

# KENYA STEPwise SURVEY FOR NON COMMUNICABLE DISEASES RISK FACTORS 2015 REPORT



Ministry of Health

DIVISION OF NON-COMMUNICABLE DISEASES



WORLD HEALTH ORGANIZATION

**KENYA STEPwise SURVEY  
FOR NON COMMUNICABLE DISEASES  
RISK FACTORS 2015 REPORT**



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## List of Acronyms and Abbreviations

BMI	Body Mass Index
CI	Confidence Interval
CVD	Cardiovascular Diseases
DM	Diabetes Mellitus
GATS	Global Adult Tobacco Survey
EA	Enumeration Areas
FELTP	Field Epidemiology and laboratory training Program
FCTC	Framework Convention on Tobacco Control
HDL	High-density lipoprotein
KEMRI	Kenya Medical Research Institute
KNBS	Kenya National Bureau of Statistics
MOH	Ministry of Health
NCD	Non Communicable Diseases
NASSEP	National Sample Survey and Evaluation Programme
NTSA	National Transport and Safety Authority
OOP	Out-of-pocket
OTC	Over the Counter
PDA	Personal Digital Assistant
PPS	Probability Proportional to Size
RTI	Road Traffic Injury
SHS	Second Hand Smoke
TCA	Tobacco Control Act
VIA	Visual Inspection with Acetic Acid
VILI	Visual inspection with Lugol's Iodin
WHO	World Health Organization

## Foreword

This report presents the findings of the Kenya STEPwise survey for non communicable diseases (NCD) risk factors 2015. The Kenya STEPs survey is the first nationally representative survey to collect comprehensive information on risk factors for NCDs and Injuries.

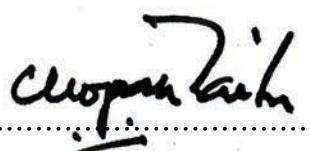
Kenya is experiencing an epidemiological transition in its diseases burden from infectious to non-communicable conditions resulting in a double burden of disease. Non communicable diseases are a major public health concern with significant social and economic implications in terms of health care-needs, lost productivity and premature death. NCDs are thus a serious setback to our attainment of social, health and economic targets if no proper interventions are put in place. This report provides the very essential information to inform policy geared towards halting and reversing this burden of non-communicable diseases.

The report gives a brief of the burden of NCD both globally and in Kenya. The report includes statistics on NCD risk factors, injuries and oral health among adults age 18-69, which will serve as an evidence base to strengthen NCD prevention and control initiatives in the country. It will also serve as an authoritative reference source for policymakers, stakeholders, public health professionals, and others concerned with NCD control in Kenya.

Implementing the Kenya STEPS survey required wide stakeholder engagement, in-depth literature review and dedication from the technical working group that undertook the planning and implementation phases of the survey. The hard work and determination of the STEPS field teams additionally allowed this vital activity to run smoothly to completion. We owe each of them our sincere appreciation.

The Ministry of Health is grateful to the World Health Organization (WHO) for the technical assistance. We are equally grateful for the generous funding from World Bank, CDC and the WHO that enabled us to complete this important activity. The technical expertise given by the Kenya National Bureau of Statistics was very key for this survey and is appreciated.

The STEP survey results demonstrate the big challenge that NCDs present to our nation and both the strengths and challenges of Kenya's response to NCD, Injuries and Oral Health. In line with the multi-sectoral nature of the NCD determinants, I call on all state and non-state actors to partner with the ministry of health to embrace this report as a call to action and lend us their support towards halting and reversing the burden of Non communicable diseases.



Dr. Cleopa Mailu EBS  
Cabinet Secretary  
Ministry of health

## Preface

Non communicable diseases (NCDs) are a major public health concern with significant social and economic implications in terms of health care needs, lost productivity and premature death. NCDs are thus a serious setback to our attainment of social, health and economic targets.

The WHO STEPwise approach to surveillance of NCD risk factors (STEPS) survey is part of a global surveillance strategy in response to the growing need for country level trends in non communicable diseases and injuries. The aim of this survey is to establish an NCD surveillance platform that collects baseline indicators on determinants of NCD and their risk factors for policy and planning purposes.

The report should be used as a resource to inform the process of planning and policy formulation as well as a monitoring and evaluation tool for NCDs. STEPs Kenya 2015 is fundamentally important as it will provide baseline information which will be used to evaluate future NCD and Injuries prevention and control initiatives.

The Kenya STEPS survey is part of our efforts to address the increasing burden of the NCD epidemic affecting the nation. It marks an increased commitment by the Ministry of Health to tackle the NCD and Injuries challenge and will serve us well in the further development, monitoring and evaluation of effective health policies and programs appropriate to our context, and to our ongoing efforts in NCD risk factor and injuries surveillance.

Because of the multi-factorial nature of NCDs and their determinants, prevention and control strategies need the partnership and engagement of multi-sectoral stakeholders outside the health sector, including relevant government ministries, NGOs, private sector and the community. This report contains actions points for various players that require commitment towards policy development, program implementation, resource mobilization, Monitoring and evaluation.

Finally, this report provides an opportunity to realize the growing burden of NCDs and Injuries whose understanding is a key ingredient towards achieving our national development targets and the Sustainable Development Goal (SDG) 3.4 ‘By 2030 to reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being’.



.....  
Dr. Nicholas Muraguri  
Principal Secretary  
Ministry of Health

# Executive Summary

The Kenya STEPs 2015 is the first nationally representative survey to collect comprehensive information on risk factors for NCDs, Injuries and oral health in adults' age 18 - 69 years. The aim of the survey was to establish an NCD surveillance platform that collects baseline indicators on determinants of NCD and their risk factors for policy and planning purposes.

The key objectives of the NCD STEPS survey were:

- a) To determine the prevalence and determinants for the four major behavioral risk factors for NCDs in Kenya: tobacco use, harmful use of alcohol, unhealthy diets, and physical inactivity.
- b) To determine the prevalence and determinants for the four key biological risk factors for NCDs in Kenya: overweight and obesity, raised blood pressure, raised blood glucose and abnormal blood lipids
- c) To determine the prevalence and determinants of unintentional injuries in Kenya.
- d) To determine the prevalence and determinants of oral diseases in Kenya
- e) To investigate potential links between different risk factors and determinants of health (socio-economical status, demographic factors, gender, age)

## KENYA STEPS SURVEY 2015 FINDINGS:

### Behavioral Risk factors –STEP 1:

Within STEP 1 of the survey, Socio demographic and behavioral information on age, sex, marital status, education, occupation, housing and social amenities were collected. Behavioral Information regarding Tobacco Use, Alcohol Consumption, Diet, Physical Activity, History of Raised Blood Pressure, History of Diabetes, History of Raised Total Cholesterol, History of Cardiovascular Diseases, Lifestyle Advice, History of Diabetes, Cervical Cancer Screening, Injury and Oral health were also collected.

Thirteen percent of Kenyans currently consume some form of tobacco products with a significantly higher prevalence among men (23.0 percent) than women (4.1 percent). The percentage of Kenyans who are currently using smoked tobacco products that includes manufactured cigarettes, hand rolled cigarettes, pipes and shisha is 10.1 percent. Eight percent of Kenyans are daily tobacco smokers with the mean number of manufactured cigarettes smoked per day being seven sticks per smoker. Current use of smokeless tobacco was reported in 3.6 percent of Kenyans. Twenty four percent and 20.9 percent of Kenyans are exposed to second hand smoke at home and work respectively.

Approximately, 19.3 percent of Kenyans currently drink alcohol with 13 percent of these consuming alcohol on a daily basis. However, three in five Kenyans are lifetime abstainers with the percentage of abstinence among women being nearly twice that among men. Heavy episodic drinking defined as drinking six or more drinks on a single occasion was reported by 12.7 percent of Kenyans. The overall mean number of standard drinks per drinking occasion is 9.7 standard drinks with no significant difference between the sexes. Approximately 17 percent of former drinkers had stopped drinking due to health reasons in the past 12 months. Consumption of unrecorded alcohol (alcoholic drink alcohol that is homebrewed alcohol (excluding changaa, busaa or muratina) or any alcohol not intended for drinking was reported by 35.5 percent of adults.

Fruit is consumed on average on 2.5 days a week and vegetables on 5.0 days a week among Kenyans. The World Health Organization (WHO) recommends at least 5 servings of fruits and vegetables a day. The survey results thus show that 94.0 percent of Kenyans are consuming less than 5 servings of fruits and vegetables per day.

Nearly a quarter (23.2 percent) of Kenyans always add salt often before eating or when eating and a further 4.3 percent admitted to always or often consume processed food high in salt.

Twenty eight percent of Kenyans always add sugar to beverages. Majority of Kenyans use vegetable oil (59.1 percent) for cooking, compared to 38.5 percent who use vegetable fat.

Overall, 6.5 percent of Kenyans do not engage in the recommended amount physical activity. WHO recommends that adults aged 18–64 years should do at least 150 minutes of moderate-intensity physical activity throughout the week, or do at least 75 minutes of vigorous-intensity physical activity throughout the week. The median minutes of total physical activity per day is 263. It was established that 68.6 percent of total physical activity is work-related, 26.1 percent transport-related and 5.4 percent recreation-related. 26.1.

More than half (56 percent) of Kenyans have never been measured for raised blood pressure. Among those who reported to have been previously diagnosed with hypertension, only 22.3 percent were currently on medication prescribed by a health worker. Overall, 87.8 percent of Kenyans had never been measured for raised blood sugar and among those diagnosed with elevated blood sugar, less than half (40.1 percent) were currently taking medication. Majority of Kenyans (97.7 percent) have never been measured for cholesterol levels with only 13.3 percent of respondents who reported to have been diagnosed with elevated cholesterol levels being on medication.

Four in ten adult Kenyans have heard of any cervical cancer screening test while only 11.3 percent of women have ever been screened for cervical cancer. Among the age group 30-49 years which is the recommended age for screening, 16.4 percent have ever been screened for cervical cancer.

Only one in five Kenyans have ever been advised to eat at least five servings of fruit and/or vegetables by a health worker while eight percent of the respondents had been advised against tobacco use by a health care worker in the past three years. Ten percent of the respondents have been advised to either stop drinking alcohol or not to start by a health care worker. Ten percent and 11.4 percent have been advised to reduce salt and fat in the diet respectively.

## Physical Measurements-STEP 2

Physical measurements such as height, weight and blood pressure were collected in Step 2.

Twenty seven percent of Kenyans are either overweight or obese with the percentage being significantly higher in women (38.5 percent) than men (17.5 percent). Twelve percent of respondents from urban settlements were obese while 7 percent of rural dwellers are obese indicating a big risk of NCDs and their complications.

The mean waist circumference for men and women is 78.6 cm 79.1 cm respectively. Twenty eight percent of the men and 36 % of the Kenyan women had a higher Waist–hip ratio than recommended. The Waist–hip ratio (the waist circumference divided by the hip circumference) is an index used to identify individuals at increased risk of obesity related morbidity due to accumulation of abdominal fat (WHO, 2011). Women whose waist hip ratio (WHR) is  $\geq 0.85$  and men with a WHR  $\geq 0.9$  are considered to be at increased risk of obesity-related morbidity.

Raised blood pressure (defined as having SBP  $\geq 140$  mmHg and/or DBP  $\geq 90$  mmHg or on medication for raised blood pressure) was found in 23.8 percent of the respondents. Eight percent of the Kenyans have severe hypertension (defined as having SBP  $\geq 160$  mmHg and/or DBP  $\geq 100$  mmHg) and among this group seven percent were not currently taking medication.

### Biochemical Measurements – STEP 3

The survey results show that 3.1 percent and 1.9 percent of Kenyans have impaired Fasting glycaemia and raised blood glucose respectively. Raised blood glucose was defined as plasma venous value  $\geq 7.0$  mmol/L or currently on medication for diabetes. Approximately one in ten respondents have cholesterol  $\geq 5.0$  mmol/L or currently on medication for raised cholesterol. Half of all men (50%) and more than half of the women (60%) had low HDL levels (values of HDL cholesterol below 1.03 mmol/L for men and 1.29 mmol/L for women)

The total risk of developing cardiovascular disease (CVD) was determined by the combined effect of behavioral and biological risk factors (for instance smoking, or having raised blood sugar), age and sex. Eight percent of the Kenyans in the 40-69 age group have a CVD risk of 30 percent or and above with only 6.2 percent of them currently receiving drug therapy and counseling to prevent heart attacks and strokes.

Assessment of the risk posed by combined risk factors was also determined. The five common and critical risk factors for NCDs including current daily smokers, overweight or obese ( $BMI > 25\text{kg/m}^2$ ), raised blood pressure ( $SBP > 140$  and/or  $DBP > 90$  mmHg or currently on medication for raised BP), less than 5 servings of fruit and vegetables per day and low level of physical activity were used. Only 3 percent of Kenyans have none of the above risk factors. Among the age group 18-44 years, 10.4 percent have three or more of the above risk factors while among the age group 45 to 69 years, 25.9 percent have three or more of the above risk factors indicate a heightened risk of NCDs and their complications that warrants interventions ranging from awareness, treatment and follow-up.

### Violence and Injuries

A vast majority of Kenyans (87.6 percent) do not always use seat belt when travelling in a vehicle. Additionally 94.1 percent of drivers or passengers of motorcycles or motor-scooter do not always use protective helmets. Overall, 3.4 percent of adults reported driving under the effects of alcohol in the past 30 days while 12.7 percent reported to riding in a vehicle with a driver under the effect of alcohol. Six percent of Kenyans have been involved in a road traffic crash during the past 12 of which 53.9 percent

were serious enough to necessitate medical attention. The survey results indicates that 10.4 percent of all respondents got seriously injured in other injuries other than road traffic crashes with the most prevalent injuries being Cuts (47.6 percent) and falls (34.0 percent). Overall, 3.9 percent of the respondents were involved in violent incident resulting in a serious injury in the past 12 months with majority of the injuries being caused by a friend or acquaintance (23.4 percent).

## Oral Health

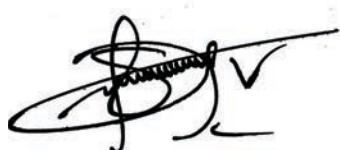
Overall, eighty nine percent of adults have 28 or more natural teeth. Twelve percent and 7.2 percent of Kenyans reported to have poor or very poor state of teeth and poor or very poor state of gums among those having natural teeth respectively. Five percent of Kenyans have removable dentures. While a history of oral pain and discomfort in the past 12 months was reported by 31.6 percent only one in ten Kenyans visited a dentist in the past 12 months. Overall, 62.7 percent of Kenyans have never visited a dentist. Thirty six percent of Kenyans clean their teeth twice daily.

## Conclusions and Recommendations

The Kenya STEPs is the first nationally representative survey to collect comprehensive information on risk factors for NCDs, Injuries and oral health in Kenya. It provides essential information on Key NCD indicators by age group, sex and residence, education level and wealth quintile in some cases. The findings are useful in informing public health policy and the following recommendations are proposed:

1. There is a need to Prioritize NCD prevention and control at both national and county level using whole of government, whole of society and life course approach as it is an emerging threat to health, social and economic development.
2. Sustained public awareness campaigns and interventions to reduce the modifiable risk factors for NCDs: unhealthy diets, physical inactivity, harmful use of alcohol, tobacco use and exposure to tobacco smoke.
3. Build the capacity of the health workforce while ensuring the availability, access, affordability and quality of safe, efficacious medicines and basic technologies for screening, diagnosis, treatment and monitoring of common NCDs such as hypertension and diabetes at primary health care.
4. Restructure the health information systems to guarantee reliable, timely, complete and quality data for evidence-based practice and decision making in NCD prevention and control.
5. Establish wellness clinics in all facilities to encourage early detection and screening of NCDs such as diabetes, cervical cancer, hypertension and others as well as serve as sources of information for prevention and health promotion.
6. Strengthen the implementation of the Framework Convention on Tobacco Control (FCTC) by enforcing the provisions of the Tobacco control Act at both the national and county level.
7. Adapt the global strategy to reduce harmful use of alcohol.
8. Strengthen implementation of the Kenya's National Nutrition Action Plan 2012-2017 and ensure continuous engagement with the agricultural sector to promote healthy diets and eating habits.
9. Introduction of legislations on production, packaging and responsible marketing

- of food and drinks to reduce consumption of unhealthy foods.
10. Implement the physical activity tool kit in the country to encourage adoption of active lifestyles and to reduce sedentary lifestyles.
11. Establish mechanisms to foster multi-sectoral collaboration to ensure all the pillars of the decade of action on road safety are well implemented
12. Conduct public education and social marketing campaigns on prevention of injuries.
13. Strengthen the delivery of oral health services throughout the country by raising the awareness on the importance of regular dental checkups and maintenance of proper oral health hygiene.
14. Integrate NCD indicators in national health surveys to supplement the data collected in periodic STEPS survey for proper planning and projection of NCD prevention and control.



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## Acknowledgements

The Ministry of Health would like to acknowledge the efforts of the individuals and organizations that contributed to the success of this Kenya STEPwise Survey. The close cooperation between the Ministry of Health, WHO and the Kenya National Bureau of Statistics (KNBS) was critical to the successful completion of the survey, and special thanks go to the staff of these three institutions.

Further, the technical support from World Health Organization, Kenya Medical Research Institute, African Institute for Health & Development (AIHD), the Kenya diabetes management and information centre (DMI), the African Population and Health Research Center (APHRC) and the Nairobi University in all phases of the survey is appreciated.

Special Thanks go to the office of the Cabinet Secretary for Health, Principal Secretary, Director of Medical Services, the head of the department of preventive and promotive health Dr. Jack Kioko, the head of the Department of Policy, Planning and Health Care Financing Dr. Peter Kimuu and the Director General and the Director, Population & Social Statistics of KNBS. The Division of Non Communicable Diseases wishes to also thank Dr. Custodia Mandlhate the WHO Country Representative and the entire team at the WHO Kenya Country Office for their support.

The contribution and dedication of the following individuals and organizations is highly appreciated; Dr. Kibachio Joseph, Awes Abulkadir, Dr. Gladwel Gathecha, Paul Waweru, Zachary Ndegwa, John Bore, Dr. Jutta Jorgensen, Robert Buluma, Dr Joyce Nato, Dr. Waihenya Mwangi, Dorcas Kiptui, Scholastica Owondo, Dr. Muthoni Gichu, Prof Elijah Ogola, Eva Muchemi, Dr Maina Kiberenge, Lilian Karugu, Dr. Nelson Muriu, Dr. Wekesa Paul, Angela Ngetich, Dr. Ogara Esther, Dr. Alfred Karagu, Prof. Gerald Yonga, Dr. Mary Nyamongo, Winnie Muhoro, Dr. Loise Nyanjau, Peris Wangau, Joshua Muiruri, Dr. George Githuka, Dr. Martin Mwangi, Dr. Duncan Kibongong, Dr. Wences Alvero

We owe the success of this entire survey to the sacrifice of the field team that collected data in the entire country surmounting numerous challenges and setbacks.

We are indebted to the World Bank, WHO, AstraZeneca and the MOH/CDC CoAg for funding the process of development, implementation, printing, launch and dissemination of this report.





## **CHAPTER ONE**

### INTRODUCTION

## CHAPTER ONE: INTRODUCTION

### Kenya Country Profile

#### Geographical and Governance structure

##### Geographical structure

Kenya is a former British colony which got independence on 12th December, 1963 and became a republic on December 12, 1964. The country lies between latitudes 4° N and 4° S, and longitudes 34° E and 41° E (Abdelaziz Marhoum & David A. Samper, 2010a). Kenya has a total land area of 224,960 square miles with 5,200 sq. miles comprising of water. The country is positioned on the equator on Africa's east coast and shares borders with five other countries. Kenya's eastern and northern neighbors are Somalia and Ethiopia. To the northwest lies Southern Sudan while Uganda lies to the west and Tanzania to the south. Kenya is divided into seven major geographic regions. (Abdelaziz Marhoum & David A. Samper, 2010)

##### Coastal Region

The Coastal region extends some 250 miles from the southern border where Kenya meets Tanzania, to the border with Somalia in the north. The coastal region is characterized by a variety of geographical features which include stretches of coral rock and sand interrupted by bays, inlets, and branched creeks. In the inland of the coast is a narrow plain and a low plateau area reaching an elevation of about 500 feet. The main geographic feature of the northern part of the coastal region is the Lamu Archipelago.

##### Southern Coastal Hinterland

The southern coastal hinterland is a relatively featureless erosional plain with few groups of small hills. The Tana Plains extend northward from the upper coastal region to the northern plains. The plain's eastern edge forms the border of Somalia while the western part of the plain ends with the elevated Eastern Plateau Region. The Tana River flows across the plain from the Kenyan Highlands into the Indian Ocean.

##### The Eastern Plateau

This region consists of a belt of plains extending north-and southward to the eastern Kenya Highlands. Land elevations vary mainly between 1,000 and 3,000 feet above sea level.

## Northern Region

The Northern plain-lands region stretches from the border with Uganda on the west to the Somalia border on the east and consists of a series of arid plains formed by erosion or by great outpourings of lava. The region includes Lake Turkana and the Chalbi Desert. To the West of Lake Turkana are arid lands with scarce rainfall. East of Lake Turkana lies the Chalbi Desert; still farther east are equally arid lands that ordinarily support only semi-desert vegetation.

## Highlands Region

The Kenya Highlands Region was referred to as the White Highlands during colonial times. The region consists of two major divisions, lying east and west of the Great Rift Valley. The entire area is characterized by significantly higher altitude, cooler temperatures and more plentiful precipitation than in other regions in the country.

## Rift Valley Region

Rift Valley Region comprises of Eastern Africa's Rift Valley which was formed by an extended series of faulting and differential rock movements. The valley stretches from Kenya's Lake Turkana area, running southward through the Kenya Highlands into Tanzania. Near Lake Turkana, the valley floor is less than 1,500 feet above sea level and rises to about 6,200 feet in its central section near Lake Naivasha.

## Western Plateau Region

The Western Plateau Region forms part of the extensive basin around Lake Victoria. The region consists mainly of faulted plateaus marked by escarpments that descend gently from the Kenya Highlands to the lakeshore. The region is divided by the Kano Rift Valley into northern and southern sub-regions with distinct geographical features.

## Climate.

Kenya's position along the equator makes its terrain highly diversified with climatic conditions ranging from moist to arid. Her seasons are distinguished by duration of rainfall rather than by changes in temperature. In the Western Plateau and the Highlands, rain falls in a single long season while in the east of the Rift Valley, there are two distinct seasons characterized by a period of long rains from March to May and one of short rains from September to October. Rainfall is most plentiful in the Highlands and in the coast. Though much of country has two wet and two dry seasons, total rainfall varies unpredictably. More than 70 percent of the country is arid or semi-arid with sporadic rainfall of less than 51 cm per year. Variations in altitude are the major factor in temperature differences in the various parts of the country. The Highlands generally have cool temperatures. The nation's highest temperatures are found in the Northern Plain. The hottest months fall between January and March while the coldest are June and July.

## Vegetation.

Kenya's plant life ranges from mangrove forests and coconut palms on the coast to Savannah grassland and woods to thick coniferous evergreen forests on the mountain slopes. On the western plateaus, low trees grow amid grass over 1.5 meters high. Similar vegetation is found between 915 and 1,829 meters east and south of Mount Kenya and near Tana and Athi rivers. On the northern and southern edges of the highlands, flat-topped trees are scattered through meter-high grass.

## Drainage System

The country's principal drainage system begins in the Kenya Highlands Region which forms the source of streams and rivers running eastward toward the Indian Ocean, westward to Lake Victoria, and northward to Lake Turkana. A secondary drainage system is formed by rivers in the southern highlands of Ethiopia, which extends into Kenya along the eastern part of their shared boundary. Most of these rivers are seasonal with some receiving sufficient rainwater. The two largest rivers are the Tana and the Galana, which empty into the Indian Ocean. The Tana basin with an area of about 24,000 square miles receives much of the flow from the Aberdare Range and Mount Kenya. The Galana River has its source in the southeastern Kenya Highlands and flows together with its tributaries into the Indian Ocean north of Malindi. Several other smaller rivers begin in the foothills of the eastern Kenya Highlands in the Tana River basin.

The western Kenya Highlands are drained by a number of rivers that empty into Lake Victoria. The largest of these are the Nzoia, about 160 miles long, and the Yala, with a length of about 110 miles. The Mara River, in the Mau Escarpment in the southwest highlands, flows southward for about 100 miles, enters Tanzania, and turns westward to flow for almost another 100 miles into Lake Victoria. The northern Kenya Highlands east of the Rift Valley are drained by small rivers that disappear in the arid land to the north and by the larger, eastward-flowing system of the Ewaso Niro.

## Governance Structure

Kenya's central government is structured through the constitution with administrative and policy making powers being distributed to its three arms of government: Executive, Legislature and Judiciary. The current structure is enshrined in the Kenya constitution of 2010. ("Kenya Government," 2015)

The executive is headed by the president of the republic. Appointments of cabinet secretaries and other key positions such as that of the attorney general, secretary to the cabinet, high commissioners, consular representatives and ambassadors are vested in the president subject to approval by parliament.

The Legislature is responsible for advocating for the people's interest in law making. It is vested in two houses: the national assembly and the senate. Members of the national assembly are obligated to represent their constituents and all the special interests within

their respective constituencies while the main roles of the Kenya Senate include debating and approving county bills; determining the allocation of national revenue to be distributed according to the counties; and representing the interests of the counties at the national level.

The judiciary mainly centers on the Kenyan Judicial system which adheres to a hierarchical system, with The Supreme Court being the highest organ, followed by the Court of Appeal, High Court, Magistrate's Courts and other Subordinate Courts. The chief justice is the president of the judiciary and is appointed by the president subject to the approval of the National Assembly.

### Devolved Governments

Kenya has 47 county governments, whose main objectives are to involve the people in governance; and allow better supervision and implementation of policies at the grassroot level. The county Government constitutes of a county assembly and county executive. The responsibilities of the county assembly include, exercising the powers of enacting laws at the county level; acting as an oversight instrument on the county executive; and approval of plans and policies for smooth operation and management of resources and county institutions.

The people elect the members of the county assembly at Ward level while additional slots are reserved for nominations. This ensures that membership is well distributed by gender, marginalized groups and persons with disability. The county assembly is headed by a county Speaker who by law is not supposed to be a member of the assembly.

The county executive on the other hand is charged with the responsibility of exercising executive power at the county level; implementing laws for administration of the county as well as carrying out other executive functions of the county. The county executive gives the people an opportunity to be more actively involved in lawmaking. The county executive is led by a governor who is directly elected by the people at the county level. The appointment of the county executive members is placed under the mandate of the governor, and approval is subject to the county assembly.

### The Economy

Kenya has a market-based economy that promotes economic efficiency and competition and encourages foreign investment. Since independence, the market structure has changed from one in which prices were influenced by the government to one in which they are determined by the market forces of supply and demand. Liberalization of the agricultural sector was undertaken in the 1980s and 1990s, reducing government's control of agricultural production and marketing. This led to an environment that encouraged private sector participation in agriculture. (Mwangi Kimenyi, 2014)

The Kenyan economy has been fluctuating since independence with the initial years registering high economic growth of up to 6% that declined to below 4% in the following

decades. In the 1990s, Kenya's GDP also experienced great inconsistency, ranging between negative figures to 4%. This economic growth peaked in 2007 at 7% but the post-election violence in early 2008 following a contested election, coupled with the effects of the global financial crisis reduced the GDP growth to 1.7%. The economy has since rebounded in 2010-11 by showing growth rates higher than 5% and the economic prospects for Kenya for the coming years remain favorable. ("Kenya Economy," 2015)

According to 2015 Economic Survey, Kenya's economy expanded by 5.3 per cent in 2014, compared to a growth of 5.7 per cent in 2013. A number of factors influenced the country's economic performance during the review period. From the demand side, government and private final consumption increased by 2.7 per cent and 5.5 per cent, respectively. The major drivers of the economy were agriculture, forestry and fishing(14.5 percent), construction(11.1 percent); wholesale and retail trade (9.8 percent); education(9.7 percent); and finance and insurance (9.1 percent).

The World Bank, in its Kenya Economic Update for March 2015, projected the economy to grow by 6% in 2015. The growth is expected to be supported by lower energy costs, investment in infrastructure, agriculture, manufacturing and other industries. A stable macroeconomic environment, continued investment in infrastructure, improved business environment, exports and regional integration will help sustain the growth momentum.("Kenya Overview," 2015)

Despite Kenya having very limited arable land and rainfall, it has a vibrant agricultural sector with horticulture contributing the highest percentage of agricultural gross domestic product (33 percent), followed by food crops (32 percent). Equally, Kenya is doing tremendously well in mobile money services sector which has given the economy a big boost. Tourism is another main industry in Kenya exploiting the great flora and fauna of the country coupled by a warm spirit of the people.

Kenya is the consistently growing its export portfolio with its main export partners being the other East African states as well as the UK, the Netherlands and the US. Main import partners include China, India, United Arab Emirates (UAE) and South Africa.

Kenya does not have a well established oil industry, but recent discoveries of oil in the Northern part of the country may change that. It is the first time that Kenya has made such a discovery, but the commercial viability of the findings has still not been confirmed .

### The Population

According to the Kenya Population and Housing Census 2009, Kenya has a population of 38,610,097 comprising of 19,192,458 males and 19,417,639 females. Approximately 43 percent of the population is below 15 years of age while 4 percent is above 65 years of age. The Kenya's population is projected to be 44,156,577 in 2015 with 41 percent being below 15 years of age and 3 percent above 65 years of age.

## Social Services, Health Policy, and Health Status

### Social Services

Social Health determinants include maternal education, nutrition, safe water, adequate sanitation, and proper housing among others. Maternal education has a strong correlation with a child's health and survival. In Kenya, there have been improvements in maternal education over the years, with declines in the numbers of women with no education and increases in those with secondary or higher education.

Even though there has been improvements in acute nutrition deficiencies, such as under-weight in children under five, not much improvement has been seen in the prevalence of more chronic under-nutrition variables, such as stunting and wasting the nutrition status of women has also shown stagnating patterns.

There has been an improvement in the availability of safe water sources and sanitation facilities particularly in rural areas, although some regions such as arid and semi-arid areas still have poor services. Housing conditions have been improving, with a notable increase in households using permanent roofing, and a decrease in households using earth floors. The proportion of population in active employment has been reducing with an associated increase in the proportion of inactive population. Migration from rural to urban areas is mostly noted among people aged 20 – 34 years significantly contributing to an increase in the urban population which in turn has fuelled an increase in the urban informal settlements and their associated health risks.

### Health Policy

The Kenya Health Policy, 2014–2030 gives directions to ensure significant improvement in overall status of health in Kenya in line with the Constitution of Kenya 2010, the country's long-term development agenda, Vision 2030 and global commitments. It demonstrates the health sector's commitment, under the government's stewardship, to ensuring that the country attains the highest possible standards of health, in a manner responsive to the needs of the population.

This policy is designed to be comprehensive and focuses on the two key obligations of health: realisation of fundamental human rights including the right to health as enshrined in the Constitution of Kenya 2010 and; contribution to economic development as envisioned in Vision 2030; and. It focuses on ensuring equity, people centeredness, participatory approaches, efficiency, multi-sectoral approach, and social accountability in the delivery of healthcare services. The policy embraces the principles of protection of the right to health and fundamental freedoms of vulnerable groups of persons, including children, persons with disabilities, youth, minorities, the marginalised and older members of the society, in accordance with the Constitution.

The policy takes into account the functional responsibilities between the two levels of government (county and national) with their respective accountability, reporting, and

management lines. It proposes a comprehensive and innovative approach to harness and synergise health services delivery at all levels and engaging all actors, signalling a radical departure from past approaches in addressing the health agenda. There is therefore, need to raise awareness and ensure that the objectives of this policy are understood and fully owned by the various stakeholders and implementing partners.

The policy has six objectives that span across the whole spectrum of health determinants ranging from infectious, non-communicable diseases and injuries.

### Health Status

The life expectancy at birth in Kenya is 61.5 years comprising 59.9 years for men, 63.1 years for women. Based on the 2014 Kenya Demographic and Health Survey, the total fertility rate (TFR) for women aged 15-49 years is 3.9 births per woman. In the same period, 58 percent of women in the reproductive age group were using modern contraceptive methods. The crude birth rate was 30.5 per 1000 population in 2014, and the crude death rate was 8.3 per 1000 population in 2013. The infant mortality rate is estimated at 39 per 1000 live births, and child mortality is 14 per 1000 live births while as the under-five mortality rate at 52 per 1000 live births,

Slightly more than half of currently married women (58 percent) are currently using some method of contraception; while 65 percent of sexually active unmarried women currently use some method of contraception. About 62 percent of births in Kenya are delivered by a skilled provider. A similar proportion of deliveries (61 percent) take place in health facilities. Overall, 68 percent of children age 12-23 months are fully vaccinated with BCG, measles, pentavalent, polio, and pneumococcal vaccines; 71 percent have received all basic vaccinations.

### Health Sector Financial Allocations and Expenditure

The government expenditure on health as a percentage of total government expenditures has remained between 6 and 8 per cent over the last decade. Within the last two years, health expenditures as a proportion of GDP increased from 5.1% to 5.4 % while public expenditures as a proportion of general government expenditures has been reduced from 8.0% to 4.6% during the same period. The health sector is predominantly financed by private sector sources (including by households' out-of-pocket (OOP) spending).

## Non-communicable Diseases

### The Burden of NCDs

Non-communicable diseases (NCDs) are the leading causes of morbidity and mortality globally, causing more deaths than all other causes combined. Non communicable diseases (NCDs) kill 38 million people each year accounting for 63% of deaths globally, with 80% of these deaths occurring in developing countries whose fragile health systems are still grappling with a heavy burden of communicable diseases resulting to a duo burden of disease.

The World Health Organization (WHO) estimates that NCDs will cause 73% of global deaths and 60% of the burden of disease by 2020. Sixteen million of NCD deaths occur before the age of 70 with 82% of these "premature" deaths occurred in low- and middle-income countries. Cardiovascular diseases account for most NCD deaths, or 17.5 million people annually, followed by cancers (8.2 million), respiratory diseases (4 million), and diabetes (1.5 million). These 4 groups of diseases account for 82% of all NCD deaths with tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets all increase the risk of dying from an NCD significantly.

Besides the burden of deaths and disability, non communicable diseases pose a greater social and economic burden to the economy. NCDs threaten progress in the post-2015 development agenda as poverty is closely linked with NCDs. The rapid rise in NCDs is predicted to impede poverty reduction initiatives in low-income countries, particularly by increasing household costs associated with health care. Vulnerable and socially disadvantaged people get sicker and die sooner than people of higher social positions, especially because they are at greater risk of being exposed to harmful products, such as tobacco or unhealthy food, and have limited access to health services.

In low-resource settings, health-care costs for cardiovascular diseases, cancers, diabetes or chronic lung diseases can quickly drain household resources, driving families into poverty. The exorbitant costs of NCDs, including often lengthy and expensive treatment and loss of breadwinners, are forcing millions of people into poverty annually, stifling development.

Up to 80% of premature deaths from heart disease, stroke and diabetes can be averted with evidence based behavioral and pharmaceutical interventions.

### 1.2.3 NCDs in Kenya

Non communicable diseases accounts for more than 50% of total hospital admissions and over 55% of hospital deaths in Kenya. The major NCDs are cardiovascular conditions, cancers, diabetes, and chronic obstructive pulmonary diseases with their sequelae and their shared risk factors. Equally contributing to the huge burden are violence and injuries, haemoglobinopathies, mental disorders, oral, eye and dental diseases

#### Cancer

In Kenya, it is estimated to be the second leading cause of NCD related deaths after cardiovascular diseases and accounting for 7% of overall national mortality.(World Health Organization (WHO), 2014)

Existing evidence shows that the annual incidence of cancer is close to 37,000 new cases with an annual mortality of over 28,000 making cancer the third leading cause of death after infectious diseases and cardiovascular conditions. These estimates are conservative and could be higher given that many cases go unreported and unaccounted for. The leading cancers in Kenyan women are breast, cervical and esophagus. Breast cancer affects 34 per 100,000 population while cervical cancer affects 25 per 100,000 population a clear

indication of the threat cancer poses to women. In men, esophageal, prostate cancer and Kaposi sarcoma are the most common cancers with incidence rates of 17.5, 15.2 and 9.2 per 100,000 men respectively. (C. I. Report, 2002)

Risk factors for cancer in Kenya includes genetic predisposition, behavioral risk factors (mainly smoking, alcohol use, inadequate physical inactivity and poor diet), environmental carcinogens (e.g. aflatoxin and asbestos), and infections (e.g. HPV in cervical cancers, Hepatitis B and C in liver cancers, H. Pylori in stomach cancers, HIV in Karposi Sarcoma). While early detection ensures a favorable outcome and prognosis of most cancers, about 80% of reported cases are detected at an advanced stage when very little can be achieved in terms of treatment. Some of the challenges include low awareness of cancer signs and symptoms, inadequate early detection services, weak referral systems, poor treatment and palliative services. Achieving universal coverage for the key cancer control interventions will therefore be vital in halting and reducing the rising burden of cancer in Kenya. Key interventions for cancer prevention and control prioritized in Kenya include primary prevention, early detection, effective diagnosis and treatment, pain relief and palliative care, cancer surveillance and research, monitoring and evaluation and proper coordination of cancer control and prevention activities.

### Diabetes

This rise in diabetes is associated with demographic and social changes such as globalization, urbanization, aging population and adoption of unhealthy lifestyles such as consumption of unhealthy diets and physical inactivity. In Kenya, the prevalence of diabetes in adults is estimated to be 4.56% according to IDF, amounting to almost 750,000 persons and 20,000 annual deaths. There is a disparity in distribution with an estimate of approximately 10.7% among urban and 2.7% among rural dwellers (Diabetes Atlas 2014) this figure is based on regional projections and is likely to be an underestimation as over 60% of people diagnosed to have diabetes in Kenya usually present to the health care facility with seemingly unrelated complaints. It is also estimated that about 14% of the population in Kenya have impaired glucose.

As the prevalence of Diabetes mellitus is escalating, patients face an even greater threat from long term complications like foot, cardiovascular, eye, nerve and renal complications that are the hall mark of diabetes and its impact. Owing to poor glycemic control, a majority of patients referred for specialized end organ damage treatment at the national referral hospitals and outside the country are diabetes patients. More than 200 risk factors for CVD has to date been identified (Reid, 2001) with the major modifiable risk factors being high blood pressure, abnormal lipids levels, tobacco and alcohol use, physical inactivity, obesity, unhealthy diets

## Cardiovascular Diseases

Mortality due to CVD in Kenya ranges from 6.1% (NHSSP) to 8% (World Health Organisation, 2014), while autopsy studies suggest that more than 13% of cause-specific deaths among adults could be due to CVDs (Bloomfield et al, 2014)(Ogeng'o, Gatonga, & Olabu, 2011). The prevalence of hypertension has increased over the last 20 years. Recent studies have shown the overall prevalence to vary in various Kenyan communities. A study in Korogocho slums in Nairobi indicated the overall prevalence of hypertension in adults of 18% (Oti et al., 2013) while in Garrissa County, the level is lower at 12.6 (Hasan, 2012). Other studies have showed levels of HTN among adults at 21.4% in rural Kenya (Hendriks et al, 2012) and 50% in population over 50 years in Nakuru (Mathenge, Foster, & Kuper, 2010). RHD continues to be a major contributor to cardiovascular disease prevalence and affects both in children and adults

## Chronic Obstructive Pulmonary Disease (COPD)

Chronic Obstructive Pulmonary Disease (COPD) describes chronic lung diseases that cause limitations in lung airflow. COPD is an often under-diagnosed, life threatening lung disease that may progressively lead to death.

Despite high prevalence in developed nations, almost 90% of COPD deaths occur in low- and middle-income countries (WHO Fact sheet N315)

The main drivers of COPD include tobacco smoking, indoor air pollution (from use of biomass fuel for cooking and heating), outdoor air pollution and occupational dusts and chemicals. Within sub-Saharan Africa, limited data on COPD exists but the BOLD study reported COPD in 22.2% of men and 16.7% of women aged above 40 years. In Kenya COPD is estimated to cause approximately the same amount of DALYs as ischemic heart disease, stroke and epilepsy (GBD 2010 Heat Map

## Injuries and Violence

In Kenya, injuries are becoming an increasing important cause of hospital admissions and mortality. The leading causes of injury in Kenya include assault (42%), road traffic crashes (RTC) (28%), unspecified soft tissue injury (STI) (11%), cut-wounds and dog-bites, falls, burns and poisoning (each <10%).

Road traffic crashes are the ninth leading cause of mortality in Kenya. In 2015 data from the National Transport and Safety Authority indicates that road traffic crashes were responsible for 3057 deaths. Pedestrians are the most commonly affected in road traffic incidences where they comprise 43% of road traffic fatalities in 2015. Violence is ranked as the ninth highest cause of mortality in Kenya (Health, 2015). According to violence against children national survey conducted in 2010, 48.7% of female and 47.6% of male aged between 13-17 years had experienced some form of physical violence in the preceding 12 months before the survey.

The Kenya Health and Demographic Survey 2008/9 revealed that 39% and 20.6% of women have ever experienced physical and sexual violence respectively.

## Mental disorders

Mental disorders are an important cause of morbidity and contribute to the global burden of non-communicable diseases. Their control requires therefore equitable access to effective programmes and health care services.

Mental disorders also affect, and are affected by other non-communicable diseases: they can be a precursor or consequence of a non-communicable disease, or the result of interactive effects. For example, there is evidence to suggest that depression predisposes people to heart attacks and, conversely, heart attacks increase the likelihood of depression. The same appears for diabetes, where the association of depression to diabetes appears stronger than the inverse (Lyketsos, 2010).

Depression is associated with severe obesity, physical inactivity, and poor self-care, all risk factors for diabetes, and studies suggest long-term use of antidepressants increases the risk of diabetes by almost twofold (Raval, Dhanaraj, Bhansali, Grover, & Tiwari, 2010). Despite these strong connections, mental disorders in patients with non-communicable diseases as well as non-communicable diseases in patients with mental disorders have not received the attention they deserve. Mental disorders share common risk factors with other non-communicable diseases such as sedentary behavior and harmful use of alcohol and are more common among the economically underprivileged population segments such as those with lower educational level. UMM

## Non communicable diseases prevention and control

The National NCD strategic plan 2015-2020 was launched in July 2015 by the Ministry of Health as the strategic blue print for the national and county response to non-communicable diseases prevention and control for the next five years in Kenya. It has the following strategic priorities. This strategy aimed to establish mechanisms to raise the priority accorded to NCDs at national and county levels and to integrate their prevention and control into policies across all government sectors. It also was meant to coordinate, formulate and strengthen legislations, policies and plans for the prevention and control of non-communicable diseases at both county and national government levels.

In a bid to strengthen primary prevention, the strategic plan was to promote healthy lifestyles and implement interventions to reduce the modifiable risk factor for NCDs: unhealthy diets, physical inactivity, and harmful use of alcohol, tobacco use and exposure to tobacco smoke while putting in place interventions to reduce exposure to environmental, occupational and biological risk factors.

To Promote and strengthen advocacy, communication and social mobilization for NCD prevention and control and to Promote sustainable local and international partnerships for the prevention and control of non-communicable diseases by Strengthening health systems for NCD prevention and control across all levels of the health sector was also an objective of the strategy.

Considering the rising burden of violence and injuries, the government aims to promote and implement evidence based strategies and interventions for prevention and control of violence and injuries and to Establish and strengthen effective Monitoring & Evaluation (M&E) systems for NCDs and their determinants.

Finally, the National NCD strategic plan 2015-2020 aimed to promote and conduct research and surveillance for the prevention and control of non-communicable diseases. This was the basis of conducting the Kenya stepwise survey for non communicable diseases risk factors 2015.



## **CHAPTER TWO**

### **SURVEY METHODS AND OPERATIONS**

## CHAPTER TWO: SURVEY METHODS AND OPERATIONS

### 2.1 Survey Rationale and Objectives

Kenya is experiencing an epidemiological transition in its diseases burden from infectious to non-communicable conditions resulting in a double burden of disease. Non communicable diseases are a major public health concern with significant social and economic implications in terms of health care-needs, lost productivity and premature death. NCDs are thus a serious setback to our attainment of social, health and economic targets if no proper interventions are put in place.

The disease burden caused by NCDs in Kenya is fueled by adoption of unhealthy lifestyles whose magnitude and impact on NCDs has not been documented hitherto appropriately. Planning and programming has been depended on fragmented local data and epidemiological models and projections that may not be nationally representative or accurate.

A comprehensive study was therefore needed to examine the prevalence and the magnitude of common risk factors for NCDs in Kenya which is useful to the Ministry of Health and county governments to establish interventions that are based on local risk factor burden.

The basis of chronic disease prevention is the identification of the major common risk factors and their prevention and control as the risk factors of today are the diseases of tomorrow. Additionally, information from this study will provide baseline data that will be used to assess disease trends and impact of various interventions. This will be the first national NCD risk factor survey against which future surveys can be based to assess impact and effectiveness of national prevention and control efforts for NCDs and their risk factors.

The general objective of the survey was to establish the magnitude of the major behavioral and biological risk factors for Non-Communicable Diseases in Kenya. Additionally, it was meant to determine the magnitude of unintentional injuries and oral diseases in Kenya which have an equally high burden.

The specific objectives were:

- a) To determine the prevalence and determinants for the four major behavioral risk factors for NCDs in Kenya: tobacco use, harmful use of alcohol, unhealthy diets, and physical inactivity.
- b) To determine the prevalence and determinants for the four key biological risk factors for NCDs in Kenya: overweight and obesity, raised blood pressure, raised blood glucose and abnormal blood lipids
- c) To determine the prevalence and determinants of unintentional injuries in Kenya.
- d) To determine the prevalence and determinants of oral diseases in Kenya
- e) To investigate potential links between different risk factors and determinants of health (socio-economical status, demographic factors, gender, age)

## 2.2 Survey Sampling and Methodology

### 2.2.1 Sample Size and Eligibility

The 2015 Kenya STEPs survey was a national cross-sectional household survey designed to provide estimates for indicators on risk factors for non-communicable diseases for persons age 18 – 69 years. The sample was designed with a sample size of 6,000 individuals to allow national estimates by sex (male and female) and residence (urban and rural areas).

The survey used the fifth National Sample Surveys and Evaluation Programme (NASSEP V) master sample frame that was developed and maintained by KNBS. The frame was developed using the Enumeration Areas (EAs) generated from the 2009 Kenya Population and Housing Census to form 5,360 clusters split into four equal sub-samples.

A three-stage cluster sample design was adopted for the survey involving selection of clusters, households and eligible individuals. In the first stage, 200 clusters (100 urban and 100 rural) were selected from one sub-sample of NASSEP V frame. A uniform sample of 30 households from the listed households in each cluster was selected in the second stage of sampling. The last stage of sampling was done using Personal Digital Assistants (PDAs) at the time of survey, where one individual was randomly selected from all eligible listed household members using a programmed KISH method of sampling. Details of the sample design are provided in Appendix A.

### 2.2.2 Survey Tools and Structure

The tools and structure for the survey was adapted from the WHO STEPwise approach to chronic disease risk factor surveillance (STEPS) with modification to suite the Kenyan situation. The approach was a sequential process consisting of three ‘steps’ of information gathering as follows:

- Step 1 Interviews on demographic information and selected major health risk behaviors
- Step 2 Anthropometric measurements on Blood Pressure and heart rate, height, weight, waist and hip circumference.
- Step 3 Biochemical measurements of fasting blood glucose, triglyceride, and cholesterol levels.

Figure 1.1: The WHO STEPwise approach to surveillance of NCDs



The questionnaire used covered all core modules and expanded questions relevant to Kenya. The following are the contents of the questionnaire.

**STEP 1** included gathering information on demographic and behaviour.

- **Demographic Information:** questions regarding the demographic information of individual, i.e., age, sex, marital status, education, and occupation. In addition, questions on housing and social amenities were included in the module.
- **Behavioral Information:** questions on Tobacco Use, Alcohol Consumption, Diet, Physical Activity, History of Raised Blood Pressure, History of Diabetes, History of Raised Total Cholesterol, History of Cardiovascular Diseases, Lifestyle Advice, History of Diabetes, Cervical Cancer Screening, Injury and Oral health.

**STEP 2** included **Physical Measurements** on Blood Pressure, Heart Rate, Height, Weight, and Waist & Hip Circumference.

- The height measurements were taken in centimeter by using a portable height measuring equipment using unique ultrasonic and infrared technology.
- Weight measurement was done in kilogram using a portable electronic weighting scale.
- Waist circumference measurements were done using a constant tension tape across the umbilicus level.
- Blood pressure and pulse rate was taken three times using an automated blood pressure measuring instrument (OMRON®).

**STEP 3** included **Biochemical Measurements** on Blood Glucose and Blood Lipids.

- A point-of-care instrument (CardiocheckPA analyzer®) from PTS diagnostics was used for Blood Glucose and Blood Lipids.

#### **The full questionnaire is attached in Appendix C**

Data collection was administered using a Personal Digital Assistant (PDA) loaded with eSTEPS software. The system was designed to allow PDA to show only a question and all its possible answers at a time in one screen view, and also provided various filters, skips and validation procedures.

#### **2.2. 3 Ethical Consideration**

##### **Informed Consent.**

Written Informed consent was sought from the selected individual

##### **Confidentiality**

Strict confidentiality was maintained and all personal identifiers were be delinked by coding. Personal identifies only appeared in the consent form which were stored separately. The codes were stored securely in a password protected computer .All data collected were kept secured, in locked storage spaces for the written notes or in password-protected files and computers for the digital files. All team staff were trained in ethical procedures and measures to protect confidentiality and were required to sign confidentiality agree-

ments.

### Protection of Human Participants

The main benefit for participants in this survey was their contribution to informing, identifying, and improving NCD prevention, care, and treatment interventions. Participants did not directly benefit from their participation but indirectly benefit from the improvement of NCD prevention, care, and treatment services within their communities. Another benefit was the possibility of identification and referral for treatment of non-communicable diseases after presentation of the results. Participants were referred to the nearest health facility or facility of their choice using a referral form.

Specimen taking was done using appropriate infection control procedures protecting both the participant and study staff. The risk of participation for all the respondents was minimal, being limited mostly to temporary discomfort associated with the finger prick blood collection process.

## Survey Administration

### Training of Data Collectors

A six-day training workshop was held where the training programme included sessions on STEPS survey background, sampling methods, cluster-level sampling of households, questioning skills including obtaining informed consent, how to use PDAs, questionnaire completion, blood taking, testing and referral procedures. Orientation of supervisors on supervision skills and checking (editing) of completed questionnaires were also conducted.

After the training, twenty teams were constituted who included a Supervisor, two Research Assistants, and two Health Workers (a clinician and a laboratory technologist) per team. Three teams that had a high work load had two additional members. The training for the STEPS survey was conducted in a centralized location and the trainees included 20 supervisors, 45 interviewers and 43 health workers. The training was designed to follow the standard approach in training and included class presentations, use of IPAQ PDAs and mock paired interviews. In addition, all the trainees participated in a full day practice fieldwork in a few selected areas surrounding the training venue. The various approaches to training were aimed at helping participants understand the survey concepts and how to complete the questionnaires using IPAQ PDAs. Participants were also given tips on interviewing techniques and field procedures. All the supervisors were taken through a special session on logistics, quality control, data management and transmission.

### Fieldwork

Fieldwork started after completion of data collection training and it took place over a period of 60 days from 9th April 2015 to 10th June 2015. Fieldwork was conducted by the trained 20 teams each composed of one supervisor and two interviewers and two lab technicians. In addition, a team of six technical coordinators and regional coordinators were in charge of the teams to ensure that quality data was collected.

STEPS is a sequential process that starts with gathering key information on NCD risks

factors with a questionnaire, then moves to simple physical measurements and then to more complex collection of blood samples for biochemical analysis.

Specifically, the STEPS approach was conducted through the three levels of data collection:

- Step 1:** Contained the core or “minimum set” of self-report measures. This includes socio-economic data, data on tobacco and alcohol use, and some measure of nutritional status and physical inactivity, as markers of current and future health status. This information was collected using Personal Digital Assistant (PDA) loaded with eSTEPS questionnaire.
- Step 2:** Included simple physical measurements, such as height, weight, waist circumference, and blood pressure. This was done after consent by the health worker assisted by the interviewer.
- Step 3:** This step happened on day two after fasting instructions were given on day one. This step involved collecting and analyzing blood samples to assess fasting blood glucose and blood lipid levels. The results were captured immediately and released to the participant.

#### 2.3.2.1 Electronic Data Collection

The field data collection for 2015 STEPS survey was fully undertaken electronically using the IPAQ PDAs. Each interviewer was supplied with an IPAQ together with its accessories and an extra battery. The PDAs were programmed to automatically save the data in both internal memory and also in the provided Secure Digital Card (SD card).

The STEPS survey data was backed up every day by the supervisors who had laptops to retrieve the data from SD cards and later emailed the zipped folders to a provided central address every two days. The electronic data collection was successful and there was no data loss. However, one PDA malfunctioned in the course of data collection and interviews had to be repeated for the affected households

Each STEPs survey team was composed of a supervisor, two enumerators who conducted step one, two health care workers (a clinician or a laboratory personnel) who performed step two and three. The team visited households and conducted face to face interviews by administering the questionnaires. The interview would start with an explanation of the study and thereafter written consent obtained. After the interview, anthropometric measurements and blood pressure were measured. Fasting instructions would be given and biochemical measurements taken the following day in the household.

There was a total of twenty teams, who on average did 8 interviews per day. Five days were allocated per EA to include call-backs, transfer to new EA, and resting time for data collectors. The survey time period was 60 days which was enough to complete the data collection exercise.

#### 2.3.2.2 Data Quality Management

Since the supervisors had been instructed to send their team’s data every two days, incoming data were checked for consistency by a central control team at KNBS. Any identified problems were communicated back to the teams for rectification.

The following were the quality assurance measures put in place to ensure the quality of field data collection:-

- a) All field personnel were-trained rigorously on interview techniques and use of the equipment.
- b) The questionnaire was translated into Kiswahili and back to English.
- c) Each team of field workers was supervised by a team supervisor.
- d) The Supervisors spot checked at least 5% randomly selected households and conducted interviews for each of the fieldworkers they supervised. They also conducted sit-ins and observations for each field interviewer at the initial stages of data collection at random intervals.
- e) Team leaders checked all questionnaires filled by interviewers to check for potential errors and missing information. Where it was necessary, the field worker was asked to revisit the respondent and clarify the information.
- f) The study co-coordinators conducted random spot checks across the study areas.
- g) All interview responses were recorded electronically using PDAs. Hence, there was no need for manual data entry.
- h) The eSTEPS questionnaire was pre-coded with specific check codes and skip patterns to minimize entry errors.
- i) Biochemical results were recorded on a paper and entered into the database twice.
- j) For the chemical biomarkers, control strips were used at recommended intervals to ensure that equipment were taking accurate measurements.
- k) The final dataset was cleaned by a team of qualified data analysts.

#### 2.3.2.3 Logistical Challenges/Limitations

Considering the unique nature of the STEPS survey, the following were some of the logistical challenges encountered during the survey:-

- a) Financial constrains that necessitated multi-stakeholder engagement for fundraising. Owing to different financial processes of the different stakeholders, some aspects of the survey were delayed.
- b) This was a large survey with numerous call backs and having to come back to every house hold for the step 3 that meant a coordination and logistical challenge.
- c) The heavy rains and floods that were being experienced at the time caused delays owing to change of routes due to floods, migration of populations and inaccessibility of some areas.
- d) There were serious security concerns as the survey happened around the same time as a terrorist attack in one of the areas that meant an increase in the budget owing to security costs and increase in days in areas where night travel was not permitted.
- e) Some study staff were derailed by sickness and 2 pregnant ladies delivered during the survey. This was however handled by prompt deployment of trained reserve interviewers.
- f) Some equipment malfunctioned causing delays as teams waited for replacements or repair.

## 2.4 Data Management

### 2.4.1 Weighting of Data

To produce unbiased estimates, sampling weights were calculated as the inverse or reciprocal of all the selection probabilities at all the stages mentioned above. The weights were derived from the processes involved in the creation of sampling frame (NASSEP V) and selection of individuals in the study. Further, the weights were adjusted to cover individual non-responses. Post stratification adjustments were done to align with the population projections according to age-sex categories. All the results presented in the report, except for the response rates and demographic outputs, are based on weighted data.

### 2.4.2 Data Analysis

The data analysis team, in conjunction with the report writing team developed the tabulation plans for the key indicators used in this report. Data cleaning for STEPS survey data was done in Microsoft Excel and Statistical Package for Social Sciences (SPSS). The data was then exported to Microsoft Access which is the platform that Epi Info Software uses to generate the standard WHO STEPS tabulations. The outputs were then copied from html files that are generated by Epi Info software to Microsoft word processor.

### 2.4.3 Analysis and Report writing

A team of NCD experts from the Ministry of Health, WHO and KNBS staff were involved in putting the findings of the survey in perspective, generating recommendations from the findings and in compiling the Kenya STEPS survey 2015 report.



## **CHAPTER THREE**

### SURVEY RESULTS

## CHAPTER THREE: SURVEY

### 3.1 Response rate

A total of 6,000 households were sampled, of which 4,754 gave consent for the next stages of the survey. This represents an overall response rate of 92 percent for households that were found occupied at the time of the fieldwork (after excluding dwellings that were vacant or had been destroyed).

Of all the households that gave consent, a total of 4,500 eligible individuals were successfully interviewed for STEP 1, yielding a response rate of 95 percent. The response was slightly higher in rural areas (95.1%) than in urban areas (94.2%). Actual refusals accounted to only 2 percent of all eligible respondents.

The STEP 2 (Physical Measurements) that were done immediately after the individual interviews recorded a 99 percent response for both urban and rural areas. However, the STEP 3 (Biochemical Measurements) that were done a day later recorded a slightly lower response rate of 93 percent

### 3.2 Characteristics of the Survey Respondents

#### Age and Sex distribution of Respondents

Table 3.2.1 shows the distribution of respondents age 18-69 by age group and sex. Women and men constitute 40 and 60 percent of the respondents respectively. The largest age group is 30-44 years at 38 percent.

Table 3.2.1: Age group and sex of respondents

Age Group (Years)	Men		Women		Both Sexes	
	n	%	n	%	n	%
18-29	561	37.4	937	62.6	1498	33.3
30-44	725	42.3	989	57.7	1713	38.1
45-59	355	40.6	520	59.4	875	19.4
60-69	159	38.4	255	61.6	414	9.2
<b>TOTAL</b>	<b>1799</b>	<b>40.0</b>	<b>2701</b>	<b>60.0</b>	<b>4500</b>	<b>100.0</b>

## Highest Level of Education

Table 3.2.2 indicates the distribution of the respondents age 18 - 69 by the level of education, age group and sex. Approximately 13 percent of the respondents have no formal schooling. The results show that 18 percent of the women have no formal schooling compared with 7 percent of men. Majority of the respondents (33 percent) have completed primary school.

Table 3.2.2: Highest level of education

Age Range	n	No formal Schooling	95% CI	Primary school incomplete	95% CI	Primary school complete	95% CI	Secondary school and above	95% CI
<b>Men</b>									
18-29	561	2.6	0.8-4.4	20.3	15.4-25.2	32.8	27.7-37.9	44.4	36.5-52.3
30-44	724	7.7	3.9-11.5	25.8	20.2-31.3	33.9	27.4-40.4	32.7	24.4-41.0
45-59	355	12.0	5.8-18.3	22.7	16.0-29.4	23.3	16.1-30.5	42.0	30.1-53.9
60-69	159	18.3	11.3-25.3	29.3	20.2-38.3	32.0	22.0-42.0	20.4	13.3-27.6
<b>TOTAL</b>	<b>1799</b>	<b>6.6</b>	<b>4.1-9.1</b>	<b>23.0</b>	<b>18.9-27.1</b>	<b>31.6</b>	<b>27.5-35.6</b>	<b>38.8</b>	<b>32.5-45.2</b>
<b>Women</b>									
18-29	937	13.0	6.9-19.1	18.8	14.0-23.6	36.2	29.5-42.8	32.0	25.0-39.0
30-44	989	16.3	9.5-23.0	26.0	20.9-31.1	36.3	30.8-41.8	21.4	15.3-27.6
45-59	520	26.3	18.9-33.7	31.8	25.6-37.9	28.4	22.1-34.6	13.5	8.8-18.3
60-69	255	49.5	39.8-59.3	27.0	19.3-34.7	20.4	11.5-29.2	3.1	0.4-5.8
<b>TOTAL</b>	<b>2701</b>	<b>18.1</b>	<b>12.7-23.5</b>	<b>23.5</b>	<b>19.6-27.5</b>	<b>34.1</b>	<b>29.8-38.5</b>	<b>24.2</b>	<b>19.4-29.1</b>
<b>Both Sexes</b>									
18-29	1498	8.0	4.0-12.0	19.5	15.7-23.3	34.5	29.3-39.7	37.9	31.1-44.8
30-44	1713	12.0	7.2-16.7	25.9	21.9-29.9	35.1	30.3-39.9	27.1	20.9-33.3
45-59	875	19.2	13.9-24.4	27.2	22.4-32.0	25.8	20.5-31.2	27.8	20.2-35.4
60-69	414	34.4	27.4-41.3	28.1	21.5-34.7	26.0	19.4-32.6	11.5	7.4-15.6
<b>TOTAL</b>	<b>4500</b>	<b>12.5</b>	<b>8.7-16.3</b>	<b>23.3</b>	<b>20.1-26.5</b>	<b>32.9</b>	<b>29.5-36.3</b>	<b>31.4</b>	<b>26.1-36.7</b>

## Marital Status of Respondents

Table 3.2.3 shows the distribution of respondents age 18-69 by marital status and sex. Sixty seven percent of respondents are married. The results show that there is no difference in proportion of men and women who are married. The results further show that 15 percent of the respondents are either separated, divorced or widowed.

Table 3.2.3: Marital Status of respondents

Age Group (years)	n	Marital status					
		% Never married	% Currently married	% Separated	% Divorced	% Widowed	% Cohabiting
18-29	561	60.6	35.3	2.1	0.0	0.2	1.8
30-44	724	9.9	80.2	7.0	1.1	1.2	0.4
45-59	355	2.8	87.6	5.1	0.8	3.7	0.0
60-69	159	1.9	76.7	7.5	3.1	10.7	0.0
<b>18-69</b>	<b>1799</b>	<b>23.6</b>	<b>67.4</b>	<b>5.2</b>	<b>0.9</b>	<b>2.2</b>	<b>0.7</b>
Age Group (years)	n	Women					
		% Never married	% Currently married	% Separated	% Divorced	% Widowed	% Cohabiting
18-29	937	27.4	66.4	3.1	0.6	1.4	1.1
30-44	988	7.5	76.1	6.6	2.3	7.2	0.3
45-59	520	4.8	63.1	6.2	4.0	21.7	0.2
60-69	254	3.1	43.7	5.1	4.3	43.7	0.0
<b>18-69</b>	<b>2699</b>	<b>13.5</b>	<b>67.2</b>	<b>5.2</b>	<b>2.3</b>	<b>11.4</b>	<b>0.5</b>
Age Group (years)	n	Both Sexes					
		% Never married	% Currently married	% Separated	% Divorced	% Widowed	% Cohabiting
18-29	1498	39.9	54.7	2.7	0.4	0.9	1.3
30-44	1712	8.5	77.9	6.8	1.8	4.7	0.4
45-59	875	4.0	73.0	5.7	2.7	14.4	0.1
60-69	413	2.7	56.4	6.1	3.9	31.0	0.0
<b>18-69</b>	<b>4498</b>	<b>17.5</b>	<b>67.3</b>	<b>5.2</b>	<b>1.7</b>	<b>7.7</b>	<b>0.6</b>

## Household wealth index quintiles

Wealth in 2015 STEPS Survey is used to determine the relative economic status of the households surveyed. In order to measure it, a proxy index was created based on the survey responses from several household variables.

These variables fall in the following categories:

- a) Type of dwelling
- b) Ownership of the dwelling
- c) Construction materials of the dwelling
- d) Source of cooking fuel
- e) Source of lighting fuel
- f) Household possessions/goods
- g) Source of water for household consumption'
- h) Type of sanitation facility

The wealth index was then generated using the multivariate statistical technique (Principal Components Analysis). Principal components are weighted averages of the variables used to construct them. Among all weighted averages, the first principal component is usually the one that has the greatest ability to predict the individual variables that make it up, where prediction is measured by the variance of the index. The wealth index was therefore the first principal component of the indicated variables.

The generated index was then used to categorize the households into five quintiles:

1. Poorest
2. Second
3. Middle
4. Fourth
5. Richest

The table 3.2.4 shows the distribution of respondents by wealth quintile. The age group 18-29 has the highest percentage of responds in the richest quintile at 26 percent.

**Table 3.2.4: Wealth quintiles by Age group of respondents**

Age Group	n	% Poorest	% Second	% Middle	% Fourth	% Richest
18-29	1498	17.7	17.0	15.1	23.9	26.3
30-44	1713	20.0	20.4	21.0	17.9	20.8
45-59	875	21.4	22.4	23.9	18.9	13.5
60-69	414	25.8	23.9	25.6	17.1	7.5
<b>TOTAL</b>	<b>4500</b>	<b>20.0</b>	<b>20.0</b>	<b>20.0</b>	<b>20.0</b>	<b>20.0</b>

### 3.3 Behavioral Risk factors

#### 3.3.1 Tobacco Use

Tobacco use is a major public health problem worldwide and it is the single most preventable cause of morbidity and mortality (W. H. O. Report, The, & Epidemic, 2008). Tobacco use continues to kill nearly 6 million people each year, including more than 600 000 non-smokers who die from exposure to tobacco smoke. Nearly 80% of these deaths occur in low and middle-income countries that are still grappling with communicable diseases. The prevalence of Tobacco use in the World Health Organization (WHO) Afro region is estimated at 14% .(Network of African Science Academies, 2014)

Kenya ratified the Framework Convention on Tobacco Control in 2004 followed by enactment of a comprehensive Tobacco Control Act (TCA) in 2007. One of the key focus areas of the TCA is research for policy formulation.

This section describes tobacco use status of respondents age 18 to 69 in Kenya. Tobacco products include smoked products (cigarettes, hand-rolled, cigars, waterpipes/shisha, or pipes/kiko) and smokeless tobacco products (snuff, chewing tobacco, kuber and pan).

#### Current tobacco users

**Table 3.3.1** shows the distribution of current tobacco use by age group and sex. Current tobacco use is defined as use of any tobacco product within the past 30 days. The overall prevalence of current tobacco use is 13 percent with significantly higher prevalence among men (23 percent) than women (4 percent). The age group 60-69 had the highest percentage of tobacco use (22 percent)

**Table 3.3.1**

Age Group (years)	Men			Women			Both Sexes		
	n	% Current users	95% CI	n	% Current users	95% CI	n	% Current users	95% CI
18-29	560	17.0	11.5-22.6	936	2.8	0.2-5.3	1496	9.6	6.5-12.6
30-44	722	26.4	21.8-30.9	989	3.3	1.0-5.6	1711	14.9	12.0-17.7
45-59	355	29.1	22.0-36.3	519	7.3	3.7-10.9	874	18.3	13.6-22.9
60-69	159	33.6	25.0-42.2	255	10.2	4.6-15.9	414	21.6	15.9-27.2
<b>18-69</b>	<b>1796</b>	<b>23.0</b>	<b>19.3-26.7</b>	<b>2699</b>	<b>4.1</b>	<b>1.7-6.5</b>	<b>4495</b>	<b>13.3</b>	<b>10.9-15.7</b>

The distribution of current tobacco use by selected demographic characteristics is detailed in table 3.3.2. The prevalence of current tobacco use is almost similar among the rural and urban residents. Current use of tobacco decreases with increase in education attainment and increase in wealth.

Table 3.3.2: Percentage of current tobacco users by selected demographic characteristics

	Both sexes		
	n	%	95% CI
<b>Residence</b>			
Rural	2305	13.4	10.6-16.2
Urban	2190	13.2	8.9-17.5
<b>Education attainment</b>			
No formal Schooling	754	20.1	11.1-29.0
Primary school incomplete	1099	18.6	14.4-22.8
Primary school complete	1426	11.3	7.6-15.0
Secondary school and above	1216	8.8	5.1-12.5
<b>Wealth Quintiles</b>			
Poorest	901	18.2	11.7-24.6
Second	897	13.2	9.7-16.7
Middle	899	13.4	9.8-16.9
Fourth	899	12.6	7.9-17.4
Richest	899	10.0	4.8-15.1
<b>TOTAL</b>	<b>4495</b>	<b>13.3</b>	<b>10.9-15.7</b>

### Current Tobacco Smokers

Table 3.3.3 indicates the distribution of current tobacco smokers by age group and sex. One in every ten respondents currently smokes tobacco. The percentage of tobacco smoking among the men is 20 percent while among the women it is less than 1 percent.

Table 3.3.3

Age Group (years)	Men			Women			Both Sexes		
	n	% Current smoker	95% CI	n	% Current smoker	95% CI	n	% Current smoker	95% CI
18-29	560	14.5	8.7-20.4	936	0.7	0.0-1.5	1496	7.3	4.4-10.1
30-44	723	23.6	19.1-28.1	989	0.9	0.0-1.7	1712	12.2	9.6-14.8
45-59	355	24.8	18.2-31.5	519	0.9	0.0-2.0	874	12.9	9.2-16.5
60-69	159	24.5	15.8-33.3	255	3.4	0.0-8.1	414	13.7	9.0-18.3
<b>18-69</b>	<b>1797</b>	<b>19.7</b>	<b>15.9-23.6</b>	<b>2699</b>	<b>0.9</b>	<b>0.0-1.8</b>	<b>4496</b>	<b>10.1</b>	<b>8.1-12.2</b>

## Mean tobacco smoked by daily tobacco smokers

Table 3.3.4 shows the mean amount of tobacco used by daily smokers by type of product. The mean number of manufactured cigarette smoked per day is 7.1 while the mean hand-rolled cigarette smoked per day is 1.8.

**Table 3.3.4:** Mean amount of tobacco used by daily smokers by type

Age Group (years)	n	Both Sexes							
		Mean # of manufactured cig.	95% CI	n	Mean # of hand-rolled cig.	95% CI	n	Mean # other type of tobacco	95% CI
18-29	55	6.4	5.2-7.6	54	0.9	0.3-1.5	55	0.3	0.0-0.7
30-44	153	7.9	6.4-9.4	153	2.0	0.5-3.6	151	0.1	0.0-0.2
45-59	87	7.0	5.3-8.7	87	2.3	0.7-4.0	86	0.1	0.0-0.2
60-69	34	6.1	3.4-8.9	34	2.2	0.9-3.5	34	0.0	0.0-0.0
<b>18-69</b>	<b>329</b>	<b>7.1</b>	<b>6.3-7.9</b>	<b>328</b>	<b>1.8</b>	<b>0.9-2.6</b>	<b>326</b>	<b>0.1</b>	<b>0.0-0.3</b>

A third of the daily cigarette smokers consume less than five cigarettes per day while five percent smoke more than twenty five cigarettes daily (Appendix Table B1)

## Smoking status

Table 3.3.5 shows the smoking status of respondents categorized as daily smokers, non daily smokers, former smokers and never smokers. Overall, 8 percent of the respondents are current daily smokers. Eighty three percent of respondents have never smoked while 7 percent are former smokers. Ninety seven percent of the women have never smoked compared with 67 percent of the men

**Table 3.3.5:** Smoking status of respondents

Age Group (years)	n	Men							
		% Daily	95% CI	% Non-daily	95% CI	% Former smoker	95% CI	% Never smoker	95% CI
18-29	560	11.3	5.6-17.1	3.2	1.4-5.0	5.9	3.5-8.3	79.6	73.6-85.6
30-44	723	19.7	15.6-23.9	3.8	1.2-6.5	16.2	12.1-20.3	60.3	55.2-65.3
45-59	355	22.6	16.0-29.2	2.2	0.3-4.2	21.9	15.0-28.9	53.2	44.7-61.8
60-69	159	23.3	14.3-32.2	1.3	0.0-3.4	24.6	15.9-33.3	50.9	40.5-61.3
<b>18-69</b>	<b>1797</b>	<b>16.6</b>	<b>13.1-20.0</b>	<b>3.2</b>	<b>2.0-4.3</b>	<b>12.9</b>	<b>10.7-15.1</b>	<b>67.4</b>	<b>63.0-71.7</b>
Women									
18-29	936	0.1	0.0-0.3	0.6	0.0-1.3	1.2	0.0-3.0	98.1	96.1-100.0
30-44	989	0.5	0.0-1.1	0.4	0.0-1.0	1.1	0.3-1.9	98.0	96.8-99.3
45-59	519	0.6	0.0-1.6	0.3	0.0-0.8	2.3	0.9-3.7	96.8	95.1-98.5
60-69	255	0.9	0.0-2.1	2.5	0.0-7.2	6.6	1.9-11.4	90.0	83.8-96.2
<b>18-69</b>	<b>2699</b>	<b>0.4</b>	<b>0.0-0.7</b>	<b>0.6</b>	<b>0.0-1.4</b>	<b>1.7</b>	<b>0.7-2.6</b>	<b>97.4</b>	<b>96.1-98.7</b>
Both Sexes									
18-29	1496	5.5	2.7-8.2	1.8	0.9-2.7	3.5	2.1-4.9	89.3	85.6-92.9
30-44	1712	10.1	7.8-12.5	2.1	0.7-3.5	8.6	6.5-10.8	79.1	76.0-82.3
45-59	874	11.6	8.1-15.2	1.3	0.3-2.3	12.1	8.8-15.5	75.0	70.6-79.3
60-69	414	11.8	7.1-16.4	1.9	0.0-4.5	15.3	10.5-20.2	71.0	65.5-76.5
<b>18-69</b>	<b>4496</b>	<b>8.3</b>	<b>6.5-10.1</b>	<b>1.8</b>	<b>1.1-2.5</b>	<b>7.2</b>	<b>6.0-8.3</b>	<b>82.7</b>	<b>80.1-85.3</b>

## Mean age of smoking initiation

Table 3.3.6 highlights the mean age that current smokers started smoking. The overall mean age of starting smoking is 21 years.

**Table 3.3.6:** The mean age of smoking initiation

Age Group (years)	Men			Women			Both Sexes		
	n	Mean age	95% CI	n	Mean age	95% CI	n	Mean age	95% CI
18-29	53	17.3	15.6-18.9				54	17.3	15.7-18.9
30-44	145	21.3	18.5-24.1				150	21.4	18.7-24.2
45-59	82	23.4	21.2-25.6				84	24.0	21.6-26.3
60-69	31	22.6	19.4-25.7				33	22.5	19.4-25.6
<b>18-69</b>	<b>311</b>	<b>20.6</b>	<b>19.2-22.0</b>	<b>10*</b>			<b>321</b>	<b>20.8</b>	<b>19.4-22.2</b>

## Tobacco products used by age group

The tobacco products used by current smokers are illustrated in table 3.3.7. Nine in every ten current smoker uses manufactured cigarettes. Nearly a quarter of the current smokers use hand-rolled cigarettes while 6 percent use shisha.

**Table 3.3.7:** Percentage of smokers smoking each of the following products current

Age Group (years)	Both Sexes							
	N	% Manuf. cigs.	% Hand- rolled cigs.	% Pipes of tobacco	% Cigars, cheroots, cigarillos	% Pipes of tobacco	% Shisha	% Other
18-29	75	88.7	20.5	0	2.7	0	14.2	12.9
30-44	177	96.1	20.7	0.2	3.1	0.2	2.3	2.6
45-59	98	83.8	36	0	3	0	0	0.9
60-69	39	77.7	34.3	0	0	0	0	9.3
<b>18-69</b>	<b>389</b>	<b>89.8</b>	<b>24.7</b>	<b>0.1</b>	<b>2.7</b>	<b>0.1</b>	<b>5.6</b>	<b>6.2</b>

## Smokeless Tobacco

Table 3.3.8 shows the distribution of current smokeless tobacco users by age group and sex. Overall, 4 percent of the respondents currently use smokeless tobacco. The age group 60-69 are the highest users of smokeless tobacco (9 percent). The percentage of current smokeless tobacco users among the sexes is similar; men (4 percent) and (3 percent).

**Table 3.3.8:** Percentage of current users of smokeless tobacco

Current users of smokeless tobacco									
Age Group (years)	Men			Women			Both Sexes		
	n	% Current users	95% CI	n	% Current users	95% CI	n	% Current users	95% CI
18-29	560	3.1	0.4-5.9	936	2.2	0.0-4.5	1496	2.7	0.7-4.6
30-44	722	3.8	2.2-5.4	989	2.5	0.7-4.2	1711	3.1	1.9-4.3
45-59	355	4.7	1.3-8.1	519	6.4	2.9-10.0	874	5.6	2.6-8.5
60-69	159	9.7	4.0-15.5	255	8.1	3.8-12.4	414	8.9	4.5-13.3
<b>18-69</b>	<b>1796</b>	<b>4.0</b>	<b>2.4-5.6</b>	<b>2699</b>	<b>3.3</b>	<b>1.3-5.2</b>	<b>4495</b>	<b>3.6</b>	<b>2.1-5.1</b>

Table 3.3.9 details current smokeless tobacco users by selected demographic characteristics. Five percent of the respondents residing in rural areas are currently using smokeless tobacco while only 2 percent of respondents residing in urban areas are using smokeless tobacco. Respondents with no formal education comprise the highest users of smokeless tobacco at 15 percent. Among the wealth quintiles, the poorest respondents have the largest percentage of current smokeless tobacco use at 9 percent.

**Table 3.3.9.** Percentage of current users of smokeless tobacco by selected demographic characteristics

Residence	Both sexes		
	n	%	95% CI
Rural	2305	4.7	2.4-7.0
Urban	2190	1.9	0.3-3.5
<b>Education Levels</b>			
No formal Schooling	754	15.3	7.1-23.6
Primary school incomplete	1099	3.4	1.6-5.2
Primary school complete	1426	1.2	0.5-1.8
Secondary school and above	1216	1.7	0.0-3.6
<b>Wealth Quintiles</b>			
Poorest	901	9.8	4.1-15.6
Second	897	3.3	1.9-4.8
Middle	899	2.3	0.9-3.6
Fourth	899	0.9	0.1-1.7
Richest	899	2.0	0.0-4.6
<b>TOTAL</b>	<b>4495</b>	<b>3.6</b>	<b>2.1-5.1</b>

**Table 3.3.10** shows the smokeless tobacco use status of respondents categorized as daily users, non daily users, former users and never users. Overall, 95 percent of the respondents have never used smokeless tobacco. Two percent of respondents are former users of smokeless tobacco. Three percent and 2 percent of women and men respectively are current daily smokeless tobacco users.

**Table 3.3.10. Status of smokeless tobacco use**

Smokeless tobacco use								
Age Group (years)	n	Men				Non user		
		Current user	% Daily	95% CI	% Non-daily	95% CI	% Past user	95% CI
18-29	560	0.7	0.0-1.6	2.4	0.0-5.1	2.7	1.1-4.3	94.1
30-44	722	2.4	1.2-3.7	1.4	0.4-2.3	3.8	1.4-6.2	92.4
45-59	355	3.5	1.0-6.1	1.2	0.0-2.6	2.7	0.7-4.8	92.5
60-69	159	7.5	2.9-12.2	2.2	0.0-6.1	1.4	0.0-3.9	88.8
<b>18-69</b>	<b>1796</b>	<b>2.1</b>	<b>1.2-3.1</b>	<b>1.9</b>	<b>0.5-3.2</b>	<b>3.0</b>	<b>1.9-4.2</b>	<b>93.0</b>
<b>Women</b>								
18-29	936	2.0	0.0-4.2	0.2	0.0-0.7	0.1	0.0-0.2	97.7
30-44	989	1.9	0.5-3.4	0.5	0.0-1.2	0.9	0.0-2.2	96.7
45-59	519	5.6	2.3-9.0	0.8	0.0-2.0	1.3	0.1-2.5	92.3
60-69	255	6.3	2.7-9.9	1.8	0.0-4.3	5.0	1.7-8.4	86.9
<b>18-69</b>	<b>2699</b>	<b>2.8</b>	<b>1.0-4.5</b>	<b>0.5</b>	<b>0.1-0.9</b>	<b>0.8</b>	<b>0.2-1.4</b>	<b>96.0</b>
<b>Both Sexes</b>								
18-29	1496.0	1.4	0.0-2.9	1.3	0.0-2.6	1.3	0.6-2.1	96.0
30-44	1711.0	2.2	1.2-3.2	0.9	0.4-1.5	2.3	1.0-3.7	94.5
45-59	874.0	4.6	2.0-7.2	1.0	0.1-1.9	2.0	0.9-3.2	92.4
60-69	414.0	6.9	3.5-10.3	2.0	0.0-5.1	3.3	1.2-5.3	87.8
<b>18-69</b>	<b>4495.0</b>	<b>2.4</b>	<b>1.2-3.7</b>	<b>1.2</b>	<b>0.4-1.9</b>	<b>1.9</b>	<b>1.2-2.5</b>	<b>94.5</b>
<b>92.8-96.2</b>								

The distribution of current users of smokeless tobacco using various smokeless tobacco products is detailed in table 3.3.11. Forty three percent of the current users of smokeless tobacco use snuff by mouth, 38 percent use chewing tobacco followed by 25 percent who use snuff by nose.

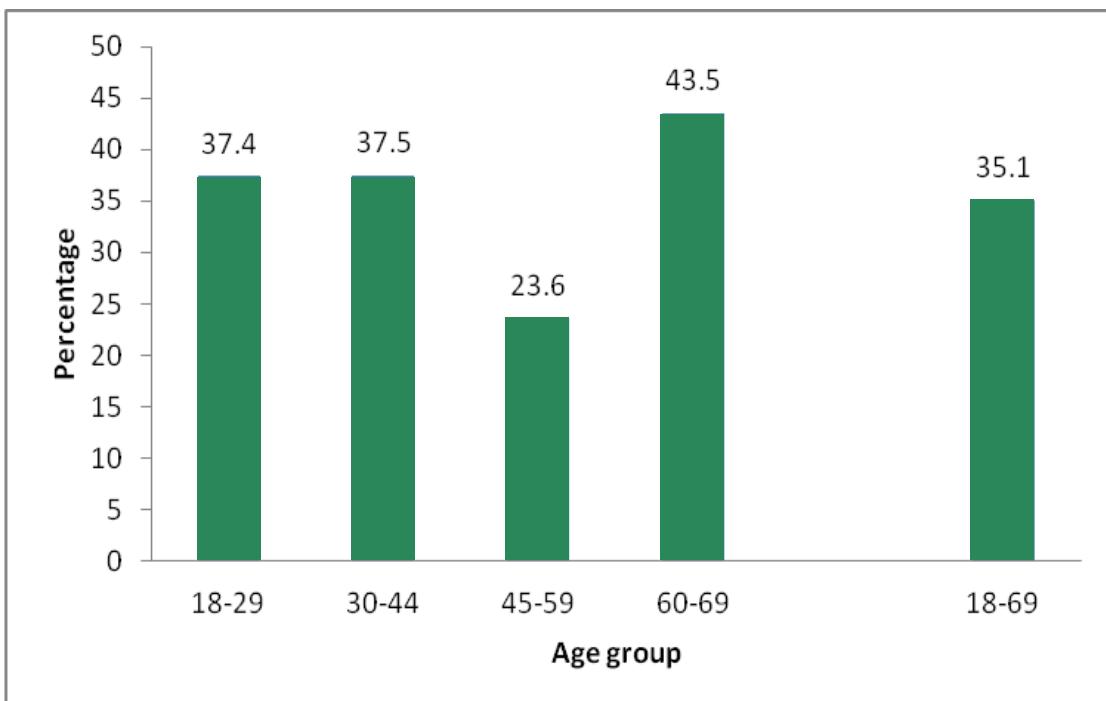
**Table 3.3.11: Percentage of current users of smokeless tobacco by selected products**

Both Sexes									
Age Group (years)	n	% Snuff by mouth	95% CI	% Snuff by nose	95% CI	% Chewing tobacco	95% CI	% Other	95% CI
18-29	25	56.8	25.9-87.6	4.7	0.0-10.9	42.4	15.5-69.2	1.5	0.0-4.8
30-44	61	27.7	10.2-45.2	43.7	25.8-61.6	41.7	22.2-61.1	0.8	0.0-2.3
45-59	57	35.3	9.8-60.9	32.5	11.4-53.6	33.0	5.2-60.9	0.8	0.0-2.4
60-69	39	57.3	33.1-81.5	24.0	6.6-41.4	29.9	13.2-46.5	11.2	0.0-29.8
<b>18-69</b>	<b>182</b>	<b>43.4</b>	<b>25.2-61.5</b>	<b>25.1</b>	<b>12.5-37.6</b>	<b>38.2</b>	<b>21.5-55.0</b>	<b>2.4</b>	<b>0.0-5.3</b>

## Tobacco Smoking Cessation

Figure 3.3.1 shows the distribution of current smokers who have attempted to quit smoking in the past 12 months. Thirty five percent of the current smokers have tried to stop smoking in the past 12 months.

Figure 3.3.1: Percentage of current smokers who have tried to stop smoking in past 12 months



**Table 3.3.12** indicates the distribution of current smokers who have attempted to quit smoking in the past 12 months by selected demographic characteristics. Forty two percent and 26 percent of the residents residing in rural and urban areas respectively have attempted to quit smoking in the past 12 months. Respondents with no formal education constitute the highest proportion (47 percent) of those who have tried to stop smoking in the past 12 month. Only one in five of the respondents from the richest quintile have attempted to quit smoking in the past 12 month.

**Table 3.3.12:** Percentage of current smokers who have tried to stop smoking by selected demographic characteristics

Residence	Both sexes		
	n	%	95% CI
Rural	188	41.9	33.4-50.4
Urban	201	26.4	12.5-40.3
<b>Education level</b>			
No formal Schooling	35	46.5	29.7-63.4
Primary school incomplete	141	36.0	23.6-48.5
Primary school complete	136	33.8	19.4-48.2
Secondary school and above	77	31.8	18.0-45.7
<b>Wealth Quintiles</b>			
Poorest	70	34.1	20.3-47.9
Second	91	43.8	29.4-58.3
Middle	89	42.8	30.6-55.0
Fourth	73	31.8	12.8-50.9
Richest	66	21.6	4.6-38.6
<b>TOTAL</b>	<b>389</b>	<b>35.1</b>	<b>26.3-43.9</b>

**Table 3.3.13** details current smokers who have been advised by doctor or other health worker to stop smoking. Overall, only 14 percent of the current smokers have been advised by a doctor or other health worker to stop smoking in the past 12 months. Forty two percent of current smokers in age 60-69 years have been advised by a doctor or health worker to stop smoking.

**Table 3.3.13:** Percentage of smokers who have been advised by a health worker to stop smoking by age group

Age Group (years)	Men			Women			Both Sexes		
	n	% Advised to stop smoking	95% CI	n	% Advised to stop smoking	95% CI	n	% Advised to stop smoking	95% CI
18-29	54	11.5	1.2-21.7				58	10.7	1.3-20.1
30-44	136	12.4	5.7-19.1				143	12.4	5.9-18.9
45-59	81	11.6	3.4-19.8				85	13.1	4.6-21.6
60-69	26	48.2	23.1-73.4				31	42.2	17.8-66.5
<b>18-69</b>	<b>297</b>	<b>14.2</b>	<b>8.8-19.5</b>	21*			<b>317</b>	<b>14.2</b>	<b>9.0-19.3</b>

\*Indicates estimate based on less than 25 unweighted cases and has been suppressed.

## Exposure to second hand smoking

Respondents exposed to second hand smoking in the home during the past 30 days are detailed in table 3.3.14. Nearly a quarter (24 percent) of the respondents (including current smokers) reported having been exposed to second hand smoking in their homes at least once, with more men (30 percent) than women (18 percent) being exposed.

**Table 3.3.14:** Percentage of respondents exposed to second-hand smoke in the home

Age Group (years)	Men			Women			Both Sexes		
	n	% Exposed	95% CI	n	% Exposed	95% CI	n	% Exposed	95% CI
18-29	560	31.1	25.0-37.2	936	16.5	12.4-20.6	1496	23.5	19.1-27.8
30-44	723	30.7	25.6-35.9	989	20.3	16.0-24.7	1712	25.5	21.6-29.4
45-59	355	27.8	20.7-34.9	519	19.6	15.2-24.0	874	23.7	19.3-28.0
60-69	159	28.3	20.8-35.7	255	17.8	12.6-23.0	414	22.9	18.3-27.5
<b>18-69</b>	<b>1797</b>	<b>30.3</b>	<b>26.2-34.4</b>	<b>2699</b>	<b>18.3</b>	<b>15.0-21.5</b>	<b>4496</b>	<b>24.1</b>	<b>20.9-27.3</b>

Table 3.3.15 shows the distribution of respondents exposed to second-hand smoke in the home by selected demographic characteristics. There is no significant difference in proportion of respondents exposed to second hand smoking by place of residence. Respondents from the richest wealth quintile were the least exposed to second hand smoking at home at 17 percent

Residence	Both sexes		
	n	%	95% CI
Rural	2305	24.0	20.9-27.1
Urban	2191	24.3	17.6-31.0
<b>Education</b>			
No formal Schooling	754	12.1	7.4-16.8
Primary school incomplete	1100	35.3	30.5-40.0
Primary school complete	1426	25.3	20.3-30.2
Secondary school and above	1216	19.5	14.2-24.8
<b>Wealth Quintiles</b>			
Poorest	901	25.2	18.7-31.6
Second	897	28.7	24.5-33.0
Middle	899	25.2	20.8-29.6
Fourth	900	26.1	20.4-31.8
Richest	899	16.8	9.1-24.4
<b>TOTAL</b>	<b>4496</b>	<b>24.1</b>	<b>20.9-27.3</b>

**Table 3.3.16** highlights the distribution of respondents exposed to second-hand smoke in the workplace during the past 30 days. A fifth of the respondents reported having been exposed to second-hand smoke at their work place during the past 30 days. A significantly higher proportion of men (30 percent) than women (12 percent) reported that they been exposed to second-hand smoke in the workplace.

**Table 3.3.16:** Percentage of respondents exposed to second-hand smoke in the workplace in the past 30 days

Age Group (years)	Men			Women			Both Sexes		
	N	% Exposed	95% CI	n	% Exposed	95% CI	n	% Exposed	95% CI
18-29	433	32.2	24.8-39.6	721	11.2	7.0-15.3	1154	21.2	16.4-26.1
30-44	570	29.6	22.9-36.4	723	15.0	10.5-19.5	1293	22.6	18.0-27.2
45-59	266	25.9	18.7-33.1	367	11.4	6.2-16.6	633	18.9	14.3-23.5
60-69	119	14.4	6.7-22.2	162	8.9	3.2-14.6	281	11.9	6.2-17.5
<b>18-69</b>	<b>1388</b>	<b>29.4</b>	<b>24.5-34.4</b>	<b>1973</b>	<b>12.3</b>	<b>9.7-15.0</b>	<b>3361</b>	<b>20.9</b>	<b>17.6-24.2</b>

### 3.3.2 Alcohol consumption

#### Distribution of Alcohol Consumption

Distribution of alcohol consumption among the respondents is shown in table 3.3.17. Nineteen percent of respondents are current drinkers of alcohol with a significant difference between the sexes (34 percent of men against 5 percent of women). Three in five respondents are lifetime abstainers with the percentage of abstinence among women being nearly twice that among men (80 percent and 41 percent respectively). Age group 30-44 among the men constitute the highest consumers of alcohol at 44 percent.

	N	% Current drinker (past 30 days)	95% CI	% Drank in past 12 months, not current	95% CI	% Past 12 months abstainer	95% CI	% Lifetime abstainer	95% CI
<b>Men</b>									
18-29	561	24.9	18.8-31.1	9.0	5.0-13.1	14.6	10.6-18.7	51.4	45.5-57.2
30-44	723	44.0	38.4-49.6	6.2	4.0-8.3	17.6	13.0-22.3	32.2	26.5-37.9
45-59	355	35.8	27.6-44.0	4.1	1.6-6.6	23.0	17.1-28.9	37.1	28.3-45.9
60-69	159	38.9	31.0-46.8	5.9	2.1-9.8	27.7	19.5-35.8	27.5	19.8-35.3
<b>18-69</b>	<b>1798</b>	<b>33.8</b>	<b>29.5-38.1</b>	<b>7.1</b>	<b>5.0-9.2</b>	<b>17.7</b>	<b>14.7-20.7</b>	<b>41.4</b>	<b>37.3-45.4</b>
<b>Women</b>									
18-29	936	5.5	3.0-8.0	6.4	3.5-9.4	7.8	4.8-10.8	80.3	75.2-85.3
30-44	989	4.9	2.9-6.9	4.0	2.2-5.8	7.5	5.4-9.6	83.5	79.9-87.2
45-59	519	4.4	2.0-6.7	2.9	0.9-5.0	13.7	10.1-17.4	79.0	74.2-83.8
60-69	255	10.5	1.1-20.0	3.1	0.3-6.0	21.2	14.4-28.0	65.1	54.6-75.6
<b>18-69</b>	<b>2699</b>	<b>5.4</b>	<b>3.6-7.2</b>	<b>4.9</b>	<b>3.3-6.6</b>	<b>9.4</b>	<b>7.6-11.1</b>	<b>80.3</b>	<b>77.1-83.5</b>
<b>Both Sexes</b>									
18-29	1497	14.8	11.7-17.9	7.7	5.5-9.8	11.1	8.3-13.9	66.5	62.2-70.7
30-44	1712	24.5	20.6-28.3	5.1	3.7-6.5	12.6	9.9-15.3	57.8	53.2-62.5
45-59	874	20.1	15.4-24.9	3.5	1.9-5.1	18.4	15.0-21.8	58.0	52.5-63.4
60-69	414	24.3	17.6-31.1	4.5	2.2-6.8	24.4	18.7-30.0	46.8	40.1-53.5
<b>18-69</b>	<b>4497</b>	<b>19.3</b>	<b>16.7-21.8</b>	<b>6.0</b>	<b>4.8-7.2</b>	<b>13.4</b>	<b>11.5-15.3</b>	<b>61.3</b>	<b>57.9-64.6</b>

The percentage of current drinkers among the urban residents is twenty three percent and among the rural residents is seventeen percent. The richest quintile has the highest proportion of current drinkers (24 percent) see Appendix Table B2 .

### Frequency of Alcohol Consumption past 7 days

Thirteen percent of current alcohol drinkers consume alcohol daily. Nearly half of current drinkers consume alcohol 1 to 2 days in a week, while eight percent consumed for 5 to 6 days as shown in table 3.3.18. Sixteen percent of current drinkers did not consume alcohol at all during the whole week.

**Table 3.3.18:** Frequency of alcohol consumption in the past 7 days among current drinkers

Age Group (years)	n	Men									
		% Daily	95% CI	% 5-6 days	95% CI	% 3-4 days	95% CI	% 1-2 days	95% CI	% 0 days	95% CI
18-29	122	6.7	0.7-12.7	7.8	0.0-18.1	10.2	4.0-16.4	55.9	44.7-67.1	19.4	11.6-27.1
30-44	267	13.1	6.9-19.4	9.0	3.6-14.4	16.7	11.1-22.3	46.2	36.2-56.1	15.0	8.6-21.5
45-59	120	17.7	10.4-25.0	4.1	0.0-8.2	17.9	6.9-29.0	46.4	33.9-58.9	13.9	6.9-20.9
60-69	56	26.5	12.1-40.9	10.3	0.7-19.9	17.7	6.4-28.9	28.5	16.4-40.6	17.1	4.6-29.5
<b>18-69</b>	<b>565</b>	<b>12.6</b>	<b>8.0-17.3</b>	<b>7.8</b>	<b>2.4-13.3</b>	<b>14.8</b>	<b>11.1-18.5</b>	<b>48.3</b>	<b>40.5-56.2</b>	<b>16.4</b>	<b>12.8-20.0</b>
Women											
18-29	43	6.5	0.0-17.0	7.1	0.0-15.1	7.5	0.0-19.9	67.7	46.8-88.7	11.1	1.6-20.5
30-44	49	9.7	0.0-21.4	0.5	0.0-1.4	5.7	0.0-13.7	59.9	36.1-83.8	24.2	7.3-41.0
45-59	26	9.0	0.0-20.8	13.1	0.0-29.2	20.8	1.9-39.7	42.2	11.4-73.0	14.9	0.0-36.2
60-69	18	55.1	8.6-100.0	8.2	0.0-22.0	2.8	0.0-9.0	28.1	0.0-61.8	5.8	0.0-18.4
<b>18-69</b>	<b>136</b>	<b>12.9</b>	<b>0.6-25.2</b>	<b>6.0</b>	<b>1.0-11.0</b>	<b>8.1</b>	<b>1.0-15.2</b>	<b>58.2</b>	<b>43.5-72.9</b>	<b>14.8</b>	<b>7.5-22.1</b>
Both Sexes											
18-29	165	6.7	1.5-11.8	7.7	0.0-16.1	9.7	4.3-15.0	58.2	48.7-67.8	17.7	11.0-24.5
30-44	316	12.8	7.1-18.5	8.2	3.3-13.1	15.6	10.4-20.7	47.6	37.6-57.5	15.9	10.2-21.6
45-59	146	16.8	10.2-23.4	5.0	0.5-9.5	18.2	8.3-28.1	46.0	34.0-57.9	14.0	7.5-20.6
60-69	74	33.0	10.9-55.2	9.8	1.6-18.0	14.3	4.5-24.1	28.4	15.8-41.0	14.5	4.0-25.0
<b>18-69</b>	<b>701</b>	<b>12.7</b>	<b>7.7-17.6</b>	<b>7.6</b>	<b>2.8-12.4</b>	<b>13.8</b>	<b>10.3-17.4</b>	<b>49.8</b>	<b>42.2-57.3</b>	<b>16.2</b>	<b>13.1-19.3</b>

**Table 3.3.19** shows the mean number of drinking occasions among current drinkers. The mean number of drinking occasions in the past 30 days is 2.6 (2.7 among men and 1.9 among women).

**Table 3.3.19:** Mean number of drinking occasions in the past 30 days among current drinkers

Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-29	124	2.4	1.9-2.9	43	1.6	1.3-1.9	167	2.2	1.9-2.6
30-44	268	2.9	2.6-3.2	49	2.0	1.6-2.4	317	2.8	2.5-3.1
45-59	116	2.9	2.4-3.3	27	2.1	1.4-2.7	143	2.8	2.3-3.2
60-69	58	2.1	1.7-2.5	18	2.6	1.8-3.3	76	2.2	1.9-2.5
<b>18-69</b>	<b>566</b>	<b>2.7</b>	<b>2.4-2.9</b>	<b>137</b>	<b>1.9</b>	<b>1.6-2.1</b>	<b>703</b>	<b>2.6</b>	<b>2.3-2.8</b>

**Table 3.3.20** shows the average volume of alcohol consumed during a drinking occasion. The mean number of standard drinks per drinking occasion 9.7 with no significant difference between the sexes.

**Table 3.3.20:** Mean number of standard drinks per drinking occasion among current drinkers

Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-29	125	9.8	7.3-12.3	43	6.7	4.1-9.2	168	9.2	7.2-11.3
30-44	273	10.4	8.8-12.0	48	7.2	4.5-9.9	321	10.1	8.7-11.6
45-59	121	9.0	7.0-10.9	27	5.5	3.4-7.5	148	8.6	6.9-10.3
60-69	58	10.5	6.5-14.4	18	21.1	2.2-40.0	76	12.8	4.7-21.0
<b>18-69</b>	<b>577</b>	<b>10.0</b>	<b>8.6-11.4</b>	<b>136</b>	<b>8.2</b>	<b>4.6-11.8</b>	<b>713</b>	<b>9.7</b>	<b>8.3-11.2</b>

**Table 3.3.21** shows the mean of the largest number of drinks consumed on a single drinking occasion. The mean maximum number of standard drinks on one occasion is 13.2 with men consuming a higher quantity (13.7) compared with women (10.2).

**Table 3.3.21:** Mean maximum number of standard drinks consumed on one occasion in the past 30 days

Age Group (years)	Men			Women			Both Sexes		
	n	Mean maximum number	95% CI	n	Mean maximum number	95% CI	n	Mean maximum number	95% CI
18-29	125	13.8	10.9-16.8	43	9.4	3.8-15.0	168	13.0	10.5-15.5
30-44	272	14.6	12.2-16.9	48	10.0	4.5-15.5	320	14.1	12.0-16.2
45-59	121	11.8	9.6-14.0	27	6.4	3.6-9.1	148	11.2	9.2-13.2
60-69	58	13.3	8.5-18.1	18	18.8	3.4-34.3	76	14.5	7.1-21.9
<b>18-69</b>	<b>576</b>	<b>13.7</b>	<b>12.0-15.5</b>	<b>136</b>	<b>10.2</b>	<b>5.7-14.7</b>	<b>712</b>	<b>13.2</b>	<b>11.5-15.0</b>

**Table 3.3.22** shows proportion of current drinkers consuming 6 or more drinks on a single occasion. Overall, 13 percent of the respondents had six or more drinks on a single occasion. The percentage of men was significantly higher (23 percent) than women (3 percent).

**Table 3.3.22:** Consumption of six or more drinks on a single occasion among current drinkers by age group

Age Group (years)	Men			Women			Both Sexes		
	N	% ≥ 6 drinks	95% CI	n	% ≥ 6 drinks	95% CI	n	% ≥ 6 drinks	95% CI
18-29	561	17.7	11.2-24.2	936	2.8	0.7-4.9	1497	9.9	6.8-13.1
30-44	723	30.9	25.2-36.7	989	2.1	0.9-3.4	1712	16.6	12.8-20.3
45-59	355	21.8	15.4-28.2	519	1.7	0.6-2.8	874	11.8	8.0-15.6
60-69	159	23.6	16.0-31.1	255	7.2	0.0-16.6	414	15.1	8.3-22.0
<b>18-69</b>	<b>1798</b>	<b>23.1</b>	<b>18.6-27.6</b>	<b>2699</b>	<b>2.7</b>	<b>1.2-4.1</b>	<b>4497</b>	<b>12.7</b>	<b>10.2-15.1</b>

**Table 3.3.23** shows the distribution of heavy episodic drinking among current drinkers by selected demographic characteristics. Respondents with no formal education have the lowest percentage of consumption of six or more drinks on a single occasion (8 percent). Current drinkers in the richest wealth quintile have the highest percentage of consumption of six or more drinks on a single occasion.

**Table 3.3.23** shows the distribution of heavy episodic drinking among current drinkers by Table 3.3.23: Six or more drinks on a single occasion among current drinkers by level of education and wealth index

Education	BOTH SEXES		
	n	% ≥ 6 drinks	95% CI
No formal schooling	754	7.9	3.3-12.6
Primary school incomplete	1100	15.7	10.9-20.5
Primary school complete	1427	8.4	6.1-10.7
Secondary school and above	1216	16.8	11.0-22.5
<b>WEALTH QUINTILE</b>			
Poorest	901	11.4	6.2-16.6
Second	898	10.1	7.0-13.3
Middle	899	10.9	8.4-13.4
Fourth	900	12.4	8.9-16.0
Richest	899	17.5	10.0-25.0
<b>TOTAL</b>	<b>4497</b>	<b>12.7</b>	<b>10.2-15.1</b>

### Cessation of alcohol consumption

Table 3.3.24 shows distribution of cessation of alcohol consumption due to health reasons among former drinkers. Overall, 17 percent of the respondents who had not drunk alcohol in the past 12 months had stopped drinking due to health reasons. There is a significant difference between the sexes in regards to cessation due to health reasons, men (24 percent) and women (5 percent).

**Table 3.3.24:** Cessation of alcohol use due to health reasons among former drinkers

Age Group (years)	Men			Women			Both Sexes		
	n	% stopping due to health reasons	95% CI	n	% stopping due to health reasons	95% CI	n	% stopping due to health reasons	95% CI
18-29	68	23.6	5.5-41.8	63	0.7	0.0-2.1	131	15.2	2.5-27.8
30-44	111	32.3	14.6-50.0	79	9.0	0.0-18.8	190	25.3	11.8-38.9
45-59	75	9.7	2.3-17.1	66	4.1	0.0-8.7	141	7.6	2.5-12.7
60-69	40	27.6	11.6-43.6	50	13.1	2.8-23.4	90	21.1	10.8-31.4
<b>18-69</b>	<b>294</b>	<b>23.9</b>	<b>13.5-34.3</b>	<b>258</b>	<b>5.1</b>	<b>2.0-8.2</b>	<b>552</b>	<b>17.2</b>	<b>9.8-24.5</b>

**Table 3.3.25** shows distribution of alcohol cessation by selected demographic characteristics. Twenty one percent of the urban dwellers stopped drinking due to health reasons compared to 15 percent of those in the rural areas. Percentage of respondents who stopped drinking due to health reasons increases with increase in level of education..

**Table 3.3.25:** Cessation of alcohol consumption due to health reasons by selected demographic characteristics

Residence	BOTH SEXES		
	n	%	95% CI
Rural	281	14.6	9.7-19.4
Urban	271	21.1	5.0-37.3
EDUCATION	N	%	95% CI
No formal schooling	59	16.2	5.6-26.8
Primary school incomplete	151	14.3	7.7-20.9
Primary school complete	192	16.6	6.8-26.3
Secondary school and above	150	20.4	5.9-34.9

**Table 3.3.26** shows the percentage of current drinkers who consume unrecorded alcohol. Thirty Six percent of current drinkers consume unrecorded alcohol with similar proportions between the sexes.

**Table 3.3.26:** Consumption of unrecorded alcohol among current drinkers

Age Group (years)	Men			Women			Both Sexes		
	n	% consuming unrecorded alcohol	95% CI	n	% consuming unrecorded alcohol	95% CI	n	% consuming unrecorded alcohol	95% CI
18-29	122	29.7	15.7-43.7	43	18.1	1.7-34.5	165	27.4	15.4-39.4
30-44	268	40.0	29.2-50.8	49	35.1	17.8-52.4	317	39.5	29.0-50.1
45-59	119	34.3	18.8-49.7	28	62.4	36.4-88.4	147	37.4	22.6-52.1
60-69	57	38.5	20.6-56.3	18	83.9	63.4-100.0	75	48.9	28.8-69.0
<b>18-69</b>	<b>566</b>	<b>35.5</b>	<b>25.7-45.2</b>	<b>138</b>	<b>35.5</b>	<b>20.3-50.8</b>	<b>704</b>	<b>35.5</b>	<b>26.2-44.7</b>

**Table 3.3.27** shows the distribution of consumption of unrecorded alcohol by residence and wealth index. Forty five percent of current drinkers residing in rural areas consume unrecorded alcohol compared to 24 percent in the urban areas. Consumption of unrecorded alcohol decreases with increase in wealth.

**Table 3.3.27:** Consumption of unrecorded alcohol during past 7 days

Residence	Both sexes		
	n	mean	95% CI
Rural	329	44.8	36.2-53.5
Urban	375	24.1	8.7-39.4
<b>Total</b>	<b>704</b>	<b>35.5</b>	<b>26.2-44.7</b>
Wealth	Both sexes		
	n	mean	95% CI
Poorest	138	56.2	43.2-69.2
Second	137	54.4	42.1-66.6
Middle	134	42.7	29.9-55.4
Fourth	127	38.0	14.1-62.0
Richest	168	5.1	0.1-10.1
<b>TOTAL</b>	<b>704</b>	<b>35.5</b>	<b>26.2-44.7</b>

### 3.3.3 Diet

Consuming a healthy diet throughout the life-course helps prevent malnutrition in all its forms as well as a range of non-communicable diseases and conditions. However, the increased production of processed foods, rapid urbanization and changing lifestyles have led to a shift in dietary patterns. People are now consuming more foods high in energy, fats, free sugars or salt/sodium, and many do not eat enough fruit, vegetables and dietary fiber such as whole grains. (WHO, 2015)

This survey asked respondents questions on the following areas of interest and are covered in this section; fruits and vegetable consumption, dietary salt intake, dietary sugar intake, and consumption of oils and fats at the household level.

#### Fruits and vegetable consumption

##### Mean number of days of fruit consumption in a typical week

Respondents' were asked about their fruit and vegetable intake in a typical week and on how many servings of fruit and vegetables they consumed on one of these days. The World Health Organization (WHO) recommends at least 400g (5 portions) of fruits and vegetables a day (WHO, 2015).

**Table 3.3.28** below shows the distribution of mean number of days of fruit consumption among the respondents by age and sex. The mean consumption of fruits among the respondents is 2.5 days per week

**Table 3.3.28:** Mean number of days of fruit consumption

Age Group (years)	Men			Women			Both Sexes		
	n	Mean number of days	95% CI	N	Mean number of days	95% CI	n	Mean number of days	95% CI
18-29	557	2.8	2.5-3.2	931	2.6	2.3-3.0	1488	2.7	2.5-3.0
30-44	720	2.5	2.2-2.8	980	2.3	2.0-2.6	1700	2.4	2.1-2.6
45-59	352	2.3	2.0-2.7	516	2.4	2.1-2.7	868	2.4	2.1-2.6
60-69	158	2.1	1.7-2.6	253	1.9	1.4-2.4	411	2.0	1.7-2.3
<b>18-69</b>	<b>1787</b>	<b>2.6</b>	<b>2.3-2.8</b>	<b>2680</b>	<b>2.4</b>	<b>2.2-2.7</b>	<b>4467</b>	<b>2.5</b>	<b>2.3-2.7</b>

### Mean number of days vegetables consumed in a typical week

Table 3.3.29 below shows the distribution of mean number of days of vegetable consumption among the respondents by age and sex. The mean number of days of vegetable consumption in a typical week is 5 days.

**Table 3.3.29:** Mean number of days vegetables consumed in a typical week

Age Group (years)	Men			Women			Both Sexes		
	n	Mean number of days	95% CI	N	Mean number of days	95% CI	n	Mean number of days	95% CI
18-29	559	4.7	4.3-5.1	936	4.7	4.3-5.0	1495	4.7	4.4-5.0
30-44	721	5.1	4.8-5.5	989	5.2	4.8-5.7	1710	5.2	4.9-5.5
45-59	355	5.3	4.9-5.7	520	5.3	4.9-5.6	875	5.3	5.0-5.6
60-69	158	5.3	4.9-5.8	253	5.0	4.5-5.6	411	5.2	4.8-5.6
<b>18-69</b>	<b>1793</b>	<b>5.0</b>	<b>4.7-5.3</b>	<b>2698</b>	<b>5.0</b>	<b>4.6-5.3</b>	<b>4491</b>	<b>5.0</b>	<b>4.7-5.2</b>

### Mean number of servings on average per day

The World Health Organization (WHO) recommends at least 400g (5 servings) of fruits and vegetables a day. Tables 3.3.30 and 3.3.31 below show the mean number of servings of fruit and vegetables per day respectively during a typical week.

#### Mean number of servings of fruit on average per day

Table 3.3.30 below shows that, overall, respondents' report an average of less than one (0.8) serving of fruit per day consistently across all age groups.

**Table 3.3.30:** Mean number of servings of fruit on average per day

Age Group (years)	Men			Women			Both Sexes		
	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI	N	Mean number of servings	95% CI
18-29	557	0.9	0.8-1.1	930	0.8	0.6-0.9	1487	0.8	0.7-0.9
30-44	717	0.8	0.7-0.9	978	0.7	0.6-0.8	1695	0.8	0.7-0.8
45-59	350	0.7	0.6-0.9	513	0.7	0.6-0.9	863	0.7	0.6-0.8
60-69	158	0.8	0.6-1.0	253	0.6	0.4-0.8	411	0.7	0.5-0.8
<b>18-69</b>	<b>1782</b>	<b>0.8</b>	<b>0.7-0.9</b>	<b>2674</b>	<b>0.7</b>	<b>0.7-0.8</b>	<b>4456</b>	<b>0.8</b>	<b>0.7-0.9</b>

## Mean number of servings of vegetables on average per day

Table 3.3.31 below shows that respondents on average consume one serving (1.3) of vegetables per day.

Table 3.3.31: Mean number of servings of vegetables on average per day

Age Group (years)	Men			Women			Both Sexes		
	n	Mean number of servings	95% CI	N	Mean number of servings	95% CI	n	Mean number of servings	95% CI
18-29	559	1.1	1.0-1.3	935	1.2	1.1-1.3	1494	1.2	1.1-1.3
30-44	719	1.4	1.2-1.5	986	1.4	1.2-1.5	1705	1.4	1.3-1.5
45-59	355	1.4	1.2-1.6	519	1.5	1.3-1.6	874	1.4	1.3-1.6
60-69	158	1.4	1.2-1.6	253	1.5	1.3-1.8	411	1.5	1.3-1.7
<b>18-69</b>	<b>1791</b>	<b>1.3</b>	<b>1.2-1.4</b>	<b>2693</b>	<b>1.3</b>	<b>1.2-1.5</b>	<b>4484</b>	<b>1.3</b>	<b>1.2-1.4</b>

## Fruit and vegetable servings on average per day

The World Health Organization (WHO) recommends at least 5 servings of fruits and vegetables a day. Table 3.3.32 below shows the mean number of servings of fruit and vegetables on an average day. Overall, respondents report an average daily consumption of two servings (2.1) of fruit and vegetables consistently across all age groups.

Table 3.3.32: Mean number of servings of fruit and/or vegetables on average per day

Age Group (years)	Men			Women			Both Sexes		
	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI	N	Mean number of servings	95% CI
18-29	560	2.1	1.8-2.3	936	2.0	1.8-2.2	1496	2.0	1.9-2.2
30-44	722	2.2	2.0-2.4	989	2.1	1.9-2.3	1711	2.1	2.0-2.3
45-59	355	2.1	1.9-2.3	519	2.2	2.0-2.4	874	2.2	2.0-2.3
60-69	159	2.2	1.9-2.5	254	2.1	1.8-2.5	413	2.2	1.9-2.4
<b>18-69</b>	<b>1796</b>	<b>2.1</b>	<b>2.0-2.3</b>	<b>2698</b>	<b>2.1</b>	<b>1.9-2.2</b>	<b>4494</b>	<b>2.1</b>	<b>1.9-2.2</b>

### Number of servings of fruit and vegetables on average per day

This survey observes that 18 percent of the male respondents and 20 percent of female respondents have no fruit and/or vegetable intake per day and only 7 percent of the male respondents and 5 percent of the female respondents report consuming more than five servings of fruit and/or vegetables per day.

**Table 3.3.33:** Percent of respondents taking various number of servings of fruit and vegetables on average per day

Age Group (years)	n	Men						
		% no fruit and/or vegetables	95% CI	% 1-2 servings	95% CI	% 3-4 servings	95% CI	% ≥5 servings
18-29	560	17.9	12.7-23.1	62.3	55.7-68.9	12.9	8.9-17.0	6.9
30-44	722	18.8	13.5-24.2	59.0	53.8-64.2	15.1	11.5-18.7	7.1
45-59	355	19.1	12.5-25.6	59.6	53.3-65.9	16.9	11.9-21.9	4.4
60-69	159	15.9	8.9-22.9	63.8	54.5-73.1	9.7	4.9-14.5	10.6
<b>18-69</b>	<b>1796</b>	<b>18.3</b>	<b>14.3-22.3</b>	<b>60.8</b>	<b>56.5-65.1</b>	<b>14.1</b>	<b>11.2-17.0</b>	<b>6.8</b>
Women								
18-29	936	19.7	13.9-25.5	60.7	54.8-66.5	15.3	11.3-19.3	4.4
30-44	989	20.5	13.9-27.1	57.0	50.4-63.6	17.4	13.4-21.5	5.1
45-59	519	19.1	13.6-24.5	57.8	51.5-64.1	16.3	12.1-20.5	6.8
60-69	254	23.2	12.6-33.8	55.0	44.1-65.9	13.2	8.1-18.4	8.6
<b>18-69</b>	<b>2698</b>	<b>20.0</b>	<b>14.9-25.2</b>	<b>58.7</b>	<b>53.9-63.6</b>	<b>16.0</b>	<b>13.4-18.7</b>	<b>5.2</b>
Both Sexes								
18-29	1496	18.8	13.9-23.7	61.4	56.0-66.8	14.2	11.4-17.0	5.6
30-44	1711	19.7	15.1-24.3	58.0	53.4-62.5	16.3	13.2-19.3	6.1
45-59	874	19.1	14.3-23.8	58.7	54.0-63.5	16.6	13.1-20.1	5.6
60-69	413	19.7	12.2-27.1	59.3	51.4-67.2	11.5	7.7-15.3	9.5
<b>18-69</b>	<b>4494</b>	<b>19.2</b>	<b>15.1-23.2</b>	<b>59.8</b>	<b>55.6-63.9</b>	<b>15.1</b>	<b>12.8-17.4</b>	<b>6.0</b>

### Inadequate intake of fruit and/or vegetables on average per day

Table 3.3.34 below shows the distribution of inadequate consumption of fruits and/or vegetables by age and sex. Ninety four percent of all respondents consumed less than five servings of fruit and vegetables on an average day with no sex or age group significant difference.

**Table 3.3.34: Less than five servings of fruit and/or vegetables on average per day**

Age Group (years)	Men			Women			Both Sexes		
	n	% < five servings per day	95% CI	n	% < five servings per day	95% CI	n	% < five servings per day	95% CI
18-29	560	93.1	90.0-96.2	936	95.6	93.9-97.3	1496	94.4	92.4-96.5
30-44	722	92.9	90.2-95.6	989	94.9	92.9-96.9	1711	93.9	92.0-95.8
45-59	355	95.6	93.3-97.9	519	93.2	90.2-96.1	874	94.4	92.5-96.3
60-69	159	89.4	83.2-95.7	254	91.4	87.1-95.8	413	90.5	86.7-94.2
<b>18-69</b>	<b>1796</b>	<b>93.2</b>	<b>91.1-95.3</b>	<b>2698</b>	<b>94.8</b>	<b>93.3-96.3</b>	<b>4494</b>	<b>94.0</b>	<b>92.4-95.7</b>

## Salt intake

Salt provides our body with the vital mineral sodium, that works together with potassium, (a mineral naturally contained in our body cells) to maintain normal blood pressure and normal function of muscles and nerves. The WHO recommendation on sodium consumption is <2g/day (5g of salt per day). This is because sodium is associated with fluid retention in the body cells, resulting to high risk onset of increased blood pressure leading to hypertension and cardiovascular diseases. Reducing salt intake has been identified as one of the most cost effective measures a country can take to improve population health outcomes.

### Respondents who add salt always to food

Overall, 23 percent of respondents add salt always or often before eating or when eating with a higher proportion among men (26 percent) than women (20 percent). Men in age group 18-29 present the highest proportion (29 percent) of adding salt always or often before eating or when eating.

**Table 3.3.35:** Percentage of respondents who add salt always or often before eating or when eating

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	557	28.8	22.1-35.5	936	18.9	13.8-24.1	1493	23.6	18.5-28.8
30-44	722	25.1	19.5-30.6	989	23.2	17.7-28.6	1711	24.1	19.7-28.5
45-59	354	21.9	15.9-27.9	519	18.2	13.4-23.0	873	20.1	16.1-24.1
60-69	159	24.7	16.1-33.3	254	20.7	10.8-30.7	413	22.6	15.3-30.0
<b>18-69</b>	<b>1792</b>	<b>26.2</b>	<b>21.5-31.0</b>	<b>2698</b>	<b>20.3</b>	<b>15.9-24.6</b>	<b>4490</b>	<b>23.2</b>	<b>19.1-27.2</b>

Twenty five percent of the rural respondents compared to 20 percent of the urban respondents add salt always or often before eating or when eating (Appendix Table B2).

**Table 3.3.36** highlights the percentage of respondents who add salt always or often when cooking or preparing food at home. Eighty four percent of the respondents add salt always or often when cooking or preparing food at home.

**Table 3.3.36:** Percentage of respondents who add salt always or often when cooking or preparing food at home

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	N	%	95% CI	n	%	95% CI
18-29	558	86.1	81.0-91.1	936	86.9	82.6-91.2	1494	86.5	82.4-90.6
30-44	722	82.7	78.1-87.4	989	80.8	75.9-85.7	1711	81.8	77.5-86.0
45-59	353	83.4	77.0-89.8	520	80.0	73.6-86.3	873	81.7	76.2-87.2
60-69	158	80.6	72.8-88.3	254	80.4	72.5-88.2	412	80.5	74.2-86.7
<b>18-69</b>	<b>1791</b>	<b>84.2</b>	<b>80.2-88.3</b>	<b>2699</b>	<b>83.5</b>	<b>79.3-87.8</b>	<b>4490</b>	<b>83.9</b>	<b>80.0-87.8</b>

### Consumption of processed foods high in Salt

WHO reports that most salt consumed comes from processed foods (e.g. processed foods like bacon, ham and salty snacks) or foods consumed frequently in large amounts such as bread.

**Table 3.3.37** below shows the distribution of the consumption of processed foods high in salt. Four percent of respondents always or often consume processed food high in salt with no significant sex difference. Consumption of processed foods decreases with advancing age.

**Table 3.3.37:** Percentage of respondents who always or often consume processed food high in salt

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	N	%	95% CI	n	%	95% CI
18-29	560	7.0	3.8-10.1	934	4.2	2.3-6.1	1494	5.5	3.9-7.2
30-44	722	3.7	2.1-5.3	986	3.8	1.1-6.6	1708	3.8	2.2-5.3
45-59	355	3.3	1.2-5.3	519	2.8	0.0-5.8	874	3.0	1.4-4.7
60-69	159	1.6	0.0-4.2	253	0.0	0.0-0.0	412	0.8	0.0-2.0
<b>18-69</b>	<b>1796</b>	<b>5.0</b>	<b>3.2-6.8</b>	<b>2692</b>	<b>3.7</b>	<b>2.1-5.2</b>	<b>4488</b>	<b>4.3</b>	<b>3.2-5.5</b>

## Consumption of processed foods high in Salt in relation to the place of residence, wealth quintile and the level of education

It was noted that 3 percent of rural residents and 6 percent of urban residents always or often consume processed foods high in salts. Respondents from the fourth wealth quintile have the highest percentage (7 percent) of those who always or often consume processed food high in salt (Appendix Table B4 and Table B5).

### Respondents perception and knowledge on Salt consumption

**Table 3.3.38** below shows respondents perception and knowledge on amount of consumed. Eleven percent of respondents think they consume far too much or too much salt. Men in age group 30-44 years represent the highest percentage (14 percent) of those who think they consume far too much or too much salt. Sixty nine percent of respondents perceive their consumption of salt to be just the right amount with the highest proportion (72 percent) being in the age groups 18-29 years.

**Table 3.3.38:** Perception of amount of salt consumed

Age Group (years)	n	Both Sexes									
		% Far too much	95% CI	% Too much	95% CI	% Just the right amount	95% CI	% Too little	95% CI	% Far too little	95% CI
18-29	1473	1.0	0.4-1.6	9.9	7.3-12.5	72.1	68.4-75.8	16.0	11.9-20.1	1.0	0.2-1.8
30-44	1684	1.3	0.5-2.0	11.7	9.7-13.7	66.8	63.5-70.0	17.5	14.7-20.2	2.8	1.5-4.1
45-59	858	0.9	0.2-1.6	9.1	6.6-11.5	66.4	61.4-71.4	19.7	15.3-24.1	4.0	2.3-5.6
60-69	410	0.9	0.0-2.0	6.9	3.6-10.3	65.0	58.7-71.4	21.3	16.1-26.6	5.8	3.0-8.6
18-69	4425	1.1	0.7-1.5	10.2	8.7-11.7	69.1	66.7-71.5	17.4	14.6-20.1	2.3	1.6-3.0

### Respondents perception on the importance of Lowering salt in the diet

Nearly half (49 percent) of respondents perceive lowering salt in the diet as being very important. Twenty four percent of the respondents do not think that reducing salt in the diet is important at all. Perception of the importance of lowering salt in the diet increased with advancing levels of education (Appendix Table B6)

### Respondents Knowledge of the dangers of high Salt intake

Table 3.3.39 below shows the percentage of respondents who think that too much salt can cause a health problem. Seventy eight percent of all respondents think that consuming too much salt could cause serious health problem with no sex differences.

**Table 3.3.39:** Knowledge on dangers of high salt intake

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	N	%	95% CI	n	%	95% CI
18-29	560	80.9	76.8-85.1	936	77.9	72.8-83.0	1496	79.3	75.6-83.1
30-44	723	77.3	71.1-83.5	989	75.2	70.2-80.1	1712	76.2	72.1-80.4
45-59	355	74.2	66.0-82.4	519	79.6	74.8-84.4	874	76.9	72.0-81.8
60-69	159	72.7	64.2-81.3	255	70.1	62.4-77.9	414	71.4	65.4-77.3
<b>18-69</b>	<b>1797</b>	<b>78.2</b>	<b>74.6-81.7</b>	<b>2699</b>	<b>76.9</b>	<b>72.7-81.0</b>	<b>4496</b>	<b>77.5</b>	<b>74.4-80.6</b>

### Strategies to Controlling salt intake

#### Limit consumption of processed foods

Table 3.3.40 below shows the percentage of respondents limiting the consumption of processed foods. Nearly half (46 percent) of all respondents control salt intake by limiting consumption of processed foods, with no significant difference between the sexes.

**Table 3.3.40:** Percentage of respondents who limit consumption of processed foods

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	N	%	95% CI	n	%	95% CI
18-29	560	49.3	41.1-57.5	936	44.7	36.8-52.6	1496	46.9	40.0-53.8
30-44	722	42.6	35.7-49.6	989	46.1	39.8-52.4	1711	44.3	39.0-49.7
45-59	355	43.9	35.7-52.0	520	46.3	39.4-53.2	875	45.1	39.1-51.1
60-69	159	44.1	33.6-54.6	255	47.4	38.5-56.4	414	45.8	38.5-53.1
<b>18-69</b>	<b>1796</b>	<b>45.9</b>	<b>39.7-52.2</b>	<b>2700</b>	<b>45.5</b>	<b>39.4-51.7</b>	<b>4496</b>	<b>45.7</b>	<b>40.3-51.2</b>

### Look at the salt or sodium content on food labels

Table 3.3.41 shows distribution of respondents who look at food labels to establish the salt content. Eight percent of all respondents control salt intake by looking at the salt or sodium content on food labels.

**Table 3.3.41:** Percentage of respondents who look at the salt or sodium content on food labels

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	560	9.5	5.9-13.2	936	8.4	5.2-11.7	1496	9.0	6.4-11.5
30-44	723	6.4	3.9-8.9	989	8.6	5.6-11.6	1712	7.5	5.1-9.9
45-59	355	9.4	5.2-13.6	520	7.8	4.3-11.3	875	8.6	5.4-11.7
60-69	159	7.0	1.3-12.7	255	7.8	2.2-13.5	414	7.4	3.4-11.5
<b>18-69</b>	<b>1797</b>	<b>8.3</b>	<b>6.0-10.7</b>	<b>2700</b>	<b>8.4</b>	<b>5.9-10.8</b>	<b>4497</b>	<b>8.4</b>	<b>6.2-10.5</b>

### Buying of low salt/sodium alternatives

Table 3.3.42 below describes the percentage of respondents who buy low salt/sodium alternatives as a way of controlling salt intake. Five percent of all respondents buy low salt/sodium alternatives.

**Table 3.3.42:** Percentage of respondents buying low sodium alternatives

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	560	31.6	23.7-39.4	936	28.9	21.4-36.4	1496	30.2	23.5-36.9
30-44	723	20.5	13.7-27.2	989	25.3	18.3-32.4	1712	22.9	16.9-28.9
45-59	355	23.9	16.0-31.8	520	17.6	12.2-23.0	875	20.8	15.5-26.0
60-69	159	18.3	9.3-27.3	255	10.6	3.6-17.5	414	14.3	8.6-20.0
<b>18-69</b>	<b>1797</b>	<b>25.9</b>	<b>19.9-32.0</b>	<b>2700</b>	<b>25.0</b>	<b>18.9-31.1</b>	<b>4497</b>	<b>25.5</b>	<b>19.9-31.1</b>

### Avoid eating foods prepared outside of home

Table 3.3.44 below shows distribution of respondents who control their salt intake by avoiding eating foods prepared outside of home. Thirty two percent of all respondents avoid eating foods prepared outside home.

**Table 3.3.44:** Percentage of respondents avoiding eating foods prepared outside of home

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	560	29.2	23.0-35.4	936	34.7	27.9-41.5	1496	32.1	26.7-37.5
30-44	723	25.5	19.8-31.3	989	35.9	29.5-42.4	1712	30.7	26.2-35.3
45-59	355	26.5	18.0-35.1	520	38.2	31.5-45.0	875	32.4	26.3-38.5
60-69	159	30.8	21.5-40.0	255	38.4	29.3-47.5	414	34.7	28.1-41.2
<b>18-69</b>	<b>1797</b>	<b>27.6</b>	<b>23.1-32.2</b>	<b>2700</b>	<b>35.8</b>	<b>30.1-41.6</b>	<b>4497</b>	<b>31.8</b>	<b>27.6-36.1</b>

## Dietary sugar intake

The World Health Organization recommends limiting of the intake of free sugars to <10% of total energy intake which is equivalent to 50g (around 12 level teaspoons) per day. Ideally, free sugar consumption of <5% of total energy intake has additional health benefits. Sources of free sugar include sweetened foods and drinks, naturally occurring sugars present in honey, syrups, fruit juices and fruit juice concentrates (WHO, 2015).

The World Health Organization recommends limiting of the intake of free sugars to <10% of total energy intake which is equivalent to 50g (around 12 level teaspoons) per day. Ideally, free sugar consumption of <5% of total energy intake has additional health benefits. Sources of free sugar include sweetened foods and drinks, naturally occurring sugars present in honey, syrups, fruit juices and fruit juice concentrates (WHO, 2015)

In this section respondents were asked on the following in the regard to dietary sugar intake: Always add sugar to beverages, add sugar always or often when cooking or preparing food at home, always consume processed food high in sugar, self reported quantity of sugar consumed, importance of lowering sugar in diet, think consuming too much sugar could cause serious health problem. The survey also asked the respondents on the strategies to minimize the amount of sugar used in beverages such as limiting consumption of soda and sugary drinks, limiting consumption of processed foods, use of natural or unrefined alternatives, and any other strategies to control sugar intake.

### Respondents who always add sugar to beverages

Table 3.3.45 below shows percentage of respondents who always add sugar to beverages. Twenty eight percent of respondents always add sugar to beverages. Men in age group 18-29 have the highest proportion (32 percent) of respondents who always add sugar to beverages.

**Table 3.3.45: Percentage of respondents who always add sugar to beverages**

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	559	31.6	25.3-38.0	936	24.4	17.6-31.2	1495	27.9	21.9-33.8
30-44	722	27.9	20.6-35.2	989	26.9	20.7-33.0	1711	27.4	21.6-33.2
45-59	355	30.0	19.4-40.6	519	26.6	20.4-32.8	874	28.3	21.7-34.9
60-69	159	23.4	15.7-31.0	255	30.7	21.0-40.5	414	27.1	20.0-34.3
<b>18-69</b>	<b>1795</b>	<b>29.7</b>	<b>24.2-35.2</b>	<b>2699</b>	<b>25.9</b>	<b>20.4-31.4</b>	<b>4494</b>	<b>27.7</b>	<b>22.7-32.8</b>

Twenty nine percent of urban respondents and 27 percent of the rural respondents always add sugar to their beverages. Respondents in the poorest quintile have the highest percentage (35 percent) of respondents who always add sugar to beverages (Appendix Table B7).

#### **Respondents who add sugar always or often when cooking or preparing beverages at home**

Table 3.3.46 below shows percentage of respondents who always add sugar when cooking or preparing food at home. Eighty four percent of the respondents always or often add sugar when cooking or preparing beverages at home with the highest proportion (87 percent) being among the age group of 18-29 years.

**Table 3.3.46: Percentage of respondents always adding sugar when preparing beverages at home**

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	558	86.1	81.0-91.1	936	86.9	82.6-91.2	1494	86.5	82.4-90.6
30-44	722	82.7	78.1-87.4	989	80.8	75.9-85.7	1711	81.8	77.5-86.0
45-59	353	83.4	77.0-89.8	520	80.0	73.6-86.3	873	81.7	76.2-87.2
60-69	158	80.6	72.8-88.3	254	80.4	72.5-88.2	412	80.5	74.2-86.7
<b>18-69</b>	<b>1791</b>	<b>84.2</b>	<b>80.2-88.3</b>	<b>2699</b>	<b>83.5</b>	<b>79.3-87.8</b>	<b>4490</b>	<b>83.9</b>	<b>80.0-87.8</b>

## Respondents who consume processed foods

Two percent of the respondents always consume processed food high in sugar, with the highest proportion (3 percent) being among women age 18-29 years (Appendix Table B8).

### Self-reported quantity of sugar consumed

Table 3.3.47 below shows the percentage of the respondents' perception of the quantity of sugar they consume. Sixty three percent of respondents perceive their sugar consumption to be just the right amount while 14 percent perceive they consume too much sugar.

**Table 3.3.47: Self-reported quantity of sugar consumed**

Age Group (years)	N	Men									
		% Far too much	95% CI	% Too much	95% CI	% Just the right amount	95% CI	% Too little	95% CI	% Far too little	95% CI
18-29	550	1.1	0.0-2.2	17.7	13.5-21.8	66.5	60.9-72.1	12.6	9.0-16.3	2.1	0.6-3.6
30-44	706	1.7	0.2-3.2	13.8	9.4-18.2	60.8	53.9-67.7	19.2	14.5-23.9	4.5	2.3-6.7
45-59	353	2.3	0.5-4.0	12.7	7.1-18.2	64.2	56.8-71.6	15.9	10.8-21.0	5.0	2.0-7.9
60-69	159	2.6	0.0-5.5	5.9	2.1-9.6	53.1	43.1-63.0	27.1	19.0-35.2	11.4	5.5-17.2
<b>18-69</b>	<b>1768</b>	<b>1.6</b>	<b>0.6-2.5</b>	<b>14.9</b>	<b>11.9-18.0</b>	<b>63.5</b>	<b>59.3-67.8</b>	<b>16.1</b>	<b>13.3-18.9</b>	<b>3.9</b>	<b>2.5-5.2</b>
Women											
18-29	926	0.8	0.3-1.2	13.7	10.4-17.0	64.4	59.5-69.2	17.8	14.2-21.3	3.4	1.5-5.3
30-44	961	1.1	0.3-1.9	12.8	10.1-15.5	62.0	56.9-67.1	21.7	17.5-25.8	2.5	1.3-3.6
45-59	514	1.0	0.0-2.1	11.1	7.5-14.7	60.6	55.6-65.6	19.8	15.4-24.1	7.6	4.6-10.5
60-69	253	1.7	0.0-3.4	6.1	3.0-9.1	62.4	53.1-71.7	18.7	12.3-25.2	11.2	6.2-16.1
<b>18-69</b>	<b>2654</b>	<b>1.0</b>	<b>0.5-1.4</b>	<b>12.6</b>	<b>10.4-14.8</b>	<b>62.9</b>	<b>59.5-66.4</b>	<b>19.4</b>	<b>16.9-21.8</b>	<b>4.2</b>	<b>2.9-5.5</b>
Both Sexes											
18-29	1476	0.9	0.3-1.6	15.6	12.9-18.2	65.4	61.0-69.8	15.3	12.5-18.1	2.8	1.4-4.1
30-44	1667	1.4	0.5-2.3	13.3	11.0-15.6	61.4	57.2-65.6	20.4	17.3-23.6	3.5	2.1-4.9
45-59	867	1.6	0.6-2.7	11.9	8.1-15.7	62.4	57.8-67.0	17.8	14.4-21.3	6.3	4.2-8.3
60-69	412	2.1	0.4-3.8	6.0	3.6-8.3	57.8	50.5-65.2	22.8	17.4-28.2	11.3	7.3-15.2
<b>18-69</b>	<b>4422</b>	<b>1.3</b>	<b>0.7-1.8</b>	<b>13.7</b>	<b>11.7-15.8</b>	<b>63.2</b>	<b>60.0-66.5</b>	<b>17.8</b>	<b>15.7-19.9</b>	<b>4.0</b>	<b>2.9-5.1</b>

## Importance of lowering sugar in diet

Fifty percent of the male and 51 percent of female respondents report that it is very important to lower sugar in diet while 17 percent of male and 16 percent of female respondents report that it is not important at all. (Appendix Table B9)

## Respondents perception on harm caused by consuming too much Sugar

Table 3.3.48 below shows the distribution of the respondent's perception on the harm caused by consumption of too much sugar. Eighty five percent of male and 83 percent of female respondents think consuming too much sugar could cause serious health problems with the highest proportion (86 respondents) being among those in the age group 18-29 years

**Table 3.3.48:** Percentage of respondents who think consuming too much sugar could cause serious health problem

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	559	87.6	83.7-91.5	936	84.1	79.1-89.1	1495	85.8	82.1-89.5
30-44	723	83.6	79.3-87.8	989	80.1	75.1-85.1	1712	81.8	77.9-85.8
45-59	355	82.7	76.9-88.5	519	85.3	80.9-89.8	874	84.0	80.2-87.8
60-69	159	77.7	69.8-85.6	255	75.6	68.0-83.3	414	76.7	70.8-82.5
<b>18-69</b>	<b>1796</b>	<b>84.9</b>	<b>82.0-87.9</b>	<b>2699</b>	<b>82.6</b>	<b>78.3-86.8</b>	<b>4495</b>	<b>83.7</b>	<b>80.5-86.9</b>

## Strategies to Control sugar intake in the diet

### Minimize the amount of sugar used in beverages

Table 3.3.49 below shows the distribution of respondents who minimize sugar used in beverages. Fifty four percent of respondents control their sugar intake by minimizing the amount of sugar used in beverages, with women in the age group 45-59 having the highest percentage (60 percent).

**Table 3.3.49:** Percentage of respondents minimizing sugar used in beverages

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	559	48.8	43.3-54.4	936	52.1	46.0-58.2	1495	50.5	45.6-55.5
30-44	722	51.9	45.9-58.0	989	57.1	50.5-63.6	1711	54.5	49.1-59.9
45-59	355	56.5	49.1-64.0	520	59.8	54.1-65.5	875	58.2	53.3-63.1
60-69	159	65.2	55.2-75.1	255	57.1	48.3-65.9	414	61.0	54.2-67.9
<b>18-69</b>	<b>1795</b>	<b>52.0</b>	<b>47.7-56.2</b>	<b>2700</b>	<b>55.1</b>	<b>50.0-60.3</b>	<b>4495</b>	<b>53.6</b>	<b>49.5-57.7</b>

### Limiting consumption of soda and sugary drinks

Table 3.3.50 below shows the distribution of respondents who limit consumption of soda and sugary drinks. Forty eight percent of men and 53 percent of women control their sugar intake by limiting consumption of soda and sugary drinks.

**Table 3.3.52:** Percentage of respondents who use of natural & unrefined alternatives instead of sugar

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	559	15.7	10.6-20.8	936	9.2	6.4-11.9	1495	12.3	9.2-15.4
30-44	723	12.4	8.6-16.2	989	11.5	7.9-15.1	1712	12.0	9.0-14.9
45-59	355	10.4	5.9-14.9	520	11.9	7.8-16.0	875	11.1	7.7-14.6
60-69	159	9.1	4.2-13.9	255	10.7	5.8-15.7	414	9.9	6.1-13.8
<b>18-69</b>	<b>1796</b>	<b>13.4</b>	<b>10.1-16.7</b>	<b>2700</b>	<b>10.4</b>	<b>8.1-12.7</b>	<b>4496</b>	<b>11.9</b>	<b>9.6-14.1</b>

## Dietary Fats and oils

Reducing the amount of total fat intake to less than 30 percent of total energy intake helps prevent unhealthy weight gain in the adult population. The risk of developing NCDs is lowered by reducing saturated fats to less than 10 percent of total energy intake, and trans-fats to less than 1 percent of total energy intake, and replacing both with unsaturated fats (WHO, 2015).

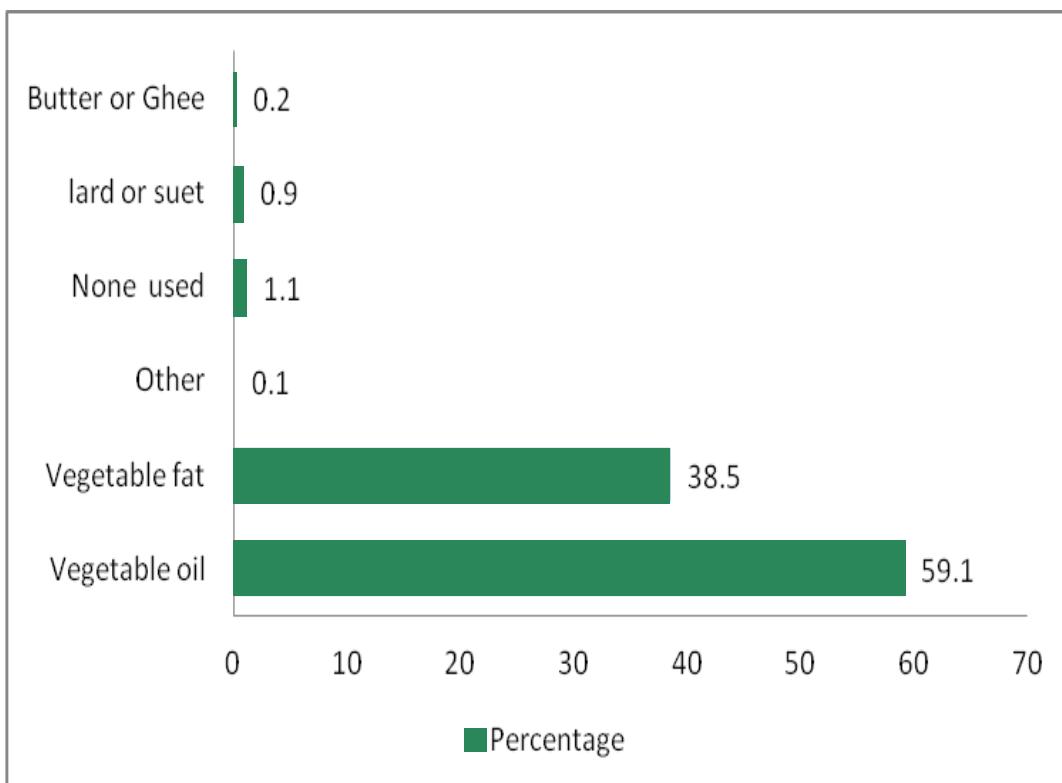
This survey asked respondents on the type of oil or fat most often used for meal preparation in household as a strategy to limit consumption of fats and fatty acids in their diet.

### Type of oil used most frequently

Figure 3.3.2 below shows the distribution of type of oil used for meal preparation in the household.

Vegetable oil usage has the highest proportion at 60 percent while 39 percent of the respondents use lard as a source of oils or fats used for meal preparation at home.

Figure 3.3.2: Type of oil used for cooking



### Meals not prepared at home

Table 3.3.53 below shows the distribution of respondents who consume meals not prepared at home. The mean number of meals taken outside home by all the respondents was approximately 2 meals per week. There is a difference between men (3 meals) and women (1 meal) on the number of meals eaten not prepared at home per week.

Table 3.3.53: Mean number of meals eaten not prepared at home

Age Group (years)	Men			Women			Both Sexes		
	n	mean	95% CI	n	mean	95% CI	n	mean	95% CI
18-29	555	3.1	2.4-3.8	936	1.0	0.8-1.2	1491	2.0	1.6-2.4
30-44	721	3.4	2.9-3.9	988	1.0	0.8-1.3	1709	2.2	1.9-2.6
45-59	354	2.3	1.9-2.8	519	0.8	0.5-1.0	873	1.6	1.3-1.8
60-69	159	1.2	0.8-1.6	255	0.5	0.3-0.7	414	0.8	0.6-1.0
<b>18-69</b>	<b>1789</b>	<b>3.0</b>	<b>2.6-3.4</b>	<b>2698</b>	<b>0.9</b>	<b>0.8-1.1</b>	<b>4487</b>	<b>1.9</b>	<b>1.7-2.2</b>

Meals eaten not prepared at home was higher in the urban (3) than rural areas (2). Respondents from of the richest wealth quintile have the highest mean number of meals eaten not prepared at home (Appendix Table B10).

### 3.3.4 Physical Activity

World Health Organization (WHO) defines physical activity as any bodily movement produced by skeletal muscles that requires energy expenditure – including activities undertaken while working, playing, carrying out household chores, travelling, and engaging in recreational pursuits.

The term "physical activity" should not be confused with "exercise", which is a subcategory of physical activity that is planned, structured, repetitive, and aims to improve or maintain one or more components of physical fitness. Both, moderate and vigorous intensity physical activity brings health benefits. In order to be beneficial for cardio-respiratory health, all activity should be performed in bouts of at least 10 minutes duration.

WHO recommends that adults aged 18–64 years should do at least 150 minutes of moderate-intensity physical activity throughout the week, or do at least 75 minutes of vigorous-intensity physical activity throughout the week, or an equivalent combination of moderate- and vigorous-intensity activity. Adults age 65 years and above should follow the recommendations of the above age group and in addition do the following; those

with poor mobility should perform physical activity to enhance balance and prevent falls, 3 or more days per week and perform muscle-strengthening activities involving major muscle groups, 2 or more days a week. However during analysis in this survey for respondents above we only considered the same recommendations as for persons as 18-64 years.

This survey asked respondents questions on the following areas of interest and are covered in this chapter; Level of total physical activity according to WHO recommendations on physical activity for health; Level of total physical activity according to former recommendations; duration of the physical activity; physical activity at the work place; physical activity during travel; physical activity during leisure time and sedentary behavior

### Levels of total physical activity using former WHO recommendations

Table 3.3.55 below shows the levels of total physical activity based on a combination of physical activity done as part of work, transport and leisure time. Eleven percent of respondents have a low level of total physical activity, 15 percent are moderately active while 75 percent have a high level of physical activity. Respondents in the age group 60-69 are least active.

Table 3.3.55: Level of total physical activity

Age Group (years)	n	Men					
		% Low	95% CI	% Moderate	95% CI	% High	95% CI
18-29	550	12.7	8.2-17.2	12.9	9.1-16.7	74.4	68.3-80.6
30-44	710	7.2	4.3-10.1	9.4	5.7-13.2	83.4	78.5-88.3
45-59	349	7.2	2.9-11.5	16.0	8.0-24.0	76.8	66.8-86.9
60-69	154	12.8	6.7-19.0	11.5	5.3-17.8	75.6	67.7-83.5
<b>18-69</b>	<b>1763</b>	<b>10.0</b>	<b>7.1-12.8</b>	<b>12.2</b>	<b>9.5-14.9</b>	<b>77.9</b>	<b>73.8-82.0</b>
Women							
18-29	907	12.3	8.7-16.0	19.8	16.2-23.3	67.9	63.0-72.8
30-44	973	9.3	6.6-12.0	14.3	10.7-17.9	76.4	71.3-81.5
45-59	500	11.2	8.0-14.4	13.5	9.3-17.6	75.3	70.1-80.5
60-69	244	22.3	15.1-29.5	14.8	9.3-20.4	62.8	54.5-71.1
<b>18-69</b>	<b>2624</b>	<b>11.7</b>	<b>9.2-14.2</b>	<b>16.8</b>	<b>14.2-19.3</b>	<b>71.5</b>	<b>67.7-75.4</b>
Both Sexes							
18-29	1457	12.5	9.7-15.2	16.4	13.4-19.5	71.1	67.1-75.0
30-44	1683	8.2	6.3-10.2	11.9	9.2-14.5	79.9	76.6-83.2
45-59	849	9.2	6.4-11.9	14.7	10.3-19.2	76.1	70.8-81.4
60-69	398	17.7	12.2-23.2	13.2	8.9-17.6	69.1	62.9-75.2
<b>18-69</b>	<b>4387</b>	<b>10.8</b>	<b>9.0-12.7</b>	<b>14.5</b>	<b>12.5-16.5</b>	<b>74.7</b>	<b>71.8-77.5</b>

Table 3.3.56 below shows the levels of total physical activity based on a combination of physical activity done as part of work, transport and leisure time by residence. The proportion of respondents who engage in low level of physical activity is higher in urban (14 percent) than in rural (9 percent).

Table 3.3.56: Level of total physical activity by residence

Residence	n	Both sexes					
		% Low	95% CI	% Moderate	95% CI	% High	95% CI
Rural	2253	9.0	6.8-11.2	12.6	10.3-14.9	78.4	74.5-82.2
Urban	2134	13.8	10.6-17.0	17.6	14.0-21.1	68.7	64.6-72.8
<b>Total</b>	<b>4387</b>	<b>10.8</b>	<b>9.0-12.7</b>	<b>14.5</b>	<b>12.5-16.5</b>	<b>74.7</b>	<b>71.8-77.5</b>

### Mean minutes of physical activity on average per day

Table 3.3.57 below shows the distribution of the mean minutes of total physical activity across all three domains (work, transport and leisure time) in minutes per day by sex and age group. Overall, respondents spend an average of 291 minutes per day in total physical activity with men spending more time (324 minutes) than women (259 minutes).

**Table 3.3.57:** Mean minutes of total physical activity on average per day by age and sex

Age Group (years)	Men			Women			Both Sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
18-29	550	307.3	276.0-338.5	907	230.2	212.6-247.8	1457	267.6	248.0-287.2
30-44	710	342.9	318.9-366.8	973	293.6	262.0-325.1	1683	318.2	294.9-341.6
45-59	349	335.3	289.8-380.9	500	282.2	256.6-307.9	849	309.0	281.7-336.4
60-69	154	317.7	266.1-369.3	244	227.1	199.1-255.1	398	271.3	243.6-298.9
<b>18-69</b>	<b>1763</b>	<b>324.2</b>	<b>303.9-344.6</b>	<b>2624</b>	<b>258.6</b>	<b>242.5-274.8</b>	<b>4387</b>	<b>291.0</b>	<b>275.4-306.6</b>

Table 3.3.58 below shows the distribution of the median minutes of total physical activity across all three domains per day by sex and age group. Overall, respondents spend a median of 263 minutes per day in total physical activity with men spending more time (308 minutes) than women (231 minutes).

**Table 3.3.58:** Median minutes of total physical activity on average per day

Age Group (years)	Men			Women			Both Sexes		
	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)
18-29	550	291	86-463	907	196	77-343	1457	223	86-421
30-44	710	337	174-480	973	267	137-411	1683	300	154-457
45-59	349	308	137-480	500	257	115-426	849	283	129-446
60-69	154	283	106-433	244	214	68-343	398	244	90-377
<b>18-69</b>	<b>1763</b>	<b>308</b>	<b>121-480</b>	<b>2624</b>	<b>231</b>	<b>103-375</b>	<b>4387</b>	<b>263</b>	<b>111-436</b>

## Domain-specific physical activity- mean minutes per day

### Work-related physical activity

Table 3.3.59 below shows distribution of the mean minutes spent in work-related physical activities by age and sex. Overall, respondents spend an average of 228 minutes in work-related physical activities with men being more active (248) compared with women (208).

**Table 3.3.59:** Mean minutes of work-related physical activity on average per day

Age Group (years)	Men			Women			Both Sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
18-29	550	233.8	205.4-262.1	907	178.6	161.0-196.1	1457	205.3	187.0-223.7
30-44	710	270.9	245.8-296.0	973	242.5	212.7-272.3	1683	256.7	233.0-280.5
45-59	349	249.1	212.8-285.4	500	231.6	209.3-254.0	849	240.4	218.4-262.5
60-69	154	228.4	199.6-257.3	244	183.5	152.5-214.5	398	205.4	185.0-225.8
<b>18-69</b>	<b>1763</b>	<b>248.3</b>	<b>229.0-267.7</b>	<b>2624</b>	<b>207.8</b>	<b>191.6-224.0</b>	<b>4387</b>	<b>227.8</b>	<b>212.2-243.4</b>

Respondents who reside in rural areas spend more time on work-related physical activity (237.4 minutes per day) compared with urban (212.4 minutes per day) residents. Respondents in the richest quintile have the lowest mean minutes of work-related physical activity (Appendix Table B12)

### Transport-related physical activity

Table 3.3.60 below shows the distribution of mean minutes spend on transport-related physical activity by age group and sex. Overall, respondents spend 53 minutes in transport-related physical activities with men reporting 60 minutes and women 45.4 minutes.

**Table 3.3.60:** Mean minutes spent on transport-related physical activity on average per day

Age Group (years)	Men			Women			Both Sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
18-29	550	52.8	43.7-61.9	907	43.6	37.0-50.3	1457	48.1	41.8-54.3
30-44	710	60.7	52.6-68.7	973	47.4	39.1-55.6	1683	54.0	47.9-60.2
45-59	349	74.3	56.5-92.1	500	48.3	39.5-57.1	849	61.4	50.3-72.5
60-69	154	72.5	51.8-93.2	244	41.0	29.2-52.7	398	56.3	41.9-70.8
<b>18-69</b>	<b>1763</b>	<b>59.9</b>	<b>52.6-67.2</b>	<b>2624</b>	<b>45.4</b>	<b>39.7-51.1</b>	<b>4387</b>	<b>52.6</b>	<b>47.1-58.1</b>

**Table 3.3.61** below shows the mean minutes spend on transport related physical activity by residence and wealth quintile. There was a higher number of mean minutes among rural (59 minutes/day) compared with urban (43 minutes/day) residents. There is a decrease in the mean number of minutes of transport-related physical activity with increasing levels of wealth status.

**Table 3.3.61:** Mean minutes spent on transport-related physical activity on average per day by residence and wealth quintile

Residence	Both sexes		
	n	mean	95% CI
Rural	2253	58.7	52.0-65.4
Urban	2134	42.7	34.9-50.4
<b>Wealth Quintile</b>			
Poorest	883	75.2	60.1-90.4
Second	871	53.4	45.4-61.3
Middle	875	51.8	44.5-59.1
Fourth	880	44.5	38.9-50.1
Richest	878	40.5	29.6-51.3
<b>TOTAL</b>	<b>4387</b>	<b>52.6</b>	<b>47.1-58.1</b>

#### Recreation-related physical activities

Table 3.3.62 below shows the mean minutes spent on recreation related physical activity on average per day by the respondents. The mean time spent in recreation-related activities among the respondents is 11 minutes per day with a difference between men (16 minutes per day) and women (6 minutes per day).

**Table 3.3.62:** Mean minutes spent on recreation related physical activity on average per day by age group

Age Group (years)	Men			Women			Both Sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
18-29	550	20.7	14.6-26.8	907	8.0	5.0-11.0	1457	14.2	10.7-17.6
30-44	710	11.3	7.4-15.1	973	3.7	1.9-5.5	1683	7.5	5.2-9.7
45-59	349	11.9	4.5-19.4	500	2.3	0.0-4.8	849	7.2	3.2-11.1
60-69	154	16.7	0.0-40.5	244	2.7	0.5-4.9	398	9.5	0.0-20.9
<b>18-69</b>	<b>1763</b>	<b>15.9</b>	<b>12.5-19.4</b>	<b>2624</b>	<b>5.5</b>	<b>3.9-7.0</b>	<b>4387</b>	<b>10.6</b>	<b>8.7-12.6</b>

**Table 3.3.63** below shows the distribution of mean minutes spent on recreation-related physical activities by residence. It is worth noting that there is no difference in the mean minutes spent on recreation-related physical activity between the rural and urban residents. Respondents in the richest quintile spend the highest mean minutes of recreation-related physical activity (13 minutes per day).

**Table 3.3.63:** Mean minutes spent on recreational related physical activity by residence and wealth quintile

residence	Both sexes		
	n	mean	95% CI
Rural	2253	10.7	8.3-13.0
Urban	2134	10.6	7.2-13.9
<b>TOTAL</b>	<b>4387</b>	<b>10.6</b>	<b>8.7-12.6</b>
Wealth quintile	Both sexes		
	n	mean	95% CI
Poor	883	8.5	4.5-12.6
Second	871	10.9	8.1-13.7
Middle	875	9.7	7.0-12.5
Fourth	880	10.2	4.6-15.8
Richest	878	13.2	8.9-17.4
<b>TOTAL</b>	<b>4387</b>	<b>10.6</b>	<b>8.9-12.7</b>

### No physical activity by domain

#### No Work-related physical activity

**Table 3.3.64** below shows the percentage of respondents who do not engage in work-related physical activity. Overall, 16 percent of the respondents report no work-related physical activity, with a higher percentage among men (18 percent) than women (14 percent).

**Table 3.3.64:** Percentage of respondents with no work-related physical activity by age group

Age Group (years)	Men			Women			Both Sexes		
	n	% no activity at work	95% CI	n	% no activity at work	95% CI	n	% no activity at work	95% CI
18-29	550	24.6	17.2-32.0	907	15.6	11.4-19.8	1457	20.0	15.7-24.2
30-44	710	11.2	7.2-15.3	973	10.0	6.6-13.4	1683	10.6	8.0-13.3
45-59	349	12.6	5.6-19.5	500	13.0	8.6-17.4	849	12.8	8.8-16.7
60-69	154	16.5	9.5-23.6	244	23.1	12.7-33.5	398	19.9	12.4-27.4
<b>18-69</b>	<b>1763</b>	<b>17.8</b>	<b>12.9-22.6</b>	<b>2624</b>	<b>13.8</b>	<b>10.6-17.0</b>	<b>4387</b>	<b>15.8</b>	<b>12.8-18.7</b>

**Table 3.3.65** below shows the percentage of respondents who do not engage in work-related physical activity by residence, wealth and level of education. There is a higher percentage of urban (21 percent) than rural (12 percent) residents who do not engage in any work related physical activity. Respondents with no formal schooling (29 percent) and those in the richest quintile (25 percent) report the highest proportions of no work-related physical activity.

**Table 3.3.65:** Percentage of respondents with no work-related physical activity by residence, wealth and education

	Both sexes		
	n	%	95% CI
<b>Residence</b>			
Rural	2253	12.3	8.7-15.8
Urban	2134	21.4	16.7-26.1
<b>Education Level</b>			
No formal education	734	28.6	20.8-36.4
Primary incomplete	1068	7.7	5.4-10.1
Primary school complete	1393	13.1	9.2-17.0
Secondary and above	1192	19.3	15.0-23.6
<b>Wealth Quintiles</b>			
Poorest	883	18.7	10.8-26.6
Second	871	6.7	4.6-8.9
Middle	875	10.5	7.2-13.8
Fourth	880	15.9	10.1-21.6
Richest	878	25.4	21.3-29.4
<b>TOTAL</b>	<b>4387</b>	<b>15.8</b>	<b>12.8-18.7</b>

## No transport-related physical activity

Table 3.3.66 below shows the percentage of respondents who do not engage in transport-related physical activity. Overall, 14 percent of respondents do not engage in transport-related physical activity.

**Table 3.3.66:** Percentage of respondents with no transport-related physical activity by age group

Age Group (years)	Men			Women			Both Sexes		
	n	% no activity for transport	95% CI	n	% no activity for transport	95% CI	n	% no activity for transport	95% CI
18-29	550	15.6	9.1-22.0	907	13.6	9.7-17.5	1457	14.5	10.9-18.2
30-44	710	16.6	12.2- 21.0	973	11.9	8.7-15.1	1683	14.3	11.3-17.2
45-59	349	14.3	7.1-21.5	500	11.3	8.0-14.7	849	12.8	8.7-17.0
60-69	154	10.3	5.0-15.6	244	16.7	9.8-23.7	398	13.6	9.3-17.9
<b>18-69</b>	<b>1763</b>	<b>15.4</b>	<b>10.9- 20.0</b>	<b>2624</b>	<b>12.9</b>	<b>10.2-15.6</b>	<b>4387</b>	<b>14.1</b>	<b>11.4-16.9</b>

## No recreation-related physical activity

Table 3.3.67 below shows the percentage of respondents who do not engage in recreational-related physical activity. More than three-quarters (77 percent) of the respondents report no recreation-related physical activity with a significantly higher proportion in women (85 percent) than men (68 percent).

**Table 3.3.67:** Percentage of respondents with no recreation-related physical activity by age group

Age Group (years)	Men			Women			Both Sexes		
	n	% no activity at recreation	95% CI	n	% no activity at recreation	95% CI	n	% no activity at recreation	95% CI
18-29	550	56.4	48.1- 64.7	907	78.7	73.4- 83.9	1457	67.8	62.3- 73.4
30-44	710	74.9	69.5- 80.2	973	87.3	83.8- 90.8	1683	81.1	77.3- 84.8
45-59	349	82.3	76.3- 88.4	500	92.9	88.9- 96.8	849	87.6	83.8-91.3
60-69	154	88.4	81.7-95.1	244	95.9	93.5- 98.4	398	92.3	88.8- 95.7
<b>18-69</b>	<b>1763</b>	<b>68.4</b>	<b>63.9- 72.9</b>	<b>2624</b>	<b>84.6</b>	<b>81.4- 87.7</b>	<b>4387</b>	<b>76.6</b>	<b>73.4- 79.9</b>

**Table 3.3.68** below shows the percentage of respondents who do not engage in recreation-related physical activity by wealth status and education. The highest percentage of respondents with no recreation-related physical activity is among those with no formal education (93 percent) and among the poorest quintile (86 percent).

**Table 3.3.68:** Percentage of respondents with no recreation-related physical activity by education level and wealth

No formal schooling	734	93.0	88.8-97.2
Primary school incomplete	1068	81.8	77.5-86.1
Primary school complete	1393	75.7	71.3-80.2
Secondary school and above	1192	67.2	61.9-72.5
<b>Wealth Quintiles</b>			
Poorest	883	85.7	81.6-89.9
Second	871	73.8	68.7-79.0
Middle	875	75.0	70.2-79.9
Fourth	880	77.9	71.7-84.0
Richest	878	71.8	64.9-78.7
<b>TOTAL</b>	<b>4387</b>	<b>76.6</b>	<b>73.4-79.9</b>

### Composition of total physical activity

Table 3.3.69 below shows the distribution of the total physical activity across the three domains. Overall, 69 percent of total physical activity is work-related, 26 percent transport-related and 5 percent recreation-related.

**Table 3.3.69:** Composition of total physical activity among both men and women by age group

Age Group (years)	n	Both Sexes					
		% Activity from work	95% CI	% Activity for transport	95% CI	% Activity during leisure time	95% CI
18-29	1397	63.7	60.0-67.4	27.7	24.1-31.2	8.6	6.0-11.3
30-44	1636	73.8	70.4-77.1	23.4	20.2-26.6	2.8	2.1-3.5
45-59	813	72.0	68.7-75.2	25.7	22.3-29.1	2.3	1.4-3.3
60-69	366	67.6	61.6-73.7	29.7	24.3-35.2	2.6	0.9-4.3
<b>18-69</b>	<b>4212</b>	<b>68.6</b>	<b>65.6-71.5</b>	<b>26.1</b>	<b>23.4-28.7</b>	<b>5.4</b>	<b>4.1-6.7</b>

## No vigorous physical activity

Table 3.3.70 below shows the percentage of respondents who do not engage in vigorous physical activity by age group and sex. Close to half of the respondents (46 percent) do not engage in vigorous physical activity with a higher percentage among women (53 percent) than men (39 percent).

**Table 3.3.70:** Percentage of respondents who do not engage in vigorous physical activity by age group

Age Group (years)	Men			Women			Both Sexes		
	n	% no vigorous activity	95% CI	n	% no vigorous activity	95% CI	n	% no vigorous activity	95% CI
18-29	550	39.4	31.7- 47.0	907	59.4	53.3- 65.5	1457	49.7	44.5-54.8
30-44	710	35.5	29.6- 41.5	973	47.1	40.4- 53.9	1683	41.3	35.8-46.9
45-59	349	43.9	33.7- 54.2	500	44.0	36.8-51.2	849	44.0	37.2-50.8
60-69	154	45.6	34.0- 57.2	244	57.4	47.9- 66.9	398	51.6	42.9-60.4
<b>18-69</b>	<b>1763</b>	<b>39.2</b>	<b>34.2- 44.2</b>	<b>2624</b>	<b>52.9</b>	<b>48.5- 57.3</b>	<b>4387</b>	<b>46.1</b>	<b>42.3-49.9</b>

Table 3.3.71 below shows the percentage of respondents who do not engage in vigorous physical activity by residence. A higher percentage of urban (55 percent) do not engage in vigorous physical activity compared with rural (41 percent) residents. Respondents with no formal education (66 percent) and those in the highest wealth quintile (61 percent) have the highest percentage of those not engaging in vigorous physical activity.

**Table 3.3.71:** Percentage of respondents with no vigorous physical activity by residence, wealth and education

Residence	Both sexes		
	n	mean	95% CI
Rural	2253	40.7	35.5-45.9
Urban	2134	54.9	49.7-60.1
<b>Education level</b>			
No formal Schooling	734	65.8	54.5-77.1
Primary school incomplete	1068	31.7	26.7-36.6
Primary school complete	1393	40.2	36.3-44.1
Secondary school and above	1192	55.1	50.3-59.9
<b>Wealth Quintile</b>			
Poorest	883	49.0	37.4-60.5
Second	871	33.1	28.0-38.1
Middle	875	36.4	31.6-41.1
Fourth	880	48.6	41.2-56.1
Richest	878	61.1	56.5-65.8
<b>TOTAL</b>	<b>4387</b>	<b>46.1</b>	<b>42.3-49.9</b>

## Sedentary behavior

Table 3.3.72 below shows the mean minutes spent in sedentary activities on a typical day. Overall, respondents spend an average of 151 minutes per day on sedentary time. The median minutes of total sedentary activity per day is 120.

**Table 3.3.72:** Minutes spent in sedentary time on average per day among men by age group

Men					
Age Group (years)	n	Mean minutes	95% CI	Median minutes	Interquartile range (P25-P75)
18-29	559	157.5	143.3-171.7	120	60-210
30-44	721	152.1	140.3-163.8	120	60-180
45-59	355	159.0	139.3-178.7	120	60-210
60-69	159	185.8	163.2-208.5	180	120-240
<b>18-69</b>	<b>1794</b>	<b>157.4</b>	<b>148.6-166.3</b>	<b>120</b>	<b>60-180</b>
Women					
Age Group (years)	n	Mean minutes	95% CI	Median minutes	Interquartile range (P25-P75)
18-29	936	146.6	134.1-159.0	120	60-180
30-44	989	132.0	120.4-143.6	120	60-180
45-59	520	151.2	134.4-168.0	120	60-180
60-69	255	173.6	152.2-195.0	150	60-240
<b>18-69</b>	<b>2700</b>	<b>144.1</b>	<b>135.0-153.2</b>	<b>120</b>	<b>60-180</b>
Both Sexes					
Age Group (years)	n	Mean minutes	95% CI	Median minutes	Interquartile range (P25-P75)
18-29	1495	151.8	141.3-162.2	120	60-180
30-44	1710	142.0	132.7-151.3	120	60-180
45-59	875	155.1	141.7-168.5	120	60-180
60-69	414	179.5	164.0-195.1	180	90-240
<b>18-69</b>	<b>4494</b>	<b>150.6</b>	<b>143.0-158.2</b>	<b>120</b>	<b>60-180</b>

## 3.4 Past Medical History

### 3.4.1 Raised Blood Pressure or Hypertension

Raised blood pressure (hypertension) is defined as systolic blood pressure  $\geq 140$  mm Hg and /or diastolic blood pressure  $\geq 90$  mm Hg (WHO). Respondents were asked if they had ever had their blood pressure measured by a doctor or other health worker and for those measured if they had been diagnosed with hypertension.

More than half (56 percent) of the respondents had never been measured for hypertension (HTN) with the highest percentage reported among those in age group 18-29 years (62 percent). Approximately 5 percent of the respondents reported to have ever been diagnosed with hypertension in the past 12 months. Seventy one percent of men and 41 percent of women had never been screened for hypertension. For both sexes the age group less likely to be screened is 18-29 years while the age group 60-69 years has the highest percentage of being screened as shown in Table 3.4.1 below.

**Table 3.4.1:** Previous diagnosis of raised blood pressure /HTN

Age Group (years)	N	Men						% diagnosed within past 12 months	95% CI
		% Never measured	95% CI	% measured, not diagnosed	95% CI	% diagnosed, but not within past 12 months	95% CI		
18-29	559	80.9	73.6-88.2	16.9	9.9-23.9	1.7	0.6-2.8	0.5	0.0-1.1
30-44	721	70.4	64.1-76.6	25.7	20.4-31.0	1.5	0.4-2.6	2.4	0.4-4.5
45-59	355	51.8	41.3-62.3	35.6	27.3-43.8	5.0	2.2-7.7	7.6	4.0-11.3
60-69	159	50.9	40.2-61.6	31.5	21.3-41.7	4.8	0.9-8.7	12.7	5.0-20.5
<b>18-69</b>	<b>1794</b>	<b>71.1</b>	<b>64.9-77.3</b>	<b>23.6</b>	<b>18.7-28.5</b>	<b>2.3</b>	<b>1.4-3.3</b>	<b>3.0</b>	<b>1.7-4.3</b>
Women									
18-29	936	44.2	38.0-50.4	49.2	43.1-55.2	3.6	1.5-5.6	3.1	1.8-4.4
30-44	989	38.8	33.0-44.6	50.0	45.1-54.9	5.9	4.0-7.8	5.3	3.5-7.2
45-59	519	37.4	30.6-44.2	39.1	33.2-44.9	9.8	6.6-13.0	13.7	9.0-18.5
60-69	255	41.4	32.5-50.3	36.8	28.6-45.0	6.7	3.1-10.2	15.1	9.8-20.4
<b>18-69</b>	<b>2699</b>	<b>41.3</b>	<b>36.5-46.0</b>	<b>47.2</b>	<b>42.9-51.4</b>	<b>5.4</b>	<b>4.0-6.9</b>	<b>6.1</b>	<b>4.8-7.4</b>
Both Sexes									
18-29	1495	61.7	57.2-66.2	33.7	29.2-38.3	2.7	1.5-3.8	1.9	1.1-2.6
30-44	1710	54.6	49.7-59.4	37.8	34.1-41.6	3.7	2.6-4.8	3.9	2.2-5.6
45-59	874	44.6	38.2-51.0	37.3	32.0-42.6	7.4	5.1-9.7	10.7	7.8-13.5
60-69	414	46.0	38.5-53.5	34.2	27.2-41.3	5.8	3.1-8.4	14.0	9.2-18.7
<b>18-69</b>	<b>4493</b>	<b>55.8</b>	<b>51.8-59.9</b>	<b>35.7</b>	<b>32.4-39.0</b>	<b>3.9</b>	<b>3.1-4.8</b>	<b>4.6</b>	<b>3.6-5.5</b>

**Table 3.4.2** highlights the percentage of respondents who have never been screened for raised blood pressure (BP)/hypertension by residence and wealth status. Sixty one percent of the respondents residing in rural areas had never been screened compared with 48 percent of those residing in the urban areas. Respondents in the poorest wealth quintile were more likely not to have been screened for elevated BP (73 percent) compared with the highest quintile (38 percent)

**Table 3.4.2:** Previous diagnosis of raised BP/HTN by residence and wealth status

Residence		N	% Never measured BP	95% CI	% Measured, not diagnosed	95% CI	% Diagnosed not within past 12 months	95% CI	% Diagnosed within past 12 months	95% CI
Rural	2304	60.7	56.9-64.5	31.4	28.2-34.6	3.8	2.9-4.8	4.1	3.1-5.1	
Urban	2189	48.1	40.1-56.1	42.5	36.4-48.6	4.1	2.5-5.6	5.4	3.4-7.3	
Wealth Quintile										
Poorest	901	73.3	68.8-77.7	21.9	17.7-26.0	2.7	1.3-4.1	2.1	0.8-3.4	
Second	897	63.5	58.6-68.4	29.1	24.5-33.7	3.3	1.9-4.7	4.0	2.4-5.7	
Middle	898	51.8	46.2-57.3	38.6	33.4-43.9	4.3	2.7-5.8	5.3	3.6-7.1	
Fourth	899	55.3	48.1-62.5	36.1	30.8-41.4	3.9	2.0-5.9	4.6	2.9-6.4	
Richest	898	38.4	30.0-46.7	50.1	43.1-57.2	5.1	2.8-7.4	6.4	3.9-8.9	
Poorest	901	73.3	68.8-77.7	21.9	17.7-26.0	2.7	1.3-4.1	2.1	0.8-3.4	
<b>TOTAL</b>	<b>4493</b>	<b>55.8</b>	<b>51.8-59.9</b>	<b>35.7</b>	<b>32.4-39.0</b>	<b>3.9</b>	<b>3.1-4.8</b>	<b>4.6</b>	<b>3.6-5.5</b>	

**Table 3.4.3** shows the percentage of respondents who have never been screened for hypertension by education level. More than two-thirds (69 percent) of respondents with no formal schooling had never been screened for hypertension. The percentage of those who have never been measured increased with decrease in education level.

**Table 3.4.3.** Percentage of respondents previous diagnosis of raised BP/HTN by highest Education level

Education	N	% Never measured BP	95% CI	% Measured, not diagnosed	95% CI	% Diagnosed not within past 12 months	95% CI	% Diagnosed within past 12 months	95% CI
No formal Schooling	754	68.9	62.7-75.2	24.4	19.2-29.7	3.1	1.5-4.8	3.6	1.9-5.3
Primary school incomplete	1100	62.9	58.4-67.5	28.7	24.5-32.9	3.6	2.4-4.8	4.8	3.2-6.3
Primary school complete	1425	58.2	53.9-62.5	34.2	30.4-37.9	3.3	2.2-4.5	4.3	3.0-5.7
Secondary school and above	1214	42.9	35.0-50.8	46.9	40.4-53.4	5.1	3.4-6.8	5.1	3.1-7.1
<b>TOTAL</b>	<b>4493</b>	<b>55.8</b>	<b>51.8-59.9</b>	<b>35.7</b>	<b>32.4-39.0</b>	<b>3.9</b>	<b>3.1-4.8</b>	<b>4.6</b>	<b>3.6-5.5</b>

## Currently on treatment

Respondents who reported to have been previously diagnosed were asked if they were currently on treatment (had been taking medication for hypertension prescribed by a health worker in the past two weeks). Table 3.4.4 below shows the proportion of respondents who reported to have been diagnosed with hypertension and were on treatment. Among those who reported to have been diagnosed with hypertension, only 22 percent were currently on medication prescribed by a health worker; a higher percentage of women (24 percent) than men (18 percent) were on treatment.

**Table 3.4.4:** Percentage of respondents currently taking drugs (medication) prescribed by doctor or health worker

Age Group (years)	Men			Women			Both Sexes		
	N	% taking meds	95% CI	n	% taking meds	95% CI	n	% taking meds	95% CI
18-29	20	3.2	0.0-8.0	69	4.8	0.0-11.6	89	4.4	0.0-9.7
30-44	30	18.4	0.0-37.7	112	24.4	5.2-43.7	142	22.9	10.3-35.4
45-59	39	16.2	0.7-31.7	121	33.9	21.5-46.3	160	27.7	17.0-38.5
60-69	27	37.7	15.3-60.1	65	44.4	30.8-58.1	92	41.5	29.6-53.5
<b>18-69</b>	<b>116</b>	<b>18.0</b>	<b>9.6-26.5</b>	<b>367</b>	<b>24.1</b>	<b>16.0-32.2</b>	<b>483</b>	<b>22.3</b>	<b>17.1-27.4</b>

Among respondents on treatment for hypertension, one percent were currently taking herbal or traditional remedy. Six percent of men age 60-69 were currently taking herbal or traditional remedy compared with 3 percent of women in the same age group (Appendix Table B13)

### 3.4.2 Diabetes Mellitus

Diabetes mellitus (DM) is a chronic metabolic disorder characterized by elevated blood sugar resulting from defects in insulin secretion, insulin action or both (MOPHS, 2010). A diagnosis of diabetes mellitus is made based on measurement of a blood sugar either after fasting or as a random measure. A fasting blood glucose level of >7 mmol/l is considered diagnostic of diabetes mellitus while a level of 6.1-7mmol/l is known as impaired fasting glycemia (pre-diabetic state).

Respondents were asked if they had ever had their blood glucose measurement taken and if so whether they had been diagnosed with DM.

Table 3.4.5 shows the percentage of respondents who have been measured for raised blood sugar/DM Overall, 88 percent of the respondents had never been measured for raised blood sugar. Less than 1 percent of the respondents have been diagnosed with raised blood sugar in the past 12 months.

**Table 3.4.5:** Percentage of respondents who have been measured for Raised Blood Sugar

Age Group (years)	N	Men						
		% Never measured	95% CI	% measured, not diagnosed	95% CI	% diagnosed, but not within past 12 months	95% CI	% diagnosed within past 12 months
18-29	559	94.6	91.9-97.3	5.3	2.6-8.0	0.0	0.0-0.1	0.0
30-44	721	89.4	84.5-94.3	10.1	5.2-15.1	0.2	0.0-0.7	0.2
45-59	355	72.5	63.7-81.4	24.7	15.6-33.7	1.5	0.0-3.0	1.3
60-69	159	75.2	66.8-83.7	18.5	10.4-26.6	2.5	0.0-5.4	3.7
<b>18-69</b>	<b>1794</b>	<b>88.2</b>	<b>84.6-91.9</b>	<b>10.8</b>	<b>7.1-14.4</b>	<b>0.5</b>	<b>0.1-0.8</b>	<b>0.5</b>
<b>Women</b>								
18-29	936	91.8	89.2-94.3	8.0	5.5-10.5	0.1	0.0-0.4	0.1
30-44	988	88.2	85.2-91.2	11.1	8.1-14.0	0.2	0.0-0.4	0.6
45-59	519	77.1	71.7-82.5	17.9	12.7-23.2	1.2	0.1-2.4	3.7
60-69	255	71.9	62.5-81.3	24.0	14.9-33.1	0.0	0.0-0.1	4.0
<b>18-69</b>	<b>2698</b>	<b>87.3</b>	<b>85.2-89.4</b>	<b>11.4</b>	<b>9.3-13.5</b>	<b>0.3</b>	<b>0.1-0.5</b>	<b>1.0</b>
<b>Both Sexes</b>								
18-29	1495	93.1	91.3-95.0	6.7	4.9-8.6	0.1	0.0-0.2	0.1
30-44	1709	88.8	85.5-92.1	10.6	7.3-13.9	0.2	0.0-0.5	0.4
45-59	874	74.8	69.2-80.4	21.3	15.9-26.7	1.4	0.3-2.5	2.5
60-69	414	73.5	66.8-80.3	21.3	15.1-27.6	1.2	0.0-2.6	3.9
<b>18-69</b>	<b>4492</b>	<b>87.8</b>	<b>85.5-90.0</b>	<b>11.1</b>	<b>8.9-13.3</b>	<b>0.4</b>	<b>0.2-0.6</b>	<b>0.8</b>

Respondents in the highest wealth quintile were more likely to have been screened for elevated blood sugar as shown in the Appendix Table B14.

Respondents with no formal education have the highest percentage of those who have never been measured as shown in Appendix Table B15.

## Currently on treatment

Respondents who reported to have been diagnosed with DM were asked if they were currently on treatment (had been taking medication for DM prescribed by a health worker in the past two weeks).

Tables 3.4.6 below show the percentage of respondents who reported to have been diagnosed with diabetes and were on treatment. Among those diagnosed with elevated blood sugar/DM, less than half (40 percent) were currently taking medication. There was a marked variation in current medication use between women (57 percent) and men (17 percent) while those age 30-44 years reported the highest current use (67 percent).

**Table 3.4.6:** Percentage of respondents currently taking medication among those previously diagnosed with DM

Age Group (years)	Men			Women			Both Sexes		
	N	% taking meds	95% CI	N	% taking meds	95% CI	n	% taking meds	95% CI
18-29		0.0-100.0		2	0.0	0.0-0.0	4	10.2	0.0-35.2
30-44		0.0-100.0		9	77.5	43.5-100.0	12	67.1	32.0-100.0
45-59		0.0-1.8		22	61.0	33.1-88.9	32	39.0	11.8-66.2
60-69		0.0-56.7		16	48.2	9.5-86.9	24	31.9	5.2-58.6
<b>18-69</b>	<b>23*</b>	<b>16.8</b>	<b>0.0-35.7</b>	<b>49</b>	<b>56.5</b>	<b>34.3-78.7</b>	<b>72</b>	<b>40.1</b>	<b>21.9-58.4</b>

\* Indicates estimate based on less than 25 unweighted cases and has been suppressed.

**Table 3.4.7** shows the distribution of insulin use among respondents diagnosed with DM. Current insulin use among those previously diagnosed with diabetes was reported at 17 percent. The highest current insulin use was reported among those age 30-44 years (24 percent).

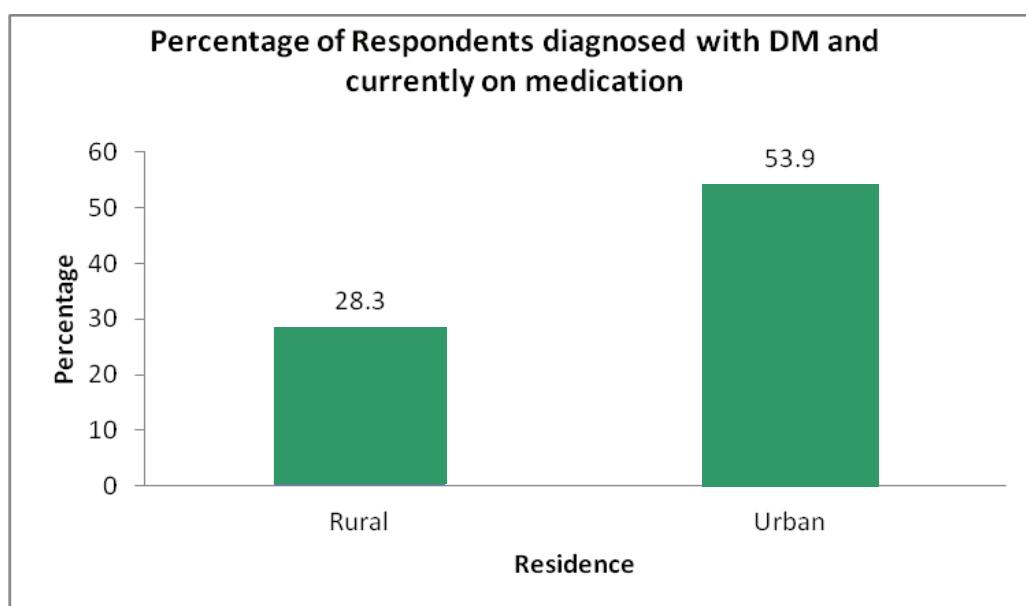
**Table 3.4.7:** Percentage of respondents currently taking Insulin among those previously diagnosed with DM

Age Group (years)	Men			Women			Both Sexes		
	N	% taking insulin	95% CI	N	% taking insulin	95% CI	n	% taking insulin	95% CI
18-29		0.0-100.0		2	0.0	0.0-0.0	4	10.2	0.0-35.2
30-44		0.0-94.4		9	43.7	3.6-83.9	12	39.5	5.5-73.5
45-59		0.0-1.8		22	10.9	0.0-25.3	32	7.1	0.0-16.5
60-69		0.0-54.6		16	31.5	0.0-67.7	24	23.8	0.0-49.2
<b>18-69</b>	<b>23*</b>	<b>13.3</b>	<b>0.0-30.8</b>	<b>49</b>	<b>19.0</b>	<b>4.3-33.8</b>	<b>72</b>	<b>16.7</b>	<b>5.9-27.5</b>

\*Indicates estimate based on less than 25 unweighted cases and has been suppressed.

A higher percentage of respondents who had been diagnosed with DM and were currently on treatment reside in the urban at 54 percent compared with rural residents at 28 percent as shown in Figure 3.4.1 below.

**Fig 3.4.1:** Percentage of respondents diagnosed with DM and currently on medication



Five percent of the respondents who had been diagnosed with diabetes were currently using herbal therapy or treatment (Appendix Table B16).

### 3.4.3 Raised Total Cholesterol

Elevated total blood cholesterol is one of the modifiable risk factors for the development of the major non-communicable conditions such as cardiovascular disease, diabetes and many cancers. Blood cholesterol test profiles is usually categorized into low-density lipoprotein cholesterol (LDL), high-density lipoprotein cholesterol (HDL) and triglycerides.

Nearly all, (98 percent) of the respondents had never been measured for cholesterol levels and the percentage of those never been measured was lowest among those age 45-59 (94 percent) as shown in table 3.4.8 below.

Table 3.4.8: Percentage of Respondents measured for raised Total Cholesterol

Age Group (years)	n	Men						95% CI
		% Never measured	95% CI	% measured, not diagnosed	95% CI	% diagnosed, but not within past 12 months	95% CI	
18-29	559	99.1	98.3-99.8	0.9	0.2-1.7	0.0	0.0-0.0	0.0-0.0
30-44	721	98.3	97.1-99.5	1.6	0.4-2.8	0.0	0.0-0.0	0.1-0.2
45-59	355	92.9	87.7-98.0	6.4	1.2-11.6	0.2	0.0-0.5	0.6-0.1-1.3
60-69	159	93.3	87.3-99.4	6.7	0.6-12.7	0.0	0.0-0.0	0.0-0.0
<b>18-69</b>	<b>1794</b>	<b>97.5</b>	<b>96.2-98.8</b>	<b>2.3</b>	<b>1.1-3.6</b>	<b>0.0</b>	<b>0.0-0.1</b>	<b>0.1</b>
<b>Women</b>								
18-29	936	98.7	97.9-99.5	1.2	0.4-2.0	0.0	0.0-0.0	0.1-0.0-0.3
30-44	988	98.2	97.2-99.2	0.7	0.1-1.2	0.4	0.0-1.0	0.7-0.1-1.3
45-59	519	94.6	91.0-98.1	4.3	0.9-7.7	0.3	0.0-0.8	0.8-0.0-1.9
60-69	255	97.1	94.9-99.4	1.1	0.0-2.3	1.1	0.0-2.5	0.7-0.0-2.0
<b>18-69</b>	<b>2698</b>	<b>97.8</b>	<b>97.1-98.5</b>	<b>1.5</b>	<b>0.9-2.2</b>	<b>0.2</b>	<b>0.1-0.4</b>	<b>0.4</b>
<b>Both Sexes</b>								
18-29	1495	98.9	98.3-99.4	1.1	0.5-1.6	0.0	0.0-0.0	0.0-0.0-0.1
30-44	1709	98.2	97.4-99.1	1.1	0.4-1.9	0.2	0.0-0.5	0.4-0.1-0.7
45-59	874	93.7	90.3-97.2	5.3	2.2-8.4	0.3	0.0-0.5	0.7-0.1-1.3
60-69	414	95.3	91.9-98.6	3.8	0.8-6.9	0.5	0.0-1.3	0.4-0.0-1.0
<b>18-69</b>	<b>4492</b>	<b>97.7</b>	<b>96.9-98.4</b>	<b>1.9</b>	<b>1.2-2.6</b>	<b>0.1</b>	<b>0.0-0.2</b>	<b>0.3</b>

## Currently on treatment

Tables 3.4.9 below shows the percentage of respondents who were on treatment among those who reported to have been diagnosed with elevated cholesterol. Only 13 percent of respondents who reported to have been diagnosed with elevated cholesterol levels were currently on medication

**Table 3.4.9:** Percentage of respondents currently taking oral treatment for raised cholesterol

Age Group (years)	Both Sexes		
	n	% taking meds	95% CI
18-29	1	0.0	0.0-0.0
30-44	11	2.1	0.0-6.8
45-59	13	19.0	0.0-45.4
60-69	6	46.7	0.0-100.0
<b>18-69</b>	<b>31</b>	<b>13.3</b>	<b>0.0-27.8</b>

## 3.5 Cervical Cancer Screening

### Awareness of Cervical Cancer Screening

Cancer of the cervix is a leading cause of cancer deaths in developing countries as well as one of the top cancers affecting women in Africa. Early detection has been shown to prevent up to 80 percent of cervical cancers. Screening is therefore recommended for every woman age 30 to 49 at least once in her lifetime and ideally more frequently (WHO Fact Sheet No 380, 2015). Some of the common tests used for cervical cancer screening include Visual Inspection with Acetic Acid (VIA), Visual Inspection under Lugol's Iodine (VILI), Pap smear and the Human Papilloma Virus test.

Table 3.5.1 presents the proportion of respondents' age 18-69 years who have ever heard of cervical cancer screening. Overall, 43 percent of the respondents have ever heard of any of the three cervical cancer screening methods. Women in age group 30-44 have the highest percentage of women who have ever heard of cervical cancer screening. More women (47 percent) were aware of cervical cancer screening than men (40 percent).

**Table 3.5.1: Percentage of respondents who have ever heard of cervical cancer screening**

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	550	38.4	31.9-45.0	926	44.8	38.6-51.0	1476	41.8	36.2-47.3
30-44	710	38.8	32.5-45.2	979	50.9	44.9-57.0	1689	44.9	40.0-49.9
45-59	348	45.6	36.5-54.7	509	46.6	39.1-54.2	857	46.1	39.2-53.1
60-69	153	33.3	24.8-41.8	251	39.7	28.8-50.6	404	36.6	29.3-43.9
<b>18-69</b>	<b>1761</b>	<b>39.5</b>	<b>34.0-45.0</b>	<b>2667</b>	<b>46.8</b>	<b>41.6-51.9</b>	<b>4426</b>	<b>43.2</b>	<b>38.4-48.1</b>

Approximately 61 percent of the respondent in the richest quintile have heard of cervical cancer screening compared with 22 percent among the poorest as illustrated in Appendix Table B17.

## Life time screening among all the women

Table 3.5.2 shows the percentage of women who had ever been screened for cervical cancer. Overall, 11 percent reported having had a screening test done. Women in age group 30 – 44 years have the highest percentage of those who had ever been screened for cervical cancer (17 percent)

**Table 3.5.2:** Prevalence of women who have ever been screened for cervical cancer

Age Group (years)	Women		
	n	% ever tested	95% CI
18-29	934	7.3	4.3-10.2
30-44	987	16.6	12.8-20.5
45-59	519	14.0	8.9-19.1
60-69	254	8.0	3.5-12.4
<b>18-69</b>	<b>2694</b>	<b>11.3</b>	<b>8.8-13.9</b>

## Life time screening among all the women age 30-49 years

Table 3.5.3 below shows the uptake of screening services among women age 30-49 years based on residence, wealth quintile and education level. Overall, 16 percent of women age 30-49 years have ever been screened for cervical cancer. Twenty three percent of women in urban areas have been ever screened compared with 14 percent in rural areas. The percentage of women who had ever been screened was noted to increase with advancing level of education.

**Table 3.5.3:** Percentage of women age 30-49 years who have ever been screened for cervical cancer by selected demographic characteristic

	N	%	95% CI
<b>Residence</b>			
Rural	652	13.9	9.8-18.0
Urban	529	22.5	14.7-30.2
<b>Education Level</b>			
No formal Schooling	199	3.2	0.0-6.8
Primary school incomplete	323	13.9	8.6-19.2
Primary school complete	405	17.6	12.5-22.7
Secondary school and above	254	27.8	19.9-35.7
<b>Wealth Quintile</b>			
Poorest	251	3.6	0.5-6.6
Second	253	11.0	6.6-15.4
Middle	259	19.7	12.8-26.6
Fourth	195	25.4	15.7-35.0
Richest	223	29.6	19.4-39.8
<b>TOTAL</b>	<b>1181</b>	<b>16.4</b>	<b>12.7-20.1</b>

Table 3.5.4 shows the percentage of women who have heard of any cervical screening methods and have ever been screened. Overall, approximately a quarter of women who are aware of screening methods of cervical cancer have ever been screened.

**Table 3.5.4:** Percentage of women who have ever heard of any cervical cancer screening methods and have ever been screened

Age Group	n	Yes	95% CI
18-29	413	16.1	9.7-22.5
30-44	509	32.0	25.9-38.2
45-59	227	30.4	20.6-40.2
60-69	97	18.7	9.8-27.7
<b>TOTAL</b>	<b>1246</b>	<b>23.9</b>	<b>19.2-28.6</b>

### 3.6 Primary Source of Health Care

Table 3.6.1 details the primary source of health care for the respondents. Overall, 61 percent of the patients seek health care at level 1-3 health facilities. Twenty eight percent go to level 4-6 while 10 percent self medicate/use over the counter.

Table 3.6.1: Primary Source of Health Care

Age Group	n	Self medicati on+OTC	95% CI	Herbal/a lt therapy	95% CI	Level 1- 3*	95% CI	Level 4- 5†	95% CI	Level 6	95% CI
<b>Men</b>											
18-29	558	15.2	9.7-20.7	0.3	0.0-0.8	58.8	50.1- 67.6	25.6	18.8- 32.3	0.1	0.0-0.3
30-44	720	13.4	7.5-19.2	0.6	0.1-1.2	57.2	49.7- 64.7	28.8	23.1- 34.4	0.0	0.0-0.0
45-59	354	13.3	6.2-20.3	0.1	0.0-0.2	58.6	46.7- 70.4	28.1	20.1- 36.1	0.0	0.0-0.0
60-69	156	11.0	4.3-17.8	0.5	0.0-1.1	58.1	46.3- 69.9	30.0	19.7- 40.3	0.4	0.0-1.0
<b>TOTAL</b>	<b>1788</b>	<b>14.0</b>	<b>10.1-17.9</b>	<b>0.4</b>	<b>0.1-0.7</b>	<b>58.2</b>	<b>51.5- 65.0</b>	<b>27.3</b>	<b>22.6- 32.0</b>	<b>0.1</b>	<b>0.0-0.1</b>
<b>Women</b>											
18-29	935	5.7	2.6-8.8	0.4	0.0-0.9	63.5	57.1- 69.8	30.3	24.6- 36.1	0.1	0.0-0.2
30-44	988	8.2	5.1-11.4	0.2	0.0-0.5	64.1	57.2- 71.0	27.3	21.6- 33.1	0.1	0.0-0.3
45-59	519	5.5	2.6-8.4	0.4	0.0-0.9	65.4	58.5- 72.3	28.7	22.1- 35.3	0.0	0.0-0.0
60-69	255	5.6	2.5-8.8	0.2	0.0-0.6	65.6	57.1-74.1	27.7	19.3- 36.2	0.9	0.0-2.5
<b>TOTAL</b>	<b>2697</b>	<b>6.5</b>	<b>4.5-8.5</b>	<b>0.3</b>	<b>0.0-0.6</b>	<b>64.1</b>	<b>58.8- 69.4</b>	<b>29.0</b>	<b>24.0- 34.0</b>	<b>0.1</b>	<b>0.0-0.2</b>
<b>Both sexes</b>											
18-29	1493	10.2	7.2-13.2	0.4	0.0-0.7	61.3	54.5- 68.0	28.1	22.3- 33.8	0.1	0.0-0.2
30-44	1708	10.8	6.9-14.7	0.4	0.1-0.7	60.7	54.7- 66.7	28.1	23.3- 32.8	0.1	0.0-0.2
45-59	873	9.4	5.4-13.4	0.2	0.0-0.5	62.0	54.3- 69.6	28.4	22.3- 34.5	0.0	0.0-0.0
60-69	411	8.3	4.0-12.5	0.3	0.0-0.8	62.0	53.8- 70.1	28.8	21.5- 36.2	0.6	0.0-1.6
<b>TOTAL</b>	<b>4485</b>	<b>10.2</b>	<b>7.5-12.9</b>	<b>0.4</b>	<b>0.1-0.6</b>	<b>61.2</b>	<b>55.6- 66.8</b>	<b>28.2</b>	<b>23.6- 32.7</b>	<b>0.1</b>	<b>0.0-0.2</b>

\*Includes- Community health Worker, dispensaries, health centers and private clinics

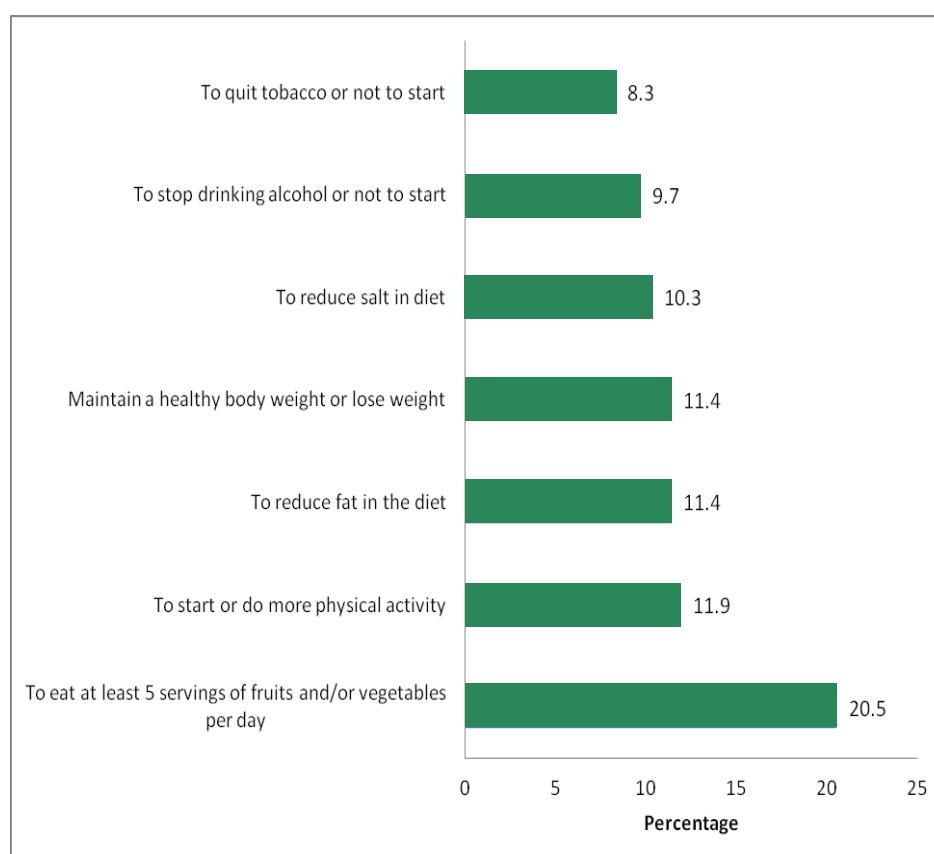
†Includes- Sub county hospitals, county referral hospitals, national referral hospitals and private hospitals

### 3.7 Healthy Lifestyle Advice

Health workers play a major role in the prevention of non communicable diseases by educating their clients on the need to adopt healthy lifestyles. The STEPS survey sought to assess from the respondents if they had been given lifestyle advice by a health care worker. In this survey respondents were asked if they had been advised by a health worker to either avoid engaging in a certain risky behavior or encouraged to adopt healthy habits that reduce their risk of developing NCDs.

Figure 3.7.1 below shows the percentage of respondents age 18-69 years who had been given advice by a health worker relating to the four major NCD behavioral risk factors in the past three years. Only eight percent of the respondents had been advised against tobacco use. Overall, 10 percent of the respondents have been advised to either stop drinking alcohol or not to start drinking alcohol by a health care worker. Twenty one percent of the respondents have received advice to eat adequate fruits and vegetables.

Fig 3.7.1: Percentage of respondents receiving healthy advice



## 3.8 Physical Measurement

### Overweight and Obesity

Overweight and obesity refer to abnormal accumulation of fat in the body that may impair health. Body mass index (BMI) is a simple index of weight-for-height that provides population-level measure of overweight and obesity as it is the same for both sexes and for all ages of adults. It is defined as a person's weight in kilograms divided by the square of his height in meters ( $\text{kg}/\text{m}^2$ ). A person whose BMI is greater than or equal to 25 is considered overweight while one with a BMI greater than or equal to 30 is considered obese. See Appendix Table B18 for further classification

### Overweight and Obesity

Overweight and obesity are a major risk factor for noncommunicable diseases such as cardiovascular diseases, diabetes and some types of cancer. In this survey, respondents had their weight and height measurements taken using a portable BMI scale.

Table 3.8.1 shows the percentage of respondents who had a  $\text{BMI} \geq 25$  and were thus considered either overweight or obese. Twenty-eight percent of the respondents are either overweight or obese with a significantly higher percentage of women (39 percent) being overweight or obese compared with men (18 percent).

**Table 3.8.1:** Prevalence of Overweight and Obesity

Age Group (years)	Men			Women			Both Sexes		
	N	% 5	95% CI	n	% 5	95% CI	n	% 5	95% CI
18-29	552	11.7	7.2-16.2	839	31.4	26.3-36.5	1391	21.5	18.5-24.5
30-44	698	21.0	15.2-26.9	913	44.6	37.9-51.3	1611	32.5	27.1-37.9
45-59	345	25.0	17.2-32.8	509	46.1	39.2-53.0	854	35.6	30.4-40.7
60-69	157	23.2	14.5-31.8	249	39.6	29.8-49.5	406	31.6	24.2-39.0
<b>18-69</b>	<b>1752</b>	<b>17.5</b>	<b>13.2-21.8</b>	<b>2510</b>	<b>38.5</b>	<b>34.4-42.7</b>	<b>4262</b>	<b>27.9</b>	<b>24.8-31.0</b>

Table 3.8.2 shows the Percentage of respondents in each BMI classification. Overall, 61 percent have BMI 18.5-24.9 which is normal weight. Nine percent of the respondents have BMI above 30 (obese) while 19 percent have BMI 25.0-29.9 (overweight). Women are more likely to be obese (14 percent) and overweight (25 percent) than the men obese (4 percent) and overweight (13 percent).

Table 3.8.2: Percentage of respondents in each BMI classification

Men									
Age Group (years)	n	% Under-weight <18.5	95% CI	% Normal weight 18.5-24.9	95% CI	% BMI 25.0-29.9	95% CI	% Obese ≥30.0	95% CI
18-29	552	12.9	8.7-17.1	75.4	69.7-81.2	10.9	6.4-15.4	0.8	0.0-1.6
30-44	698	10.5	7.2-13.8	68.5	62.6-74.4	14.4	10.2-18.7	6.6	2.6-10.6
45-59	345	18.0	10.7-25.2	57.0	49.5-64.6	15.7	10.8-20.6	9.3	4.4-14.2
60-69	157	27.1	17.6-36.5	49.8	40.3-59.3	18.3	11.1-25.6	4.8	0.9-8.8
<b>18-69</b>	<b>1752</b>	<b>13.7</b>	<b>10.3-17.0</b>	<b>68.8</b>	<b>64.3-73.3</b>	<b>13.2</b>	<b>10.2-16.3</b>	<b>4.3</b>	<b>2.6-6.0</b>
Women									
Age Group (years)	n	% Under-weight <18.5	95% CI	% Normal weight 18.5-24.9	95% CI	% BMI 25.0-29.9	95% CI	% Obese ≥30.0	95% CI
18-29	839	10.0	6.5-13.5	58.6	54.1-63.1	22.4	18.3-26.5	9.0	5.4-12.7
30-44	913	7.6	5.0-10.2	47.8	42.0-53.6	29.2	24.1-34.3	15.4	11.7-19.1
45-59	509	7.1	4.3-9.9	46.8	40.6-53.0	23.9	19.1-28.6	22.3	18.0-26.5
60-69	249	12.8	5.3-20.3	47.6	38.7-56.4	23.3	15.3-31.2	16.4	9.3-23.5
<b>18-69</b>	<b>2510</b>	<b>8.9</b>	<b>6.5-11.4</b>	<b>52.6</b>	<b>49.2-55.9</b>	<b>24.9</b>	<b>22.0-27.7</b>	<b>13.7</b>	<b>11.3-16.1</b>
Both Sexes									
Age Group (years)	n	% Under-weight <18.5	95% CI	% Normal weight 18.5-24.9	95% CI	% BMI 25.0-29.9	95% CI	% Obese ≥30.0	95% CI
18-29	1391	11.5	8.4-14.5	67.1	63.1-71.0	16.6	13.3-19.9	4.9	3.0-6.7
30-44	1611	9.1	6.8-11.3	58.5	53.7-63.2	21.6	18.4-24.8	10.9	7.4-14.3
45-59	854	12.5	8.5-16.5	51.9	47.3-56.5	19.8	16.3-23.3	15.8	12.7-18.9
60-69	406	19.8	12.3-27.3	48.6	41.4-55.8	20.9	15.0-26.7	10.7	6.3-15.2
<b>18-69</b>	<b>4262</b>	<b>11.3</b>	<b>9.0-13.7</b>	<b>60.8</b>	<b>57.9-63.6</b>	<b>19.0</b>	<b>16.7-21.3</b>	<b>8.9</b>	<b>7.5-10.4</b>

**Table 3.8.3** shows the percentage of respondents in each BMI classification by residence. The survey results shows that respondents residing in urban areas (25 percent) are more likely to be overweight than those residing in rural areas (16 percent). Twelve percent of respondents from urban settlements were obese while 7 % of rural dwellers are obese.

**Table 3.8.3:** Prevalence of overweight and obesity by residence

Residence	BMI class								
	N	% Under-weight <18.5	95% CI	% Normal weight 18.5-24.9	95% CI	% BMI 25.0- 29.9	95% CI	% Obese ≥30.0	95% CI
Rural	2190	13.4	10.2-16.5	64.2	60.7-67.8	15.5	13.3-17.7	6.9	5.2-8.6
Urban	2072	8.0	4.9-11.2	55.2	50.8-59.6	24.6	20.2-28.9	12.2	9.8-14.6
<b>TOTAL</b>	<b>4262</b>	<b>11.3</b>	<b>9.0-13.7</b>	<b>60.8</b>	<b>57.9-63.6</b>	<b>19.0</b>	<b>16.7-21.3</b>	<b>8.9</b>	<b>7.5-10.4</b>

The percentage of overweight and obesity increases with increase in education level and increase in wealth (Appendix Table B19)

## Waist and Hip Measurements

### Waist Circumference

The respondents' waist circumference is detailed in table 3.8.4. The mean waist circumference for men is 78.6 while for women is 79.1

**Table 3.8.4:** Mean Waist Circumference

Age Group (years)	Men			Women		
	n	Mean	95% CI	n	Mean	95% CI
18-29	554	75.2	73.5-76.9	843	76.1	74.2-77.9
30-44	704	80.8	78.4-83.3	922	79.8	77.4-82.2
45-59	346	82.9	79.3-86.4	510	84.4	81.9-86.9
60-69	159	80.1	77.6-82.7	250	83.4	80.0-86.7
<b>18-69</b>	<b>1763</b>	<b>78.6</b>	<b>76.7-80.4</b>	<b>2525</b>	<b>79.1</b>	<b>77.4-80.7</b>

## Waist–hip ratio

Waist–hip ratio (the waist circumference divided by the hip circumference) is an index used to identify individuals at increased risk of obesity related morbidity due to accumulation of abdominal fat (WHO, 2011). Women whose waist hip ratio (WHR) is  $\geq 0.85$  and men with a WHR  $\geq 0.9$  are considered to be at increased risk of obesity-related morbidity.

Table 3.8.5 below shows the percentage of respondents waist hip ratio above the normal values by sex and age group. Twenty eight percent of the men and 36 percent of the Kenyan women had a higher Waist–hip ratio than recommended.

Table 3.8.5: Percentage of respondents waist hip ratio by sex and age group

Age Group	Men		
	n	At or above 0.9	95%CI
18-29	554	17.5	11.2-23.9
30-44	704	30.1	23.9-36.3
45-59	346	43.8	33.8-53.8
60-69	159	41.2	31.9-50.5
<b>TOTAL</b>	<b>1763</b>	<b>27.2</b>	<b>22.2-32.3</b>
Women			
	n	At or above 0.85	95%CI
	843	28.4	23.8-33.0
30-44	922	36.4	32.3-40.6
45-59	510	48.6	42.4-54.8
60-69	250	56.0	47.3-64.6
<b>TOTAL</b>	<b>2525</b>	<b>35.9</b>	<b>32.4-39.3</b>

## Blood pressure measurement

Elevated blood pressure is one of the major risk factors for development of cardiovascular diseases. In this study, respondents blood pressure measurement was taken using battery powered digital blood pressure machines. Three readings were taken 3-5 minutes apart with the last reading being recorded as the respondent's blood pressure.

### Mean Systolic and Diastolic Blood Pressure

Overall the mean systolic blood pressure of the respondents is 124mmHH while the diastolic is 80mmHH. The mean systolic blood pressure is significantly higher among the men (127 mmHg) than women 122 (mmHg) (Appendix Table B20 and Appendix Table B21).

### Prevalence of Raised Blood Pressure

Twenty four percent of the respondents have raised blood pressure (raised blood pressure is defined as  $SBP \geq 140$  and/or  $DBP \geq 90$  mmHg or currently on medication for raised BP). The highest prevalence was reported among those age 60-69 years (53 percent) with women age 60-69 years having a prevalence of 58 percent compared with men in the same age group (49 percent) as shown in the table 3.8.6 below

**Table 3.8.6:** Percentage of Respondents with Raised Blood Pressure or currently on medication

Age Group (years)	Men			Women			Both Sexes		
	N	%	95% CI	N	%	95% CI	n	%	95% CI
18-29	555	15.4	10.9-19.9	931	11.1	8.8-13.4	1486	13.2	10.4-15.9
30-44	705	27.8	22.6-33.0	974	21.4	17.3-25.5	1679	24.6	21.0-28.2
45-59	349	38.7	31.3-46.1	511	48.5	42.9-54.1	860	43.6	39.0-48.2
60-69	159	48.5	38.5-58.6	251	57.7	48.7-66.7	410	53.2	46.4-60.0
<b>18-69</b>	<b>1768</b>	<b>25.1</b>	<b>21.9-28.2</b>	<b>2667</b>	<b>22.6</b>	<b>20.0-25.3</b>	<b>4435</b>	<b>23.8</b>	<b>21.4-26.2</b>

Table 3.8.7 shows the percentage of Kenyans with raised blood pressure by residence and wealth quintile. Raised blood pressure was found in 26 percent and 22 percent of rural and urban residents respectively.

**Table 3.8.7.** Percentage of Kenyans with Raised Blood Pressure by Residence and Wealth Quintile

	n	Above or on medicines %	95% CI
<b>Residence</b>			
Rural	2276	25.3	22.6-28.0
Urban	2159	21.5	17.4-25.5
<b>Wealth Quintile</b>			
Poorest	191	19.5	15.6-23.3
Second	234	24.4	20.6-28.2
Middle	279	29.8	25.4-34.2
Fourth	252	24.4	19.8-29.0
Richest	245	21.7	15.7-27.8
<b>TOTAL</b>	<b>4435</b>	<b>23.8</b>	<b>21.4-26.2</b>

**Table 3.8.8** shows the percentage of respondents with raised blood pressure on medication. Overall, 92 percent of people living with hypertension are not on treatment with 97 percent of those age 18-29 years not being on treatment. Among respondents living with hypertension only three percent are well controlled with the level of control noted to improve with increasing age as shown in the table below. The percentage of men not on treatment (95 percent) is higher than that of women (88 percent).

Table 3.8.8: Percentage of respondents with raised blood pressure on medication

Age Group (years)	n	Men				% Not on medication and SBP≥140 and/or DBP≥90 95% CI
		% On medication and SBP<140 and DBP<90	95% CI	% On medication and SBP≥140 and/or DBP≥90	95% CI	
18-29	103	0.0	0.0-0.0	0.0	0.0-0.0	100.0 100.0
30-44	169	1.7	0.0-5.0	2.9	0.0-6.1	95.5 91.0-99.9
45-59	128	3.5	0.0-8.2	4.3	0.0-8.9	92.2 85.8-98.6
60-69	81	6.5	0.0-13.1	5.2	0.0-14.0	88.3 78.1-98.5
<b>18-69</b>	<b>481</b>	<b>2.2</b>	<b>0.3-4.0</b>	<b>2.7</b>	<b>0.9-4.5</b>	<b>95.2</b> <b>92.7-97.6</b>
Women						
18-29	109	4.7	0.0-10.1	2.6	0.0-6.5	92.7 86.3-99.2
30-44	210	5.6	0.0-11.5	4.1	0.5-7.7	90.3 84.0-96.7
45-59	241	4.0	0.9-7.2	11.5	4.6-18.4	84.5 77.2-91.7
60-69	156	5.1	1.2-9.0	9.7	4.6-14.7	85.3 78.4-92.1
<b>18-69</b>	<b>716</b>	<b>4.8</b>	<b>2.0-7.6</b>	<b>6.9</b>	<b>4.1-9.8</b>	<b>88.3</b> <b>84.7-91.9</b>
Both Sexes						
18-29	212	2.1	0.0-4.6	1.1	0.0-2.9	96.8 93.9-99.7
30-44	379	3.4	0.2-6.6	3.4	1.0-5.8	93.3 89.6-96.9
45-59	369	3.8	1.1-6.5	8.3	3.7-12.9	87.9 82.8-93.0
60-69	237	5.7	2.3-9.2	7.6	2.9-12.4	86.6 80.3-92.9
<b>18-69</b>	<b>1197</b>	<b>3.4</b>	<b>1.8-5.0</b>	<b>4.7</b>	<b>3.1-6.3</b>	<b>91.8</b> <b>89.7-93.9</b>

## Severe hypertension

Severe hypertension is defined as systolic blood pressure  $\geq 160$  mm Hg and/or diastolic blood pressure  $\geq 100$  mm Hg.

Table 3.8.9 highlights the percentage of respondents who have severe hypertension. Overall, eight percent of the respondents have severe hypertension.

**Table 3.8.9:** Prevalence of Severe Hypertension

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	555	2.3	0.9-3.6	931	2.7	1.2-4.2	1486	2.5	1.5-3.5
30-44	705	7.2	4.4-10.1	974	8.3	5.9-10.6	1679	7.8	5.7-9.8
45-59	349	16.3	10.5-22.0	511	25.2	20.1-30.2	860	20.7	16.1-25.3
60-69	159	26.4	16.9-35.8	251	29.1	21.8-36.4	410	27.8	21.9-33.7
<b>18-69</b>	<b>1768</b>	<b>7.5</b>	<b>6.1-8.9</b>	<b>2667</b>	<b>9.4</b>	<b>7.9-10.9</b>	<b>4435</b>	<b>8.4</b>	<b>7.3-9.6</b>

Table 3.8.10 below shows the percentage of respondents who have severe hypertension and are not currently taking medication. In this survey, seven percent of the respondents not currently on medication were found to have severe hypertension with the highest prevalence recorded among those age 60-69 years at 22 percent.

**Table 3.8.10:** Prevalence of Severe Hypertension among respondents not on medication

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	555	2.3	0.9-3.6	923	1.9	0.9-3.0	1478	2.1	1.2-3.0
30-44	700	6.0	3.4-8.7	956	6.4	4.2-8.5	1656	6.2	4.6-7.9
45-59	340	13.6	8.0-19.3	473	19.1	14.8-23.4	813	16.3	12.0-20.6
60-69	151	21.9	13.7-30.1	225	22.6	15.8-29.4	376	22.3	16.9-27.7
<b>18-69</b>	<b>1746</b>	<b>6.3</b>	<b>5.0-7.7</b>	<b>2577</b>	<b>6.9</b>	<b>5.6-8.2</b>	<b>4323</b>	<b>6.6</b>	<b>5.6-7.7</b>

## 3.9 BIOCHEMICAL MEASUREMENTS

### Blood Glucose Measurements

In this survey respondents had their blood glucose levels measured after at least 12 hours of fasting. Testing was performed using a Cardiocheck machine which used test strips for both blood glucose and lipid profile (total Cholesterol and HDL Cholesterol). Blood sample was collected via a minimally invasive figure prick.

#### Mean Fasting Glucose

The survey showed that the mean fasting glucose is 4.6 mmol/l. There was no significance difference in mean fasting glucose between the sexes (Appendix Table B22).

#### Prevalence of Impaired fasting Glycaemia

Table 3.9.1 shows the prevalence of impaired fasting glycaemia. Overall, three percent of the respondents had impaired fasting glycaemia. The age group 60-69 has the highest percentage of impaired fasting glycaemia (7 percent).

**Table 3.9.1:** Prevalence of Impaired Fasting Glycaemia\*

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	505	2.0	0.2-3.8	859	2.1	0.8-3.5	1364	2.1	0.8-3.3
30-44	643	2.5	1.2-3.9	908	3.2	1.6-4.8	1551	2.9	1.8-3.9
45-59	325	5.7	2.3-9.0	472	4.8	2.3-7.3	797	5.2	3.2-7.2
60-69	144	5.7	1.6-9.8	231	8.1	3.6-12.5	375	6.9	3.6-10.2
<b>18-69</b>	<b>1617</b>	<b>3.0</b>	<b>1.7-4.2</b>	<b>2470</b>	<b>3.2</b>	<b>2.1-4.3</b>	<b>4087</b>	<b>3.1</b>	<b>2.2-4.0</b>

#### Prevalence of Raised Blood Glucose

Table 3.9.2 below shows the prevalence of respondents who have raised blood glucose/DM or are on treatment for diabetes by age group and sex. Two percent of the respondents have either raised fasting blood glucose (FBG) or are currently on treatment for diabetes. The highest percentage of raised FBG was found among the age group 45-59 years (5 percent).

**Table 3.9.2:** Prevalence of raised blood glucose or currently on medication for

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	505	0.5	0.0-1.2	859	0.4	0.0-0.8	1364	0.5	0.1-0.9
30-44	643	1.2	0.3-2.1	908	3.0	1.3-4.6	1551	2.1	1.1-3.1
45-59	325	4.9	0.7-9.1	472	6.0	2.3-9.6	797	5.4	2.9-8.0
60-69	144	1.3	0.0-3.4	231	4.6	1.8-7.4	375	3.0	1.2-4.7
<b>18-69</b>	<b>1617</b>	<b>1.5</b>	<b>0.7-2.3</b>	<b>2470</b>	<b>2.3</b>	<b>1.6-3.1</b>	<b>4087</b>	<b>1.9</b>	<b>1.3-2.5</b>

\*\* plasma venous value  $\geq$  7.0 mmol/L

**Table 3.9.3** shows the percentage of respondents with raised blood glucose by residence and wealth quintile. Two percent of urban respondents have raised blood glucose. Respondents in the fourth wealth quintile have the highest percentage of with raised blood glucose at 3percent.

**Table 3.9.3:** Prevalence of raised blood glucose or currently on medication for diabetes\*\*by residence and wealth quintile

	n	%	95% CI
<b>Residence</b>			
Rural	2100	1.6	1.0-2.2
Urban	1987	2.4	1.2-3.6
<b>Wealth Quintile</b>			
Poorest	831	1.4	0.6-2.2
Second	818	1.0	0.4-1.7
Middle	815	2.2	1.2-3.3
Fourth	807	2.9	1.3-4.4
Richest	816	2.1	0.2-4.1
<b>TOTAL</b>	<b>4087</b>	<b>1.9</b>	<b>1.3-2.5</b>

## Blood Cholesterol Measurements

### Mean total cholesterol

The overall mean total cholesterol is 3.6 mmol/L (males 3.4 mmol/L and females 3.8 mmol/L). Age group 45-59 has the highest mean at 4.0 (Appendix Table B23).

### Prevalence of raised total cholesterol

There are no standard cut-off points for total cholesterol levels but in many developed countries values below 5.0 mmol/L are considered normal while values above 6.2 mmol/L are considered high (Mayo Clinic).

In this survey, respondents had their total and HDL Cholesterol levels measured after at least 12 hours of fasting using a Cardiocheck machine and test strips for lipid profile. The percentage of respondents with total cholesterol  $\geq$  5.0 mmol/L or currently on medication for raised cholesterol is shown in table 3.9.4. Approximately one in ten respondents have cholesterol  $\geq$  5.0 mmol/L or are currently on medication for raised cholesterol. The percentage is slightly higher among the women (13 percent) compared with men (7 percent). The age group 60-69 have the highest percentage of raised cholesterol at 17 percent.

**Table 3.9.4:** Percentage with Total Cholesterol  $\geq 5.0$  mmol/L or currently on medication for raised cholesterol

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	512	2.1	0.8-3.4	874	8.8	5.8-11.8	1386	5.6	3.9-7.3
30-44	658	11.0	5.6-16.3	929	12.8	9.3-16.3	1587	11.9	8.2-15.6
45-59	330	13.7	7.8-19.7	483	21.0	15.8-26.1	813	17.3	12.9-21.8
60-69	146	9.1	1.1-17.0	237	23.5	14.8-32.2	383	16.5	10.6-22.4
<b>18-69</b>	<b>1646</b>	<b>7.3</b>	<b>4.7-9.9</b>	<b>2523</b>	<b>12.8</b>	<b>10.6-14.9</b>	<b>4169</b>	<b>10.1</b>	<b>8.1-12.1</b>

Approximately 2 percent of the respondents have raised total cholesterol at or above 6.2 mmol/L or were on medication for raised cholesterol. Men age 45-59 years had the highest prevalence of raised total cholesterol (4 percent). This was similar for women age 60-69 years (4 percent).

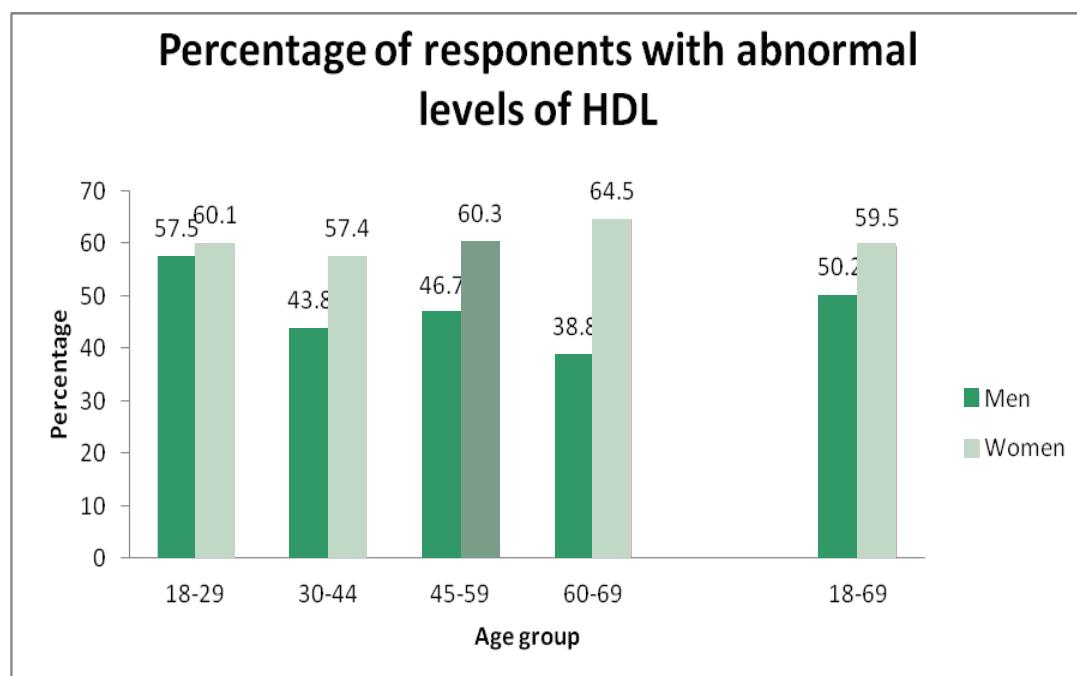
**Table 3.9.5:** Prevalence of raised total cholesterol

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	512	0.1	0.0-0.2	874	1.1	0.4-1.9	1386	0.6	0.2-1.0
30-44	658	1.0	0.0-2.3	929	1.7	0.7-2.7	1587	1.4	0.5-2.2
45-59	330	4.0	0.6-7.5	483	3.4	1.1-5.6	813	3.7	1.6-5.7
60-69	146	1.7	0.0-3.5	237	3.6	0.4-6.8	383	2.7	0.8-4.6
<b>18-69</b>	<b>1646</b>	<b>1.1</b>	<b>0.4-1.9</b>	<b>2523</b>	<b>1.8</b>	<b>1.1-2.5</b>	<b>4169</b>	<b>1.5</b>	<b>1.0-2.0</b>

## Prevalence of low HDL cholesterol

HDL is considered the 'good' cholesterol. Values of HDL cholesterol below 1.03 mmol/L for men and 1.29 mmol/L for women are abnormal, while those above 1.5 mmol/L are normal for both sexes (Mayo Clinic).

Figure 3.9.1 below shows the percentage of respondents who have abnormal levels of HDL cholesterol. Half of all men (50 percent) more than half of the women (60 percent) had abnormal HDL levels.



### 3.10 Combined risk factors

#### Population risk of developing cardiovascular disease

The total risk of developing cardiovascular disease (CVD) is determined by the combined effect of behavioral and biological risk factors (for instance smoking, or having raised blood sugar), age and sex. An individual with several mildly raised risk factors may be at a higher total risk of CVD than someone with just one elevated risk factor, for instance raised blood pressure. Using total CVD risk instead of a single risk factor means that resources can be spent on those who benefit the most (those with a high risk) instead of treating those with a very low risk of morbidity and mortality.

In this report, the WHO risk estimation model for CVD where age, sex, smoking, blood pressure, blood cholesterol, and presence of diabetes serves as basis for estimating the 10 year risk of a fatal or non-fatal cardiovascular event (meaning death from, or developing cardiovascular disease) is used. A risk at or above 30 percent is considered high and cost-effective to treat.

Table 3.10.1 below shows the percentage of respondents who have a CVD risk of 30 percent or above. Eight percent of the respondents in the 40-69 age group have a CVD risk of 30 percent or above with a higher proportion of women (9 percent) than men (7 percent) being at risk.

**Table 3.10.1:** Percentage of respondents' age 40-69 yrs with a 10-year CVD risk  $\geq 30\%$  or with existing CVD

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
40-54	408	6.5	2.4-10.6	565	7.9	5.3-10.6	973	7.2	4.6-9.7
55-69	239	6.7	2.5-10.9	365	10.5	5.7-15.3	604	8.6	5.6-11.6
<b>40-69</b>	<b>647</b>	<b>6.6</b>	<b>3.2-9.9</b>	<b>930</b>	<b>8.8</b>	<b>6.1-11.5</b>	<b>1577</b>	<b>7.6</b>	<b>5.4-9.9</b>

Table 3.10.2 shows that 6 percent of eligible respondents are receiving drug therapy and counseling to prevent heart attacks. Seven percent of eligible persons age 40-54 are receiving drugs compared to 5 percent of eligible person's in age group 55-69 years.

**Table 3.10.2:** Percentage of eligible persons receiving drug therapy and counseling to prevent heart attacks and stroke

Age Group (years)	Both Sexes		
	n	%	95% CI
40-54	68	6.6	0.5-12.8
55-69	46	5.4	0.0-11.5
<b>40-69</b>	<b>114</b>	<b>6.2</b>	<b>1.8-10.6</b>

### 3.11 Injuries

An injury is a harmful event in which a transfer of energy results in tissue damage. They can be due to impact from objects, an acute exposure to physical agents such as mechanical energy, heat, electricity, chemicals and ionising radiation interacting with the body in amounts and at rates that exceed the threshold of human tolerance.

Injuries remain a significant public health concern affecting a wide variety of risk groups e.g. elderly, youth, workers, pedestrians for whom continual focus on research and prevention will yield important health benefits. There is need for experienced staff, innovative approaches and analysis expertise to address the public health challenge.

Injuries can be classified according to mode of causation;

Three broad categories

- Unintentional (accidental)
- Intentional (deliberate)
- Undetermined intent

#### Unintentional Injuries

##### Road Safety

Road traffic injuries (RTI) are one of the major causes of mortality among all the injuries. Additionally, RTI cause considerable economic losses to victims, their families and to the nation as a whole. RTI are largely preventable by use of various methods such as seatbelt use, helmet use, avoiding of drink driving among others.

##### Seatbelt Use

Seat belts are a vital part of safety in vehicles hence should be present and functional in all vehicles. The following are benefits of wearing a seat belt; provides security, prevents dangerous injuries and lowers medical costs.

Table 3.11.1 shows percentage of drivers or passengers not always using a seat belt. Eighty eight percent of the respondents do not always use a seat belt. Ninety percent and 85 percent of women and men respectively do not always use a seat belt.

**Table 3.11.1:** Percentage of drivers or passengers not always using a seat belt

Age Group (years)	Men			Women			Both Sexes		
	N	% Not always using seat belt	95% CI	n	% Not always using seat belt	95% CI	n	% Not always using seat belt	95% CI
18-29	437	90.7	87.2-94.3	694	90.7	87.3- 94.0	1131	90.7	88.5- 93.0
30-44	566	81.6	75.1-88.0	726	89.8	86.9- 92.7	1292	85.4	81.2-89.6
45-59	268	79.5	72.3-86.7	393	86.8	81.6- 91.9	661	83.1	78.2-88.1
60-69	113	79.3	70.1-88.5	174	93.9	89.8- 98.0	287	87.0	81.9-92.1
<b>18-69</b>	<b>1384</b>	<b>85.2</b>	<b>80.9-89.6</b>	<b>1987</b>	<b>89.9</b>	<b>87.6- 92.3</b>	<b>3371</b>	<b>87.6</b>	<b>85.0- 90.2</b>

## Helmet Use

Wearing a helmet is the single most effective way of reducing head injuries and fatalities resulting from motorcycle and bicycle crashes. Wearing a helmet has been shown to decrease the risk and severity of injuries among motorcyclists reduces the likelihood of death and substantially reduces the costs of health care associated with such crashes (MacLeod, D'Giacomo, & Tinkoff, 2010)

The table 3.11.2 below shows the percentage of motorcycle or a motor-scooter driver-/passengers who do not always wear helmets. It is noted that 94 percent of the respondent do not always wear helmets. Women are more likely not to always wear a helmet than their male counterpart ( 98 percent Vs 90 percent).

**Table 3.11.2:** Percentage of drivers or passengers of a motorcycle or motor-scooter not always using a helmet

Age Group (years)	Men			Women			Both Sexes		
	n	% Not always using helmet	95% CI	n	% Not always using helmet	95% CI	n	% Not always using helmet	95% CI
18-29	485	91.4	88.7-94.2	739	97.7	96.1-99.2	1224	94.6	92.8-96.3
30-44	596	88.0	84.0-92.0	745	97.2	95.2-99.2	1341	92.3	89.8-94.9
45-59	273	91.7	87.1-96.2	377	99.4	98.8-100.0	650	95.4	93.0-97.9
60-69	116	93.9	88.3-99.5	171	99.5	98.5-100.0	287	96.7	93.8-99.5
<b>18-69</b>	<b>1470</b>	<b>90.4</b>	<b>88.1-92.8</b>	<b>2032</b>	<b>97.9</b>	<b>96.8-98.9</b>	<b>3502</b>	<b>94.1</b>	<b>92.6-95.5</b>

The percentage of cyclist not always using a helmet is detailed in table 3.11.3. Overall, ninety five percent of the cyclists do not always wear a helmet when riding a bicycle.

**Table 3.11.3:** Percentage of cyclists not always wearing helmets when ridding among those riding a bike

Age Group (years)	Men			Women			Both Sexes		
	n	% Not always using helmets for cyclists	95% CI	N	% Not always using helmets for cyclists	95% CI	n	% Not always using helmets for cyclists	95% CI
18-29	427	92.5	89.6-95.3	639	99.1	98.1-100.0	1066	95.7	94.1-97.3
30-44	518	90.0	86.7-93.3	634	98.3	96.9-99.8	1152	93.9	91.7-96.0
45-59	235	92.2	87.0-97.3	321	98.8	97.7-100.0	556	95.4	92.6-98.2
60-69	106	95.1	89.6-100.0	145	100.0	100.0-100.0	251	97.5	94.7-100.0
<b>18-69</b>	<b>1286</b>	<b>91.7</b>	<b>89.6-93.8</b>	<b>1739</b>	<b>98.9</b>	<b>98.0-99.7</b>	<b>3025</b>	<b>95.1</b>	<b>93.8-96.5</b>

## Drink driving

Driving under the influence of alcohol is dangerous as it impairs judgment and reduces reaction time.

The percentages of drivers who reported to have driven under the effects of alcohol is detailed in table 3.11.4 below. The survey results indicates that 3 percent of the respondents reported to have driven under the influence of alcohol in the past 30 days. Five percent men reported to have driven under the influence of alcohol compared with women at 2 percent. The highest percentage of respondents among men who reported to have driven under the influence of alcohol is in the age group 18-29 years (7 percent).

**Table 3.11.4:** Percentage of respondents who reported driving under the effects of alcohol

Age Group (years)	Men			Women			Both Sexes		
	N	% drove after drinking	95% CI	n	% drove after drinking	95% CI	n	% drove after drinking	95% CI
18-29	553	7.1	3.1-11.1	918	1.7	0.4-2.9	1471	4.2	2.3-6.2
30-44	715	4.0	2.2-5.9	978	1.0	0.3-1.7	1693	2.5	1.5-3.5
45-59	345	3.2	1.1-5.4	509	2.7	0.8-4.7	854	3.0	1.4-4.5
60-69	159	3.7	0.4-7.0	251	1.3	0.1-2.5	410	2.5	0.8-4.2
<b>18-69</b>	<b>1772</b>	<b>5.3</b>	<b>3.4-7.1</b>	<b>2656</b>	<b>1.6</b>	<b>0.8-2.4</b>	<b>4428</b>	<b>3.4</b>	<b>2.4-4.3</b>

The table 3.11.5 below shows the percentages of respondents who rode in a vehicle with a driver who is under the influence of alcohol in the past 30 days. Approximately 13 percent of all respondents rode in a vehicle with a driver under the influence of alcohol.

**Table 3.11.5:** Riding in a vehicle with a driver under the effect of alcohol

Age Group (years)	Men			Women			Both Sexes		
	n	% rode with driver who drank	95% CI	n	% rode with driver who drank	95% CI	n	% rode with driver who drank	95% CI
18-29	517	18.8	12.2-25.3	842	9.2	6.0-12.3	1359	13.8	10.2-17.5
30-44	655	15.6	11.5-19.8	899	7.1	4.7-9.5	1554	11.3	8.6-14.1
45-59	323	15.5	9.9-21.1	446	12.5	8.1-16.8	769	14.0	10.2-17.8
60-69	142	7.9	2.8-13.1	228	7.5	3.3-11.7	370	7.7	4.3-11.1
<b>18-69</b>	<b>1637</b>	<b>16.6</b>	<b>13.1-20.2</b>	<b>2415</b>	<b>8.9</b>	<b>6.5-11.3</b>	<b>4052</b>	<b>12.7</b>	<b>10.2-15.1</b>

## Road Traffic crashes

The table 3.11.6 below shows the percentage of respondents involved in road traffic crash within the past 12 months. It is noted that 6 percent of all the respondents were involved in a road traffic crash. The age group 18yrs -29 has the highest percentage of involvement in a road traffic crash followed by 30-44. Men are more likely (9 percent) to be involved in road traffic crash than women (3 percent).

**Table 3.11.6:** Percentage of respondents involved in a road traffic crash during the past 12 months

Age Group (years)	Men			Women			Both Sexes		
	N	% Involved in road traffic crashes	95% CI	n	% Involved in road traffic crashes	95% CI	n	% Involved in road traffic crashes	95% CI
18-29	559	10.2	6.6-13.7	933	2.8	1.3-4.4	1492	6.3	4.3-8.4
30-44	721	7.9	5.0-10.8	986	3.3	2.0-4.7	1707	5.6	4.0-7.3
45-59	355	5.9	2.6-9.2	520	3.8	1.9-5.8	875	4.9	2.9-6.9
60-69	159	6.3	1.3-11.2	254	2.4	0.3-4.6	413	4.3	1.4-7.2
<b>18-69</b>	<b>1794</b>	<b>8.5</b>	<b>6.5-10.6</b>	<b>2693</b>	<b>3.1</b>	<b>2.2-4.1</b>	<b>4487</b>	<b>5.8</b>	<b>4.5-7.0</b>

The table 3.11.7 below shows percentage of respondents involved in a road traffic crash according to residence during 12 months prior to the survey. It is noted that 7 percent are from the urban compared with 5 percent from the rural areas.

**Table 3.11.7:** Percentage of respondents involved in a road traffic crash during the past 12 months by residence

residence	Both sexes		
	n	%	Involved in road traffic crashes
Rural	2303	4.8	
Urban	2184	7.2	
<b>TOTAL</b>	<b>4487</b>	<b>5.8</b>	

The table 3.11.8 below shows the percentage of the respondents seriously injured as a result of road traffic crash among those involved in a road traffic crash. Serious injuries were described as injuries that required medical attention. The table indicates that 54 percent of all the respondents who were involved in a road traffic crash were seriously injured. Men account for 59 percent compared with women at 41 percent.

**Table 3.11.8:** Percentage of respondents seriously injured as a result of road traffic crash among those involved in a road traffic crash

Age Group (years)	Men			Women			Both Sexes		
	N	% Seriously injured	95% CI	n	% Seriously injured	95% CI	n	% Seriously injured	95% CI
18-29	64	49.9	28.8-71.0	27	30.8	6.2-55.4	91	45.4	25.6-65.3
30-44	51	70.1	53.6-86.7	34	45.2	23.8-66.6	85	62.7	47.9-77.5
45-59	20	76.7	54.8-98.5	22	49.7	20.6-78.9	42	66.4	50.1-82.8
60-69	8	40.2	0.0-80.9	5	76.0	34.4-100.0	13	50.6	12.8-88.5
<b>18-69</b>	<b>143</b>	<b>58.8</b>	<b>46.9-70.7</b>	<b>88</b>	<b>41.1</b>	<b>25.3-56.9</b>	<b>231</b>	<b>53.9</b>	<b>43.7-64.1</b>

### Injuries other than road traffic Injuries

The table 3.11.9 below shows the percentage of the respondents who were seriously injured accidentally in the past 12 months. The survey results indicates that 10 percent of all respondents were seriously injured in other injuries other than road traffic injuries. Respondents in the age group 45-59 years have the highest percentage of injury comprising 13 percent.

**Table 3.11.9:** Percentage of respondents seriously injured in a non-road traffic accident

Age Group (years)	Men			Women			Both Sexes		
	N	% Seriously injured	95% CI	n	% Seriously injured	95% CI	n	% Seriously injured	95% CI
18-29	558	11.4	7.4-15.4	936	7.9	5.5-10.3	1494	9.6	6.9-12.2
30-44	721	12.8	9.5-16.2	987	8.0	5.5-10.5	1708	10.4	8.1-12.8
45-59	354	12.9	8.9-16.9	519	12.8	8.2-17.4	873	12.8	9.5-16.1
60-69	159	9.8	3.5-16.0	255	9.4	4.7-14.1	414	9.6	5.6-13.5
<b>18-69</b>	<b>1792</b>	<b>12.0</b>	<b>9.1-14.9</b>	<b>2697</b>	<b>8.8</b>	<b>6.8-10.7</b>	<b>4489</b>	<b>10.4</b>	<b>8.3-12.4</b>

### Types of unintentional injuries

The table 3.11.10 shows the percentages of respondents who were seriously injured by types of injuries. The table indicates that injuries resulting from cuts are the leading cause of injuries (48 percent), followed by falls (34 percent). Fifty six percent of respondents age 30-44yrs and 51 percent of respondents' age 18-29 years were more likely to get cut.

Table 3.11.10: Percentage of respondents who were seriously injured by types of injuries

Age Group (years)	n	% Fall	95% CI	% Burn		% Poisoning		95% CI		% Near drowning		95% CI		% Animal Bites		95% CI	
				Cl	%	Cl	%	Cl	% Cut	Cl	% Near drowning	Cl	% Animal Bites	Cl	% Other	Cl	% 95% CI
<b>Men</b>																	
18-29	82	32.2	19.8-44.6	2.2	0.0-6.2	0	0.0-0.0	53.9	41.3-66.5	0.3	0.0-1.0	6.9	0.0-16.5	4.5	0.2-8.9		
30-44	99	22.9	13.5-32.4	3.7	0.0-8.5	0	0.0-0.0	53.4	39.3-67.5	0	0.0-0.0	3.8	0.0-7.8	16.2	7.3-25.1		
45-59	44	42.8	22.5-63.2	0	0.0-0.0	2	0.0-6.0	41.1	23.8-58.3	0	0.0-0.0	5.1	0.0-10.5	8.9	0.020.2		
60-69	11	61.4	32.4-90.4	0	0.0-0.0	0	0.0-0.0	27.6	0.7-54.4	0	0.0-0.0	0	0.0-0.0	11	0.0-31.9		
<b>18-69</b>	<b>236</b>	<b>32.0</b>	<b>24.0-40.0</b>	<b>2.2</b>	<b>0.0-4.5</b>	<b>0.3</b>	<b>0.0-1.0</b>	<b>50.3</b>	<b>42.0-58.7</b>	<b>0.1</b>	<b>0.0-0.4</b>	<b>5.2</b>	<b>0.7-9.7</b>	<b>9.7</b>	<b>5.5-13.9</b>		
<b>Women</b>																	
18-29	86	32.4	19.3-45.6	9.4	1.7-17.2	46	32.7-59.4	1.2	0.0-3.5	3.1	0.0-7.2	7.8	0.9-14.8	1.2	0.0-3.5		
30-44	83	32.2	20.0-44.4	1	0.0-2.6	60.3	47.2-73.5	1	0.0-3.2	1.5	0.0-3.6	3.9	0.0-7.8	1	0.0-3.2		
45-59	66	50.3	34.2-66.5	7.4	0.0-14.9	21.9	10.0-33.7	0.5	0.0-1.5	11.4	1.9-20.9	8.6	0.0-18.4	0.5	0.0-1.5		
60-69	22	33.7	12.8-54.6	0	0.0-0.0	35.5	11.9-59.1	0	0.0-0.0	6.6	0.0-19.4	24.2	1.8-46.7	0	0.0-0.0		
<b>18-69</b>	<b>257</b>	<b>36.5</b>	<b>27.9-45.0</b>	<b>6.0</b>	<b>2.4-9.6</b>	<b>44.1</b>	<b>35.1-53.0</b>	<b>0.9</b>	<b>0.0-2.1</b>	<b>4.7</b>	<b>1.8-7.7</b>	<b>7.8</b>	<b>3.7-11.9</b>	<b>0.9</b>	<b>0.0-2.1</b>		
<b>Both Sexes</b>																	
18-29	168	32.3	23.8-40.8	5.3	1.3-9.3	0	0.0-0.0	50.5	42.1-58.9	0.7	0.0-1.8	5.3	0.0-11.0	6	2.1-9.9		
30-44	182	26.5	18.6-34.4	2.7	0.0-5.6	0	0.0-0.0	56.1	45.3-66.8	0.4	0.0-1.2	2.9	0.3-5.5	11.5	5.4-17.5		
45-59	110	46.6	32.5-60.6	3.7	0.0-7.7	1	0.0-3.0	31.5	19.6-43.5	0.2	0.0-0.7	8.3	2.8-13.7	8.7	1.2-16.3		
60-69	33	47.4	30.1-64.7	0	0.0-0.0	0	0.0-0.0	31.6	13.1-50.0	0	0.0-0.0	3.3	0.0-9.9	17.7	3.1-32.2		
<b>18-69</b>	<b>493</b>	<b>34.0</b>	<b>28.1-39.8</b>	<b>3.9</b>	<b>1.9-5.8</b>	<b>0.2</b>	<b>0.0-0.6</b>	<b>47.6</b>	<b>41.3-53.9</b>	<b>0.5</b>	<b>0.0-1.0</b>	<b>5</b>	<b>2.2-7.8</b>	<b>8.9</b>	<b>6.0-11.8</b>		

## Place of injury

Table 3.11.11 below shows the percentage of various locations where the serious unintentional injuries occurred. Majority of the injuries occurred at home (41 percent) followed by school/workplace (21 percent). The highest percentage of those injured at home is age group 60-69 years at 52 percent. Women respondents comprising 51 percent are more likely to be injured at home compared with men at 33 percent. In contrast more men (28 percent) are more likely to be injured at the workplace/school than women (12 percent).

**Table 3.11.11:** Location of accidental serious injuries among respondents seriously injured-

Age Group (years)	n	% Home	95% CI	% School/ workplace	95% CI	% Road-Street-Highway	95% CI	% Farm	95% CI	% Sports-Athletic area	95% CI	% other	95% CI
<b>Men</b>													
18-29	82	29.2	14.7-43.8	24.4	14.4-34.4	17.1	7.2-27.0	23.6	10.7-36.6	3.5	0.0-7.8	2.2	0.0-6.2
30-44	99	32.8	20.9-44.7	33.6	22.5-44.7	11.4	0.2-22.6	12.6	1.6-23.6	3.3	0.0-7.3	6.3	0.3-12.3
45-59	44	39.2	20.0-58.3	29.9	8.0-51.8	14.7	1.1-28.4	9.5	0.2-18.8	0	0.0-0.0	6.7	0.0-16.7
60-69	11	44.9	9.6-80.2	0	0.0-0.0	32.5	1.6-63.4	13.4	0.0-32.9	0	0.0-0.0	9.2	0.0-26.9
<b>18-69</b>	<b>236</b>	<b>32.9</b>	<b>24.7-41.1</b>	<b>27.6</b>	<b>20.2-34.9</b>	<b>15.3</b>	<b>8.8-21.8</b>	<b>16.8</b>	<b>10.1-23.5</b>	<b>2.7</b>	<b>0.3-5.0</b>	<b>4.7</b>	<b>1.4-8.1</b>
<b>Women</b>													
18-29	86	50.3	36.6-63.9	21.7	8.0-35.4	8.1	1.6-14.6	11.9	2.8-21.1	1.8	0.0-4.4	6.3	0.0-13.2
30-44	83	52.9	37.2-68.5	8	2.1-13.9	6.8	0.8-12.8	23.3	9.9-36.8	0	0.0-0.0	9	1.6-16.3
45-59	66	46.3	31.1-61.5	2.9	0.0-6.7	27.3	13.2-41.5	20.9	5.9-35.9	0	0.0-0.0	2.6	0.0-6.9
60-69	22	59	36.3-81.7	4	0.0-12.1	18.8	0.0-38.9	18.1	2.5-33.7	0	0.0-0.0	0	0.0-0.0
<b>18-69</b>	<b>257</b>	<b>50.6</b>	<b>42.4-58.9</b>	<b>12.4</b>	<b>6.1-18.8</b>	<b>12.7</b>	<b>7.4-18.0</b>	<b>17.6</b>	<b>10.9-24.4</b>	<b>0.8</b>	<b>0.0-1.9</b>	<b>5.9</b>	<b>2.1-9.6</b>
<b>Both Sexes</b>													
18-29	168	38.3	28.5-48.1	23.2	15.3-31.2	13.2	6.7-19.7	18.6	9.8-27.3	2.7	0.1-5.4	3.9	0.3-7.6
30-44	182	40.5	29.3-51.7	23.8	15.7-31.9	9.6	2.3-16.9	16.7	8.0-25.4	2	0.0-4.5	7.3	2.7-11.9
45-59	110	42.7	30.5-54.9	16.5	3.6-29.4	21	11.1-30.9	15.2	6.4-23.9	0	0.0-0.0	4.7	0.0-10.2
60-69	33	52	30.3-73.8	2	0.0-6.1	25.6	6.9-44.3	15.8	3.0-28.5	0	0.0-0.0	4.5	0.0-13.4
<b>18-69</b>	<b>493</b>	<b>40.6</b>	<b>33.7-47.4</b>	<b>21</b>	<b>15.9-26.2</b>	<b>14.2</b>	<b>9.7-18.7</b>	<b>17.2</b>	<b>12.0-22.4</b>	<b>1.8</b>	<b>0.4-3.2</b>	<b>5.2</b>	<b>2.7-7.8</b>

## Violence/Intentional injuries

Violence is described as "the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation". Interpersonal violence as an act of violence inflicted by another individual or by a small group of individuals, and self-directed violence is defined as an act of violence inflicted upon oneself (Daher, 2002)(Krug et al., 2002).

The table 3.11.12 below shows the percentage of respondents involved in a violent incident resulting in a serious injury. Overall, 4 percent of the respondents were involved in violent incident resulting in a serious injury in the past 12 months. Men are more likely (5 percent) to have in violent injuries compared with women at 3 percent. The survey results further shows that the age group 30-44 years had the highest occurrence (6 percent) of violent injury while age group 60-69 years had the least occurrence (1 percent).

**Table 3.11.12:** Percentage of respondents seriously injured from violent incidents

Age Group (years)	Men			Women			Both Sexes		
	N	% Seriously injured from violent incidents	95% CI	n	% Seriously injured from violent incidents	95% CI	n	% Seriously injured from violent incidents	95% CI
18-29	558	4.3	1.9-6.6	935	1.9	0.9-3.0	1493	3.0	1.6-4.5
30-44	720	7.3	4.2-10.5	985	4.1	2.4-5.8	1705	5.7	3.9-7.5
45-59	353	4.9	2.1-7.8	518	2.6	0.8-4.4	871	3.8	2.1-5.4
60-69	159	0.6	0.0-1.3	255	2.1	0.0-4.7	414	1.4	0.0-2.7
<b>18-69</b>	<b>1790</b>	<b>5.2</b>	<b>3.6-6.8</b>	<b>2693</b>	<b>2.7</b>	<b>1.7-3.8</b>	<b>4483</b>	<b>3.9</b>	<b>2.9-5.0</b>

Respondents from the richest quintile have the lowest percentage of being involved in a serious violent injury. Respondents with primary education incomplete have the highest percentage of involvement in a serious violence injury (Appendix table B24).

The table 3.11.13 below shows the percentage of violent incident caused by firearms, other weapons and without a weapon. It is noted that 59 percent of all the violently injured persons were injured without a weapon. Less than 1 percent of the injuries were caused by a firearm. Majority of the men were injured without a weapon (64 percent) in contrast to majority of women who were injured with a weapon (52 percent).

**Table 3.11.13:** Percentage of injuries caused by firearms, other weapons and without a weapon

Age Range	n	1) Firearm	95% CI	2) Other weapon	95% CI	3) Injured without a weapon	95% CI
<b>Men</b>							
18-29	28	0.4	0.0-1.3	54.7	27.4-81.9	44.9	17.7-72.1
30-44	40	0.2	0.0-0.7	20.5	2.5-38.4	79.3	61.3-97.3
45-59	13	0.0	0.0-0.0	25.5	0.0-51.9	74.5	48.1-100.0
60-69	3	0.0	0.0-0.0	100.0	100.0-100.0	0.0	0.0-0.0
<b>TOTAL</b>	<b>84</b>	<b>0.3</b>	<b>0.0-0.8</b>	<b>35.3</b>	<b>19.6-51.0</b>	<b>64.4</b>	<b>48.7-80.1</b>
<b>Women</b>							
18-29	20	0.0	0.0-0.0	40.8	12.8-68.9	59.2	31.1-87.2
30-44	25	0.0	0.0-0.0	51.4	23.6-79.3	48.6	20.7-76.4
45-59	11	0.0	0.0-0.0	86.1	66.3-100.0	13.9	0.0-33.7
60-69	4	0.0	0.0-0.0	0.0	0.0-0.0	100.0	100.0-100.0
<b>TOTAL</b>	<b>60</b>	<b>0.0</b>	<b>0.0-0.0</b>	<b>51.5</b>	<b>34.0-69.1</b>	<b>48.5</b>	<b>30.9-66.0</b>
<b>Both Sexes</b>							
18-29	48	0.3	0.0-0.9	50.5	30.1-71.0	49.2	28.7-69.6
30-44	65	0.2	0.0-0.5	31.3	15.3-47.2	68.6	52.6-84.6
45-59	24	0.0	0.0-0.0	48.4	23.4-73.5	51.6	26.5-76.6
60-69	7	0.0	0.0-0.0	20.7	0.0-50.8	79.3	49.2-100.0
<b>TOTAL</b>	<b>144</b>	<b>0.2</b>	<b>0.0-0.5</b>	<b>40.9</b>	<b>28.5-53.3</b>	<b>58.9</b>	<b>46.5-71.3</b>

## Persons causing violent injury

Table 3.11.14 below shows the perpetrators of the violent injury in relation to the victim. The survey shows that most of the injuries were caused by a friend or acquaintance accounting for 23 percent followed by stranger at 22 percent. The most affected age group due to intimate partner is 60-69 years comprising 47 percent. Women respondents are more (45 percent) likely to injured by intimate partner compared to men (33 percent).

**Table 3.11.14:** Percentage of those receiving violent injuries caused by different persons

Age Group	n	1) Intimate Partner	3) Child, sibling or other relative		4) Friend or acquaintance	5) Unrelated caregiver		6) Stranger	7) Official or legal authorities		8) Other	95% CI	
			95% CI	95% CI		95% CI	95% CI		95% CI	95% CI			
<b>Men</b>													
18-29	28	7.3	0.0-18.9	5.5	0.0-15.5	64.0	37.6-90.5	0.0	0.0-2	0.0-47.2	0.0	0.0-0.0	
30-44	48	5.6	0.0-12.3	26.1	0.7-51.5	29.4	13.2-45.5	0.2	0.0-2	38.0-57.5	0.0	0.0-0.0	
45-59	15	0.0	0.0-0.0	23.9	0.0-54.5	30.7	2.5-58.9	8.0	0.0-8	27.1.8-53.8	9.6	0.0-26.0	
60-69	3	0.0	0.0-0.0	0.0	0.0-0.0	0.0	0.0-0.0	0.0	0.0-0.0	100.0-100.0	0.0	0.0-0.0	
<b>TOTAL</b>	<b>94</b>	<b>5.3</b>	<b>0.4-10.2</b>	<b>18.0</b>	<b>3.3-32.6</b>	<b>42.3</b>	<b>27.7-56.8</b>	<b>1.3</b>	<b>0.0-3.9</b>	<b>23.4-45.3</b>	<b>1.5</b>	<b>0.0-4.1</b>	
<b>Women</b>													
18-29	23	52.7	25.6-79.8	33.4	6.7-60.0	2.9	0.0-7.7		5.4	0.0-13.7	3.0	0.0-9.1	
30-44	33	43.0	20.6-65.5	13.5	0.0-30.0	10.2	0.0-21.4		12.0	0.0-24.6	16.4	0.0-36.0	
45-59	11	29.2	0.0-59.4	29.5	0.0-64.3	32.3	0.0-70.0		9.0	0.0-26.9	0.0	0.0-0.0	
60-69	4	59.0	100.0	0.0	0.0-0.0	10.0	0.0-28.2		0.0	0.0-0.0	31.1	0.0-88.9	
<b>TOTAL</b>	<b>71</b>	<b>44.9</b>	<b>28.9-60.9</b>	<b>21.9</b>	<b>5.4-38.4</b>	<b>11.0</b>	<b>3.0-19.0</b>		<b>8.9</b>	<b>1.8-15.9</b>	<b>10.1</b>	<b>0.0-21.7</b>	
<b>Both sexes</b>													
18-29	51	22.2	8.1-36.4	14.7	5.4-24.0	43.9	23.5-64.3	0.0	0.0-3	1.0-33.7	1.0	0.0-3.0	
30-44	81	19.0	8.9-29.0	21.6	4.2-39.0	22.5	10.9-34.1	0.2	0.0-9	28.41.2	5.8	0.0-13.8	
45-59	26	10.0	0.0-20.8	25.8	2.8-48.8	31.3	8.6-53.9	5.3	0.0-3	21.3.1-39.6	6.3	0.0-17.1	
60-69	7	46.8	0.0-100.0	0.0	0.0-0.0	7.9	0.0-21.2	0.0	0.0-7	20.50.8	24.6	0.0-69.0	
<b>TOTAL</b>	<b>165</b>	<b>19.3</b>	<b>11.9-26.6</b>	<b>19.4</b>	<b>9.2-29.5</b>	<b>31.2</b>	<b>20.7-41.8</b>	<b>0.9</b>	<b>0.0-2.5</b>	<b>23.4</b>	<b>14.3-32.5</b>	<b>4.5</b>	<b>0.0-9.3</b>

## 3.12 Oral Health

The WHO defines oral health as a state of being free from chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal (gum) disease, tooth decay and tooth loss, and other diseases and disorders that affect the oral cavity (WHO Fact Sheet No 318, 2012).

### Oral Health Status

Table 3.12.1 shows the percentage of respondents in regards to number of natural teeth present. Overall, eighty nine percent of all the respondents have 28 or more natural teeth. The age group 60-69 has the lowest percentage with more than 28 natural teeth at 60 percent.

**Table 3.12.1:** Percentage of respondents with natural teeth

Age range	n	no natural teeth	95% CI	1-9 teeth	95% CI	10-19 teeth	95% CI	20-27 teeth	95% CI	28 teeth or more	95% CI
Men											
18-29	557	0.0	0.0-0.0	0.0	0.0-0.0	1.1	0.0-3.1	1.9	0.5-3.3	97.0	94.6-99.4
30-44	721	0.0	0.0-0.0	0.0	0.0-0.0	0.1	0.0-0.4	5.6	3.7-7.5	94.3	92.4-96.2
45-59	355	0.4	0.0-1.2	0.9	0.0-1.9	0.4	0.0-0.9	16.4	10.6-22.3	81.8	75.9-87.7
60-69	159	4.0	0.0-8.8	5.9	1.9-9.9	6.3	1.7-10.9	15.5	8.7-22.4	68.3	60.8-75.9
<b>TOTAL</b>	<b>1792</b>	<b>0.3</b>	<b>0.0-0.6</b>	<b>0.5</b>	<b>0.2-0.7</b>	<b>0.9</b>	<b>0.0-1.9</b>	<b>6.2</b>	<b>4.8-7.7</b>	<b>92.1</b>	<b>90.5-93.7</b>
Women											
18-29	934	0.0	0.0-0.0	0.0	0.0-0.0	0.5	0.0-1.6	4.4	2.4-6.4	95.0	92.4-97.7
30-44	987	0.1	0.0-0.4	0.0	0.0-0.1	1.6	0.0-3.6	14.8	10.5-19.0	83.5	78.4-88.5
45-59	518	0.3	0.0-0.8	2.0	0.4-3.6	3.8	1.6-6.0	19.4	14.1-24.7	74.5	68.5-80.5
60-69	255	2.8	0.3-5.3	7.7	2.8-12.5	6.2	2.7-9.6	31.1	22.3-39.9	52.3	42.0-62.6
<b>TOTAL</b>	<b>2694</b>	<b>0.2</b>	<b>0.1-0.4</b>	<b>0.7</b>	<b>0.4-1.1</b>	<b>1.7</b>	<b>0.5-2.9</b>	<b>11.5</b>	<b>9.0-13.9</b>	<b>85.9</b>	<b>82.8-89.0</b>
Both Sexes											
18-29	1491	0.0	0.0-0.0	0.0	0.0-0.0	0.8	0.0-1.9	3.2	1.9-4.6	96.0	93.9-98.1
30-44	1708	0.1	0.0-0.2	0.0	0.0-0.0	0.9	0.0-1.9	10.2	7.7-12.7	88.9	86.0-91.8
45-59	873	0.3	0.0-0.8	1.5	0.6-2.4	2.1	1.0-3.2	17.9	13.6-22.3	78.2	73.4-82.9
60-69	414	3.4	0.2-6.5	6.8	3.7-9.8	6.2	3.2-9.3	23.5	17.9-29.2	60.1	53.3-66.8
<b>TOTAL</b>	<b>4486</b>	<b>0.3</b>	<b>0.1-0.5</b>	<b>0.6</b>	<b>0.4-0.9</b>	<b>1.3</b>	<b>0.6-2.1</b>	<b>8.9</b>	<b>7.3-10.5</b>	<b>88.9</b>	<b>86.9-90.9</b>

Ninety two percent of the urban residents have 28 or more teeth compared with eighty seven percent in rural. Respondents from the richest wealth quintile have the highest percentage of 28 teeth or more (Appendix Table B25).

## Perception of state of teeth

Table 3.12.2 indicates the percentage of respondents' who perceive their state of teeth to be poor or very poor among those having natural teeth. Only 12 percent of the respondents reported to have poor or very poor state of teeth. Women reported a higher percentage of having poor or very poor state of teeth at 15 percent compared to men at 8 percent. For both sexes, age 60-69 years reported the highest percentage (24 percent) of poor or very poor state of the teeth.

**Table 3.12.2:** Percentage of respondents having poor or very poor state of teeth among those having natural teeth

Age Group (years)	Men			Women			Both Sexes		
	N	% having poor or very poor state of teeth	95% CI	n	% having poor or very poor state of teeth	95% CI	n	% having poor or very poor state of teeth	95% CI
18-29	559	6.4	3.5-9.4	927	11.7	7.7-15.7	1486	9.2	6.3-12.0
30-44	720	9.2	6.2-12.2	985	17.2	12.7-21.7	1705	13.2	10.7-15.7
45-59	353	9.3	5.6-13.0	518	16.1	11.2-20.9	871	12.7	9.5-15.8
60-69	152	18.3	11.0-25.7	246	28.9	20.2-37.5	398	23.8	17.8-29.7
<b>TOTAL</b>	<b>1784</b>	<b>8.4</b>	<b>6.4-10.5</b>	<b>2676</b>	<b>15.0</b>	<b>12.0-18.0</b>	<b>4460</b>	<b>11.8</b>	<b>9.9-13.7</b>

Table 3.12.3 shows the percentage of respondents who perceive their state of gums to be poor or very poor among those having natural teeth. Seven percent of the respondents reported to have poor or very poor state of gums among those with natural teeth. The age group 60-69 reported the highest percentage of having poor or very poor state of gum at 13 percent.

**Table 3.12.3:** Percentage of respondents having poor or very poor state of gums among those having natural teeth

Age Group (years)	Men			Women			Both Sexes		
	N	% having poor or very poor state of gums	95% CI	n	% having poor or very poor state of gums	95% CI	n	% having poor or very poor state of gums	95% CI
18-29	559	6.0	3.1-8.9	933	6.5	3.6-9.4	1492	6.2	4.1-8.4
30-44	721	4.6	2.5-6.7	985	7.9	5.7-10.1	1706	6.2	4.7-7.8
45-59	354	8.2	4.5-11.9	519	12.2	7.8-16.6	873	10.2	7.1-13.3
60-69	152	8.8	3.9-13.8	245	16.0	10.4-21.5	397	12.5	8.4-16.6
<b>TOTAL</b>	<b>1786</b>	<b>6.0</b>	<b>4.4-7.7</b>	<b>2682</b>	<b>8.3</b>	<b>6.4-10.2</b>	<b>4468</b>	<b>7.2</b>	<b>6.0-8.4</b>

Table 3.12.4 shows percentage of respondents who have removable dentures. Overall, 5 percent of the respondents have removable dentures. There is no notable difference in proportion of men and women having removable dentures. The age group of 60-69 has a highest percentage of respondents with removable dentures for both men and women at 9 percent.

Table 3.12.4: Percentage of respondents having removable dentures

Age Group (years)	Men			Women			Both Sexes	
	N	% Having removable dentures	95% CI	N	% Having removable dentures	95% CI	n	% Having removable dentures
18-29	559	2.7	0.5-4.9	936	3.2	1.5-4.9	1495	3.0
30-44	721	4.7	2.0-7.5	987	6.1	3.2-8.9	1708	5.4
45-59	355	6.5	2.9-10.2	519	6.5	3.6-9.5	874	6.5
60-69	159	9.3	3.4-15.2	255	8.6	3.8-13.3	414	8.9
<b>TOTAL</b>	<b>1794</b>	<b>4.4</b>	<b>2.3-6.4</b>	<b>2697</b>	<b>4.9</b>	<b>2.9-6.9</b>	<b>4491</b>	<b>4.6</b>
								<b>2.8-6.5</b>

Table 3.12.5 indicates the percentage of respondents having removable dentures by residence and wealth quintile. There is no notable difference between the rural (5 percent) and the urban residents (4 percent) having removable dentures. Respondents from the poorest quintile had the highest percentage of removable dentures at 9 percent.

Table 3.12.5: Percentage of respondents having removable dentures by residence and wealth Quintile

Residence	Both sexes		
	n	%	95% CI
Rural	2303	5.0	2.4-7.5
Urban	2188	4.1	1.5-6.7
<hr/>			
Poorest	901	9.4	3.2-15.6
Second	897	3.6	1.7-5.6
Middle	897	3.8	2.0-5.6
Fourth	899	3.4	1.2-5.7
Richest	897	3.3	1.0-5.6
<b>TOTAL</b>	<b>4491</b>	<b>4.6</b>	<b>2.8-6.5</b>

**Table 3.12.6** below shows the percentage of respondents who have upper dentures, lower dentures or both. Forty percent and 78% of the respondents have upper dentures and lower dentures respectively. Among the respondents with removable dentures, 38 percent have both upper and lower jaw denture.

**Table 3.12.6:** Percentage of respondents who have upper denture, lower denture or both

Age Group (years)	Men			Women			Both Sexes	
	N	% Having an upper/lowe r jaw denture	95% CI	n	% Having an upper/lowe r jaw denture	95% CI	N	% Having an upper/lower jaw denture
<b>Percentage of respondents having an upper jaw denture among those having removable dentures</b>								
18-29	21	45.7	9.4-81.9	46	52.2	37.7-66.6	67	49.3
30-44	56	41.3	18.9-63.7	78	64.7	48.4-81.1	134	54.4
45-59	31	75.3	57.2-93.4	48	77.0	61.4-92.5	79	76.1
60-69	18	82.5	57.7-100.0	32	63.2	46.2-80.1	50	72.9
<b>TOTAL</b>	<b>126</b>	<b>55.5</b>	<b>39.8-71.2</b>	<b>204</b>	<b>63.2</b>	<b>53.1-73.3</b>	<b>47.9-71.5</b>	<b>40.3</b>
<b>Percentage of respondents having a lower jaw denture among those having removable dentures</b>								
18-29	21	96.8	92.3-100.0	46	72.7	52.2-93.2	67	83.2
30-44	56	77.3	63.5-91.1	78	70.0	57.0-82.9	134	73.2
45-59	31	76.7	58.0-95.4	48	77.4	59.9-94.8	79	77.0
60-69	18	75.2	45.7-100.0	32	84.0	68.2-99.8	50	79.5
<b>TOTAL</b>	<b>126</b>	<b>82.4</b>	<b>74.1-90.7</b>	<b>204</b>	<b>73.7</b>	<b>63.3-84.0</b>	<b>330</b>	<b>77.7</b>
<b>Percentage of respondents having an upper and a lower jaw denture among those having removable dentures</b>								
18-29	21	42.5	5.7-79.2	46	27.7	14.2-41.2	67	34.2
30-44	56	19.0	2.5-35.5	78	34.7	20.6-48.8	134	27.8
45-59	31	52.3	26.6-78.0	48	54.3	31.5-77.2	79	53.3
60-69	18	57.6	24.0-91.2	32	55.1	38.6-71.6	50	56.4
<b>TOTAL</b>	<b>126</b>	<b>38.1</b>	<b>24.0-52.2</b>	<b>204</b>	<b>38.5</b>	<b>28.9-48.2</b>	<b>330</b>	<b>38.3</b>
<b>28.4-48.2</b>								

## History of pain and discomfort

Table 3.12.7 shows distribution of respondents with history of oral pain and discomfort in the past 12 months. Thirty two percent of the respondents reported having oral pain or discomfort in the past 12 months. More women (37 percent) reported to have had pain or discomfort than men at (26 percent).

**Table 3.12.7:** Percentage of respondents having oral pain and discomfort in the past 12 months

Age Group (years)	Men			Women			Both Sexes		
	n	% Having oral pain or discomfort	95% CI	n	% Having oral pain or discomfort	95% CI	n	% Having oral pain or discomfort	95% CI
18-29	559	23.8	18.5-29.1	936	32.0	26.9-37.0	1495	28.1	23.8-32.3
30-44	721	26.8	22.4-31.1	987	41.3	36.1-46.5	1708	34.1	30.2-37.9
45-59	355	26.2	20.9-31.4	519	42.3	36.7-47.9	874	34.2	29.7-38.7
60-69	159	34.7	25.6-43.9	255	43.6	35.1-52.2	414	39.3	32.4-46.2
<b>TOTAL</b>	<b>1794</b>	<b>25.7</b>	<b>22.3-29.2</b>	<b>2697</b>	<b>37.2</b>	<b>33.0-41.4</b>	<b>4491</b>	<b>31.6</b>	<b>28.4-34.8</b>

## Oral health behavior/risk factors

### Dental visits

Table 3.12.8 shows percentage of respondents who have visited a dentist within the past 12 months. Approximately, 11 percent of the respondents have visited a dentist in the last 12 months. Women (13 percent) are likely to have visited the dentist more than men (8 percent). Among men, the highest percentage of those who have seen a dentist in the last 12 months are the age group 18-29 at 9 percent while among the women the age 30-44 are highest at 15 percent.

Age Group (years)	Men			Women			Both Sexes		
	n	% having visited a dentist during the past 12 months	95% CI	n	% having visited a dentist during the past 12 months	95% CI	N	% having visited a dentist during the past 12 months	95% CI
18-29	559	8.8	5.6-12.0	936	13.1	8.9-17.4	1495	11.0	7.8-14.3
30-44	721	7.3	4.8-9.9	987	15.3	12.7-17.9	1708	11.3	9.3-13.3
45-59	355	7.6	4.2-11.0	519	9.7	6.6-12.9	874	8.7	6.1-11.2
60-69	159	4.6	0.8-8.3	254	9.1	4.7-13.5	413	6.9	3.9-9.9
<b>TOTAL</b>	<b>1794</b>	<b>7.9</b>	<b>5.9-9.9</b>	<b>2696</b>	<b>13.1</b>	<b>10.6-15.5</b>	<b>4490</b>	<b>10.5</b>	<b>8.5-12.5</b>

**Table 3.12.9** shows the distribution of respondents who have visited a dentist in the past 12 months by residence and wealth quintile. Respondents in the richest quintile are more likely to have visited a dentist than respondents in the poorest quintile at (12 percent vs 7 percent). The survey results reveal that that higher the education level, the more the likelihood to have visited a dentist

**Table 3.12.9:** Percentage of respondents who have visited a dentist during the past 12 months by residence and wealth quintile

Residence	Both sexes		
	n	% having visited a dentist during the past 12 months	95% CI
Rural	2302	10.3	8.4-12.3
Urban	2188	10.8	6.6-15.1
Wealth			
Poorest	901	7.1	3.7-10.4
Second	897	10.1	7.5-12.8
Middle	896	10.2	7.4-13.0
Fourth	899	12.4	8.1-16.8
Richest	<b>897</b>	<b>12.4</b>	<b>6.4-18.5</b>
<b>TOTAL</b>	4490	10.5	8.5-12.5

**Table 3.12.10** indicates percentage of respondents who have never visited a dentist. Overall, 63 percent of the respondents have never visited a dentist. Men (67 percent) are more likely not to have received dental care than women (59 percent) respectively.

**Table 3.12.10:** Percentage of respondents who have never visited a dentist

Age Group (years)	Men			Women			Both Sexes		
	n	% never visited a dentist	95% CI	N	% never visited a dentist	95% CI	n	% never visited a dentist	95% CI
18-29	559	77.3	72.1-82.5	936	67.0	61.3-72.8	1495	71.9	67.0-76.8
30-44	721	62.3	56.3-68.2	987	51.3	45.7-56.9	1708	56.8	52.6-61.0
45-59	355	51.8	43.1-60.5	519	48.2	41.4-54.9	874	50.0	43.9-56.1
60-69	159	57.5	48.5-66.6	254	55.9	45.6-66.2	413	56.7	49.2-64.2
<b>TOTAL</b>	1794	<b>67.1</b>	<b>63.2-71.0</b>	2696	<b>58.5</b>	<b>54.4-62.7</b>	4490	<b>62.7</b>	<b>59.2-66.2</b>

## Perception of state of teeth

Table 3.12.2 indicates the percentage of respondents' who perceive their state of teeth to be poor or very poor among those having natural teeth. Only 12 percent of the respondents reported to have poor or very poor state of teeth. Women reported a higher percentage of having poor or very poor state of teeth at 15 percent compared to men at 8 percent. For both sexes, age 60-69 years reported the highest percentage (24 percent) of poor or very poor state of the teeth.

**Table 3.12.11:** Main reason for last visit to the dentist among those who ever visited a dentist

Age Group	n	consultation/advice	95% CI	pain	95% CI	follow-up	95% CI	check-up	95% CI	other	95% CI
<b>Men</b>											
18-29	126	4.0	0.0-8.4	79.6	69.7-89.6	10.9	4.2-17.5	5.4	0.6-10.3	0.0	0.0-0.0
30-44	260	1.4	0.0-3.1	85.7	80.5-91.0	9.5	4.8-14.2	3.2	0.0-6.5	0.2	0.0-0.5
45-59	166	3.4	0.1-6.7	81.0	73.8-88.2	11.6	4.3-18.8	3.7	0.0-7.5	0.3	0.0-0.7
60-69	71	0.0	0.0-0.0	81.7	70.4-93.1	12.3	3.2-21.4	3.1	0.0-8.2	2.9	0.0-8.5
<b>TOTAL</b>	<b>623</b>	<b>2.6</b>	<b>0.2-5.0</b>	<b>82.4</b>	<b>77.7-87.1</b>	<b>10.6</b>	<b>6.6-14.6</b>	<b>4.0</b>	<b>1.9-6.1</b>	<b>0.3</b>	<b>0.0-0.8</b>
<b>Women</b>											
18-29	307	2.6	0.4-4.7	80.8	74.1-87.5	10.5	5.4-15.7	3.9	1.2-6.5	2.3	0.2-4.3
30-44	503	2.3	0.6-4.1	84.6	80.2-89.1	10.8	6.6-15.0	1.4	0.4-2.5	0.8	0.0-1.7
45-59	284	2.6	0.2-5.0	82.4	75.1-89.6	9.4	5.4-13.4	4.3	0.0-10.2	1.4	0.0-2.9
60-69	123	2.9	0.0-7.1	78.0	68.2-87.7	11.0	4.8-17.3	3.4	0.0-7.9	4.7	0.1-9.2
<b>TOTAL</b>	<b>1217</b>	<b>2.5</b>	<b>0.9-4.1</b>	<b>82.4</b>	<b>78.9-85.8</b>	<b>10.4</b>	<b>7.4-13.5</b>	<b>3.0</b>	<b>1.5-4.5</b>	<b>1.7</b>	<b>0.4-2.9</b>
<b>Both Sexes</b>											
18-29	433	3.1	0.5-5.8	80.3	74.0-86.7	10.7	6.7-14.7	4.5	1.9-7.1	1.4	0.1-2.7
30-44	763	1.9	0.4-3.4	85.1	81.4-88.8	10.2	6.7-13.7	2.2	0.6-3.8	0.5	0.0-1.0
45-59	450	3.0	1.0-5.0	81.7	76.1-87.3	10.5	5.8-15.1	4.0	0.5-7.5	0.8	0.0-1.7
60-69	194	1.5	0.0-3.7	79.8	71.8-87.7	11.7	5.9-17.4	3.2	0.0-6.6	3.8	0.0-8.5
<b>TOTAL</b>	<b>1840</b>	<b>2.6</b>	<b>0.8-4.3</b>	<b>82.4</b>	<b>79.1-85.7</b>	<b>10.5</b>	<b>7.7-13.4</b>	<b>3.4</b>	<b>2.2-4.7</b>	<b>1.1</b>	<b>0.3-1.9</b>

## Teeth cleaning

Table 3.12.12 shows percentage of respondents cleaning their teeth at least once or twice a day. Overall, 89 percent of the respondents clean their teeth once daily and 36 percent clean their teeth twice daily. The percentage of those who clean at least daily or at least twice a day decrease as age advances.

**Table 3.12.12:** Percentage of respondents cleaning their teeth at least once or twice a day

Once a day								
Age Group (years)	N	Men		Women		Both Sexes		
		% cleaning teeth at least daily	95% CI	N	% cleaning teeth at least daily	95% CI	n	% cleaning teeth at least daily
18-29	559	90.1	86.4-93.9	936	94.8	91.9-97.7	1495	92.6
30-44	721	88.5	85.3-91.7	987	89.9	87.1-92.8	1708	89.2
45-59	355	80.6	75.5-85.7	519	82.8	78.1-87.6	874	81.7
60-69	159	69.9	61.0-78.8	254	68.6	59.8-77.4	413	69.2
<b>Total</b>	<b>1794</b>	<b>87.0</b>	<b>84.1-89.8</b>	<b>2696</b>	<b>90.0</b>	<b>87.6-92.4</b>	<b>4490</b>	<b>88.5</b>
Twice a day								
18-29	559	36.1	28.2-44.0	936	44.6	38.7-50.6	1495	40.6
30-44	721	32.7	27.6-37.9	987	37.6	32.3-42.8	1708	35.2
45-59	355	26.0	20.2-31.9	519	30.6	24.7-36.5	874	28.3
60-69	159	26.0	16.9-35.1	254	16.3	10.8-21.9	413	21.1
<b>TOTAL</b>	<b>1794</b>	<b>32.8</b>	<b>28.3-37.3</b>	<b>2696</b>	<b>38.7</b>	<b>34.8-42.6</b>	<b>4490</b>	<b>35.8</b>
								<b>32.1-39.6</b>

Table 3.12.13 shows percentage of respondents cleaning their teeth at least daily by residence. Urban residents report a higher percentage (41 percent) compared with the rural residence (33 percent) of cleaning teeth at least twice daily.

**Table 3.12.13:** Frequency of tooth cleaning by residence

Residence	Both sexes			Both sexes			Both Sexes		
	n	% cleaning teeth at least daily	95% CI	n	% cleaning teeth twice daily	95% CI	N	% never cleaning teeth	95% CI
Rural	2302	83.9	81.3-86.5	2302	32.8	28.4-37.2	2302	1.5	1.0-2.1
Urban	2188	95.9	94.1-97.7	2188	40.7	33.8-47.5	2188	0.4	0.1-0.6
<b>TOTAL</b>	<b>4490</b>	<b>88.5</b>	<b>86.3-90.7</b>	<b>4490</b>	<b>35.8</b>	<b>32.1-39.6</b>	<b>4490</b>	<b>1.1</b>	<b>0.7-1.4</b>

**Table 3.12.14** indicates percentage of respondents using toothpaste for cleaning their teeth. Overall, 74 percent of the respondents use toothpaste to clean their teeth. The highest percentage of those using toothpaste are in age group 18-29 years at 80 percent.

**Table 3.12.14:** Percentage of respondents using toothpaste among those cleaning their teeth

Age Group (years)	Men			Women			Both Sexes		
	n	% using toothpaste	95% CI	n	% using toothpaste	95% CI	n	% using toothpaste	95% CI
18-29	557	83.0	77.4-88.7	935	76.4	69.9-83.0	1492	79.6	74.0-85.2
30-44	713	75.3	69.7-80.9	981	71.1	64.3-77.9	1694	73.2	67.9-78.5
45-59	350	71.4	63.4-79.5	512	65.9	59.1-72.8	862	68.7	62.7-74.7
60-69	145	54.3	43.4-65.3	233	44.8	34.8-54.8	378	49.4	40.9-57.9
<b>TOTAL</b>	<b>1765</b>	<b>77.2</b>	<b>72.4-81.9</b>	<b>2661</b>	<b>71.5</b>	<b>65.7-77.4</b>	<b>4426</b>	<b>74.3</b>	<b>69.2-79.3</b>

**Table 3.12.15** shows percentage of respondents using toothpaste containing fluoride. Seventy two percent of the respondents use toothpaste containing fluoride. Seventy six percent of men use toothpaste containing fluoride compared with 66 percent of the female.

**Table 3.12.15:** Percentage of respondents using toothpaste containing fluoride among those using toothpaste

Age Group (years)	Men			Women			Both Sexes		
	n	% using toothpaste containing fluoride	95% CI	n	% using toothpaste containing fluoride	95% CI	n	% using toothpaste containing fluoride	95% CI
18-29	545	82.0	76.2-87.8	919	73.9	67.2-80.6	1464	77.7	72.1-83.4
30-44	705	74.1	68.3-79.8	960	67.4	60.8-73.9	1665	70.7	65.4-76.0
45-59	346	68.3	59.7-76.9	506	62.5	55.6-69.5	852	65.4	59.0-71.8
60-69	144	53.3	42.3-64.2	225	42.3	32.3-52.3	369	47.6	39.0-56.2
<b>TOTAL</b>	<b>1740</b>	<b>75.7</b>	<b>70.9-80.6</b>	<b>2610</b>	<b>68.5</b>	<b>62.6-74.3</b>	<b>4350</b>	<b>72.0</b>	<b>67.0-77.1</b>

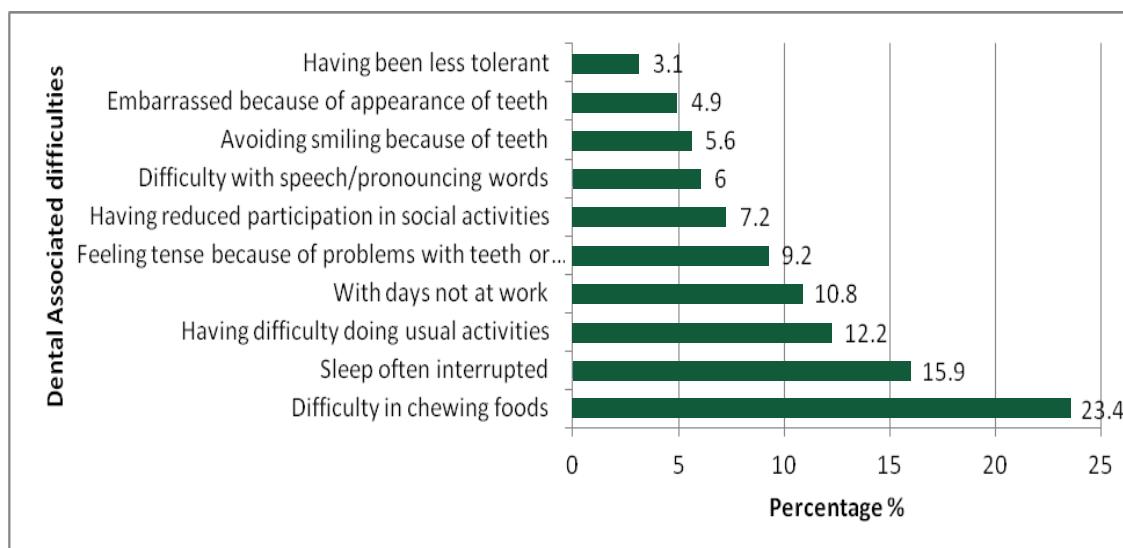
**Table 3.12.16** indicates percentage of respondents using various tools to clean their teeth. Overall, the highest tool used is a tooth brush at 75 percent followed by chewstick/mswaki at 48 percent. The use of chewstick/mswaki is highest among age group 60-69 (62 percent). Twenty eight percent of the respondents use toothpicks while only 1 percent use dental floss.

**Table 3.12.16:** Percentage of respondents using various tools to clean teeth

Age Group (years)	Both Sexes										95% CI
	n	% Tooth-brush	N	% Wood en tooth-picks	n	% Plastic tooth-picks	n	% Thread (dental floss)	N	% Charcoal	
18-29	1492	80.3	1493	27.9	1493	1.1	1493	2.0	1493	5.0	41.4 32.9-49.8
30-44	1694	74.2	1695	28.3	1695	0.7	1695	0.7	1695	4.6	52.3 46.1-58.4
45-59	862	69.7	863	29.9	863	0.2	863	1.0	863	6.4	51.3 44.5-58.1
60-69	378	50.1	379	24.9	379	0.1	379	0.3	379	9.1	62.5 54.6-70.5
<b>TOTAL</b>	<b>4426</b>	<b>75.2</b>	<b>4430</b>	<b>28.2</b>	<b>4430</b>	<b>0.8</b>	<b>4430</b>	<b>1.3</b>	<b>4430</b>	<b>5.3</b>	<b>47.5</b> <b>40.8-54.3</b>

**Figure 3.12.1** indicates percentage of respondents having dental associated difficulties during the past 12 months. Twenty three percent of all the respondents reported difficulty in chewing in the past 12 months. Fifteen percent and 6 percent of all the respondents reported having sleep interruptions and difficulty with speech/pronouncing words respectively.

**Fig 3.12.1:** Dental Associated Difficulties



### 3.13 Use of Khat

Table 3.13.1 shows percentage of respondents who have ever chewed khat. Approximately 17 percent of the respondents have ever chewed khat. Twenty eight percent of men have chewed khat compared with 5 percent women. The age group 30-44 years has the highest percentage of ever chewed khat at 20 percent.

**Table 3.13.1:** Percentage of respondents who have ever chewed khat

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	560	28.3	22.6-34.0	936	5.0	3.0-7.1	1496	16.1	12.7-19.5
30-44	722	34.2	27.8-40.7	987	4.7	2.2-7.2	1709	19.5	15.3-23.6
45-59	355	22.8	16.6-29.0	520	4.8	1.6-8.0	875	13.8	9.5-18.1
60-69	159	14.4	6.8-22.0	255	4.2	1.3-7.1	414	9.1	4.8-13.5
<b>18-69</b>	<b>1796</b>	<b>28.6</b>	<b>24.3-33.0</b>	<b>2698</b>	<b>4.8</b>	<b>3.2-6.5</b>	<b>4494</b>	<b>16.5</b>	<b>13.6-19.3</b>

Twenty one percent of urban residents have ever chewed khat compared to 14 percent of rural residents (Appendix Table B27).

Table 3.13.2 highlight the percentage of respondents who are current users of khat. Overall, 7 percent of the respondents are currently chewing khat with a significant sex variation (men 12 percent and women 2 percent).

**Table 3.13.2:** Percentage of respondents who are currently chewing Khat

Age Range	n	1, Yes	95% CI	2, No	95% CI	9, Never Chewed	95% CI
<b>Men</b>							
18-29	561	13.2	8.6-17.8	15.1	10.1-20.1	71.7	66.0-77.4
30-44	724	16.1	10.5-21.7	18.0	13.6-22.4	65.9	59.5-72.3
45-59	355	5.0	2.3-7.6	17.8	11.7-23.9	77.2	71.0-83.4
60-69	159	2.6	0.0-5.2	11.8	4.6-18.9	85.6	78.0-93.2
<b>TOTAL</b>	<b>1799</b>	<b>12.3</b>	<b>8.4-16.1</b>	<b>16.3</b>	<b>12.9-19.8</b>	<b>71.4</b>	<b>67.1-75.8</b>
<b>Women</b>							
18-29	937	1.4	0.5-2.4	3.7	1.9-5.5	94.9	92.8-96.9
30-44	989	1.5	0.0-3.1	3.2	1.7-4.8	95.3	92.7-97.8
45-59	520	3.2	0.1-6.2	1.7	0.5-2.9	95.2	92.0-98.4
60-69	255	0.4	0.0-1.1	4.3	1.3-7.3	95.3	92.3-98.4
<b>TOTAL</b>	<b>2701</b>	<b>1.7</b>	<b>0.7-2.6</b>	<b>3.3</b>	<b>2.2-4.3</b>	<b>95.1</b>	<b>93.4-96.7</b>
<b>Both Sexes</b>							
18-29	1498	7.0	4.7-9.4	9.1	6.2-12.0	83.8	80.4-87.2
30-44	1713	8.8	5.6-12.1	10.6	8.0-13.2	80.6	76.4-84.7
45-59	875	4.1	1.9-6.2	9.8	6.4-13.1	86.2	81.9-90.5
60-69	414	1.4	0.0-2.9	7.9	3.8-12.1	90.6	86.3-95.0
<b>TOTAL</b>	<b>4500</b>	<b>6.8</b>	<b>4.7-9.0</b>	<b>9.7</b>	<b>7.7-11.6</b>	<b>83.5</b>	<b>80.7-86.4</b>



## CHAPTER FOUR

### DISCUSSION AND CONCLUSIONS

## CHAPTER FOUR: DISCUSSION AND CONCLUSIONS

The STEPwise survey for NCD risk factors is the first nationwide household survey that is able to furnish the country with information regarding the four main NCD risk factors, violence and injury and oral health.

### Tobacco Use

This survey showed that 13 percent of Kenyan adults aged between 18 to 69 years currently consume any tobacco products. The country has previously conducted the Global Adult Tobacco Survey (GATS) nationally in 2014 therefore some comparisons of findings is possible. STEPs reported an overall prevalence of tobacco use of 13 percent which is comparable to the 12 percent found in GATS. This slight difference can be attributed to the different sample population ages that were used. The respondents in GATS were age 15 and above while in STEPs respondents were age 18-69 years. It should be noted that in between the two surveys a national media campaign was conducted which had the overall aim of educating on the harmfulness of tobacco use, encouraging people to quit tobacco use and discourage initiation into tobacco use. Prevalence of tobacco smoking is 10 percent in this survey. Smokeless tobacco consumption in the country is 5 percent indicating that targeted initiatives should be developed to reduce smokeless tobacco consumption.

Approximately 24 percent and 21 percent of Kenyans reported to be exposed to second hand smoking (SHS) at home and work respectively. The Tobacco Control Act 2007 prohibits tobacco smoking in public in a bid to reduce the effects of SHS which has been documented to be responsible for 600,000 deaths globally (World Health Organization, 2011). The country is in the right direction in tobacco control and needs to sustain and step up tobacco control efforts and in particular ensure tobacco control initiatives are implemented throughout the country.

### Alcohol Use

The harmful use of alcohol is among the five top risk factors for diseases and is associated with over 200 diseases and conditions. (World Health Organisation, 2014). Sixty two percent of the respondents are lifetime abstainers. This is an encouraging finding but nevertheless efforts need to be put in place to ensure that the country has a higher number of abstainers by specifically addressing the youth. The proportion of lifetime abstainers among women is twice than among men. Among respondents who have ever drunk alcohol only thirteen percent have abstained in the past 12 months.

Nearly a fifth of all the respondents are current alcohol drinkers defined as having drunk alcohol within the past 30 days with thirteen percent of these consuming alcohol daily. This is a considerable high percentage when taking into account that there are not only health consequence but alcohol use also has social and economic consequences.

Nearly 13 percent of Kenyans are involved in a heavy episodic drinking occasion in the past 30 days. Heavy episodic drinking is described as drinking more than six standard drinks in one occasion and is responsible for many acute consequences of drinking such as alcohol poisoning, injury and violence. The public needs to be informed of the determinants of alcohol related harm and be discouraged on alcohol consumption altogether.

Thirty six percent of the respondents had consumed unrecorded alcohol which includes homebrewed alcohol (excluding changaa, busaa or muratina) or any alcohol not intended for drinking in the past twelve months. This alcohol is not subjected to any formal government regulatory mechanism and may be associated with worse health outcomes.

### Diet

The World Health Organization (WHO) recommends consumption of at least 5 portions of fruits and vegetables per day. Of concern is that 95 percent of the respondents reported that they consume less than 5 servings of fruit and/or vegetables on average per day. The mean number of days fruits are consumed is equally low at 2.5 days and slightly higher for vegetables at 5 days per week. It is acknowledged that the determinants of diet are multifactorial but however lack of awareness is a factor that contributes to people not consuming the inappropriate diet.

The surveys found that nearly a quarter of the respondents always or often add salt or salty sauce to their food before eating or as they are eating. High salt intake predisposes one to high blood pressure which is a risk factor for heart disease and stroke. (Organization World Health, 2012). However a low proportion of Kenyans who always or often eat processed foods high in salt at 4 percent.

Consuming foods high in sugars leads to excess calories which can in turn lead to overweight and obesity. Despite 84 percent of the respondents always or often add sugar when cooking or preparing beverages at home, only 2 percent of Kenyans thinking they consume too much sugar. Twenty eight percent of Kenyans always add sugar to beverages with the highest percentage being among the poorest quintile.

Majority of the Kenyans (60 percent) reported that they use vegetable oil for most of their cooking. Despite this being a positive finding, it should be interpreted with caution due to the fact that some of the vegetable oil available in the country is not of the recommended standard. There may be issues of misrepresentation since this was self reporting and did not require verification.

### Physical Inactivity

Physical activity has several health benefits and has the overall effect of reducing non communicable diseases and it is therefore important that strategies are put in place that will enable the community to be involved in regular physical activity. Seven percent of Kenyans are engaging in physical activity of less than 150 minutes of moderate-intensity activity per week, as recommended by WHO. The proportion of physical inactivity in rural and urban residence is 5 percent and 9 percent respectively. This is much lower than the global

prevalence of physical inactivity that stands at approximately 25 percent. The median time spend on physical activity per day is 263 minutes. The findings of this survey however may be biased as respondents perception of vigorous and moderate physical activity which were subjective and therefore more efficient standardized tool to measure the level of physical activity in the community should be used.

Sedentary behavior is an important risk factor for all cause mortality independent of time spent on physical activity. The mean minutes spent on sedentary behavior is 150 minutes per day which is approximately 10 percent of the total time in one day. The recommended maximum sedentary time is 120 minutes. Although advances in technology are one of the factors that are contributing towards sedentary lifestyle, wellness policies should be instituted to reduce sedentary time.

### Past Medical History

Screening and early detection is an important strategy for NCD prevention and control as early treatment prevents complication and improves treatment outcomes. A large proportion of Kenyans reported that they have never had their blood pressure, blood glucose and cholesterol measured by a health worker thereby predisposing them to late diagnosis and poor treatment outcomes. This can largely be attributed to the orientation of the health sector which is disease based and not focused on wellness as well as the health seeking behavior of the population.

Fifty six percent of Kenyans have never had their blood pressure measured by a health worker. Of those who reported ever having their blood pressure measured, 9 percent had been informed that they had an elevated blood pressure or hypertension. Among those who had been informed that they had an elevated blood pressure or hypertension only 22 percent reported that they were on medication prescribed by a health worker within the past two weeks. This depicts a substantially huge treatment gap which is alarming. Uncontrolled hypertension is an important risk factor for cardiovascular diseases.

Twelve percent of Kenyans reported to have ever had their blood sugar measured by a health worker out of which less than 2 percent had been informed that they had raised blood sugar or diabetes. As was noted with respondents who had ever been informed that they had an elevated blood pressure, only 40% of Kenyans who had been informed that they had raised blood sugar were taking drugs (medication) prescribed by other health worker.

Nearly all (98 percent) of the Kenyans had never been screened for cholesterol levels. This is not entirely surprising given that lack of availability and high costs of cholesterol test especially at primary health facilities. It follows that less than 1 percent had informed told by a health worker that they have raised cholesterol with elevated blood cholesterol and among this group only 13 percent were currently on medication.

## Cervical Cancer Screening

Cervical cancer is the second leading cause of mortality among cancers in women in the country (National Cancer Control Strategy, 2012). More than 80 percent of the cancer diagnosis in Kenya is made at an advanced stages where treatment options are very limited and outcome is poor this has largely been attributed to low awareness, poor referral structures and inadequate screening and diagnostic facilities.(Division of Reproductive Health, 2015). Only 43 percent of Kenyans are aware of any of the three cervical cancer screening methods namely VILI, VIA HPV test and Pap smear.

The uptake of cervical screening among Kenyans age 18- 69 years is 11 percent for age while among age group 30-49 where cervical cancer screening is recommended is 16 percent. This is an increase from previous studies that have found the coverage of screening among women aged 18-69 to be 3.2 percent (Division of Reproductive Health, 2015). This could be explained by the fact that only 47 percent of the women are aware of the cervical cancer screening methods. The intensification of initiatives by both government and nongovernmental players to increase screening uptake may have resulted in the increase in coverage between 2012 and the present but nevertheless the coverage of 11 percent is unacceptably low. Physical Measurements

Obesity and overweight are associated with cardiovascular disease, diabetes, cancer (e.g endometrial, breast and colon) and musculoskeletal diseases .The survey found that 28 percent of the Kenyans are overweight and obese with a significant difference in proportion between the men (18 percent) and women (39 percent). These findings are almost similar to KDHS 2014 findings that reported a prevalence of overweight and obesity of 33 percent among women of age group 15- 49 years, portending a significant risk of developing NCDs and their complications.

The prevalence of hypertension was found to be 24 percent. Among this group, 92 percent are not currently on medication. This is an alarming finding given the complications of uncontrolled raised blood pressure on heart and blood vessels that results to multiple end organ damage.

## Biochemical Measurements

Three percent of Kenyans have impaired fasting glycemia while 2 percent of the respondents have diabetes. This is almost similar to estimates from the International Diabetes federation which has reported a prevalence of 2.2 percent for diabetes in the country (IDF Atlas, 2015). There is need to improve the health care infrastructure for diabetes prevention and control as this is an emerging problem.

## Cardiovascular risk

Factoring in age, sex, blood pressure, smoking total cholesterol, and diabetes, eight percent of the Kenyans age 40-69 years have a CVD risk of 30 percent or above and thus at high risk of developing cardiovascular disease or dying from a CVD event within the next 10 years. This model however does not include obesity, physical inactivity, low socioeconomic status and a family history of premature cardiovascular disease which can all modify cardiovascular risk. The findings may therefore be an underestimation of the actual risk.

## Combined Risk factors

The STEPs survey found that 14 percent of the Kenyans have three or more risk factors amongst daily cigarette smoking, less than five servings of fruits and vegetables, overweight, raised BP which raises concerns about future trends in the burden of NCD. This is especially alarming in the age group 45-69 years considering that 26 percent have three or more of the above risk factors

## Violence and Injury

The Kenya traffic Amendment Act Cap 403 mandates that every driver and passenger should always wear a seat belt when inside a vehicle. Eighty eight percent of Kenya do not always wear seat belts. The enforcement of this specific law has in the recent times been said to be weak and may contribute to the low rate of compliance (Manyara, 2013). This has been compounded further by lack of functional seat belts in especially public service vehicles. With regards to helmet use, the survey results show that 94 percent of Kenyans do not always wear a helmet. The hygiene standards of helmets are also wanting hence shunned by mostly passenger. Enforcement in these areas is also weak and challenging. Despite heightened campaigns by the National Transport and Safety Authority (NTSA) to ensure drink driving is eliminated on the roads 3 percent of respondents reported that they had driven when drunk but because this was self reported a misrepresentation bias is possible.

Road traffic injuries (RTI) account for approximately a third of all the injury fatalities (Saidi H, 2013). Six percent of respondents reported that they had been involved in a road traffic crash in the past one year of which 54 percent were serious enough to warrant medical attention. One in ten respondents has been involved in a serious injury other than RTI with the leading cause of injury being cuts followed by burns. Four in ten of the non RTI injuries occurred at home. It should be noted that majority of these injuries are preventable by adopting safe practices.

Matters pertaining to violence have a societal causal mechanism including economic status, culture and religion. Four percent of the respondents have been seriously injured in a violent incident. Despite this, there have been effective programs implemented elsewhere that can reduce prevalence of violence. It should be noted that only 21 percent of the violent acts were committed by strangers therefore initiatives that promote cohesion in the community should be promoted.

### Oral Health

The oral health section of the STEPs survey sought to determine perception and practice of respondents towards oral health. A fairly low number of respondents (12 percent) reported that they had poor or very poor state of teeth. This could be an indication that respondents may be knowledgeable on how to take care of their teeth hence suffering from minimal dental problems. In a recent national oral survey 18 percent of Kenyans perceived that their teeth were in poor or very poor status. (MOH, Kenya National Oral Health Survey Report, 2015).

Nearly a third of the Kenyans had experienced oral pain and discomfort in the past twelve months with a further 12 percent had experienced difficulty in doing usual activities in the same period. Only, 11 percent had visited a dentist in the past 12 months and although this may not necessarily be the ones who had experienced pain and discomfort, these findings show that utilization of dental service remains low in the country. This is further supported by the fact that 63 percent of Kenyans have never visited a dentist. This is much higher than the results of the national oral survey 2015 that found that 28 percent of Kenyans have never visited a dentist.

Self reporting daily cleaning of teeth at least once was high at 89 percent. This is comparable to the 79 percent reported in the national oral survey. Majority of the respondents (76 percent and 72 percent) use toothbrush and fluoride tooth paste to clean their teeth respectively. This is close to figures found in the oral survey of 72 percent and 77 percent for tooth brush and tooth paste use respectively.

### Healthy lifestyle advice by Health Workers

Health workers play a major role in the prevention of non-communicable diseases by educating their clients on the need to adopt healthy lifestyles. Kenyans were asked if they had been advised by a health worker to either avoid engaging in a certain risky behavior or encouraged to adopt healthy habits that reduce their risk of developing NCDs. It is worrying to note that only 8 percent and 10 percent of Kenyans have been advised to quit or not to start tobacco use and alcohol drinking respectively. Further 10 percent of Kenyans have been advised to limit consumption of both salt and fats in the diet. Ten percent of Kenyans reported that they have been advised to eat adequate fruits and vegetables



## CHAPTER FIVE

### POLICY IMPLICATIONS AND RECOMMENDATIONS

## CHAPTER FIVE: POLICY IMPLICATIONS AND RECOMMENDATIONS

The Kenya STEPs is the first nationally representative survey to collect comprehensive information on risk factors for NCDs, Injuries and oral health in Kenya. It provides essential information on Key NCD indicators by age group, sex and residence, education level and wealth quintile in some cases. The findings are useful in informing public health policy and the following recommendations are proposed:

1. There is a need to Prioritize NCD prevention and control at both national and county level using whole of government, whole of society and life course approach as it is an emerging threat to health, social and economic development.
2. Sustained public awareness campaigns and interventions to reduce the modifiable risk factors for NCDs: unhealthy diets, physical inactivity, harmful use of alcohol, tobacco use and exposure to tobacco smoke.
3. Build the capacity of the health workforce while ensuring the availability, access, affordability and quality of safe, efficacious medicines and basic technologies for screening, diagnosis, treatment and monitoring of common NCDs such as hypertension and diabetes at primary health care.
4. Restructure the health information systems to guarantee reliable, timely, complete and quality data for evidence-based practice and decision making in NCD prevention and control.
5. Establish wellness clinics in all facilities to encourage early detection and screening of NCDs such as diabetes, cervical cancer, hypertension and others as well as serve as sources of information for prevention and health promotion.
6. Strengthen the implementation of the Framework Convention on Tobacco Control (FCTC) by enforcing the provisions of the Tobacco control Act at both the national and county level.
7. Adapt the global strategy to reduce harmful use of alcohol.
8. Strengthen implementation of the Kenya's National Nutrition Action Plan 2012-2017 and ensure continuous engagement with the agricultural sector to promote healthy diets and eating habits.
9. Introduction of legislations on production, packaging and responsible marketing of food and drinks to reduce consumption of unhealthy foods.
10. Implement the physical activity tool kit in the country to encourage adoption of active lifestyles and to reduce sedentary lifestyles.
11. Establish mechanisms to foster multi-sectoral collaboration to ensure all the pillars of the decade of action on road safety are well implemented

12. Conduct public education and social marketing campaigns on prevention of injuries.
13. Strengthen the delivery of oral health services throughout the country by raising the awareness on the importance of regular dental checkups and maintenance of proper oral health hygiene.
14. Integrate NCD indicators in national health surveys to supplement the data collected in periodic STEPS survey for proper planning and projection of NCD prevention and control.



## CHAPTER SIX

### BIBLIOGRAPHY

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## APPENDIX

## APPENDIX A - SAMPLE DESIGN FOR THE 2015 STEPS SURVEY

### I. INTRODUCTION

The 2015 Kenya STEPs Survey is part of international WHO STEPwise approach to surveillance of chronic disease risk factors. The survey design followed the recommendations and adjusted into the Kenyan situation.

### II. STUDY POPULATION

- a) The recommendation for STEPs was to draw sample population from the targeted population by use of age-sex groups. The age groups used intervals of 12 years of individuals aged 18 years to 69 years
- b) The population covered by the 2015 Kenya STEPs survey was defined as the universe of non-institutionalized population of men and women age 18 - 69 years
- c) A sample of households were selected and one person identified within the age groups of interest in the households was eligible for interview and measurements.
- d) The inclusion criteria was:
  - i. Individuals aged between 18 and 69 years
  - ii. Willing and able to provide informed consent for participation
- e) The exclusion criteria was:
  - i. Individuals not aged between 18 and 64 69 years
  - ii. Unable or unwilling to provide informed consent or assent.

### III. SAMPLE FRAME

Administratively, Kenya is divided into 47 Counties. In turn, each county is subdivided into Sub-Counties. Prior to the enactment of the current constitution in 2010, the sub-counties had not been created but are similar units were the districts. Each district was divided into divisions, each division into locations and each location into sub-locations. In addition to these administrative units, prior to the 2009 population census, each sub-location was subdivided into census enumeration areas (EAs) i.e. small geographic units with clearly defined boundaries. A total of 96,251 EAs were developed. The list of EAs is grouped by administrative units and includes information on the number of households and population. This information was used in 2010 to design a master sample known as the fifth National Sample Survey and Evaluation Programme (NASSEP V) with a total of 5,360 selected EAs.

The NASSEP V master frame follows a two-stage stratified cluster sample format. The first stage involved selection of Primary Sampling Units (PSUs) which were the EAs using probability proportional to size (PPS) method, with the measure of size being the households from 2009 census. The second stage involves the selection of households for various surveys. The frame was designed in a multi-tiered structure with four sub-samples (C1, C2, C3 and C4), each consisting of 1,340 EAs that can serve as independent frames

The NASSEP V frame used the counties as the first level stratification and further sub divided into rural and urban sub domains. The sampling was done independently within rural - urban sub domains. Each sampled EA was developed into a cluster and undergone listing and mapping process and clusters are within measure of average of 100 households (between 50 households and 149 households).

#### IV. SAMPLE SIZE AND ALLOCATION

Following the recommendations detailed in STEPS manual, the survey drew sample population from the targeted population by use of age-sex groups. The age groups used intervals of 12 years of population age 18 years to 69 years, resulting into eight groups.

The sample size was calculated using the formula;

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

n= sample size,

Z= level of confidence,

P= baseline level of the selected indicator

e= margin of error

Using the values, P= 0.50, Z= 1.96 (95 percent confidence Interval), P =50 percent (as recommended by WHO for countries who have not conducted a STEPS survey before) and e= 0.05, the initial estimated sample size was 384. Further adjustments that included multiplication of the sample by 1.5 (design effect to cater for complex survey), 8 (the number of 12 year age-sex groups and 1.25 (to cater for 20 percent non-response) yielded a sample of 5,760. The sample was further adjusted to ease allocation into various strata.

The sample was allocated into all the 92 strata in the NASSEP V frame, ensuring that a minimum of two clusters were selected per strata. This was achieved using power allocation method.

The sample size for 2015 Kenya STEPS survey was 6,000 individuals selected from a total of 200 clusters (100 in urban and 100 in rural) with a uniform sample of 30 individuals per cluster. Distribution of the sample by county and residence is shown in Table 1.

## V. SAMPLE SELECTION

The 2015 Kenya STEPS survey sample was selected in three stages. Stage one involved selection of PSUs (i.e. clusters), households and individuals.

### Selection of PSUs

The selection of clusters was done using the Equal Probability Selection Method (EPSEM). The clusters were selected systematically from NASSEP V frame with equal probability independently within the urban-rural domains. The process involved ordering the clusters by county, then by urban/rural, and finally by unique geocode. The resulting sample retained properties of PPS as used in creation of the frame.

### Household selection

Using the total number of households from each sampled cluster available from the NASSEP V, a uniform sample of 30 households per cluster was selected using systematic sampling method. This procedure of selecting the sample households with a random start was done by the following criteria:

Let L be the total number of households listed in the cluster;

Let Random be a random number between (0, 1);

Let n be the number of households selected in the cluster;

Let  $I = L/n$  be the sampling interval.

- (1) The first selected sample household is k (k is the serial number of the household in the listing) if and only if:  
$$(k-1)/L < \text{Random} \leq k/L$$
- (2) The subsequent selected households are those having serial numbers:  
$$k + (j-1)*I, \text{ (rounded to integers)}$$
  
for  $j = 2, 3, \dots, n$ ;

Random numbers were different and independent from cluster to cluster.

### Individual selection

All the selected clusters and corresponding households were loaded into Personal Digital Assistants (PDAs). During interviews, all the eligible household members were listed down and PDA used to randomly select one for interviews using the inbuilt Kish Grid method.

County		Sample Size						
		Clusters			Households/Individuals			
Code	Name	Rural	Urban	Total	Rural	Urban	Total	
101	NAIROBI	-	4	4	-	120	120	
201	NYANDARUA	2	2	4	60	60	120	
202	NYERI	2	2	4	60	60	120	
203	KIRINYAGA	2	2	4	60	60	120	
204	MURANG'A	3	2	5	90	60	150	
205	KIAMBU	3	3	6	90	90	180	
301	MOMBASA	-	4	4	-	120	120	
302	KWALE	2	2	4	60	60	120	
303	KILIFI	2	2	4	60	60	120	
304	TANA RIVER	2	2	4	60	60	120	
305	LAMU	2	2	4	60	60	120	
306	TAITA TAVETA	2	2	4	60	60	120	
401	MARSABIT	2	2	4	60	60	120	
402	ISIOLO	2	2	4	60	60	120	
403	MERU	3	2	5	90	60	150	
404	THARAKA NITHI	2	2	4	60	60	120	
405	EMBU	2	2	4	60	60	120	
406	KITUI	3	2	5	90	60	150	
407	MACHAKOS	3	2	5	90	60	150	
408	MAKUENI	2	2	4	60	60	120	

501	GARISSA	2	2	<b>4</b>	60	60	<b>120</b>
502	WAJIR	2	2	<b>4</b>	60	60	<b>120</b>
503	MANDERA	2	2	<b>4</b>	60	60	<b>120</b>
601	SIAYA	2	2	<b>4</b>	60	60	<b>120</b>
602	KISUMU	2	2	<b>4</b>	60	60	<b>120</b>
603	MIGORI	2	2	<b>4</b>	60	60	<b>120</b>
604	HOMA BAY	3	2	<b>5</b>	90	60	<b>150</b>
605	KISII	3	2	<b>5</b>	90	60	<b>150</b>
606	NYAMIRA	2	2	<b>4</b>	60	60	<b>120</b>
701	TURKANA	2	2	<b>4</b>	60	60	<b>120</b>
702	WEST POKOT	2	2	<b>4</b>	60	60	<b>120</b>
703	SAMBURU	2	2	<b>4</b>	60	60	<b>120</b>
704	TRANS NZOIA	2	2	<b>4</b>	60	60	<b>120</b>
705	BARINGO	2	2	<b>4</b>	60	60	<b>120</b>
706	UASIN GISHU	2	2	<b>4</b>	60	60	<b>120</b>
707	ELGEYO MARAKWET	2	2	<b>4</b>	60	60	<b>120</b>
708	NANDI	2	2	<b>4</b>	60	60	<b>120</b>
709	LAIKIPIA	2	2	<b>4</b>	60	60	<b>120</b>
710	NAKURU	3	3	<b>6</b>	90	90	<b>180</b>
711	NAROK	2	2	<b>4</b>	60	60	<b>120</b>
712	KAJIADO	2	2	<b>4</b>	60	60	<b>120</b>
713	KERICHO	2	2	<b>4</b>	60	60	<b>120</b>
714	BOMET	2	2	<b>4</b>	60	60	<b>120</b>
801	KAKAMEGA	3	2	<b>5</b>	90	60	<b>150</b>
802	VIHIGA	2	2	<b>4</b>	60	60	<b>120</b>
803	BUNGOMA	3	2	<b>5</b>	90	60	<b>150</b>

## Appendix B. Additional Tables

### Tobacco Use

Table B.1: Amount of cigarettes consumed daily

Age Group (years)	n	Men									
		% <5 Cigs.	95% CI	% 5-9 Cigs.	95% CI	% 10-14 Cigs.	95% CI	% 15-24 Cigs.	95% CI	% ≥ 25 Cigs.	95% CI
18-29	53	33.3	17.2-49.3	26.4	6.8-46.1	34.9	15.9-54.0	5.4	0.0-12.4	0.0	0.0-0.0
30-44	146	28.4	16.6-40.1	28.8	18.7-39.0	25.6	13.4-37.8	9.0	3.8-14.1	8.3	2.6-14.0
45-59	84	31.0	17.7-44.4	26.0	16.4-35.5	25.6	14.1-37.1	11.7	3.5-19.9	5.7	0.0-11.6
60-69	31	39.0	15.5-62.5	35.3	14.7-55.9	7.1	0.0-16.7	14.5	0.0-29.8	4.1	0.0-12.1
<b>18-69</b>	<b>314</b>	<b>31.3</b>	<b>23.8-38.7</b>	<b>27.9</b>	<b>19.8-36.0</b>	<b>27.1</b>	<b>18.2-35.9</b>	<b>8.9</b>	<b>5.2-12.6</b>	<b>4.8</b>	<b>2.1-7.6</b>

### Alcohol

Table B2: Percentage of current alcohol drinkers by selected demographic characteristics

Residence	n	Both Sexes						
		% Current drinker (past 30 days)	95% CI	% Drank in past 12 months, not current	95% CI	% Past 12 months abstainer	95% CI	% Lifetime abstainer
Rural	2305	17.1	14.3-19.8	4.8	3.7-6.0	13.1	10.7-15.4	65.0
Urban	2192	22.8	17.9-27.7	7.9	5.5-10.2	14.0	10.8-17.2	55.3
Education Level								
No formal schooling	754	11.0	5.5-16.4	2.8	1.0-4.6	6.4	3.7-9.0	79.9
Primary incomplete	1100	24.5	18.8-30.3	6.5	4.7-8.4	14.3	11.2-17.4	54.6
Primary complete	1427	14.6	11.3-17.8	4.8	2.7-6.9	15.5	11.9-19.1	65.1
Secondary and above	1216	23.7	18.3-29.0	8.1	5.2-11.1	13.5	10.5-16.4	54.8
Wealth Quintile								
Poorest	901	18.3	12.1-24.5	4.8	2.7-6.9	8.8	5.7-11.9	68.1
Second	898	16.7	13.4-20.0	5.2	3.1-7.3	12.5	9.3-15.8	65.6
Middle	899	17.6	14.1-21.0	4.6	2.6-6.6	14.3	11.2-17.5	63.5
Fourth	900	19.0	13.3-24.8	4.8	2.8-6.8	19.8	15.2-24.3	56.4
Richest	<b>899</b>	<b>24.0</b>	<b>16.1-31.9</b>	<b>9.8</b>	<b>6.0-13.6</b>	<b>12.3</b>	<b>8.4-16.2</b>	<b>54.0</b>
<b>total</b>	<b>4497</b>	<b>19.3</b>	<b>16.7-21.8</b>	<b>6.0</b>	<b>4.8-7.2</b>	<b>13.4</b>	<b>11.5-15.3</b>	<b>61.3</b>
								<b>57.9-64.6</b>

## Diet

**Table B3:** Percentage of Respondents who add salt always or often before eating or when eating by selected demographic characteristics

Add salt always or often before eating or when eating			
residence	Both sexes		
	n	%	95% CI
Rural	2304	25.0	20.2-29.8
Urban	2186	20.3	13.7-26.8
Wealth Quintile			
Poorest	899	30.1	20.3-39.9
Second	897	24.4	19.1-29.8
Middle	898	25.4	20.7-30.0
Fourth	899	22.2	16.4-28.0
Richest	897	15.5	9.2-21.9
<b>TOTAL</b>	<b>4490</b>	<b>23.2</b>	<b>19.1-27.2</b>

**Table B4:** Percentage of respondents who always or often consume processed food high in salt by residence

Residence	Both sexes		
	n	%	95% CI
Rural	2299	3.4	2.0-4.8
Urban	2189	5.7	3.9-7.5
<b>TOTAL</b>	<b>4488</b>	<b>4.3</b>	<b>3.2-5.5</b>

**Table B5:** Percentage of respondents who always or often consume processed food high in salt by wealth quintile

Wealth	Both sexes		
	n	%	95% CI
Poorest	896	2.5	0.6-4.5
Second	897	2.9	1.2-4.6
Middle	899	3.7	2.0-5.3
Fourth	899	7.0	3.7-10.4
Richest	897	5.4	2.7-8.0
<b>TOTAL</b>	<b>4445</b>	<b>4.3</b>	<b>3.2-5.5</b>

**Table B6:** Respondents perception on the importance of Lowering salt in the diet

Age Group	n	very important	95% CI	somewhat important Men	95% CI	not at all important	95% CI
18-29	508	47.2	36.1-58.2	28.6	21.4-35.8	24.2	17.5-30.9
30-44	660	47.6	40.5-54.7	25.7	20.8-30.7	26.7	20.6-32.7
45-59	318	50.7	40.8-60.6	25.2	18.7-31.6	24.1	17.1-31.1
60-69	141	49.5	39.5-59.5	22.6	14.5-30.8	27.9	18.0-37.7
<b>TOTAL</b>	<b>1627</b>	<b>48.0</b>	<b>40.5-55.5</b>	<b>26.8</b>	<b>22.1-31.5</b>	<b>25.2</b>	<b>20.1-30.4</b>
<b>Women</b>							
18-29	851	47.2	40.5-53.8	27.8	23.2-32.4	25.0	19.9-30.2
30-44	901	49.0	42.7-55.3	28.8	23.5-34.2	22.2	17.4-26.9
45-59	461	56.0	50.5-61.5	24.0	18.2-29.7	20.1	15.6-24.5
60-69	213	51.4	40.5-62.4	32.8	22.9-42.7	15.8	9.8-21.8
<b>TOTAL</b>	<b>2426</b>	<b>49.3</b>	<b>44.2-54.4</b>	<b>27.8</b>	<b>24.0-31.6</b>	<b>22.9</b>	<b>19.2-26.6</b>
<b>Both Sexes</b>							
18-29	1359	47.2	40.4-54.0	28.2	24.0-32.4	24.7	19.9-29.4
30-44	1561	48.3	42.7-53.8	27.3	23.6-31.0	24.4	19.9-28.9
45-59	779	53.4	47.1-59.6	24.6	19.8-29.3	22.1	17.7-26.5
60-69	354	50.5	42.2-58.7	27.7	20.7-34.7	21.9	15.2-28.5
<b>TOTAL</b>	<b>4053</b>	<b>48.7</b>	<b>43.4-54.0</b>	<b>27.3</b>	<b>24.2-30.4</b>	<b>24.0</b>	<b>20.2-27.9</b>

**Table B7:** Percentage of respondents who always add sugar to beverages by residence and wealth quintile

Residence	Both sexes		
	n	%	95% CI
Rural	2305	28.5	22.4-34.5
Urban	2189	26.6	17.8-35.4
<b>Wealth Quintile</b>			
Poorest	901	35.1	22.4-47.7
Second	897	25.6	20.3-30.9
Middle	899	24.0	18.6-29.4
Fourth	899	25.8	16.9-34.6
Richest	898	28.2	18.4-38.0
<b>TOTAL</b>	<b>4494</b>	<b>27.7</b>	<b>22.7-32.8</b>

Table B8: Respondents who always consume processed food high in sugar

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	558	2.1	0.6-3.5	936	2.9	0.7-5.2	1494	2.5	1.2-3.9
30-44	721	1.9	0.5-3.4	989	0.3	0.1-0.5	1710	1.1	0.4-1.9
45-59	355	1.1	0.0-2.3	519	0.0	0.0-0.1	874	0.6	0.0-1.2
60-69	159	0.0	0.0-0.0	254	0.0	0.0-0.0	413	0.0	0.0-0.0
<b>18-69</b>	<b>1793</b>	<b>1.8</b>	<b>0.7-2.8</b>	<b>2698</b>	<b>1.5</b>	<b>0.4-2.6</b>	<b>4491</b>	<b>1.6</b>	<b>0.8-2.4</b>

Table B9: Importance of lowering sugar in diet

Age Group (years)	n	Men					
		% Very important	95% CI	% Somewhat important	95% CI	% Not at all important	95% CI
18-29	559	48.9	40.0-57.7	28.9	21.4-36.4	16.8	11.5-22.2
30-44	723	49.4	43.1-55.6	25.2	20.5-30.0	17.3	13.1-21.5
45-59	355	53.1	43.8-62.4	25.4	18.7-32.2	15.3	10.0-20.5
60-69	159	46.4	36.3-56.4	28.1	19.4-36.7	20.0	11.7-28.3
<b>18-69</b>	<b>1796</b>	<b>49.6</b>	<b>43.4-55.8</b>	<b>27.1</b>	<b>22.9-31.2</b>	<b>16.9</b>	<b>13.3-20.5</b>
Age Group (years)	n	Women					
		% Very important	95% CI	% Somewhat important	95% CI	% Not at all important	95% CI
18-29	936	51.4	44.6-58.1	24.3	20.3-28.4	16.8	12.4-21.3
30-44	989	48.6	41.9-55.2	26.2	21.6-30.9	19.0	14.5-23.4
45-59	519	57.3	51.2-63.5	23.1	18.2-28.0	9.6	6.0-13.2
60-69	255	47.8	38.2-57.4	26.3	18.1-34.4	10.5	5.6-15.4
<b>18-69</b>	<b>2699</b>	<b>51.2</b>	<b>45.8-56.7</b>	<b>24.8</b>	<b>21.8-27.8</b>	<b>16.0</b>	<b>12.8-19.3</b>

**Table B10:** Mean number of meals eaten outside a home by residence and wealth quintile

Residence	<b>Both sexes</b>		
	n	mean	95% CI
rural	2303	1.6	1.3-1.9
urban	2184	2.5	2.0-3.0
<b>TOTAL</b>	<b>4487</b>	<b>1.9</b>	<b>1.7-2.2</b>
Wealth Quintiles	<b>Both sexes</b>		
	n	mean	95% CI
Poorest	901	1.0	0.7-1.3
Second	895	1.9	1.4-2.3
Middle	897	2.0	1.6-2.3
Fourth	898	1.9	1.6-2.2
Richest	896	2.8	2.1-3.5
<b>TOTAL</b>	<b>4487</b>	<b>1.9</b>	<b>1.7-2.2</b>

## Physical Activity

**Table B11:** Percentage of respondents with insufficient physical activity by selected demographic characteristics

Residence	<b>Both sexes</b>		
	n	mean	95% CI
Rural	2253	5.0	3.6-6.3
Urban	2134	9.1	6.1-12.0
Education	<b>Both sexes</b>		
	n	mean	95% CI
No formal schooling	734	12.1	9.0-15.1
Primary incomplete	1068	4.6	2.8-6.4
Primary complete	1393	5.9	3.2-8.5
Secondary and above	1192	6.4	4.2-8.6
Wealth Quintile	<b>Both sexes</b>		
	n	mean	95% CI
Poorest	883	6.5	3.8-9.2
Second	871	3.0	1.6-4.5
Middle	875	4.5	2.9-6.2
Fourth	880	8.0	3.7-12.2
Richest	878	10.1	6.5-13.7
<b>TOTAL</b>	<b>4387</b>	<b>6.5</b>	<b>5.1-7.9</b>

**Table B12:** Mean minutes spent on work related physical activity by residence and wealth quintile

residence	Both sexes		
	n	mean	95% CI
Rural	2253	237.4	217.6-257.1
Urban	2134	212.4	185.6-239.1
<b>Wealth Quintile</b>			
Poorest	883	214.4	177.9-250.8
Second	871	255.1	229.9-280.3
Middle	875	233.7	216.2-251.3
Fourth	880	253.8	207.7-300.0
Richest	878	188.9	169.0-208.7
<b>TOTAL</b>	<b>4387</b>	<b>227.8</b>	<b>212.2-243.4</b>

### Past Medical History

**Table B13:** Respondents currently taking herbal or traditional remedy for raised blood pressure

Currently taking herbal or traditional remedy for raised blood pressure among those previously diagnosed									
Age Group (years)	Men			Women			Both Sexes		
	n	% taking trad. meds	95% CI	n	% taking trad. meds	95% CI	n	% taking trad. meds	
18-29	20	0.0	0.0-0.0	69	0.1	0.0-0.3	89	0.1	0.0-0.2
30-44	30	0.0	0.0-0.0	112	1.6	0.0-3.9	142	1.2	0.0-2.9
45-59	39	0.0	0.0-0.0	121	1.1	0.0-2.6	160	0.7	0.0-1.7
60-69	27	5.7	0.0-17.0	65	2.7	0.0-6.6	92	4.0	0.0-9.3
<b>18-69</b>	<b>116</b>	<b>1.0</b>	<b>0.0-3.0</b>	<b>367</b>	<b>1.2</b>	<b>0.2-2.1</b>	<b>483</b>	<b>1.1</b>	<b>0.2-2.0</b>

**Table B14: Percentage of respondents with a previous diagnosis of diagnosis of raised blood sugar/diabetes by wealth quintile**

wealth	N	% Never measured BG		% Measured, not diagnosed		% Diagnosed not within past 12 months		% Diagnosed within past 12 months	
		95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI
Poorest	901	96.5	95.1-97.9	3.1	1.9-4.3	0.2	0.0-0.6	0.2	0.0-0.4
Second	897	92.5	90.4-94.6	6.5	4.6-8.4	0.2	0.0-0.6	0.8	0.2-1.3
Middle	897	87.7	85.1-90.4	11.4	8.9-13.9	0.4	0.0-0.8	0.5	0.1-1.0
Fourth	899	83.3	79.0-87.7	14.9	0.2-19.6	0.4	0.0-0.8	1.4	0.3-2.6
Richest	898	79.9	73.5-86.4	18.5	12.3-24.6	0.7	0.0-1.4	0.9	0.3-1.6
<b>TOTAL</b>	<b>4492</b>	<b>87.8</b>	<b>85.5-90.0</b>	<b>11.1</b>	<b>8.9-13.3</b>	<b>0.4</b>	<b>0.2-0.6</b>	<b>0.8</b>	<b>0.5-1.1</b>

**Table B15: Percentage of respondents with a previous diagnosis of diagnosis of raised blood sugar/diabetes by education level**

EDUCATION	N	% Never measured BG		% Measured, not diagnosed		% Diagnosed not within past 12 months		% Diagnosed within past 12 months	
		95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI
No formal schooling	754	92.8	90.1-95.6	5.3	3.4-7.2	0.0	0.0-0.1	1.8	0.0-3.7
Primary school incomplete	1100	92.0	89.3-94.6	7.2	4.6-9.8	0.2	0.0-0.4	0.6	0.2-1.1
Primary school complete	1424	89.8	87.6-92.0	9.4	7.2-11.5	0.4	0.0-0.8	0.4	0.1-0.8
secondary school and above	1214	80.4	75.6-85.3	18.1	13.4-22.8	0.7	0.2-1.2	0.8	0.2-1.4
<b>TOTAL</b>	<b>4492</b>	<b>87.8</b>	<b>85.5-90.0</b>	<b>11.1</b>	<b>8.9-13.3</b>	<b>0.4</b>	<b>0.2-0.6</b>	<b>0.8</b>	<b>0.5-1.1</b>

**Table B16:** Percentage of respondents currently taking herbal or traditional treatment for diabetes among those previously diagnosed

Age Group (years)	Men			Women			Both Sexes	
	n	% taking trad. meds	95% CI	n	% taking trad. meds	95% CI	n	% taking trad. meds
18-29			2	0.0	0.0-0.0	4	0.0	0.0-0.0
30-44			9	0.0	0.0-0.0	12	0.0	0.0-0.0
45-59			22	2.3	0.0-7.3	32	7.5	0.0-18.2
60-69			16	4.6	0.0-14.2	24	1.9	0.0-5.8
<b>18-69</b>	<b>23*</b>		<b>49</b>	<b>2.1</b>	<b>0.0-5.4</b>	<b>72</b>	<b>4.5</b>	<b>0.0-10.3</b>

\*Indicates estimate based on less than 25 unweighted cases and has been suppressed

## Cervical Cancer

**Table B17:** Percentage of respondents who have heard of cervical cancer screening by wealth quintile

wealth						
	n	% Never heard of screening	95% CI	% heard of screening	95% CI	
Poorest	887	78.2	71.5-85.0	21.8	15.0-28.5	
Second	880	60.8	54.8-66.8	39.2	33.2-45.2	
Middle	886	51.5	46.2-56.7	48.5	43.3-53.8	
Fourth	884	57.7	47.0-68.4	42.3	31.6-53.0	
richest	889	39.2	30.4-48.1	60.8	51.9-69.6	
<b>TOTAL</b>	<b>4426</b>	<b>56.8</b>	<b>51.9-61.6</b>	<b>43.2</b>	<b>38.4-48.1</b>	

## Physical Measurements

**Table B18:** BMI classification

Category of relative weight	BMI
Underweight	<18.5
Normal	18.5-24.9
Overweight	25.0-29.9
Obesity	≥ 30.0

**Table B19:** Prevalence of overweight and obesity by education level

Education	n	% Under-weight <18.5	95% CI	% Normal weight 18.5-24.9	95% CI	% BMI 25.0-29.9	95% CI	% Obese ≥30.0	95% CI
No formal Schooling	689	28.8	21.2-36.3	55.8	48.9-62.7	9.5	6.3-12.7	6.0	3.2-8.7
Primary school incomplete	1047	12.3	9.1-15.6	66.8	62.0-71.5	13.6	11.0-16.3	7.2	4.2-10.2
Primary school complete	1357	8.7	6.0-11.3	61.9	57.8-65.9	20.5	17.3-23.6	9.0	6.9-11.1
Secondary school and above	1169	6.7	4.2-9.2	57.1	52.6-61.5	25.0	20.7-29.3	11.2	8.6-13.9
<b>Wealth Quintile</b>									
Poorest	853.0	25.9	19.3-32.5	62.4	56.3-68.5	9.3	7.1-11.6	2.4	1.2-3.6
Second	849.0	10.3	7.8-12.8	69.9	56.4-73.4	15.8	13.1-18.5	4.0	2.4-5.7
Middle	859.0	8.7	6.3-11.2	62.5	58.0-66.9	19.3	16.0-22.7	9.4	6.6-12.3
Fourth	854.0	6.3	2.7-9.9	61.6	54.6-68.7	18.8	13.9-23.8	13.2	9.8-16.7
Richest	847.0	6.5	2.2-10.8	49.1	44.1-54.0	29.6	24.1-35.2	14.8	11.5-18.1
<b>TOTAL</b>	<b>4262</b>	<b>11.3</b>	<b>9.0-13.7</b>	<b>60.8</b>	<b>57.9-63.6</b>	<b>19.0</b>	<b>16.7-21.3</b>	<b>8.9</b>	<b>7.5-10.4</b>

**Table B20:** Mean Systolic blood pressure (mmHg)

Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-29	555	124.2	122.7-125.6	931	116.2	115.0-117.4	1486	120.0	119.1-120.9
30-44	705	126.1	124.2-128.0	974	121.4	119.8-123.1	1679	123.8	122.3-125.2
45-59	349	132.0	129.0-135.1	511	135.0	132.3-137.8	860	133.5	131.2-135.9
60-69	159	138.8	133.4-144.1	251	141.1	136.9-145.3	410	140.0	136.5-143.5
<b>18-69</b>	<b>1768</b>	<b>126.9</b>	<b>125.6-128.2</b>	<b>2667</b>	<b>122.1</b>	<b>120.7-123.5</b>	<b>4435</b>	<b>124.4</b>	<b>123.4-125.4</b>

**Table B21:** Mean diastolic blood pressure (mmHg)

Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-29	556	77.6	76.3-79.0	931	77.9	77.0-78.8	1487	77.8	76.9-78.6
30-44	706	81.3	80.0-82.5	974	81.5	80.2-82.8	1680	81.4	80.4-82.4
45-59	349	84.5	82.1-86.8	512	87.9	86.3-89.4	861	86.2	84.6-87.7
60-69	159	84.4	81.5-87.4	252	85.3	83.3-87.3	411	84.9	83.0-86.7
<b>18-69</b>	<b>1770</b>	<b>80.3</b>	<b>79.3-81.3</b>	<b>2669</b>	<b>81.0</b>	<b>80.2-81.7</b>	<b>4439</b>	<b>80.7</b>	<b>79.9-81.4</b>

## Biochemical Measurements

**Table B22:** Mean fasting blood glucose (mmol/L)

Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-29	505	4.3	4.2-4.5	859	4.5	4.4-4.6	1364	4.4	4.3-4.6
30-44	641	4.4	4.3-4.6	908	4.8	4.7-4.9	1549	4.6	4.5-4.7
45-59	324	4.8	4.7-5.0	472	5.0	4.8-5.3	796	4.9	4.8-5.1
60-69	144	4.5	4.3-4.8	230	5.0	4.8-5.2	374	4.8	4.6-4.9
<b>18-69</b>	<b>1614</b>	<b>4.5</b>	<b>4.4-4.6</b>	<b>2469</b>	<b>4.7</b>	<b>4.6-4.8</b>	<b>4083</b>	<b>4.6</b>	<b>4.5-4.7</b>

**Table B23:** Mean total cholesterol (mmol/L)

Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-29	512	3.2	3.1-3.2	874	3.6	3.5-3.7	1386	3.4	3.3-3.5
30-44	658	3.6	3.4-3.7	929	3.8	3.7-4.0	1587	3.7	3.6-3.8
45-59	330	3.9	3.7-4.1	483	4.1	4.0-4.3	813	4.0	3.9-4.1
60-69	146	3.7	3.5-3.9	237	4.1	4.0-4.3	383	3.9	3.8-4.1
<b>18-69</b>	<b>1646</b>	<b>3.4</b>	<b>3.3-3.5</b>	<b>2523</b>	<b>3.8</b>	<b>3.7-3.9</b>	<b>4169</b>	<b>3.6</b>	<b>3.5-3.7</b>

**Table B24:** Percentage of respondents seriously injured from violent incidents by wealth quintile

wealth	Both sexes		
	n	% Seriously injured from violent incidents	95% CI
Poorest	898	4.7	2.5-6.8
Second	896	5.7	3.3-8.1
Middle	895	3.9	2.0-5.9
Fourth	897	3.8	1.8-5.8
Richest	897	1.9	0.6-3.2
<b>Education level</b>			
No formal Schooling	750	4.3	1.2-7.3
Primary school incomplete	1098	7.2	4.7-9.6
Primary school complete	1421	3.2	1.9-4.6
Secondary school and above	1214	2.2	1.0-3.3
<b>TOTAL</b>	<b>4483</b>	<b>3.9</b>	<b>2.9-4.9</b>

**Table B25:** Percentage of respondents with natural teeth by residence and wealth quintile

Age Group	n	1) no natural teeth	95% CI	2) 1-9 teeth	95% CI	3) 10-19 teeth	95% CI	4) 20-27 teeth	95% CI	5) 28 teeth or more	95% CI
Rural	2301	0.4	0.0-0.7	0.8	0.5-1.2	1.5	0.5-2.5	10.2	8.1-12.4	87.1	84.4-89.7
Urban	2185	0.1	0.0-0.2	0.2	0.0-0.4	1.1	0.0-2.2	6.8	4.8-8.8	91.8	89.2-94.5
<b>Wealth Quintile</b>											
Poorest	901	0.1	0.0-0.2	0.6	0.1-1.2	2.7	0.0-5.5	11.7	6.7-16.6	84.9	79.0-90.8
Second	895	0.3	0.0-0.6	1.1	0.5-1.7	1.5	0.5-2.4	7.9	5.9-9.9	89.3	86.7-91.8
Middle	897	0.6	0.0-1.4	1.1	0.3-1.8	0.8	0.1-1.4	11.0	8.6-13.4	86.5	83.5-89.5
Fourth	897	0.2	0.0-0.4	0.3	0.0-0.6	0.3	0.0-0.6	8.3	5.5-11.1	90.9	87.9-94.0
Richest	896	0.2	0.0-0.4	0.0	0.0-0.0	1.3	0.0-3.1	6.4	4.1-8.7	92.1	89.0-95.3
<b>TOTAL</b>	<b>4486</b>	<b>0.3</b>	<b>0.1-0.5</b>	<b>0.6</b>	<b>0.4-0.9</b>	<b>1.3</b>	<b>0.6-2.1</b>	<b>8.9</b>	<b>7.3-10.5</b>	<b>88.9</b>	<b>86.9-90.9</b>

**Table B26:** Percentage of Respondents who have never visited a dentist by residence and wealth quintile

Residence	Both sexes		
	n	%	95% CI
Rural	2302	63.9	60.5-67.3
Urban	2188	60.8	53.4-68.3
<b>Education</b>			
No formal Schooling	753	73.8	67.0-80.6
Primary school incomplete	1100	66.4	62.0-70.9
Primary school complete	1423	63.9	58.6-69.1
Secondary school and above	1214	54.3	48.9-59.8
<b>Wealth Quintile</b>			
Poorest	901	75.7	71.1-80.4
Second	897	66.9	63.0-70.9
Middle	896	58.8	53.8-63.9
Fourth	899	59.0	50.2-67.8
Richest	897	54.3	45.0-63.6
<b>TOTAL</b>	<b>4490</b>	<b>62.7</b>	<b>59.2-66.2</b>

## Khat Use

Table B27: Percentage of ever Khat use by residence, wealth and education

Residence	N	%	95% CI
Rural	2304	13.7	9.9-17.6
Urban	2190	20.8	17.3-24.4
<b>Education</b>			
No formal Schooling	754	14.4	8.2-20.5
Primary school incomplete	1101	18.2	12.9-23.4
Primary school complete	1424	16.0	12.0-19.9
Secondary school and above	1215	16.6	12.8-20.3
<b>Wealth</b>			
Poorest	901	13.1	8.6-17.6
Second	899	12.2	8.0-16.3
Middle	898	14.4	8.6-20.2
Fourth	899	23.8	14.8-32.8
Richest	897	18.8	13.3-24.3
<b>TOTAL</b>	<b>4494</b>	<b>16.5</b>	<b>13.6-19.3</b>

## APPENDIX C - QUESTIONNAIRE



The WHO STEP wise approach to  
Chronic Disease risk factor surveillance (STEPS)



Kenya 2015 (12-March-2015)

Participant Identification Number (seven digits)

Survey Information		
Location and Date	Response	Code
Cluster/Centre/Village ID (4 digits)	<input type="text"/>	I1
Cluster/Centre/Village name (20 characters)	<input type="text"/>	I2
County Name (20 digits)	<input type="text"/>	X1
Location \Residence	Rural 1 Urban 2	X2a
Household number	<input type="text"/>	X2b
Interviewer ID	<input type="text"/>	I3
Date of interview	dd <input type="text"/> mm <input type="text"/> year	I4
Consent, Interview Language and Name	Response	Code
Consent has been read and obtained	Yes 1 No 2    If NO, END	I5
Interview Language	English 1 Kiswahili 2 Other 3	I6
Time of interview (24 hour clock)	<input type="text"/> : <input type="text"/> hrs      mins	I7
Family Surname	<input type="text"/>	I8
First Name	<input type="text"/>	I9
Contact phone number where possible (10 digits)	<input type="text"/>	I10

## Step 1 Demographic Information

Demographic Information		
Question	Response	Code
Sex ( <i>Record Male / Female as observed</i> )	Male 1 Female 2	C1
What is your date of birth? <i>Don't Know 77 77 7777</i>	dd mm year [ ] [ ] [ ] If known, Go to C4	C2
How old are you?	Years [ ]	C3
In total, how many years have you spent at school and in full-time study (excluding pre-school)?	Years [ ]	C4
What is the <b>highest level of education</b> you have completed? <i>[INSERT COUNTRY-SPECIFIC CATEGORIES]</i>	No formal schooling 1 primary school incomplete 2 Primary school completed 3 Secondary school incomplete 4 Secondary school completed 5 A-level completed 6 College/University completed 7 Post graduate degree 8 Refused 88	C5
What is your <b>ethnic background</b> ?	Borana 1 Embu 2 Kalenjin 3 Kamba 4 Kikuyu 5 Kisii 6 Luhya 7 Luo 8 Maasai 9 Meru 10 Miji Kenda 11 Somali 12 Turkana 13 Others 14 Refused 88	C6
What is your <b>marital status</b> ?	Never married 1 Currently married 2 Separated 3 Divorced 4 Widowed 5 Cohabiting 6 Refused 88	C7

Question	Response	Code
Which of the following best describes your <b>main work</b> status over the past 12 months?	Government employee 1 Non-government employee 2 Self-employed 3 Non-paid/volunteer 4 Student 5 Homemaker (housewife/house husband) 6 Retired 7 Unemployed (able to work) 8 Unemployed (unable to work) 9 Refused 88	C8
How many people older than 18 years, including yourself, live in your household?	Number of people [ ]	C9
What is the main source of drinking water for members of your household? (Choose ONLY One)	Piped water (into dwelling) 11 Piped into compound, yard 12 Piped to neighbor 13 Piped to water kiosk 14 Public tap/standpipe 15 Tubewell/Borehole 21 Dug well (protected) 31 Dug well (unprotected) 32 Spring water (protected) 41 Spring water (unprotected) 42 Rainwater collection 51 Tanker-truck 61 Cart with small tank/drum 71 Surface water (river, stream, dam, lake, pond, canal, irrigation channel) 81 Bottled water 91 Other ( <i>specify</i> ) 96  Others	X3 X3others

Question	Response	Code
What kind of toilet facility do members of your household usually use?	Flush to piped sewer system 11 Flush to septic tank 12 Flush to pit (latrine) 13 Flush to somewhere else 14 Flush to unknown place/not sure/DK 15 Ventilated Improved Pit latrine (VIP) 21 Pit latrine with slab 22 Pit latrine without slab/open 23 Composting toilet 31 Bucket 41 Hanging toilet/hanging 51 No facilities or bush or field or ocean 95 Other (specify) 96	X4
	Others _____	X4other
Main material of the dwelling floor: Record observation	Earth/sand 11 Dung 12 Wood planks 21 Palm/bamboo 22 Parquet or polished wood 31 Vinyl or asphalt strips 32 Ceramic tiles 33 Cement 34 Carpet 35 Other (specify) 96	X5
	Other _____	X5other
Main material of the roof: Record observation <b>(Choose ONLY One)</b>	No Roof 11 Grass/Thatch/Makuti 12 Dung/Mud 13 Corrugated iron (Mabati) 21 Tin cans 22 Asbestos sheet 31 Concrete 32 Tiles 33 Others 96	X6
	Others _____	X6other

Question	Response	Code
Main materials of the walls: Record observation	No walls 11 Cane/palm/trunks 12 Dirt 13 Bamboo with mud 21 Stone with mud 22 Uncovered adobe 23 Plywood 24 Cardboard 25 Reused wood 26 Cement 31 Stone with lime/cement 32 Bricks 33 Cement blocks 34 Covered adobe 35 Wood planks/shingles 36 Other (specify) 96	X7
	Others _____	X7other
What type of fuel does your household mainly use for cooking?	Electricity 01 Liquefied Petroleum Gas 02 Natural gas 03 Biogas 04 Kerosene 05 Coal / Lignite 06 Charcoal 07 Wood 08 Straw/shrubs/grass 09 Animal dung 10 Agricultural crop residue 11 Other (specify) 96 No food cooked in the 97	X8
Does this household or any member of the household own any of the following items?	a. Electricity 1 = Yes, 2 = No b. Radio 1 = Yes, 2 = No c. Television 1 = Yes, 2 = No d. Mobile Telephone 1 = Yes, 2 = No e. Non-Mobile Telephone 1 = Yes, 2 = No f. Refrigerator 1 = Yes, 2 = No g. Washing machine 1 = Yes, 2 = No h. Computer 1 = Yes, 2 = No i. Watch 1 = Yes, 2 = No j. Bicycle 1 = Yes, 2 = No k. Motorcycle/scooter 1 = Yes, 2 = No l. Animal Drawn Cart 1 = Yes, 2 = No m. Car\Truck 1 = Yes, 2 = No n. Boat with motor 1 = Yes, 2 = No	X9a X9b X9c X9d X9e X9f X9g X9h X9i X9j X9k X9l X9m X9n

Do you or someone living in this household own this dwelling or do you rent this dwelling?	Own 1 Rent 2 Rent free/squatter/other 3	X10
Does your household employ any help (such as house help, shamba man etc)?	Yes 1 No 2	X11
Does any member of this household own any agricultural land?	Yes 1 No 2	X12
Does this household own any livestock, herds, other farm animals, or poultry?	Yes 1 No 2 If no, skip to T1	X13
How many of the following animals does the household own?	a. Local Cattle b. Exotic/grade cattle c. Horse/donkey/cam el d. goat e. sheep f. chicken/goose/duck g. Pigs h. Camel  If don't know, record 888	X14a X14b X14c X14d X14e X14f X14g X14h

Step 1 Behavioural Measurements		
<b>CORE: Tobacco Use</b>		
Now I am going to ask you some questions about tobacco use.		
Question	Response	Code
Do you <b>currently</b> smoke any <b>tobacco</b> products, such as cigarettes, hand-rolled, cigars, waterpipes/shisha, or pipes/kiko? <i>(USE SHOWCARD)</i>	Yes 1  No 2 <i>If No, go to T8</i>	T1
Do you currently smoke tobacco products <b>daily</b> ?	Yes 1  No 2	T2
How old were you when you <b>first started</b> smoking?	Age (years) Don't know 77  <i>If Known, go to T5a/T5aw</i>	T3
Do you remember how long ago it was? <i>(RECORD ONLY 1, NOT ALL 3)</i>  Don't know 77	In Years  <i>If Known, go to T5a/T5aw</i>  OR in Months  <i>If Known, go to T5a/T5aw</i>  OR in Weeks 	T4a  T4b  T4c
On average, <b>how many</b> of the following products do you smoke <b>each day/week</b> ?  <i>(IF LESS THAN DAILY, RECORD WEEKLY)</i>  <i>(RECORD FOR EACH TYPE, USE SHOWCARD)</i>  Don't Know 7777	DAILY↓   WEEKLY↓	
	Manufactured cigarettes 	T5a/T5 aw
	Hand-rolled cigarettes 	T5b/T5 bw
	Pipes full of tobacco (Kiko) 	T5c/T5 cw
	Cigars, cheroots, cigarillos 	T5d/T5 dw
	Number of Shisha sessions 	T5e/T5 ew
	Other   <i>If Other, go to T5other, else go to T6</i>	T5f/T5f w
	Other (please specify): 	T5other /  T5other w
During the past 12 months, have you tried to <b>stop smoking</b> ?	Yes 1  No 2	T6

Question	Response	Code
During any visit to a doctor or other health worker in the past 12 months, were you advised to quit smoking tobacco?	Yes 1 If $T2=Yes$ , go to T12; if $T2=No$ , go to T9 No 2 If $T2=Yes$ , go to T12; if $T2=No$ , No visit during the past 12 months 3 If $T2=Yes$ , go to T12; if $T2=No$ , go to T9	T7
In the past, did you <b>ever smoke</b> any tobacco products? (USE SHOWCARD)	Yes 1 No 2 If No, go to T12	T8
In the past, did you <b>ever smoke daily</b> ?	Yes 1 If $T1=Yes$ , go to T12, else go to T10 No 2 If $T1=Yes$ , go to T12, else go	T9
How old were you when you <b>stopped</b> smoking?	Age (years) █ If Known, go to T12 Don't Know 77	T10
How <b>long ago</b> did you stop smoking? (RECORD ONLY 1, NOT ALL 3) Don't Know 77	Years ago █ If Known, go to T12 OR Months ago █ If Known, go to T12 OR Weeks ago █	T11a T11b T11c
Do you <b>currently use</b> any <b>smokeless tobacco</b> products such as <i>snuff, chewing tobacco, kuber, , pan?</i> (USE SHOWCARD)	Yes 1 No 2 If No, go to T15	T12
Do you <b>currently use smokeless tobacco</b> products <b>daily</b> ?	Yes 1 No 2 If No, go to T14aw	T13
On average, how many <b>times a day/week</b> do you use ....  (IF LESS THAN DAILY, RECORD WEEKLY)  (RECORD FOR EACH TYPE, USE SHOWCARD)  Don't Know 7777	DAILY↓ WEEKLY↓  Snuff, by mouth █ █ █ █ █ █ █ █ T14a/ T14aw Snuff, by nose █ █ █ █ █ █ █ █ T14b/ T14bw Chewing tobacco e.g. kuber █ █ █ █ █ █ █ █ T14c/ T14cw Betel, quid with tobacco (pan) █ █ █ █ █ █ █ █ T14d/ T14dw  Other █ █ █ █ █ █ █ █ If Other, go to T14other, if $T13=No$ , go to T16, else go to T17 T14e/ T14ew  Other (please specify): █ █ █ █ █ If $T13=No$ , go to T16, else go to T17 T14oth er/ T14oth erw	
In the <b>past</b> , did you <b>ever use</b> smokeless tobacco products such as <i>snuff, chewing tobacco, kuber,or pan?</i>	Yes 1 No 2 If No, go to T17	T15

Question	Response	Code
In the <b>past</b> , did you <b>ever use</b> smokeless tobacco products such as <i>snuff, chewing tobacco, or betel daily?</i>	Yes 1 No 2	T16
During the past 30 days, did someone smoke <b>in your home?</b>	Yes 1 No 2	T17
During the past 30 days, did someone smoke in closed areas <b>in your workplace</b> (in the building, in a work area or a specific office)?	Yes 1 No 2 Don't work in a closed 3	T18
Have you ever used an electronic cigarette?"	Yes 1 No 2 Don't know 3	X15

### Alcohol Consumption

The next questions ask about the consumption of alcohol. When asking about amount of alcohol consumed, you can tell me what types of alcohol you were drinking and I will calculate how much this is when measured in "standard unit of alcohol" or "standard drink" which is the amount of alcohol you find in a small beer, one glass of wine, or one tot of spirits.

Question	Response	Code
Have you <b>ever</b> consumed any alcohol such as beer, wine, spirits, fermented cider, changaa, busaa, or any other local brew? <i>(USE SHOWCARD OR SHOW EXAMPLES)</i>	Yes 1 No 2 <i>If No, go to D1</i>	A1
Have you consumed any alcohol within the <b>past 12 months?</b>	Yes 1 <i>If Yes, go to A4</i> No 2	A2
Have you stopped drinking due to health reasons, such as a negative impact on your health or on the advice of your doctor or other health worker?	Yes 1 <i>If Yes, go to D1</i> No 2 <i>If No, go to D1</i>	A3

Question	Response	Code
During the past 12 months, <b>how frequently</b> have you had at least one standard alcoholic drink? <i>(READ RESPONSES, USE SHOWCARD)</i>	Daily 1 5-6 days per week 2 3-4 days per week 3 1-2 days per week 4 1-3 days per month 5 Less than once a month 6	A4
Have you consumed any alcohol within the <b>past 30 days?</b>	Yes 1 No 2 <i>If No, go to D1</i>	A5
During the past 30 days, on how many <b>occasions</b> did you have at least one standard alcoholic drink?	Number Don't know 77 <input type="text"/>	A6
During the past 30 days, when you drank alcohol, <b>how much did you on average drink</b> during one drinking occasion? <i>(USE SHOWCARD)</i>	Number of standard units of alcohol Don't know 77 <input type="text"/>	A7
During the past 30 days, what was the <b>largest number</b> of standard drinks you had on a single occasion, counting all types of alcoholic drinks together?	Largest number of standard units of alcohol Don't Know 77 <input type="text"/>	A8
During the past 30 days, how many times did you have <b>six or more</b> standard drinks in a single drinking occasion?	Number of times Don't Know 77 <input type="text"/>	A9
During each of the <b>past 7 days</b> , how many standard drinks did you have each day? <i>(USE SHOWCARD)</i> Don't Know 7	Monday <input type="text"/> Tuesday <input type="text"/> Wednesday <input type="text"/> Thursday <input type="text"/> Friday <input type="text"/> Saturday <input type="text"/> Sunday <input type="text"/>	A10a A10b A10c A10d A10e A10f A10g

### Alcohol Consumption, continued

I have just asked you about your consumption of alcohol during the past 7 days. The questions were about alcohol in general, while the next questions refer to your consumption of homebrewed alcohol, alcohol brought over the border/from another country, any alcohol not intended for drinking or other untaxed alcohol. Please only think

Question	Response	Code
During the <b>past 7 days</b> , did you consume any <b>homebrewed</b> alcohol (excluding changaa, busaa or muratina) or any alcohol <b>not intended for drinking</b> ? <i>(USE SHOWCARD)</i>	Yes 1 No 2 <i>If No, go to D1</i>	A11
On average, <b>how many standard drinks</b> of the following did you consume <b>during the past 7 days</b> ? <i>(USE SHOWCARD)</i> Don't Know 77	Homebrewed spirits, e.g. changaa <input type="text"/>	A12a
	Homebrewed beer or wine, e.g. Busaa, muratina, mnazi, mkoma beer, or fruit wine <input type="text"/>	A12b
	Alcohol brought over the border/from another country <input type="text"/>	A12c
	Alcohol not intended for drinking, e.g. alcohol-based medicines, perfumes, after shaves <input type="text"/>	A12d
	Other untaxed alcohol in the country <input type="text"/>	A12e

### Diet

The next questions ask about the fruits and vegetables that you usually eat. I have a nutrition card here that shows you some examples of local fruits and vegetables. Each picture represents the size of a serving (one serving). As you answer these questions please think of a typical week in the last year.

Question	Response	Code
In a typical week, on how many days do you <b>eat fruit</b> ? <i>(USE SHOWCARD)</i>	Number of days Don't Know 77 <input type="text"/> If Zero days, go to D3	D1
How many <b>servings</b> of fruit do you eat on <b>one</b> of those days? <i>(USE SHOWCARD)</i>	Number of servings Don't Know 77 <input type="text"/>	D2
In a typical week, on how many days do you <b>eat vegetables</b> ? <i>(USE SHOWCARD)</i>	Number of days Don't Know 77 <input type="text"/> If Zero days, go to D5	D3
How many <b>servings</b> of vegetables do you eat on one of those days? <i>(USE SHOWCARD)</i>	Number of servings Don't know 77 <input type="text"/>	D4

## Dietary

With the next questions, we would like to learn more about salt in your diet. Dietary salt includes ordinary table salt, unrefined salt such as sea salt, iodized salt, salty stock cubes and powders, and salty sauces such as soya sauce or fish sauce (see show cards). The following questions are on adding salt to the food right before you eat it, on how food is prepared in your home, on eating processed foods that are high in salt such as packaged salty snacks e.g crisps, and questions on controlling your salt intake. Please answer the questions even if you consider yourself to eat a diet low in salt.

Question	Response	Code
How often do you <b>add salt or a salty sauce such as soya sauce</b> to your food right before you eat it or as you are eating it? <i>(USE SHOWCARD)</i>	Always (every meal) 1 Often (most meals) 2 Sometimes (every week) 3 Rarely (not every week) 4 Never 5 Don't know 77	D5
How often is <b>salt, salty seasoning or a salty sauce put</b> in the food when cooking or preparing foods in your household?	Always (every meal) 1 Often (most meals) 2 Sometimes (every week) 3 Rarely (not every week) 4 Never 5 Don't know 77	D6
How often do you eat <b>processed food high in salt</b> ? By processed food high in salt, I mean foods that have been altered from their natural state, such as njugu-karanga, packaged salty snacks, canned salty food including pickles and preserves, salty food prepared at a fast food restaurant, cheese, bacon and processed meat	Always (every meal) 1 Often (most meals) 2 Sometimes (every week) 3 Rarely (not every week) 4 Never 5 Don't know 77	D7
<b>How much salt or salty sauce</b> do you think you consume?	Far too much 1 Too much 2 Just the right amount 3 Too little 4 Far too little 5 Don't know 77	D8
How important to you is <b>lowering the salt</b> in your diet?	Very important 1 Somewhat important 2 Not at all important 3 Don't know 77	D9
Do you think that too much salt or salty sauce in your diet could cause a <b>health problem</b> ?	Yes 1 No 2 Don't know 77	D10
Do you do any of the following on a regular basis to <b>control your salt intake</b> ? <i>(RECORD FOR EACH)</i>		
Limit consumption of processed foods	Yes 1 No 2 Not applicable 3	D11a

Question	Response	Code
Buy low salt/sodium alternatives	Yes 1 No 2 Not applicable 3	D11c
Use spices other than salt when cooking	Yes 1 No 2 Not applicable 3	D11d
Avoid eating foods prepared outside of a home	Yes 1 No 2 Not applicable 3	D11e
Do other things specifically to control your salt intake	Yes 1 <i>If Yes, go to</i> No 2 Not applicable 3	D11f
Other (please specify)	<input type="text"/>	D11other
The next questions ask about the oil or fat that is most often used for meal preparation in your household, and about meals that you eat outside a home.		
What type of <b>oil or fat is most often</b> used for meal preparation in your household?  <i>(USE SHOWCARD) (SELECT ONLY ONE)</i>	Vegetable oil (liquid) 1	D12
	Vegetable fat (solid) 2	
	Lard or suet 3	
	Butter or ghee 4	
	Margarine 5	
	Palm Oil 6	
	Coconut Oil 7	
	Other 8 <i>If Other, go to D12 other</i>	
	None in particular 9	
	None used 10	
	Don't know 77	
	Other <input type="text"/>   <input type="text"/>   <input type="text"/>   <input type="text"/>   <input type="text"/>   <input type="text"/>   <input type="text"/>	
On average, how many meals per week do you eat that were not prepared at a home? By meal, I mean breakfast, lunch and dinner.	Number Don't know 77 <input type="text"/>   <input type="text"/>	D13

## Dietary Sugar Intake

With the next questions, we would like to learn more about sugar in your diet. Dietary sugar includes ordinary sugar, refined sugar such as candy, chocolate, fizzy drinks (see show card). The following questions are on adding sugar to beverages right before you drink them, on how sweet beverages foods are prepared in your home, on eating processed foods that are high in sugar such as packaged snacks and questions on controlling your sugar intake.

Please answer the questions even if you consider yourself to eat a diet low in sugar.

Question	Response	Code
How often do you <b>add sugar to your beverages</b> right before you drink them or as you are drinking them? <i>(SELECT ONLY ONE)</i> <i>(USE SHOWCARD)</i>	Always (every drink) 1 Often (every day but not every . . .) 2 Sometimes (every week) 3 Rarely (not every week) 4 Never 5 Don't know 77	X16
In a typical week on how many days do you take soda (carbonated drinks) like fanta, coca cola, 7-up, Afya, Softa, Vimto, or other sugary drinks?	Number of days Don't Know 77 <input type="text"/> If Zero days, go to x18	X17a
How many 300ml bottles do you take each time you drink soda on <b>one</b> of those days? <i>(USE SHOWCARD)</i>	Number of servings Don't Know 77 <input type="text"/>	X17b
Question	Response	Code
How often do you eat <b>processed food high in sugar</b> ? By processed food high in sugar, I mean biscuits, wafers, cakes, candy, sweets and chocolate and alike? <i>(USE SHOWCARD)</i>	Always (every meal) 1 Often (every day) 2 Sometimes (every week) 3 Rarely 4 Never 5 Don't know 77	X18
How much sugar do you think you consume?	Far too much 1 Too much 2 Just the right amount 3 Too little 4 Far too little 5 Don't know 77	X19
How important to you is <b>lowering the sugar</b> in your diet?	Very important 1 Somewhat important 2 Not at all important 3 Don't know 77	X20
Do you think that too much sugar in your diet could cause a <b>health problem</b> ?	Yes 1 No 2 Don't know 77	X21
Do you do any of the following on a regular basis to <b>control your sugar intake</b> ? <i>(RECORD FOR EACH)</i>		
Minimize the amount of sugar used in beverages	Yes 1 No 2	X22a
Limit consumption of soda and sugary drinks	Yes 1 No 2	X22b
Limit consumption of processed foods	Yes 1 No 2	X22c
Use of natural/unrefined alternatives	Yes 1 No 2	X22d
Do other things specifically to control your sugar intake	Yes 1 No 2	X22e
Other (please specify)	<input type="text"/>	X22other

## Physical Activity

Next I am going to ask you about the time you spend doing different types of physical activity in a typical week. Please answer these questions even if you do not consider yourself to be a physically active person.

Think first about the time you spend doing work. Think of work as the things that you have to do such as paid or unpaid work, study/training, household chores, harvesting food/crops, fishing or hunting for food, seeking employment. *[Insert other examples if needed]*. In answering the following questions 'vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate, 'moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.

### Work

Question	Response	Code	Questio
Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like <i>carrying or lifting heavy loads, digging or construction work</i> for at least 10 minutes continuously?	Yes 1  No 2 <i>If No, go to P 4</i>		P1
In a typical week, on how many days do you do vigorous-intensity activities as part of your work?	Number of days <input type="text"/>		P2
How much time do you spend doing vigorous-intensity activities at work on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> hrs mins		P3 (a-b)
Does your work involve moderate-intensity activity, that causes small increases in breathing or heart rate such as brisk walking or <i>carrying light loads</i> for at least 10 minutes continuously? <i>(USE SHOWCARD)</i>	Yes 1  No 2 <i>If No, go to P 7</i>		P4
In a typical week, on how many days do you do moderate-intensity activities as part of your work?	Number of days <input type="text"/>		P5
How much time do you spend doing moderate-intensity activities at work on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> hrs mins		P6 (a-b)

**Travel to and from places**

Question	Response	Code
The next questions exclude the physical activities at work that you have already mentioned. Now I would like to ask you about the usual way you travel to and from places. For example to work, for shopping, to market, to place of worship.		
Do you walk or use a bicycle ( <i>pedal cycle</i> ) for at least 10 minutes continuously to get to and from places?	Yes 1 No 2 <i>If No, go to P 10</i>	P7
In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places?	Number of days _____	P8
How much time do you spend walking or bicycling for travel on a typical day?	Hours : minutes    _____ : _____ hrs                mins	P9 (a-b)

**Recreational activities**

Question	Response	Code
The next questions exclude the work and transport activities that you have already mentioned. Now I would like to ask you about sports, fitness and recreational activities ( <i>leisure</i> ),		
Do you do any vigorous-intensity sports, fitness or recreational ( <i>leisure</i> ) activities that cause large increases in breathing or heart rate like running or playing football for at least 10 minutes continuously? <i>(USE SHOWCARD)</i>	Yes 1 No 2 <i>If No, go to P 13</i>	P10
In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational ( <i>leisure</i> ) activities?	Number of days _____	P11
How much time do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?	Hours : minutes    _____ : _____ hrs                mins	P12 (a-b)
Do you do any moderate-intensity sports, fitness or recreational ( <i>leisure</i> ) activities that cause a small increase in breathing or heart rate such as brisk walking, <i>cycling, swimming, volleyball</i> for at least 10 minutes continuously? <i>(USE SHOWCARD)</i>	Yes 1 No 2 <i>If No, go to P16</i>	P13

Question	Response	Code
In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational ( <i>leisure</i> ) activities?	Number of days _____	P14
How much time do you spend doing moderate-intensity sports, fitness or recreational ( <i>leisure</i> ) activities on a typical day?	Hours : minutes    _____ : _____ hrs                mins	P15 (a-b)

### Sedentary behavior

The following question is about sitting or reclining at work, at home, getting to and from places, or with friends including time spent sitting at a desk, sitting with friends, traveling in car, bus, train, reading, playing cards or watching television, but do not include time spent sleeping.  
*(USE SHOWCARD)*

How much time do you usually spend sitting or reclining on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> hrs                  mins	P16 (a-b)
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### History of Raised Blood Pressure

Question	Response	Code
Have you ever had your blood pressure measured by a doctor or other health worker?	Yes 1 No 2 <i>If No, go to H6</i>	H1
Have you ever been told by a doctor or other health worker that you have raised blood pressure or hypertension?	Yes 1 No 2 <i>If No, go to H6</i>	H2a
Have you been told in the past 12 months?	Yes 1 No 2	H2b
In the past two weeks, have you taken any drugs (medication) for raised blood pressure prescribed by a doctor or other health worker?	Yes 1 No 2	H3
Have you ever seen a traditional healer for raised blood pressure or hypertension?	Yes 1 No 2	H4
Are you currently taking any herbal or traditional remedy for your raised blood pressure?	Yes 1 No 2	H5

### History of Diabetes

Have you ever had your blood sugar measured by a doctor or other health worker?	Yes 1 No 2 <i>If No, go to H12</i>	H6
Have you ever been told by a doctor or other health worker that you have raised blood sugar or diabetes?	Yes 1 No 2 <i>If No, go to H12</i>	H7a
Have you been told in the past 12 months?	Yes 1 No 2	H7b
In the past two weeks, have you taken any drugs (medication) for diabetes prescribed by a doctor or other health worker?	Yes 1 No 2	H8
Are you currently taking insulin for diabetes prescribed by a doctor or other health worker?	Yes 1 No 2	H9
Have you ever seen a traditional healer for diabetes or raised blood sugar?	Yes 1 No 2	H10
Are you currently taking any herbal or traditional remedy for your diabetes?	Yes 1 No 2	H11

### CORE: History of Cardiovascular Diseases

Have you ever had a heart attack or chest pain from heart disease (angina) or a stroke (cerebrovascular accident or incident)?	Yes 1 No 2	H17
Are you currently taking aspirin regularly to prevent or treat heart disease?	Yes 1 No 2 Don't know 3	H18
Are you currently taking statins (Lovastatin/Simvastatin/Atorvastatin or any other statin) regularly to prevent or treat heart disease?	Yes 1 No 2 Don't know 3	H19

### Lifestyle Advice

During the past three years, has a doctor or other health worker advised you to do any of the following?  
(RECORD FOR EACH)

Quit using tobacco or don't start	Yes 1 No 2	H20a
Reduce the use of alcohol/ don't start	Yes 1 No 2	H20b
Reduce salt in your diet	Yes 1 No 2	H20c
Reduce use of refined sugar in your diet	Yes 1 No 2	H20d
Eat at least five servings of fruit and/or vegetables each day	Yes 1 No 2	H20e
Reduce fat in your diet	Yes 1 No 2	H20f
Start or do more physical activity	Yes 1 No 2	H20g
Did not see a physician within the last 3 years		

Question	Response	Code
Maintain a healthy body weight or lose weight	Yes 1 No 2	H20h
Where is your primary source of health care?	Self-medication 1 Herbal/alternative therapy 2 Dispensaries 3 Community Health Worker 4 Health center 5 Sub county/district hospitals 6 County referral hospital (provincial) 7 National referral 8 Private clinic 9 Private hospital 10 OTC/pharmacy 11	X23

### Cervical Cancer Screening

The next question asks about cervical cancer prevention. Screening tests for cervical cancer prevention can be done in different ways, including Visual Inspection with Acetic Acid/vinegar (VIA), pap smear and Human Papillomavirus (HPV) test. VIA is an inspection of the surface of the uterine cervix after acetic acid (or vinegar) has been applied to it. For both pap smear and HPV test, a doctor or nurse uses a swab to wipe from inside your vagina/cervix, take a sample and send it to a laboratory. It is even possible that you were given the swab yourself and asked to swab the inside of your vagina. The laboratory checks for abnormal cell changes if a pap smear is done, and for the HP virus if an HPV test is done.

Question	Response	Code
<b>For men and women:</b> Have you heard of the cervical cancer screening methods described above??	Yes 1 No 2 Don't know 77	X24
<b>For women only:</b> Have you ever had a screening test for cervical cancer, using any of these methods described above?	Yes 1 No 2 Don't know 77	CX1

## Injury

The next questions ask about different experiences and behaviours that are related to road traffic injuries.

Question	Response	Code
In the past 30 days, how often did you use a seat belt when you were the driver or passenger of a motor vehicle?	All of the time 1 Sometimes 2 Never 3 Have not been in a vehicle in past 30 days 4 No seat belt in the vehicle I usually am in 5 Don't Know 77 Refused 88	V1
In the past 30 days, how often did you wear a helmet when you drove or rode as a passenger on a motorcycle or motor-scooter?	All of the time 1 Sometimes 2 Never 3 Have not been on a motorcycle or motor-scooter in past 30 days 4 Do not have a helmet 5 Don't Know 77 Refused 88	V2
In the past 12 months, have you been involved in a road traffic crash as a driver, passenger, pedestrian, or cyclist?	Yes (as driver) 1 Yes (as passenger) 2 Yes (as pedestrian) 3 Yes (as a cyclist) 4 No 5 <i>If No, go to V5</i> Don't know 77 <i>If don't know, go to V5</i> Refused 88 <i>If Refused, go to V5</i>	V3 Residence
Did you have any injuries in this road traffic crash which required medical attention?	Yes 1 No 2 Don't know 77 Refused 88	V4
The next questions ask about the most serious <b>accidental</b> injury you have had in the past 12 months.		
In the past 12 months, were you injured accidentally, other than the road traffic crashes which required medical attention?	Yes 1 No 2 <i>If No, go to V8</i> Don't know 77 <i>If don't know, go to V8</i> Refused 88 <i>If Refused, go to V8</i>	V5
Please indicate which of the following was the cause of this injury.	Fall 1 Burn 2 Poisoning 3 Cut 4 Near-drowning 5 Animal bite/attack 6 Other (specify) 7 Don't know 77 Refused 88	V6
	Other (please specify) _____	V6other

## Violence

The following questions are about different experiences and behaviours that are related to violence and intentional injury.

Question	Response	Code
In the past 12 months, how many times were you in a violent incident in which you were injured and required medical attention?	Never 1 <i>If never, go to O1</i> Rarely (1- 2 times) 2 Sometimes (3 – 5 times) 3 Often (6 or more times) 4 Don't know 77 <i>If don't know, go to O1</i> Refused 88 <i>If Refused, go to O1</i>	V11
The next questions ask about the most serious violent incidence you have had in the past 12 months.		
Please indicate which of the following caused your most serious injury in the last 12 months. <i>(USE SHOWCARDS)</i>	Being shot with a firearm 1 A weapon (other than a firearm) was used by the person who injured me 2 Being injured without any weapon (slapped, pushed...) 3 Other (specify) 4 Don't know 77 Refused 88	V12
	-----	V12oth er
Please indicate the relationship between yourself and the person(s) who caused your injury.	Intimate partner 1 Parent 2 Child, sibling, or other relative 3 Friend /acquaintance/neighbor 4 Unrelated caregiver 5 Stranger (unknown) 6 Official or legal 7 Other (specify) 8 Refused 88	V13
	Other (please specify) <input type="text"/>	V13oth er

Oral Health			
The next questions ask about your oral health status and related behaviours.			
Question	Response	Code	
How many <b>natural teeth</b> do you have?	No natural teeth 1 If no natural teeth, go to O4 1 to 9 teeth 2 10 to 19 teeth 3 20 to 27 teeth or more 4 28 to 32 teeth 5 Don't know 77	O1 Residen ce Wealth Quintiles	
How would you describe the <b>state of your teeth?</b>	Excellent 1 Very Good 2 Good 3 Average 4 Poor 5 Very Poor 6 Don't Know 77	O2 LOE	
How would you describe the <b>state of your gums?</b>	Excellent 1 Very Good 2 Good 3 Average 4 Poor 5 Very Poor 6 Don't know 77	O3 LOE	
Do you have any <b>removable dentures?</b>	Yes 1 No 2 If No, go to O6	O4	
Which of the following removable dentures do you have? <i>(RECORD FOR EACH)</i>			
An upper jaw denture	Yes 1 No 2	O5a	
A lower jaw denture	Yes 1 No 2	O5b	
During the past 12 months, did your teeth or mouth cause any <b>pain or discomfort?</b>	Yes 1 No 2	O6	
The last time you had pain or discomfort with your teeth or mouth, what did you do first of all?	Went to consult a Traditional healer 1 Went to Health dispensary 2 Went to Public Medical Center\Hospital 3 Went to Private Medical Center\Hospital 4 Went to a Private Dental Clinic 5 Went to a Pharmacy 6 I used self-medication only 7 I did not use or do anything 8 Did other things 9 Don't know 77	X26	
	Other (please Specify) _____	X26oth er	
How long has it been since you last <b>saw a dentist?</b>	Less than 6 months 1 6-12 months 2 More than 1 year but less than 2 years 3 2 or more years but less than 5 years 4 5 or more years 5 Never received dental care 6 If Never, go to	O7	

Question	Response	Code
What was the <b>main reason for your last visit</b> to the dentist?	Consultation / advice 1 Pain or trouble with teeth, gums or 2 Treatment / Follow-up treatment 3 Routine check-up treatment 4 Other 5 <i>If Other, go to O8other</i>  Other (please specify) <input type="text"/>	O8
How often do you clean your teeth?	Never 1 <i>If Never, go to O13a</i> Once a month 2 2-3 times a month 3 Once a week 4 2-6 times a week 5 Once a day 6 Twice or more a day 7	O9
Do you use <b>toothpaste</b> to clean your teeth?	Yes 1 No 2 <i>If No, go to O12a</i>	O10
Do you use <b>toothpaste</b> containing <b>fluoride</b> ?	Yes 1 No 2 Don't know 77	O11
Do you use any of the following to <b>clean your teeth?</b> <i>(RECORD FOR EACH)</i>		
	Yes 1 No 2	O12a (LOE)
Wooden toothpicks	Yes 1 No 2	O12b (LOF)
Plastic toothpicks	Yes 1 No 2	O12c (LOF)
Thread (dental floss)	Yes 1 No 2	O12d LOF
Charcoal	Yes 1 No 2	O12eL OE
Chewstick / miswak	Yes 1 No 2	O12fLO E
Other	Yes 1 <i>If Yes, go to O12other</i> No 2	O12gL OE
Other (please specify)	<input type="text"/>	O12oth erLOE

How often do you replace your tooth brush?		
Have you <b>experienced any of the following problems</b> during the past 12 months because of the <b>state of your teeth?</b> <i>(RECORD FOR EACH)</i>		
Difficulty in chewing foods	Yes 1 No 2	O13a
Difficulty with speech/trouble pronouncing words	Yes 1 No 2	O13b
Felt tense because of problems with teeth or mouth	Yes 1 No 2	O13c
Embarrassed about appearance of teeth	Yes 1 No 2	O13d
Avoid smiling because of teeth	Yes 1 No 2	O13e
Sleep is often interrupted	Yes 1 No 2	O13f

Question	Response	Code
Days not at work (or school) because of teeth or mouth	Yes 1 No 2	O13g
Difficulty doing usual activities	Yes 1 No 2	O13h
Less tolerant of spouse or people close to you	Yes 1 No 2	O13i
Reduced participation in social activities	Yes 1 No 2	O13j

<b>Khat use</b>		
Now I am going to ask you some questions about Khat chewing.		
Question	Response	Code
Have you ever chewed Khat? <i>(USE SHOWCARD)</i>	Yes 1 No 2 <i>If No, go to End of STEP1</i>	K1
Do you currently chew Khat?	Yes 1 No 2 <i>If No, go to End of STEP1</i>	K2

## Step 2 Physical Measurements

### Blood Pressure

Question	Response	Code
Interviewer ID	_____	M1
Device ID for blood pressure	_____	M2
Reading 1	Systolic ( mmHg) _____	M4a
	Diastolic (mmHg) _____	M4b
Heart Rate Reading 1	Beats per minute _____	M16a
Reading 2	Systolic ( mmHg) _____	M5a
	Diastolic (mmHg) _____	M5b
Heart Rate Reading 2	Beats per minute _____	M16b
Reading 3	Systolic ( mmHg) _____	M6a
	Diastolic (mmHg) _____	M6b
Heart Rate Reading 3	Beats per minute _____	M16c
In the past two weeks, have you been treated for raised blood pressure with drugs (medication) prescribed by a doctor or other health worker?	Yes 1 No 2	M7

### Height and Weight

For women: Are you pregnant?	Yes 1 If Yes, go to M 16 No 2	M8
Device IDs for height and weight	Height _____ Weight _____	M10a M10b
Height	in Centimetres (cm) _____ . ____	M11
Weight <i>If too large for scale 666.6</i>	in Kilograms (kg) _____ . ____	M12

### Waist

Waist circumference	in Centimetres (cm) _____ . ____	M14
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### Hip Circumference and Heart Rate

Hip circumference	in Centimeters (cm) _____ . ____	M15
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### Step 3 Biochemical Measurements

<b>Blood Glucose</b>		
<b>Question</b>	<b>Response</b>	<b>Code</b>
During the past 8 hours have you had anything to eat or drink, other than water?	Yes 1 No 2	B1
Technician ID	_____	B2
Device ID	_____	B3
Time of day blood specimen taken (24 hour clock)	Hours : minutes _____ : _____ hrs mins	B4
Fasting blood glucose	mmol/l    _____ . _____	B5
Today, have you taken insulin or other drugs (medication) that have been prescribed by a doctor or other health worker for raised blood glucose?	Yes 1 No 2	B6
<b>Blood Lipids</b>		
Total cholesterol	mmol/l    _____ . _____	B7
Hdl cholesterol	mmol/l    _____ . _____	B8
During the past two weeks, have you been treated for raised cholesterol with drugs (medication) prescribed by a doctor or other health worker?	Yes 1 No 2	B9

## APPENDIX D. PERSONS INVOLVED IN THE 2015 KENYA STEPWise Survey for NCD Risk factors

### Technical and Administrative Survey Coordinators

1. Dr. Nicholas Muraguri
2. Dr. Joseph Kibachio
3. Dr. Joyce Nato
4. Dr. Gladwell Gathecha
5. Dr. Jutta Jorgensen
6. Mr. Zachary Ndegwa
7. Mr. Zachary Mwangi
8. Mr. Macdonald Obudho
9. Mr. A.A. Awes
10. Mr. Paul Waweru
11. Mr. John Bore

### Regional Supervisors

1. Robert Buluma
2. Dickson Makuba
3. Emma Otieno
4. Stanley Wambua
5. Godfrey Otieno
6. Dr. Samuel Oti
7. Dr. Esther Ogara
8. Dr. Jane Onyango
9. Onesmus Kamau
10. Felister Kiberenge
11. Dorcas Kiptui
12. Eva Muchemi

### Survey Teams- Supervisors

1. Dr. Alfred Maina
2. Alinoor Hapikha
3. Anne Kendagor
4. Caroline Muriuki
5. Elias Nyaga
6. George Magara
7. Dr. Gichu Muthoni
8. Ibrahim Mohamed
9. Joseph Mungai
10. Martha Ongonga
11. Peter Ochiel
12. Raphael Maritim
13. Robert Nzuli
14. Robinson Mwati
15. Samwel Mwenda
16. Scholastica Owondo
17. William Nyongo
18. Winnie Muhoro
19. Wilfred Githinji
20. Wycliffe Alubokho

## Health Workers

1. Adan Issak
2. Agnes Achieng
3. Ann Mugo
4. Anthony Wachira
5. Anthony Muriuki
6. Bidalla Chuphi
7. Catherine Ahonge
8. Charity Gichugu
9. Deborah Ombui
10. Dyphine Ndenga
11. Elizabeth Maina
12. Elyas Osman
13. Florence Ndathi
14. Fraciah Mwati
15. George Githuka
16. Henry Chebii
17. Hilda Halubha
18. Jacinta Kimata
19. Janeth Setluget
20. John Kanyiki
21. Kevina Cherop Lopeta
22. Leah Baswony
23. Lilian Karugu
24. Longinus Watiangu
25. Maore Gacheri
26. Mariam Mbatha
27. Mary Ruguru
28. Maryan Abdi
29. Meshach Wambua
30. Meshack Ombongi
31. Micah Kariwareng
32. Michael Chelang'a
33. Milka Mang'ara
34. Miriam Samburu
35. Mohamud Dahir
36. Musau Kennedy
37. Obulemire Ronniey
38. Purity Mburugu
39. Salmon Odongo
40. Simon Lemooge
41. Simon Maika
42. Sophie Opiyo
43. Teresia Maina

## Enumerators

1. Abdullahi Hassan
2. Agnes Njuki
3. Alex Ayew
4. Allan Ngetha
5. Amina Koba
6. Aziza Rauji
7. Calvin Ngare
8. Chepkoech Vivian
9. Chepkoech Fancy
10. Diana Lentoijoni
11. Elizabeth Njoroge
12. Emma Sisia
13. Emmanuel Isacko
14. Eric Ndunda
15. Francis Ngunjiri
16. Fridah Mbajo
17. Gilbert Onyango
18. Grace Ogallo
19. Hafsa Ibrahim
20. Isaac Miruka
21. James Kiende
22. Janet Maina
23. Julia Kimutai
24. Kennedy Gathura
25. Kevin Mutai
26. Khamis Ali
27. Lennah Gitungo
28. Lilian Patrick
29. Linet Odhiambo
30. Margaret Wambura
31. Mercy Lisangari
32. Monica Aengwo
33. Moturi Mervyn
34. Mwangi Melba
35. Pascaline Munyao
36. Patricia Njeri
37. Patrick Ntete
38. Peris Mbugua
39. Rufo Halakhe
40. Salma Mahamoud
41. Viviene Kamwaro
42. Tioko Ekalimon
43. Winston Anangwe



**Ministry of Health**

DIVISION OF NON-COMMUNICABLE DISEASES

**KENYA STEPwise SURVEY  
FOR NON COMMUNICABLE DISEASES  
RISK FACTORS 2015 REPORT**

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