WHO STEPS

Liberia Stepwise Survey for Non Communicable Diseases Risk Factors

2022 Report

Ministry of Health Republic of Liberia

Figure 1.0: Map of Liberia of Survey Areas will be inserted

Acknowledgement

The Non Communicable Diseases (NCDs) risk factors surveillance survey was conducted for 45 days beginning March 4th 2022 across the fifteen counties of Liberia. It is the second national survey on NCDs to provide important information and data for formulating programs and policies that will help alleviate suffering associated with chronic non-communicable diseases and improve the lives of our people.

The Ministry of Health (MOH) extends sincere gratitude to the HMER and NCDs Units of the MOH and Liberia Institute for Statistics and Geo-Services (LISGISS), particularly the HMER (MOH) for providing oversight responsibilities and management of the entire survey. We also want to appreciate and knowledge the financial and technical support provided by the WHO Liberia.

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Lastly, supervisors and data collectors who participated in this worthy endeavor merit special thanks and appreciation for their time and tolerance to collect essential and requisite information from the respondents.

We hope that data and information contained in this report will be appreciated, meaningful and fully utilized in health development planning, programming and decision making for all stakeholders to improve the health and wellbeing of all Liberians.

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List of Abbreviations

BMI	Body Mass Index
BP	Blood Pressure
CVD	Cardiovascular Disease
DBP	Diastolic Blood Pressure
EPHS	Essential Package of Health Services
ETS	Environmental Tobacco Smoke
FCTC	Framework Convention for Tobacco Control
GPAG	Global Physical Activity Questionnaire
HBP	High Blood Pressure
LDHS	Liberia Demographic and Health Survey
LISGIS	Liberia Institute for Statistics and Geo-information Services
MOH	Ministry of Health
MOHSW	Ministry of Health and Social Welfare
NCDs	Non-Communicable Diseases
PDA	Personal Digital Assistant
PSU	Primary Sampling Unit
SBP	Systolic Blood Pressure
SSU	Secondary Sampling Unit
STDs	Sexually Transmitted Diseases
UNDP	United Nations Development Program
WC	Waist Circumference
WHO	World Health Organization

Executive Summary

Chronic diseases are diseases of long duration and generally slow progression. Chronic diseases, such as heart disease, stroke, cancer, chronic respiratory diseases and diabetes, are by far the leading cause of mortality in the world, representing 60% of all deaths. Out of the 35 million people who died from chronic disease in 2005, half were under 70 and half were women.

In Liberia, the burden of NCDs is unknown though some piece-meal hospital based studies were conducted especially in the JFK Medical Center, St. Joseph's Catholic Hospital and the Firestone Hospital. Scopes of these studies were limited to complications related to hypertension and diabetes mellitus. Before 2010, there was no program on NCDs, partly because of many years of conflict coupled with weak health system. It is likely that the burden of NCDs and their risk factors must be monitored continuously, it could be increasing silently among the general population. It is a national priority to provide accurate and updated information about NCDs, which would allow understanding the epidemiology of NCDs, forecasting the trends and planning interventions effectively.

A multistage sampling strategy with 3 stages consisting of county, district and chiefdom/clans was employed during this survey. The World Health Organization STEPwise Approach (STEPS) for the surveillance of NCD risk factors was used to assess the prevalence of NCD risk factors in Liberia.. The 5 randomly selected counties for the survey were Bomi, Bong, Maryland, Montserrado and Sinoe. The survey was conducted on a sample of adult Liberians population aged 18 to 69 years old.
A total of 4069 adults aged 18-69 years participated in the survey with an overall respond rate of 100%. There were 62.3% (n=2,537) females and 37.7% (n=1,532) males involvement in the survey. Approximately 34.7% of the respondents had no formal education with a significant proportion being females (44.5%). The proportion of respondents with high school education level completion were males with 43.1%, while university level education attainment amongst the survey participants was only 3.4% with a huge disparity between males and females. The sampled population that was never married constitutes 28.8%, while 28.2% were currently married and 35.8% cohabiting ("living together"). Almost half (42.6%) of the respondents were unpaid (unemployed) and 52.9% were employed either in the public sector (48.8%-government employees) or in the private sector (4.1%-non-government employees), while (4.6%) of the respondents were self-employed.

The survey shows that 7.4% of the respondents are current tobacco users with 30.68% engaged in smoking tobacco products such as manufactured cigarettes, hand-rolled cigars, pipes, cigars or shisha, of tobacco. Only 2.2% of the interviewed population use smokeless tobacco product with males constituting 3.3% and female 1.2%. Among the current and daily smokers, males dominated with 11.7% and 61.0% respectively, compare with 3.1% female current smokers and 46.2% daily smokers. The average age at which tobacco smoking was initiated was 21 years with

91.8% of daily smokers smoking approximately 6 sticks of manufactured cigarette daily. Exposure to Environmental Tobacco Smoke (ETS) was prevalence among the survey participants with 21.9% of respondents were expose to smoking at home and 22.3% at the workplace.

The proportion of respondents who currently drink alcohol such as beer, whisky, spirit and local beverages, is 32% with males constituting 42.1% and females 22.1%. The proportion of lifetime abstainers is 47.1% with a significant proportion being females (56.5%). Among the current alcohol consumers, 14.2% of males and 6.9% of females were engaged in episodic drinking (i.e. men who had 5 or more bottles and women who had 4 or more alcoholic drinks on any day in the past 30 days prior to the survey). Furthermore, 5.2% (7.4%-males and 1.7%-females) of the respondents drank alcohol daily in the past 12 months prior to the survey.

The mean number of days fruits and vegetables were consumed in a typical week by all respondents was 2 and 3 days respectively. In addition to fruit consumption, the mean number of servings per day of fruit was 0.7 and of vegetable was 1.1. Also, for both fruits and vegetables, the mean number serving per day is 1.7 for males, 1.7 for females and 1.7 for both sexes.

The survey revealed that respondents were grouped into three categories (low, moderate, and high), result shows that (66.5%) of the respondents were involved with high level physical activity and 12.8% in low level activities. The proportion of males (74.1%) in high level activities was more than the females (61.1%) counterpart. Respondents in the age group 60-69 are least active. The total minutes of physical activity across all three domains (work, transport and recreation) among all respondents were 251 minutes spent per day. Males significantly spent more time in physical activity (299 mins) as compared to females (201.2 mins). Majority of all respondents spent more minutes (169.3 mins) with work-related activities than transport (58 mins) and recreational activities (24.6 mins) on average per day. However, a crossed the three domains, results show men with significant high minutes per day as compared to women.

A total of 38.3% of all respondents had never had their blood pressure checked for hypertension (HTN), with those between the ages of 18 and 29 reporting the highest percentage (51.6%). About 46 percent of men and 31 percent of women had never been screened for hypertension. Approximately 5 percent of the respondents reported to have ever been diagnosed with hypertension in the past 12 months. Only 6% of respondents have been diagnosed within the past 12 months with the proportion of women being diagnosed within the past 12 months increasing with age The proportion of respondents with SBP of $\geq$ 140 mmHg and/or DBP $\geq$ 90 mmHg including those currently on medication for raised BP or hypertension was 25.6% for both sexes, 23.7% for males and 26.7% for females respectively.

A significant proportion of the respondents (89.4%) had never measured their blood sugar. The mean fasting blood glucose was 4.4 mmol/l (78.4mg/dl) for both sexes, 4.3 mmol/l (77.3 mg/dl)

for males and 4.4 mmol/l (79.4mg/dl) for females. The was no significant difference in mean fasting glucose between the sexes. Furthermore, the percentage of respondents that are currently on medication was 1.3% for both sexes, 1.0% for males and 1.5% for females.
The analysis of the survey (STEPS) provides data and information on the prevalence of NCDs risk factors in Liberia. Findings from the survey indicate that only 3.4% of the sample population had none of the risk factors for NCD, 78.8% had 1-2 risk factors, and 17.8% had 3-5 risk factors.

About 8 in 10 (81.8%) adults in the 18 to 44 age group had one to two risk factors. This was significantly higher than the age group 45–69, for whom it was around six in ten (65.5%). With the emerging concern of non-communicable diseases risk factors in Liberia, a critical step that is required to prevent, control and mitigate these casual factors is a national policy and strategy formulation. Tools are now available to collect important risk factors of non-communicable diseases such as was used in this survey. Data were collected electronically using handheld devices, and included behavioral, physical and biochemical indicators.
Also, a blood sample was collected from participants to measure the level of blood sugar. The Ministry of Health should work with the relevant institution to enforce the regulation/legislation on tobacco use (ban on public smoking, sale to minor, etc.), create awareness on the importance of fruits and vegetables consumption and promote healthy lifestyle by exercises, regulation of diet, etc. In order to prevent and control the wide spread of NCDs.

Chapter 1:Introduction

1.1 Geography, Population and Demography

Liberia is located on the West Coast of Africa, and borders Côte d'Ivoire, Guinea and Sierra Leone. With a total land area of 111,369 square kilometers, the country is divided administratively into 15 counties. It is a low-income country with an estimated Gross Domestics Product (GDP) per capita of USD 622 in 2019, a 8.8% declined from 2018 . The country is geographically divided into five regions and 15 counties, with populations ranging from 74,317 in Grand Kru County to 1,434,974 in Montserrado County . The 2022 Population and Housing Census of Liberia shows a population of 5.2 million population. In terms of sex ratio, women account for 49.6% of the population while men account for 50.4%[1]. The fertility rate is currently 4.2 compared 5.2 in 2008 indicating a substantial reduction since 2008 from 5.2.

According to the 2019 United Nations Development Program (UNDP) Human Development Index, Liberia ranked 176 out of 189 countries which is among the lowest in the world. The report stated that the average life expectancy in Liberia is estimated at 65 years (66.5-females and 63.5-males) and the adult literacy rate is 52% for women and 75% for men[2] . Progress is being made on some of the Sustainable Development Goals (SDG)—for example, access to improved drinking water is 85 percent, and 48 percent of households have access to improved sanitation facility with services concentrated in urban (35 percent) than rural areas (9 percent)[3] .

1.2 Overview of the Health Sector, and System in Liberia

The ten (10) year National Health Policy (2011–2021) now revised for 2022-2031, includes the creation of a health sector recovery and investment plan (2011–2021) that serves as a road map for future health sector implementation, were both made more apparent by multiple outbreaks including the Ebola virus disease (EVD) in 2014 and now the Covid-19 outbreak in March 2020. The National Health Policy and Plan has nine investment areas (fit for purpose health workforce, community engagement, leadership and governance, health information system, quality health service delivery, medicines and technology, emergency preparedness and response, health financing, and health infrastructure), and the Investment Plan for Building a Resilient Health System is a complement to those areas. These investment areas allow the health sector to become responsive and proactive in dealing with future outbreaks. These policy documents will be reviewed and updated in 2022 considering the health care performance and challenges encountered during implementation especially as a result of multiple outbreaks including Ebola and Covid-19.

[1] Liberia population and housing census, 2022 LISGIS
[2] UNESCO Institute for Statistics (http://uis.unesco.org/)
[3] Liberia Demographic and Health Survey, 2019-2020

The health service delivery system has three-tiers (EPHS 2011), namely Tertiary (referral hospitals), the secondary (county hospitals and health centers) and primary (clinics & Community Health Services) managed through a de-concentration approach.

Rapid expansion of the private-for-profit and NGO sectors is augmenting the public-private partnership (PPP) for health and furthering health service coverage and utilization.

As of 2021, there were 866 health facilities reporting to the Liberia DHIS2 across the 15 counties. Public health facilities account for majority (55%), followed by private (45%). Fewer number of these facilities account for Hospitals (4.2%) and Health Centers (7%) and majority (88%) are clinics. There is basically equal distribution of health facilities between rural (49.6%) and Urban (50.4%). Though access to healthcare increased from 59% in 2008 to 71% in 2013 with the construction of new health facilities. Since 2013, the Ministry of Health has not estimated access to health care which is a vigorous process that is obtain from surveys (DHS or LMIS) or population census. However, this figure has change slightly with the increased in health facilities over the years.

The 2019-20 Demographic and Health Survey (DHS) results indicate that infant mortality rate in Liberia increased from 54 deaths per 1,000 live births in 2013 to 63 deaths per 1,000 live births in 2019-20 thus disrupting the gains made in previous years towards achievement of the Sustainable Development Goal 3 (SDG 3). According to the LDHS 2019, the under-5 mortality rate declined slightly from 94 deaths per 1,000 live births in 2013 to 93 in 2019-20. Mortality during the first month of life (neonatal) is higher than post neonatal deaths (37 deaths per 1,000 births versus 25 deaths per 1,000 births) and accounts for 59 percent of overall infant mortality. Liberia's maternal mortality is among the highest in the world with a ratio of 742 deaths per 100,000 live births (DHS 2019-20), a 31% declined from the 2013 estimate (1,072).

The total fertility rate is 4.2 with rural women most likely to have more children (5.5 births per woman) than those in urban areas (3.4 births). The modern contraceptive prevalence rate (MCPR) increased from 19 percent in 2013 to 24 percent in 2019-2020[4]. However, the unmet need for family planning increased from 31 percent to 33 percent during the same period. The DHS also reported that 80 percent of deliveries took place in a health facility, 84 percent of deliveries were assisted by a skilled birth attendant.

Malaria remains the major cause of outpatients as well as hospitalization in Liberia and the entire population is at risk of acquiring the disease in the health sector.

The Malaria Health Facility Survey (HFS) 2018, estimated that Malaria accounted for 33.9% of the total outpatient attendance at health facilities in Liberia. This represents seven percent reduction in the total percentage of lab-confirmed cases of malaria among outpatient attendants in 2013[5]. Liberia, on the other hand, has a high burden of HIV/AIDS, which affects 1.8 percent to 5.4 percent of the population, with about 1.9 percent of the population living with the infection.

[4] Liberia Demographic and Health Survey, 2019-2020

[5] Liberia Malaria Indicator Survey, 2018

1.3 Background of the Survey

Chronic diseases are diseases of long duration and generally slow progression. Chronic diseases, such as heart disease, stroke, cancer, chronic respiratory diseases and diabetes, are by far the leading cause of mortality in the world, representing 60% of all deaths. Chronic diseases are estimated to kill almost 41 million people a year worldwide, making up seven out of ten deaths globally. Of these deaths, approximately 17 million are classed as premature, with people dying significantly younger than expected on average. In 2015, international leaders signed up to achieve the United Nations' Sustainable Development Goal 3.4 of a one-third reduction in the risk of death between 30-70 years of age from four key NCDs by the year 2030. These disease areas include cancer, cardiovascular disease, chronic respiratory disease, and diabetes – collectively termed NCD4[6].

Globally, tobacco use and alcohol consumption have increased in recent decades, particularly among men in developing countries, contributing to the increasing prevalence of chronic diseases and cancers. Almost six million people die from tobacco use and 2.5 million from harmful use of alcohol each year worldwide, the World Health Organization (WHO) reports[7].

Liberia is struggling with the burden of chronic conditions which is further exacerbated by limited access to health facility level NCD services; inadequate drugs and medical supplies; insufficient number of qualified technical personnel in the country; weak diagnostic and treatment capacity and weak enforcement of current NCDs related regulations (Tobacco, Traffic, Air Pollution, and Alcohol). NCDs lower the quality of life of people, impede economic growth and place a heavy demand on the family and national budgets. A review of national hospital records to determine the burden of common NCDs shows that cancers are on the increase. The common types of cancers among females are breast cancer constituting 17% and cervical cancers accounting for 8%, while in males, liver and prostate cancers are common[8]. According to the 2014 NCDs country profile, NCDs accounted for 34 % of mortality in 2012 and the probability of dying between the ages of 30 and 70 year old from the 4 main NCDs (cardiovascular disease, cancer, chronic respiratory disease and diabetes) was 21%. In the same year, 5% of total mortality was due to cancer[9].

A risk factor survey conducted in 2011 in Liberia reveals that 11.5% of the respondents are current tobacco users with 9.9% engaged in smoking tobacco products such as cigarettes, cigars or pipes of tobacco. Only 2.1% of the interviewed population use smokeless tobacco product with males constituting 1.1% and female 3.1%. Exposure to Environmental Tobacco Smoke (ETS) was prevalent among the survey participants with 37.5% of respondents were expose to

[6] Alwan A. Global status report on noncommunicable diseases 2015. *World Health Organization.* 2015
[7] WHO Report: Smoking and Drinking Cause Millions of Deaths Worldwide
[8] Liberia DHIS2 2020 Aggregated Data
[9] WHO report, Global Situation of NCD 2014

smoking at home and 43.1% at the workplace. The population that currently drink alcohol such as beer, whisky, spirit and local beverages was 24% with males constituting 34.3% and females 14% respectively. Among the current alcohol consumers, 23% of males and 9.7% of females were engaged in episodic drinking[10]. According to the same source, the mean consumption of fruits and vegetables were 2 and 4 days respectively.
The survey also revealed that less than half of the sampled population (47.3%) was engaged in high level physical activities.

The mean blood pressure of all respondents including those who were on medication for hypertension was 128.7/79.7 for both sexes, 129.7/79.5 for males and 127.8/79.9 mmHg for females respectively. The proportion of respondents with SBP of ≥ 140 mmHg and/or DBP ≥ 90mmHg including those currently on medication for hypertension was 30.7% for both sexes, 30.3% for males and 31% for females respectively. A significant proportion of the respondents (91.5%) had never measured their glucose level. The mean fasting blood glucose, including those currently on medication for diabetes was 96.7 for both sexes, 97 for males and 96.4 for females. Furthermore, the percentage of respondents that are currently on medication was 19.2% for both sexes, 19% for males and 19.3% for females.

Rationale

The purpose of the STEPS survey in Liberia is to generate evidence based information for monitoring the trend and magnitude of chronic disease risk factors among the general population as well as determining the prevalence of non-communicable diseases (especially hypertension and diabetes). NCD surveillance is not part and parcel of routine health information systems, and Liberia has to report on national, regional, and global NCD-related commitments such as global NCD action plan and the sustainable development goals (SDGs). The STEPS survey does provide data for reporting on national, regional, and global indicators for the level of implementation of these commitments.

The data and information generated from this survey will be useful for designing interventions to prevent and control chronic NCDs through promotion of healthy lifestyles. The 2011 STEPS established a baseline for magnitude of the key risk factors in Liberia, so a follow up data point is necessary to provide a trend over time and to know the impact of national NCD prevention and control that were implemented since 2011. There is evidence of the increasing burden of chronic disease in low and middle income countries. For example, in 2012 the major chronic NCDs accounted for 34%of all deaths. More than 40% of these deaths were premature (less than 70 years) and more than 82% of premature deaths occurred in low- and middle-income countries.[11] Also, the increase in global NCDs over the next 10 years is estimated by WHO at 17% and 27%

[10] Liberia chronic NCDs risk factor survey, 2011.
[11] Global Situation of NCD, WHO, 2014.

in the African region[12]. Therefore, this STEPS survey was undertaken to provide information for basis of chronic diseases prevention is the identification of the major common risk factors and their prevention and control.

1.4 Goal and Objectives of the Survey

The goal of the STEPS survey is to provide data and information that will be used to develop programs aimed at reducing morbidity, mortality and disability related to chronic non communicable diseases risk factors in Liberia.

The specific objectives are as follows:

- Describe the current prevalence of common risk factors for non-communicable diseases such as tobacco use, harmful alcohol consumption, poor diet, physical inactivity, obesity, high blood glucose, high blood pressure etc. in the population.
- Track the direction and magnitude of trends in risk factors;
- Collect information for addressing and monitoring the trend of non-communicable diseases.

Chapter 2: Methodology

Liberia conducted a nationwide surveillance to determine the magnitude of the most common NCDs risk factors among ages 18 to 69. The country was divided into five regions to enable appropriate population distribution and adequate sample size. The country undertake all the three STEPS of the survey and two optional modules (Oral Health and Injuries & Violence) in all of the 15 counties of Liberia.

2.1 Survey Design

This survey was designed based on the WHO STEPS Survey approach. The survey utilized the STEPS procedures for calculating sample size at the primary (district-PSU) and secondary (Chiefdom-SSU) levels, the Kish Method for household level sampling, a generic questionnaire that are adaptable by countries and Personal Digital Assistance (PDAs) that are approved by WHO for data collection and submission including blood pressure monitors (omron), blood pressure monitor cuffs and weighing scales. STEPS is a sequential process starting with gathering information on key risk factors by the use of questionnaires (Step 1), then moving to

[12] WHO- African Health Report, 2014.

simple physical measurement (Step 2) and then the collection of blood samples for biochemical assessment (Step 3). In addition to the three steps used in risk factor assessment, the conceptual framework of STEPS also includes three modules in the assessment of each risk factor, namely core, expanded and optional.

2.2 Sample Size

The sample size of the survey was 4320 covering the fifteen counties of Liberia. The sample size was calculated as follows.
Step 1: The calculation of the sample size (n) is a process that begun with the equation below:

The symbols in the equation represent the following:

Z	**Level of Confidence Measure**	**1.96**
e	**Margin of Error (MOE)**	**0.05**
P	**Baseline levels of the indicators**	**0.5**

Executing the equation will yield an initial sample size (n) of 384.16.

Step 2: The second step in the sample size calculation is the multiplication of the initial sample size by a) the Design Effect (DE) which by recommendation is set at (1.5) and b) by the number of age/sex estimates. Ideally, the age/sex estimate is set at 6 (3 age groups and male/female).

n = 384 X 1.5 X 6 = 3,456

Step 3: An adjustment was made for the anticipated non-response of 20% by dividing the sample size in step 2 with the anticipated response rate. An anticipated response rate of (0.8) is selected by default.

n = 3456÷ 0.8 = 4,320

The final sample size for the survey after rounding up is 4,320

2.3 Sampling Method

The Multi-stage cluster sampling technique was used for the selection of the sampling units. The 15 counties and Monrovia were the primary sampling unit (PSU). The total number of clusters (288) was distributed with probability proportionate to size (PPS) among the 15 counties selected counties and Monrovia. The Clusters serve as the secondary sampling unit (SSU), the assigned numbers of clusters were selected from the list of enumeration areas (EAs) as identified for the Liberia Demographic and Health Survey 2019-2020.

At the household level (TSU), the team used the software in the android tablet to select one-person age 18-69 years via random selection. Table below shows sample size distribution by county.

Table 1: Sample size distribution base on Probability proportionate size by County

County (PSU)	Pop (18-69)	# of Cluster (SSU)	# of HHs (TSU)	Tot HHs
Bomi	41,208	7	15	102
Bong	164,499	27	15	406
Bassa	112,176	18	15	277
Cape Mount	62,343	10	15	154
G.Gedeh	66,821	11	15	165
G.Kru	27,517	5	15	68
Gbarpolu	42,087	7	15	104
LOFA	131,865	22	15	325
Margibi	105,575	17	15	260
Maryland	63,924	11	15	158
Montserrado (Rural)	41,926	7	15	103
Montserrado (Urban)	557,012	92	15	1373
Nimba	218,078	36	15	538
Rivercess	35,522	6	15	88
Sinoe	50,967	8	15	126
River Gee	30,861	5	15	76
Total	**1,752,378**	**288**		**4320**

2.4 Survey Questionnaire

Liberia conducted all three steps of the surveillance (Steps 1, 2 and 3) during this survey. The exercise included both core and expanded questionnaires for the three steps.
A brief explanation of each step has been elaborated below:
Step 1: questionnaires focused on the demographic and behavioral information related to tobacco use, alcohol consumption, fruits and vegetable consumption, dietary salt and physical inactivity. The optional modules included oral health and injuries and violence.
Under oral health were questionnaires on oral health, while injuries and violence questionnaires was administered focusing on experiences to road traffic accidents, violence and behaviors on safety.

Step 2: measurements included weight and height, waist circumference, blood pressure as well as hip circumference and heart rate.
Step 3: This focuses on biochemical measurements for estimating **fasting blood glucose levels, total fasting cholesterol**. The aim is to have a quick biochemical result (on spot) and avoid cumbersome process.

2.5 Field Staff Training

A five day Step surveillance survey training Workshop was organized and held to prepare interviewers and supervisors successfully to conduct the Step survey. The training was attended by 33 field staff, 5 coordinators, 2 (an ICT officer and a data manager) and 288 mobilizers across the fifteen counties. The training was co-facilitated by MOH and WHO Liberia/Geneva. During the training, field staffs were taught interviewing skills and techniques to administer questionnaire.

Specific areas of the training included the following:

- Personal Digital Assistant (PDA) use;
- Community entry and interview techniques and skills;
- Physical measurements in accordance with approved protocols;
- Use of interviewer instructions and show cards;

2.6 Data Collection and Processing

The Liberia Step survey 2022 data was collected using handheld devices for a period of 45 days beginning March 4th 2022 across the fifteen counties of Liberia. The data was edited and the final version weighted and analyzed using WHO recommended Epi Info software version 3.4. The tables and graphs were customized using Micro Soft Excel.

Chapter 3: Survey Results

The Liberia 2022 STEP survey was conducted across the 15 counties of Liberia and had a total of 4,069 adults who participated. This chapter shows the result of the STEP instrument which is comprised of three different levels or "steps" of risk factor assessment: Step 1 (questionnaire), Step 2 (physical measures) and Step 3 (biochemical measures).

3.1. Demographic Information of Respondents

3.1.1 Age and Sex distribution of Respondents

Age and sex are important variables that are used as the primary basis for demographic classification and analysis. The age-sex distribution of adults in the sampled households is shown in Table 2. A total of 4,069 individuals participated in the survey, out of which 1,532 (37.7%) were male and 2,537 (62.3%) were female. Over two-third of the respondents were 18-44 years.

Table 2: Age group and sex of respondents

Age group and sex of respondents						
Age Group (years)	**Men**		**Women**		**Both Sexes**	
	n	%	n	%	n	**%**
18-29	444	32.9	906	67.1	1350	**33.2**
30-44	494	36.8	850	63.2	1344	**33.0**
45-59	401	41.6	564	58.4	965	**23.7**
60-69	193	47.1	217	52.9	410	**10.1**
18-69	**1532**	**37.7**	**2537**	**62.3**	**4069**	**100.0**

3.1.2 Educational Status

The lifestyle and social standing that a person enjoys in a society are significantly influenced by their education. Studies have repeatedly shown that educational level has a significant impact on health-related behaviors and attitudes. Results from the STEPS Survey reveals respondents' educational accomplishment.

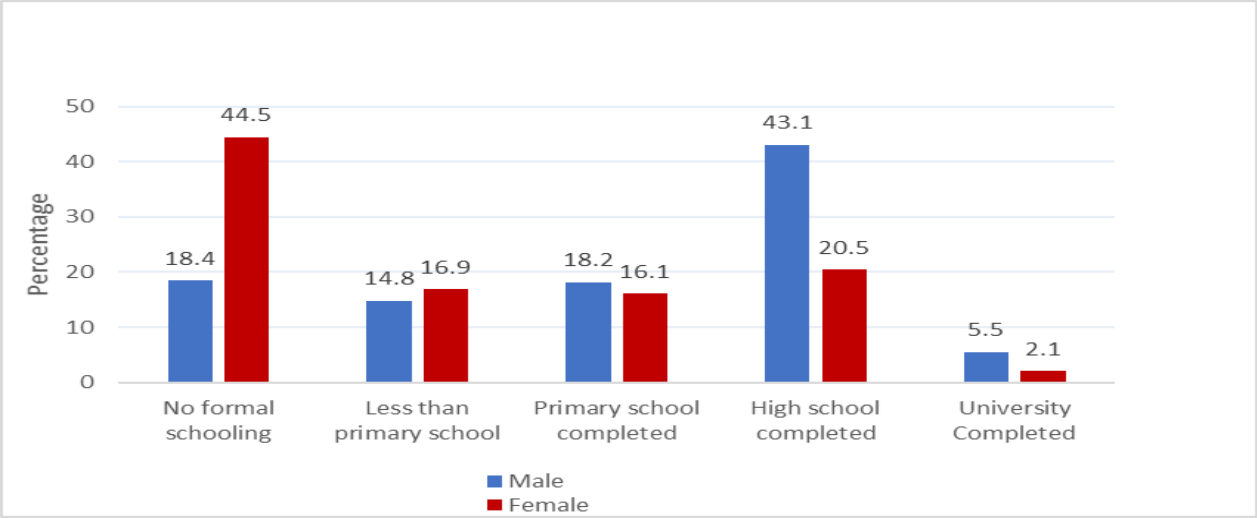
Table 3 below shows the mean number of years of education of respondents aged 18 - 69 by age group and sex. The mean number of years respondents spent in education was 7.0 years, with males tending to have more years of schooling than females.

Table 3: Mean number of years of education, by Gender and Age of Respondents

Mean number of years of education						
Age Group (years)	**Men**		**Women**		**Both Sexes**	
	n	Mean	n	Mean	n	**Mean**
18-29	444	8.2	906	7.2	1350	**8.0**
30-44	494	8.9	850	5.0	1344	**7.0**
45-59	401	8.2	564	3.2	965	**5.5**
60-69	193	8.2	217	2.3	410	**5.3**
18-69	**1532**	**8.4**	**2537**	**5.2**	**4069**	**7.0**

Figure 1 below shows that about 34 percent of the respondents have no formal education, with females accounting for 44.5% and males 18.4% respectively. Approximately 5.5% of males and 3.4% females completed university education. Significant proportion of the sampled population who had completed some level of education were among high school education compared to the other levels.

Figure 1: Distribution of Respondents by Education Level Completed



3.1.3 Marital Status

Under the Liberia law, the two types of marriages are the customary (traditional) and the Statutory marriages (western or faith-based marriages). The marital status for this survey were classified as never married, married, divorced, separated, widowed and cohabiting. Table 4 below presents the percentage distribution of respondents by marital status. The survey results show that a significant proportion of the respondents were married (28.2%) and 28.8% were never married and 35.8% were cohabiting (living together).

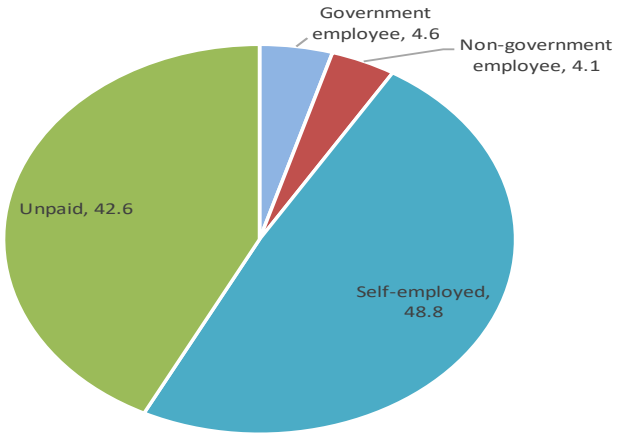
Table 4: Marital Status of respondents by age range

Age Group (years)	Both Sexes						
	n	% Never married	% Married	% Separated	% Divorced	% Widowed	**% Cohabiting**
18-29	1342	48.7	10.1	0.4	0.0	0.2	**40.7**
30-44	1342	22.5	30.6	1.4	0.7	1.6	**43.2**
45-59	964	16.1	43.6	2.0	2.0	8.6	**27.8**
60-69	408	14.7	43.6	2.2	3.9	20.8	**14.7**
18-69	**4056**	**28.8**	**28.2**	**1.3**	**1.1**	**4.8**	**35.8**

3.1.4 Employment Status

During the survey, respondents were asked about their employment status. Respondents were asked to best describes their main work status over the past 12 months. Figure 2 below shows the result of respondents' employment status in which they were asked to best describes their main work status over the past 12 months. The result shows that 8.7% of the respondents were employed (4.6%-Government and 4.1%-Non-Government). The study also reveals gender disparities in employment status. About 15.7% of males were employed compared to only 4.3% females.

Figure 2: Percent of employment status of respondents.



Chapter 3.2 NCDs Risk Factors

This section focuses on the results of the survey, particularly on tobacco use and exposure to tobacco smoke, alcohol consumption, fruit and vegetable consumption, physical activity, blood pressure, diabetes history, physical and biochemical measurements and NCDs summary risk factors.

3.2.1 Tobacco Use and Exposure to Tobacco Smoke

Tobacco use and smoking are very dangerous addictions which commonly cause a wide variety of diseases, cancer and death. The vast majority of tobacco users and smokers gets introduced to tobacco during their early ages. During this time period they are easily influenced by peer pressure and advertising. Once hooked, the majority of tobacco users become hopelessly addicted.

Current Smokers

The survey asked questions about tobacco use and smoking among adult males and females. Results from the survey show that 7.4 % of sampled adults are current smokers compared to 9.9% in 2011. The data further reveal that more men (11.7 %) are current smokers than women (3.1 %), though current smoker among men has declined from 17.2% in 2011. On the other hand, current smokers among women has increased compared to 2.8% in 2011. Table 5 below presents percentage of current smokers by age and sex.

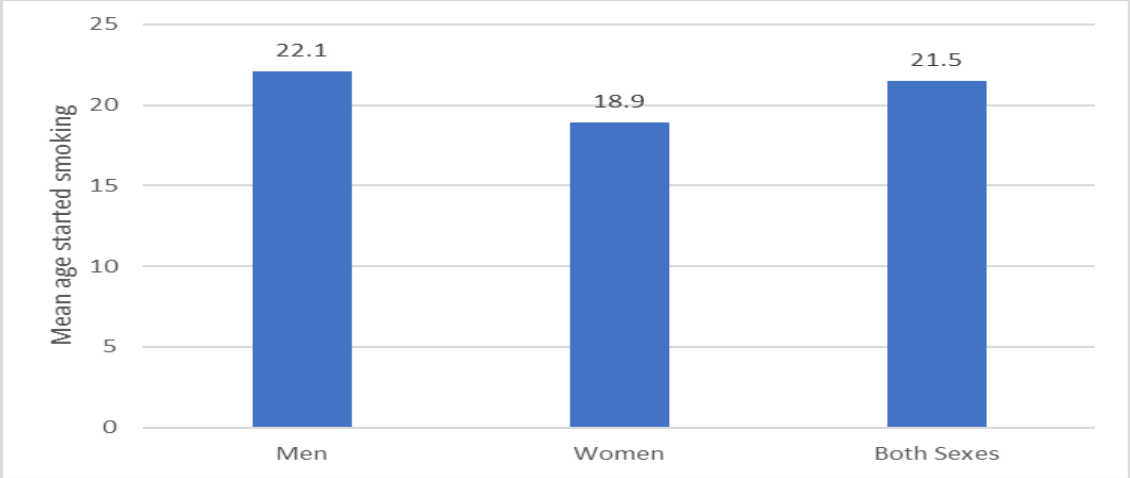
Table 5: Percentage of current smokers by age and sex

Age Group (years)	Men			Women			Both Sexes		
	n	Current smoker %	95% CI	n	Current smoker %	95% CI	n	Current smoker %	95% CI
18-29	444	8.8	4.6-12.9	906	4.4	1.6-7.1	1350	6.5	**4.0-9.0**
30-44	494	14.7	9.6-19.8	850	1.5	0.3-2.6	1344	8.1	**5.4-10.8**
45-59	401	15.7	10.1-21.4	564	2.5	0.0-5.3	965	9.5	**6.4-12.6**
60-69	193	11.1	4.9-17.4	217	1.5	0.0-3.1	410	6.0	**2.3-9.6**
18-69	**1532**	**11.7**	**9.3-14.2**	**2537**	**3.1**	**1.8-4.4**	**4069**	**7.4**	**6.1-8.6**

Mean age of smoking initiation

Studies have documented that majority of those who are addicted to tobacco use or smoking got initiated during their adolescent age. The survey asked respondents at what age did they start smoking. The majority of the sampled population initiated at age 21. Figure 3 shows average age at which respondents started smoking.

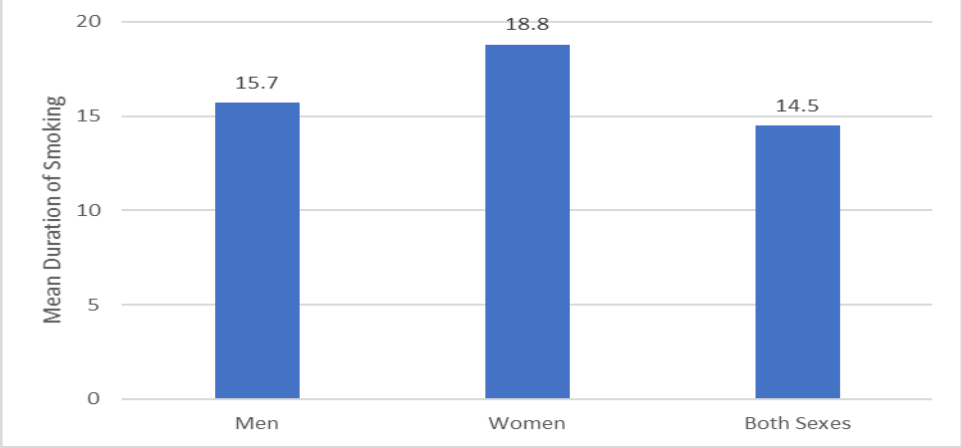
Figure 3: Mean Age initiated Tobacco Smoking Among Daily Smokers (Years)



Mean Duration of Tobacco Smoking

On average, the duration of tobacco smoking among daily smokers was 14 years, ranging up to 18 years of smoking among women as compared to men, 15 years of smoking. Figure 4 below shows further distribution.

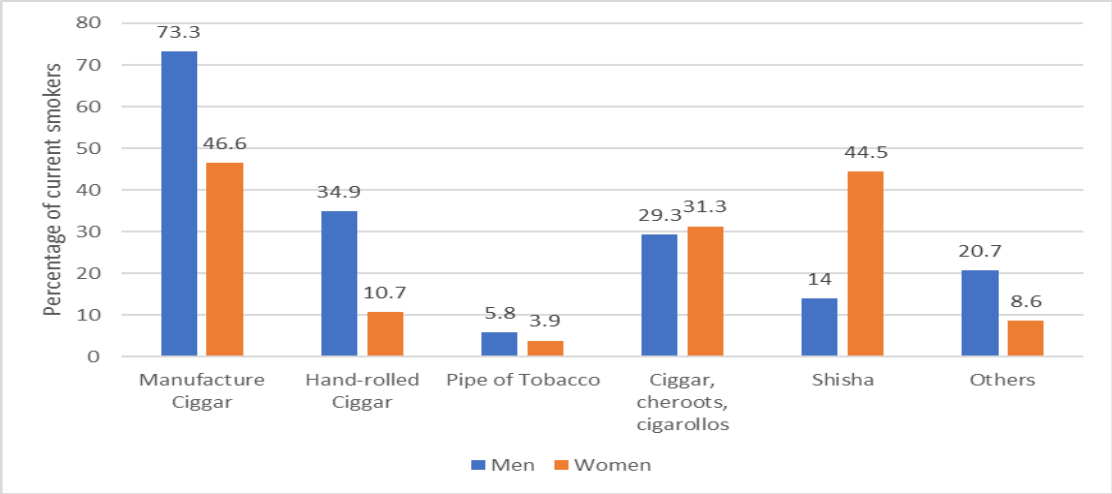
Figure 4: Mean duration of tobacco smoking among daily smokers (years)



Tobacco products used by Sex

Among current smokers, the tobacco products mainly smoked by males were primarily manufactured cigarette 73.3%, hand-rolled cigarettes 34.9%, and cigar, cheroots, cigarllos 29.3%. Manufactured cigarettes were also the main tobacco product used among current female smokers as stated by 46.6% of respondents. On the other hand, smoking shisha among females at 44.5% was triple than seen in men. Moreover, cigar, cheroots, cigarllos were reported by 31.3% of females as compared to men smokers. See Figure 5 below.

Figure 5: Current Smokers Classified by Type of Conventional Tobacco Product.



Smoking status

According to the 2022 Liberia step survey, daily smoking has decreased by 57.3% since 2011 step survey.

Among current tobacco product smokers, daily smoking was reported by 4.3% compared to 7.5% in 2011. More than half of the sample (87.7%) never smoked any tobacco products. Current smokers increases with age particularly among men, while higher incidence of smoking are observed among younger women. Table 6 below shows further distribution.

Table 6: Respondents' smoking status by sex by age distribution

Age Group (years)	n	Current smoker				Non-smokers			
		% Daily	95% CI	% Non-daily	95% CI	% Former smoker	95% CI	% Never smoker	95% CI
Men									
18-29	444	4.5	1.6-7.4	4.3	1.2-7.3	6.1	2.5-9.6	85.2	80.1-90.3
30-44	494	9.7	5.6-13.7	5.1	1.2-9.0	8.4	4.7-12.1	76.9	71.3-82.4
45-59	401	10.4	6.4-14.4	5.4	1.6-9.1	13.3	6.9-19.7	70.9	61.0-80.9
60-69	193	8.9	2.9-15.0	2.2	0.5-4.0	26.7	17.6-35.8	62.2	51.8-72.5
18-69	**1532**	**7.2**	**5.1-9.3**	**4.6**	**2.8-6.3**	**8.9**	**6.5-11.2**	**79.4**	**76.7-82.1**
Women									
18-29	906	2.2	0.0-4.8	2.2	0.8-3.6	1	0.0-1.9	94.7	91.7-97.6
30-44	850	0.4	0.0-0.9	1.1	0.2-2.0	0.1	0.0-0.4	98.4	97.1-99.6
45-59	564	1.3	0.0-2.9	1.2	0.0-2.6	2	0.4-3.5	95.5	92.4-98.7
60-69	217	0.5	0.0-1.3	1	0.0-2.0	2.8	0.0-6.2	95.7	91.6-99.7
18-69	**2537**	**1.4**	**0.2-2.7**	**1.7**	**0.9-2.5**	**1**	**0.4-1.5**	**95.9**	**94.5-97.4**
Both Sexes									
18-29	1350	3.3	1.3-5.2	3.2	1.6-4.9	3.4	1.5-5.4	90	86.9-93.2
30-44	1344	5	2.8-7.2	3.1	1.1-5.0	4.3	2.4-6.1	87.7	84.8-90.6
45-59	965	6.1	4.0-8.3	3.4	1.3-5.4	8	4.5-11.4	82.5	77.2-87.8
60-69	410	4.4	1.2-7.6	1.6	0.5-2.7	13.8	7.3-20.3	80.2	71.8-88.6
18-69	**4069**	**4.3**	**3.2-5.4**	**3.1**	**2.2-4.1**	**4.9**	**3.6-6.2**	**87.7**	**86.2-89.3**

The survey also asked questions about smokers who use manufactured cigarettes among daily smokers. Results from the survey show that 85.5% of manufactured cigarette smokers smoke daily. The proportion of males (88.9%) daily smokers is higher than females (69.4%). Table 7 below presents manufactured cigarette smokers daily amongst smokers.

Table 7: Percentage of smokers who use manufactured cigarettes among daily smokers by age group by Sex

Age Group (years)	Men			Women			Both Sexes		
	n	% Manu-factured cigarette smoker	95% CI	n	% Manu-factured cigarette smoker	95% CI	n	% Manu-factured cigarette smoker	**95% CI**
18-29	26	77.7	51.8-100.0	6	63.3	34.3-92.2	32	72.7	**46.3-99.1**
30-44	54	90.5	74.3-100.0	2	100.0	100.0-100.0	56	90.7	**74.9-100.0**
45-59	52	99.6	98.7-100.0	5	100.0	100.0-100.0	57	99.6	**98.8-100.0**
60-69	20	100.0	100.0-100.0	1	100.0	100.0-100.0	21	100.0	**100.0-100.0**
18-69	**152**	**88.9**	**78.4-99.3**	**14**	**69.4**	**38.7-100.0**	**166**	**85.5**	**73.7-97.3**

Tobacco smoked by daily tobacco smokers

The mean amount of tobacco used by daily smokers by type among males and females were primarily manufactured cigarette at 4.1% and 6.2% respectively. However, the higher mean daily smoking of cigars, cheerots or cigarillos among females (5.5%) compared to males with 2.6%. Figure 6 below shows detailed breakdown.

Figure 6: Mean amount of tobacco used by daily smokers by type

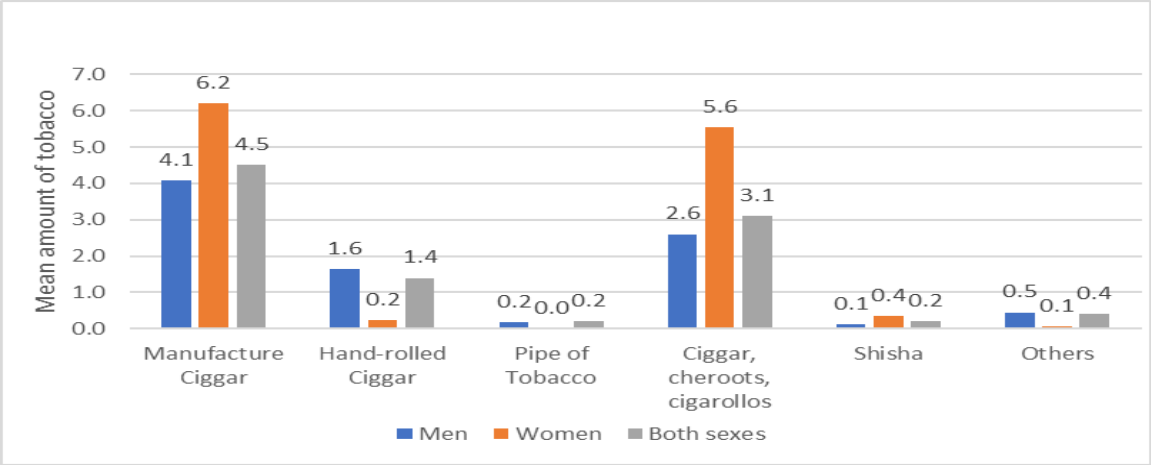


Table 8 below shows that among all respondents, 6.4% of men were former daily smokers, compared to 0.8% among women. The results also shows significant reduction with aging. Among both sexes, former daily smokers increases with age.

Table 8: Percentage of former daily smokers among all respondents by age group by sex

Age Group (years)	Men			Women			Both Sexes		
	n	% Former daily smokers	95% CI	n	% Former daily smokers	95% CI	n	% Former daily smokers	**95% CI**
18-29	444	3.6	0.7-6.5	906	0.9	0.0-2.0	1350	2.2	**0.8-3.7**
30-44	494	5.2	2.7-7.7	850	0.4	0.0-0.8	1344	2.8	**1.5-4.0**
45-59	401	14.3	6.5-22.0	564	1.0	0.0-2.1	965	8.0	**4.0-12.0**
60-69	193	18.5	11.2-25.7	217	1.5	0.0-3.8	410	9.3	**4.7-13.9**
18-69	**1532**	**6.4**	**4.3-8.6**	**2537**	**0.8**	**0.2-1.4**	**4069**	**3.6**	**2.6-4.6**

Table 9 below shows that current smokers who were advised by a health care professional to stop smoking constituted 32.4% of those who visited a doctor or other health workers in the past 12 months. Smokers aged 60-69 years old (43.4%) and aged 45-59 years old (39.9%) were significantly more likely to receive advice as compared to smokers aged 18-44% on tobacco cessation by health workers.

Table 9: Percentage of current smokers advised by a health professional to stop smoking by age by sex

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	34	33.5	4.9-62.2	15	45.9	0.0-95.9	49	37.3	**12.3-62.2**
30-44	60	20.1	5.5-34.7	9	2.9	1.0-4.8	69	18.1	**5.5-30.7**
45-59	60	37.3	19.0-55.6	9	53.2	38.8-67.7	69	39.9	**24.2-55.6**
60-69	22	50.4	24.8-76.0	7	14.5	0.0-42.1	29	43.4	**21.1-65.8**
18-69	**176**	**30.5**	**16.2-44.8**	**40**	**39.0**	**2.4-75.5**	**216**	**32.4**	**18.5-46.2**

Exposure to second hand smoking

The survey asked questions on whether someone smokes in their presence and on how many occasions. From the data, 21.9 % of the sampled population was exposed to environmental tobacco smoke in home, and 22.3% of the same population was exposed to tobacco smoke in the workplace. The tables 3.2.x present exposure to environmental tobacco smoke in homes and in the workplace on 1 or more of the past 30 days. However, Men were more significantly exposed (26.9%) in homes and in workplaces (26.4%) as compared to females in homes (16.9%) and in workplaces (18.2%). Tables 10 & 11

Table 10: Second-hand smoke in the home in the past 30 days by age by sex

Age Group (years)	Men			Women			Both Sexes		
	n	% Exposed	95% CI	n	% Exposed	95% CI	n	% Exposed	**95% CI**
18-29	444	29.4	21.7-37.0	906	16.1	11.9-20.3	1350	22.6	**18.3-26.9**
30-44	494	27.0	21.5-32.6	850	19.0	14.7-23.2	1344	23.0	**19.4-26.6**
45-59	401	22.2	14.2-30.3	564	17.7	12.7-22.8	965	20.1	**14.8-25.5**
60-69	193	15.6	8.8-22.4	217	10.8	3.3-18.3	410	13.0	**7.1-19.0**
18-69	**1532**	**26.9**	**22.2-31.7**	**2537**	**16.9**	**13.4-20.4**	**4069**	**21.9**	**18.7-25.0**

Table 11: Second-hand smoke in the workplace in the past 30 days by age by sex

Age Group (years)	Men			Women			Both Sexes		
	n	% Exposed	95% CI	n	% Exposed	95% CI	n	% Exposed	**95% CI**
18-29	368	23.6	15.7-31.5	767	18.1	13.0-23.1	1135	20.8	**15.5-26.2**
30-44	416	31.6	21.1-42.1	729	20.3	14.5-26.1	1145	25.8	**20.1-31.4**
45-59	350	27.0	17.1-36.9	478	17.9	12.4-23.3	828	22.7	**16.4-29.0**
60-69	158	22.4	12.9-31.9	177	7.9	2.4-13.4	335	14.6	**7.6-21.7**
18-69	**1292**	**26.4**	**19.7-33.0**	**2151**	**18.2**	**14.4-22.0**	**3443**	**22.3**	**17.9-26.7**

Smokeless Tobacco

Table 12 shows the percentage of current smokeless tobacco users by age group and sex. The use of smokeless tobacco product (ie: snuff, chewing tobacco, etc) was assessed among the sampled population. Approximately 3.3% of men and 1.2% of women and 2.2% of both sexes were current smokeless tobacco users. These show a decline when compared to 14.2% of men, 3.7% of women and 8.8% of both sexes in 2011 Step survey. Table 3.10 also reveals the age group 60-69 are the highest users of smokeless tobacco (6.9%).

Table 12: Current smokeless tobacco users by age by sex

Age Group (years)	Men			Women			Both Sexes		
	n	% Current users	95% CI	n	% Current users	95% CI	n	% Current users	**95% CI**
18-29	444	3.2	0.8-5.7	906	0.0	0.0-0.1	1350	1.6	**0.4-2.8**
30-44	494	2.9	1.0-4.8	850	0.8	0.3-1.3	1344	1.8	**0.9-2.8**
45-59	401	3.7	0.0-8.0	564	3.7	1.8-5.7	965	3.7	**1.3-6.1**
60-69	193	6.1	2.6-9.6	217	7.6	2.1-13.2	410	6.9	**3.3-10.5**
18-69	**1532**	**3.3**	**1.9-4.7**	**2537**	**1.2**	**0.8-1.6**	**4069**	**2.2**	**1.5-3.0**

Table 13 shows the smokeless tobacco use status of respondents categorized as daily users, non-daily users, former users and never users. Of all the respondents about 94.5% of the respondents have never used smokeless tobacco. Only one percent of respondents are current daily users of smokeless tobacco.

Table 13: Respondents status of Smokeless tobacco use by age by sex

	Men								
Age Group (years)	n	Current user				Non user			
		% Daily	95% CI	% Non-daily	95% CI	% Past user	95% CI	% Never used	95% CI
18-29	444	0.9	0.4-1.4	2.3	0.0-4.7	1.4	0.0-3.0	95.3	92.5-98.1
30-44	494	1.5	0.0-3.1	1.4	0.4-2.3	1.3	0.2-2.4	95.8	93.6-98.1
45-59	401	0.4	0.0-0.9	3.2	0.0-7.5	3.3	0.0-7.8	93	86.8-99.2
60-69	193	3	0.6-5.3	3.1	0.5-5.8	3.2	0.0-6.6	90.7	85.8-95.6
18-69	**1532**	**1.1**	**0.6-1.6**	**2.2**	**0.9-3.6**	**1.8**	**0.6-2.9**	**94.9**	**93.2-96.6**

Women									
18-29	892	0	0.0-0.1	0	0.0-0.0	0.7	0.2-1.3	892	0
30-44	820	0.6	0.2-1.1	0.2	0.0-0.4	1	0.5-1.6	820	0.6
45-59	521	3	1.4-4.7	0.7	0.0-1.6	1.8	0.1-3.5	521	3
60-69	188	6.5	1.5-11.5	1.2	0.0-2.4	1	0.0-2.3	188	6.5
18-69	**2421**	**1**	**0.6-1.3**	**0.2**	**0.0-0.4**	**1**	**0.6-1.4**	**2421**	**1**
Both Sexes									
18-29	1302	0.5	0.2-0.7	1.1	0.0-2.3	1.1	0.3-1.9	1302	0.5
30-44	1277	1.1	0.2-1.9	0.8	0.3-1.3	1.2	0.6-1.8	1277	1.1
45-59	900	1.7	0.8-2.6	2	0.0-4.3	2.6	0.0-5.7	900	1.7
60-69	360	4.9	2.0-7.7	2.1	0.5-3.6	2	0.2-3.8	360	4.9
18-69	**3839**	**1**	**0.7-1.4**	**1.2**	**0.5-1.9**	**1.4**	**0.7-2.0**	**3839**	**1**

The percent of current users of smokeless tobacco using various smokeless tobacco products is shown in table 14. About forty-seven percent (47%) of the current users of smokeless tobacco use snuff by nose, 45% use snuff by mouth, 29% use chewing tobacco followed by 9% who use betel quid.

Table 14: Percentage of current users of smokeless tobacco using each of the following products by age

Age Group (years)	**Both Sexes**						
	n	% Snuff by mouth	95% CI	% Snuff by nose	95% CI	% Chewing tobacco	**95% CI**
18-29	27	25.7	0.4-50.9	47.7	9.7-85.8	65.3	**34.3-96.3**
30-44	38	51.1	24.1-78.1	53.4	24.8-82.0	8.3	**0.0-19.8**
45-59	45	48.1	14.4-81.7	35.0	4.2-65.9	7.7	**0.0-17.0**
60-69	36	82.6	65.7-99.6	49.1	29.1-69.1	15.5	**1.2-29.8**
18-69	**146**	**45.2**	**27.2-63.3**	**46.5**	**29.7-63.3**	**29.6**	**7.0-52.2**

3.2.2 Alcohol Consumption

Alcohol is one of the most widely used drug substances in the world. Alcohol use has health and social consequences for those who drink, for those around them, and for the nation as well. The World Health Organization (WHO) recognizes harmful alcohol use as one of the main common risk factors for the four major non-communicable diseases (NCD): diabetes, cancer, chronic respiratory illnesses, and cardiovascular disease [13].

The STEPS Survey gathered responses on alcohol consumption among the sampled population. The result in table 15 below shows that 32% of the respondents consumed alcohol in past 30 days compared to 24% in 2011. Disaggregation reveals that 42.1% of males and 22.1% of females have consumed alcohol during the past 30 days compared to 34.3% and 14% male and female respectively.

Lifetime abstainer among the sampled population is 47.2%. Women constitute more than half of lifetime abstainer compared to men accounting of 37%. Age groups 30-44, 45-59 among the both sexes constitute the highest consumers of alcohol. The distribution of alcohol consumption among the respondents is shown in table 15.

Table 15: Alcohol consumption status by age by sex

Age Group (years)	Men				
	n	% Current drinker (past 30 days)	% Drank in past 12 months, not current	% Past 12 months abstainer	**% Lifetime abstainer**
18-29	444	36.2	17.0	5.8	**41.0**
30-44	494	50.7	10.6	8.0	**30.7**
45-59	401	46.2	7.3	9.8	**36.8**
60-69	193	36.5	12.1	6.3	**45.2**
18-69	**1532**	**42.1**	**13.3**	**7.1**	**37.4**
	Women				
18-29	906	21.4	13.8	9.4	**55.4**
30-44	850	26.1	11.9	7.6	**54.3**
45-59	564	20.4	9.3	8.7	**61.6**
60-69	217	11.3	14.7	7.2	**66.8**
18-69	**2537**	**22.1**	**12.7**	**8.7**	**56.5**
	Both Sexes				
18-29	1350	28.6	15.3	7.6	**48.4**
30-44	1344	38.3	11.3	7.8	**42.6**
45-59	965	34.0	8.2	9.3	**48.5**
60-69	410	22.9	13.5	6.8	**56.9**
18-69	**4069**	**32.0**	**13.0**	**7.9**	**47.1**

[13] World Health Organization. Noncommunicable diseases, http://www.who.int/mediacentre/factsheets/fs355/en/ (2022).

Cessation of alcohol consumption

Table 16 shows percent distribution of cessation of alcohol consumption among former drinkers (those who did not drink during the past 12 months) who stopped drinking due to health reasons, such as a negative impact of drinking on their health or as per advice of a doctor or other health worker. Overall, 21.1% of the respondents who had not drunk alcohol in the past 12 months had stopped drinking due to health reasons. In comparison to the sexes with regards to cessation due to health reasons, women account for 18.1%, while men account for 24.8%.

Table 16: Percentage of former drinkers who stopped drinking due to health reason by age by sex

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	31	20.8	2.6-39.0	89	14.5	4.7-24.3	120	16.8	**7.8-25.9**
30-44	45	16.5	0.0-33.2	89	15.9	7.2-24.6	134	16.2	**6.4-26.0**
45-59	51	38.5	24.1-53.0	56	24.2	10.7-37.7	107	32.2	**21.3-43.1**
60-69	18	60.1	31.4-88.7	29	57.9	39.4-76.4	47	58.8	**43.4-74.2**
18-69	**145**	**24.8**	**14.7-34.8**	**263**	**18.1**	**11.3-25.0**	**408**	**21.1**	**14.9-27.3**

Frequency of Alcohol Consumption past 7 days

The percentage of current alcohol drinkers who consume alcohol on daily basis account for 9.3%. Among both sexes, age groups 30-44 and 60-69 account for the highest daily consumers with 18.3% among men and 15.4% among women. A little over half of current drinkers consume alcohol 1 to 2 days in a week, while three percent consume for 5 to 6 days in a week. Table 17 shows further distribution.

Table 17: Frequency of alcohol consumption in the past 7 days by current (past 30 days) drinkers.

Age Group (years)	Men										
	n	% Daily	95% CI	% 5-6 days	95% CI	% 3-4 days	95% CI	% 1-2 days	95% CI	0% days	95% CI
18-29	162	4.9	1.1-8.7	2.4	0.4-4.4	11.9	3.3-20.5	51.9	38.7-65.0	28.9	16.1-41.7
30-44	213	20.4	7.4-33.4	4.4	1.3-7.5	11.5	6.0-16.9	50.3	38.3-62.3	13.4	4.0-22.8
45-59	163	18.3	9.7-26.9	7	0.0-14.3	13.4	5.2-21.7	45.3	33.0-57.6	16	6.9-25.1
60-69	70	7.8	0.0-16.4	4.9	0.4-9.5	13.1	5.8-20.5	48.6	31.0-66.1	25.6	10.0-41.1
18-69	**608**	**12.9**	**6.6-19.1**	**4**	**2.2-5.7**	**12**	**7.0-17.1**	**50.1**	**41.9-58.3**	**21**	**12.6-29.4**
	Women										
18-29	169	2	0.0-4.1	1	0.0-2.2	7.1	2.1-12.1	57.1	46.7-67.5	32.9	21.8-44.0
30-44	170	1.7	0.0-4.5	3.4	0.2-6.6	4.2	0.0-9.0	49.3	36.5-62.2	41.4	28.0-54.7
45-59	105	4.9	0.3-9.5	0.2	0.0-0.6	13.9	5.4-22.3	47.5	35.1-59.9	33.6	21.0-46.3
60-69	30	15.4	0.0-32.1	4.3	0.0-12.9	21.3	0.0-47.9	33.7	10.0-57.4	25.2	4.3-46.1
18-69	**474**	**2.6**	**0.9-4.3**	**1.8**	**0.5-3.1**	**7.2**	**3.6-10.7**	**52.6**	**45.9-59.4**	**35.8**	**29.0-42.6**
	Both Sexes										
18-29	331	3.8	1.4-6.3	1.8	0.5-3.2	10.1	4.5-15.6	53.9	44.0-63.7	30.4	21.7-39.2
30-44	383	14	5.3-22.7	4	1.7-6.4	9	4.7-13.2	50	41.3-58.7	23	16.8-29.3
45-59	268	14.6	8.1-21.0	5.1	0. 20-10.5	13.5	6.7-20.3	45.9	37.0-54.8	20.9	14.0-27.8
60-69	100	9.7	2.0-17.3	4.8	0.1-9.4	15	6.4-23.9	44.9	30.2-59.7	25.5	12.8-38.2
18-69	**1082**	**9.3**	**5.5-13.1**	**3.2**	**2.0-4.5**	**10.3**	**6.9-13.8**	**51**	**45.2-56.8**	**26.2**	**20.9-31.5**

Table 18 below shows the frequency of needing a first drink in the morning to get going during the past 12 months among past 12-month drinkers. Majority of the respondents who drank alcohol in the past 12 months never needed a first drink in the morning to get going, however those needing a first drink in the morning to get going within a monthly or more frequently accounts for 7.7% on the overall, with age group 45-59 being the highest at 15%.

Table 18: Frequency of needing a first drink in the morning to get going among past 12-month drinkers

Age Group (years)	Both Sexes						
	n	% monthly or more frequently	95% CI	% less than monthly	95% CI	% never	**95% CI**
18-29	578	4.1	2.4-5.9	2.7	0.8-4.6	93.2	**90.5-95.8**
30-44	570	9.4	5.3-13.5	4.7	2.3-7.0	85.9	**81.7-90.1**
45-59	383	15.9	9.2-22.6	4.9	1.8-8.1	79.2	**72.4-86.0**
60-69	157	8.7	3.8-13.7	3.3	0.0-6.7	87.9	**81.9-94.0**
18-69	**1688**	**7.7**	**5.6-9.7**	**3.7**	**2.3-5.0**	**88.7**	**86.3-91.1**

Drinking Occasions and Standard Drinks per occasions

The mean number of drinking occasions in the past 30 days among current drinkers in table 19 was 3.3 among both sexes with men (3.9) having more occasions than women (2.3), while the mean number of standard drinks per drinking occasion in table 20 was 2.6 and distribution by males and females were 2.7 and 2.4 between males and females. There were no significant trends when looking at specific age groups.

Table 19: Mean number of drinking occasions in the past 30 days among current (past 30 days) drinkers

Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-29	152	2.8	2.0-3.5	161	2.3	1.6-3.1	313	2.6	2.1-3.2
30-44	194	4.8	3.3-6.2	158	2.0	1.5-2.4	352	3.8	2.8-4.8
45-59	153	5.0	3.4-6.7	95	2.4	1.8-3.1	248	4.3	3.1-5.5
60-69	60	3.5	2.1-4.9	28	4.4	0.0-9.2	88	3.7	2.1-5.4
18-69	**559**	**3.9**	**3.2-4.6**	**442**	**2.3**	**1.9-2.7**	**1001**	**3.3**	**2.8-3.8**

Table 20: Mean number of standard drinks per drinking occasion among current (past 30 days) drinkers

Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-29	156	2.3	1.8-2.8	167	2.4	1.8-3.0	323	2.4	2.0-2.7
30-44	209	3.2	2.4-4.1	154	2.5	2.0-3.1	363	3.0	2.4-3.6
45-59	151	2.7	2.1-3.4	92	2.6	1.8-3.5	243	2.7	2.2-3.2
60-69	64	2.3	1.8-2.7	28	1.4	1.2-1.7	92	2.1	1.7-2.4
18-69	**580**	**2.7**	**2.3-3.2**	**441**	**2.4**	**2.1-2.8**	**1021**	**2.6**	**2.3-3.0**

Similarly, largest number of drinks consumed during a single occasion in the past 30 days among current (past 30 days) drinkers was also assessed among the sampled population. Table 21 below reveals that the mean maximum number of standard drinks consumed on one occasion in the past 30 days was 3.2% for both sexes, with men and women accounting for 3.3% and 2.9% respectively.

Table 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	149	2.9	2.5-3.3	160	2.9	2.3-3.5	309	2.9	2.5-3.2
30-44	200	3.8	2.9-4.8	151	3.1	2.5-3.7	351	3.6	2.9-4.3
45-59	153	3.4	2.6-4.1	97	2.6	1.9-3.3	250	3.1	2.5-3.8
60-69	57	2.5	1.8-3.2	28	1.8	1.3-2.3	85	2.3	1.8-2.8
18-69	**559**	**3.3**	**2.8-3.8**	**436**	**2.9**	**2.5-3.3**	**995**	**3.2**	**2.8-3.5**

Table 22 below shows the percentage of respondents who had six or more drinks on any occasion in the past 30 days during a single occasion among the total population. Among both sexes, about 10% had six or more drinks on any occasion. Disaggregation reveals over twice as many men (14.2%) having six or more drinks on any occasion in the past 30 days compared to women (6.9%). See table below for more information.

Table 22: Six or more drinks on a single occasion at least once during the past 30 days among total population

Age Group (years)	Men			Women			Both Sexes		
	n	% ≥ 6 drinks	95% CI	n	% ≥ 6 drinks	95% CI	n	% ≥ 6 drinks	95% CI
18-29	401	12.3	6.5-18.1	874	8.3	5.3-11.2	1275	10.2	6.6-13.8
30-44	424	17.4	12.0-22.9	799	6.6	3.8-9.5	1223	11.9	8.5-15.2
45-59	358	16.3	8.2-24.5	530	4.5	1.2-7.8	888	10.6	6.2-14.9
60-69	163	6.7	1.0-12.4	210	1.8	0.0-3.6	373	3.9	1.0-6.9
18-69	**1346**	**14.2**	**10.7-17.7**	**2413**	**6.9**	**5.0-8.8**	**3759**	**10.4**	**8.0-12.8**

The survey also assess the frequency of having had problems with family or partner due to someone else's drinking in the past 12 months among all respondents. As shown in table 1-3, annex 1, 5.1% and 1.8% of men and women had family problems either monthly or more frequently due to someone else's drinking during the past 12 months among all respondents.

The percentage of unrecorded alcohol from all alcohol consumed during the past 7 days among current (past 30 days) drinkers was assessed and are distributed in tables 23 and 24 below. In table 23, the incidence of unrecorded alcohol of all alcohol was slightly higher among males (26.9%) compared to females (25.9%). Also in table 24 further below, the incidence of unrecorded alcohol consumption during the past 7 days by type was higher for percent home-brewed spirits (35.1%) and percent home-brewed beer/wine (27.7%) while the percent brought over border 34.2%. These trends are similar across both sexes as shown in table.

Table 23: Percentage of unrecorded alcohol from all alcohol consumed during past 7 days

Age Group (years)	Men		Women		Both Sexes	
	n	% unrecorded alcohol of all alcohol	n	% unrecorded alcohol of all alcohol	n	% unrecorded alcohol of all alcohol
18-29	118	21.5	104	21.4	222	21.5
30-44	171	30.2	106	29.1	277	30.0
45-59	126	27.3	71	33.4	197	28.2
60-69	53	25.2	21	32.6	74	27.2
18-69	**468**	**26.9**	**302**	**25.9**	**770**	**26.7**

Table 24: Unrecorded alcohol consumption during the past 7 days by type

Age Group (years)	Both Sexes					
	n	% home-brewed spirits	% home-brewed beer/ wine	% brought over border	% surro-gate alcohol	% other
18-29	75	32.8	42.7	21.6	1.4	1.6
30-44	106	28.2	20.3	48.3	1.2	2.0
45-59	73	50.9	29.5	17.3	1.1	1.2
60-69	23	73.8	5.1	17.4	1.8	1.8
18-69	**277**	**35.1**	**27.7**	**34.2**	**1.3**	**1.7**

3.2.3 Diet

Unhealthy diet and lack of physical activity are leading global risks to health. Nowadays, individuals eat more meals that are heavy in calories, fats, free sugars, and salt/sodium, while many people eat insufficient amounts of fruit, vegetables, and other dietary fiber-rich foods like whole grains (WHO, 2020). The benefit accrue from vegetables and fruits include: Lower blood pressure; reduced risk of heart disease, stroke, and probably some cancers; lower risk of eye and digestive problems; and a soft effect on blood sugar that can help keep appetite in check.

The STEPS Survey gathered responses on fruits and vegetable consumption, dietary salt intake, dietary sugar intake, and consumption of oils and fats at the household level among the sampled population.

Fruits and Vegetables Consumption

The average number of days fruits and vegetables were consumed in a typical week by all respondents was determined during the administration of this survey. In a typical week the mean number of days fruits were consumed was 2.1 for both sexes compared to 2.3 in 2011. This is similar across sexes (Table 25).

Table 25: Mean number of days fruit 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	369	2.1	1.7-2.5		746	2.1	1.9-2.4		1115	2.1	**1.8-2.4**
30-44	405	2.1	1.8-2.5		692	2.0	1.8-2.3		1097	2.1	**1.8-2.3**
45-59	319	2.1	1.8-2.4		447	1.9	1.6-2.2		766	2.0	**1.8-2.2**
60-69	159	1.9	1.5-2.2		166	1.9	1.5-2.2		325	1.9	**1.6-2.1**
18-69	**1252**	**2.1**	**1.9-2.3**		**2051**	**2.1**	**1.9-2.3**		**3303**	**2.1**	**1.9-2.3**

Similarly, the mean number of days vegetables were consumed in 2022 by males was 3.1, female 3.3 and both sexes 3.2 compared 3.4 male, females 3.6 and both sexes 3.5 in 2011. Tables 26 present mean number of days vegetables were consumed in a typical week.

Table 26: 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	388	3.1	2.7-3.4		801	3.2	3.0-3.5		1189	3.2	**2.9-3.4**
30-44	443	3.3	2.9-3.7		742	3.6	3.3-3.8		1185	3.4	**3.2-3.7**
45-59	342	2.9	2.5-3.2		501	2.9	2.5-3.3		843	2.9	**2.6-3.2**
60-69	167	3.2	2.8-3.6		182	3.3	2.8-3.8		349	3.2	**2.9-3.6**
18-69	**1340**	**3.1**	**2.9-3.4**		**2226**	**3.3**	**3.1-3.5**		**3566**	**3.2**	**3.0-3.4**

Also, the mean number of servings of fruits on average per day was similar (0.7) for both male and female. Similarly, the mean number of servings of vegetables on average per day was the same at 1.1 for both sexes. The combined mean number of servings for fruit and/ or vegetable on average per day was 1.7. Tables 27, 28 and 29) below shows further distribution.

Table 27: 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	357	0.7	0.5-1.0		725	0.7	0.5-0.8		1082	0.7	**0.6-0.8**
30-44	396	0.7	0.5-0.8		668	0.7	0.5-0.8		1064	0.7	**0.6-0.8**
45-59	313	0.7	0.5-0.8		432	0.7	0.5-0.8		745	0.7	**0.5-0.8**
60-69	153	0.7	0.5-0.8		161	0.5	0.4-0.6		314	0.6	**0.5-0.7**
18-69	**1219**	**0.7**	**0.6-0.8**		**1986**	**0.7**	**0.6-0.8**		**3205**	**0.7**	**0.6-0.8**

Table 28: 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	374	1.0	0.8-1.3		773	1.1	0.9-1.3		1147	1.1	**0.9-1.3**
30-44	429	1.2	0.9-1.4		721	1.2	1.0-1.3		1150	1.2	**1.0-1.4**
45-59	331	1.1	0.9-1.4		480	1.1	0.8-1.4		811	1.1	**0.9-1.3**
60-69	159	1.0	0.7-1.2		172	1.1	0.9-1.4		331	1.0	**0.9-1.2**
18-69	**1293**	**1.1**	**0.9-1.3**		**2146**	**1.1**	**1.0-1.3**		**3439**	**1.1**	**1.0-1.3**

Table 29: 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	396	1.6	1.3-2.0		799	1.7	1.4-2.0		1195	1.7	**1.4-1.9**
30-44	442	1.7	1.4-2.0		748	1.8	1.5-2.0		1190	1.7	**1.5-2.0**
45-59	346	1.7	1.4-1.9		498	1.6	1.2-2.0		844	1.6	**1.4-1.9**
60-69	169	1.5	1.2-1.8		182	1.4	1.1-1.7		351	1.5	**1.3-1.7**
18-69	**1353**	**1.7**	**1.4-1.9**		**2227**	**1.7**	**1.5-1.9**		**3580**	**1.7**	**1.5-1.9**

This survey observes that 49.3% of the male respondents and 45.1% of female respondents have no fruit and/or vegetable intake per day (See table 4-5). Also as shown in table 6 in annex 1, the number of servings of fruit and/or vegetables on average per day for both sexes at 1-2 servings was 36% compared to 47% of both sexes that had no fruit and /or vegetables on average per day. Only 7.1% of all respondents consumed the WHO recommended number of servings of vegetables and fruits, which is 5 or more servings per day. See table 4-6 in annex 1 for details.

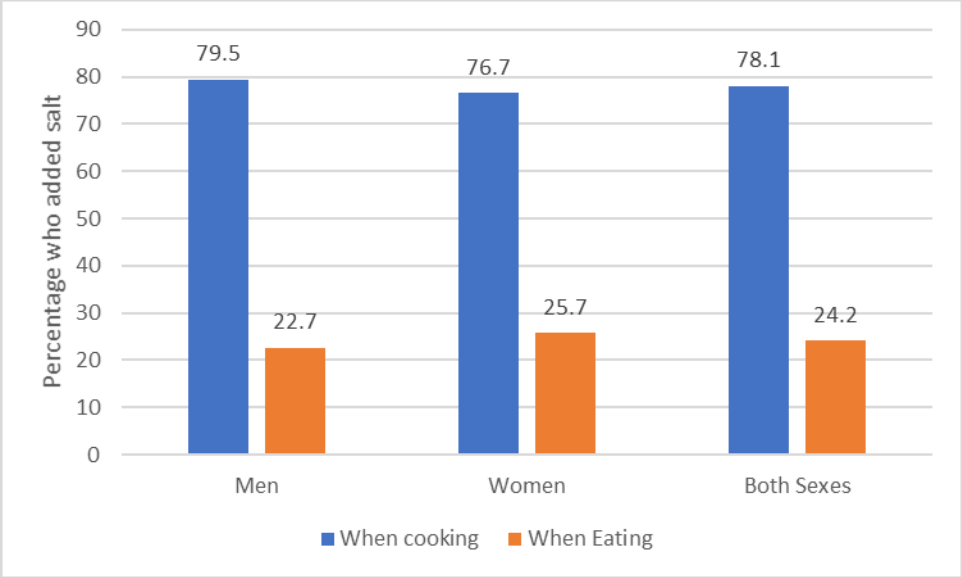
Salt Consumption

The amount of dietary salt (sodium chloride) consumed is an important determinant of blood pressure levels and of hypertension and overall cardiovascular risk. 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. A salt intake of less than 5 grams (approximately 2g sodium) per person per day is recommended by WHO for the prevention of cardiovascular diseases, the leading cause of death globally.[14]

People are often unaware of the amount of salt they consume. Processed food give most of the salt to the diet either from food like (like ready meals, processed meats like ham, and cheese, salty snack foods, and instant noodles, among others), or from food frequently consumed in large quantities (like bread and processed cereal products).

Figure 7 below shows on overall 78.1% of all respondents always or often added salt to their food before or as they were eating when compare to cooking 24.2%. About 25% of women compared to 22% of men add salt always or often before eating or when eating.

Figure 7: Percentage of respondents who always or often add salt when preparing food or Add salt when eating



[14] World Health Organization. (2012). *Guideline: Sodium intake for adults and children*. World Health Organization.

Consumption of processed foods high in Salt

WHO reported that in many countries, most salt comes from processed foods (e.g. ready meals; processed meats such as bacon, ham and salami; cheese; and salty snacks) or from foods consumed frequently in large amounts (e.g. bread).

Table 30 below shows the distribution of the consumption of processed foods high in salt. Overall, 27.4% of the respondents always or often consume processed food high in salt with no significant sex difference.

Table 30: 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	428	29.0	20.7-37.3		880	28.7	21.0-36.3		1308	28.8	**23.2-34.5**
30-44	481	24.1	18.1-30.1		827	26.2	16.6-35.8		1308	25.2	**19.4-30.9**
45-59	393	26.7	8.5-44.8		544	24.4	12.8-36.1		937	25.6	**11.0-40.3**
60-69	188	25.9	12.4-39.4		205	37.0	14.1-60.0		393	31.9	**13.2-50.5**
18-69	**1490**	**27.0**	**21.1-33.0**		**2456**	**27.8**	**19.0-36.6**		**3946**	**27.4**	**21.0-33.9**

Similarly, Figure 8 below and Table 7-9 in annex 1 show respondents who think they consume far too much or too little salt. Very few (3.6%) of the respondents think they consume far too much. Majority of the respondents (65.4%) think that their consumption of salt is the right amount.

Figure 8 : Perception of Respondents on quantity of salt consumed

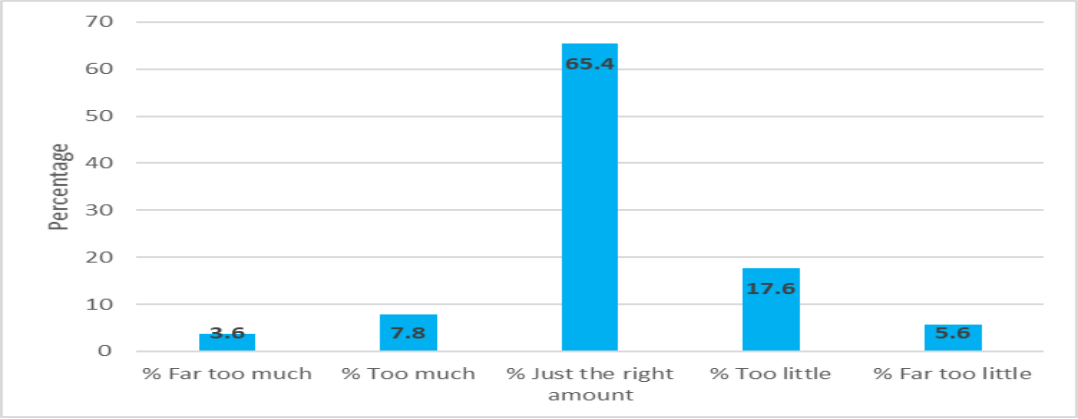


Table 31 and 32 reveal that a majority (85.4%) of the respondents think that lowering salt in diet is very important. Also majority (91.8%) believed that too much salt could cause serious health problems. Females showed a little more awareness when compared to males on the harmful effects of salt on health. See table 10-11 in annex 1 for more details.

Table 31: Percentage of respondents who think lowering salt in diet is very, somewhat, or not at all important

Age Group (years)	Both Sexes						
	n	% Very important	95% CI	% Somewhat important	95% CI	% Not at all important	**95% CI**
18-29	1284	84.2	80.7-87.7	10.9	8.0-13.8	4.9	**2.8-7.0**
30-44	1289	85.9	82.7-89.1	11.3	8.4-14.2	2.8	**1.7-3.9**
45-59	926	87.8	84.2-91.3	9.4	6.4-12.5	2.8	**1.2-4.4**
60-69	388	86.7	80.6-92.8	9.5	4.7-14.4	3.8	**1.3-6.3**
18-69	**3887**	**85.4**	**82.8-88.0**	**10.7**	**8.6-12.9**	**3.9**	**2.6-5.2**

Table 32: Percentage of respondents who think consuming too much salt could cause a serious health problem.

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	**95% CI**
18-29	444	91.9	88.5-95.2	906	92.6	89.9-95.2	1350	92.2	**89.8-94.6**
30-44	494	88.8	83.9-93.7	850	93.8	91.8-95.9	1344	91.3	**88.6-94.1**
45-59	401	91.3	86.1-96.5	564	91.1	87.9-94.4	965	91.2	**87.7-94.7**
60-69	193	91.9	87.1-96.7	217	92.5	87.2-97.8	410	92.2	**88.2-96.2**
18-69	**1532**	**90.9**	**88.1-93.6**	**2537**	**92.7**	**90.8-94.6**	**4069**	**91.8**	**90.0-93.6**

The survey also asked respondents on specific actions taken on a regular basis to control salt intake. Table 33 below reveals that almost half of respondents (48%) limited their consumption of processed food regularly to control their salt intake. Other measures respondents took to control salt intake included, using spices instead of salt (43.8%), avoiding eating foods prepared outside home (30.1%), and doing other things specifically to control your salt intake accounting for the least (4.8%). See tables 12-17 in annex for further details.

Table 33: Percentage of respondents who take specific action on a regular basis to control salt intake

Age Group (years)	Both Sexes						
	n	Limit consumption of processed foods	Look at the salt or sodium content on food labels	Buy low salt/sodium alternatives	Use spices other than salt when cooking	Avoid eating foods prepared outside of a home	Do other things specifically to control your salt intake
18-29	1350	48.2	11.1	12.9	43.9	28.6	**4.3**
30-44	1344	50.6	12.7	20.7	47.7	35.6	**5.8**
45-59	965	46.7	9.0	15.4	36.9	26.3	**5.1**
60-69	410	38.7	9.2	13.0	39.8	23.7	**2.4**
18-69	**4069**	**48.2**	**11.2**	**15.6**	**43.8**	**30.1**	**4.8**

3.2.4 Physical Activity

Physical exercise is any bodily activity that enhances or maintains physical fitness and overall health and wellness. It is performed for various reasons including strengthening muscles and the cardiovascular system, honing athletic skills, weight loss or maintenance, as well as for the purpose of enjoyment. Frequent and regular physical exercise boosts the immune system, and helps prevent the "diseases of affluence" such as heart disease, cardiovascular disease, Type 2 diabetes and obesity. It also improves mental health, helps prevent depression, helps to promote or maintain positive self-esteem. It is also important for maintaining physical fitness and can contribute positively to maintaining a healthy weight, building and maintaining healthy bone density, muscle strength, and joint mobility, promoting physiological well-being, reducing surgical risks, and strengthening the immune system.

The global physical activity questionnaire (GPAQ) section of the STEPS instrument was used for assessment of physical activity, and total physical activity was presented in MET (metabolic equivalent) minutes per week. The instrument looks into three major domains of day-to-day activities; work (including domestic work), transport, and recreational activities.

Throughout a week, including activity for work, during transport and leisure time, adults should do at least

- 150 minutes of moderate-intensity physical activity OR
- 75 minutes of vigorous-intensity physical activity OR
- An equivalent combination of moderate- and vigorous-intensity physical activity achieving at least 600 MET-minutes.

Using GPAQ analysis guideline provided along with the STEPS instrument, the three levels of physical activity suggested for classifying populations were low, moderate, and high. The criteria for these levels are shown below:

- **High**

A person reaching any of the following criteria is classified in this category:

  - Vigorous-intensity activity on at least 3 days achieving a minimum of at least 1,500 MET-minutes/week OR
  - or more days of any combination of walking, moderate- or vigorous-intensity activities achieving a minimum of at least 3,000 MET-minutes per week.

- **Moderate**

A person not meeting the criteria for the "high" category, but meeting any of the following criteria is classified in this category:

  - or more days of vigorous-intensity activity of at least 20 minutes per day OR

- or more days of moderate-intensity activity or walking of at least 30 minutes per day OR
- or more days of any combination of walking, moderate- or vigorous-intensity activities achieving a minimum of at least 600 MET-minutes per week.

• **Low**

A person not meeting any of the above-mentioned criteria falls in this category.

Not meeting WHO recommendations on physical activity for health

Of all respondents, 7.6% did not meet the WHO recommendations on physical activity for health, which is doing at least a 150 minutes of moderate-intensity physical activity per week or do at least 75 minutes of vigorous-intensity physical activity throughout the week, or an equivalent combination of moderate and vigorous-intensity physical activity achieving at least 600 MET-minutes per week. (Table 34).

Table 34: Not meeting WHO recommendations on physical activity for health

Age Group (years)	Men				Women				Both Sexes		
	n	% not meeting recs	95% CI		n	% not meeting recs	95% CI		n	% not meeting recs	95% CI
18-29	393	2.1	0.5-3.8		787	9.2	6.3-12.1		1180	5.6	**3.6-7.5**
30-44	427	5.8	3.1-8.6		711	6.6	4.0-9.1		1138	6.2	**4.2-8.2**
45-59	345	11.7	5.1-18.4		484	10.6	4.7-16.4		829	11.2	**6.8-15.5**
60-69	172	26.3	15.0-37.7		186	30.4	5.6-55.1		358	28.4	**14.3-42.5**
18-69	**1337**	**5.7**	**3.9-7.5**		**2168**	**9.7**	**7.2-12.1**		**3505**	**7.6**	**5.8-9.4**

The percentage of respondents classified into three categories of total physical activity according to former recommendations. Based on the categories, respondents were grouped into the three categories (low, moderate, and high). The result in Table 35 below shows that (66.5%) of the respondents were involved with high level physical activity, 20.8% moderate and 12.8% in low level physical activities. High level physical level category has improved among the population when compared to 47% in 2011. The proportion of males (74.1%) in high level activities was more than their females (61.1%) counterpart. Respondents in the age group 60-69 are least active.

Table 35: Level of total physical activity according to former recommendations

Men							
Age Group (Years)	n	% Low	95% CI	% Moderate	95% CI	% High	95% CI
18-29	393	6.5	3.0-10.1	24.6	16.0-33.1	68.9	59.9-77.9
30-44	427	8.5	5.0-12.1	12.8	7.6-18.0	78.7	72.4-84.9
45-59	345	19.4	11.9-27.0	12.9	7.2-18.6	67.6	58.6-76.7
60-69	172	30.7	19.4-42.0	10.7	6.1-15.4	58.6	47.1-70.1
18-69	**1337**	**10**	**6.9-13.0**	**18.6**	**13.9-23.4**	**71.4**	**66.1-76.7**
Women							
18-29	787	14.3	10.9-17.6	27.3	22.1-32.4	58.4	53.0-63.9
30-44	711	13.3	8.2-18.4	19.2	14.9-23.5	67.5	62.3-72.7
45-59	484	18.2	11.4-25.0	18.7	12.8-24.6	63.1	55.9-70.3
60-69	186	39.7	17.8-61.6	14.5	6.8-22.1	45.9	28.2-63.6
18-69	**2168**	**15.8**	**12.8-18.8**	**23.1**	**19.6-26.6**	**61.1**	**57.4-64.9**
Both Sexes							
18-29	1180	10.3	7.3-13.3	25.9	20.3-31.5	63.8	58.0-69.6
30-44	1138	10.7	8.1-13.4	15.8	11.8-19.7	73.5	69.5-77.5
45-59	829	18.8	13.3-24.3	15.7	11.9-19.4	65.5	58.7-72.2
60-69	358	35.3	22.2-48.3	12.6	8.4-16.8	52.1	40.8-63.5
18-69	**3505**	**12.8**	**10.3-15.3**	**20.8**	**17.4-24.2**	**66.5**	**62.6-70.3**

Mean minutes of physical activity on average per day

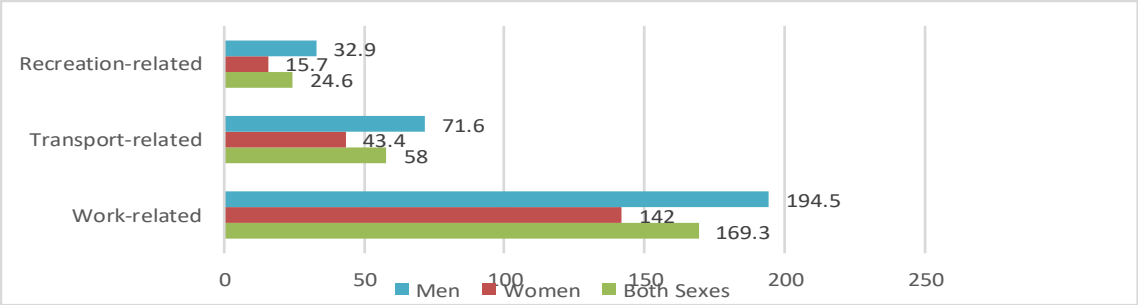
Table 36 below shows the distribution of the mean minutes of total physical activity across all three domains (work, transport and leisure time) in minutes per day by sex and age group. Among all respondents, 251 minutes was the mean time of total physical activity per day in Liberia. Males significantly spent more time in physical activity (299 min) compared to females (201.2 min). For both sexes the age group 30-44 spent more time in physical activity compared to other age groups.

Table 36: Mean minutes of total 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	393	290.2	200.2-380.1		787	182.0	162.4-201.7		1180	237.3	**187.7-287.0**
30-44	427	334.0	263.8-404.1		711	231.8	202.7-260.9		1138	286.4	**246.3-326.5**
45-59	345	284.7	239.8-329.7		484	222.8	189.3-256.2		829	255.0	**222.6-287.4**
60-69	172	194.5	153.7-235.3		186	159.5	98.6-220.4		358	176.8	**137.3-216.2**
18-69	**1337**	**299.0**	**247.5-350.6**		**2168**	**201.2**	**184.6-217.8**		**3505**	**251.9**	222.5-281.4

Those that were engaged in physical activities were classified as work, transport and recreation related physical activities. Majority of the respondents, both sexes spent more minutes (194.5 minutes) with work-related activities than transport and recreational activities compared to 140 minutes in 2011. The mean minutes spent in recreation related activities for both sexes was 24.6 minutes per day compared to 10.4 minutes. Whereas physical activity related to transport was on average 58 minutes for both sexes. Figure 9 presents mean minutes spent in work-related physical activities on average per day.

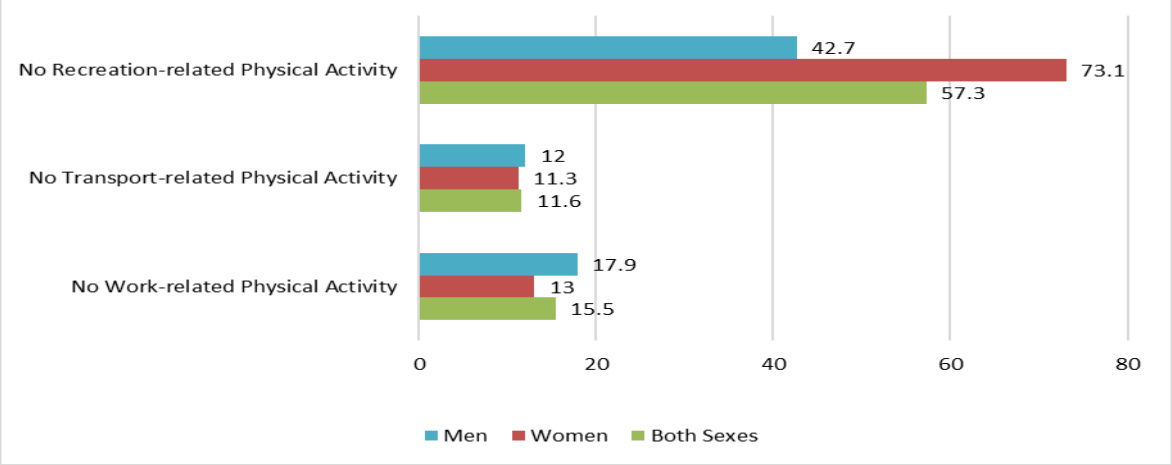
Figure 9: Mean minutes spent in work-, transport- and recreation-related physical activity on average per day



No physical activity by domains

Figure 10 below show the proportion of respondents who were classified as doing no work-recreation and transportation related physical activities. Approximately 57% of those that were not doing any work were found in no recreation physical activities while 15.5% were found in no transport related physical activities.

Figure 10: Percentage of respondents classified as doing no work, transport or recreational-related physical Activity



Composition of total physical activity

Table 37 below shows the proportion of the total physical activity across the three domains. Overall, 59 percent of total physical activity is work-related, 29 percent transport-related and 12 percent recreation-related/leisure time.

Table 37 : Percentage of work, transport and recreational activity contributing to total activity

Age Group (years)	Both Sexes						
	n	% Activity from work	95% CI	% Activity for transport	95% CI	% Activity during leisure time	**95% CI**
18-29	1156	53.7	49.1-58.3	29.6	26.8-32.4	16.8	**13.2-20.3**
30-44	1106	64.7	61.5-67.9	27.5	24.5-30.4	7.8	**6.1-9.5**
45-59	796	65.3	59.7-71.0	29.2	24.0-34.3	5.5	**3.9-7.2**
60-69	333	62.9	56.5-69.3	34.2	28.0-40.3	3.0	**1.0-4.9**
18-69	**3391**	**59.0**	**56.2-61.8**	**29.0**	**27.0-31.1**	**11.9**	**10.2-13.7**

The percentage of respondents not engaging in vigorous activities was 46.3% compared to 59.9% in 2011. The table 38 below reveals that higher proportion of women (64.6%) compared to males (29%) were not engaging in vigorous physical activity. Table 3.3.1 below shows the percentage of respondents not engaged in vigorous activities.

Table 38: Percentage of respondents not engaging in vigorous physical activity

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	393	22.5	13.5-31.5	787	63.3	56.9-69.7	1180	42.4	**35.6-49.3**
30-44	427	31.8	25.1-38.6	711	63.9	58.6-69.2	1138	46.8	**41.9-51.6**
45-59	345	38.5	29.7-47.4	484	68.0	60.5-75.5	829	52.7	**45.7-59.6**
60-69	172	58.8	48.3-69.4	186	72.6	60.3-84.9	358	65.8	**56.9-74.8**
18-69	**1337**	**29.3**	**23.4-35.2**	**2168**	**64.6**	**59.7-69.4**	**3505**	**46.3**	**41.4-51.1**

Table 39 below shows the mean minutes spent in sedentary activities on a typical day. On average, all respondents spent 152.4 minutes per day in sedentary activities, with men engaging in more sedentary activity at 158.8 minutes compared to women (146.1) minutes per day, respectively. Compared to the older age groups, minutes spent on sedentary activities were more noticeable in the younger age group (18-29). The median minutes of total sedentary activity per day is 90.

Table 39: Minutes spent in sedentary activities on average per day

Age Group (years)	Men				
	n	Mean minutes	95% CI	Median minutes	Inter-quartile range (P25-P75)
18-29	444	170.1	137.2-203.0	120	15-240
30-44	494	155.2	122.9-187.6	90	25-190
45-59	401	129.3	92.9-165.8	75	15-210
60-69	193	158.6	116.9-200.3	105	5-240
18-69	**1532**	**158.8**	**135.3-182.3**	**120**	**15-240**
	Women				
18-29	906	148.2	118.8-177.6	70	10-240
30-44	850	146	112.5-179.4	63	10-225
45-59	564	141.7	113.7-169.6	90	10-210
60-69	217	137.1	50.9-223.3	30	0-190
18-69	**2537**	**146.1**	**118.8-173.4**	**70**	**10-225**
	Both Sexes				
18-29	1350	158.9	134.7-183.1	90	10-240
30-44	1344	150.6	125.8-175.4	90	15-210
45-59	965	135.2	106.1-164.2	80	15-210
60-69	410	147	86.2-207.9	70	0-240
18-69	**4069**	**152.4**	**131.7-173.0**	**90**	**10-240**

3.2.5 Past Medical History

Raised Blood Pressure of Hypertension

The WHO has set high blood pressure as one of its global targets for the prevention of non-communicable diseases because it is a leading modifiable cause of premature death [15]. Hypertension, also referred to as high or raised blood pressure, is a condition where the blood vessels have persistently raised pressure, putting them under increased stress. Normal adult blood pressure is defined as a blood pressure of 120 mm Hg[1] when the heart beats (systolic) and a blood pressure of 80 mm Hg when the heart relaxes (diastolic).
When systolic blood pressure is equal to or above 140 mm Hg and/or a diastolic blood pressure equal to or above 90 mm Hg the blood pressure is considered to be raised or high. The higher the blood pressure, the higher the risk of damage to the heart and blood vessels in major organs such as the brain and kidneys. Hypertension is the most important preventable cause of heart disease and stroke worldwide.[16]

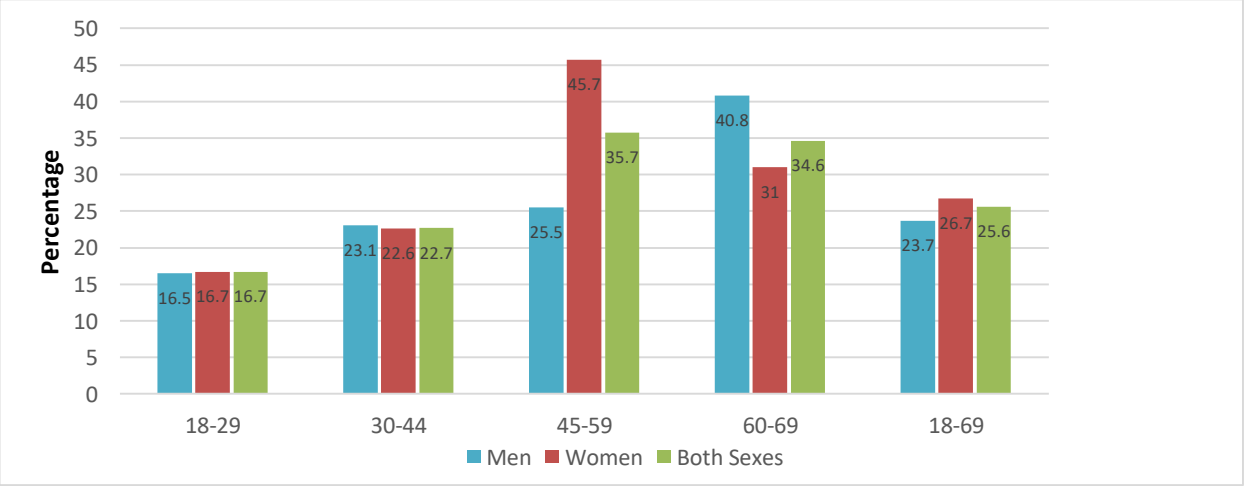
Table 18 in annex 1 reveal that 38.3% (compared to 29.9% 2011) of all respondents had never had their blood pressure checked for hypertension (HTN), with those between the ages of 18 and 29 reporting the highest percentage (51.6%). Also about 46% of men and 31% of women had never been screened for hypertension. Approximately 5% of the respondents reported diagnosed, but not within past 12 months. Only 6% of respondents have been diagnosed within the past 12 months compared to 7% in 2011. More proportion of women were being diagnosed within the past 12 months increasing with age.

Respondents who reported to have been previously diagnosed by doctors and health workers with raised blood pressure or hypertension (SBP ≥ 140 and/or DBP ≥ 90 mmHg) and currently on medication for raised BP or hypertension was only 25.6% compared to 30.7% in 2011. Disaggregation reveals 23.7% men and 26.7% women of having hypertension. Figure 11 below shows the proportion of respondents who reported to have been diagnosed with hypertension and were on treatment.

[15] Nguyen, Tu N., and Clara K. Chow. "Global and national high blood pressure burden and control." *Lancet (London, England)* 398.10304 (2021): 932-933.

[16] World Health Organization. Noncommunicable diseases (2015) https://www.who.int/news-room/questions-and-answers/item/noncommunicable-diseases-hypertension

Figure 11: Percent of Respondents who were previously diagnosed with raised blood pressure and are currently on treatment/medication



As shown in table 40 below, 6.7% of the respondents among those previously diagnosed with raised blood pressure were seen by traditional healer, of which 4.6% (see table 41 below) were taking traditional medicines when compared to 12% in 2011. Respondent currently taking herbal or traditional remedy were more between the ages 45-59 compared to other age groups. Also, 11% of men aged 45-59 were currently taking herbal or traditional remedy compared with 7% of women in the same age group. See table 40 and 41 for further distribution.

Table 40: Percentage of respondents seeing a traditional healer among those previously diagnosed

Age Group (years)	Men			Women			Both Sexes		
	n	% seen trad. healer	95% CI	n	% seen trad. healer	95% CI	n	% seen trad. healer	95% CI
18-29	20	1.1	0.0-3.3	90	6.4	0.0-13.1	110	4.4	0.0-8.8
30-44	37	2.1	0.0-5.3	144	5.0	0.0-10.1	181	4.2	0.3-8.2
45-59	87	14.2	5.2-23.1	133	11.2	3.6-18.8	220	12.7	7.4-17.9
60-69	42	5.0	0.0-10.9	63	5.2	0.0-11.2	105	5.1	0.9-9.4
18-69	**186**	**6.4**	**2.7-10.2**	**430**	**6.8**	**3.5-10.1**	**616**	**6.7**	**4.2-9.2**

Table 41: Percentage of respondents 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	95% CI
18-29	20	0.0	0.0-0.0	90	6.3	0.0-13.9	110	3.9	0.0-8.8
30-44	37	1.3	0.0-4.1	144	1.8	0.0-4.2	181	1.7	0.0-3.6
45-59	87	10.7	2.5-18.8	133	7.0	2.5-11.6	220	8.8	4.1-13.6
60-69	42	6.1	0.0-12.8	63	2.3	0.0-6.6	105	3.7	0.0-7.6
18-69	**186**	**4.8**	**1.4-8.1**	**430**	**4.5**	**1.7-7.3**	**616**	**4.6**	**2.5-6.7**

History of Raised Blood Sugar/Diabetes

The biochemical measurement in this survey includes the collection of blood sample from adults to measure a type of sugar in the body call glucose. There are several different types of blood glucose tests available but this survey used the fasting blood sugar (FBS), which measures blood glucose after you have not eaten for at least 8 hours. It is often the first test done to check for pre- diabetes and diabetes.

In general, up to 100 milligrams per deciliter (mg/dL) are considered normal for a fasting blood glucose test and persons with levels between 100 and 125 mg/dL have impaired fasting glucose, or pre-diabetes. These levels are considered to be risk factors for type 2 diabetes and its complications. Diabetes is diagnosed in persons with fasting blood glucose levels that are 126 mg/dL or higher.

Diabetes

Diabetes is a lifelong condition in which sugar (glucose) remains in the blood rather than entering the body's cells to be used for energy. This results in persistently high blood sugar, which, over time, can damage many body systems. Symptoms of diabetes include increased thirst and frequent urination (especially at night); unexplained increase in appetite; unexplained weight loss; fatigue; erection problems; blurred vision; and tingling, burning, or numbness in the hands or feet.

People who have diabetes are at increased risk for many serious health problems, including hardening of the arteries (atherosclerosis) and heart problems, eye problems that can lead to blindness, circulation and nerve problems, and kidney disease and kidney failure.

All forms of diabetes have been treatable since insulin became available in 1921, and type 2 diabetes may be controlled with medications. Both type 1 and 2 are chronic conditions that usually cannot be cured. Adequate treatment of diabetes is thus important, as well as blood pressure control and lifestyle factors such as smoking

cessation and maintaining a healthy body weight.
Diabetes mellitus is characterized by recurrent or persistent hyperglycemia, and is diagnosed by demonstrating any one of the following:

- Fasting plasma glucose level ≥ 7.0 mmol/L (126 mg/dL).
- Plasma glucose ≥ 11.1 mmol/L (200 mg/dL) two hours after a 75 g oral glucose load as in a glucose tolerance test.
- Symptoms of hyperglycemia and casual plasma glucose ≥ 11.1 mmol/L (200 mg/dL).
- Glycated hemoglobin (Hb A1C) ≥ 6.5%.

People with fasting glucose levels from 100 to 125 mg/dL (5.6 to 6.9 mmol/L) are considered to have impaired fasting glucose. Patients with plasma glucose at or above 140 mg/dL (7.8 mmol/L), but not over 200 mg/dL (11.1 mmol/L), two hours after a 75 g oral glucose load are considered to have impaired glucose tolerance. Of these two pre-diabetic states, the latter in particular is a major risk factor for progression to full-blown diabetes mellitus as well as cardiovascular disease.

Respondents were asked if they had their blood sugar measured by a doctor or other health worker.

Table 42 shows the percentage of respondents who have been measured for raised blood sugar or diabetes. Overall, 89.4% of the respondents had never been measured for raised blood sugar. Only one percent of the respondents have been diagnosed with raised blood sugar in the past 12 months. Table 19-20 in annex 1 shows the distribution by males and females.

Table 42: Blood sugar measurement and diagnosis among respondents

Age Group (years)	Both sexes								
	n	% Never measured	95% CI	% measured, not diagnosed	95% CI	% diagnosed, but not within past 12 months	95% CI	% diagnosed within past 12 months	95% CI
18-29	1350	92.6	89.4-95.7	6.6	3.7-9.6	0.2	0.0-0.4	0.6	0.0-1.6
30-44	1344	88.8	86.1-91.5	9.7	7.1-12.3	0.3	0.0-0.6	1.2	0.3-2.1
45-59	965	81.4	76.8-86.0	15.1	10.4-19.9	1.8	0.6-2.9	1.7	0.6-2.8
60-69	410	83.5	75.5-91.5	11.6	5.3-17.9	3.4	0.0-7.0	1.5	0.2-2.8
18-69	**4069**	**89.4**	**87.2-91.5**	**9.0**	**7.0-11.0**	**0.6**	**0.3-0.9**	**1.0**	**0.5-1.6**

Tables 43 below shows the percentage of respondents who reported to have been diagnosed with diabetes and are currently taking medication. Among those diagnosed with raised blood sugar, almost one-third (31.7%) of the respondents were currently taking medication compared to 19.2%. The proportion currently taking medication increases with age similarly observed in 2011.

Table 43: Currently taking drugs (medication) prescribed for diabetes among those previously diagnosed

Age Group (years)	Men			Women			Both Sexes		
	n	% taking insulin	95% CI	n	% taking insulin	95% CI	n	% taking insulin	**95% CI**
18-29	2	0.0	0.0-0.0	5	13.8	0.0-42.0	7	4.2	**0.0-13.9**
30-44	6	70.9	27.8-100.0	14	12.4	0.3-24.5	20	26.8	**1.8-51.9**
45-59	11	42.6	7.6-77.5	22	50.7	20.2-81.2	33	47.1	**26.1-68.1**
60-69	9	82.4	59.3-100.0	10	13.9	0.0-29.9	19	54.1	**18.6-89.6**
18-69	**28**	**38.7**	**6.8-70.7**	**51**	**25.4**	**10.7-40.0**	**79**	**31.7**	**17.2-46.1**

History of Raised Total Cholesterol

High serum total cholesterol (TC) is regarded by many as the primary factor causing coronary atherosclerosis, and it has been widely known that elevated TC is associated with an increased risk of cardiovascular disease (CVD) [17]. Blood cholesterol test profiles is usually categorized into low-density lipoprotein cholesterol (LDL), high-density lipoprotein cholesterol (HDL) and triglyceride.

Almost all, (97.4%) 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 (93.4 percent) as shown in table 44 below.

Table 44: Total cholesterol measurement and diagnosis among all respondents.

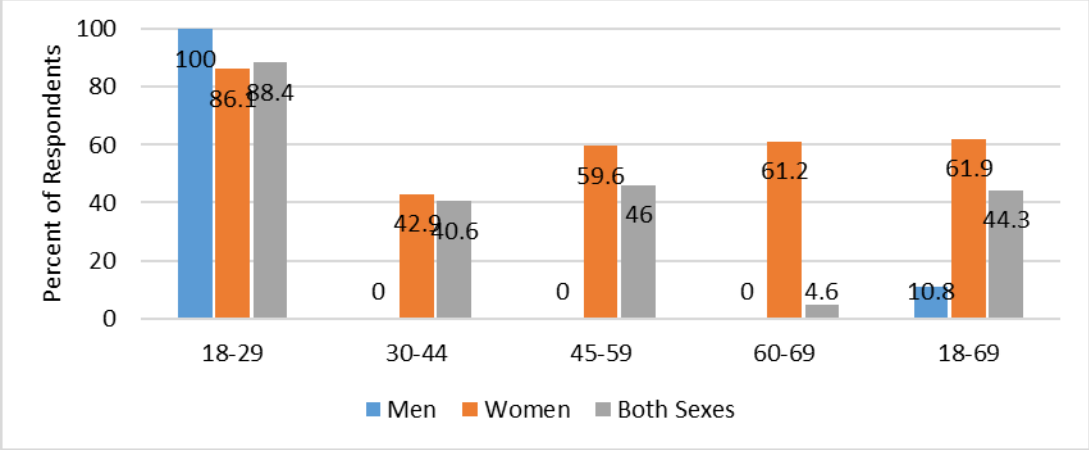
Age Group (years)	Men								
	n	% Never measured	95% CI	% measured, not diagnosed	95% CI	% diagnosed, but not within past 12 months	95% CI	% diagnosed within past 12 months	95% CI
18-29	444	99.5	98.8-100.0	0.4	0.0-1.0	0	0.0-0.0	0.1	0.0-0.3
30-44	494	98.9	97.9-99.8	1.1	0.1-2.0	0	0.0-0.0	0.1	0.0-0.2
45-59	401	92.4	86.0-98.7	7	0.7-13.3	0	0.0-0.0	0.6	0.0-1.7
60-69	193	92.5	84.8-100.0	1.1	0.0-2.8	6.1	0.0-13.6	0.3	0.0-0.9

[17] Jung E, Kong SY, Ro YS, Ryu HH, Shin SD. Serum Cholesterol Levels and Risk of Cardiovascular Death: A Systematic Review and a Dose-Response Meta-Analysis of Prospective Cohort Studies. Int J Environ Res Public Health. 2022 Jul 6;19(14):8272. doi: 10.3390/ijerph19148272. PMID: 35886124; PMCID: PMC9316578

18-69	**1532**	**97.9**	**96.8-99.0**	**1.7**	**0.6-2.7**	**0.3**	**0.0-0.6**	**0.2**	**0.0-0.4**
	Women								
18-29	906	98.1	96.8-99.4	1.4	0.4-2.4	0.1	0.0-0.2	0.4	0.0-1.2
30-44	850	97.5	96.2-98.9	1.5	0.5-2.6	0.2	0.0-0.4	0.7	0.0-1.6
45-59	564	94.5	91.2-97.8	3.1	0.2-5.9	0.5	0.0-1.6	1.9	0.0-3.8
60-69	217	97.7	95.0-100.0	1.9	0.0-4.3	0	0.0-0.0	0.5	0.0-1.1
18-69	**2537**	**97.4**	**96.5-98.4**	**1.7**	**0.9-2.5**	**0.2**	**0.0-0.3**	**0.7**	**0.2-1.3**
	Both sexes								
18-29	1350	98.8	98.1-99.5	0.9	0.3-1.5	0	0.0-0.1	0.3	0.0-0.7
30-44	1344	98.2	97.4-99.0	1.3	0.6-2.0	0.1	0.0-0.2	0.4	0.0-0.8
45-59	965	93.4	89.4-97.3	5.2	1.8-8.5	0.2	0.0-0.7	1.2	0.1-2.3
60-69	410	95.3	91.1-99.4	1.5	0.0-3.0	2.8	0.0-6.5	0.4	0.0-0.9
18-69	**4069**	**97.7**	**96.9-98.4**	**1.7**	**1.1-2.3**	**0.2**	**0.0-0.4**	**0.4**	**0.2-0.7**

Figure 12 below shows the percentage of respondents who were previously diagnosed with raised cholesterol and are currently on treatment. Of those diagnosed with raised cholesterol, roughly 11% of respondents reported currently taking treatment or medication. Moreover, of those diagnosed with cholesterol, the age group 18–29 years had a higher proportion (88.4%) currently on treatment when compared to other age groups; of the sexes in this age group, all men who were previously diagnosed are currently on treatment.

Figure 12: Percent of respondents currently taking oral treatment prescribed for raised cholesterol



Though aspirin and statins have been generally used for the past three decades to reduce cardiovascular events in patients, however, the proportion of respondents currently taking aspirin and statins regularly is very low, accounting for 2.2% and 0.6% respectively as shown in (Table 45) below.

Table 45: Percentage of respondents who are currently taking aspirin or statins regularly to prevent or treat heart disease

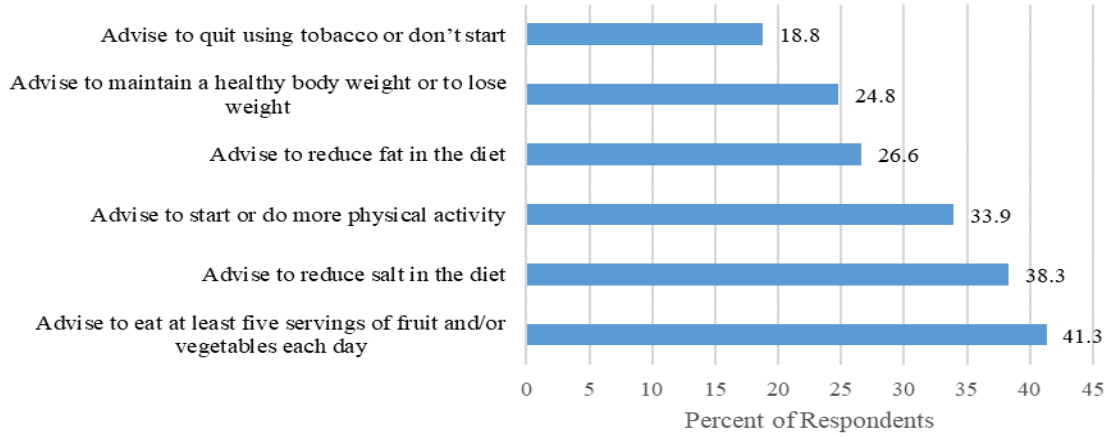
Age Group (Years)	Men			Women			Both Sexes		
	n	% taking aspirin	% taking statins	n	% taking aspirin	% taking statins	n	% taking aspirin	% taking statins
18-29	444	1.5	0.3	906	0.9	0.5	1350	1.2	0.4
30-44	494	3.2	0.6	850	3.1	0.9	1344	3.1	0.7
45-59	401	4.5	0.7	564	3.7	0.6	965	4.1	0.7
60-69	193	0.6	0.3	217	1.1	1.7	410	0.9	1
18-69	**1532**	**2.4**	**0.5**	**2537**	**2**	**0.7**	**4069**	**2.2**	**0.6**

3.2.6 Lifestyle Advice

Health workers play a crucial role in providing advice related to dietary habits, benefits of physical activity, health education and other lifestyles choices in the prevention of non-communicable diseases. shows the following lifestyle advice had reportedly been received from a doctor or health worker during the past three years among all respondents.

Respondents were asked if they had received lifestyle advice from a physician or a health care worker in the previous three years. Of those, 18.8% reported receiving advice on quitting smoking, 24.8% on maintaining a healthy body weight, 26.6% on reducing fats in diet, 33.9% on doing physical activity, 38.6% on reducing salt in diet, and 41.3% on eating five servings of fruits and vegetables each day (figure 13 below).

Figure 13: Percentage of respondents who received lifestyle advice from a doctor or health worker during the past three years among all respondents



3.2.7 Cervical Cancer Screening

The likelihood of successfully treating cancer is considerably increased by early detection. WHO launched the global Cervical Cancer Elimination Initiative in 2020 aiming to reduce incidence to a threshold of 4 cases per 100 000 women-years in every country and so reduce international disparities associated with this disease[18]

The STEPS survey sought to assess from the female respondents aged 30-49 years if they had a screening test for cervical cancer. Table 46 shows the percentage of women who have had a screening test for cervical cancer. Of all female respondents aged between 30 and 49 years old, only 1.9% stated ever having a screening test for cervical cancer.

[18] WHO. (2020). Global strategy to accelerate the elimination of cervical cancer as a public health problem. *In*.

Table 46: Percentage of women aged 30-49 years who have ever been screened for cervical cancer

Age Group (years)	Women		
	n	% ever tested	95% CI
30-49	**790**	**1.9**	**0.7-3.2**

3.2.8 Physical Measurement

The WHO STEPS instrument was used to collect data on selected socio-demographic characteristics and lifestyle behaviors including physical activity, and physical measurements of weight, height, waist and hip circumference, as well as blood pressure. Weight and height were measured with participants standing without shoes and wearing light clothing. Participants stood upright with the head in Frankfort plane for height measurement. Height was recorded to the nearest 0.5 cm, and weight was recorded to the nearest 100g. Body-mass index (BMI) was calculated as weight in kilograms over height in meters squared [weight (kg)/ (height (m)2]. Waist circumference was measured at the level of the iliac crest using a non-elastic tape measure. Hip circumference was measured at the maximum circumference of the hip. Waist-to-hip ratio (WHR) was calculated as a ratio of waist and hip circumference.

Body Mass Index (BMI)

Body Mass Index is used to estimate your total amount of fat. This calculator is designed for men and women over the age of 18. A healthy BMI for an adult is between 20 and 25. Once you have measured an individual BMI, you can determine his/her healthy weight range. If BMI is:

- Under 18 - you are very underweight and possibly malnourished.
- Under 20 - you are underweight and could afford to gain a little weight.
- 20 to 25 - you have a healthy weight range for young and middle-aged adults.
- 26 to 30 - you are overweight
- Over 30 - you are obese.

Height, Weight, Body Mass Index (BMI)

The survey assessed respondents' height, weight and determined their correspondent body mass index based on their height and weight. The result shows that men were generally taller and with more weight (67.7 kg/m^2) than women (65.2 kg/m^2). On the other hand, women had a slight more average BMI (26.3 kg/m^2) than men (25 kg/m^2). These trends are similar to the 2011 results. Figure 14 presents respondents' height, weight and body mass index.

Figure 14: Mean height, weight, and body mass index among all respondents (excluding pregnant women).

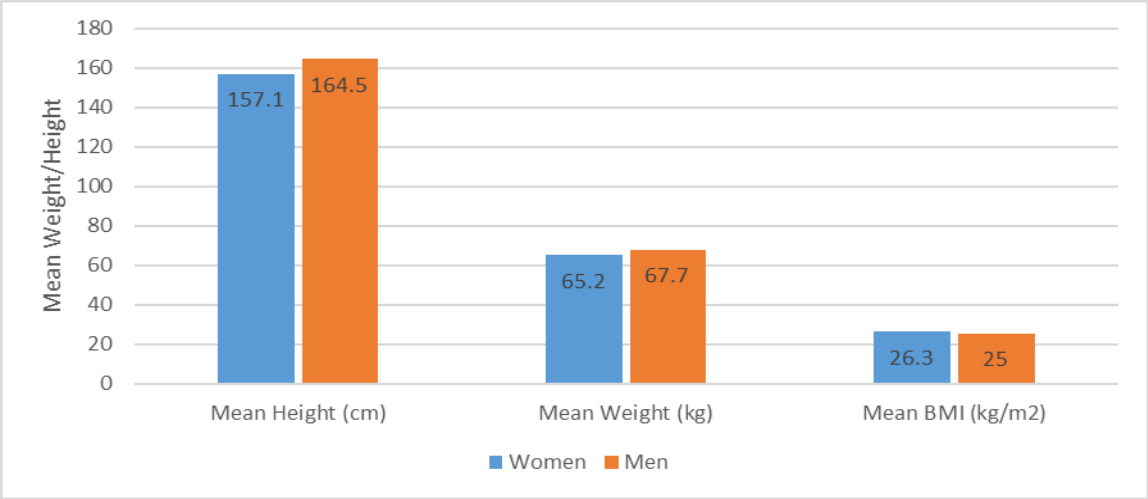


Table 47 below depicts the mean body mass index of the sampled population by age and sex. The mean BMI Index (kg/m^2) for all the respondents was 25.7 kg/m^2 compared to 26.4 kg/m^2 in 2011. There were no significant difference of the mean BMI (kg/m^2) between age groups.

Table 47: Mean BMI (kg/m2) of Respondents by Age/Sex

Age Group (years)	Men				Women				Both Sexes		
	n	Mean	95% CI		n	Mean	95% CI		n	Mean	95% CI
18-29	440	24.8	22.8-26.8		794	25.4	24.0-26.8		1234	25.1	**23.7-26.4**
30-44	492	25.8	24.3-27.4		779	27.5	25.8-29.2		1271	26.6	**25.2-28.0**
45-59	398	24.6	23.7-25.5		556	27.7	26.6-28.7		954	26.1	**25.3-26.8**
60-69	193	24.5	23.1-25.8		215	24.8	22.9-26.6		408	24.6	**23.6-25.6**
18-69	**1523**	**25.0**	**23.8-26.3**		**2344**	**26.3**	**25.1-27.6**		**3867**	**25.7**	**24.6-26.8**

The STEP survey determined different BMI classification of the sampled population. Results from Figure 16 indicate that a little over half (54.9%) of all the respondents had normal BMI (18.5-24.9) compared 45.9% in 2011. The result also shows that 6.3% of men were underweight, 60.2% had normal weight and 17.7% were obese compared to 4% under weight, 53% normal weight and 15.4% Obese in 2011. Similarly, 5.2% of women were underweight, 49.3% had normal weight and 22.2% were obese as compared to 4.2% under-weight, 38.7% normal weight and 28.7% Obesity.

Figure 15: Proportion of Respondents per BMI classification

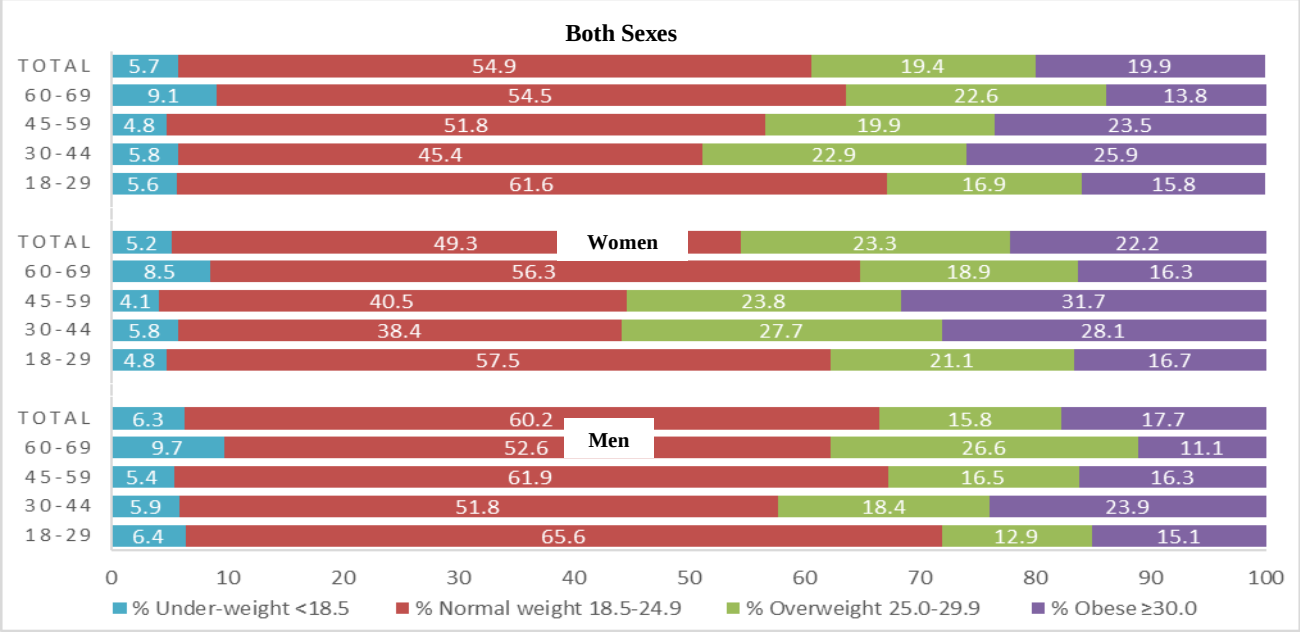
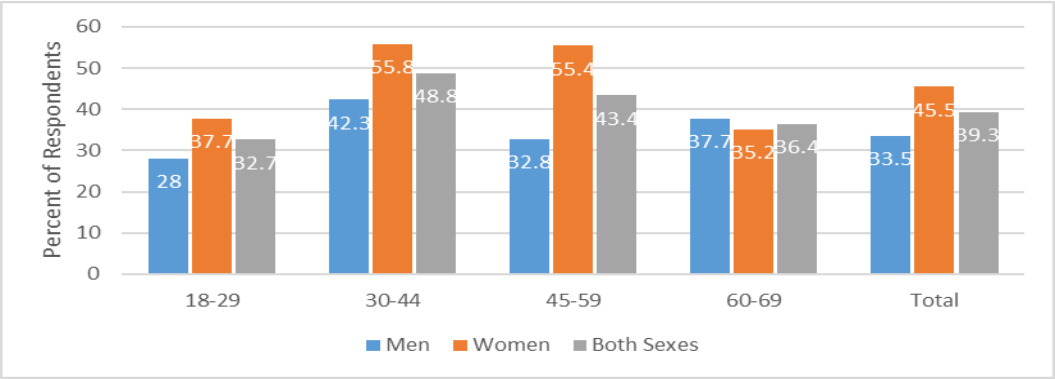


Figure 16 below presents the percentage of respondents (excluding pregnant women) that were overweight by sex. About 39% of the respondents were found to be overweight compared to 27.9% in 2011. The figure below also shows that 33.5% of men and 45.5% of women were overweight compared to 43% men and 57% women in 2011. Additionally, the proportion of overweight women was significantly higher for the 30 to 44 and 45 to 59 age groups compared to the 18 to 29 and 60-69 age group.

Figure 16: **Percentage of respondents (excluding pregnant women) classified as overweight (BMI≥25).**



3.2.8.2 Waist and Hip Measurements

Waist Circumference Measurement

High Waist Circumference (WC) is associated with an increased risk for type 2 diabetes, dyslipidemia, hypertension and cardiovascular disease when the BMI is between 25 and 34.9. Waist Circumference can be useful for those people categorized as normal or overweight in terms of BMI. For example, an athlete with increased muscle mass may have a BMI greater than 25 - making him or her overweight on the BMI scale - but a Waist Circumference measurement would most likely indicate that he or she is, in fact, not overweight. Changes in Waist Circumference over time can indicate an increase or decrease in abdominal fat. Increased abdominal fat is associated with an increased risk of heart disease.

Waist circumference and BMI are interrelated, but waist circumference provides an independent prediction of risk over and above that of BMI. This is because body fat that accumulates around the stomach area poses a greater health risk than fat stored in the lower half of the body.

Waist circumference measurement is particularly useful in patients who are categorized as overweight on the BMI scale, although increased waist circumference can also be a marker for increased risk even in persons of normal weight. However, for someone with a BMI of 35 or over (obese), waist circumference has little added predictive power of disease risk beyond that of BMI. It is therefore not necessary to measure waist circumference in individuals with BMIs of 35 or over.

To determine your Waist Circumference, locate the upper hip bone and place a measuring tape around the abdomen (ensuring that the tape measure is horizontal).
As such, to assess the etiological link between adiposity and cardiovascular disease, measures of central adiposity and body composition, such as waist circumference, waist-to-hip ratio, and waist-to-height ratio, may be more appropriate than BMI[19].
The World Health Organization (WHO) determines the cut-off points and risk of metabolic complications with regards to waist and hip circumference ratio for women and men as shown below in table 48:

Table 48: World Health Organization cut-off points and risk of metabolic complications

Indicator	Cut-off points	Risk of metabolic complication
Waist Circumference	>94 cm (M); >80 cm (W)	Increased
Waist Circumference	>102 cm (M); >88 cm (W	Substantially increased
Waist-hip ratio	≥0.90 cm (M); ≥0.85 cm (W)	Substantially increased

During the survey, respondents' waists were measured to determine their health status. To determine the waist circumference, the upper hip bone was located and place a measuring tape around the abdomen (ensuring that the tape measure is horizontal). Result from these measurements show a mean waist circumference of 76.3 centimeters for men and 78.6 centimeters for females as compared to 73.3cm and 80.4cm men and women in 2011. Table 49 presents respondents waist circumference by age and sex.

Table 49: Mean Waist circumference (cm) of respondents by age by sex

Age Group (years)	Men				Women		
	n	Mean	95% CI		n	Mean	95% CI
18-29	443	74.3	72.7-75.8		797	74.7	**72.2-77.1**
30-44	494	76.9	75.0-78.8		790	81.3	**78.6-83.9**
45-59	399	80.9	78.1-83.6		561	84.1	**81.0-87.2**
60-69	192	79.2	75.9-82.6		217	83.9	**80.8-87.0**
18-69	**1528**	**76.3**	**75.0-77.6**		**2365**	**78.6**	**76.7-80.4**

[19] Peters, S. A., Bots, S. H., & Woodward, M. (2018). Sex differences in the association between measures of general and central adiposity and the risk of myocardial infarction: results from the UK Biobank. *Journal of the American Heart Association*, *7*(5), e008507.

Hip Circumference Measurement

The waist circumference is widely viewed as a simple but effective measure for assessing obesity-related health risks, whereas measurement of the hip circumference is not currently prioritized. Abdominal obesity is increasingly recognized as a major risk factor for cardiovascular disease (CVD). Compared with body mass index (BMI), anthropometric measures of abdominal obesity (e.g. waist circumference and waist-to-hip ratio), appear to be more strongly associated with metabolic risk factors. Waist to hip ratio is an important tool that helps determine the overall health risk. Individuals with more weight around their waist are at greater risk of lifestyle related diseases such as heart disease and diabetes than those with weight around their hips. Hip measurement is a simple but useful measure of fat distribution.

During the survey, respondents' hip circumference was determined. Result from the anthropometric measurements show that the mean hip circumference of men was 89.3 cm and 92.2 cm for women as compared to 86.8cm and 94.9cm men and women in 2011. Table 50 presents respondents hip circumference by age and sex.

Table 50: Respondents Hip circumference (cm) by Age and Sex

Age Group (years)	Men				Women		
	n	Mean	95% CI		n	Mean	**95% CI**
18-29	443	88.1	86.5-89.8		797	89.4	**86.7-92.1**
30-44	494	89.5	87.0-91.9		790	94.7	**91.5-97.8**
45-59	399	92.1	89.9-94.3		561	95.6	**92.6-98.5**
60-69	192	90.9	87.2-94.7		217	94.6	**91.0-98.1**
18-69	**1528**	**89.3**	**87.8-90.7**		**2365**	**92.2**	**90.1-94.2**

Waist–hip ratio

The waist-hip ratio, which is calculated by dividing the waist circumference by hip circumference, is an index used to determine who is most at risk for obesity-related morbidity due to the accumulation of abdominal fat. Hip measurement is a simple but useful measure of fat distribution. Table 51. below shows the percentage of respondents' mean waist hip ratio values by sex and age group. The mean waist/hip ratio for both males and females was similar at 0.9. Table 51 below shows further distribution.

Table 51: Mean waist / hip ratio of respondents by age by sex

Age Group (years)	Men				Women		
	n	Mean	95% CI		n	Mean	**95% CI**
18-29	443	0.8	0.8-0.8		797	0.8	**0.8-0.8**
30-44	494	0.9	0.8-0.9		790	0.9	**0.9-0.9**
45-59	399	0.9	0.9-0.9		561	0.9	**0.9-0.9**
60-69	192	0.9	0.9-0.9		217	0.9	**0.9-0.9**
18-69	**1528**	**0.9**	**0.8-0.9**		**2365**	**0.9**	**0.8-0.9**

3.2.8.3 Blood Pressure

High blood pressure (HBP), also called hypertension, is blood pressure that is higher than normal. This is a serious condition that can lead to coronary heart disease (also called coronary artery disease), heart failure, stroke, kidney failure, and other health problems. Blood pressure measurement is vital as a first step in subsequent hypertension prevention. Therefore, the STEPS survey data can be used to determine which social backgrounds are associated with lower blood pressure measurements in Liberia.
Blood pressure measurements usually have the systolic and diastolic numbers**:**

- Systolic number: the systolic number is the first and higher number, it measures the pressure in your arteries when your heart beats.

- Diastolic numbers: the second and lower number, measures the pressure in your arteries when your heart rests between beats.

Blood pressure numbers of less than 120/80 mm Hg are considered within the normal range. Elevated blood pressure is when readings consistently range from 120-129 systolic and less than 80 mm Hg diastolic. Three consecutive measurements of blood pressure were taken from 4,059 (99.7%) of the survey population. The remaining individuals refused to participate in the measurement of blood pressure, mainly due to misconception, discomfort associated with the repeated measurements of blood collection, among others.

Systolic blood pressure
Blood pressure among all respondents, including those currently on medication for raised blood pressure was assessed. Data from these measurements indicate that the mean systolic blood pressure for men was 125.3 mmHg, 121.5 mmHg for women and 123.3 mmHg for both sexes compared to 129.7 mmHg, 127.8 mmHg for women and 128.7 mmHg for both sexes in 2011. Table 52 shows respondents mean systolic blood pressure.

Table 52: Mean systolic blood pressure (mmHg) of respondents by age by sex

Age Group (years)	Men				Women				Both Sexes		
	n	Mean	95% CI		n	Mean	95% CI		n	Mean	**95% CI**
18-29	444	123.7	121.8-125.7		906	116.3	114.8-117.8		1350	120.0	**118.6-121.3**
30-44	492	124.3	122.4-126.2		848	121.8	118.7-124.9		1340	123.1	**121.4-124.7**
45-59	399	128.3	124.1-132.5		561	135.9	133.2-138.5		960	131.9	**129.0-134.7**
60-69	193	137.2	131.7-142.7		216	132.9	122.7-143.1		409	134.9	**127.5-142.2**
18-69	**1528**	**125.3**	**123.9-126.6**		**2531**	**121.5**	**120.2-122.7**		**4059**	**123.3**	**122.4-124.3**

In addition to the systolic blood pressure measurement, diastolic pressure was also assessed. Result from the survey show that the mean diastolic blood pressure for men was 81.2 mmHg, 80.9 mmHg for women and 81.1 mmHg for both sexes compared to mean diastolic blood pressure for men was 79.5 mmHg, 79.9 mmHg for women and 79.7 mmHg for both sexes. Table 53 presents respondents mean diastolic blood pressure.

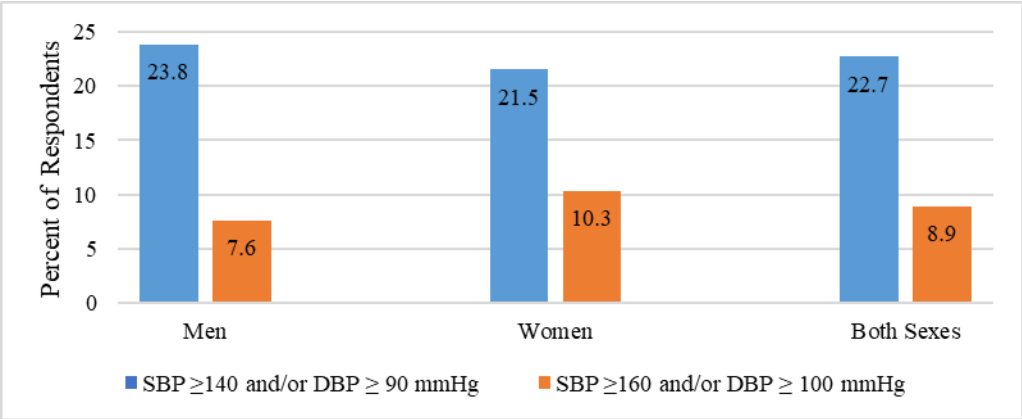
Table 53: Mean diastolic blood pressure (mmHg) by age and sex of respondents

Age Group (years)	Men				Women				Both Sexes		
	n	Mean	95% CI		n	Mean	95% CI		n	Mean	95% CI
18-29	444	78.4	76.9-79.9		906	77.4	76.3-78.5		1350	77.9	**76.9-78.9**
30-44	492	82.4	81.2-83.7		848	82.7	80.8-84.6		1340	82.6	**81.5-83.6**
45-59	399	85.6	83.5-87.7		561	89.5	88.0-90.9		960	87.4	**86.1-88.7**
60-69	193	88.7	85.6-91.8		216	84.2	77.6-90.7		409	86.3	**81.8-90.7**
18-69	**1528**	**81.2**	**80.4-82.1**		**2531**	**80.9**	**80.2-81.7**		**4059**	**81.1**	**80.4-81.7**

High Blood Pressure

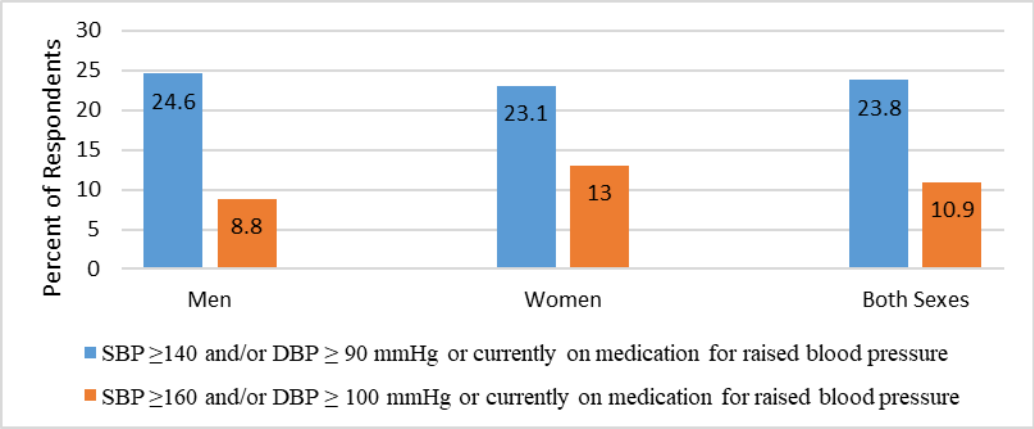
Figure 17 highlights the percentage of respondents with high blood pressure levels. Overall, 22.7% of the respondents were found to have blood pressure readings of SBP ≥140 and/or DBP ≥ 90 mmHg whereas 8.9% were found to have blood pressure readings of SBP ≥160 and/or DBP ≥ 100 mmHg. In comparison with sexes, more men had high blood pressure readings of SBP ≥140 and/or DBP ≥90 mmHg than women, on the other hand more women had high blood pressure readings of SBP ≥160 and/or DBP ≥ 100 mmHg than men.

Figure 17: Percent of Respondents with High Blood Pressure



Overall, 23.8% respondents had either elevated blood pressure (SBP ≥140 and/or DBP ≥ 90 mmHg) or were currently on medication for high blood pressure whereas only eleven percent had either elevated blood pressure (SBP ≥160 and/or DBP ≥ 100 mmHg) or were currently on medication for high blood pressure. No significant difference was found between the sexes (Figure 18).

Figure 18: Percent of Respondents receiving Medication for Raised Blood Pressure Among Those Diagnosed



Majority of the respondents (71.8%) with raised blood pressure had never had their blood pressure checked for hypertension (HTN). Distribution among sexes show more men (75.6%) compared to women (67.9%) with raised blood pressure had never had their blood pressure checked for hypertension (HTN). To those who have been previously diagnosed with raised blood pressure and not on medication accounted for 14.2% men and 12.9% women. Table 54 and 55 below show details of respondents with raised blood pressure diagnosis, treatment and control among those with raised blood pressure (SBP ≥ 140 and/or DBP ≥ 90 mmHg) or on medication for raised blood pressure.

Table 54: Raised blood pressure diagnosis, treatment and control among those with raised blood pressure (SBP ≥ 140 and/or DBP ≥ 90 mmHg) or on medication for raised blood pressure

Age Group (years)	Men								
	n	% with raised blood pressure, not previously diagnosed	95% CI	% with previously diagnosed raised blood pressure, not on medication	95% CI	% with previously diagnosed raised blood pressure, on medication but not controlled	95% CI	% with previously diagnosed raised blood pressure, on medication and blood pressure controlled	95% CI
18-29	66	76.0	55.7-96.2	19.1	0.0-39.9	2.8	0.0-8.3	2.2	0.0-5.1
30-44	106	89.5	80.9-98.0	4.8	0.0-10.5	2.5	0.0-5.9	3.2	0.0-9.0
45-59	155	63.0	53.4-72.6	17.7	10.0-25.4	14.9	7.6-22.2	4.4	1.1-7.7
60-69	104	61.8	47.5-76.0	13.5	3.9-23.1	20.7	8.2-33.3	4.0	0.0-8.1
18-69	**431**	**75.6**	**66.0-85.1**	**14.2**	**4.8-23.7**	**7.1**	**3.5-10.6**	**3.1**	**0.9-5.4**

Table 55: Raised blood pressure diagnosis, treatment and control among those with raised blood pressure (SBP ≥ 140 and/or DBP ≥ 90 mmHg) or on medication for raised blood pressure

Age Group (years)	Women								
	n	% with raised blood pressure, not previously diagnosed	95% CI	% with previously diagnosed raised blood pressure, not on medication	95% CI	% with previously diagnosed raised blood pressure, on medication but not controlled	95% CI	% with previously diagnosed raised blood pressure, on medication and blood pressure controlled	95% CI
18-29	105	75.4	63.6-87.2	11.2	3.3-19.0	5.6	0.0-12.2	7.8	1.7-14.0
30-44	202	66.5	55.6-77.3	10.9	5.1-16.8	13.6	3.8-23.5	9.0	3.0-15.0
45-59	260	63.1	54.0-72.2	16.7	10.2-23.2	17.1	10.2-23.9	3.2	1.4-4.9
60-69	122	65.2	50.4-79.9	12.6	2.4-22.9	16.3	7.6-24.9	5.9	1.1-10.8
18-69	**689**	**67.9**	**61.4-74.5**	**12.9**	**9.2-16.6**	**12.6**	**8.3-16.8**	**6.6**	**4.0-9.3**

3.9 Biochemical Measurement

The biochemical measurement in this survey includes the collection of blood sample from adults to measure a type of sugar in the body call glucose. There are several different types of blood glucose tests available but this survey used the fasting blood sugar (FBS), which measures blood glucose after you have not eaten for at least 12 hours. It is often the first test done to check for pre- diabetes and diabetes.

About 100 milligrams per deciliter (mg/dL) are considered normal for a fasting blood glucose test and persons with levels between 100 and 125 mg/dL have impaired fasting glucose, or pre-diabetes. These levels are considered to be risk factors for type 2 diabetes and its complications. Diabetes is diagnosed in persons with fasting blood glucose levels that are 126 mg/dL or higher.

3.9.1 Blood Glucose Measurements

In this survey, respondents who had fasted for at least 12 hours had their blood glucose levels checked. Tests were conducted utilizing a Cardiocheck machine that utilized test strips for both the lipid profile and blood glucose.

Mean Fasting Glucose

Table 56 below shows that the mean fasting glucose is 4.4 mmol/l (78.4mg/dl). The was no significant difference in mean fasting glucose between the sexes.

Table 56: Mean fasting blood glucose (mmol/L) (mg/dl) of respondents by age and sex

Age Group (years)	Men				Women				Both Sexes		
	n	Mean (mmol/L)	Mean (mg/dl)		n	Mean (mmol/L)	Mean (mg/dl)		n	Mean (mmol/L)	Mean (mg/dl)
18-29	399	4.1	73.4		825	4.2	75.9		1224	4.1	74.7
30-44	446	4.4	80.1		776	4.5	81.4		1222	4.5	80.8
45-59	379	4.5	81.8		521	4.7	85.3		900	4.6	83.4
60-69	181	4.8	86.2		204	4.8	86.5		385	4.8	86.4
18-69	**1405**	**4.3**	**77.3**		**2326**	**4.4**	**79.4**		**3731**	**4.4**	**78.4**

The percentage of sampled population with impaired fasting glycaemia (fasting plasma glucose 6.1 to 6.9 mmol/L [110 to 125 mg/dL]), was 1.3% for men, 4.3% for women and 2.8% for both sexes (Table 57).

Table 57: Percent of Respondents with Impaired Fasting Glycaemia

Age Group (years)	Men				Women				Both Sexes		
	n	%	95% CI		n	%	95% CI		n	%	95% CI
18-29	399	1.2	0.1-2.4		825	4.9	2.2-7.6		1224	3.1	**1.5-4.6**
30-44	446	1.3	0.1-2.5		777	3.9	1.2-6.6		1223	2.7	**1.2-4.2**
45-59	379	1.7	0.4-3.0		521	3.2	1.4-4.9		900	2.4	**1.2-3.5**
60-69	182	0.5	0.0-1.3		204	2.9	0.0-5.9		386	1.8	**0.2-3.3**
18-69	**1406**	**1.3**	**0.5-2.1**		**2327**	**4.3**	**2.4-6.1**		**3733**	**2.8**	**1.7-3.8**

Table 58 below shows the percent of respondents who have raised blood glucose or are on treatment for diabetes by age group and sex. Only one 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 men with age group 60-69 years (6.3 percent).

Table 58: Percent of Respondents with Raised blood glucose or currently on medication for diabetes

Age Group (years)	Men				Women				Both Sexes		
	n	%	95% CI		n	%	95% CI		n	%	95% CI
18-29	403	0.1	0.0-0.2		835	0.2	0.0-0.6		1238	0.2	**0.0-0.3**
30-44	456	1.6	0.3-2.9		787	2.8	0.0-6.2		1243	2.2	**0.3-4.1**
45-59	382	1.3	0.2-2.5		526	3.6	1.2-6.0		908	2.4	**1.0-3.8**
60-69	183	6.3	0.0-14.7		205	0.9	0.0-2.1		388	3.5	**0.0-7.7**
18-69	**1424**	**1.0**	**0.4-1.6**		**2353**	**1.5**	**0.4-2.6**		**3777**	**1.3**	**0.5-2.0**

3.9.2 Blood Cholesterol Measurements

Mean total cholesterol

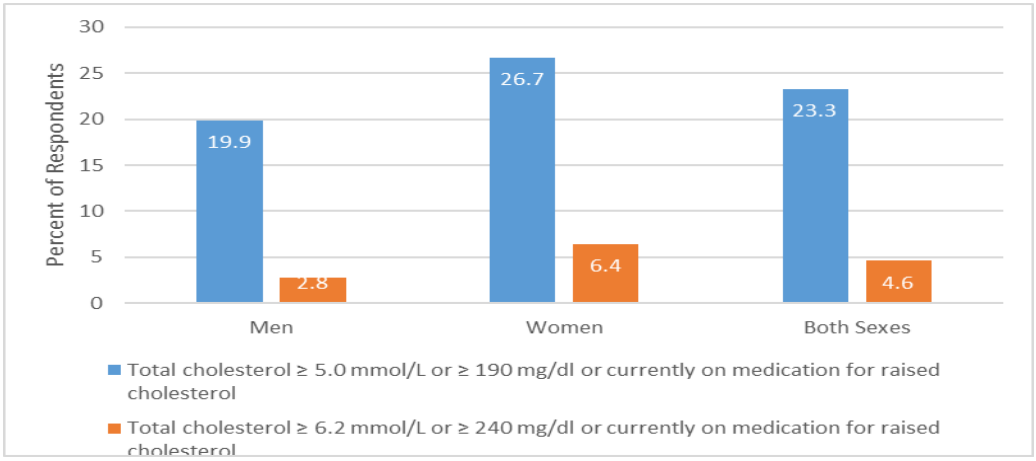
Table 59 below reveals that the overall mean total cholesterol is 4 mmol/L (153.2mg/dl). Women in age group 45-59 has the highest mean at 4.5 mmol/L (172.9mg/dl).

Table 59: Percent of respondents with Mean total cholesterol (mmol/L) (mg/dl)

Age Group (years)	Men				Women				Both Sexes		
	n	Mean (mmol/L)	Mean (mg/dl)		n	Mean (mmol/L)	Mean (mg/dl)		n	Mean (mmol/L)	Mean (mg/dl)
18-29	403	3.5	136.3		834	4	155		1237	3.8	145.7
30-44	456	3.9	152.1		787	4.2	164.3		1243	4.1	158.4
45-59	382	4.1	159.4		526	4.5	172.9		908	4.3	165.7
60-69	183	4.3	164.7		205	4.1	159.2		388	4.2	161.8
18-69	**1424**	**3.8**	**145.9**		**2352**	**4.2**	**160.5**		**3776**	**4**	**153.2**

Respondents with raised total cholesterol (defined as ≥ 5.0 mmol/L or ≥ 190 mg/dl) or those currently on medication for raised cholesterol constituted 23.3% (19.9% in males and 26.7% in females). Also, the prevalence of respondents with very high total cholesterol (defined as cholesterol ≥ 6.2 mmol/L or ≥ 240 mg/dl) or those currently on medication for raised cholesterol was seen in 4.6% of all respondents (2.8% in males and 6.4% in females). There were significant differences seen between the sexes (Figure 19).

Figure 19: Respondents with Raised Total Cholesterol or Currently on Medication



3.10 Cardiovascular Disease Risk

The percentage of eligible persons (defined as aged 40-69 years with a 10-year cardiovascular disease (CVD) risk* ≥20%, including those with existing CVD) receiving drug therapy and counseling** (including glycaemic control) to prevent heart attacks and strokes was calculated using available data but with emphasis on the following:

- Gender, age
- Smoking status
- Systolic blood pressure measurements
- History of diabetes
- Total cholesterol measurements
- Body mass index

Table 60 below reveals that the percentage of respondents by level of 10-year CVD risk among age group 40-49 was highest among less than 10% of the population in both males and females. With in 10-20% of the population, the 10-year CVD risk is the highest among age group 55-69. This trend is the same for both sexes.

Table 60: percentage of eligible persons (defined as aged 40-69 years with a 10-year cardiovascular disease (CVD) risk* ≥20% in the general population of Liberia

Percentage of respondents by level of 10-year CVD risk							
Age Group (years)	Men						
	n	<10%	95% CI	10-20%	95% CI	≥20%	95% CI
40-54	460	98.6	85.8-99.5	1.4	0.5-4.2	-	-
55-69	268	78.1	69.5-84.8	19.4	13.2-27.5	2.6	0.8-8.1
40-69	**728**	**92.7**	**89.5-95.0**	**6.6**	**4.5-9.6**	**0.7**	**0.2-2.5**

Percentage of respondents by level of 10-year CVD risk							
Age Group (years)	Women						
	n	<10%	95% CI	10-20%	95% CI	≥20%	95% CI
40-54	648	100.0	-	-	-	-	-
55-69	327	82.7	77.6-86.8	16.4	12.4-21.3	1.0	0.2-4.1
40-69	**975**	**94.7**	**92.9-96.1**	**5.0**	**3.6-6.9**	**0.3**	**0.0-1.2**

Percentage of respondents by level of 10-year CVD risk							
Age Group (years)	Both Sexes						
	n	<10%	95% CI	10-20%	95% CI	≥20%	95% CI
40-54	1108	99.3	97.8-99.8	0.7	0.2-2.2	-	-
55-69	595	80.4	75.7-84.4	17.9	14.2-22.2	1.7	0.7-4.6
40-69	**1703**	**93.7**	**92.0-95.2**	**5.8**	**4.6-7.3**	**0.5**	**0.2-1.4**

Similarly in table 61 below, the percentage of respondents with a 10-year CVD risk ≥20% or with existing CVD was higher among males (14.3%) compared to females (10.7%) with a combined percentage of 12.5% among both sexes. These findings are the same among men but different among females with age group 40-54 having 11.6%. The table below shows further distribution.

Table 61: Percentage of respondents with a 10-year CVD risk ≥20% or with existing CVD

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
40-54	460	14.3	9.0-22.0	650	11.6	8.1-16.4	1110	13.0	9.3-17.8
55-69	268	14.4	9.7-20.8	327	8.5	4.7-14.9	595	11.4	7.9-16.3
40-69	**728**	**14.3**	**10.1-19.9**	**977**	**10.7**	**7.5-14.9**	**1705**	**12.5**	**9.5-16.4**

As shown in table 62 below, the percentage of eligible persons receiving drug therapy and counseling to prevent heart attacks and strokes was also assessed during the study. The study reveals that more females (19.9%) than males (8.2%) were receiving drug therapy and counseling to prevent heart attacks and strokes with a combined percentage of 12.5. The table below show further distribution.

Table 62: Percentage of eligible persons receiving drug therapy and counseling to prevent heart attacks and strokes

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
40-54	76	6.3	2.4-15.7	106	20.9	11.3-35.3	182	12.7	7.0-21.9
55-69	49	13.0	5.5-27.6	53	16.6	6.4-36.9	102	14.4	7.8-25.0
40-69	**125**	**8.2**	**4.3-15.3**	**159**	**19.9**	**11.6-32.0**	**284**	**13.1**	**8.3-20.1**

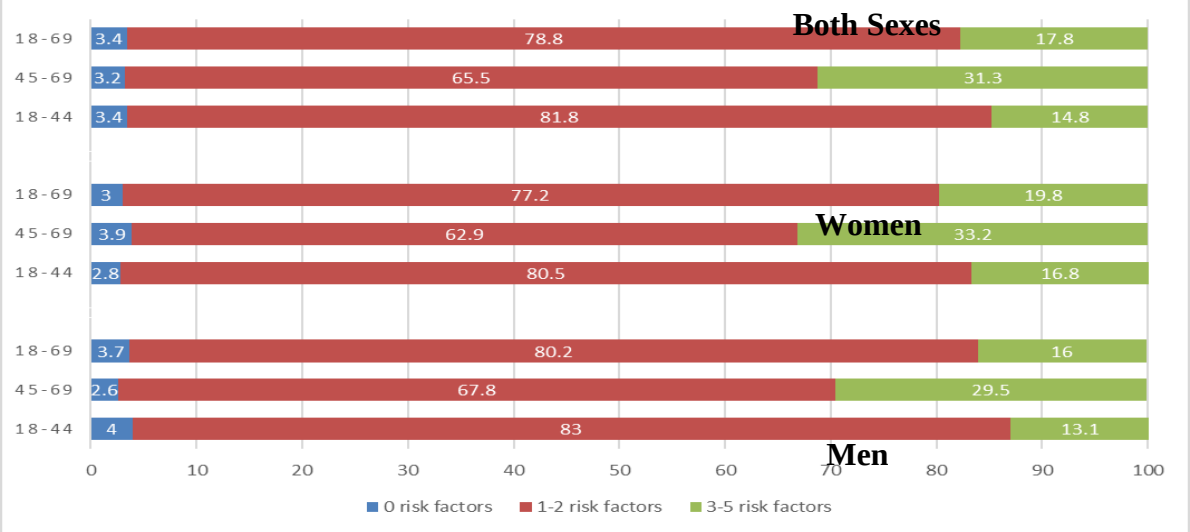
3.11. Summary of Combined Risk Factors

The relationship between behavioral and biological risk factors (such as smoking, physical activity or having increased blood sugar), age, and sex determines the combined risk of getting cardiovascular disease (CVD). The results were divided by two age groups—18 to 44 and 45 to 69—and assessed for the following combination of risk factors:

- Current daily smoking
- Less than five servings of fruit and/or vegetables per day
- Not meeting WHO recommendations on physical activity for health (<150 minutes of moderate activity per week, or equivalent)
- Overweight or obese (BMI ≥ 25 kg/m^2)
- Raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg or currently on medication for raised BP)

Findings from the survey indicate that only 3.4% of the sample population (compared to 1.1% in 2011) had none of the risk factors for NCD, 78.8% had 1-2 risk factors, and 17.8% had 3-5 risk factors. About 8 in 10 (81.8%) adults in the 18 to 44 age group had one to two risk factors. This was significantly higher than the age group 45–69, for whom it was around six in ten (65.5%). Figure 20 presents a summary of combined risk factors.

Figure 20: Percentage of respondents with 0, 1-2, or 3-5 of the following risk factors



Chapter 4: Discussion and Conclusion

This survey is the second national STEPwise survey being conducted after eleven years from conducting the first one in 2011. The 2011 STEPwise Survey provided evidence-based baseline data for estimating the magnitude and prevalence of non-communicable disease risk factors within the Liberian population, whereas the 2022 STEPwise Survey for non-communicable disease risk factors provides the country with an updated information regarding the four main NCD risk factors (tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets) likewise proving trend analysis on the NCD risk factors in Liberia.

Tobacco Use

The tobacco epidemic is regarded as one of the world's biggest public health problems it has ever faced, killing more than 8 million people around the world every year. The STEP survey revealed that the prevalence of current tobacco smokers aged 18-69 years is relatively low. Only 7.4% of Liberian adults currently smoke any tobacco products. However, smoking among men aged 18 to 29 was almost three times than the women. When compared to the STEP 2011 Survey, the prevalence of current tobacco smokers has reduced by 4.1%. The variation with the current smoker prevalence could be attributed to the varying ages of the sample population employed. The respondents in the 2011 STEP survey were aged 25–69, while in the 2022 STEP survey, the respondents were aged 18–69.

Second-hand smoke exposure causes serious disease and death, including heart disease and lung cancer in non-smoking adults and sudden infant death syndrome, acute respiratory infections, ear problems, and more frequent and severe asthma attacks in children (US Department of Health and Human Services, 2010). The survey revealed that 21.9% and 22.3% of Liberians reported to be exposed to second-hand smoking (SHS) in home and workplace respectively. This report revealed a significant decline in second-hand smoke (SHS) exposure when compared to the STEP 2011 report, which revealed 37.5% and 43.1% reported to be exposed to second-hand smoke in the home and workplace, respectively. This decline could be as a result of the adoption of the WHO Framework Convention on Tobacco Control (FCTC) by the Liberian Government and also the implementation of the law passed in 2008 that prohibits smoking in buses, restaurants, workplaces, and other public places in Liberia. The ban also prohibits those under the age of 18 from buying or using tobacco products. Though it can be indicated that the country is in the right direction in tobacco control, it needs to sustain and scale-up tobacco control efforts throughout the country.

Smokeless tobacco consumption in the country is 2.2% indicating that targeted initiatives should be developed to reduce smokeless tobacco consumption. The proportion of current smokers who smoke manufacture cigar has declined by 18.5% when compared to the 2011 STEP survey showing 91.8% in 2011 and 73.3% in 2022. Yet a significant proportion of smokers smoke at least six manufactured cigars daily, government should levy high import taxes on tobacco products to serve as a deterrent to the use of manufactured tobacco.

After 11 years since the first STEP survey, the mean age started tobacco smoking is about the same,21.5 years in 2011 and 21.3 years in 2022. Warnings on cigarettes packs and shisha devices can play an important role in raising awareness among youth and prevent them from starting smoking. About 32% of current tobacco smokers were advised by a health provider to stop smoking. This shows a need for incorporating cessation services in Health facilities.

Alcohol consumption

The harmful use of alcohol is among the common risk factors for NCDs and is associated with over 200 diseases and conditions (World Health Organization, 2014). The proportion of respondents who currently drink alcohol such as beer, whisky, spirit and local beverages, is 32% showing an increase of 8% when compared to 2011 report. The proportion of lifetime abstainers is 47.1% with a significant proportion being female (56.5%). The proportion of respondents who are life abstainers have declined compared to 63.2% in 2011. This decline reflects the need to concentrate effort in ensuring that the country has a higher number of abstainers with a greater focus on the youth.

Furthermore, 9.3% (12.9% -males and 2.6%-females) of the respondent drank alcohol daily in the past 7 days prior to the survey. This is a considerable high percentage when considering not only the negative effects of alcohol usage on health but also its social and economic consequences. Heavy episodic drinking is described as drinking more than six standard rinks on one occasion and is responsible for many acute consequences of drinking such as alcohol poisoning, injury and violence. The report revealed that 10 percent of respondents were involved in a heavy episodic drinking occasion in the past 30 days. As such, to reduce morbidity and mortality associated with alcohol use, government should levy higher tariff on alcoholic products to deter episodic drinkers, develop messages that are specific to danger associated with alcohol consumption and NCDs policy and strategy when elaborated should focus on alcohol-related diseases prevention and services.

Fruits and Vegetables consumption

Maintaining a balanced/healthy diet throughout life helps prevent non-communicable diseases (NCDs) like diabetes, heart disease, stroke, and cancer as well as malnutrition in all of its forms. However, there has been a shift in dietary patterns as a result of increased production of processed foods, growing urbanization, and changing lifestyles. WHO recommends at least 400 g (i.e., five portions) of fruit and vegetables per day. The STEPs survey 2022 confirmed that the majority of Liberians (92.9%) reported that they consume less than 5 servings of fruit and/or vegetables on average per day. Moreover, the mean number of serving of fruits and/or vegetables on average per day was nearly 2. The mean number of days fruits and vegetables were consumed by all respondents was 0.7 and 1.1 days respectively. This result acknowledged that the lack of awareness is a factor that contributes to people not consuming the inappropriate diet. Liberia needs to develop a culture of fruits and vegetable consumption, through the dissemination of key messages on food and nutrition, fruit and vegetable consumption and healthy lifestyle practices.

The surveys found that more than two-third 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. (WHO, 2012). Additionally, the consumption of processed foods high in salt among respondents is another factor that explained the high daily salt intake. Interestingly, majority of the respondents think that lowering salt in diet is very important (85.4%) and believed that too much salt could cause serious health problems (91.8%), yet there is high proportion of them adding salt or salty sauce to their food before or when eating.

Since the WHO and Member States have agreed to reduce global salt consumption by 30% by 2025, MOH should collaborate with the Ministry of Commence and other pertinent institutions to adopt regulatory measures to lower the salt content of bread, dairy products, and pickles. These regulatory measures should be backed up by a public awareness campaign to encourage a healthy diet and raise public awareness.

Physical activity

The 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 survey revealed two-third of the respondent 66.5% were engaged in high level physical activities. High physical as defined by the survey include 3 day of intense physical activities such as lifting or carrying heavy loads, digging and/or construction works, or 7 day of walking or jogging. This when compared to 2011 revealed a significant increase of 19.2%. Additionally, a low proportion of respondents

(7.6%) did not meet the WHO recommendations on physical activity for health.

Maintaining physical fitness can contribute positively to maintaining a healthy weight, building, and maintaining healthy bone density, muscle strength, and joint mobility, promoting physiological well-being, reducing surgical risks, and strengthening the immune system. The mean time spent on physical activity on average per day by the respondents was 251.9 minutes showing an increase of almost an hour comparing to 2011 report (193.6%). The survey shows males spend sufficient time (299 minutes) on physical activity than females (201.2 minutes). The mean minutes spent in recreation related activities was the lowest among respondents compared to time spent on work-related and transport-related physical activity accounting for 24.6 minutes per day.

Thus, the need for developing and promoting NCD policy which promotes increase physical activity will not only reduce the incidence of these disorders is essential for breaking the barriers for physical activity. Additionally, effective physical education is also cardinal along with strategies that encourage the Liberia population to engage in regular physical activity.

History of past Medical Screening

The Past Medical history and physical examination are critically important NCD strategies to identify, prevent and manage acute and chronic health conditions.

Raised Blood Pressure of Hypertension

Raised blood pressure (BP) is a serious medical condition that increases the risk of heart, brain, kidney and other diseases. It is the leading preventable risk factor for cardiovascular disease (CVD) and all-cause mortality worldwide (Roth et al, 2018).

About 38.3% of all respondents had never had their blood pressure checked for hypertension (HTN) compared to 29.9% of respondents in 2011. This survey also revealed that overall, 1 in five of the sample population (22.7%) had raised blood pressure (SBP $\geq$ 140 and/or DBP $\geq$ 90 mmHg). Additionally, those who have been previously diagnosed with raised blood pressure and not on medication accounted for 14.2% men and 12.9% women. Hypertension being one of the global targets of NCDs to reduce its prevalence by 25% in 2025, it is important that the Liberian government dedicate effort to keep on course with the current trend to reach this target with collaboration with stakeholders.

Diabetes

Raised blood glucose is a well-recognized cause of premature death and disability. Surprisingly, a significant proportion of the respondents (89.4%) had never measured their glucose level there is no significant difference when compared to 2011 report (91.5%). The mean fasting blood glucose, including those currently on medication for diabetes was 78.4 mg/dl whereas the 2011 report accounted for 96.7mg/dl among respondents.

Impaired fasting glycemia or impaired fasting glucose and raised blood glucose lead to serious complications such as ischemic heart disease, stroke, kidney failure, blindness and lower-limb amputation. Only one percent of the respondents have either raised fasting blood glucose (FBG) or are currently on treatment for diabetes. Whereas 2.8% of the sample population were reported to have impaired fasting glycaemia. Considering the finding on Diabetes, NCDs policy and strategy should address the emerging concerns of diabetes.

Cholesterol

Raised cholesterol increases the risks of heart disease and stroke. Nearly all of respondents (97.7%) reported they had never been measured for cholesterol levels by health workers. This however identify the gaps in patient awareness of their cholesterol level and also their blood pressure level. This also implies that most Liberians are predisposed to late diagnosis and poor treatment outcome. Additionally, the survey also revealed that reveals that the overall mean total cholesterol for the sample population is 4 mmol/L (153.2mg/dl). Women in age group 45-59 has the highest mean at 4.5 mmol/L (172.9mg/dl).

Overweight/Obesity

The World Health Organization (WHO) defines overweight (BMI, 25 to 29) and obesity (BMI, ≥30) as abnormal or excessive fat accumulation that presents a risk to health (WHO, 2016a). Obesity-associated conditions are manifold; however, even modest weight reduction may enable patients to reduce their risk for CVD, diabetes, obstructive sleep apnea (OSA), osteoarthritis and hypertension among many other comorbidities (Cefalu et al., 2015).

The survey found that 39.3% of the Liberians are overweight and obese with a significant difference in proportion between the men (33.5 percent) and women (45.5 percent). Comparing this result with 2011 report the proportion of Liberians who were overweight or obese has reduced by 10% showing 49.9%. To achieve optimal health, the goal for individuals should be to maintain a BMI in the range 18.5-24.9 kg/m2 as such health promotion is needed to enlighten individuals of the risk involved of being overweight and obese.

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. In the survey, Liberians were asked if they had received lifestyle advice from a physician or a health care worker in the previous three years. It is cardinal to note that only 18.8% and 24.8% of the respondents have been advised to quit or not to start tobacco use and on maintaining a healthy body weight respectively. However, 4 in 10 adults have been advised on eating five servings of fruits and vegetables each day and 3 in 10 adults have been advised to limit consumption of both salt and fats in the diet.

Cervical Cancer Screening

Cervical cancer is the second leading cause of mortality among cancers in women in the country (National Cancer Control Strategy, 2012). It is worrisome to note that a close to two percent of women aged 30-49 ever been tested for cervical cancer. This could be explained by the fact that only 2% of the women in that age group are aware of the cervical cancer screening methods. Such unacceptable low coverage could indicate that women diagnoses were most likely done at an advanced stage where treatment options are limited. The intensification of initiatives by both government and non-governmental players to increase screening uptake may result in the increase in coverage.

Combined Risk Factors

The STEPs survey found that about 17.8% in the age groups 18-69 years have three or more NCDs risk factors including current daily smoking, eating fewer than five servings of fruits and vegetables/day, being overweight, having raised BP and physically inactive. When compared to the 2011 report, about 33.3% of sampled population had 3-5 risk factors showing a decline of nearly half of the proportion of sampled population who have 3-5 NCD risk factors. On the other hand, only 3.4% of the sample population had none of these risk factors. This dramatic fall indicate a need to continue all efforts in ensuring trend of NCD in the country declines by prioritizing NCDs in health plans.

Chapter 5: Recommendations

- The analysis of the 2022 STEP survey provides data and information on the prevalence of NCD risk factors in Liberia to inform public health policy in preventing, controlling, and mitigating these casual factors. Below are specific recommendations that should be considered for reducing the prevalence of NCDs and the general wellbeing of the general population.
- The Liberian government, through the Ministry of Health, should develop NCDs policy and strategic plan addressing the common risks of NCDs and implement them with set national time-bound targets to be achieved by 2030, based on WHO recommendations on NCDs risk factors.
- The Ministry of Health should continue to engage relevant institutions to enforce the regulation or legislation on tobacco use (ban on public smoking, sales to minors, etc.).
- The Ministry of Health should ensure strengthening the surveillance, monitoring, and evaluation systems for NCDs. Additionally, incorporate NCD surveillance into the already-in-place Health Information Systems (i.e., the DHIS2) to enable ongoing monitoring of NCDs for more informed prevention and control measures.
- The Ministry should create awareness about the importance of fruits and vegetables. Moreover, implement salt reduction initiatives at the population level.
- Routine and regular examination of blood sugar, weight, and blood pressure should be promoted and also increase awareness of the importance of early detection of hypertension, diabetes, and cholesterol levels. Furthermore, early detection and screening of NCDs such as diabetes, cervical cancer, and hypertension in health facilities should be enforced.
- Health promotion messages on changing lifestyles should be developed in local languages and also designed according to the educational level of the population.
- With the low employment rate, NCDs policies addressing lifestyle changes or healthy living should not be limited to workplaces but rather promote population-based interventions.
- Implement the physical activity tool kit in the country to encourage the adoption of active lifestyles and reduce sedentary lifestyles.
- The government should levy high import taxes on both tobacco products and alcoholic drinks to serve as a deterrent to manufactured tobacco smoke and the harmful use of alcohol.
- With the proportion of respondents indicating their exposure to SHS either at home or at workplace has declined, NCDs policy discouraging smoking at home, at workplace, or public places should be continuously enforced through collaborative

efforts with other stakeholders following national and internationally accepted standards.

- In order to better understand the true burden of NCDs, additional research on NCDs, their risk factors, and outcomes, such as the negative effects of alcohol use, health outcomes in general, and the economic impact of the NCDs should be conducted.

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Annexes

Annex 1: Tables

Table 1: Frequency of family/partner problems due to someone else's drinking during the past 12 months among all respondents							
	Men						
Age Group (years)	n	% monthly or more frequently	95% CI	% less than monthly	95% CI	% never	95% CI
18-29	444	7.5	0.8-14.1	6.8	3.8-9.8	85.7	79.0-92.5
30-44	494	3.1	1.2-5.0	16.5	10.4-22.7	80.4	74.4-86.3
45-59	401	1.9	0.5-3.3	12.1	6.5-17.8	86.0	79.7-92.3
60-69	193	4.3	0.0-9.5	5.2	2.0-8.4	90.5	84.5-96.5
18-69	**1532**	**5.1**	**1.7-8.6**	**10.5**	**7.9-13.0**	**84.4**	**80.8-88.0**

Table 2: Frequency of family/partner problems due to someone else's drinking during the past 12 months among all respondents							
	Women						
Age Group (years)	n	% monthly or more frequently	95% CI	% less than monthly	95% CI	% never	95% CI
18-29	906	1.5	0.5-2.5	6.1	3.5-8.7	92.5	89.7-95.2
30-44	850	1.9	0.5-3.4	8.8	5.2-12.4	89.3	85.5-93.1
45-59	564	2.8	0.0-5.6	5.7	2.4-8.9	91.6	87.3-95.9
60-69	217	1.7	0.0-3.7	2.3	0.2-4.5	96.0	92.7-99.2
18-69	**2537**	**1.8**	**1.0-2.6**	**6.6**	**4.7-8.6**	**91.6**	**89.4-93.7**

Table 3: Frequency of family/partner problems due to someone else's drinking during the past 12 months among all respondents							
	Both Sexes						
Age Group (years)	n	% monthly or more frequently	95% CI	% less than monthly	95% CI	% never	95% CI
18-29	1350	4.4	1.0-7.8	6.4	4.5-8.4	89.2	85.6-92.8
30-44	1344	2.5	1.2-3.8	12.6	9.1-16.2	84.8	81.4-88.3
45-59	965	2.3	0.8-3.8	9.1	5.8-12.3	88.6	84.9-92.4
60-69	410	2.9	0.1-5.7	3.7	1.5-5.8	93.5	89.7-97.3
18-69	**4069**	**3.5**	**1.7-5.2**	**8.5**	**6.7-10.4**	**88.0**	**85.7-90.3**

Table 4: Number of servings of fruit and/or vegetables on average per day									
Age Group (years)	Men								
	n	% no fruit and/or vegetables	95% CI	% 1-2 servings	95% CI	% 3-4 servings	95% CI	% ≥5 servings	95% CI
18-29	396	53.8	43.6-64.1	28.7	21.2-36.2	9.4	4.9-13.9	8.1	4.1-12.0
30-44	442	45.6	34.6-56.6	36.3	27.1-45.5	11.2	6.6-15.8	6.9	3.5-10.3
45-59	346	43.9	35.1-52.6	40.6	33.4-47.7	9.7	5.1-14.3	5.9	3.0-8.8
60-69	169	41.2	30.4-52.0	45.7	35.1-56.4	8.8	2.3-15.3	4.3	1.0-7.6
18-69	**1353**	**49.3**	**42.0-56.6**	**33.5**	**28.2-38.9**	**10.0**	**7.1-12.9**	**7.2**	**4.8-9.6**

Table 5: Number of servings of fruit and/or vegetables on average per day									
Age Group (years)	Women								
	n	% no fruit and/or vegetables	95% CI	% 1-2 servings	95% CI	% 3-4 servings	95% CI	% ≥5 servings	95% CI
18-29	799	43.0	34.2-51.8	40.8	32.1-49.4	9.6	6.1-13.2	6.6	3.6-9.6
30-44	748	45.7	38.4-53.1	38.1	31.9-44.3	9.5	6.4-12.7	6.6	4.0-9.3
45-59	498	49.0	38.4-59.6	34.3	26.1-42.4	6.9	4.0-9.7	9.9	3.1-16.7
60-69	182	56.4	45.6-67.2	31.7	22.2-41.2	6.7	1.2-12.3	5.1	2.0-8.3
18-69	**2227**	**45.1**	**38.3-52.0**	**38.7**	**32.8-44.7**	**9.1**	**6.7-11.6**	**7.0**	**4.5-9.4**

Table 6: Number of servings of fruit and/or vegetables on average per day									
Age Group (years)	Both Sexes								
	n	% no fruit and/or vegetables	95% CI	% 1-2 servings	95% CI	% 3-4 servings	95% CI	% ≥5 servings	95% CI
18-29	1195	48.3	39.9-56.7	34.8	28.6-41.1	9.5	6.8-12.2	7.3	4.8-9.8
30-44	1190	45.6	37.6-53.7	37.2	30.5-43.9	10.4	7.4-13.4	6.8	4.3-9.2
45-59	844	46.3	38.9-53.7	37.5	31.5-43.6	8.3	5.5-11.2	7.8	4.2-11.4
60-69	351	48.4	40.1-56.6	39.1	31.8-46.5	7.8	3.5-12.1	4.7	2.3-7.0
18-69	**3580**	**47.2**	**41.0-53.5**	**36.1**	**31.7-40.5**	**9.6**	**7.6-11.5**	**7.1**	**5.2-9.0**

Table 7: Self-reported quantity of salt consumed											
	Men										
Age Group (years)	n	% 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	413	3.4	0.5-6.3	10.4	4.6-16.3	65.3	58.6-72.0	16.4	11.2-21.5	4.5	1.7-7.2
30-44	464	1.3	0.5-2.0	7.9	3.1-12.7	69.3	61.9-76.7	15.5	10.4-20.6	6.0	2.9-9.1
45-59	379	3.2	1.3-5.0	8.5	2.5-14.6	66.9	56.6-77.2	16.6	10.3-22.9	4.8	1.8-7.7
60-69	176	2.1	0.1-4.1	10.8	3.6-17.9	68.2	58.1-78.3	13.7	7.1-20.3	5.3	1.8-8.8
18-69	**1432**	**2.7**	**1.2-4.1**	**9.4**	**5.4-13.3**	**66.9**	**61.9-71.9**	**16.0**	**12.8-19.2**	**5.0**	**2.9-7.2**

Table 8: Self-reported quantity of salt consumed											
	Women										
Age Group (years)	n	% 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	854	4.8	3.2-6.4	4.6	3.0-6.2	63.1	57.4-68.8	21.2	17.1-25.4	6.3	3.8-8.9
30-44	804	4.8	1.9-7.8	8.0	4.6-11.4	64.3	57.6-70.9	16.8	12.0-21.7	6.1	3.7-8.5
45-59	519	4.0	1.8-6.3	9.1	1.7-16.6	64.2	54.1-74.3	17.4	12.7-22.0	5.3	2.1-8.4
60-69	197	1.8	0.2-3.3	2.5	0.5-4.6	68.7	51.4-86.1	18.8	6.5-31.1	8.2	2.4-14.0
18-69	**2374**	**4.6**	**3.1-6.0**	**6.1**	**4.1-8.2**	**63.9**	**58.3-69.5**	**19.2**	**15.8-22.7**	**6.2**	**4.3-8.1**

Table 9: Self-reported quantity of salt consumed											
Age Group (years)	Both Sexes										
	n	% 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	1267	4.1	2.5-5.7	7.4	4.3-10.6	64.2	59.5-68.8	18.8	15.7-22.0	5.4	3.2-7.7
30-44	1268	3.1	1.5-4.7	8.0	5.2-10.7	66.7	61.3-72.1	16.2	12.2-20.2	6.0	3.8-8.3
45-59	898	3.6	1.9-5.2	8.8	4.1-13.5	65.7	57.0-74.3	16.9	12.3-21.6	5.0	2.8-7.2
60-69	373	1.9	0.6-3.2	6.5	2.4-10.7	68.5	56.5-80.5	16.3	8.9-23.8	6.8	3.3-10.3
18-69	**3806**	**3.6**	**2.5-4.7**	**7.8**	**5.5-10.0**	**65.4**	**61.1-69.7**	**17.6**	**15.1-20.1**	**5.6**	**3.8-7.4**

Table 10: Importance of lowering salt in diet							
Age Group (years)	Men						
	n	% Very important	95% CI	% Somewhat important	95% CI	% Not at all important	95% CI
18-29	424	82.1	76.6-87.7	11.8	6.6-17.1	6.0	2.6-9.5
30-44	470	85.0	80.1-89.9	12.4	7.5-17.3	2.6	0.6-4.6
45-59	384	89.1	84.5-93.7	8.7	4.6-12.8	2.2	0.6-3.8
60-69	185	88.0	83.1-92.9	7.5	3.9-11.0	4.5	1.3-7.8
18-69	**1463**	**84.4**	**80.6-88.1**	**11.3**	**7.8-14.8**	**4.3**	**2.6-6.1**

Table 11: Importance of lowering salt in diet							
Age Group (years)	Women						
	n	% Very important	95% CI	% Somewhat important	95% CI	% Not at all important	95% CI
18-29	860	86.2	82.4-90.1	10.0	7.1-12.9	3.8	1.7-5.9
30-44	819	86.8	82.4-91.1	10.3	6.2-14.3	2.9	1.6-4.3
45-59	542	86.2	80.8-91.6	10.3	5.5-15.1	3.5	1.1-5.8
60-69	203	85.5	75.5-95.6	11.3	2.8-19.8	3.1	0.0-6.6
18-69	**2424**	**86.4**	**82.9-89.9**	**10.2**	**7.3-13.0**	**3.5**	**2.1-4.8**

Table 12: Limit consumption of processed foods									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	444	49.4	40.3-58.5	906	47.1	39.8-54.4	1350	48.2	41.4-55.1
30-44	494	53.8	45.0-62.7	850	47.3	38.8-55.8	1344	50.6	43.8-57.4
45-59	401	45.3	32.3-58.3	564	48.3	38.7-58.0	965	46.7	36.6-56.9
60-69	193	49.6	37.5-61.7	217	29.4	11.5-47.2	410	38.7	23.2-54.1
18-69	**1532**	**50.1**	**43.1-57.2**	**2537**	**46.4**	**39.1-53.6**	**4069**	**48.2**	**41.9-54.5**

Table 13: 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	444	12.1	6.8-17.4	906	10.2	7.5-12.9	1350	11.1	7.9-14.4
30-44	494	14.5	9.0-20.0	850	10.9	7.4-14.3	1344	12.7	9.6-15.8
45-59	401	8.8	4.9-12.6	564	9.3	5.4-13.2	965	9.0	6.1-12.0
60-69	193	14.3	6.9-21.6	217	4.9	1.2-8.6	410	9.2	4.2-14.3
18-69	**1532**	**12.4**	**9.3-15.5**	**2537**	**10.0**	**7.5-12.5**	**4069**	**11.2**	**9.0-13.4**

Table 14: Buy low salt/sodium alternatives									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	444	13.0	8.3-17.7	906	12.8	9.2-16.3	1350	12.9	9.9-15.8
30-44	494	21.5	15.6-27.5	850	19.8	15.3-24.4	1344	20.7	17.1-24.2
45-59	401	13.0	7.9-18.2	564	18.0	11.5-24.4	965	15.4	11.0-19.8
60-69	193	17.6	9.7-25.4	217	9.0	2.7-15.4	410	13.0	6.7-19.3
18-69	**1532**	**15.8**	**12.8-18.8**	**2537**	**15.4**	**11.8-19.0**	**4069**	**15.6**	**13.1-18.1**

Table 15: Use spices other than salt when cooking									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	444	42.1	32.7-51.5	906	45.6	39.3-51.9	1350	43.9	37.9-49.9
30-44	494	49.3	42.1-56.4	850	46.2	38.5-53.9	1344	47.7	42.0-53.5
45-59	401	32.7	22.1-43.3	564	41.6	33.3-49.9	965	36.9	28.4-45.3
60-69	193	44.1	32.8-55.4	217	36.2	25.6-46.7	410	39.8	29.9-49.7
18-69	**1532**	**42.9**	**37.3-48.5**	**2537**	**44.7**	**38.5-50.9**	**4069**	**43.8**	**38.9-48.8**

Table 16: Avoid eating foods prepared outside of a home									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	444	28.4	21.6-35.1	906	28.8	23.1-34.5	1350	28.6	24.3-32.8
30-44	494	39.4	30.6-48.2	850	31.8	25.1-38.4	1344	35.6	30.1-41.0
45-59	401	23.0	15.3-30.8	564	29.9	22.8-37.0	965	26.3	19.9-32.6
60-69	193	29.1	19.2-38.9	217	19.0	6.7-31.3	410	23.7	13.4-33.9
18-69	**1532**	**30.9**	**25.4-36.4**	**2537**	**29.3**	**24.1-34.5**	**4069**	**30.1**	**26.0-34.1**

Table 17 Do other things specifically to control your salt intake									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	444	3.2	1.7-4.8	906	5.3	3.0-7.6	1350	4.3	2.9-5.7
30-44	494	8.0	2.0-14.0	850	3.7	2.3-5.1	1344	5.8	2.6-9.0
45-59	401	3.9	1.3-6.6	564	6.5	1.3-11.7	965	5.1	2.2-8.0
60-69	193	3.7	0.9-6.4	217	1.4	0.0-2.8	410	2.4	0.8-4.0
18-69	**1532**	**4.8**	**2.6-6.9**	**2537**	**4.8**	**2.9-6.6**	**4069**	**4.8**	**3.0-6.5**

Table 18: Blood pressure measurement and diagnosis among all respondents.									
Age Group (years)	**Men**								
	n	% Never measured	95% CI	% measured, not diagnosed	95% CI	% diagnosed, but not within past 12 months	95% CI	% diagnosed within past 12 months	95% CI
18-29	444	56.1	49.1-63.1	38	30.3-45.7	4.1	0.0-8.9	1.8	0.5-3.2
30-44	494	40.3	33.0-47.7	54	46.6-61.4	1.9	0.6-3.2	3.7	0.7-6.7
45-59	401	29.6	23.4-35.8	49.9	41.8-57.9	11.2	5.6-16.9	9.3	5.2-13.4
60-69	193	23.3	13.7-32.8	56.3	44.4-68.3	10.2	3.9-16.5	10.2	4.0-16.3
18-69	**1532**	**45.7**	**41.1-50.3**	**45.5**	**40.7-50.4**	**4.8**	**2.3-7.3**	**3.9**	**2.5-5.4**
	Women								
18-29	906	38.2	31.3-45.0	52.7	45.1-60.4	3.3	1.6-5.0	5.8	3.6-8.1
30-44	850	23	17.6-28.4	60.3	52.7-67.9	5.3	2.4-8.3	11.3	7.0-15.6
45-59	564	26.2	20.0-32.4	50.3	44.1-56.6	8.7	5.3-12.1	14.7	10.4-19.0
60-69	217	19.4	7.0-31.8	51.2	43.7-58.8	18	2.9-33.1	11.4	3.7-19.0
18-69	**2537**	**31**	**27.0-35.0**	**54.6**	**49.9-59.3**	**5.4**	**3.9-6.9**	**9**	**6.9-11.0**
	Both sexes								
18-29	1350	46.9	42.3-51.5	45.5	40.2-50.9	3.7	1.2-6.1	3.9	2.5-5.3
30-44	1344	31.6	26.8-36.5	57.2	52.3-62.1	3.6	1.9-5.4	7.5	5.2-9.8
45-59	965	28	22.9-33.1	50.1	44.4-55.7	10.1	6.4-13.7	11.9	8.5-15.2
60-69	410	21.2	11.8-30.6	53.6	46.7-60.5	14.4	5.7-23.0	10.8	5.4-16.2
18-69	**4069**	**38.3**	**35.1-41.5**	**50.1**	**46.6-53.6**	**5.1**	**3.7-6.6**	**6.5**	**5.3-7.7**

Table 19: Blood sugar measurement and diagnosis									
	Men								
Age Group (years)	n	% Never measured	95% CI	% measured, not diagnosed	95% CI	% diagnosed, but not within past 12 months	95% CI	% diagnosed within past 12 months	95% CI
18-29	444	93.2	87.8-98.6	5.6	0.4-10.9	0.0	0.0-0.0	1.1	0.0-3.1
30-44	494	92.4	89.5-95.2	6.9	4.1-9.7	0.2	0.0-0.6	0.5	0.0-1.2
45-59	401	86.8	80.0-93.6	10.3	3.8-16.9	0.9	0.0-1.9	2.0	0.3-3.7
60-69	193	78.2	67.7-88.7	15.5	6.1-24.9	5.2	0.0-11.8	1.1	0.0-2.3
18-69	**1532**	**91.3**	**88.4-94.2**	**7.2**	**4.4-10.0**	**0.4**	**0.1-0.8**	**1.1**	**0.1-2.1**

Table 20 Blood sugar measurement and diagnosis									
	Women								
Age Group (years)	n	% Never measured	95% CI	% measured, not diagnosed	95% CI	% diagnosed, but not within past 12 months	95% CI	% diagnosed within past 12 months	95% CI
18-29	906	91.9	88.7-95.2	7.6	4.3-10.8	0.3	0.0-0.8	0.2	0.0-0.3
30-44	850	85.3	80.2-90.4	12.4	7.8-17.1	0.4	0.0-0.9	1.9	0.2-3.5
45-59	564	75.3	69.2-81.5	20.5	14.0-27.1	2.8	0.7-4.8	1.4	0.1-2.7
60-69	217	88.0	79.3-96.7	8.2	1.8-14.6	1.9	0.0-4.6	1.8	0.0-4.0
18-69	**2537**	**87.5**	**84.9-90.1**	**10.8**	**8.3-13.4**	**0.8**	**0.3-1.2**	**0.9**	**0.4-1.5**

Annex 2: Questionnaire