names from the list and identified the potential study participants, then explained the study aims and procedures, assessed participant eligibility and invited the patient to participate. The researchers then

obtained a written consent from the patients for the study. The interview was conducted in Kiswahili or English in a room where only the respondent was present. To ensure the subject was not recruited twice, the subjects' hospital file number was noted on a list and the researcher kept a list of the file numbers to countercheck with during the recruitment process. Enrolment was done daily Monday to Friday, and consecutive subjects who met the inclusion criteria were enrolled until required sample size was obtained.

#### **b) Selection of Health Care Workers**

The leaders of the clinicians, nurses, nutritionists, who were working at the clinic, were purposively selected for key informant interviews.

### **3.5 Data collection.**

The data collection tools were a semi structured questionnaire (Appendix 1) and Key informant interview guide (Appendix 4). Two research assistants were recruited, and trained by the researcher on how to obtain a written consent and interview the participants using the research tools. A pilot study to assess the accuracy of the questionnaires was carried out in Kenyatta National Hospital, where 6 stroke patients were consecutively selected, and interviewed. These six were not included in the main study. The findings helped to further refine the questionnaire.

#### **Procedure for Key Informant Interviews.**

KII were carried out to validate the quantitative data. The researcher conducted the KII. Purposive sampling technique was employed in recruiting the participants. Written consent was obtained from the leaders of health care workers recruited for the study. The interview was conducted in their respective offices. The researcher introduced herself and explained the purpose of the study, then used the KII guide to conduct the interview. The researcher reassured the leaders on confidentiality of the information obtained.



### 3.6 Study variables.

Information was collected on the following variables from the study respondents and how they were measured is presented in table 3.2.

1. Age
2. Sex
3. Level of education
4. Marital status
5. Occupation
6. Income
7. Family history of stroke
8. Working environment
9. Living environment
10. Inappropriate diet
11. Harmful use of alcohol
12. Tobacco use
13. Physical inactivity
14. Staffing
15. Health information
16. Universal coverage
17. Medicines and technology
18. Service delivery.

**Table 3.2 Measurement of study variables**

Study variable	Measurement
Age	Number of years lived
Sex	Male or female as observed
Level of education	Highest level of education attained
Marital status	Whether married, single, divorced, separated or cohabiting
Occupation	Main work done for past 12 months
Income	Individual and household income
Family history	History of stroke in relatives (grandparents, parents and siblings of the respondent)
Working environment	Passive smoking in place of work
Living environment	Exposure to passive smoking, availability of places for physical activity in areas of residence
Inappropriate diet	Foods rich in salt and cholesterol Consumption of red meat, fruits and vegetables
Harmful use of alcohol	Use of alcohol per WHO steps instrument
Tobacco use	Use of tobacco in any form as per WHO steps instrument
Physical inactivity	Engagement in physical exercise per WHO STEPS instrument
Staffing	Patient staff ratio
Health information	Stroke register
Universal coverage	Mode of payment for the services
Medicines and technology	Availability of medicines and CT scan.
Service delivery	Comprehensive services

### **3.7 Data quality control**

A pilot test was conducted at Kenyatta National Hospital. Two research assistants with a medical background and knowledge on medical field data collection were recruited and trained by the researcher on administration of study questionnaire. Training included description of study objectives, sampling technique, ethical considerations and entry of data. The research assistants were monitored closely and supervised during the study. The researcher held daily briefings to share experiences and scrutinize filled questionnaires for completeness.

### **3.8 Data Processing and Analysis**

Filled questionnaires were cleaned on a daily basis to ensure completeness, accuracy and consistency by the researcher. The questionnaires were coded using numbers for easy of data entry. Data was entered into a computer database, cleaned, verified and analyzed using Statistical Package for Social Sciences (SPSS) version 20. Descriptive data was summarised into means, frequencies and percentages. The results were presented in form of tables, Pie charts and bar charts.

The qualitative data was processed and analysed continuously, beginning from the data collection period. Field notes taken during KIIs were transcribed, coded and summarized according to emerging themes and analysis was done through content analysis according to study objectives.

### **3.9 Ethical Considerations**

Informed consent was sought from study participants. They were given the opportunity to ask questions, and to withdraw from the study without penalty or loss of benefits, if they chose to, and were not coerced, forced or bribed to participate.

Human rights, privacy and dignity of the participants were upheld and respected, their confidentiality was protected by using codes and serialised the questionnaires. No identifying information was disclosed in the analysis.

Ethical approval for the study was obtained from Kenyatta National Hospital and University of Nairobi Ethics and Research Committee (Appendix 6).

Permission was also obtained from Kenyatta National Hospital and a certificate for the study was issued (Appendix 5).

### **3.10 Minimization of Errors and Biases**

The potential errors and biases were minimized by:

1. Standardized structured questionnaire was used for data collection.
2. Research assistants were trained prior to data collection.
3. Pre-testing of the questionnaires and any ambiguity corrected before the actual data collection of data.
4. The filled questionnaires were counterchecked to ensure completeness immediately after the interview.
5. The principal investigator went through all the files to identify respondents with recorded diagnosis of stroke.

### **3.11 Study limitations**

The study limitations included reliance on self-reported data. The questions asked were of behavioural nature (e.g visiting herbalists, missing clinic appointments, eating habits, engagement in physical activities and taking medications daily) and the responses were more likely to be distorted by fear of reprisal. The findings may not be wholly generalized in Kenya, as the study was in a public health setting, where majority of population have financial constraints.

### **3.12 Dissemination of study results**

The results of the study are to be presented as a dissertation to the University of Nairobi. Summarized thesis will be presented to KNH medical outpatient clinic. Copies of the report will be kept in the University of Nairobi library for references. The study will also be published in scientific peer reviewed journals for public access.

## CHAPTER FOUR

### RESULTS

#### 4.0 Introduction

The results presented in this chapter are derived from data obtained from the structured questionnaires from 66 respondents and 3 key informant interviews with the healthcare workers. The chapter is organized into subsections; Section 1 on Socio-demographic characteristics of the study participants, Section 2 on biological and behavioral risk factors and Section 3 on health system related factors.

#### 4.1 Socio-demographic characteristics of the study respondents

The socio-demographic characteristics of the respondents are shown in table 4.1.

##### **Sex.**

Out of the 66 respondents who participated in the study, two thirds, 44 (66.7 %) were female and a third, 22 (33.3%) were male, resulting into a female to male ratio of 2:1.

##### **Age**

The ages of the respondents ranged from 29 to 90 years with a median of 57, mean age of 58.3 years and a standard deviation of 3.76. More than a half 38 (57.6%) of the respondents were aged below 60 years with 2 (3%) being below 30 years of age and only 15 (22.7%) were aged above 70 years of age.

##### **Marital status**

Thirty seven (56.1%) respondents were married; 18 (27.3%) were widowed; 7 (10.6%) were single and 4 (6.1%) were separated.

**Table 4.1: Socio-demographic characteristics of study respondents**

Characteristic		Frequency	Percent (n = 66)
Gender			
	Male	22	33.3
	Female	44	66.7
	Total	66	100
Age (years)			
	21-30	2	3.0
	31-40	5	7.6
	41-50	15	22.7
	51-60	16	24.2
	61-70	13	19.7
	>70	15	22.7
	Total	66	100
Marital status			
	Single	7	10.6
	Married	37	56.1
	Widowed	18	27.3
	Separated	4	6.1
	Total	66	100
Level of education			
	No formal schooling	8	12.1
	incomplete primary	16	24.2
	Primary completed	21	31.8
	Secondary completed	14	21.2
	Tertiary	7	10.6
	Total	66	100
Religion			
	Christian	64	97.0
	Muslim	2	3.0
	Total	66	100
Occupation			
	Formal employment	12	18.2
	Self employed	15	22.7
	Retired	10	15.2
	Unemployed (able to work)	12	18.1
	Unemployed ( not able to work)	17	25.8
	Total	66	100
Monthly Household income			
	Less than 10,000	29	43.9
	11,000-20,000	17	25.8
	Above 20,000	20	30.3
	Total	66	100

### Level of education

Eight (12.1%) of the respondents had no formal schooling, 16 (24.2%) had not completed primary level of education, 21 (31.8) completed primary level of education, 14 (21.2 %) completed secondary level of education, and 7 (10.6%) had attained tertiary level of education.

In comparison more females than males had no formal schooling and had incomplete primary level of education. A larger proportion of males than females had attained secondary and above level of education (59.2%) in comparison to (18.2%) among females. (Tab. 4.2)

Level of education	Male		Female	
	No	%	No	%
No formal schooling	1	4.5	7	15.9
Primary incomplete	3	13.6	13	29.5
Primary completed	5	22.7	16	36.4
Secondary completed	11	50.0	3	6.8
tertiary	2	9.1	5	11.4
Total	22	100.0	44	100.0

**Table 4.2: Level of education by gender of the respondents.**

### Religion

Sixty four respondents (97%) were Christians, and the remaining 2 (3%) were Muslims.

### Occupation

The respondents were asked about their occupation in the past twelve months preceeding the study. Twelve (18.2%) were in formal employment and the same number were unemployed and able to work, 17 (25.8%) were unemployed and not able to work; 15 (22.7%) were self-employed and 10 (15.2%) had retired from employment. A larger propotion of males were in employment, whether formal or self employed than females as shown in table 4.3.

Occupation	Male		Female	
	No	%	No	%
Formal employment	6	27.3	6	13.6
Self employment	4	18.2	11	25.0
Retired	7	31.8	3	6.8
Unemployed (able to work)	3	13.6	9	20.5
Unemployed (not able to work)	2	9.1	15	34.1
Total	22	100.0	44	100.0

**Table 4.3: Occupation of study respondents.**

## **Income**

The respondents were asked about their combined household monthly income. Twenty nine (43.9%) had a household monthly income of less than Ksh10, 000, 17 (25.8%) had income of Ksh 11,000-20,000, and 20 (30.3%) had household monthly income of over Ksh 20,000.

## **4.2 Biological/physiological and Behavioural Risk Factors**

The study also collected information on biological/physiological and behavioural risk factors of the respondents. The biological risk factors studied were; age at which the respondents experienced first stroke, sex as observed, family history of stroke, other chronic conditions experienced by the respondents. The behavioural risk factors studied were; tobacco smoking, harmful use of alcohol, inappropriate diet and physical inactivity. information on health seeking behaviour such as adherence to treatment and patient education was sought from the respondents.

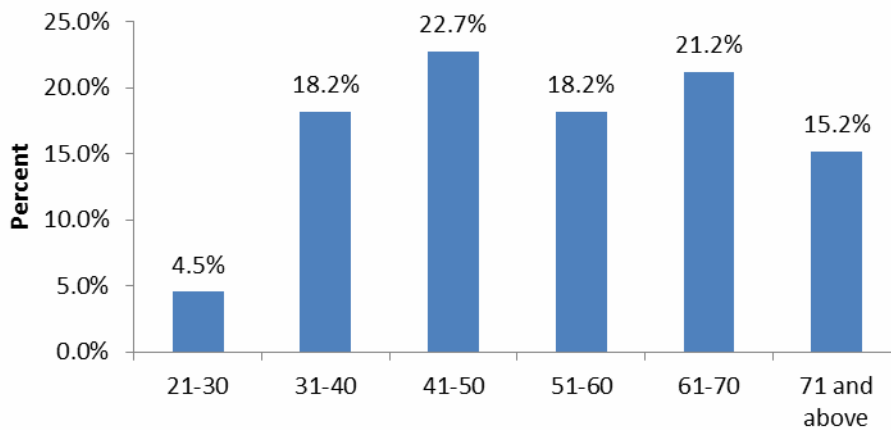
### **4.2.1 Biological risk factors**

#### **Sex as observed**

Two thirds of the study respondents (66.7%) were female and remaining third (33.3%) were male.

#### **Age at experiencing first stroke**

The study participants were asked at what age they experienced their first stroke. The ages of the respondents at which they first experienced stroke ranged from 22 to 85 years with a median of 52.5. About three fifths (59.1%) of the study participants experienced their first stroke between the ages of 31 and 60 years only 4.5% experienced first stroke at the ages below 30 years. The mean age of experiencing first stroke was at 53.7 and a standard deviation of 3.86 years. (Fig. 4.1)



**Figure 4.1 Age at experiencing first stroke**

### Co morbidities

The participants were asked if they suffered from any other chronic diseases other than stroke. Sixty (90.9%) respondents reported to be suffering from other chronic conditions. Slightly over three quarters 52 (78.8%) had hypertension; 6 (9.1%) diabetes mellitus; 5 (7.6%) hypertensive heart disease; 5 (7.6%) had both hypertension and diabetes mellitus. 1.5% had asthma and 1.5% rheumatic heart disease (Table 4.4).

**Table 4.4 Chronic Conditions among study participants**

Chronic condition	Frequency	Percent (n = 66)
Hypertension	52	78.8
Diabetes Mellitus	6	9.1
Hypertensive Heart disease	5	7.6
Asthma	1	1.5
Rheumatic Heart Disease	1	1.5
No chronic condition	6	9.1

### Family history of stroke

Asked if any of their close family members, namely grandparents, parents and sibling had suffered from stroke, 21 (31.8%) answered in the affirmative while 45 (68.2%) respondents did not have a family member who had suffered from stroke.



#### **4.2.2 Behavioural risk factors and health seeking behaviour of the respondents.**

The study also collected information on respondents health seeking behaviour such as adherence to medication, keeping scheduled appointment, seeking services of a traditional healer, the health seeking behaviour has a big role in management of stroke (table 4.5). The behavioural risk factors studied were; tobacco smoking, alcohol consumption, physical inactivity and inappropriate diet.

##### **Duration of medication**

When the study respondents were asked for how long they would be on medication, 37 (56.1%) answered that they did not know, while 21 (31.8%) said that they would be on medication indefinitely, 6 (9.1%) said they would be on medication until they felt better, while 2 (3%) said they would be on medication until the next clinic visit.

##### **Self-reported Adherence**

When the respondents were asked if they were taking their medication daily. Forty one (62.1%) answered in the affirmative while the remaining 25 (37.9%) were not taking their medication daily. Reasons given for not taking medication daily were; drugs availability 9 (36.0%) and affordability 9 (36.0%).

##### **Scheduled appointment keeping**

Respondents were asked if they had missed any scheduled clinic appointment. About two thirds, 45 (68.2%) of the respondents said they had not missed while 21 (18.2%) had missed. Twelve (57.1%) of the respondents who had missed an appointment, did not give a reason why they missed. Four (19.0%) cited financial constraints as a reason for missing scheduled appointment.

##### **Sensitization on risk factors for stroke**

Patient awareness on risk factors for stroke is one of the key areas in management of stroke. The respondents were asked if the health care workers had made them aware of the common risk factors for stroke. Fifty nine (89.4%) of the respondents were aware on need for body exercises; 40 (60.6%) on diet modification; 39 (59.1%) on hypertension; 27 (40.9%) on alcohol consumption; 24 (36.4%) on cigarette smoking, while 12 (18.2%) on diabetes mellitus.

### Challenges respondents were facing since experiencing stroke

When the respondents were asked about challenges they faced since suffering stroke. Twenty four (46.2%) of the respondents said they were not able to work as before; 19 (28.8%) were facing financial constraints and a similar number were having walking difficulties, 14 (21.2%) were depending on others for activities of daily living; 4 (6.1%) were stigmatized at work; 3 (4.5%) lost their jobs and 1 (1.5%) had reduced libido.

**Table 4.5 Behavioural risk factors**

	Frequency	Percent
<b>Duration of Medication(n = 66)</b>		
Until the medication gets finished	0	0
Until the next clinic	2	3.0
Until I feel better	6	9.1
Indefinitely	21	31.8
I don't know	37	56.1
<b>Reason for not taking medication daily(n = 25)</b>		
Drugs not available	9	36.0
Drugs too expensive	9	36.0
I felt the drugs made me feel better	2	8.0
Forgot	2	8.0
Side effects	1	4.0
Too many drugs	1	4.0
No reason	1	4.0
<b>Reason for missing appointment (n = 21)</b>		
No reason	12	57.1
Financial constraint	4	19.0
Holiday	2	9.5
Travelled home	2	9.5
Not able to get permission from place of work	1	4.8
<b>Sensitization area(n = 66)</b>		
Body exercises	59	89.4
Diet modification	40	60.6
Hypertension	39	59.1
Alcohol consumption	27	40.9
Cigarette smoking	24	36.4
Diabetes	12	18.2
<b>Challenges faced since suffering stroke(n = 66)</b>		
Not able to work as before	24	36.4
Financial constraints	19	28.8
Walking difficulties	19	28.8
Depending on others for activities of daily living	14	21.2
Stigma at work	4	6.1
Lost job	3	4.5
Reduced libido	1	1.5

### **Seeking services of traditional healer by the respondents**

Asked if they had sought services of a traditional healer for stroke, 61 (92.4%) of the respondents denied seeking services of a traditional healer for their stroke, as compared to 5 (7.6%) who admitted to have sought services of a traditional healer. Seven (10.6%) respondents were taking herbal or traditional remedy for their stroke.

### **Tobacco smoking and Alcohol Consumption.**

The respondents were asked if they had ever used any tobacco products either in the past or at the time of study. None of the respondents was smoking any tobacco product as at the time of the study. However, 12 (18.2%) respondents had smoked tobacco in the past. Six percent of the respondents were passive smokers.

Asked if they had ever consumed alcohol either in the past or at the time of study, only 3 (4.5%) of the respondents consumed alcohol during time the of study, while 7 (10.6%) consumed alcohol in the past 12 months proceeding this study.

### **Physical activities.**

The study participants were asked about engagement in physical activities using the World Health Organization, four main domains of opportunities (walking, sitting/reclining, digging/construction, carrying/lifting loads) for people to be physically active. Thirty three (50%) of the respondents were involved in sitting/ reclining, 12 (18.2%) were involved in digging/construction, 11 (16.7%) were involved in carrying/lifting and 10 (15.2%) were involved in walking (Table 4.6 a and b)

**Table 4.6 a and b; Physical activities, Frequency and Duration among respondents**

	<b>Frequency</b>	<b>Percent (n = 66)</b>
<b>Physical activities</b>		
Carrying/lifting	11	16.7
Digging/ construction	12	18.2
Sitting/reclining	33	50.0
walking	10	15.2
<b>Frequency of physical activity</b>		
Carrying/lifting		
Daily	8	12.1
Less than 3 days	1	1.5
More than 3 days	2	3.0
Digging/construction		
Daily	7	10.6
Less than 3 days	3	4.5
More than 3 days	2	3.0
Sitting/reclining		
Daily	24	36.4
Less than 3 days	2	3.0
More than 3 days	7	10.6
Walking		
Daily	8	12.1
Less than 3 days	1	1.5
More than 3 days	1	1.5
<b>Duration of work physical activity</b>		
Carrying/lifting	0	0
Less than 15 min	0	0
15-20 min	0	0
20-30 min	11	16.7
More than 30 min		
Digging /construction	0	0
Less than 15 min	1	1.5
15-20 min	0	0
20-30 min	11	16.7
More than 30 min		
Sitting /reclining	1	1.5
Less than 15 min	1	1.5
15-20 min	2	3.0
20-30 min	29	43.9
More than 30 min		
Walking		
Less than 15 min	1	1.5
15-20 min	0	0
20-30 min	0	0
More than 30 min	9	13.6

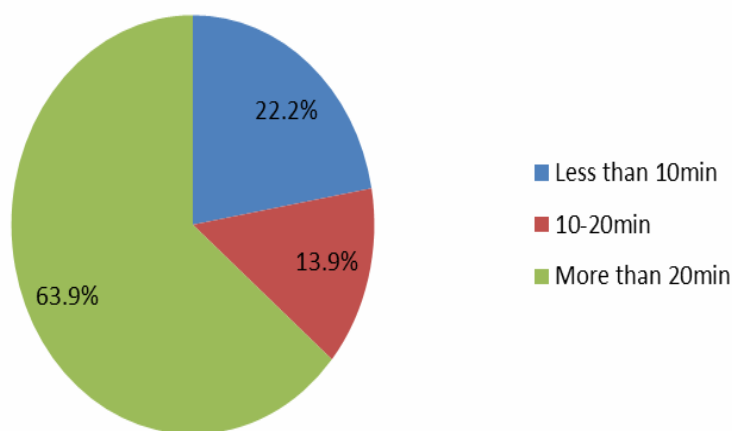
Physical activities	Frequency of work activities	Duration of work activities			
		Less than 15 minutes	15-20 min	20-30 min	More than 30 min
Carrying /lifting loads (n=11)	Daily	0	0	0	8
	Less than 3 days	0	0	0	1
	More than 3 days	0	0	0	2
Digging/construction work (n=12)	Daily	0	1	0	6
	Less than 3 days	0	0	0	3
	More than 3 days	0	0	0	2
Sitting or reclining (n=33)	Daily	0	1	2	21
	Less than 3 days	1	0	0	1
	More than 3 days	0	0	0	7
Walking (n=10)	Daily	0	0	0	8
	Less than 3 days	1	0	0	0
	More than 3 days	0	0	0	1

**Table 4.6 b**

### Mode of transport

When the respondents who were working were asked about their mode of transport they used to get to their work station, 26 indicated that they walked to work, one used motor vehicle, and no respondent cycled to work

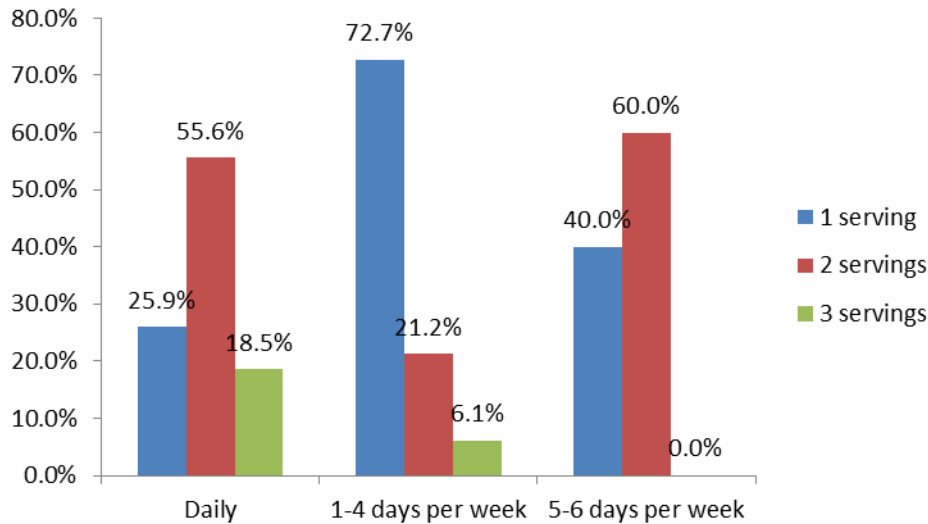
Asked how long they walked to their work station, 63.9% of the respondents who walked took more than 20 minutes, 13.9 % took between 10-20 minutes and 22.2% took less than 10 minutes (Figure 4.2).



**Figure 4.2: Duration of walking to work station**

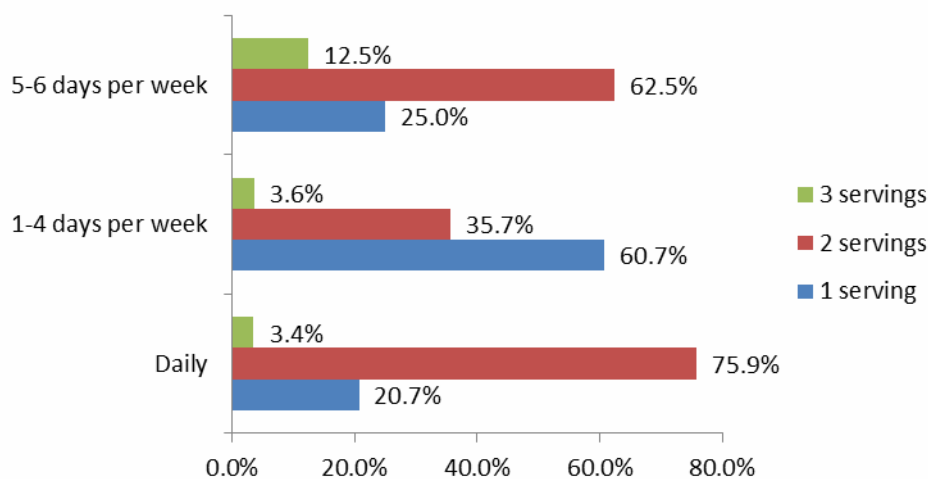
## Diet

The respondents were asked about their diet, that is, consumption of fruits, vegetables, red meat, type of cooking oil used and use of salt. A half of the respondents took fruits for 1 to 4 days per week with average of 1.4 servings. The frequency of eating fruits increased with decrease in fruit servings (Figure 4.3)



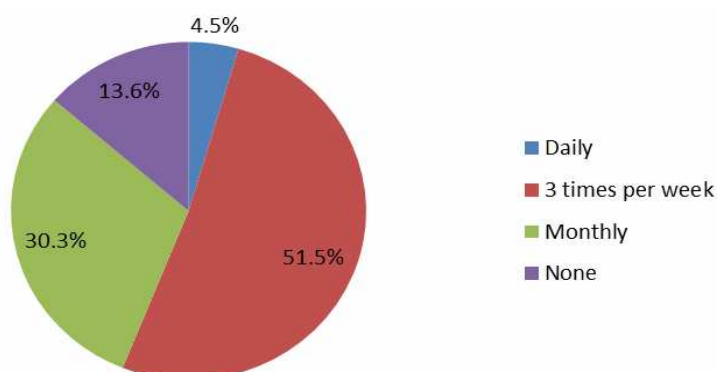
**Figure 4.3: Fruit Servings among respondents**

When the respondents were asked about consumption of vegetables, 29 (43.9%) of the respondents consumed vegetables daily, 28 (43.1%) consumed one to four days per week while 8 (12.3) consumed 5 to 6 days per week (Figure 4.4). One respondent reported, not to be taking fruits and vegetables at all.



**Figure 4.4: Vegetable servings among respondents**

Only 2 (3%) respondents ate the WHO recommended five portions of fruits and/or vegetables. About a half (51.5%) of the respondents consumed red meat 3 times per week and 13.6% of the respondents were not consuming red meat at all (Figure 4.5).



**Figure 4.5: Frequency of taking red meat among respondents**

The respondents were asked if they cooked their food with salt. About 90% respondents answered in the affirmative. When asked if they added salt to their food while eating, 88.1% reported not to be adding salt to food when eating.

Asked what type of oil they used in preparing meals, 59 (89.4%) respondents used vegetable oil while 9.1% used Lard or suet and 1.5% used no oil in cooking.

When respondents were asked how many times in a week they ate meals that were not prepared at home, 52 (78.8%) said they ate meals prepared at their households, while 14 (22.2%) ate varying numbers of meals in a week not prepared at home as shown in (Table 4.7).

**Table 4.7: Frequency of meals eaten but not prepared at home**

Number of meals per week	Frequency	Percent (n = 14)
1-7	11	78.6
8-14	1	7.1
15-21	2	1.4

### 4.3 Health System Related Factors.

In order to assess the health system related factors, the respondents were asked questions based on the World Health Organization building blocks; mode of payment, comprehensive services, stroke register, availability of medicines and CT/MRI scan and staffing.

#### **4.3.1 Mode of service payment.**

The majority of the respondents 62 (93.9 %) paid cash and only 4 (6.1%) paid through insurance, as shown in figure 4.10. This was also evidenced in the KII as reported by one health care worker “...*the patients have to pay before they are seen*”. The hospital has a system of waiving payments for patients who are not able to afford, though this system works more for inpatients compared to outpatient, as one health care worker noted, “...*The patients who are not able to pay, there is a waiver system in place but this works more for the patients who are admitted, but for the ones who are on follow up at the clinic, they simply don't turn up for the clinic*”

And another health care worker noted:

“...*in the ward it is easy, as the investigations are done and patient pays upon discharge*”

Some patients were missing some services, because they were not able to afford, as reported by one health care worker:...*Among the patients referred to us for nutritional services majority of them are not able to afford, so once they realize they have to pay, majority go away without being seen*”

Lack of money was cited as a major challenge the respondents were facing and this was a reason as to why they missed appointments.

#### **4.3.2 Staffing**

It was apparent that the Medical Outpatient Department was understaffed. , as noted by one healthcare worker “...*The hospital does not have enough qualified staff to run the clinic, KNH neurophysicians are very few, and it becomes difficult when the registrars are doing exams, the patients wait for long to be seen*” and another in charge said:

“...*The patients are many and we have no say in bookings*” It takes a long time for the patients to get their first booking as the patients are many and they have to be booked together with others in the general neurology clinic, as noted by one health worker: “...*The first bookings take up to six months, due to many patients and limited number of staff*”

#### **4.3.3 Comprehensive services**

WHO recommends that CT scan should be done to all suspected stroke patients and it should be done within 24 hours from the time of experiencing stroke. When the respondents were asked if CT scan was done, 97% of the respondents answered in the affirmative. However, only 35 (54.7%) of the respondents, had their CT scan done within the recommended 24 hours (Table 4.8)



**Table 4.8: Length of time between stroke occurrence and doing CT scan.**

<b>Length of time</b>	<b>Frequency</b>	<b>Percent</b>
Within 24 hours	35	54.7
After 24 hours	23	35.9
Can't remember	6	9.4
<b>Total</b>	<b>64</b>	<b>100.0</b>

### **Services received by the respondents**

The respondents were asked if they were receiving all the services prescribed by the respective clinicians in the facility. About a half 34 (51.5%) of the respondents answered in the affirmative. The services missed most at the facility were drugs.

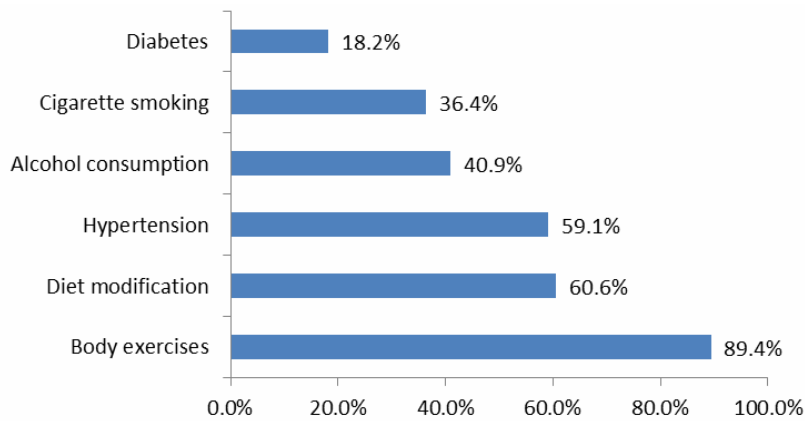
### **Visitation by Community Health Care workers**

When the respondents were asked if they were visited by community health workers in their homes, only 3 (4.5%) respondents answered in the affirmative.

### **4.3.4 Patient education on risk factors of stroke.**

The department does general health talks every morning any topic was discussed not necessarily on stroke and its risk factors however for diabetic patients, health education was done every day. As reported by one health care worker: *...“health talks are done every day to diabetic patients in their mini clinics,... and another health care worker noted...“There are no programmes for stroke, though the hospital has medical outreaches for diabetes, tuberculosis, but none has been done for stroke”*

However, when respondents when asked if the health care workers had sensitized them on the risk factors for stroke, they was varying degrees of the level of sensitization on behavioral risk factors as shown in figure 4.13. Majority 59 (89.2%) had been sensitized on regular body exercises (Figure 4.6)



**Figure 4.6 Sensitization areas among respondents**

#### **4.3.5 Stroke register**

The World health organization recommends a stroke register to be filled for each country (WHO, 2006) “...*The hospital does not have stroke register, nor a clinic specifically for stroke*”. As noted by one health worker.

#### **4.3.6 Availability of Medicine and CT scan**

Availability and affordability of medicine plays an important role in management of stroke. WHO recommends a CT scan to be done within 24 hours to all suspected stroke patients. Medicine availability at the facility was a challenge to most respondents as 9 (13.7%) were not taking medication daily because drugs were not available and another 13 % because drugs were not affordable.

And as one, healthcare worker noted:

*“...Some of the investigations ordered like CT scan the majority of the patients are not able to afford and some take long to do them”*. Only 35 (53%) of the respondents had their CT scan done within 24 hours, and 2 (3%) of the respondents CT scan was never done.

#### **4.3.7 Challenges faced by the healthcare workers;**

The health care workers were asked what challenges they faced in attending to stroke patients; Space and workload “...*majority of stroke patients use stretchers and wheelchairs, and space is not enough this affect flow of the patients, and then we are sharing clinic with the TB patients who are infectious...and the patients are many and we have no say in*

*bookings*. Also there was concerns by the health care workers in mixing of tuberculosis patients who are infectious with stroke patient.

Unhonoured budget and recommendations. The management is not honoring most of the recommendations forwarded by the health care workers as reported by one health care worker

*“...we present a budget and is not honored”*

## CHAPTER FIVE

### DISCUSSION

The main focus of the study was to describe the social determinants of stroke patients, using WHO Conceptual framework on social determinants of health. The framework asserts that the conditions in which a people are born, grow, live, work and age determines their health outcome. The policies in place also determine the care the patients will receive. The study looked at social demographic characteristics of stroke patients, their working and living environment, their biological and behavioral risk factors and finally health system related factors.

#### 5.1 Socio demographic characteristics

In this study, low level of education, low level of employment and low monthly household income were observed. This is comparable to other African countries, where in a systemic review of 19 studies conducted in 10 countries, up to 70% of stroke patients had low income background (Kengne et al, 2006). These findings are also similar to studies done in Pakistan (Qamar, 2011). Studies also done in developed countries like Germany and Britain, also found out that people from lower socioeconomic groups had a higher burden of stroke (Grube et al, 2012; National stroke strategy, 2007). Education is completed early in life and getting employment is partly due to educational achievements, employment determines ones income (Ahacic et al, 2012). The low level of education in this study has possibly contributed to the low level of employment among the study participants, leading to the low household monthly income, consequently leading to their health seeking behavior. As evidenced by some respondents missing taking medication because the drugs were expensive and some missing scheduled appointment because of financial constraints. Some respondents were also unable to receive all services due to finances as noted by one key informant “...we have many clients lost to follow up, due to inability to pay”. The disability due to stroke may also have contributed to the low employment among the respondents consequently leading to low monthly household income.

#### 5.2 Material Circumstances

In this study none of the respondents was being exposed to passive smoking in their places of work. This may be attributed to the enactment of the tobacco act of 2007, which stipulates that smokers to be smoking in designated smoking areas. The same cannot be said in the living environment where 6.1% of the study respondents were passive smokers. A half of the

respondents did not have facilities for physical activities in their places of residence. This may have contributed to the majority of respondents being physically inactive.

### **5.3 Biological /Physiological risk factors**

#### **Family history of stroke.**

In this study, 31.8% of the respondents said that their immediate family members had experienced stroke. Stroke has been shown to be caused by different genes whose individual effects are determined by certain environmental triggers (Norris & Hachinski, 2001). This study, however, did not look at the specific genetic disorders, which lead to damage of blood vessels in the brain, blocking blood flow.

#### **Sex**

The female respondents were more than the males (66.% vs. 33.3%), this finding concurs with a community based study in Harare where it was found that the women experienced stroke more than men with male: female ratio of 1:1.08 (Matenga, 1997). However, in other studies, stroke incidence were greater for men than women, with rates of about 25%-30% greater for men (Norris & Hachinski, 2001). In a study in five low and middle income countries, 45% of cases were women (Truelsen et al, 2007), which concurred with a study in Nairobi, Kenya (Jowi & Mativo, 2008), where males were more than females. In another study in Pakistan, 60.5% were male and 39.5% female (Qamar, 2011). These disparities can be attributed to females seeking health services more than males. Other studies have attributed the disparities to few age adjusted sex data for stroke and fatality rate in developing countries (Lloyd-sherlock, 2009)

#### **Age**

In this study majority of the respondents experienced first stroke below 60 years of age. This is similar to other studies in SSA where stroke occurs at 10-15 years earlier (Lemogoun et al, 2005). This study also concurs with other studies from SSA where the mean age of stroke was below 60 years (Kengne et al, 2006). In this study the mean age of experiencing stroke was 53.7yrs which is similar to a community based study in Zimbabwe where 51% were below 54 years (Matenga, 1997), this is much younger compared to a study in five low and middle income countries where the mean age was 64.2 years (Truelsen et al, 2004). while in a hospital study in Nairobi, the mean age of stroke was 61.3 years (Jowi & Mativo, 2008). In England 25% of stroke cases occur in people who are below 65 years (National Stroke

strategy, 2007). In this study, the youngest respondent experienced stroke at the age of 22 years and oldest at the age of 85 years. Similar studies in South Africa found out that black population face a substantially higher risk of stroke at younger ages than the white population (Connor et al., 2005). The earliest available local studies, showed that the mean age of experiencing stroke was 52 years and 54 years (Kwasa & Lore, 1990; Bahemuka, 1985). The early age occurrence of stroke in this study can be attributed to the low socioeconomic background and the health seeking behavior among the respondents, also much has not been done by the health system in terms of prevention of stroke in the country.

### **Hypertension**

In this study, hypertension was the most common risk factor found among stroke respondents at 78%. This figure is similar to a study in Nairobi hospital where hypertension was found in 80% of stroke patients (Jowi & Mativo, 2008), in South Africa, hypertension was found in 55% of the patients (Connor et al., 2005) and in Tanzania, two thirds of stroke patients who died had a history of hypertension (Walker et al, 2010). Elevated blood pressure has been shown to be a major determinant of stroke (Kengne, 2006).

### **Diabetes Mellitus Type II**

Only 9.1% of the respondents had diabetes mellitus and this finding is almost similar to 12% who were diabetic in a study in South Africa (Connor et al., 2005). This, however is contrary to what Jowi found in Nairobi hospital (Jowi & Mativo, 2008). It is not clear from the study why this was so. This calls for study to determine the prevalence of diabetes among stroke patients in the country.

## **5.4 Behavioral risk factors**

### **Smoking**

Although none of the respondents were current smokers, 18.2% had smoked in the past. A previous study in Kenyatta National Hospital showed 16.7% were smoking cigarettes. In Kenya, less than 1% of women smoke compared to 19% for males (KDHS, 2008) this is similar to this study finding, where majority of the people who smoked in the past were men. In a similar study in South Africa, 9% of stroke patients were found to be smoking cigarettes (Connor et al, 2005).

### **Harmful use of alcohol**

Only 4.5% of the respondents were consuming alcohol as at the time of the study and 10.6% had consumed alcohol in the past twelve months preceding the study. The study conducted in Kenyatta National Hospital about three decades ago found 19.4% of the respondents were taking alcohol. A study in South Africa showed that 20% of stroke patients were using alcohol (Connor et al., 2005) . This study did not look at the amount of alcohol consumed.

### **Inappropriate diet**

The consumption of fruits and vegetables was generally low among the respondents, as only 3% consumed the WHO recommendation of 5 portions of fruits and/or vegetables (Pomerleau et al, 2005). A majority of the respondents consumed red meat, cooked with salt added salt to food while eating. Higher intake of salt has been shown increase the risk of stroke (WHO, 2002), and stroke cases have been attributed to inappropriate diet (O'Donnell et al, 2010).

### **5.5 Health system related factors**

In this study finding, the health system was ill prepared to take care of patients as there was no stroke register in place nor a clinic specifically for stroke, the stroke patients were being seen in the general neurology clinic. According to the British Association of stroke Physicians, organized care of stroke patients save lives and reduces mortality (BASP, 2010). A majority of the respondents were paying cash. This finding is contrary to the WHO recommendation that governments should provide universal health coverage for the citizens. Irrespective of the source of financing for the health system selected, equitable prepayment and pooling at population level, and the avoidance at the point of delivery, of direct payments that result in financial catastrophe and impoverishment, are basic principles for achieving Universal health coverage (WHO, 2010). Although the hospital has a system of waiving the patients who were not able to afford, it worked better for inpatients as one health care worker noted, “...for the patients who are not able to pay, the hospital has a waiver system in place but this works more for inpatients , but for the ones who are on follow up at the clinic, they simply don't turn up.”

And another health worker noted,

*“...when investigations are ordered, majority of the patients are not able to afford and some take long to do them”*

Another healthcare worker noted, *“Among the patients referred to us for nutritional services, majority of them are not able to afford”*

Prevention of risk factors for stroke is key in reduction of incidences of stroke. The health system has not done enough in this area as noted by one health care worker. *“There is no institutional support to offer prevention in schools, colleges, universities, churches, work places and homes”*

### **Staffing**

The study found out that the hospital did not have enough qualified staff to run the clinic, as reported by one health care worker.

*“...The KNH consultants are very few, and it becomes difficult when the registrars are doing exams, the patients wait for long to be seen”* . The poor staffing also affected the booking as reported by another health care worker: *“the first booking for new referred patients is done after six months”*

### **Comprehensive services**

The health system did not adequately cater for needs of the stroke patients as only 51.6% received all the services and only 4.5 % had health care workers visiting them at their homes. Majority missed taking drugs mostly due to unavailability of the drugs in the hospital.

The study also found at that there were referral gaps in offering services to the patients, as one health care worker noted *“...you find a person has attended clinic for more than three times and has never been referred to a nutritionist.”*

Health education is important in control of stroke (Lemogoun et al, 2005) yet in this study the level of awareness of risk factors for stroke was different among the respondents, with some responses being less than 50%. Although the department does health talks in the mornings, topics discussed were general. One health care worker reported that; *“...for diabetic patients health talks are done every day.”* The hospital conducts outreaches, but none has been done for stroke. *...There are no programmes for stroke, though the hospital has medical outreaches for Diabetes, tuberculosis.”*



## **Stroke register**

The World health organization recommends a stroke register to be filled for each country (WHO, 2006), however, the hospital did not have stroke register, nor a clinic specifically for stroke”. Stroke incidences need to be recorded both in outpatient and in-patient set ups (Truelsens & Bonita, 2002).Germany has a national stroke register, with smaller registers in different cities for example Berlin stroke register which has several stroke units. The German stroke study group regulates and evaluates hospital performance (Grube et al, 2012)

Among the challenges faced by the health care workers, was space, “...majority of stroke patients use stretchers and wheelchairs, and space is not enough this affects flow of the patients, it is made worse by us sharing clinic with TB patients, majority of whom are infectious” the other challenge is workload,”... the patients are many and we have no say in bookings”

Another health care noted that their budget and recommendations were not honored, “...we make a budget and recommendations and are not honored”

WHO recommends that, all suspected stroke patients to have immediate CT scanning which allows rapid initiation of appropriate treatment (BASP, 2010). In this study only 53% of the respondents had their CT scan done within 24 hours.

It is prudent to do a national study on socio determinants of stroke in the country as hospital based study is not the ideal.

## **CHAPTER SIX**

### **CONCLUSIONS AND RECOMMENDATIONS**

#### **6.1 Conclusions**

The study comes up with the following conclusions:

1. The study findings reveal; more females experienced stroke, low level of education and low monthly household income among respondents.
2. The risk factors observed for stroke were, hypertension, diabetes mellitus, inappropriate diet, physical inactivity and smoking. Financial constraints was a major constraint for majority of the respondents as evidenced by the respondents healthcare seeking behavior such as missing clinics and drugs which have also been demonstrated in others studies in Africa.
3. The health system was ill prepared for management of stroke as evidenced by out of pocket payments, lack of a stroke register and stroke team in management of stroke, inadequate qualified staff. Risk factors were also not uniformly communicated to the respondents.

## **6.2 Recommendations**

The study recommends the following;

- a) Primary prevention of stroke is paramount, and therefore the Ministry of Health together with other stake holders should develop strategies and policies for prevention of modifiable risk factors for stroke. The strategy to include development of a national stroke register, stroke units and stroke team.
- b) The Ministry of Health, together with other sectors to develop appropriate policies to achieve universal health care, in order to avoid out of pocket payments.
- c) The Kenyatta National Hospital being a national referral hospital should have a stroke team, stroke register and stroke unit in place consisting of clinicians, nurses physiotherapists, occupational therapists, nutritionists, who actively participate in identification, patient education and management of stroke. The hospital should also make sure the drugs prescribed are available at the facility, CT scan is done within 24 hours to all suspected stroke patients and stroke patients should be separated from TB patients at the waiting bay.
- d) The study recommends policy makers to allocate more money for prevention of stroke and other NCDs.
- e) There is need to do similar studies at the household and community level on prevalence of risk factors for stroke and prevalence of stroke in the country.

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**APPENDIX 1: PATIENTS' QUESTIONNAIRE**

**Interviewer:**

**Participant's identification Number:**

**Social Demographic information**

1. Sex (*Record male or female as observed*)      male            female
2. How old are you? (*age in years*) -----
3. What is your marital status?
  - a. Single
  - b. Married
  - c. Divorced
  - d. Widowed
  - e. Separated
4. What is the highest level of education you have completed?
  - a) Primary school completed
  - b) Secondary school completed
  - c) Certificate/ diploma completed
  - d) University completed
  - e) No formal schooling
  - f) Less than primary
6. Which religious affiliation do you belong to?
  - a) Christian
  - b) Muslim
  - c) Hindu
  - d) Others
7. Which of the following best describes your main work over the past 12 months?
  - a) Government employee
  - b) Non government employee
  - c) Self employed
  - d) Student
  - e) Homemaker
  - f) Retired
  - g) Unemployed(able to work)
  - h) Unemployed( not able to work)

8. How many people older than 18 years, including yourself, live in your household? -----

9. Taking the past 12 months can you tell me the average monthly income?

a) Household -----

b) Individual -----

**Patient knowledge /health seeking behaviour and adherence**

1. What are you suffering from? (*if doesn't know confirm from patients' record*)

A .....(patient correct diagnosis)

b) Does not know.

2. At what age did you suffer from stroke? -----

3. Was this the first stroke? Yes  No

4. Do you suffer from any other chronic condition other than stroke?

Yes  No

5. If yes, which one? (*confirm from patient record*)

6. Are you on any of the following?

a) Tablets for Diabetes

b) Tablets for Hypertension

c) Tablets for stroke

d) None

7. How long are you going to take medication?

a) Until I run out

b) Until the next clinic

c) Until I feel better

d) Indefinitely

e) I don't Know

8. Do you take your medication daily? Yes  No

9. If no why?

a) Side effects

b) Drugs not available

c) Too many drugs

d) Drugs too expensive

e) The drugs don't seem to work

f) I felt the drugs made me feel better

g) Others specify



10. When you suffered stroke which of the following assessment was done to you?

- a) Seen by occupational therapist
- b) Seen by physiotherapist
- c) Seen by speech specialist
- d) Swallowing assessment
- e) None

11. Since you started attending clinic have you ever missed an appointment?

Yes  No

12. If yes how many times?

- a) 1
- b) 2
- c) 3
- d) 4
- e) More than 4

13. Why did you miss your appointment? \_\_\_\_\_

14. Have you been told about the following?

- a) Diet modification
- b) Alcohol consumption
- c) Cigarette smoking
- d) Body exercises
- e) Hypertension
- f) Diabetes

15. What challenges are you facing, from the time you suffered stroke? \_\_\_\_\_

16. Who is helping you in your day to day daily living activities?

17. What was your living situation prior to stroke?

- a) Independent at home
- b) Dependant at home
- c) Dependant on community facility

18. Have you ever seen a traditional healer for your stroke?

Yes  No

19. Are you taking any herbal or traditional remedy for your stroke?

Yes  No

20. Who else in your family as suffered stroke?

- a) Father
- b) Mother
- c) Grandfather
- d) Grandmother
- e) Brother
- f) sister

### Behavioural measurements

#### A. tobacco use

1. Do you currently smoke any tobacco product, such as cigarettes, cigars or pipes?( *If yes go to number 5*) yes  No
2. If no did you ever smoke in the past? Yes  No (*go to 10*)
3. If yes how old were you when you started smoking? -----
4. How long ago did you stop smoking? -----
5. If yes how many sticks per day? -----
6. How old were you when you first started smoking? -----
7. Who introduced you to smoking?
  - a) Family member
  - b) Friend
  - c) Neighbour
  - d) Others specify
8. Have you ever tried to quit smoking? Yes  No
9. During past 7 days, on how many days did someone in your home smoke when you were present? -----
10. During past 7 days, on how many days did someone smoke in closed areas in your workplace when you were present? -----

#### B. Alcohol consumption

11. Do you consume any alcoholic drink such as beer, wine, spirit, or local brew?

Yes (go to 13)  No

12. Have you consumed an alcoholic drink during the past 12 months?

Yes  No (*go to 16*)

13. During the past 12 months, how frequently have you had at least one alcoholic drink?

- a) Daily
- b) 5-6 days per week
- c) 1-4 days per week
- d) 1-3 days per month
- e) Less than once a month

14. Have you consumed an alcoholic drink within the past 30 days?

Yes  No

15. Have you ever tried to stop drinking?

Yes  No

### **C. Physical activity**

16. What activities form your work

- a) Carrying /lifting loads
- b) Digging/construction work
- c) Sitting or reclining
- d) Others specify

17. For how long do you carry out the activities in Q16

- a) Less than 15 minutes
- b) 15-20 min
- c) 20-30 min
- d) More than 30 min

18. How many times do you carry out activities in question 16 above in a week?

- a) Daily
- b) Less than 3 days
- c) More than 3 days

19. How do you get to your work station?

- a) Walking
- b) Cycling
- c) Motor vehicle

20. For how long do you walk or cycle to you workplace?

- a) Less than 10min
- b) 10-20min
- c) More than 20min

21. Where you stay, do you have places for doing physical exercise if you wanted to?

Yes  No

**D. Diet**

22. In a typical week how many times do you eat a fruit?

- a) Daily
- b) 1-4 days per week
- c) 5-6 days per week

23. How many servings of fruits do you eat on one of those days

- a) Number of servings
- b) Don't know

24. In atypical week how many times do you take vegetables?

- a) Daily
- b) 1-4 days per week
- c) 5-6 days per week

25. How many servings of vegetables do you eat on one of those days?

- a) Number of servings
- b) Don't know

26. How often do you take red meat?

- a) Daily
- b) 3 times per week
- c) Monthly
- d) none

27. Do you cook with salt? Yes  No

28. Do you add salt to your food when you are eating? Yes

29. What type of oil is used for meal preparation in your household?

- a) Vegetable oil
- b) Lard or suet
- c) Butter or ghee
- d) None used
- e) Don't know

30. On average, how many meals per week, that you eat that were not prepared at home?  
(by meal, I mean, breakfast lunch and dinner)

**Health system related factors**

1. Did you pay for the services? Yes  No
2. Which mode of payment did you use? A. Cash b. Insurance c. other
3. Which department were you admitted when you first suffered stroke?
  - a) Intensive care unit
  - b) Medical ward
  - c) Neurosurgical ward
  - d) Others (specify)
4. When you suffered stroke was CT scan done?  
Yes  No
5. If yes how long after suffering from stroke was it done?
  - a) Within 24 hours
  - b) After 24 hours
  - c) Can't remember
6. Are you receiving all the services? Yes  No
7. If no, which services are missing?
8. Are community health workers visiting you at your home? A. Yes b. No

## KIAMBATANISHO 1: DODOSO YA WAGONJWA

**Mhojaji:**

**Namba ya anayeshiriki:**

**Habari Za Kijaamii Kuhusu Muhojiwa**

1. Jinsia (andika kiume ama kike ulivyo mwona)      mme       muke

2. Una miaka mingapi? (*umri kwa miaka*).....

3. Hali yako ya ndoa ni ipi?

a. Hujaolewa/kuoa

b. Olewa/oa

c. Talaka

d. Mjane

e. Tengana

4. Nikiwango kipi cha juu cha elimu umefika?

a. Umemaliza shule ya msingi

b. Umemaliza shile ya upili

c. Umemaliza masomo ya stahada

d. Umemaliza chuo kikuu

e. Hauna elimu rasmi

f. Chini ya shule ya msingi

5. Wewe ni muumini wa dhini gani?

a. Mkristo

b. Muislamu

c. Muhindu

d. Nyinginezo

6. Ni ipi kati ya zifuatazo inaelezea bora kuhusu ajira yako kuu kwa miezi kumi na mbili iliyopita?

a. Umejiriwa na serikali

b. Umejiriwa na shirika lisilo la kiserikali

c. Umejiajiri

d. Mwanafunzi

e. Mtumishi wa nyumbani

f. Umestaafu

g. Huna ajira (ila una uwezo wa kufanya kazi)

h. Huna ajira (na huna uwezo wakufanya kazi)

7. Ni jamaa wako wangapi wenye umri wa miaka 18, pamoja nawe, wanaoishi nyumbani mwako? \_\_\_\_\_

8. Kwa miezi 12 iliyopita waweza nambia kipato chako cha mwezi kwa wastani?

a. Katika nyumba yako \_\_\_\_\_

b. Mtu binafsi \_\_\_\_\_

**Maarifa ya mgonjwa kuhusu mahitaji ya kiafya na kufuatilia matibabu?**

1. Unaugua na nini?

a)

b) sijui

2. Uliugua kiharusi ulipokua wa umri gani? \_\_\_\_\_

3. Ilikuwa mara yako ya kwanza kuugua kiharusi? ndio  la

4. Unaugua ugonjwa mwingine sugu kuliko kiharusi? Ndio  la

5. Kama ndio, ni upi? (*hakikisha kutoka kwa rekodi ya mgonjwa*)

6. Je, unatumia dawa yeyote kwa hizi zifuatazo?

a. Tembe za kisukari

b. Tembe za shinikizo la damu

c. Tembe za kiharusi

d. Hamna

7. Utakua kwa matibabu kwa muda gani?

a. Mpaka nichoke

b. Mpaka kliniki ijayo

c. Mpaka nijihisi nafuu

d. Sijui

8. Je, wewe hukunywa dawa zako kila siku? Ndio  la

9. Kama la mbona?

a. Mathara ya tembe

b. Dawa haziko

c. Dawa nyingi

d. Dawa ni za gharama kubwa

e. Dawa zinakaa hazifanyi kazi

f. Nilihisi dawa zilinipa nafuu

g. Zinginezo zitaje

10. Ulipouugua kiharusi ulikaguliwa kiviipi?

a) Nilikaguliwa na mtaalamu wa kazi viongo vya mwili

b) Nilikaguliwa na mtaalamu wa mazoezi

c) Nilikaguliwa na mtaalamu wa kuongea

d) Nilikaguliwa na mtaalamu wa kumeza

e) Hakuna

11. Tangu uanze kujia huduma ya kliniki ushawahi kukosa kliniki?

Ndio  La



12. Kama ndio ni mara ngapi?

- a) 1
- b) 2
- c) 3
- d) 4
- e) Zaidi ya mara 4

13. Mbona ulikosa kliniki? \_\_\_\_\_

14. Ushawahi ambiwa kuhusu mambo yafuatayo?

- a) Kula chakula maalumu
- b) Unywaji wa pombe
- c) Uvutaji wa sigara
- d) Mazoezi ya mwili
- e) Shinikizo la damu
- f) Kisukari

15. Ni changamoto zipi unazokumbana nazo, tangu ulipougua kiharusi?

\_\_\_\_\_

16. Nani hukusaidia kwa shughuli zako za kila siku?

17. Hali yako ya maisha ilikuaje kabla ya kuuugua kisukari?

- a) kujitegemea nyumbani
- b) Mtegemezi nyumbani
- c) Msaada wa jamii

18. Ushawahi mwona daktari wa kienyeji kwa kiharusi chako?

Ndio  la

19. Je, unatumia dawa zozote za miti shamba ama matibabu ya kienyeji dhidi ya kiharusi?

Ndio  La

20. Nani mwingine katika familia yako ameugua ugonjwa wa kiharusi?

- a) Baba
- b) Mama
- c) Babu
- d) Nyanya

- e) Kaka
- f) Dada
- g) Hamna

### Kipimo cha Tabia

#### A. Matumizi Ya Tumbaku

1. Kwa sasa unatumia bidhaa zozote zile kutoka kwa tumbaku, kama sigara, biri ama kiko? (*kama ndio neda namba 5*) ndio  la
2. Kama la, ushawahi vuta sigara hapo awali? Ndio  la
3. Kama ndio, ulikua na umri upi ulipoanza kuvuta sigara? \_\_\_\_\_
4. Ni lini uliacha uvutaji wa sigara? \_\_\_\_\_
5. Kama ndio, wewe huvuta sigara ngapi kwa siku? .....
6. Ulikua na umri upi ulipoanza kuvuta sigara? .....
7. Nani alikufundisha uvutaji wa sigara?
  - a) Mmoja wa familia
  - b) Rafiki
  - c) Jirani
  - d) Wengineo wataje
8. Ushawahi jaribu kuacha kuvuta sigara? Ndio  la
9. Kwa muda wa siku 7 zilizopita, ni siku ngapi mtu yeyote ashawahi vuta sigara nyumbani mbele yako? \_\_\_\_\_
10. Kwa muda wa siku 7 zilizopita ni siku ngapi mtu yeyote amevuta sigara kwa maeneo yaliyofungwa kazini ukiwepo? \_\_\_\_\_

#### B. Unywaji wa pombe

11. Je, wewe hutumia kileo chochote kile, kama bia, pombekali ama pombe haramu? Ndio (*nenda 13*)  la
12. Ushawahi tumia kileo chochote kile kwa miezi kumi na mbili iliyopita?
 

Ndio  la (*nenda 16*)
13. Kwa wakati wa miezi 12 iliyopita, ni mara ngapi ushakunywa angalau kileo kimoja?
  - a) Kila siku
  - b) Siku 5-6 kwa wiki
  - c) Siku 1-4 kwa wiki
  - d) Siku 1-3 kwa wiki

e) Chini ya mara moja kwa mwezi

14. Ushawahi tumia kinywaji chochote kwa siku 30 zilizopita?

Ndio  la

15. Ushawahi jaribu kuacha kunywa pombe?

Ndio  la

### C. Mazoezi

16. Ni shuguli gani huunda ajira yako?

a) Kubeba/kuondoa mizigo

b) Kulima/kazi ya mjengo

c) Kuketi/kutofanya kazi

d) Zinginezo zitaje

17. Kwa muda gani wewe hufanya shughuli zako kutokana na swali 16?

a) Chini ya dakika 15

b) Kwa dakika 15-20

c) Kwa dakika 20-30

d) Zaidi ya dakika 30

18. Ni mara ngapi wewe hufanya shughuli zako kwa wiki kutokana na swali 16?

a) Kila siku

b) Chini ya siku 3

c) Zaidi ya siku 3

19. Wewe hufikaje kazini?

a) Kwa kutembea

b) Kwa kutumia baisikeli

c) Kwa kutumia gari

20. Wewe hutumia muda kiasi gani kufika kazini?

a) Chini ya dakika 10

b) Kwa dakika 10-20

c) Zaidi ya dakika 10-20

21. Unapoishi, mna sehemu ya kufanya mazoezi ya mwili iwapo unataka?

Ndio  la

#### D. Chakula

22. Katika wiki ya kawaida, wewe hula matunda mara ngapi?
- a) Kila siku
- b) Siku 1-4 kwa wiki
- c) Siku 5-6 kwa wiki
23. Ni reshini ngapi za matunda wewe hula kati ya siku hizo?
- a) Reshini \_\_\_\_\_
- b) Sijui
24. Kwa wiki ya kawaida ni mara ngapi wewe hula mboga?
- a) Kila siku
- b) Siku 1-4 kwa wiki
- c) Siku 5-6 kwa wiki
25. Ni reshini ngapi za mboga wewe hula kwa siku hizo?
- a) Reshini \_\_\_\_\_
- b) Sijui
26. Ni mara ngapi wewe hula nyama nyekundu?
- a) Kila siku
- b) Mara 3 kwa wiki
- c) Kila mwezi
- d) Hakuna
27. Je, wewe hutumia chumvi kupikia? Ndio  la
28. Je, wewe huongeza chumvi ulapo? Ndio  la
29. Ni aina gani ya mafuta ya kupika wewe hutumia nyumbani kwa mapishi?
- a) Mafuta ya mboga
- b) Mafuta ya nguruwe
- c) Siagi ama samli
- d) Sijawahi tumia mafuta
- e) Sijui
30. Kwa wastani ni vyakula vingapi kwa wiki, wewe hula ambavyo havijatayarishwa nyumbani? (mankuli, namaanisha, kiamsha kinywa, chakula cha mchana, chakula cha jioni) \_\_\_\_\_

### Mfumo wa afya

1. Ulilipia huduma uliyopewa? Ndio  la
2. Ulitumia njia ipi kulipia huduma uliyopewa? A. pesa taslimu B. Bima C. njia nyingine
3. Ni idara ipi iliyokuhudumia wakati uliugua kiharusi kwa mara ya kwanza?
  - a) Wodi ya wagonjwa mahututi(ICU)
  - b) Wodi ya matibabu (medical)
  - c) Idara ya wagonjwa wenye shida ya kuhisi mwilini
  - d) Zinginezo zitaje
4. Ulipougua kiharusi, je, ulipigwa picha ya kichwa (skani ya kichwa)?  
Ndio  la
5. Kama ndio, ulichukua muda gani baada ya kuungua kiharusi ulipigwa picha ya kichwa (CT skani)?
  - a) Muda wa masaa 24
  - b) Baada ya masaa24
  - c) Sikumbuki
6. Je, unapokea huduma yote? Ndio  la
7. Kama la, unakosa huduma zipi? \_\_\_\_\_
8. Je, wafanya kazi wa afya ya jamii hukutembelea nyumbani?

## **APPENDIX 2 PARTICIPANT INFORMED CONSENT EXPLANATION AND FORM.**

I, Dr Jackline Kerubo Gichana, of the School of Public Health, University of Nairobi is conducting a study on Social determinants of stroke among stroke patients attending medical outpatient clinic at Kenyatta National Hospital. I am requesting you, to be in the research study. The purpose of this consent form is to give you the information you will need, to help you decide whether to be in the study or not. You may ask any questions about the research, possible risks and benefits, your rights as a volunteer and anything else. When you finish you can decide if you want to be in the study or not. This process is called 'informed consent' we will give you a copy for your own records.

### **Purpose and benefits**

The purpose of the study is to get information on social determinants of stroke. The study will last approximately three months, we shall talk to you once, but you are welcome to come back anytime if you have additional questions. You may not directly benefit from taking part in this study but the information will help health managers on the issues related to stroke in this country.

### **Procedures**

The study will involve screening to see if you can participate or not. This will be followed by an interview using a questionnaire. Participation in this survey is voluntary and you can choose not to answer any individual question or all the questions we hope that you can participate in this study, since your views are very important. We shall not take any blood, urine or any sample from you.

### **Risks stress or discomfort**

We shall be asking you sensitive information about yourself and medication. This may be uncomfortable for you.

### **Confidentiality**

The information collected will be kept in a secure place, only people involved with the study will have access to the information. The information you will give will be treated as private and confidential. Your name will not appear in any of the papers or documents related to the research. You may refuse to participate or stop answering questions at any time during the

study without penalty. In case you refuse to participate, you will not be denied services in this facility and you will continue to receive care. You will not be paid any money to participate in this study.

**Contact**

If you have questions about my rights as a research subject, I can call the Kenyatta National Hospital/University of Nairobi Ethics committee telephone 0202726300.Or the principal investigator Dr Jackline Kerubo Gichana mobile number 0724087901

**Declaration**

The purpose of the study had been explained to me. I volunteer to take part in this research. I had a chance to ask questions. I give my permission to the researchers to use my medical records as described in this consent form. I will receive a copy of this consent form.

Printed name of researcher.....

Signature.....

Date.....

Subjects' statement

Printed name of subject.....

Signature/thumb print of subject.....

Date.....

Printed name of research assistant.....

Signature.....

Date.....

## **Kiambatisho 2; Maelezo ya makubaliano na fomu**

Mimi , Jacklin Kerubo Gichana , wa Shule ya Afya ya Umma, Chuo Kikuu cha Nairobi nafanya utafiti juu ya wagonjwa wa kiharusi wanaonekana katika Hospitali ya Taifa ya Kenyatta. Mimi naomba wewe kuwa katika utafiti . Madhumuni ya fomu hii ya idhini ni kukupa maelezo unahitaji, kwa kukusaidia wewe kuamua kama utakuwa katika utafiti huu au la. Unaweza kuuliza maswali yoyote kuhusu utafiti, hatari, na faida, haki yako kama kujitolea na kitu kingine chochote. Baada ya kumaliza unaweza kuamua kama unataka kuwa katika utafiti au la. Utaratibu huu unaitwa makubaliano nitakupa nakala kwa rekodi yako mwenyewe.

### **Madhumuni na faida**

Madhumuni ya utafiti ni kupata taarifa juu ya wagonjwa wa kiharusi . Utafiti utachukua muda wa miezi mitatu , nitazungumza na wewe mara mara moja , lakini mnakaribishwa kuja wakati wowote kama una maswali ya ziada. Unaeza usifaidike moja kwa moja katika utafiti huu lakini habari utatupatia itasaidia wasimamizi wa afya na masuala yanayohusiana na kiharusi katika nchi hii.

### **Taratibu**

Uchunguzi utafanywa kuona kama unaweza kushiriki au la. Hii itafuatiwa na mahojiano kwa kutumia dodoso. Kushiriki katika utafiti huu ni kwa hiari na unaweza kuamua kutojibu swali lolote la kibinafsi au maswali yote, ni matumaini yangu kwamba unaweza kushiriki katika utafiti huu, jinsi maoni yako ni muhimu sana . Hatutachukua damu yoyote, au mkojo kutoka kwako.

### **Hatari au usumbufu**

Tutauliza habari nyeti kuhusu wewe na dawa. Hii inaweza kuwa na usumbufu kwako.

### **Siri**

Taarifa tutakusanywa itafunguwa, na watu wanaohusika na utafiti pekee ndio wanaruhusiwa kuangalia. Habari utatoa itakua binafsi na ya siri. Jina lako lako halitaandikwa kwa makaratasi yeyote yanahuusiana na utafiti. Unaweza kukataa kushiriki au kuacha kujibu maswali wakati wowote katika utafiti bila adhabu Ukikataa kushiriki , hutakataliwa huduma



katika hospitali hii, na wewe utaendelea kupata huduma . Ukulipwa fedha yoyote ya kushiriki katika utafiti huu.

**Kuwasiliana**

Kama nina maswali kuhusu haki yangu kama mshiriki kwa utafiti huu, naweza, kupiga simu, Hospitali kuu ya Kenyatta/ Chuo Kikuu cha Nairobi Kamati ya Maadili kwa namba 0202726300.Or mpelelezi mkuu Dk Jacklin Kerubo Gichana simu ya mkononi 0724087901

**Azimio**

Nimeelezwa madhumuni ya utafiti. Mimi najitolea kushiriki katika utafiti huu. Mimi nilikuwa na nafasi ya kuuliza maswali . Mimi natoa idhini yangu kwa Watafiti kutumia rekodo zangu za kiafya kama ilivyoelezwa katika fomu hii ya idhini . Mimi nitapewa nakala ya fomu hii ya idhini .

Jina la mtafiti \_\_\_\_\_

Sahihi \_\_\_\_\_

Tarehe \_\_\_\_\_

Mshiriki

Jina la mshiriki \_\_\_\_\_

Sahihi / alama ya kidole \_\_\_\_\_

Tarehe \_\_\_\_\_

Jina la Msaidizi wa utafiti \_\_\_\_\_

Sahihi \_\_\_\_\_

Tarehe \_\_\_\_\_

**Appendix 3: CONSENT FORM FOR HEALTH CARE WORKER**

My name is Dr. Jackline Kerubo Gichana, of the school of Public Health, University of Nairobi and I am conducting a study on social determinants of stroke among stroke patients seen at Kenyatta National Hospital. I have been granted permission to conduct the study by Kenyatta National Hospital/University of Nairobi Ethics Committee. If you agree to participate, you will be taken through a questionnaire that will take less than ten minutes. I guarantee confidentiality of your answers. This study does not have any physical harm and the results will assist in formulating interventions that will help in reducing the burden of stroke.

All information you will give is confidential and is for study purposes only. You may refuse to participate, or withdraw at any point during the interview. You may ask any questions before signing the consent form or at any time during the interview. Participation is voluntary but I will request if you could sign for me consent.

Signature .....

Date.....

If you have any questions you can call the principal investigator Jackline Kerubo Gichana on 0724087901 or the Kenyatta National Hospital/university of Nairobi Ethics Committee on telephone 0202726300.

#### **APPENDIX 4: Key Informants Guide**

The key informants will be the heads of various cadres working in the clinic that is in charge of (physicians registrars, nurses, nutritionists).

1. Do you have enough qualified personnel to run this clinic?
2. Do you give health education to the clients regarding stroke and risk factors?
3. For the patients who are engaged in high risk behaviours like smoking. Harmful use of alcohol, physical in activities and inappropriate diet what programmes do you have for them?
4. Do you go for outreaches in the communities and schools to talk about stroke and risk factors?
5. How do patients pay for the services? Are patients able to afford the services you are offering? What happens if patients are not able to afford some or any of the services you are offering?
6. Are all investigations/medication available here? If no what arrangements do you have for the patients?
7. Do you have a stroke unit?
8. Which health care workers are involved in the care of stroke patients?
9. Do you have a stroke register?
10. Do you hold regular meetings with the staff involved in the care of stroke patients? If yes what do you discuss in the meetings?
11. What challenges are you facing?

**APPENDIX 5: KNH STUDY REGISTRATION CERTIFICATE**

KNH/R&P/FORM/01



**KENYATTA NATIONAL HOSPITAL**  
P.O. Box 20723-00202 Nairobi

Tel.: 2726300/2726450/2726565  
Research & Programs: Ext. 44705  
Fax: 2725272  
Email: [knhresearch@gmail.com](mailto:knhresearch@gmail.com)

**Study Registration Certificate**

1. Name of the Principle Investigator/Researcher  
Dr. JACKLINE KERUBO GICHANA
2. Email address: gichanajk@yahoo.com Tel No. 0724087901
3. Contact person (if different from PI)..... -
4. Email address: ..... - Tel No. .... -
5. Study Title  
SOCIAL DETERMINANTS OF STROKE AMONG PATIENTS ATTENDING MEDICAL OUTPATIENT CLINIC AT KENYATTA NATIONAL HOSPITAL
6. Department where the study will be conducted MEDICAL OUTPATIENT CLINIC (NO-17)  
 (Please attach copy of Abstract)
7. Endorsed by Research Coordinator of the Department where the study will be conducted.  
 Name: ..... Signature ..... Date.....
8. Endorsed by H.O.D. Medicine where study will be conducted.  
 Name: Dr. WK Sigala Signature: [Signature] Date: 6.10.14
9. KNH UoN Ethics Research Committee approval number P235/04/2014  
 (Please attach copy of ERC approval)
10. I JACKLINE KERUBO GICHANA commit to submit a report of my study findings to the Department where the study will be conducted and to the Department of Research and Programs.  
 Signature: [Signature] Date: 7/10/14
11. Study Registration number (Dept/Number/Year) MEDICINE/023/2014  
 (To be completed by Research and Programs Department)
12. Research and Program Stamp

All studies conducted at Kenyatta National Hospital **must** be registered with the Department of Research and Programs and investigators **must commit** to share results with the hospital.



## APPENDIX 6: UON/KNH- ERC LETTER OF APPROVAL FOR THE STUDY



UNIVERSITY OF NAIROBI  
COLLEGE OF HEALTH SCIENCES  
P O BOX 19676 Code 00202  
Telegrams: varsity  
(254-020) 2726300 Ext 44355



KNH/UON-ERC  
Email: uonknh\_erc@uonbi.ac.ke  
Website: www.uonbi.ac.ke



KENYATTA NATIONAL HOSPITAL  
P O BOX 20723 Code 00202  
Tel: 726300-9  
Fax: 725272  
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/327

Link: [www.uonbi.ac.ke/activities/KNHUoN](http://www.uonbi.ac.ke/activities/KNHUoN)

29th September 2014

Jackline Kerubo Gichana  
School of Public Health  
College of Health Sciences  
University of Nairobi

Dear Jackline

**RESEARCH PROPOSAL: SOCIAL DETERMINANTS OF STROKE AMONG STROKE PATIENTS ATTENDING MEDICAL OUTPATIENT CLINIC AT KENYATTA NATIONAL HOSPITAL (P235/04/2014)**

This is to inform you that the KNH/UoN-Ethics & Research Committee (KNH/UoN-ERC) has reviewed and **approved** your above proposal. The approval periods are 29<sup>th</sup> September 2014 to 28<sup>th</sup> September 2015.

This approval is subject to compliance with the following requirements:

- a) Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- b) All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH/UoN ERC before implementation.
- c) Death and life threatening problems and severe adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH/UoN ERC within 72 hours of notification.
- d) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH/UoN ERC within 72 hours.
- e) Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. *(Attach a comprehensive progress report to support the renewal).*
- f) Clearance for export of biological specimens must be obtained from KNH/UoN-Ethics & Research Committee for each batch of shipment.
- g) Submission of an *executive summary* report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/or plagiarism.

For more details consult the KNH/UoN ERC website [www.uonbi.ac.ke/activities/KNHUoN](http://www.uonbi.ac.ke/activities/KNHUoN).

Protect to Discover

## APPENDIX 7: APPROVAL TO CONDUCT A STUDY AT KNH MEDICAL OUTPATIENT CLINIC



KENYATTA NATIONAL HOSPITAL  
P. O. Box 20723, 00202 Nairobi

Tel: 2726300/2726450/2726550  
Fax: 2725272  
Email: [knhadmin@knh.or.ke](mailto:knhadmin@knh.or.ke)

Ref: KNH/SAD-MED/42B/VOL.I/66

Date: 6<sup>th</sup> October, 2014

Jackline Kerubo Gichana  
School of Public Health  
College of Health Sciences  
UNIVERSITY OF NAIROBI.

### RE:APPROVAL TO CONDUCT A STUDY AT THE KNH MEDICAL OUTPATIENT CLINIC

Following approval of your study by the KNH/UoN ERC and completion of the KNH study registration form, permission is hereby granted for you to collect data from the KNH Medical Outpatient Clinic to enable you complete your study on "*Social determinants of stroke among patients attending medical outpatient clinic*" at *Kenyatta National Hospital, Nairobi County, Kenya.*

Kindly liaise with the Senior Nursing Officer Incharge of Medical Outpatient Clinic (MOPC) for facilitation. By a copy of this letter, the SNO incharge of MOPC is informed and requested to facilitate.

DR. W.K. SIGILAI  
AD - MEDICINE

Copy to: SNO Incharge , MOPC  
KNH

*Vision: A world class patient-centered specialized care hospital*



ISO 9001: 2008 CERTIFIED