SUDAN STEP WISE SURVEY FOR NON-COMMUNICABLE DISEASES RISK FACTORS 2016 REPORT

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SUDAN STEPwise SURVEY FOR NON-COMMUNICABLE DISEASES RISK FACTORS 2016 REPORT

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Dr. Shaza Ahmed Sidahmed
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PREFACE

Non-Communicable Diseases (NCDs) are a major threat to public health in Sudan, as much as they are a threat in other countries in the region and beyond. Despite this, there has been no national evidence on the burden of NCDs and their risk factors before the present STEPwise study. National planning and programming were based on information from Khartoum State's Stepwise Survey and other studies, which made it difficult to extrapolate to the whole country.

Recognizing the need for risk-factor data on NCD risk factors, in 2016, the Federal Ministry of Health (FMOH) in collaboration with the Central Bureau of Statistics and the World Health Organization conducted the first national STEPwise survey. This survey aimed at establishing a risk factor surveillance system by providing the first baseline data at a national level.

With this evidence, we will be able to inform, monitor and evaluate NCD related policies and programs. We will also be able to compare progress in the control and prevention of NCDs in Sudan with other countries.

Recommendations put forward by this study will immediately be included in the update of the NCDs action plan 2013 – 2020. This plan will adopt a multi-stakeholder approach to prevent and control NCDs, aiming to meet the global target of 25 percent reduction in morbidity and premature mortality from NCDs by 2025. This plan reflects the commitments made by world leaders in September 2011.

Furthermore, Sudan's 'Health in all Policies' roadmap of 2014 has prioritized NCDs. The roadmap sets up an accountability system that assigns responsibility on various sectors to safeguard the health of the people inclusive of NCDs. Since most NCDs' risk factors lie outside the Ministry of Health, FMOH will strongly support the update and implementation of this roadmap; ensuring control measures for NCDs are at the heart of other sector policies.

We are proud that this survey has become a milestone in the building of human and institutional capacity for NCD surveillance.

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List of Abbreviations

BMI	Body mass index
DM	Diabetes mellitus
CBS	Central Bureau of Statistics
CI	Confidence interval
CVD	Cardiovascular Diseases
DBP	Diastolic blood pressure
EA	Enumeration Areas
FBG	Fasting blood glucose
FMOH	Federal ministry of health
IFG	Impaired Fasting Glucose
NCD	Non-communicable diseases
PA	Physical activity
PAU	Public administrative unit
RBG	Raised blood glucose
RBP	Raised blood pressure
SBP	Systolic blood pressure
SSWS	Sudan STEP-wise survey
TC	Total cholesterol
WHO	World health organization

Executive summary

The Sudan STEP-wise survey (SSWS) 2016, conducted during the period February -December 2016, is the first nationally representative survey to collect comprehensive information on risk factors for NCD and oral health in Sudanese adults aged 18-69 years. The survey was conducted jointly by the FMOH, WHO and CBS. It covered 11 states from the six geographical regions North (River Nile State); East (Gedaref and Kassala States); Khartoum State; Central (Algazira, White Nile and Sennar States); Kordofan (North and West Kordofan States) and Darfur (Central and West Darfur States).

A four-stage stratified cluster sampling design was implemented resulting in a total sample of 8154 HHs/Individuals from 302 clusters. The data collection followed the WHO stepwise survey manual which recommends three steps; STEP1 Behavioral Risk Factors, STEP 2 Anthropometric and Physical measurements and STEP 3 Biochemical measurements. All results were weighted by gender and age. Response rate in this survey was high, 95% in STEPS1/2 and 88% in STEP 3.

The SSWS goal is to provide baseline indicators on determinants of NCD and their risk factors among Sudanese adult population aged 18 to 69 years for policy and planning purposes.

The main objectives of SSWS were:

1. To determine the prevalence of the four major behavioral risk factors for NCD in Sudan: tobacco use, physical inactivity, unhealthy diet and harmful use of alcohol.
2. To assess the prevalence and determinants for the major biological risk factors for NCD in Sudan: overweight and obesity, raised blood pressure, raised blood glucose, abnormal cholesterol level and salt intake level.
3. To assess the burden of oral diseases.
4. To investigate the potential link between different risk factors and determinants of heath (socio-demographic status, gender and age).

Summary of SSWS 2016 Findings:

Behavioral Risk Factors-STEP1:

Within STEP 1 of the survey, socio demographic and behavioural information on age, sex, marital status, education, occupation was collected. Behavioural information regarding tobacco use, alcohol consumption, diet, physical activity, history of Raised Blood Pressure, history of Diabetes, history of Raised Total Cholesterol, history of Cardiovascular Diseases, lifestyle advice, cervical cancer screening and Oral health was also collected.

Tobacco: More than one in four Sudanese men (27.9%) were either smokers or snuff dippers or both. The overall prevalence of smoking was 9.6% with significantly higher prevalence among men (17.1%) than women (0.7%). The prevalence of smoking among men was highest in Khartoum (22.3%) and lowest in Darfur (12.2%). The mean age of initiation into tobacco smoking was 19.5yrs. The overall prevalence of smokeless tobacco (snuff dipping) use was very high (7.9 %). The overall pattern of second-hand smoking at home (24.6%) was higher than at work (22.1%). Health warnings on tobacco packages were reported to be effective. This was demonstrated in the high proportion of smokers (71.8%) who considered quitting after noticing

the warning. The willingness to quit among current smokers (65%) is not well addressed by the health care system, since only 34% of smokers received advice from their doctors on how to quit.

Alcohol Consumption: Prevalence of current alcohol drinkers in Sudan was found to be low (3.6% for men). However, binge drinking (excessive drinking) was very high (3.2%) thus putting almost the entire population of drinkers at high risk.

Dietary Pattern: The healthy diet recommendation of consuming five portions of vegetables and fruits combined was not met by 94.7% of the population. Fruits are consumed on average on 1.9 days per week and vegetables on 4.0 days per week. Darfur, Khartoum, Northern and Central regions had a mean number of days of consumption of fruit greater than the national average of 1.9 days.

Salt consumption: Although (87%) of participants thought that consuming too much salt could cause serious health problems and (91.8%) were aware that it was important to reduce salt intake nevertheless (32.4%) added salt or salty sauce to their food before eating. Measured salt in urine was 8.2 gram of sodium in Khartoum state.

Sugar and Oil Consumption: Sugar consumption was reported to be seemingly within the WHO recommended daily intake of 50g, 12 level teaspoons. Vegetable oil was the most commonly consumed type of oil (99. %).

Physical Activity: Overall 14.1% of Sudanese (11.4% men and 17.3%) do not engage in the recommended amount of physical activity. WHO recommends that adults should do at least 150 minutes of moderate-intensity PA throughout the week. There was a great variation of insufficient PA among the regions (Kordofan 8.1% and Northern 20.8%). Inactivity was higher among urban (18%) than rural (11.6%) respondents.

Medical History:

Overall 61% of participants have never had their BP measured. Among those who reported being diagnosed with hypertension, only 51.8% were on medication.

Overall, 85.4% never had their blood sugar measured, and among those diagnosed with raised blood glucose 72.9% are taking medication.

Moreover, overall, 94.8 % had never had their cholesterol measured.

Only 1.4% of females had ever had a screening test for cervical cancer.

Healthy Life Style Advice: The results have shown that less than 25% adults received advice on healthy life style from care providers.

Anthropometric and Physical Measurement STEP2:

Overweight and Obesity:

Overall, 28.3% of Sudanese adults are either overweight or obese with the percentage being much higher in women (35.6%) than men (22.6%). There were also regional differences, overall combined overweight and obesity prevalence was (48.0%) in Khartoum, (33.3%) in Central and Northern, (24.9%) in Eastern, 21.7% in Darfur and only (12.8%) in Kordofan.

Overall (17%) of urban respondents were obese as compared to (6.2%)of rural participants with the prevalence being significantly higher (25.0%) among urban females and only (8.6%) among rural females which indicates a higher risk of NCD and its complications.

Raised Blood Pressure: RBP (defined as having SBP ≥140 mmHg and/or DBP ≥90 mmHg or on medication for raised blood pressure), was found in 31.5% percent of the respondents. Of the total 2710 participants who had raised BP after measurement only 4.8% were on medication and controlled, while 5.8% who were on medication were not controlled. However, 86.7% never had any medication. Further categorization of raised blood levels found that 7.6% of respondent have SBP ≥160 mmHg and/or DBP ≥100 mmHg. RBP increases significantly with age from 2.4% in age group 18-29 to 23.4 % in age group 60-69 years.

Biochemical Measurements STEP3:

Blood Glucose: The overall prevalence of Impaired Fasting Glycaemia (defined as capillary or whole blood of >-5.6mmol/L and < 6.1 mmol/L) was 3.4% while the prevalence of raised fasting blood glucose (RFBG) (defined as capillary or whole blood value of >-6.1 mmol/L) was 6%. The prevalence of RFBG and those on medication varied greatly among regions (11.6% in Khartoum; and 3.2% and 2.0% in Kordofan and Darfur respectively). Also there was a marked difference between urban (8.7%) and rural (4.4%) and the difference was more marked when comparing urban females (11.2%) to rural females (4.7%).

Cholesterol: Among all participants the level of high total cholesterol (>-5.0 mmol/L or -190 mg /dl and or currently on medication was 13.6%.

Cardiovascular Disease Risk:

The ten -year CVD Risk of >-30% is determined by the combined effect of behavioural and biological risk factors (smoking, or having raised blood sugar), age and sex. The prevalence was 3.5 % among the age group 40-69 years old. However, the percentage is notably high in the age group 55-69 years (7.1%) than in the age group (40-540years

Combined Risk Factors:

The five common and critical risk factors for NCDs are: current daily smoking, overweight or obese (BMI>25kg/m2), RBP of (SBP>140 and/or DBP>90 mmHg or currently on medication for raised BP), less than 5 servings of fruit and vegetables per day and low level of physical activity. A high-risk person is anyone having three or more of these risk factors. One fifth of all the participants (20.6%) aged 18-69, had three to five risk factors. Among the age group 45 to 69 years, 37.4 % have three or more of the above risk factors, while the percentage is 43.0% among women. The prevalence among urban participants is 28.4% as compared to 15.8% among rural participants. This indicates a heightened risk of NCDs and their complications that warrants interventions ranging from awareness, treatment and follow up.

Oral health:

Overall, 89.2% of participants have 20 or more natural teeth. Those who reported having poor or very poor state of teeth and poor or very poor state of gums were 7.1% in each group. Only 1.3% had removable dentures. Overall 23.1% reported a history of oral pain and discomfort in the past 12 months. Approximately 14% visited a dentist in the past 12 months while 64.6 % percent have never visited a dentist or received dental care. However, 97.9% clean their teeth at least once a day. Although the reported state of oral health was good, the high need for treatment was demonstrated in the high negative impact on quality of life. Almost 2 in every 10 reported difficulties in chewing, and 3 in 10 reported sleep often interrupted as a result of an oral health problem.

Chapter 1: Introduction

1.1 Situation analysis

1.1.2 General Description

The Republic of Sudan (Sudan) covers an area of approximately 1.8 million km² and borders seven countries; Egypt and Libya in the North, Chad and Central African Republic in the West, Ethiopia and Eretria in the East and the Republic of South Sudan in the South. It has access to the Red Sea through a long coastline of 853 kilometers (Figure 1).

Figure 1: Map of Sudan

The terrain of Sudan is generally flat, with mountains in northeast and west, while deserts dominate the north. Sudan's climate ranges between subtropical in the south and arid desert to the north. The rainy season varies by region from April to November.

1.1.3 Political Framework

Sudan has a long history with decentralization dating back to 1951. Decentralization was introduced as a system of governance compatible with the needs of the multi-ethnic and multi-cultural society of Sudan. Since 1991 the political and administrative structure of the country has been based on a presidential republic and a federal system. The system has passed through many stages of development until the Local Government Act 2003 was enacted, giving more authorities and responsibilities to the localities, particularly in the areas of health, education and development. Currently, there is a three-tier government system i.e. federal, state and local

governments. (Strategic work plan for Sudan 2008-2012). The federal level is concerned with policy making, planning, supervision and coordination while the state governments are empowered to plan, set policies and implement them at state level.

Administratively, Sudan is divided into 18 states, each in turn consists of several localities, yielding a total of 184 localities. Geographically, Sudan can be divided in six regions encompassing the 18 states: Northern Region (Northern and River Nile States), Eastern Region (Gedaref, Kassala and Red Sea states), Khartoum Region, Central Region (Algezira, White Nile, Sinnar and Blue Nile states), Kordofan Region (North, South and West Kordofan States) and the Darfur Region (Central, East, North, South and West states). This geographical classification was adopted in this survey. The capital city is Khartoum located at the confluence of the Blue and White Niles. Due to scarcity of jobs in rural areas, people are migrating from rural to urban areas and it is estimated that the urbanization rate is around 4.3% per annum. Sudan is a multiethnic multicultural country with many ethnic and tribal divisions and languages. Arabic is the official language of the country.

1.1.4 Population

According to the Annual Health Statistical Report 2016, the total population of Sudan is 39,598,700 (19,421,491 females and 20,177,209 males). The distribution of the population by region, state and sex is shown in Table 1. The population in the Northern Region is 2,316,524 persons (5.9%) as compared to 5,817,050 (14.7%) in Eastern Region; 7,385,158 (18.7%) in Khartoum; 9,911,556(25%) in Central Region; 5,124,072 (12.9%) in Kordofan Region and 9,044,340 (22.8%) in Darfur Region. The population is unevenly distributed. The country shows a mean population density of 10 persons per km^2, that reaches up to 50 persons per km^2 in certain agricultural areas. In regions like Khartoum and Gezira it is five times as high as in the rest of the country.

Table 1. 1: Population of Sudan distributed by state and sex, 2016

Region	State	Male N (%)	Female N (%)	Total
I	Northern	450,185	436,826	887,011
	Nahr Elneil	730,727	698,786	1,429,513
II	Red Sea	826,571	618,782	1,445,353
	Kassala	1,304,862	1,055,221	2,360,083
	Algedarif	1,000,098	1,011,516	2,011,614
III	Khartoum	3,466,376	3,918,782	7,385,158
IV	Elgezeira	2,295, 885	2,463,879	4,759,764
	White Nile	1,140,694	1,183,750	2,324,444
	Sinnar	866,799	911,183	1,777,982
	Blue Nile	532,833	516,533	1,049,366
V	North Kordofan	1,206,591	1,304,204	2,510,795
	South Kordofan	704,432	730,308	1,434,740
	West Kordofan	578,892	599,645	1,178, 537
VI	North Darfur	1,164,225	1,116,660	2,280,885
	West Darfur	467,736	503,779	971,515
	South Darfur	2,065,278	1,903,700	3,968,978
	Central Darfur	339,094	364,417	703,511
	East Darfur	583,525	535,926	1,119, 451
Total	**Sudan**	**20,177,491**	**19,421,491**	**39,598,700**

Other demographic indicators show that 69.2% of the population are rural while only 30.8% are urban population. The population aged below 20 years are 50.2%, while those aged 20 to 69 years represent 45.7% of the population.

The crude birth rate is 29.4 per 1000 population, while the annual growth rate is 2.53%. The life expectancy in Sudan is 62 years for males and 66 years for females.

1.1.5 Economic situation

Sudan is a lower middle-income country with a per capita gross domestic product (GDP) of $1,940 in 2014 and an annual economic growth rate of 4.7% in 2016. The Oil Sector was the driving force behind growth while the services and utilities sector has come to play an increasingly important role. Agriculture remains important in the economy as it employs 80% of the workforce and contributed 39% of GDP in 2016. The loss of 70% of the oil income after the separation of South Sudan on 9th July 2011, plus the dramatic decline in oil prices had significant impact on Sudan, pushing more people in poverty. Approximately 47% of the population are living below the poverty line according to the national definition of poverty, (1 USD per person/a day) with 8% living in extreme poverty. The poverty rate was 67.4% in semi-rural and 64.8% in rural areas. The adult literacy rate in Sudan is 69% in general and 53.52% among 15+ year olds (female = 46.7%). Sudan spends almost 6.5% of its GDP on health with an out of pocket share of about 70%. (OASIS health finance survey).

1.1.6 Non-Communicable Diseases (NCD) Burden

The Global Burden

The leading cause of morbidity and mortality globally is NCD. They cause more deaths than all other causes combined. NCD are responsible for 63% of deaths worldwide, noting that 80% of these deaths occur in developing countries which are suffering of the double burden of diseases, both communicable and non-communicable (WHO NCD Progress Monitor 2017). WHO estimates that NCD will cause 73% of global deaths and 60% of burden of diseases by the year 2020.

Approximately 16 million deaths due to NCD occur before 70 years of age and of these premature deaths 82% occur in low and middle income countries. The four major disease groups of CVD, cancer, respiratory diseases and diabetes, combined with the major four risk factors, tobacco use, physical inactivity, harmful use of alcohol and unhealthy diet, account for 82% of all NCD deaths.

Moreover, NCD pose a greater social and economic burden to the economy and especially in low and middle income countries. There is surmountable evidence that poverty is linked with NCD, since they increase the household costs associated with their management and care. The vulnerable and socially disadvantaged get sicker and die sooner than people of social class I and II. There is evidence that the majority of premature deaths from heart disease, stroke and diabetes can be averted with evidence-based behavioral interventions (WHO NCD progress monitor 2017).

Regionally, increase in sedentary life, accompanied with increased poverty rates and high rates of illiteracy, modified people's lifestyle due to urban expansion and globalization influence has led to the current shift of disease pattern in Eastern Mediterranean Region.

Sudan is not an exception from the international or the regional trends of transition of disease pattern from predominantly communicable to non-communicable diseases. Same factors and conditions apply to its situation. However, data on the disease burden of NCDs in Sudan is scarce and deficient.

NCD Burden in Sudan

NCD cause 50% of all deaths in Sudan (150 000 deaths per year). 26% of the population have a risk of premature death from targeted NCDs (WHO NCD progress monitor 2017). Although the severity of tooth decay, the most common health problem globally, is on the decline, the high tooth decay experience remains a challenge (Shuaib and Nurelhuda, 2016). Cancer of the oral cavity is reported as the 11th most common cancer across Sudan (Elnur et al., 2016).

Perhaps the most important study in Sudan that shed some light on the prevalence of NCDs and their risk factors was the Stepwise Survey for NCDs risk factors that was conducted in 2006 in Khartoum State. The survey reported a prevalence of current smoking of 29.1% among male participants were current smokers. Also 25.9% of male participants currently used snuff. The prevalence of overweight and/or obesity was 41.5% and 62.5% among male and female participants respectively. It was also found that 87% of participants were physically inactive.

The prevalence of high blood pressure was 24.8% and 22.7% among male and female participants, respectively. Only 8.1% of males and 13.5% of females were aware of the fact that they had hypertension and were being medically treated. Among the male participants 22.2% had high levels of fasting blood glucose as compared to 17.8% among females. However only 8.1% of males and 8.9% of females knew that they had diabetes. The percentage of high serum cholesterol was 19.6% and 19.9% in male and female participants respectively.

1.2 Survey Rationale

The abovementioned sections on the global burden of NCD and the NCD burden in Sudan

Sudan indicates that NCDs are major public health concerns that have significant social and economic implications in terms of health care needs, resulting in loss of productivity and premature death. They are a serious setback to Sudan to achieve social, health and economic strategic goals if no appropriate interventions are put in place. The burdens of NCD as the result of adoption of unhealthy lifestyles have not yet been fully documented at the national level in Sudan.

Moreover, planning and programming have been based on disaggregated local data and epidemiological models and projections that may not be representative or accurate at the national or state levels. Therefore, there was a need for a comprehensive study to examine the prevalence and burden of common risk factors for NCD in Sudan.

This survey will provide the country with baseline information for planning. Furthermore, it will facilitate the establishment of NCDs surveillance system to monitor diseases trends and measure the impact of different interventions.

Chapter 2: Methods & Implementation

2.1 Goal

To provide baseline indicators on determinants of NCD and their risk factors among Sudanese adult population aged 18 to 69 years for policy and planning purposes.

2.2 Objectives

1. To determine the prevalence of the major behavioral risk factors for NCD in Sudan: tobacco use, physical inactivity, unhealthy diet and harmful use of alcohol.
2. To assess the prevalence and determinants for the major biological risk factors for NCD in Sudan: overweight and obesity, raised blood pressure, raised blood glucose, abnormal cholesterol level and urine salt level.
3. To assess the burden of oral disease and behavior towards oral health
4. To investigate potential link between different risk factors and determinants of heath (socio-demographic status, gender and age)[1].

The survey followed the WHO stepwise survey manual which recommends three steps of gathering appropriate information:

STEP 1: Interviews of participants for demographic information and major health risk behaviors.

STEP 2: Anthropometric measurements to assess blood pressure, height and weight and waist circumference.

STEP 3: Biochemical measurements of fasting blood glucose and cholesterol levels.

2.3 Survey Design

This is a cross-sectional, stratified, multi-stage clustered sample survey. It is a nationwide household based survey covering all Sudan.

2.4 The Target Population

Sudanese adult population aged 18 to 69 years.

2.5 Sampling

2.5.1 Sampling Frame

A four-stage cluster sampling design was implemented. The four sampling stages were; 1) selection of states from the six regions 2) selection of clusters (a cluster was a Popular Administrative unit), 3) selection of households and 4) selection of eligible individuals.

[1] This objective will be addressed in different paper after further analysis

First Stage (State): Administratively Sudan is divided into 18 states which are grouped in six regions, (North, East, Khartoum, Central, Kordofan and Darfur region (Table 1). States were randomly selected from each region. No geographical areas or populations were excluded from the sampling frame. Thus 11 states were selected, probability proportional to the size, to represent the six regions. A list of the selected states is shown in Table 2.1.

Second Stage (Cluster PAU): The Popular Administrative Units (PAU) is the smallest geographically border unit. These were defined as the 'cluster' in the region. Clusters were randomly sampled from all PAUs, from both urban and rural strata, according to probability proportional to size in each state, and urban/rural distribution. The PAUs inaccessible due to security conditions were not excluded from the sampling frame, because within certain areas the security status was continuously changing. However, it was planned that if a PAU was found to be inaccessible at survey time, it should be replaced by the nearest accessible unit. However, no replacement was required during this survey.

Third Stage (Household): Within the selected PAUs, all households (HH) were included in the sampling frame. Accordingly (HH) were selected using systematic random methods.

Fourth Stage (Individual): The members of the household were first listed in the mobile application (customized software). The inclusion criteria for the listed members were: all individuals aged between 18 to 69 years, from both sexes, irrespective of his health status and living in the selected household for a minimum of 6 weeks. The application was then run and it randomly selected the individual who will be selected to participate in the study.

2.5.2 Sample Size

The target population size used was a projected estimation for 2016 based on the household census of 2008.

The sample size calculation considered three main factors: 1) population variability 2) accuracy required in the results and 3) resources available for the survey. The calculated sample size was based on a precision of 95%, prevalence of raised blood pressure 0.2692 based on WHO 2014 estimate, a non-response rate estimate of 10% and design effect 1.5. This sample had the power to produce results representative to Sudan, and to the six geographical regions.

The number of PAUs and the number of HH was calculated taking into consideration the variations in the prevalence of NCD morbidity and the risk factors between PAUs, thus ensuring that this variation averages out and does not add to the uncertainty of the estimate. All risk factor variables related to NCD were assumed to be similar in HHs of the same PAU.

Therefore, the total sample size was 8154 HHs/Individuals instead of 8137 for rounding purposes collected from 302 PAUs.

The formula used for the calculation of the sample size is:

$$n = \frac{z^2 * p(1-p) * deff * 2 * 6}{(ep)^2 (1-r)}$$

where:

n = the required sample size, (number of HHs, individuals)

z = the value in the normal distribution that gives level of confidence 95% (z = 1.96)

p=the prevalence raised blood pressure in Sudan (0.2692).

r = non-response rate (r = 10%)

deff = the design effect, (deff = 1.5)

ϵ = the relative margin of error at 95% confidence (RME=0.10).

e=margin of error (16%).

2= The number of gender groups.

6= The number of regions.

Substitution in the formula gives:

$$n = \frac{1.96^2 * (0.2692)(1-0.2692) * 1.5 * 2 * 6}{\{(0.16)(0.2692)^2 (1-0.10)} = 8137 \text{ individual.}$$

Table 2. 1: Distribution of sample by region, state, PAU and HH/individual

Region State	HH/ Individual	PAU/Urban	PAU/ Rural	Total PAU
1-North River Nile	621	6	17	23
2-East (a) Gadarif	648	7	17	24
(b) Kasala	648	8	16	24
3-Khartoum Khartoum	1053	31	8	39
4-Central (a) Algaziera	648	7	17	24
(b) White Nile	837	10	21	31
(c) Sinnar	648	6	18	24
5-Kordofan (a) N Kordofan	729	5	22	27
(b) W Kordofan	621	6	17	23
6-Darfur (a) W Darfur	864	6	26	32
(b) C Darfur	837	8	23	31
Sudan	8154	100 (2700)	202 (5454)	302

2.6 Implementation arrangements

The survey was planned and conducted jointly by the Communicable and NCD Directorate (CNCDCD) at FMOH, the Central Bureau of Statistics (CBS) and WHO.

The CNCDCD has taken the main technical and administrative responsibilities. A task force was formulated and included representatives of health information system directorate, academia (University of Khartoum dental public health unit) and national experts. The taskforce reviewed the methodology and tools of the survey. Furthermore, CNCDCD and partners has translated and adapted the survey tools, developed SOPS, show card, field guidelines, training materials and monitoring and evaluation (ME) forms. It also organized the field work, mobilized national resources mainly vehicles and conducted training of data collector jointly with CBS.

The CBS has overseen the practical and logistic issues related to the overall implementation of the survey; including the appointment of survey teams, mapping PAU (clusters), preparing the household list, carrying out advocacy for the survey at community level through the community leaders and arranging for data collection.

WHO office in the country provided direct technical support to the development of the proposal, funding and monitoring the survey implementation. Further support was received from WHO regional and HQ offices throughout the survey including review of survey proposal and

tools, training of survey team and data collectors, problem solving during field work and training in analysis of data.

Local IT Software Company (Moeen ICT) was contracted to develop the software version of the survey questionnaire, training of core survey team on software application and installment, support monitoring the flow of data in the initial phase and trouble shooting.

2.7 Adaptation of Survey Tools and Training Materials

The survey team in Sudan adapted the Arabic version of the WHO STEPS protocol and tools to be used by the survey administrator. The WHO STEPS tools were: 1) Generic STEPS Instrument (All basic survey indicators were included in the format as well as national and expanded questions in particular parts) and two optional modules; 2) tobacco policy and 3) oral health.

2.8 Training

At national level a five-day workshop was conducted during the period 20th to 24th December 2015, facilitated by an expert from WHO HQ and the survey core team. The total numbers of trainees was 50 participants. The participants were NCDs and CBS focal persons at state level in addition to 28 data collection team leaders. The training program included sessions on STEPS survey background, sampling methods, (PAU) cluster-level sampling of households, questioning skills including obtaining informed consent, questionnaire completion, blood taking, testing and referral procedures. Orientation of supervisors on supervision skills and checking (editing) of completed questionnaires were also conducted. After the training, a core group of trainers was established and assigned to conduct training at the 11 states level.

Another four- day workshop for data analysis was held in Khartoum in 2017 and facilitated by WHO staff from HQ and EMRO. The objective of this workshop was to train the country team to undertake the analysis of the survey data. Topics covered in the workshop included: (a) data cleaning and verification (c) weighting the data for national representativeness (d) performing basic analysis (e) training to use EpiInfo analysis software (f) creating the Data book based on STEPS standard reporting and (g) creating a Sudan STEPS factsheets.

By the end of the workshop the national team has produced the fact sheets and then later completed the entire survey data book which was used for the report writing.

2.9 Pilot Test of Field Tools and Procedures

A one-day field pilot survey was conducted in Omdurman area. Objectives of the pilot test were; (a) To assess the applicability of the adapted questionnaires to the local communities (b) To check the validity of the questions after translation (c) To assess the instructions in the field guidelines, whether relevant or clear (d) To estimate the time needed to administer each questionnaire (e) To evaluate the sequence of the questionnaire.

Six multi-disciplinary field teams were appointed for fieldwork in Omdurman area in Khartoum state. Each team conducted the interview, conducted physical measurements and conducted laboratory tests.

2.10 Training at State Level

A three- day workshop was conducted at each state level. The training took place prior to the start of data collection at each state by SWNS core team from central administration level. The objectives of the training were to train the data collectors on the following: entry into the field, observing the research ethics, systematic sampling of households in the PAU (cluster) and use of tables for data entry and sending them on regular basis. The training also explained the different

survey steps to the participants and provided them with the necessary skills to collect information as required in STEP 1, taking appropriately physical measurements in STEP 2 and performing biochemical measurement in STEP 3. The methods of training were interactive lectures, role playing and practical session on different measurement tools and equipment. The training materials include power point presentations, field guide, show cards, SOPs and M&E formats. A one day pilot was conduct in each state following the training

2.10 Data collection

2.10.1 Field Staff

Twenty eight teams participated in the survey. Each team consisted of a supervisor, and four data collectors (two statisticians and two health workers) and a driver. Two data collectors were nominated by CBS at each state; their main role was to conduct the interview to fill the questionnaire (Step 1). The other two data collectors were nominated by the state ministry of health; their main role was to take physical measurements and perform the blood tests (step 2 and 3). They also had to attend the interview to work as observer and facilitate in nutrition related questions especially calculation of fruits and vegetables portion. Most of the later were nutritionists, although, in a few states they were lab technicians. However, all data collectors were trained in all steps as the survey devices were simple and designed for self-trained or minimally trained users. Each State had 2-4 teams and a state survey coordinator. At the central level, there was an operation room consisting of 4 staff members who monitored implementation and ensured appropriate survey logistics.

2.10.2 Field activities

Data collection began immediately after training in the period from February to December. Field work was stopped during the month of Ramadan (July). Each survey team was assigned to particular clusters where they conducted the survey. Each team was provided with the data collection tools. These included: Tablets, Logistic checklist, list of selected clusters and households, stationery, M&E forms, field guide, scales for weight and height measurements tapes for girth (waist circumference), digitalized blood pressure monitors devices, cardio-check devices and test strips for STEP 3, plus (lancets, swabs, gloves, pipettes and containers). All the equipment's were placed in the field bag. Each member of the survey team had an identity card with a unique number.

The duration of the field work ranged from 15 -35 days per state. Data collection and entry was done in the field using electronic devices (Samsung tablets). WHO standard software for STEPwise survey was adapted and installed into the tablets by national software company (Moeen ICT). Figure two shows the trend of data submission from the field.

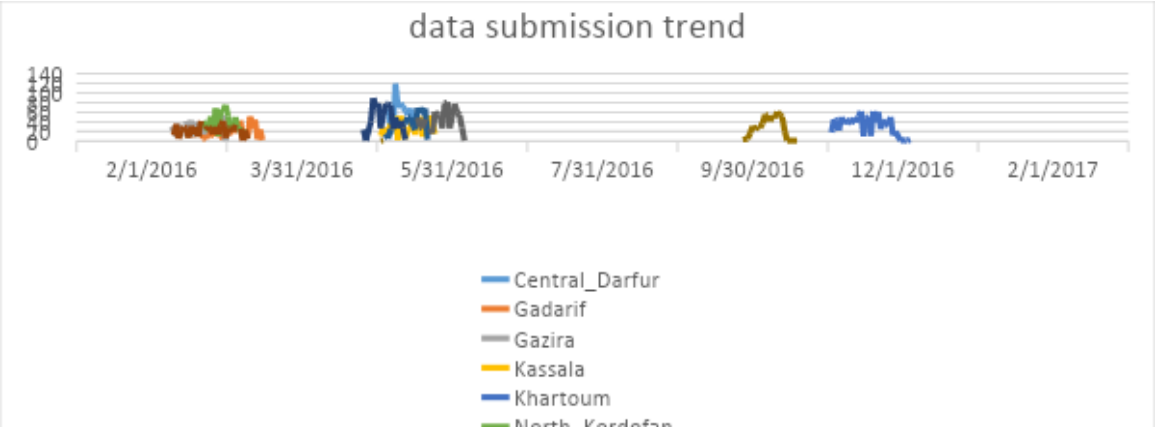

Figure 2: Trend of data submission using electronic devices (Samsung tablet)

2.11 Implementation of STEPS

STEPS is a sequential process that starts with gathering information (STEP 1), then performing anthropometric and physical measurements (STEP 2) and then biochemical measurement (STEP 3). STEP 1 and 2 were taken during the first visit to the household. STEP 3 was taken in the morning after the interview, in a predetermined place (E.g. health unit, school or mosque). Participants were asked to fast overnight, and that they should not eat any food or drink any fluids or juice except water for at least 8 hours prior to the test. Each participant was given a unique identifier (bar code) to be used at later stage for merging the data collected on the first day (STEPs 1,2) with data collected on the second day (STEP 3).

Urine test was conducted only in Khartoum state, all the participant were requested to provide spot urine sample and only five hundreds will have both 24 hour urine and spot sample.

STEP 1: Questionnaire-based assessment

The two pre-encoded questionnaire consists of the basic and extended questions collected from each participant. Socio-demographic information (age, sex, education years, occupation, household assets, income, marital status, and ethnicity).

The second questionnaire (NCDS risk factor) includes questions related to tobacco use, alcohol consumption, dietary behavior related to consumption of fruits and vegetables, consumption of salt / sodium and sugar, physical activity, history of raised blood pressure, high blood sugar / diabetes, lifestyle advice and oral health.

Respondents' responses were recorded by the survey administrator on survey tablets (Samsung tablet 4) (See Annex 1 questionnaire).

STEP 2: Anthropometric and Physical Measurements

Physical assessment included measurements of, height, weight, and waist circumference as well as BP measurement.

Measurements of height and weight were taken on the weighing scale and measured electronically. The participants were dressed in light, bare-skinned clothes. Measurements of

weight were made to the nearest 0.1 kg. The height was measured in centimeters with the participant barefooted. Measurements were taken to the nearest 0.1 cm.

The waist circumference is measured using the Finder tape. The mid-period measurement was performed between the last palpable rib and the top of the iliac crest. Measurements were made to the nearest 0.1 cm.

Blood pressure was measured using automatic blood pressure devices. Three readings were taken 3 minutes apart. See Annex 2 for SOPs

STEP 3: Biochemical assessment

Blood samples were collected from those who complied with fasting advice and had given their informed consent. Blood glucose and cholesterol were measured using cardio-check examination equipment (Cardio check P.A. In vitro diagnostic medical devices for use with PTS panels test strips. Manufacturer: Polymer Technology Systems, INC, Indianapolis, IN USA CE 0197). See Annex 3 for SOPs. Salt in urine was tested in Khartoum region only. Samples for urine spot analyses were collected by the participants after completion of step1&2, in the evening before fasting and carried to Step 3 appointment the next morning, while 24 hours samples were collected through the day till the morning of the next day, with the first voiding discarded, see Annex (4) for urine collection instruction. Urine samples was tested using 'cobas c 311' analyzer; produced by Roche Diagnostics International Ltd.

2.12 Ethical Approval

This study was approved in June 2015 by the national ethical committee at Federal Ministry of Health. Equipment was certified by the national authority for drugs and poisons. Verbal informed consent was obtained from all participants.

2.13 Data Management

The completed questionnaires were submitted regularly (in a period of one to three days of collection according to the availability of internet connection) to a central server (Ona server). WhatsApp group was established for the survey for communication and M&E purposes. The operation room received daily update from the field regarding the number of questionnaires submitted and then confirmed receipt through WhatsApp. The data was downloaded regularly and cleaned and checked for completeness and validity. The timely availability of the data enabled the survey team to communicate immediately with the data collectors in the field and verify outliers and/or inaccurate data.

When the field work was completed a final data set was generated in SPSS file through compiling STEP 1 and 2 data and merging them with STEP 3 data using bar codes. After data cleaning, a total of 95 questionnaires were excluded due errors in the bar code. Final data set was submitted for analysis using EpiInfo.

2.13.1 Data Quality Assurance Measures

All survey data collectors and supervisors were trained on interview techniques and use of the measurement equipment and data entry device. The validated WHO Arabic versions of the questionnaires were used. There was rigorous monitoring system. Each team of field workers was supervised by a team supervisor. There was an operational room that was closely following the data collection process, monitoring the flow of data in the server and conducting cross checks by contacting more than 3% of participants randomly selected. Missing information was controlled for by the data collection software design. The skip pattern design also provided restrictions to some answers E.g. *How many days in the week do you smoke?:* the program did not accept more than 7 days. On time verification of outliers and odd responses was conducted.

2.13.2 Weighting of Data

To produce data that is unbiased and representative for the targeted population in Sudan the sample has been weighted considering the probability of selection at three level (State, PAU and selection of Household in the PAU). Furthermore, it accounted for participant weight/ individual weight), non-response weight and adjustment for participant's age/sex group (population weight). All the results presented in the report were based on weighted data except for the response rates and demographic data.

2.13.3 Data analysis

Data analysis was conducted using EpiInfo analysis software, STEPS tools (syntax) previous. lt developed by WHO were adapted for use by Sudan survey team.

2.14 Report writing

The stepwise survey report in Sudan has been written by a team that included the following members: Survey core team, CBS, WHO technical officer and survey national consultants. The survey report documented the survey findings, discussed them and generated recommendation for different stakeholders in Sudan.

Chapter 3: Results

3.1 Demographic Characteristics of Participants:

A total of 8154persons (5280F, 2874M) were included in the survey. Of these a total 7722(95%) completed STEP1and 2.Among the 7722 participants, females were 5015 (64.9%) as compared to 2707(35.1%) males (Table3.1.1). Notable difference between females and males was observed in all eleven states, being highest in Khartoum and North Kordofan States (72v28). Fig1. But only7185 persons (88%) participated in STEP3.

Table 3.1. 1: Distribution of 7722 Participants who completed STEP 1/2 by Age group and Sex

Age Group (years)	Male		Female		Both Sexes	
	n	%	n	%	n	%
18-29	721	26.6	1689	33.7	2410	31.2
30-44	894	33.0	1921	38.3	2815	36.5
45-59	727	26.9	1032	20.6	1759	22.8
60-69	365	13.5	373	07.4	738	09.6
18-69	2707	35.1	5015	64.9	7722	100

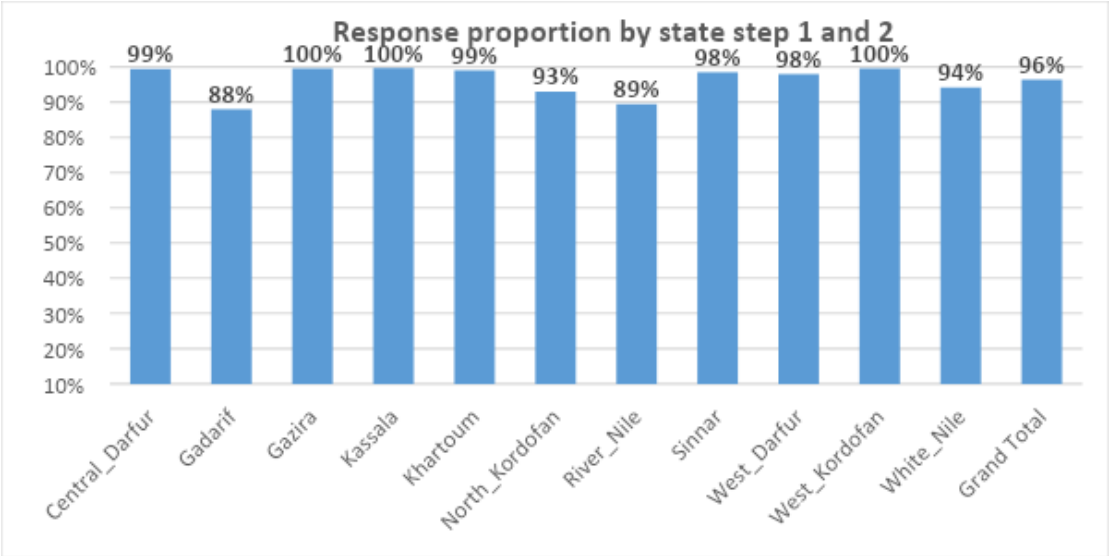

Figure 3.1. 1: Distribution of response rate by state and coverage of step 1&2

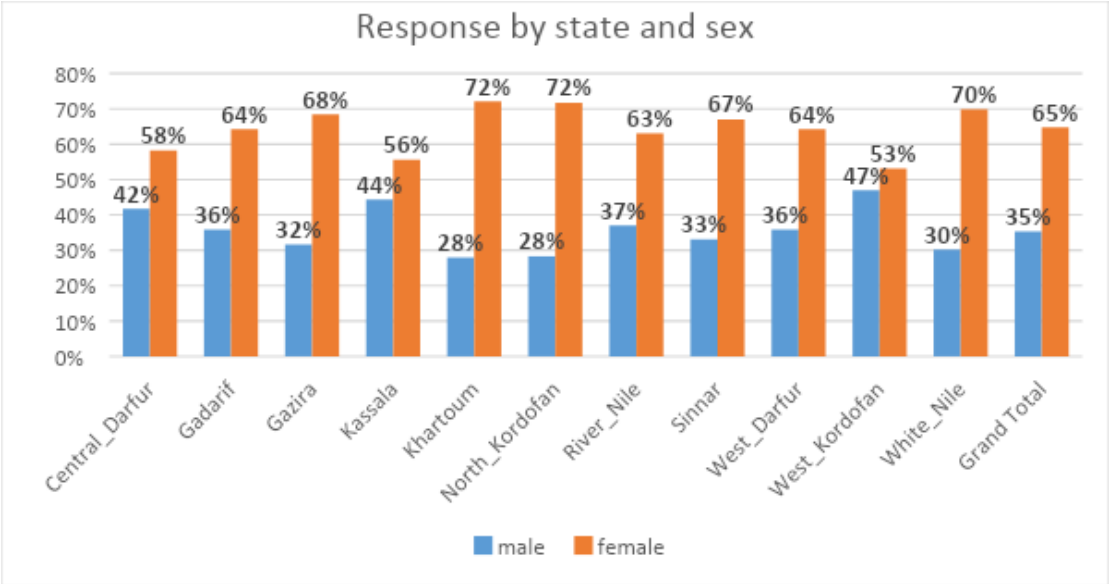

Figure 3.1. 2: Distribution of response rate by State and Sex

Education

The level of education is shown in Tables3.1.2/3. Illiteracy rate was 42.4% among all participants, while it was 49.6%and 29.0% among females and males respectively. Among females aged 60-69 illiteracy was 76.4% as compared to 42.2 % among males.

More males (30.7%) had informal schooling as compared to females (19.6%).No remarkable gender difference was noted in completion of university or higher education (18% Females vs. 20% Males) Table 3.1.2.. The mean number of years spent in education was 8.08 years for both sexes. Females had a mean of 7.8 years while men had a mean of 8.1 years Table 3.1.3.

Table 3.1. 2: Distribution of Level of Education by Sex and Age Group.

Males					
Age group	n	Illiterate	informal schooling	Intermediate schooling*	High school and above
18-29	721	24.0	25.2	23.9	26.9
30-44	894	26.1	35.6	17.9	20.5
45-59	727	31.1	26.1	24.5	18.3
60-69	365	42.2	38.6	10.4	8.8
Total	2707	29.0	30.7	20.2	20.0
Females					
Age group	n	Illiterate	informal schooling	Intermediate schooling*	High school and above
18-29	1689	42.0	23.0	13.4	21.6
30-44	1921	46.7	19.3	13.7	20.3
45-59	1032	57.8	15.9	12.6	13.7
60-69	373	76.4	16.6	4.8	2.1
Total	5015	49.6	19.6	12.7	18.0
Both sex					
Age group	n	Illiterate	informal schooling	Intermediate schooling*	High school and above
18-29	2410	36.6	23.6	16.6	23.2
30-44	2815	40.2	24.3	15.0	20.5
45-59	1759	46.8	20.0	17.6	15.6
60-69	738	59.3	27.6	7.6	5.4
Total	7722	42.4	23.4	15.4	18.8

** Participants who have completed 8 – 9 years of education; 'Primary and intermediate' or 'Basic' schooling*

Table 3.1. 3: The mean number of years of education distributed by sex and age group.

Age Group	Males		Females		Both Sexes	
(years)	n	Mean	No	Mean	No	Mean
18-29	547	9.38	975	9.06	1522	9.17
30-44	658	8.35	1017	8.97	1675	8.73
45-59	498	8.36	434	8.37	932	8.36
60-69	211	6.58	88	4.85	299	6.07
18-69	1914	8.16	2514	7.81	4428	8.08

Marital status

The majority of respondents are currently married (76.1%), and only 15.6% have never been married. Among the age group 18-29 ,(71%) of females are married as compared to only (33%) among males (Table 3.1.4). At age 60-69 years 38.4% of females are widowed as compared to only 3.6% among males. It indicates that males die earlier than females.

Table 3.1. 4: Distribution of Marital Status by age group and sex

Age Group (years)	n	Never married	Currently married	Separated	Divorced	Widowed
			Males			
18-29	721	66.3	33.0	0.4	0.3	0.0
30-44	894	9.8	86.8	1.2	1.1	1.0
45-59	727	3.4	92.0	2.1	1.0	1.5
60-69	362	1.1	93.6	1.1	0.6	3.6
18-69	2704	22.0	74.8	1.2	0.8	1.2
			Females			
18-29	1687	26.1	71.0	0.5	1.5	0.9
30-44	1916	6.7	84.8	0.9	3.3	4.3
45-59	1031	3.4	79.5	1.3	2.7	13.1
60-69	372	1.6	55.6	1.6	2.7	38.4
18-69	5006	12.2	76.9	0.9	2.5	7.5
			Both Sexes			
18-29	2408	38.1	59.6	0.5	1.1	0.6
30-44	2810	7.7	85.4	1.0	2.6	3.2
45-59	1758	3.4	84.7	1.6	2.0	8.3
60-69	734	1.4	74.4	1.4	1.6	21.3
18-69	7710	15.6	76.1	1.0	1.9	5.3

Employment status

The employment status was categorized as paid employment or unpaid. Those paid employed were either government employed, non-government employed or self-employed. Among males 79.9% were employed as compared to 17.2% among females (Table3.1.5).The majority of males (45.9%) were self-employed. Among the most productive age (30-59) years, 90.4% of males were employed as compared 21.3% among females.

Further grouping of the unpaid and the unemployed show that among the 544 males 39% were students, 18.9%unemployed and 16% retired as compared to 4.8% students, 87.4% housewives and 5.3% unemployed among the 4140 females (Table 3.1.6).

Table 3.1. 5: Distribution of Employment Status by Sex and Age Group

Age Group (years)	n	% Government employee	% Non-government employee	% Self-employed	% Unpaid
		Males			
18-29	720	4.4	19.0	36.7	39.9
30-44	892	12.8	28.6	50.2	8.4
45-59	725	15.9	25.8	47.6	10.8
60-69	363	4.4	16.5	50.4	28.7
18-69	2700	10.3	23.7	45.9	20.1
		Females			
Age Group (years)	n	% Government employee	% Non-government employee	% Self-employed	% Unpaid
18-29	1683	2.5	3.9	5.2	88.5
30-44	1914	7.0	5.4	8.6	78.9
45-59	1031	9.5	3.7	8.3	78.5
60-69	0372	1.9	3.2	5.9	89.0
18-69	5000	5.6	4.4	7.2	82.8

Table 3.1. 6: Distribution of Unpaid and Unemployed Participants by category/ sex and age group

Age Group (years)	n	% Non-paid	% Student	% Home-carer*	% Retired	Unemployed	
						% Able to work	% Not able to work
		Males					
18-29	287	6.6	70.7	5.9	0.7	15.3	0.7
30-44	75	45.3	8.0	17.3	6.7	17.3	5.3
45-59	78	20.5	2.6	24.4	28.2	9.0	15.4
60-69	104	12.5	1.0	10.6	55.8	8.7	11.5
18-69	544	15.1	39.0	11.0	16.0	13.4	5.5
		Female					
Age Group (years)	n	% Non-paid	% Student	% Home-carer*	% Retired	Unemployed	
						% Able to work	% Not able to work
18-29	1489	1.3	12.4	77.2	0.7	8.1	0.4
30-44	1511	1.1	0.8	94.0	0.9	3.0	0.2
45-59	809	1.0	0.2	94.3	1.9	1.2	1.4
60-69	331	0.6	0.0	85.8	6.9	0.6	6.0
18-69	4140	1.1	4.8	87.4	1.5	4.3	1.0

** Individual who stays at home and does household work without payment.*

3.2 Behavioral Risk Factors

3.2.1 Tobacco Use

Current Tobacco Use

Current tobacco use is defined as use of any tobacco product (cigarettes, cigars, pipes water pipes/shisha and smokeless tobacco (snuff, chewing tobacco) within the last 30 days. The distribution of current tobacco smokers by age group and sex is shown in table (3.2.1). The overall prevalence of current tobacco smoking is 9.6% (approximately 1.9 million of the population). The prevalence is significantly higher among males 463 (17.1%) as compared to women 31(0.7%). The highest percentage of smoking reported among males is in the age group 30-44 (18.7%).

Table 3.2. 1: Distribution of current smokers by age group 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	721	17.6	14.2-21.0	1689	0.5	0.0-1.0	2410	10.3	8.3-12.3
30-44	894	18.7	15.5-21.9	1921	1.2	0.4-2.0	2815	10.2	8.4-11.9
45-59	727	15.0	11.9-18.2	1032	0.3	0.0-0.6	1759	8.0	6.3-9.7
60-69	365	10.7	6.7-14.7	373	0.6	0.0-1.5	738	6.5	4.1-8.9
18-69	2707	17.1	15.0-19.2	5015	0.7	0.3-1.1	7722	9.6	8.4-10.9

Table (3.2.2) describes the smoking status among males categorized according to the frequency of smoking. Among the 17.1%current smokers, 13.8% were daily smokers and 3.3% were non-daily smoker. A total of 74% of males had never smoked while 8.9% were ex- smokers.

Table 3.2. 2: Distribution of Smoking Status among male participants

Age Group (years)	Males								
	n	Current smoker				Non-smokers			
		% Daily	95% CI	% Non-daily	95% Cl	% Former smoker	95% CI	% Never smoked	95% CI
18-29	721	14.6	11.5-17.7	3.1	1.7-4.4	5.6	3.7-7.4	76.8	72.8-80.8
30-44	894	14.9	11.9-17.9	3.7	2.2-5.2	9.9	7.6-12.1	71.4	67.3-75.6
45-59	727	11.3	8.6-14.1	3.7	1.9-5.5	14.0	11.1-17.0	71.0	66.6-75.4
60-69	365	9.1	5.3-12.8	1.6	0.1-3.1	16.6	11.5-21.6	72.8	67.0-78.5
18-69	2707	13.8	11.9-15.7	3.3	2.4-4.1	8.9	7.5-10.3	74.0	71.2-76.9

The majority of the smokers(80.8%) smoke on daily basis, while the mean age of starting smoking ranged from 16.9 to 25.6 years and the duration of smoking ranged from 7 to37.6 years.(Table 3.2.3).

Table 3.2. 3: Distribution of Current daily smoking, Age of Starting Smoking and Duration of Smoking by Age Group among male participants

Males									
Age Group years	Current Daily smoking			Mean Age of Starting smoking			Mean Duration of Smoking		
	n	% Daily smokers	95% CI	n	Mean Age	95% CI	n	Mean Duration Years	95%CI
18-29	127	82.6	75.6-89.6	122	16.9	16.1-17.7	122	07.0	06.1-07.9
30-44	168	80.0	72.5-87.5	166	20.9	19.8-22.1	166	15.8	14.7-17.0
45-59	102	75.4	65.0-85.9	101	23.3	21.2-25.4	101	27.1	25.0-29.1
60-69	35	84.9	71.5-98.2	35	25.6	21.9-29.3	035	37.6	33.9-41.3
18-69	432	80.8	76.2-85.3	424	19.5	18.8-20.2			

Status of Tobacco Use in the Six Regions

The overall prevalence of current smoking among males was highest (22.3%) in Khartoum and the lowest (14.2%) was in the Northern Region. Among males the prevalence of daily current smoking was highest (19.9%) in the Khartoum and lowest (8.4%) in Northern Region. The mean age of starting smoking manufactured cigarettes ranged from 18.1-20.1years for males .The mean number of manufactured cigarettes smoked per day ranged from (7.5-9.6)cigarettes among males Table 3.2.4.A

Table 3.2. 4A: Distribution of Status of Tobacco Use by Region, male gender.

Region/Male	Total	Central	Darfur	Eastern	Khartoum	Kordofan	Northern
% Current smokers	**17.1** (14.6-17.4)	**17.6** (13.9-19.8)	**12.2** (9.1-14.3)	**21.3** (14.9-22.0)	**22.3** (16.5-26.2)	**16.1** (13.6-20.6)	**14.2** (9.0-18.8)
% Daily Current smokers.	**13.8** (11.4-14.0)	**12.8** (10.2-15.5)	**9.6** (7.0-11.7)	**18.5** (12.0-18.6)	**19.9** (13.6-22.8)	**12.7** (10.3-16.7)	**8.4** (5.8-14.3)
Current Daily Smokers							
Average age (years) of starting smoking	19.3 (18.5-20.1)	20.1 (18.4-21.8)	19.7 (17.9-21.6)	19.6 (17.7-21.6)	18.1 (16.3-19.8)	18.8 (17.4-20.2)	21.8 (18.6-25.0)
Mean daily no of manufactured cigarettes.	8.5 (7.6-9.4)	8.6 (5.9-11.3)	8.1 (6.9-9.4)	9.6 (6.6-12.6)	8.6 (7.0-10.2)	7.5 (6.3-8.8)	7.7 (3.6-11.7)

Status of Tobacco Use Rural v Urban

Overall smoking is higher in urban setting (12.4%) as compared to 8% in rural settings. Among males the prevalence was (21.7%) in urban settings and (14.4%) in rural settings while among women it was 1.3% and 0.3% respectively. Daily male current smokers were 17.8% in urban and 11.5% in rural settings. The average age of smoking initiation is 19 years in both settings Table 3.2.4 B.

Table 3.2.4B : Distribution of Tobacco use by urban and rural settings and gender.

Results for adults aged 18-69 years	Rural			Urban		
	Males	**Females**	**Both Sexes**	**Males**	**Females**	**Both Sexes**
Step 1 Tobacco Use						
Percentage who currently smoke tobacco	14.4 (12.8-16)	0.3 (0.15 % to 0.55)	8.0 (7.3-8.78)	21.7 (18.95-24.47)	1.3 (0.75-1.81)	12.4 (11.09-13.62)
Percentage who currently smoke tobacco daily	11.5 (10.01-12.91)	0.3 (0.12-0.51)	6.4 (5.74-7.09)	17.8 (15.27-20.39)	0.7 (0.31-1.09)	10.0 (8.83-11.14)
For those who smoke tobacco daily						
Average age started smoking (years)	19.4 (18.5-20.4)	21.6 (18.9-24.3)	19.5 (18.5-20.5)	19.1 (17.8-20.4	18.0 (13.0-23.0)	19.1 (17.8-20.4)
Percentage of daily smokers smoking manufactured cigarettes	97.2 (94.9-99.43)	100 (100-100)	97.2 (95.03-99.43)	91.8 (87.19-96.41)	33.3 (8.62-57.99)	90.0 (85.12-94.7)
Mean number of manufactured cigarettes smoked per day (by smokers of manufactured cigarettes)	9.6 (8.1-11.1)	8.8 (6.3-11.2)	9.6 (8.1-11.0)	7.3 (6.4-8.3)	2.0 (0.1-4.2)	7.2 (6.2-8.1)

The most frequently smoked tobacco among males is manufactured cigarettes 91% (Table 3.2.5). Moreover 36.1% smoke cigars.

Table 3.2. 5: Percentage Distribution of smoked products among male current smokers.

Age Group	No	% Manufactured cig.	95% CI	Hand-rolled	95% CI	% Pipes of Tobacco	95% CI	% Cigars	95% CI	% Shisha	95% CI	% Other	95% CI
18-29	127	91.6	85.8-97.4	10.5	4.4-16.6	2.0	0.0-4.4	38.5	28.6-48.5	16.1	9.3-22.9	5.7	0.6-10.7
30-44	168	94.6	91.3-97.9	8.8	3.0-14.5	2.0	0.0-4.3	34.4	25.5-43.3	17.3	9.2-25.4	2.3	0.4-4.2
45-59	102	90.9	84.9-96.8	8.4	1.8-15.1	1.5	0.0-3.7	32.6	20.8-44.4	13.5	5.8-21.3	2.2	0.0-4.8
60-69	35	92.6	82.9-100.0	10.8	0.0-23.6	1.5	0.0-4.4	36.1	18.2-53.7	13.2	1.8-24.6	1.1	0.0-3.2
18-69	**432**	**92.5**	**89.3-95.6**	**9.7**	**6.1-13.2**	**1.9**	**0.1-3.8**	**36.2**	**29.7-42.7**	**16.0**	**11.4-20.5**	**3.9**	**1.3-6.5**

Table (3.2.6) shows the distribution of male former daily smokers among those who smoked daily ever. The overall percentage is 41.7% while it is 28.6% in the age group 18-29 as compared to 65.0% among age group 60-69 years.

Table 3.2. 6: Distribution of Former daily smokers among ever daily male smokers by age group.

Age Group (years)	Men		
	n	% Former daily smokers	95% CI
18-29	149	28.6	20.6-36.5
30-44	244	44.6	37.7-51.5
45-59	183	57.5	50.0-65.1
60-69	84	65.0	52.4-77.5
18-69	660	41.7	36.9-46.5

Table (3.2.7) shows that the mean years since cessation among males was 12.6 years. The mean years of smoking cessation increases with the increase in age.

Table 3.2. 7: Distribution of Mean years since cessation among Male smokers

Age Group (years)	Men		
	n	Mean years	95% CI
18-29	43	3.9	2.6-5.3
30-44	91	11.6	10.0-13.2
45-59	94	18.9	15.9-21.9
60-69	53	23.9	19.1-28.8
18-69	281	12.6	10.9-14.3

A total of 65.5% of male current smokers tried to quit smoking during the past 12 months (Table 3.2.8), ranging from 58.6% in age group 60-69 to 68.3% in age group 45-59 years.

Table 3.2. 8: Distribution of Current smokers who have tried to stop smoking by age group

Age Group (years)	Men		
	N	% Tried to stop smoking	95% CI
18-29	127	64.4	54.2-74.6
30-44	168	66.5	56.9-76.1
45-59	102	68.3	58.2-78.4
60-69	35	58.6	40.6-76.6
18-69	432	65.5	59.4-71.5

Table (3.2.9) shows that 34% of male current smokers were advised by a doctor or other health worker to stop smoking during the past 12 months when visiting a health care setting. Approximately 50% of smokers aged 60-69 years were advised.

Table 3.2. 9: Distribution of Current Male smokers who have been advised by doctor and/ or a health worker to stop smoking by age group.

Age Group (years)	Men		
	N	% Advised to stop smoking	95% CI
18-29	120	37.6	26.5-48.7
30-44	157	29.7	21.0-38.3
45-59	97	27.4	16.4-38.4
60-69	35	49.1	30.7-67.4
18-69	409	34.0	27.3-40.7

Smokeless Tobacco Use

Table (3.2.10) shows the current users of smokeless tobacco among participants. It is 71.5times more common among males as compared to females (14.3% v 0.2%). The men aged 30-44 and 45-59 have the highest percentages of current smokeless tobacco use (17.5% and 18.8%) respectively.

Table 3.2. 10: Current users of smokeless tobacco distributed by age group and sex

Age Group (years)	Men			Women		
	N	% Current users	95% CI	n	% Current users	95% CI
18-29	721	11.1	8.4-13.9	1689	0.0	0.0-0.1
30-44	894	17.5	14.2-20.8	1921	0.3	0.0-0.6
45-59	727	18.8	14.9-22.6	1032	0.3	0.0-0.7
60-69	365	11.3	7.3-15.2	373	0.2	0.0-0.5
18-69	2707	14.3	12.2-16.4	5015	0.2	0.0-0.3

Table (3.2.11) shows that 82.1% of males had never tried using smokeless tobacco as compared to (99.6%) among females. Among men (12.3%) use smokeless tobacco daily as compared (0.1%) among women.

Table 3.2. 11: Smokeless tobacco use distributed by sex and age group

Age Group (years)	Men								
	n	Current user				Non user			
		% Daily	95% CI	% Non-daily	95% CI	% Past user	95% CI	% Never used	95% CI
18-29	721	9.5	7.0-12.0	1.6	0.5-2.8	2.1	0.9-3.4	86.8	83.8-89.8
30-44	894	14.7	11.8-17.6	2.8	1.1-4.5	3.5	2.1-5.0	79.0	75.4-82.6
45-59	727	16.5	13.1-20.0	2.2	0.9-3.5	6.7	4.5-8.9	74.5	70.4-78.7
60-69	365	10.4	6.7-14.1	0.9	0.0-1.9	7.0	3.9-10.1	81.7	76.7-86.7
18-69	2707	12.3	10.4-14.1	2.0	1.2-2.8	3.6	2.7-4.5	82.1	79.8-84.5
Age Group (years)	Women								
	n	Current user				Non user			
		% Daily	95% CI	% Non-daily	95% CI	% Past user	95% CI	% Never used	95% CI
18-29	1689	0.0	0.0-0.1	0.0	0.0-0.0	0.1	0.0-0.3	99.8	99.6-100.0
30-44	1921	0.1	0.0-0.3	0.2	0.0-0.4	0.5	0.0-1.0	99.2	98.7-99.8
45-59	1032	0.3	0.0-0.7	0.0	0.0-0.0	0.1	0.0-0.2	99.6	99.2-100.0
60-69	373	0.2	0.0-0.5	0.0	0.0-0.0	0.0	0.0-0.0	99.8	99.5-100.0
18-69	5015	0.1	0.0-0.2	0.1	0.0-0.1	0.2	0.0-0.4	99.6	99.4-99.8

The Use of both Smoking and Smokeless Tobacco

Table (3.2.12) shows percentage distribution of current (both daily and non-daily) tobacco users, including smoking and smokeless. The prevalence among men (27.9%) is 35 times greater than prevalence among women (0.8%).

Table 3.2. 12: Current tobacco users for both smoking and smokeless distributed by age group and sex.

Age Group (years)	Men			Women		
	n	% Current users	95% CI	n	% Current users	95% CI
18-29	721	24.8	21.0-28.6	1689	0.6	0.0-1.1
30-44	894	32.3	28.3-36.2	1921	1.3	0.5-2.1
45-59	727	31.3	26.7-35.8	1032	0.5	0.0-1.1
60-69	365	21.0	16.1-26.0	373	0.8	0.0-1.7
18-69	2707	27.9	25.2-30.5	5015	0.8	0.4-1.2

Exposure to second hand smoking

The overall exposure to second-hand smoking at home in the past 30 days is 24.6%, (26.5% and 22.4%) among males and females respectively Table3.2.13.

Table 3.2. 13: Distribution of Exposure to second-hand smoking in homes during the past 30 days by gender and age group

Age Group (years)	Men			Women			Both Sexes		
	n	% Exposed	95% CI	N	% Exposed	95% CI	N	% Exposed	95% CI
18-29	721	29.4	24.2-34.7	1689	23.1	19.7-26.5	2410	26.7	23.0-30.5
30-44	894	25.9	21.5-30.3	1921	20.6	17.9-23.3	2815	23.3	20.4-26.2
45-59	727	21.4	17.2-25.7	1032	23.8	19.8-27.7	1759	22.5	19.4-25.7
60-69	365	19.9	14.7-25.1	373	22.4	16.4-28.3	738	20.9	16.4-25.4
18-69	2707	26.5	23.0-30.1	5015	22.4	19.8-24.9	7722	24.6	22.0-27.3

Overall 22.1% of participants are exposed to tobacco in work places during the last 30 days, 30.4% among males and 12.4 % among females. The highest exposure (33.7%) is among males aged 18-29 years (3.2.14).

Table 3.2. 14: Distribution of Exposure to second-hand smoking in the workplace during the past 30 days by age group and gender.*

Age Group (years)	Men			Women			Both Sexes		
	n	% Exposed	95% CI	N	% Exposed	95% CI	n	% Exposed	95% CI
18-29	622	33.7	28.1-39.2	337	15.4	11.6- 19.3	2090	24.8	21.0-28.6
30-44	749	29.7	24.4-35.0	383	18.9	15.0-22.8	2454	21.2	18.1-24.3
45-59	639	26.6	21.4-31.7	215	12.9	8.4-17.4	1581	19.1	15.9-22.4
60-69	309	16.3	11.1-21.5	35	15.2	3.3-27.1	638	13.5	10.1-16.9
18-69	2319	30.4	26.2-34.5	970	16.0	13.7- 18.3	6763	22.1	19.3-24.8

**For women we changed the denominator to student and employed only*

Tobacco Policy

The information on danger of smoking and environment to quit smoking available in newspapers ,television and radio during the past 30 days as reported by participants is shown in tables 3.2.15/16/17.

Table 3.2.15 shows that 35.6% of the literate males noticed the information in newspapers and magazines as compared to 35.3% among literate females.

However 40.9% of males noticed the information on television as compared to 34.0% among females Table 3.2.16.While 40.8% of males listened to such information on radio as compared to 33.5% among females. The highest percentage 57.0% was reported from Northern Province Table 3.2.17.

Table 3.2. 15: Percentage Distribution of literate participants who noticed information in newspapers or magazines about dangers of smoking distributed by sex and region

Region	Men			Women			Both Sexes		
	N	%	95% CI	N	%	95% CI	N	%	95% CI
Central	469	42.6	38.1-47.1	763	37.1	33.7-40.5	1232	40.1	39.8-45.4
Darfur	338	27.9	23.1-32.7	195	23.9	17.9-29.9	533	27.0	24.1-31.7
Eastern	265	25.4	20.2-30.6	280	24.4	19.4-29.5	545	25.1	21.7-29.1
Khartoum	276	46.5	40.6-52.4	606	48.1	44.2-52.1	882	47.3	43.2-49.8
Kordofan	230	28.5	22.7-34.3	268	17.3	12.8-21.8	498	25.1	24.5-32.5
Northern	155	41.5	33.7-49.3	216	34.2	27.9-40.5	371	38.4	36.5-46.5
Total	1733	35.6	38.1-47.1	2328	35.3	33.4-37.3	4061	35.5	34.1-37.1

Table 3.2. 16: Percentage Distribution of Participants who Noticed information on television about dangers of smoking or that encourages quitting by sex and region.

Region	Men			Women			Both Sexes		
	N	%	95% CI	n	%	95% CI	N	%	95% CI
Central	286	44.9	(39.1-50.7)	503	38.6	(34.3-42.9)	789	41.7	(38.3-45.1)
Darfur	145	32.5	(24.9-40.1)	134	19.6	(12.9-26.3)	279	27.6	(22.4-32.8)
Eastern	143	35.0	(27.2-42.8)	152	27.2	(20.1-34.3)	295	31.8	(26.5-37.1)
Khartoum	124	46.3	(37.5-55.1)	360	49.6	(44.4-54.8)	484	47.9	(43.4-52.4)
Kordofan	129	41.1	(32.6-49.6)	122	21.2	(13.9-28.5)	251	32.8	(27.0-38.6)
Northern	107	59.3	(50.0-68.6)	125	47.5	(38.7-56.3)	232	54.0	(47.6-60.4)
TOTAL	934	40.9	(37.7-44.1)	1396	34.0	(31.5-36.5)	2330	37.8	(35.8-39.8)

Table 3.2. 17: Percentage distribution of participants who listened to Information provided by radio about dangers of smoking or that encourages quitting by sex and region

Region	Men			Women			Both Sexes		
	N	%	95% CI	N	%	95% CI	N	%	95% CI
Central	306	46.5	(40.9-52.1)	510	37.3	(33.1-41.5)	816	41.8	(38.4-45.2)
Darfur	167	34.7	(27.5-41.9)	146	22.1	(15.4-28.8)	313	29.9	(24.8-35.0)
Eastern	156	36.2	(28.7-43.7)	140	23.6	(16.6-30.6)	296	31.1	(25.8-36.4)
Khartoum	112	40.7	(31.6-49.8)	316	42.0	(36.6-47.4)	428	41.3	(36.6-46.0)
Kordofan	151	41.8	(33.9-49.7)	174	29.7	(22.9-36.5)	325	36.8	(31.6-42.0)
Northern	101	57.0	(47.3-66.7)	133	52.9	(44.4-61.4)	234	55.1	(48.7-61.5)
TOTAL	993	40.8	(37.7-43.9)	1419	33.5	(31.0-36.0)	2412	37.6	(35.7-39.5)

Overall 6.7% of respondents (9.3% males and 3.4% females) noticed during the past 30 days advertisements or signs promoting cigarettes in supermarkets or shops that sell cigarettes Table 3.2.18. The highest percentage 15.6% was in Eastern Region.

Table 3.2. 18.Percentage distribution of participants who noticed advertisements or signs promoting cigarettes in supermarkets /shops distributed by sex and region

Region	Men			Women			Both Sexes		
	N	%	95% CI	n	%	95% CI	N	%	95% CI
Central	51	9.1	(1.2-17.0)	33	3.9	(0-10.5)	84	6.4	(1.2-11.6)
Darfur	20	4.8	(0-14.2)	10	1.4	(0-8.7)	30	3.4	(0-9.9)
Eastern	46	15.6	(5.1-26.1)	17	2.4	(0-9.7)	63	10.2	(2.7-17.7)
Khartoum	33	12.5	(1.2-23.8)	47	6.1	(0-12.9)	80	9.3	(2.9-15.7)
Kordofan	26	8.7	(0-19.5)	14	2.5	(-0-10.7)	40	6.2	(0-13.7)
Northern	1	0.6	(0-15.7)	4	2.6	(-0-18.2)	5	1.5	0-12.2)
TOTAL	177	9.3	(5.0-13.6)	125	3.4	(0.2-6.6)	302	6.7	(3.9-9.5)

Of the 463 current male smokers 417 responded to the question about noticing health warnings in cigarette packs Table 3.2.19. Out of respondents 66.5% noticed the health warnings and the highest percentage 72.8% was among the age group 60-69 years old.

Table 3.2. 19: Distribution of Current male smokers who noticed health warnings on cigarette packages by age groups.

Age Group (years)	Men		
	n	%	95% CI
18-29	122	70.3	61.1-79.5
30-44	162	59.9	50.3-69.5
45-59	100	66.0	55.0-77.0
60-69	33	72.8	57.0-88.7
18-69	417	66.5	60.6-72.4

Table (3.2.20) shows that 71.8% of the current male smokers who noticed health warnings on cigarette packages during the past 30 days and thought about quitting. The highest prevalence (84.1%) was among the age group 45-59 years.

Table 3.2. 20: Distribution by age group of Current male smokers who noticed health warnings on cigarette packages and thought of quitting.

Age Group (years)	Men		
	n	%	95% CI
18-29	79	66.8	55.4-78.2
30-44	98	75.6	64.3-87.0
45-59	66	84.1	74.9-93.3
60-69	21	64.6	40.1-89.2
18-69	264	71.8	64.6-79.0

Table (3.2.21) shows that the average price paid by male current smokers for a pack of 20 manufactured cigarettes is 25.4SDG.

Table 3.2. 21: Distribution of Average price paid for 20 manufactured cigarettes by age groups

Age Group (years)	Men		
	N	Mean [SDG]	95% CI
18-29	103	24.1	18.4-29.8
30-44	118	27.5	20.3-34.7
45-59	73	22.1	17.9-26.3
60-69	27	42.7	0.0-90.7
18-69	321	25.4	21.3-29.5

3.2.2 Alcohol Consumption

Status of Alcohol consumption

The prevalence of alcohol consumption among current drinkers during the past 30 days is twelve times greater among males (3.6%) as compared to 0.3% among females (Table3.2.22). Life time abstainers among women are 99.1% while they represent 91.2% among males.

Table 3.2. 22: Distribution of Alcohol consumption by gender and age group.

Age Group (years)	Men								
	N	% Current drinker (past 30 days)	95% CI	% Drank in past 12 months, not current	95% CI	% Past 12 months abstainer	95% CI	% Lifetime abstainer	95% CI
18-29	721	5.0	3.1-6.8	1.3	0.3-2.3	1.2	0.4-2.1	92.5	90.3-94.7
30-44	894	2.2	1.1-3.3	0.6	0.1-1.0	5.3	3.4-7.1	92.0	89.7-94.2
45-59	727	2.2	1.0-3.5	0.6	0.0-1.2	8.3	5.8-10.8	88.9	86.0-91.8
60-69	365	3.0	0.9-5.2	0.6	0.0-1.5	12.7	8.6-16.8	83.6	79.2-88.1
18-69	**2707**	**3.6**	**2.6-4.6**	**0.9**	**0.4-1.4**	**4.3**	**3.2-5.3**	**91.2**	**89.6-92.8**
Age Group (years)	**Women**								
	N	% Current drinker (past 30 days)	95% CI	% Drank in past 12 months, not current	95% CI	% Past 12 months abstainer	95% CI	% Lifetime abstainer	95% CI
18-29	1689	0.2	0.0-0.5	0.1	0.0-0.2	0.1	0.0-0.2	99.6	99.2-99.9
30-44	1921	0.5	0.1-0.9	0.1	0.0-0.1	0.5	0.1-0.8	99.0	98.5-99.5
45-59	1032	0.4	0.0-0.8	0.0	0.0-0.0	1.0	0.3-1.7	98.7	97.8-99.5
60-69	373	0.4	0.0-0.9	0.0	0.0-0.0	2.6	0.8-4.4	97.0	95.1-99.0
18-69	**5015**	**0.3**	**0.1-0.6**	**0.1**	**0.0-0.1**	**0.5**	**0.3-0.7**	**99.1**	**98.8-99.4**

Stopped drinking due to health reasons

Table (3.2.23) shows the percentage who did not drink during the past 12 months due to health reasons. The prevalence was similar 31.8% among males as compared to 30.2% among females.

Table 3.2. 23: Distribution of cessation of Drinking due to health reasons by age group and gender.

Age Group (years)	Men			Women		
	no	%	95% CI	no	%	95% CI
18-29	8	74.9	47.2-100.0	2	0.0	0.0-0.0
30-44	43	34.0	18.4-49.6	10	31.6	0.7-62.5
45-59	52	20.2	6.6-33.9	8	30.0	0.0-68.5
60-69	36	17.1	2.8-31.5	10	35.2	0.0-71.2
18-69	139	31.8	21.6-42.0	30	30.2	8.4-52.0

Heavy drinking

The prevalence of having six or more drinks on any one occasion in the past 30 days was 16 times greater among males (3.2%) than among females (0.2%). Men in the age group (18-29) years had the highest prevalence (4.5%). (Table 3.2.24)

Table 3.2. 24: Distribution of having six or more drinks in one occasion during the past 30 days by age group and gender.

Age Group (years)	Men			Women		
	n	% ≥ 6 drinks	95% CI	n	% ≥ 6 drinks	95% CI
18-29	54	60.2	47.1-73.2	9	54.4	21.9-86.9
30-44	78	23.9	14.4-33.4	20	39.2	17.8-60.6
45-59	84	17.5	9.4-25.6	12	5.0	-7.3-17.3
60-69	57	14.5	5.4- 23.64	13	6.1	-6.9-19.1
18-69	273	36.6	30.9-42.3	54	27.5	15.6-39.4

Note: Alcohol is locally (homemade) made

The mean number of times in the past 30 days during which current drinkers consumed six or more drinks in one single occasion was 4.5 and 5.9 for males and females respectively Table 3.2.25. The mean number of binge drinking in the last month for current drinker is (4.6%).

Table 3.2. 25: Distribution of frequency of having six or more drinks during a single occasion in the past 30 days among current drinkers by gender and age group.

Age Group (years)	Men			Women		
	n	Mean number of times	95% CI	n	Mean number of times	95% CI
18-29	31	4.2	2.5-5.9	4	3.4	0.5-6.4
30-44	21	5.6	3.4-7.8	6	6.6	4.3-9.0
45-59	15	4.3	2.8-5.7	1	1.0	
60-69	10	4.6	2.0-7.2	1	30	
18-69	77	4.5	3.2-5.7	12	5.9	2.7-9.0

Alcohol Consumption: Regional Status

The highest percentage of current drinkers (4.4%) was in Darfur Region while the lowest (0.6%) were in Khartoum (Table 3.2.26) .Heavy episodic drinking (4.0%) was also observed in Darfur Region and the lowest (0.4%) was in the Northern Region. Overall 94.8% of participants were lifetime abstainers.

Table 3.2. 26A: Alcohol consumption Status distributed by Region.

(18-69 years)	Total	Central	Darfur	Eastern	Khartoum	Kordofan	Northern
Lifetime Abstainers	94.8% (93.9-95.7)	95.6% (94.0-97.1)	94.8% (93.0-96.6)	90.8% (87.5-94.2)	97.1% (95.4-98.8)	94.2% (92.3-96.1)	97.9% (96.0-99.7)
Past 12 month Abstainers	2.5% (2.0-3.1)	2.8% (1.7-4.0)	0.8% (0.2-1.5)	6.0% (3.6-8.4)	1.3% (0.4-2.2)	3.2% (1.8-4.5)	0.9% (0.2-2.1)
Current drinkers (Past 30 days)	2.1% (1.5-2.7)	0.8% (0.2-1.4)	4.4% (2.8-6.0)	2.3% (0.8-3.7)	0.6% (0.1-1.2)	2.3% (1.0-3.6)	1.1% (0.5-2.7)
Heavy episodic drinking	1.9% 1.3-2.4)	0.6% (0.0-1.2)	4.0% (2.4-5.6)	2.2% (0.8-3.6)	0.5% (0.1-1.1)	1.9% (0.7-3.2)	0.4% (0.4-1.2)

Alcohol Consumption Rural v Urban Status

Male life time abstainers were 90.8% in rural and 91.9% in urban settings, while female life time abstainers were 99.0% and 99.4% respectively Table 3.2.26B. The percentage of last 12 month male abstainers is 3.7% in urban settings and 4.7% for in rural settings. Male currently drinkers were 3.9% and 3.1% in rural and urban settings respectively as compared to 0.5% and 0.1% among women respectively. Binge drinking was reported by 2.7% of men in urban setting compared to 3.5% of men in rural settings.

Table 3.2.26B: Distribution of Alcohol consumption by rural and urban settings and sex.

Results for adults aged 18-69 years	Rural			Urban		
Alcohol Consumption	Males	Females	Both Sexes	Males	Females	Both Sexes
% lifetime abstainers	90.8 (89.51-92.14)	99.0 (98.55-99.26)	94.5 (93.86-95.11)	91.9 (90.07-93.72)	99.4 (99.07-99.78)	95.3 (94.53-96.15)
% past 12 month abstainers	4.6 (3.64-5.55)	0.5 (0.3-0.8)	2.8 (2.31-3.21)	3.7 (2.414.92)	0.4 (0.12-0.74)	2.2 (1.62-2.74)
% current drinkers (past 30 days)	3.9 (2.98-4.74)	0.5 (0.26-0.75)	2.3 1.93-2.76%	3.1 (1.97-4.3)	0.1 (-0.06-0.18)	1.7 (1.23-2.23)
% heavy episodic drinkers (6 or more drinks on any occasion in the past 30 days)	3.5 (2.69-4.38)	0.4 (0.15- 0.56)	2.1 (1.712.49)	2.7 (1.58-3.73)	0.1 (-0.06-0.18)	1.5 (1-1.93)

3.2.3 Dietary Pattern

Fruit and Vegetable Consumption

The mean number of days per week of consumption of fruit was 1.8for males and 2.0 for females (Table 3.2.27) while for vegetables it was 3.9 and 4.2 for males and females respectively (Table 3.2.28).

Table 3.2. 27: Mean number of days fruit consumed in a typical week distributed by age group and gender.

	Mean number of days fruit consumed in a typical week								
	Men			Women			Both Sexes		
Age Group (years)	n	Mean number of days	95% CI	n	Mean number of days	95% CI	n	Mean number of days	95% CI
18-29	701	1.8	1.6-2.0	1645	2.0	1.9-2.2	2346	1.9	1.7-2.0
30-44	879	1.9	1.7-2.1	1868	1.9	1.8-2.1	2747	2.0	1.8-2.1
45-59	711	1.7	1.6-1.9	1012	2.0	1.8-2.2	1723	1.9	1.7-2.0
60-69	355	1.7	1.5-2.0	363	2.0	1.7-2.2	718	1.8	1.6-2.0
18-69	2646	1.8	1.7-2.0	4888	2.0	1.9-2.1	7534	1.9	1.8-2.0

Table 3.2. 28: Distribution of Mean number of days vegetables consumed in a typical week by age group and gender.

	Mean number of days vegetables consumed in a typical week								
	Men			Women			Both Sexes		
Age Group (years)	n	Mean number of days	95% CI	n	Mean number of days	95% CI	N	Mean number of days	95% CI
18-29	717	3.9	3.6-4.2	1673	4.0	3.8-4.2	2390	4.0	3.7-4.2
30-44	888	3.9	3.6-4.1	1907	4.2	4.0-4.4	2795	4.0	3.8-4.2
45-59	722	4.0	3.7-4.3	1027	4.6	4.3-4.8	1749	4.2	4.0-4.5
60-69	361	4.2	3.8-4.5	366	4.5	4.1-4.9	727	4.3	4.0-4.6
18-69	2688	3.918	3.7-4.1	4973	4.2	4.0-4.4	7661	4.0	3.9-4.2

Table 3.2.29 Shows the mean number of servings of fruits per day was similar (0.5) for both males and females. The mean number of serving of vegetables per day was 1.1 and 1.3 for males and females respectively Table 3.2.30. However, the overall, mean daily consumption of fruit and vegetables is (1.7) per day Table 3.2.31.

Table 3.2. 29: Mean number of servings of fruits per day distributed by sex and age group

	Mean number of servings of fruit on average per day								
	Men			Women			Both Sexes		
Age Group (years)	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI
18-29	697	0.5	0.4-0.6	1639	0.5	0.5-0.6	2336	0.5	0.4-0.6
30-44	875	0.5	0.4-0.6	1862	0.5	0.5-0.6	2737	0.5	0.5-0.6
45-59	710	0.4	0.4-0.5	1009	0.5	0.5-0.6	1719	0.5	0.4-0.5
60-69	352	0.4	0.3-0.5	362	0.5	0.4-0.6	714	0.5	0.4-0.5
18-69	2634	0.5	0.4-0.5	4872	0.5	0.5-0.6	7506	0.5	0.5-0.5

Table 3.2. 30: Mean number of servings of vegetables per day distributed by age group and sex

	Mean number of servings of vegetables on average per day								
	Men			Women			Both Sexes		
Age Group (years)	N	Mean number of servings	95% CI	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI
18-29	711	1.0	0.9-1.1	1669	1.2	1.1-1.3	2380	1.1	1.0-1.2
30-44	881	1.1	1.0-1.3	1906	1.3	1.2-1.4	2787	1.2	1.1-1.3
45-59	716	1.2	1.0-1.3	1023	1.4	1.2-1.5	1739	1.3	1.1-1.4
60-69	361	1.3	1.0-1.5	363	1.4	1.2-1.5	724	1.3	1.1-1.5
18-69	2669	1.1	1.0-1.2	4961	1.3	1.2-1.4	7630	1.2	1.1-1.3

Table 3.2. 31: Mean number of servings of fruit and/or vegetables per day distributed by sex and age group.

Age Group (years)	Mean number of servings of fruits and/or vegetables per day								
	Men			Women			Both Sexes		
	No	Mean	95% CI	No	Mean	95% CI	No	Mean	95% CI
18-29	716	1.5	1.3-1.6	1681	1.7	1.6-1.9	2397	1.6	1.5-1.7
30-44	891	1.6	1.5-1.8	1911	1.8	1.6-1.9	2802	1.7	1.6-1.8
45-59	725	1.6	1.4-1.7	1027	1.9	1.7-2.1	1752	1.7	1.6-1.8
60-69	363	1.7	1.4-1.9	367	1.9	1.6-2.1	730	1.7	1.5-1.9
18-69	2695	1.6	1.4-1.7	4986	1.8	1.7-1.9	7681	1.7	1.6-1.8

Overall 40.5 % have no fruits or vegetables intake per day, men42.3%and women 38.4%. Only 5.3% have 5servings or more per day (men4.6 %, and women 6.0 %(table3.2.32).

Table 3.2. 32: Number of servings of fruit and/or vegetables per day distributed by sex and age group.

Number of servings of fruits and/or vegetables per day									
Men									
Age Group (years)	N	% no fruit and/or vegetables	95% CI	% 1-2 servings	95% CI	% 3-4 servings	95% CI	% ≥5 servings	95% CI
18-29	716	42.5	37.0-48.1	45.7	40.2-51.2	7.6	4.9-10.3	4.2	2.6-5.9
30-44	891	41.9	36.8-46.9	43.7	39.0-48.3	8.9	6.5-11.4	5.6	3.4-7.7
45-59	725	41.9	36.5-47.3	43.5	38.4-48.6	10.8	7.6-14.1	3.8	2.3-5.2
60-69	363	44.0	37.5-50.6	38.1	32.2-44.0	11.7	7.6-15.9	6.1	3.0-9.2
18-69	2695	42.3	38.3-46.3	44.3	40.6-48.0	8.8	7.0-10.6	4.6	3.4-5.9
Women									
Age Group (years)	N	% no fruit and/or vegetables	95% CI	% 1-2 servings	95% CI	% 3-4 servings	95% CI	% ≥5 servings	95% CI
18-29	1681	40.3	36.3-44.4	43.6	40.3-46.9	10.1	8.2-12.0	6.0	4.3-7.6
30-44	1911	38.7	34.8-42.5	44.3	41.0-47.7	11.3	9.2-13.3	5.8	4.2-7.3
45-59	1027	33.7	29.3-38.1	47.1	43.1-51.1	12.7	10.1-15.3	6.5	4.4-8.6
60-69	367	37.1	30.0-44.1	40.6	34.1-47.1	16.3	10.3-22.3	6.1	3.1-9.1
18-69	4986	38.4	35.1-41.7	44.3	41.9-46.8	11.3	9.8-12.7	6.0	4.8-7.3

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	2397	41.6	37.5-45.7	44.8	41.1-48.4	8.7	6.8-10.6	5.0	3.7-6.3
30-44	2802	40.3	36.6-44.1	44.0	40.7-47.3	10.1	8.3-11.9	5.7	4.1-7.2
45-59	1752	38.0	34.0-41.9	45.2	41.7-48.8	11.7	9.5-13.9	5.1	3.7-6.4
60-69	730	41.1	35.8-46.5	39.2	34.5-43.8	13.6	9.9-17.4	6.1	3.7-8.5
18-69	7681	40.5	37.2-43.8	44.3	41.6-47.0	9.9	8.5-11.3	5.3	4.2-6.3

Inadequate Consumption of Fruits and/or Vegetables

Overall 94.7% of participants consume less than five servings of fruit and vegetables per day (men 95.4% and women 94.0%) Table 3.2.33.

Table 3.2. 33: Distribution of participants who have less than five servings of fruit and/or vegetables per day by gender and age group.

Age Group (years)	Men			Women			Both Sexes		
	N	% < five servings per day	95% CI	n	% < five servings per day	95% CI	n	% < five servings per day	95% CI
18-29	716	95.8	94.1-97.4	1681	94.0	92.4-95.7	2397	95.0	93.7-96.3
30-44	891	94.4	92.3-96.6	1911	94.3	92.7-95.8	2802	94.4	92.8-95.9
45-59	725	96.2	94.8-97.7	1027	93.5	91.4-95.6	1752	94.9	93.6-96.3
60-69	363	93.9	90.8-97.0	367	93.9	91.0-96.9	730	93.9	91.5-96.3
18-69	2695	95.4	94.1-96.6	4986	94.0	92.8-95.2	7681	94.7	93.7-95.8

Fruit and Vegetables Consumption in the Regions

Darfur, Khartoum, Northern and Central regions had a mean number of days of consumption of fruit greater than the national average of 1.9 days Table 3.2.34A. The number of servings of fruit was higher than the national mean of 0.5 in Central (0.7) and in Darfur 0.6 regions. The national mean number of days of consumption of vegetables per week was 4.0 days but it was higher in Khartoum (5.6), Northern (4.7) and Central (4.5) regions.

Table 3.2. 34A: Consumption of fruits and vegetables distributed by region.

Adults aged 18-69 years	Total	Central	Darfur	Eastern	Khartoum	Kordofan	Northern
Mean number of days of consumption of fruit per week	**1.9 (1.8-2.0)**	**2.0 (1.8-2.3)**	**2.4 (2.1-2.7)**	**1.2 (0.9-1.5)**	**2.2 (2.0-2.4)**	**1.4 (1.2-1.6)**	**2.1 (1.7-2.6)**
Mean number of servings of fruit per day	**0.5 (0.5-0.5)**	**0.7 (0.6-0.8)**	**0.6 (0.5-0.7)**	**0.4 (0.3-0.5)**	**0.5 (0.5-0.5)**	**0.3 (0.3-0.4)**	**0.5 (0.4-0.7)**
Mean number of days of consumption of vegetables / week	**4.0 (3.9-4.2)**	**4.5 (4.1-4.9)**	**3.3 (2.9-3.7)**	**3.2 (2.7-3.8)**	**5.6 (5.3-5.8)**	**3.5 (3.1-4.0)**	**4.7 (4.0-5.4)**
Mean number of servings of vegetables per day	**1.2 (1.1-1.3)**	**1.4 (1.3-1.6)**	**0.8 (0.7-0.9)**	**1.1 (0.8-1.4)**	**1.6 (1.4-1.8)**	**0.9 (0.8-1.0)**	**1.4 (1.1-1.7)**
Eating less than 5 servings of fruit and/or vegetables per day	**94.7% (93.7-95.8)**	**91.0% (88.7-93.4)**	**97.0% (95.6-98.3)**	**92.9% (89.2-96.6)**	**92.4% (89.7-95.2)**	**99.1% (98.5-99.7)**	**96.1% (93.1-99.1)**
Always or often Adding salt or salty sauce to food before or during eating	**32.4% (28.9-35.8)**	**32.3% (27.8-36.9)**	**44.1% (34.1-54.2)**	**19.6% (15.0-24.1)**	**28.4% (20.5-36.2)**	**25.1% (17.9-32.4)**	**57.8% (48.5-67.1)**
Always or often eating processed foods high in salt	**12.3% (10.8-13.8)**	**13.2% (10.5-16.0)**	**10.6% (7.0-14.1)**	**7.4% (4.5-10.4)**	**20.9% (16.4-25.5)**	**6.1% (3.8-8.4)**	**20.8% (14.2-27.5)**

Fruits and Vegetables Consumption Rural v Urban

Overall rural population consumed less fruit than urban population 1.7 and 2.2 days per week respectively Table 3.2.34B.Both rural and urban populations consumed less than one fruit per day. Vegetables were consumed more frequently than fruit in both settings, 5days per week in and 3.5 days per week in rural settings. Similarly rural population consumed less vegetable servings per day (1 serving in rural versus 1.5 in urban settings). Among the rural population 96.1% consume less than 5 servings of fruit and or vegetables per day as compared to 92.4% of urban populations.

Table 3.2.34B.Consumption of Fruits and Vegetables distributed by rural v urban and by sex.

Step 1 Diet	Rural			Urban		
	Men	Women	Both sex	Men	Women	Both sex
Mean number of days fruit consumed in a typical week	1.7 (1.5-1.9)	1.8 (1.6-1.9)	1.7 (1.6-1.9)	2.0 (1.8-2.2)	2.4 (2.2-2.5)	2.2 (2.0-2.3)
Mean number of servings of fruit consumed on average per day	0.4 (0.4-0.5)	0.5 (0.4-0.5)	0.5 (0.4-0.5)	0.5 (0.4-0.6)	0.6 (0.6-0.7)	0.6 (0.5-0.6)
Mean number of days vegetables consumed in a typical week	3.3 (3.0-3.6)	3.6 (3.3-3.8)	3.5 (3.2-.3.7)	4.9 (4.6-5.2)	5.2 (5.0-5.5)	5.0 (4.3-5.2)
Mean number of servings of vegetables consumed on average per day	0.9 (0.8-1.0)	1.1 (0.9-1.2)	1.0 (0.9-1.1)	1.4 (1.2-1.6)	1.6 (1.4-1.8)	1.5 (1.4-1.6)
Percentage who ate less than 5 servings of fruit and/or vegetables on average per day	96.5 (95.69-97.37)	95.6 (94.89-96.3)	96.1 (95.58-96.64)	93.4 (91.71-95.0)	91.3 (89.99-92.64)	92.4 (91.41-93.45)

Consumption of Salt

Overall, 32.4 % participants add salt or salty sauce to their food before eating or while eating, men (32.3%) and women (32.4%) Table 3.2.35.

Table 3.2. 35: Prevalence of Adding salt always or often before and during eating distributed by sex/age groups.

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	708	31.4	26.2-36.6	1668	34.2	30.3-38.0	2376	32.6	28.5-36.7
30-44	871	33.2	27.3-39.0	1902	30.8	27.1-34.5	2773	32.0	27.7-36.2
45-59	711	34.0	28.3-39.8	1027	31.6	27.3-35.9	1738	32.9	28.7-37.0
60-69	356	30.9	24.4-37.5	369	29.8	22.6-37.0	725	30.4	25.0-35.9
18-69	**2646**	**32.3**	**28.1-36.6**	**4966**	**32.4**	**29.2-35.5**	**7612**	**32.4**	**28.9-35.8**

Overall 58% of respondents add salt when cooking or preparing foods at home, the highest percentage (68.8%) is among women aged 60-69 years Table 3.2.36.

Table 3.2. 36: Prevalence of Adding salt always or often when cooking or preparing food at home distributed by sex and age group

Age Group (years)	Men			Women			Both Sexes		
	N	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	706	57.1	51.4-62.8	1678	59.0	54.4-63.6	2384	57.9	53.4-62.4
30-44	887	56.0	50.5-61.5	1909	57.0	52.5-61.6	2796	56.5	52.1-60.9
45-59	722	57.0	51.2-62.8	1031	63.0	58.0-67.9	1753	59.8	55.2-64.4
60-69	358	55.5	48.6-62.5	373	68.8	62.1-75.4	731	61.1	55.7-66.6
18-69	**2673**	**56.7**	**52.2-61.2**	**4991**	**59.6**	**55.6-63.5**	**7664**	**58.0**	**54.1-61.9**

Approximately 12.0% of respondents always or often consume processed food high in salt, with no significant difference between sexes. Consumption of processed foods is highest (13.5%) among age group 18-29 (13.5%) and it decreases with age to reach7.7%in the 60-69 age group (Table 3.2.37)

Table 3.2. 37: Frequent Consumption of processed food high in salt distributed by sex and age group.

Age Group (years)	Men			Women			Both Sexes		
	N	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	691	14.2	10.8-17.6	1613	12.6	10.3-15.0	2304	13.5	11.2-15.9
30-44	848	11.8	8.9-14.7	1835	12.6	10.2-15.0	2683	12.2	10.1-14.2
45-59	699	10.4	7.6-13.2	1005	10.9	8.0-13.8	1704	10.6	8.5-12.8
60-69	344	8.3	4.2-12.4	355	6.8	3.7-10.0	699	7.7	4.8-10.6
18-69	**2582**	**12.5**	**10.5-14.6**	**4808**	**12.0**	**10.4-13.7**	**7390**	**12.3**	**10.8-13.8**

Overall, 13.5 % of participants think that their consumption of salt is too high. The perception of high salt consumption is more prevalent among the young (14.2% in age group 18-29 v 9.9% among age group 60-69 years (Table 3.2.38).

Table 3.2. 38: Perception of high Consumption of Salt distributed by age group and gender

Age Group (years)	Men			Women			Both Sexes		
	N	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	721	13.3	10.3-16.3	1682	15.4	13.2-17.7	2403	14.2	12.2-16.2
30-44	894	11.9	9.3-14.5	1918	15.5	13.5-17.5	2812	13.6	11.8-15.4
45-59	724	12.3	9.2-15.4	1031	12.5	10.0-14.9	1755	12.4	10.2-14.6
60-69	364	10.4	6.8-14.0	371	9.1	5.2-13.0	735	9.9	7.2-12.6
18-69	**2703**	**12.6**	**10.8-14.4**	**5002**	**14.6**	**13.1-16.1**	**7705**	**13.5**	**12.2-14.8**

Overall 72.9 % of respondents perceive that their consumption of salt is appropriate, 75.1% in age group 18-29 as compared to 65.5% among age group60-69 years Table3.2.39. Those who perceive that they consume far too much and/ or too much salt constitute 13.4% (men 12.5% and women 14.6%).

Table 3.2. 39: Self-reported quantity of salt consumed distributed by sex and age group

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
Men											
18-29	721	3.8	1.8-5.8	9.5	7.2-11.9	76.5	72.5-80.5	8.8	6.4-11.3	1.4	0.2-2.5
30-44	894	3.7	2.1-5.2	8.2	5.9-10.4	73.8	69.9-77.6	12.1	9.5-14.8	2.2	0.8-3.6
45-59	724	4.3	2.5-6.1	8.0	5.5-10.4	70.4	66.1-74.8	13.7	10.6-16.7	3.6	1.8-5.4
60-69	364	3.6	1.5-5.8	6.8	3.8-9.8	69.1	63.6-74.6	14.2	9.9-18.5	6.3	3.0-9.6
18-69	2703	3.8	2.6-5.1	8.7	7.4-10.1	74.3	71.6-76.9	10.9	9.1-12.7	2.3	1.3-3.2
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	1682	4.2	3.0-5.4	11.2	9.3-13.1	73.2	70.4-76.0	10.1	8.1-12.1	1.3	0.3-2.2
30-44	1918	3.8	2.8-4.7	11.7	10.0-13.5	71.0	68.2-73.9	11.2	9.2-13.1	2.3	1.3-3.3
45-59	1031	3.7	2.1-5.2	8.8	6.8-10.9	70.1	66.6-73.6	15.5	12.6-18.3	2.0	0.8-3.2
60-69	371	2.0	0.0-4.0	7.1	3.8-10.4	60.6	54.1-67.2	23.7	18.3-29.1	6.5	2.1-10.9
18-69	5002	3.9	3.1-4.6	10.7	9.5-12.0	71.3	69.2-73.4	12.1	10.7-13.5	2.0	1.2-2.8
Both Sexes											
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	2403	4.0	2.6-5.3	10.3	8.7-11.8	75.1	72.3-77.8	9.4	7.6-11.1	1.3	0.5-2.1
30-44	2812	3.7	2.7-4.7	9.9	8.3-11.5	72.4	69.8-75.1	11.7	9.9-13.5	2.2	1.3-3.2
45-59	1755	4.0	2.6-5.4	8.4	6.6-10.2	70.2	67.3-73.2	14.5	12.2-16.8	2.8	1.8-3.9
60-69	735	3.0	1.4-4.5	6.9	4.7-9.2	65.5	61.2-69.9	18.2	14.5-21.9	6.4	3.7-9.1
18-69	7705	3.8	3.0-4.7	9.6	8.6-10.6	72.9	71.0-74.8	11.5	10.1-12.8	2.1	1.5-2.8

Approximately nine out of every 10 participants (91.8%) considered lowering salt in diet is very important and /or somewhat important (Table 3.2.40). Only 8.3 % of the respondents do not think that reducing salt in the diet is important at all.

Table 3.2. 40: Level of Importance of lowering salt in diet distributed by age group and sex.

Age Group (years)	N	% Very important	95% CI	% Somewhat important	95% CI	% Not at all important	95% CI
				Men			
18-29	704	33.9	28.2-39.6	55.6	49.8-61.5	10.5	7.8-13.1
30-44	878	37.4	32.1-42.7	56.0	50.9-61.1	6.6	4.5-8.7
45-59	711	40.7	35.7-45.8	50.7	45.8-55.6	8.6	6.0-11.1
60-69	355	38.8	32.1-45.5	53.2	46.5-59.9	8.0	4.5-11.5
18-69	**2648**	**36.4**	**32.3-40.5**	**54.7**	**50.7-58.8**	**8.9**	**7.2-10.6**
				Women			
Age Group (years)	N	% Very important	95% CI	% Somewhat important	95% CI	% Not at all important	95% CI
18-29	1643	31.0	27.1-34.9	60.3	56.5-64.2	8.7	7.0-10.4
30-44	1877	36.2	32.1-40.3	57.2	53.3-61.1	6.6	5.2-8.1
45-59	1011	40.1	34.9-45.3	53.3	48.2-58.3	6.7	4.5-8.8
60-69	356	34.8	27.3-42.2	59.0	51.6-66.4	6.2	3.2-9.1
18-69	**4887**	**34.6**	**31.1-38.1**	**57.9**	**54.6-61.2**	**7.5**	**6.3-8.7**
				Both Sexes			
Age Group (years)	N	% Very important	95% CI	% Somewhat important	95% CI	% Not at all important	95% CI
18-29	2347	32.6	28.5-36.8	57.7	53.6-61.7	9.7	8.0-11.5
30-44	2755	36.8	33.0-40.7	56.6	52.9-60.2	6.6	5.2-8.0
45-59	1722	40.4	36.1-44.8	51.9	47.8-56.0	7.7	5.8-9.5
60-69	711	37.1	31.7-42.6	55.6	50.5-60.7	7.3	4.9-9.6
18-69	**7535**	**35.6**	**32.2-38.9**	**56.2**	**53.0-59.4**	**8.3**	**7.1-9.4**

Approximately nine out of ten participants (87%) think that consuming too much salt could cause serious health problems Table 3.2.41.

Table 3.2. 41: Distribution of perception of consumption of too much salt on health by age group and sex.

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	721	87.8	84.6-91.0	1689	87.3	84.9-89.7	2410	87.6	85.2-90.0
30-44	894	88.9	86.3-91.5	1921	88.7	86.4-91.0	2815	88.8	86.8-90.8
45-59	727	89.1	86.4-91.7	1032	89.3	86.8-91.7	1759	89.2	87.3-91.0
60-69	365	86.5	81.5-91.4	373	88.0	84.0-91.9	738	87.1	83.8-90.5
18-69	**2707**	**88.3**	**86.1-90.4**	**5015**	**88.2**	**86.5-89.9**	**7722**	**88.2**	**86.5-89.9**

Salt in urine measurement

The overall measurement of salt in urine was 8.2 gm (CI: 7.9-8.4) among participants of Khartoum state.

Table 3.2. 42: Distribution of mean sodium in urine in grams by age and gender

Age Group (years)	Mean sodium in urine (grams)								
	Men			Women			Both Sexes		
	n	mean	95% CI	n	mean	95% CI	n	mean	95% CI
18-29	43	7.5	6.7-8.3	95	7.8	7.4-8.1	138	7.6	7.1-8.1
30-44	55	8.6	7.9-9.2	167	8.8	8.5-9.1	222	8.7	8.4-9.0
45-59	65	8.9	8.3-9.5	115	8.3	8.0-8.6	180	8.6	8.3-8.9
60-69	29	8.8	8.2-9.4	51	7.5	7.0-8.0	80	8.1	7.6-8.6
18-69	192	8.2	7.7-8.6	428	8.2	8.0-8.4	620	8.2	7.9-8.4

Salt Consumption by Region

In the Northern region (57.8%) and in Darfur (44.1%) practice addition of salt before and during eating which is greater than the national level (32.4%) Table 3.2.43A Moreover in Khartoum (20.9%) and in Northern region (20.8%) always and or often eat processed food high in salt greater than the national average of 12.3%.

Table 3.2. 43A: Salt consumption distributed by region

Adults aged 18-69 years (95% CI)	Total	Central	Darfur	Eastern	Khartoum	Kordofan	Northern
Always or often adding salt or salty sauce to food before and during eating.	32.4% (28.9-35.8)	32.3% (27.8-36.9)	44.1% (34.1-54.2)	19.6% (15.0-24.1)	28.4% (20.5-36.2)	25.1% (17.9-32.4)	57.8% (48.5-67.1)
Always or often eating processed foods high in salt.	12.3% (10.8-13.8)	13.2% (10.5-16.0)	10.6% (7.0-14.1)	7.4% (4.5-10.4)	20.9% (16.4-25.5)	6.1% (3.8-8.4)	20.8% (14.2-27.5)

Salt Consumption Rural v. Urban

The percentage of rural population who always or often add salt or salty sauce to their food before eating or as they are eating was 34.8% as compared to 28.3% among urban population Table 3.2.43B. However the percentage of urban population who always or often eat processed foods high in salt was 18.6% as compared to 8.3% among the rural population.

Table 3.2.43B Salt consumption distributed by rural and urban settings and by gender.

Diet	Rural			Urban		
	Men	Women	Both sex	Men	Women	Both sex
Percentage who always or often add salt or salty sauce to their food before eating or as they are eating	34.4 (32.2- 36.61)	35.3 (33.64- 36.94)	34.8 (33.49- 36.13)	28.9 (25.91- 31.99)	27.5 (25.42- 29.63)	28.3 (26.56- 30.03)
Percentage who always or often eat processed foods high in salt	8.3 (7.02- 9.63)	8.4 (7.56- 9.12)	8.3 (7.56- 9.12)	19.3 (16.67- 21.97)	17.8 (15.95- 19.56)	18.6 (17.1-20.11)

Sugar Consumption

The average number of days in which respondents consumed soft drinks and /or manufactured juices is 1.2 days per week. Consumption is higher among men (1.3) than among women (0.9) and highest among age group 18-29 years. Table 3.2.44.

Table 3.2. 44: Mean number of days of consumption of soft drinks and/or manufactured juice per week distributed by sex and age group.

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	697	1.6	1.4-1.7	1625	1.2	1.0-1.3	2322	1.4	1.3-1.5
30-44	870	1.2	1.0-1.4	1854	0.8	0.7-0.9	2724	1.0	0.9-1.1
45-59	711	1.0	0.9-1.2	1002	0.7	0.6-0.9	1713	0.9	0.8-1.0
60-69	354	0.7	0.5-0.9	360	0.6	0.4-0.8	714	0.7	0.5-0.8
18-69	2632	1.3	1.2-1.5	4841	0.9	0.8-1.0	7473	1.2	1.1-1.3

Overall 1.6 cups of soft drink were consumed per day, and there is no difference observed between gender and age groups Table 3.2.45.

Table 3.2. 45: The average cups of soft drink consumed by per day distributed by age group and gender.

Age Group (years)	Men			Women			Both Sexes		
	n	Mean number soft drink	95% CI	n	Mean number soft drink	95% CI	n	Mean number soft drink	95% CI
18-29	436	1.7	1.5-1.8	826	1.6	1.5-1.7	1262	1.6	1.5-1.7
30-44	430	1.6	1.4-1.7	769	1.6	1.5-1.8	1199	1.6	1.5-1.7
45-59	288	1.6	1.4-1.8	368	1.4	1.3-1.6	656	1.5	1.4-1.6
60-69	126	1.6	1.4-1.8	112	1.6	1.3-1.9	238	1.6	1.4-1.8
18-69	1280	1.6	1.5-1.7	2075	1.6	1.5-1.7	3355	1.6	1.5-1.7

On average participants consume 6.3 teaspoons of sugar daily (men 6.5 and women 6.2) Table 3.2.46.There is no great differences between sexes and among age groups.

Table 3.2. 46: The average number of teaspoons of sugar consumed per day distributed by sex and age group.

Average number of teaspoons of sugar consumed per day									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean number of sugar spoon	95% CI	n	Mean number of sugar spoon	95% CI	n	Mean number of sugar spoon	95% CI
18-29	710	6.4	5.6-6.8	1672	6.2	5.9-6.6	2382	6.3	6.0-6.7
30-44	885	6.6	6.1-7.1	1909	6.3	6.0-6.6	2794	6.5	6.1-6.8
45-59	722	6.4	6.0-6.9	1025	6.1	5.7-6.5	1747	6.3	5.9-6.6
60-69	361	6.3	5.7-7.0	369	5.9	5.4-6.5	730	6.2	5.7-6.6
18-69	2678	6.5	6.1-6.8	4975	6.2	5.9-6.5	7653	6.3	6.0-6.6

Consumption of sugar, soft drinks and/ or manufactured juice per day/ week

Table (3.2.47) shows that the mean consumption of soft drinks and/or manufactured juice per week among urban participants (1.4) is higher than among rural respondents (1.0) .In both urban and rural area men consume more than females.

Table 3.2. 47: Distribution of Consumption of sugar, soft drinks and/ or manufactured juice per day/ week by sex and residence (rural v urban)

Adults aged 18-69 years (incl. 95% CI)	Rural			Urban		
	Males	**Females**	**Both sexes**	**Males**	**Females**	**Both sexes**
Mean number of soft drinks or manufactured juice per week	1.1 (1.0-1.3)	0.8 (0.7-0.9)	1.0 (0.9-1.1)	1.6 (1.4-1.8)	1.2 (1.0-1.4)	1.4 (1.3-1.6)
Mean number of cups of soft drinks consumed per day?	1.7 (1.6-1.8)	1.6 (1.5-1.8)	1.7 (1.5-1.8)	1.5 (1.4-1.7)	1.5 (1.4-1.6)	1.5 (1.4-1.6)
Mean number of teaspoons of sugar consumed per day.	6.7 (6.2-7.2)	6.4 (6.0-6.8)	6.5 (6.1-7.0)	6.1 (5.6-6.5)	5.9 (5.5-6.3)	6.0 (5.6-6.4)

Oil

Vegetable oil is the most used type (99.5%) for cooking and preparation of meals Table 3.2.48A.No household uses margarine or butter for meal preparation.

Table 3.2. 48A: Distribution of Types of oil/ fat used for cooking and meal preparation.

N (house-holds)	%Vegetable oil	95% CI	% Lard	95% CI	% Butter	95% CI	% none in particular	95% CI	% None used	95% CI
7717	99.5	99.1-99.8	0.3	0.0-0.7	0.0	0.0-0.1	0.1	0.0-0.1	0.1	0.0-0.1

The mean number of meals eaten outside home is 2.6 per week. Men eat outside home (3.5) times per week as compared to women (1.6) times Table 3.2.48 B. The male younger age groups have higher tendency of eating outside home (3.9).

Table 3.2.48B: Distribution of Frequency of eating meals mean outside home per week by sex and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	mean	95% CI	n	Mean	95% CI	n	mean	95% CI
18-29	701	3.9	3.3-4.4	1638	1.8	1.4-2.2	2339	3.0	2.5-3.4
30-44	870	3.5	3.0-4.0	1864	1.5	1.2-1.9	2734	2.5	2.2-2.9
45-59	711	2.9	2.5-3.3	1011	1.5	1.1-1.9	1722	2.2	1.9-2.6
60-69	351	1.9	1.4-2.4	366	1.0	0.6-1.4	717	1.5	1.2-1.9
18-69	2633	3.5	**3.1-3.9**	4879	1.6	**1.3-1.9**	7512	2.6	**2.3-3.0**

3.2.4 Physical Activity PA

WHO defined PA as any bodily movement produced by skeletal muscles that requires energy expenditure. WHO recommends doing at least 150 minutes of moderate-intensity physical activity per week or equivalent.

Table 3.2.49 shows the percentage of respondents not meeting WHO recommendations. Overall, 14.1% of respondents are not meeting the recommendations. Women have higher percentage of not meeting the recommendation (17.3%) as compared to men (11.4%). The highest percentage of not meeting the recommendation is among the age group 60-69 years in both sexes.

Table 3.2. 49: Percentage Distribution of respondents 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	713	7.8	5.3-10.4	1649	13.5	10.6-16.5	2362	10.3	8.2-12.3
30-44	877	11.2	8.7-13.7	1874	14.2	11.9-16.6	2751	12.7	10.8-14.5
45-59	713	15.3	11.8-18.7	1007	25.2	21.3-29.1	1720	20.0	17.1-23.0
60-69	360	31.4	25.4-37.5	370	40.6	34.2-47.1	730	35.3	30.6-39.9
18-69	2663	11.4	9.6-13.2	4900	17.3	15.0-19.5	7563	14.1	12.4-15.7

Former WHO Classification of Physical Activity:

WHO previously categorized PA into three levels. The overall PA was defined as the sum of PA performed during work, transport and leisure time and thus classified into high, moderate and low levels.

- **High Level:**

A person reaching any of the following criteria:

- Vigorous-intensity activity on at least 3 days achieving a minimum of at least 1,500 MET-minutes/week OR

- 7 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 Level:**

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

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

- 5 or more days of moderate-intensity activity or walking of at least 30 minutes per day OR

- 5 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 Level:**

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

Overall 19.4% of respondents were classified as low level, 23.3% as moderate level while 57.3 % had high level. Women had higher percentage (23.9%) of low level of physical activities than men (15.5%).The oldest age group (60-69) in both sexes had the highest percentage of low level physical activities (40.7%) Table 3.2.50.

Table 3.2. 50: Distribution of Level of total physical activity according to former WHO recommendations by sex and age group.

Age Group (years)	Men						
	N	% Low	95% CI	% Moderate	95% CI	% High	95% CI
18-29	713	11.6	8.6-14.7	15.4	11.8-19.1	72.9	68.1-77.7
30-44	877	15.4	12.3-18.5	13.1	10.3-15.9	71.5	67.7-75.4
45-59	713	20.5	16.4-24.6	18.2	14.7-21.7	61.3	56.2-66.3
60-69	360	35.1	28.9-41.4	13.0	8.9-17.0	51.9	45.9-57.9
18-69	2663	15.5	13.3-17.8	15.1	12.8-17.4	69.4	66.1-72.6
Age Group (years)	Women						
	N	% Low	95% CI	% Moderate	95% CI	% High	95% CI
18-29	1649	20.1	16.9-23.4	36.9	33.3-40.5	43.0	39.1-46.9
30-44	1874	20.9	18.1-23.7	30.1	27.2-33.1	48.9	45.5-52.4
45-59	1007	31.7	27.5-35.8	31.5	27.3-35.6	36.9	32.4-41.3
60-69	370	48.4	41.6-55.2	29.0	23.0-35.1	22.6	17.5-27.6
18-69	4900	23.9	21.5-26.4	33.3	30.9-35.7	42.8	39.9-45.7
Age Group (years)	Both Sexes						
	N	% Low	95% CI	% Moderate	95% CI	% High	95% CI
18-29	2362	15.3	12.8-17.7	24.6	21.9-27.2	60.2	56.6-63.7
30-44	2751	18.1	15.8-20.4	21.4	19.2-23.5	60.5	57.6-63.5
45-59	1720	25.8	22.5-29.2	24.5	21.8-27.2	49.7	45.8-53.6
60-69	730	40.7	35.9-45.5	19.7	16.4-23.1	39.6	35.1-44.1
18-69	7563	19.4	17.4-21.3	23.3	21.6-25.1	57.3	54.6-60.0

Overall, 14.1% of respondents did not do PA of 150 minutes per week, it was higher (17.3%) among women and (11.4%) among men Table 3.2.51. The highest group not meeting the recommendation is women aged 60-69 (40.6%).

Table 3.2. 51: Distribution of participants performing PA of less than150 minutes per week by gender and age group.

Age Group (years)	Men			Women			Both Sexes		
	No	% PA <150 mints	95% CI	No	% PA <150 mints	95% CI	n	% PA< 150 mints	95% CI
18-29	713	7.8	5.3-10.4	1649	13.5	10.6-16.5	2362	10.3	8.2-12.3
30-44	877	11.2	8.7-13.7	1874	14.2	11.9-16.6	2751	12.7	10.8-14.5
45-59	713	15.3	11.8-18.7	1007	25.2	21.3-29.1	1720	20.0	17.1-23.0
60-69	360	31.4	25.4-37.5	370	40.6	34.2-47.1	730	35.3	30.6-39.9
18-69	2663	11.4	9.6-13.2	4900	17.3	15.0-19.5	7563	14.1	12.4-15.7

Mean Minutes of PA per day

The distribution of the mean minutes per day of total PA through the three domains (work, transport and leisure time) by sex and age group is shown in Table 3.2.52. Overall, respondents spent 186 minutes per day in total PA, men spending (233 minutes) and women (128 minutes).The age group(60-69)had the lowest mean in both gender(182.5 minutes) for men and (67.4 minutes) for women.

Table 3.2. 52: Mean minutes of total physical activity per day by age group and sex

Age Group (years)	Men			Women			Both Sexes		
	No	Mean minutes	95% CI	No	Mean minutes	95% CI	No	Mean minutes	95% CI
18-29	713	232.1	211.5-252.6	1649	127.5	117.4-137.6	2362	187.5	174.0-201.0
30-44	877	249.9	228.7-271.1	1874	146.5	136.2-156.8	2751	199.6	186.5-212.6
45-59	713	228.3	202.2-254.5	1007	116.1	103.9-128.3	1720	174.9	157.9-192.0
60-69	360	182.5	156.9-208.2	370	067.4	55.9-79.0	730	134.2	117.4-151.0
18-69	2663	233.7	219.0-248.5	4900	128.6	120.3-136.9	7563	186.1	175.7-196.5

When computing the median minutes of PA (Table 3.2.53) the overall median average was 124.3 minutes as compared to overall mean minutes of 186.1 minutes. The median minutes were 180 for men and 85.7 for women as compared to mean minutes of 233.7 and 128.6 for men and women respectively

Table 3.2. 53: Distribution of average Median minutes of total physical activity per day by sex and age group.

Age Group (years)	Men			Women			Both Sexes		
	N	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)
18-29	713	167.1	81.4-347.1	1649	087.9	38.0-180.0	2362	128.6	60.0-270.0
30-44	877	197.1	197.1-375.0	1874	105.7	38.6-201.4	2751	137.1	51.4-300.0
45-59	713	171.4	171.4-360.0	1007	064.3	20.0-163.6	1720	102.9	30.0-257.1
60-69	360	110	110.0-307.1	370	030.0	6.4-85.7	730	055.7	8.6-188.6
18-69	2663	180.0	68.6-355.7	4900	085.7	32.1-180.0	7563	124.3	42.9-270.0

Specific Physical Activity- Mean Minutes per Day

Work-related PA:

Table (3.2.54) shows distribution of the mean minutes spent in work-related PA on average per day by age and sex. Overall participants spent an average of 131.4 minutes in work-related PA with men being more active (160.7 minutes) as compared to women (96.0 minutes).The most active age group was the 30-44 years group , men 189.4 minutes and women 111.2 minutes. The median showed less value (64.3 minutes) for all respondents. Similarly men were more active (87.1 minutes) than women (60 minutes).

Table 3.2. 54: Distribution of Mean minutes of work-related Physical Activity per day by age and sex

Age Group (years)	Men			Women			Both Sexes		
	no	Mean minutes	95% CI	no	Mean minutes	95% CI	n	Mean minutes	95% CI
18-29	713	145.6	128.3-162.9	1649	94.7	86.0-103.4	2362	123.9	112.6-135.2
30-44	877	189.4	169.5-209.3	1874	111.2	102.0-120.4	2751	151.3	139.2-163.5
45-59	713	164.1	144.5-183.7	1007	86.3	75.6-96.9	1720	127.0	113.9-140.2
60-69	360	136.4	114.6-158.1	370	43.4	33.8-52.9	730	97.4	82.9-111.8
18-69	2663	160.7	148.4-173.1	4900	96.0	88.7-103.3	7563	131.4	122.4-140.3

Transport-related PA

Table (3.2.55) shows the distribution of mean minutes spent daily on transport-related PA by age group and sex. Overall respondents spent 39.2 minutes in transport-related PA with men reporting49.3 minutes and women 27.0 minutes. The highest (54.8) was among men in the age group 45-59 years.

Table 3.2. 55: Distribution of Mean minutes of transport-related Physical Activity per day by age and sex

Age Group (years)	Men			Women			Both Sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
18-29	713	51.6	45.3-57.9	1649	27.0	24.3-29.7	2362	41.1	37.2-45.1
30-44	877	44.1	39.3-49.0	1874	28.8	25.5-32.0	2751	36.7	33.5-39.8
45-59	713	54.8	43.3-66.3	1007	24.8	21.5-28.1	1720	40.5	33.9-47.1
60-69	360	39.3	31.4-47.2	370	22.5	17.9-27.0	730	32.2	27.1-37.4
18-69	2663	49.3	44.8-53.9	4900	27.0	24.9-29.1	7563	39.2	36.3-42.1

Recreation-related PA

Table (3.2.56) shows mean minutes of recreation-related PA distributed by age group and sex. The mean time spent by participants was 15.5 minutes per day, with notable difference between men (23.7minutes) and women (5.7 minutes per day). The highest (34.9 minutes) was spent by the male age group 18-29 years.

Table 3.2. 56: Distribution of Mean minutes of recreation-related physical activity per day by age and sex.

Age Group (years)	Men			Women			Both Sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
18-29	713	34.9	30.1-39.6	1649	5.8	4.2-7.4	2362	22.5	19.5-25.4
30-44	877	16.3	12.7-20.0	1874	6.5	4.7-8.3	2751	11.5	9.3-13.8
45-59	713	9.5	6.1-12.8	1007	5.0	2.4-7.6	1720	7.3	5.1-9.5
60-69	360	6.8	3.2-10.4	370	1.6	0.7-2.5	730	4.6	2.5-6.7
18-69	2663	23.7	20.7-26.6	4900	5.7	4.3-7.0	7563	15.5	13.6-17.4

No Work-related PA

Table (3.2.57) shows the percentage distribution of respondents with no work-related PA by age group and sex. Overall, 24.9% of participants reported no work-related PA, with a higher percentage among men (31.3%) than women (17.3%). Approximately 50% of women in age group 60-69 reported no work-related PA.

Table 3.2. 57: Percentage Distribution of no work-related PA by sex and age group

Age Group (years)	Men			Women			Both Sexes		
	n	% no activity at work	95% CI	N	% no activity at work	95% CI	n	% no activity at work	95% CI
18-29	713	32.9	27.8-38.0	1649	12.6	9.8-15.4	2362	24.3	20.7-27.8
30-44	877	24.0	19.8-28.2	1874	14.1	11.5-16.8	2751	19.2	16.5-21.9
45-59	713	34.4	29.1-39.6	1007	25.4	21.4-29.4	1720	30.1	26.4-33.8
60-69	360	44.4	38.3-50.4	370	49.6	42.6-56.6	730	46.6	41.6-51.6
18-69	2663	31.3	27.8-34.7	4900	17.3	14.9-19.7	7563	24.9	22.4-27.5

No Transport-related PA

Table 3.2.58 shows the percentage distribution of participants who do not engage in transport-related PA. Overall 17.5% of participants do not engage in transport-related PA, women (20.9%) as compared to 14.7% among men.

Table 3.2. 58: Percentage Distribution of participants with no transport-related PA by age group and gender.

Age Group (years)	Men			Women			Both Sexes		
	no	% no activity f	95% CI	No	% no activity	95% CI	no	% no activity	95% CI
18-29	713	11.6	8.4-14.8	1649	19.4	16.7-22.1	2362	14.9	12.5-17.3
30-44	877	18.3	14.6-22.1	1874	20.4	17.8-22.9	2751	19.3	16.7-22.0
45-59	713	15.4	11.9-19.0	1007	23.7	19.8-27.6	1720	19.4	16.5-22.3
60-69	360	21.2	15.0-27.4	370	27.4	21.9-32.9	730	23.8	19.4-28.2
18-69	2663	14.7	12.1-17.3	4900	20.9	18.8-23.1	7563	17.5	15.5-19.5

No Recreation-related PA

Table 3.2.59 shows the percentage distribution of participants who do not engage in recreational-related PA. Overall, 70.9% do not engage in recreation-related PA, with a higher percentage among women (85.7%) as compared to58.7% among men. The highest (92.2%) is among women aged 60-69 years.

Table 3.2. 59: Percentage Distribution of participants with no Recreation -related PA by age group and sex.

Age Group (years)	Men			Women			Both Sexes		
	n	% no activity at recreation	95% CI	n	% no activity at recreation	95% CI	n	% no activity at recreation	95% CI
18-29	713	42.9	38.0-47.9	1649	84.6	81.6-87.5	2362	60.7	57.2-64.2
30-44	877	66.6	61.7-71.5	1874	85.3	82.6-87.9	2751	75.7	72.4-78.9
45-59	713	81.2	76.7-85.8	1007	87.4	83.6-91.2	1720	84.2	81.0-87.3
60-69	360	87.0	82.4-91.5	370	92.2	88.9-95.5	730	89.2	86.2-92.2
18-69	2663	58.7	55.1-62.3	4900	85.7	83.4-88.0	7563	70.9	68.3-73.5

Composition of Total PA:

Among women 65.8% of all PA time is work-related, 30.5% transport-related and 3.6 % recreation-related as compared to 51.9%, 34% and 14.1% respectively among men.Table3.2.60.

Table 3.2. 60: Distribution of Composition of total PA among Men and Women by age group

Age Group (years)	n	% Activity/ work	95% CI	% Activity /transport	95% CI	% Activity / recreation	95% CI
				Men			
18-29	681	45.9	42.2-49.6	32.6	29.1-36.1	21.5	18.6-24.4
30-44	837	60.9	57.1-64.6	30.3	27.1-33.5	8.8	6.9-10.8
45-59	662	54.5	50.1-58.8	40.9	36.6-45.3	4.6	3.2-6.0
60-69	310	50.5	45.4-55.6	46.1	41.0-51.2	3.5	1.9-5.0
18-69	2490	51.9	49.2-54.5	34.0	31.4-36.6	14.1	12.5-15.8
				Women			
Age Group (years)	n	% Activity/ work	95% CI	% Activity /transport	95% CI	% Activity/ recreation	95% CI
18-29	1588	67.9	65.4-70.5	28.3	26.1-30.6	3.7	2.8-4.6
30-44	1789	69.0	66.4-71.6	27.6	25.1-30.0	3.4	2.6-4.2
45-59	918	60.5	56.8-64.2	35.5	32.0-38.9	4.0	1.9-6.2
60-69	290	42.0	36.2-47.7	55.6	49.6-61.6	2.5	0.8-4.1
18-69	4585	65.8	63.7-68.0	30.5	28.5-32.5	3.6	2.8-4.4
				Both Sexes			
Age Group (years)	n	%Activity from work	95% CI	% Activity for transport	95% CI	% Activity during leisure time	95% CI
18-29	2269	55.3	52.6-58.1	30.8	28.3-33.2	13.9	12.1-15.8
30-44	2626	64.8	62.3-67.4	29.0	26.7-31.3	6.2	5.0-7.4
45-59	1580	57.3	54.2-60.4	38.4	35.3-41.4	4.4	3.1-5.6
60-69	600	47.0	43.0-51.0	50.0	45.9-54.1	3.0	1.9-4.2
18-69	7075	58.2	56.1-60.3	32.4	30.4-34.5	9.4	8.3-10.5

No Vigorous PA

Table (3.2.61) shows the percentage of respondents who do not engage in vigorous physical activity by age group and sex. Overall (62.4 %) of participants do not engage in vigorous PA, with higher percentage (86.1%) among women as compared (42.7%) among men. The percentage increases with age in both sexes.

Table 3.2. 61: Percentage Distribution of Participants who do not engage in Vigorous PA by age group and sex.

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	713	35.1	30.0-40.2	1649	85.4	82.4-88.3	2362	56.5	52.8-60.2
30-44	877	43.8	39.1-48.6	1874	83.7	80.5-86.9	2751	63.2	59.8-66.6
45-59	713	55.6	50.2-60.9	1007	89.7	87.0-92.4	1720	71.8	68.6-75.1
60-69	360	64.0	57.8-70.1	370	94.4	91.8-97.0	730	76.8	72.7-80.8
18-69	2663	42.7	39.0-46.4	4900	86.1	83.6-88.5	7563	62.4	59.6-65.1

Sedentary Behavior

Average Sedentary Time per day

Table (3.2.62) shows minutes spent in sedentary activities on average per day. The mean sedentary time for women is 188.6minutes/day (median time 150.0 minutes/day) as compared to a mean of 176.2 minutes and median of140 minutes/day for men. Among both sexes the age group (60-69) had higher mean of sedentary time as compared to younger age groups (18-59).

Table 3.2. 62: Distribution of Sedentary Time in Minutes spent per day by sex and age group

Age Group (years)	Men				
	n	Mean minutes	95% CI	Median minutes	Interquartiles range (P25-P75)
18-29	721	171.8	159.0-184.5	150	70.0-240.0
30-44	894	176.3	163.4-189.3	135	120.0-240.0
45-59	727	172.5	159.0-186.0	120	90.0-240.0
60-69	365	225.3	199.1-251.5	180	120.0-300.0
18-69	2707	176.2	166.5-185.8	140	90.0-240.0
Age Group (years)	Women				
	n	Mean minutes	95% CI	Median minutes	Interquartiles range (P25-P75)
18-29	1689	196.2	183.6-208.7	150	90.0-285.0
30-44	1921	175.7	164.6-186.8	120	60.0-240.0
45-59	1032	183.5	167.9-199.2	150	70.0-240.0
60-69	373	227.5	199.7-255.2	180	120.0-300.0
18-69	5015	188.6	178.3-198.8	150.0	90.0-240.0

*Table 3.2.62: Distribution of Sedentary Time in Minutes spent per day by sex and age group, Cont...

Age Group (years)	Both Sexes				
	n	Mean minutes	95% CI	Median minutes	Interquartiles range (P25-P75)
18-29	2410	182.2	171.9-192.6	150	90.0-240.0
30-44	2815	176.0	166.0-186.0	120	90.0-240.0
45-59	1759	177.8	166.2-189.4	120	90.-240.0
60-69	738	226.2	203.8-248.6	180	120.0-300.0
18-69	7722	181.8	173.1-190.5	150.0	90.0-240.0

Physical Activities Status in the Regions:

Table (3.2.63) shows percentage of physical activities among participants in the six regions. The highest percentage of sufficient physical activity (91.9%) was reported from Kordofan and the lowest (79.2%) from Northern region. Kordofan had also the highest percentage of participants (58.1%) engaged in vigorous PA as compared to (24.2%) in Khartoum.

Table 3.2. 63: Distribution of Physical Activities by region

Adults aged 18-69 years (incl. 95% CI)	**Total**	**Central**	**Darfur**	**Eastern**	**Khartoum**	**Kordofan**	**Northern**
Percentage of insufficient physical activity	**14.1% (12.4-15.7)**	**15.7% (11.7-19.6)**	**11.2% (8.5-13.8)**	**14.1% (10.2-18.0)**	**20.0% (14.6-25.4)**	**8.1% (5.5-10.8)**	**20.8% (12.9-28.7)**
Median time spent in physical activity on average per day (minutes) (presented with inter-quartile range)	**124.3 (42.9-270.0)**	**124.3 (40-282.9)**	**113.7 (51.4-218.6**	**150 (57.1-290.0)**	**85.7 (30-197.1)**	**210 (81.4-377.1)**	**68.6 (25.7-150)**
% not engaging in vigorous activity	**62.4% (59.6-65.1)**	**73.4% (70.0-76.7)**	**53.1% (46.5-59.6)**	**68.5% (63.0-74.0)**	**75.8% (70.5-81.0)**	**41.9% (36.3-47.6)**	**68.9% (61.7-76.1)**

Physical activity Rural v. Urban

Overall urban population have higher percentage (18.0%) of insufficient physical activity than rural population (11.6%) Table 3.2.64.They also spend less time on physical activity 91.4minutes as compared to rural population (145.7minutes). Urban participants not engaging in vigorous activity constituted 67.0% as compared to 59.5% among rural population. Urban women were the least active group.

Table 3.2. 64: Distribution of Physical Activities by rural v urban and by sex.

Physical Activity	Rural			Urban		
	Males	Females	Both sexes	Males	Females	Both sexes
% of insufficient physical activity	9.3 (7.98- 10.66)	14.4 (13.26- 15.71)	11.6 (10.76- 12.54)	14.8 (12.44- 17.21)	21.9 (19.91-23.82)	18.0 (16.55- 19.53)
Median time spent in physical activity on average per day (minutes) (presented with inter-quartile range)	192.9 (85.7-357.9)	102.9 (40.0-205.7)	145.7 (60.0-291.4)	136.4 (42.9-347.1)	62.9 (25.7-137.1)	91.4 (30.0-230.0)
% not engaging in vigorous activity	40.6 (38.32 -42.85)	82.6 (81.25 -83.89)	59.5 (58.16 - 60.88)	46.3 (42.91- 49.59)	91.8 (90.47 -93.07)	67.0 (65.23 - 68.86)

3.3 Anthropometric Measurements (Overweight and Obesity)

Height, Weight and Body Mass Index (BMI)

Body mass index (BMI) is a simple index of weight-for-height that provides measure of overweight and obesity. It is the same for both sexes and for all ages of adults, and defined as a person's weight in kgm divided by the square of his/her height in meters (kg/m2). A person whose BMI is greater than or equal to 25 is considered overweight while one with a BMI greater than or equal to 30 is considered obese.

Tables (3.3.1 - 3.3.3) show the mean height in cms weight in kgm and BMI among all respondents (excluding pregnant women). The mean height was 171.2 cm for men and 160.3 cm for women. The mean weight for men was 65.4kg and 61.6kg for women Table 3.3.2.The mean BMI for men was 22.3, as compared to 23.9 for women Table 3.3.3.

Table 3.3. 1: Distribution of Mean Height (cm) of participants by sex and age group

Age Group (years)	Men			Women		
	No	Mean/cm	95% CI	No	Mean/cm	95% CI
18-29	704	171.4	170.5-172.4	1448	160.4	159.8-161.0
30-44	880	171.5	170.8-172.2	1721	160.7	160.2-161.2
45-59	719	170.7	170.0-171.5	1012	160.0	159.5-160.5
60-69	359	168.7	167.8-169.5	367	157.7	156.5-158.8
18-69	2662	171.2	170.5-171.8	4548	160.3	159.9-160.7

Table 3.3. 2: Distribution of Mean Weight (kgs) of Participants by sex and age group

Age Group (years)	Men			Women		
	No	Mean	95% CI	No	Mean	95% CI
18-29	704	62.1	60.6-63.5	1448	56.6	55.6-57.6
30-44	880	67.7	66.4-69.1	1722	64.8	63.6-66.0
45-59	719	70.0	68.4-71.5	1013	66.4	64.8-68.0
60-69	359	68.5	66.6-70.5	366	63.1	61.0-65.2
18-69	2662	65.4	64.4-66.5	4549	61.6	60.7-62.6

Table 3.3. 3: Distribution of Mean BMI (kg/m2) of Participants by sex and age group

Age Group (years)	Mean BMI (kg/m²)								
	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-29	700	21.2	20.7-21.6	1443	21.9	21.6-22.3	2143	21.5	21.1-21.8
30-44	879	23.0	22.6-23.4	1714	25.0	24.5-25.4	2593	23.9	23.6-24.2
45-59	716	23.9	23.5-24.4	1005	26.0	25.3-26.6	1721	24.9	24.5-25.3
60-69	357	24.0	23.3-24.6	362	25.3	24.5-26.2	719	24.5	24.0-25.1
18-69	2652	22.3	22.0-22.7	4524	23.9	23.5-24.3	7176	23.0	22.7-23.3

BMI Classification

Tables (3.3.4) shows the percentage distribution of participants in each BMI category. Among men 59.4% had normal BMI, 15.9 % were overweight and 6.7 % were obese as compared to 48.2%, 20.6% and 14.9% respectively among women. Those underweight represented 18% and 16.2 % among men and women respectively. Obesity is more than two times common among women.

Table 3.3. 4: Percentage Distribution of Participants by BMI categories, sex and age group.

Age Group (years)	n	Under wt. <18.5	95% CI	% Normal wt. 18.5-24.9	95% CI	Over wt. 25.0-29.9	95% CI	Obese ≥30.0	95% CI
				Men					
18-29	700	22.5	18.7-26.2	64.0	59.5-68.5	9.0	6.3-11.7	4.5	2.3-6.8
30-44	879	16.2	13.3-19.1	56.2	52.2-60.2	20.1	17.0-23.3	7.5	5.2-9.7
45-59	716	10.9	8.4-13.3	54.2	49.7-58.7	24.3	20.8-27.8	10.6	7.8-13.4
60-69	357	11.5	7.4-15.5	52.4	46.4-58.4	27.4	21.9-32.8	8.8	5.5-12.1
18-69	2652	18.0	15.7-20.3	59.4	56.6-62.1	15.9	13.9-17.9	6.7	5.2-8.2
Age Group. (yrs.)	n	Under wt. <18.5	95% CI	% Normal wt. 18.5-24.9	95% CI	Over wt. 25.0-29.9	95% CI	Obese ≥30.0	95% CI
				Women					
18-29	1443	22.6	19.8-25.5	57.4	54.2-60.6	13.0	10.7-15.3	7.0	5.1-8.8
30-44	1714	12.0	9.8-14.2	45.0	41.8-48.2	25.4	22.9-27.9	17.6	15.2-20.0
45-59	1005	10.6	8.1-13.1	37.6	33.8-41.5	26.3	22.9-29.7	25.5	21.8-29.2
60-69	362	12.4	8.1-16.7	36.2	29.7-42.6	30.0	23.3-36.8	21.3	15.9-26.8
18-69	4524	16.2	14.5-17.9	48.2	46.0-50.5	20.6	18.9-22.4	14.9	13.1-16.8
Age Group (years)	n	% Under-weight <18.5	95% CI	% Normal weight 18.5-24.9	95% CI	% BMI 25.0-29.9	95% CI	% Obese ≥30.0	95% CI
				Both Sexes					
18-29	2143	22.5	19.9-25.2	61.3	58.2-64.4	10.6	8.6-12.6	5.5	3.9-7.2
30-44	2593	14.3	12.3-16.2	51.0	48.2-53.8	22.6	20.5-24.7	12.2	10.3-14.0
45-59	1721	10.8	9.0-12.6	46.4	43.2-49.5	25.2	22.8-27.7	17.6	15.3-19.9
60-69	719	11.9	8.9-14.9	45.6	41.1-50.1	28.5	24.3-32.7	14.0	11.2-16.9
18-69	7176	17.2	15.6-18.9	54.5	52.5-56.5	18.0	16.5-19.5	10.3	9.0-11.6

Women had a higher prevalence of 35.6%as compared to men 22.6%. Among women in the age groups 45-59 and 60-69 approximately one in two is overweight Table3.3.5

Table 3.3. 5: Prevalence of overweight BMI≥25 distributed by sex and age group.

Age Group (years)	Men			Women			Both Sexes		
	no	% BMI≥25	95% CI	n	% BMI≥25	95% CI	n	% BMI≥25	95% CI
18-29	700	13.5	9.7-17.4	1443	20.0	17.0-23.0	2143	16.1	13.3-19.0
30-44	879	27.6	23.7-31.4	1714	43.0	39.3-46.7	2593	34.7	31.8-37.7
45-59	716	34.9	30.5-39.3	1005	51.8	47.1-56.4	1721	42.9	39.4-46.4
60-69	357	36.2	30.0-42.3	362	51.4	44.0-58.8	719	42.5	37.5-47.6
18-69	2652	22.6	19.8-25.3	4524	35.6	32.8-38.4	7176	28.2	25.9-30.5

Mean BMI, Overweight, Obesity and Waist Circumference by Region:

The overall prevalence of overweight (BMI=>25) is 28.3% while it is 48.0% in Khartoum, 33.3% in both Central and Northern regions, 24.9% in Eastern region, 21.7 in Darfur and only 12.8% in Kordofan (Table 3.3.6)

Table 3.3. 6: Distribution of mean BMI, overweight, obesity and waist circumference among respondents by region.

Results (18-69 years)	Total	Central	Darfur	Eastern	Khartoum	Kordofan	Northern
Mean BMI (kg/m2)	23.0 (22.7-23.3)	23.4 (23.0-23.8)	22.5 (21.8-23.1)	22.5 (21.7-23.3)	25.6 (25.0-26.2)	21.0 (20.6-21.4)	23.8 (22.9-24.7)
Percentage overweight (BMI ≥ 25-29.9 kg/m2)	18.0% (16.5-19.5)	23.8% (20.6-27.0)	15.6% (12.0-19.2)	14.5% (11.7-17.3)	25.0% (21.6-28.4)	9.9% (7.3-12.5)	19.8% (15.4-24.2)
Percentage obese (BMI ≥ 30 kg/m2)	10.3% (9.0-11.6)	9.5% (7.8-11.3)	6.1% (3.7-8.5)	10.4 (6.5-14.3)	23.0% (19.6-26.4)	2.9% (1.8-4.0)	13.5% (9.6-17.3)
Mean waist circumference (cm) (Men)	82.2 (81.1-83.2)	85.3 (83.9-86.7)	81.6 (79.9-83.4)	81.0 (78.9-83.1)	86.2 (83.5-88.9)	76.8 (74.3-79.3)	85.2 (81.7-88.6)
Mean waist circumference (cm) (Women)	83.5 (82.6-84.4)	86.7 (85.5-88.0))	79.4 (77.8-80.9)	82.6 (79.9-85.3)	88.1 (85.8-90.3)	78.5 (76.5-80.5)	85.8 (81.0-90.6

BMI categories and waist circumference rural v Urban

The mean BMI of urban population was (24.4) higher than the rural (22.2). Urban women had a mean BMI of (26.2) as compared to 22.5 among rural women. Table 3.3.7. The prevalence of overweight and obesity was 52.6% and 25% respectively among urban women as compared to 24.9% and 8.6% respectively among rural women. Rural men had low percentages of overweight and obesity; 18.8% and 4.5% respectively as compared to 29.0% and 10.5% among urban men respectively.

Table 3.3. 7: Distribution of mean BMI, overweight, Obesity and waist circumference by rural v urban settings and sex.

Results for adults aged 18-69 years	Rural			Urban		
	Males	Females	Both Sexes	Males	Females	Both Sexes
Mean - BMI (kg/m^2)	21.9 (21.5-22.3)	22.5 (22.1-22.9)	22.2 (21.8-22.5)	23.0 (22.4-23.6)	26.2 (25.6-26.8)	24.4 (23.9-24.9)
% overweight (BMI ≥ 25 kg/m^2)	18.8 (17-20.6)	24.9 (23.35-26.49)	21.4 (20.25-22.59)	29.0 (25.96-32.11)	52.6 (50.14-55.02)	(39.5 37.59-41.47)
% obese (BMI ≥ 30 kg/m^2)	4.5 (3.51-5.41)	8.6 (7.61-9.65)	6.2 (5.56-6.94)	(10.5 8.4-12.54)	25.0 (22.91- 27.14)	17.0 (15.47- 18.44)
Average waist circumference (cm)	81.3 (80.2-82.4)	80.8 (79.7-81.8)		83.7 (81.6-85.8)	87.8 (86.3-89.4)	

3.4 Physical Measurement

3.4.1 Raised Blood Pressure (RBP)

Medical History of RBP

RBP (hypertension) is defined as SBP=>140 mm Hg and /or DBP=> 90 mm Hg (WHO). Respondents were asked if they had ever had their BP measured by a doctor or other health worker and for those measured if they had been diagnosed with hypertension. Overall 61% of participants had never had BP measurement. Among the 39% who had their BP measured 32.3% were normal and 6.7% were diagnosed as having RBP of whom 4.1 % were diagnosed within the last 12 months and 2.6% diagnosed earlier. Among females 48.1% had their BP measured of whom 9.3% were diagnosed with RBP as compared to only 31.4% of males who had their BP measured and of whom4.5% were diagnosed with RBP (Table 3.4.1).

Table 3.4. 1: Distribution of Previous BP measurement and diagnosis by sex and age group.

Men									
Age Group (years)	no	% 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	721	79.4	75.0-83.9	19.1	14.7-23.5	0.5	0.0-1.2	1.0	0.3-1.7
30-44	894	64.6	59.8-69.5	31.8	27.0-36.5	2.1	0.9-3.2	1.5	0.7-2.3
45-59	727	52.5	47.3-57.7	37.5	32.7-42.3	4.1	2.4-5.7	5.9	4.0-7.9
60-69	365	44.6	37.7-51.5	36.2	29.8-42.5	6.3	3.0-9.6	12.9	7.8-18.0
18-69	**2707**	**68.6**	**65.1-72.1**	**26.9**	**23.6-30.1**	**1.9**	**1.3-2.5**	**2.6**	**2.0-3.3**
Women									
Age Group (years)	no	% 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	1689	62.4	58.5-66.4	35.5	31.6-39.3	1.1	0.5-1.6	1.1	0.3-1.8
30-44	1921	49.1	44.8-53.4	41.3	37.3-45.3	4.0	2.9-5.2	5.6	4.3-6.9
45-59	1032	37.9	33.3-42.6	42.4	38.3-46.5	6.6	4.8-8.4	13.1	10.4-15.8
60-69	373	31.0	24.8-37.3	38.3	32.3-44.3	8.9	4.8-13.0	21.7	16.0-27.4
18-69	**5015**	**51.9**	**48.4-55.4**	**38.8**	**35.8-41.8**	**3.5**	**2.8-4.1**	**5.8**	**4.8-6.8**
Both sexes									
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	2410	72.1	68.6-75.7	26.1	22.6-29.6	0.8	0.3-1.2	1.0	0.5-1.5
30-44	2815	57.1	53.2-61.0	36.4	32.8-40.0	3.0	2.2-3.8	3.5	2.7-4.3
45-59	1759	45.6	41.4-49.8	39.8	36.2-43.5	5.3	4.0-6.5	9.4	7.6-11.2
60-69	738	39.0	33.6-44.3	37.1	32.7-41.5	7.4	4.8-10.0	16.6	12.5-20.7
18-69	**7722**	**61.0**	**57.9-64.2**	**32.3**	**29.5-35.0**	**2.6**	**2.1-3.1**	**4.1**	**3.4-4.7**

Overall, only 51.8% of those reported being diagnosed with RBP are currently taking medication for their condition Table 3.4.2. Participants in the age group18-29 were less likely to take medication (16.8%) as compared to 77% in the age group (60-69) years.

Table 3.4. 2: Percentage Distribution of Participants Currently taking Medication for RBP prescribed by doctor or health worker by age group and sex.

Age Group (years)	Men			Women			Both Sexes		
	No	% taking meds	95% CI	No	% taking meds	95% CI	No	% taking meds	95% CI
18-29	12	19.3	0.0-44.6	32	14.5	0.0-28.9	44	16.8	2.6-31.0
30-44	34	28.0	12.5-43.4	179	39.1	30.7-47.6	213	36.0	29.1-42.9
45-59	73	55.9	43.8-67.9	199	65.9	58.3-73.5	272	62.3	55.5-69.1
60-69	63	69.4	55.8-83.1	110	84.8	77.3-92.3	173	77.7	69.9-85.4
18-69	182	46.9	37.6-56.2	520	54.6	49.2-60.1	702	51.8	46.6-56.9

Among the 702 participants diagnosed with RBP, 10.1% of respondents had visited traditional healers and there was no great difference between men (9.5%) and women (10.9%) Table 3.4.3. However 14.3% are currently taking herbal or traditional treatment, 17% among women and 10.5% among men. Table 3.4.4

Table 3.4. 3: Percentage Distribution of Visits to traditional healer among previously diagnosed participants with RBP by age group and sex.

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	12	19.9	0.0-43.0	32	1.8	0.0-5.4	44	10.6	0.0-21.6
30-44	34	13.7	0.7-26.7	179	8.5	3.9-13.1	213	9.9	5.0-14.9
45-59	73	10.9	0.7-21.0	199	12.2	6.8-17.5	272	11.7	6.4-17.0
60-69	63	2.4	0.0-6.2	110	9.9	3.2-16.7	173	6.4	2.3-10.6
18-69	182	10.9	4.8-17.1	520	9.5	6.4-12.7	702	10.1	6.9-13.2

Table 3.4. 4: Percentage Distribution of Participants currently taking herbal or Traditional Medications by age group and sex.

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	12	10.7	0.0-26.2	32	1.8	0.0-5.2	44	6.1	0.0-13.5
30-44	34	7.1	0.0-16.9	179	15.8	9.1-22.4	213	13.3	7.7-19.0
45-59	73	12.6	3.8-21.4	199	22.0	14.8-29.2	272	18.6	12.6-24.7
60-69	63	10.2	0.0-20.7	110	18.8	9.4-28.2	173	14.8	8.2-21.3
18-69	182	10.5	5.3-15.6	520	17.3	13.0-21.7	702	14.8	11.2-18.4

Blood Pressure Measurement

In this survey, BP measurement was taken using an automatic BP monitor. Three readings were taken five minutes apart with the mean of the three readings recorded as the participant BP.

The overall mean SBP among respondents, including those currently on medication is 127.6(mmHg), and it was higher among men (129.5 mmHg) as compared to women (125.4 mmHg) Table 3.4.5. Women had higher mean diastolic blood pressure (83.4) than men (82.3). The mean systolic and diastolic pressure increased significantly with age Table 3.4.6.

Table 3.4. 5: Distribution of Mean SBP (mmHg) by age group and sex

Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-29	706	126.8	125.6-128.0	1679	118.6	117.8-119.4	2385	123.2	122.4-124.0
30-44	882	128.0	126.9-129.1	1908	126.0	124.8-127.2	2790	127.0	126.1-127.9
45-59	721	135.3	133.4-137.1	1025	135.7	134.2-137.3	1746	135.5	134.3-136.7
60-69	360	143.4	140.3-146.6	371	143.6	140.3-146.8	731	143.5	141.2-145.7
18-69	2669	129.5	128.7-130.4	4983	125.4	124.6-126.2	7652	127.6	127.0-128.3

Table 3.4. 6: Distribution of Mean DBP (mmHg) by age group and sex

Mean diastolic blood pressure (mmHg)									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-29	706	79.5	78.7-80.4	1679	80.1	79.5-70.8	2385	79.8	79.2-80.3
30-44	882	84.0	83.2-84.9	1908	84.8	84.0-85.5	2790	84.4	83.8-85.0
45-59	721	86.2	85.1-87.2	1025	87.5	86.5-88.6	1746	86.8	86.1-87.6
60-69	360	85.9	84.2-87.6	371	87.1	85.9-88.3	731	86.4	85.3-87.5
18-69	2669	82.3	81.8-82.9	4983	83.4	82.9-83.9	7652	82.8	82.4-83.2

The overall prevalence of RBP (SBP ≥140 and/or DBP ≥ 90 mmHg or currently on medication for RBP) is 31.5%, women (32.1%) and men 31.0% Table 3.4.7.However, the prevalence increases with age from 20.3% at age group 18-29 to 60.5% among age group 60-69 years.

Table 3.4. 7: Distribution of Prevalence of RBP (SBP ≥140 and/or DBP ≥ 90 mmHg and those currently on medication for RBP) by age group and sex.

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	706	21.6	17.9-25.4	1679	18.6	16.4-20.8	2385	20.3	18.0-22.7
30-44	882	32.0	28.3-35.8	1908	34.6	31.7-37.4	2790	33.3	30.8-35.8
45-59	721	46.6	42.2-51.0	1025	50.5	46.5-54.4	1746	48.5	45.5-51.4
60-69	360	57.0	51.3-62.7	371	65.3	58.8-71.8	731	60.5	56.1-64.8
18-69	2669	31.0	28.5-33.5	4983	32.1	30.3-33.9	7652	31.5	29.8-33.2

The overall prevalence of RBP among participants not on medication was 28.5% ,(men 28.8% and women 28.1%).It increases greatly with age 19.3%, 30.9%,43.6% and 51.3% among age groups 18-29, 30-44,45-59,60-69 respectively Table 3.4.8.

Table 3.4. 8: Prevalence of RBP, excluding those on medication, distributed by age group and sex.

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	694	20.5	16.9-24.2	1662	17.7	15.5-19.9	2356	19.3	17.0-21.6
30-44	861	30.6	26.9-34.4	1827	31.2	28.4-34.0	2688	30.9	28.5-33.3
45-59	682	43.6	39.1-48.1	893	43.5	39.4-47.5	1575	43.6	40.5-46.6
60-69	309	48.7	42.4-55.1	286	55.2	47.6-62.9	595	51.3	46.5-56.2
18-69	2546	28.8	26.4-31.2	4668	28.1	26.4-29.9	7214	28.5	26.8-30.1

Grade II (Severe) RBP:

The overall prevalence of Grade II hypertension (SBP ≥160 and/or DBP ≥ 100 mmHg) and those currently on medication was 11.4%, with more women 13.5% than men 9.7% Table 3.4.9. It increases tenfold with age, from 3.7% in age group 18-29 to37.8%in age group 60-69 years.

TableTable 3.4. 9: Prevalence of Grade II RBP and those currently on medication distributed by age group and gender.

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	706	3.6	2.1-5.1	1679	3.7	2.7-4.8	2385	3.7	2.7-4.7
30-44	882	8.4	6.4-10.3	1908	14.6	12.5-16.7	2790	11.4	9.9-12.9
45-59	721	20.2	16.9-23.5	1025	27.5	23.7-31.3	1746	23.7	21.1-26.3
60-69	360	36.6	31.1-42.1	371	39.4	32.3-46.6	731	37.8	33.0-42.5
18-69	2669	9.7	8.4-11.0	4983	13.5	12.2-14.7	7652	11.4	10.4-12.5

The prevalence of raised blood pressure (SBP ≥160 and/or DBP ≥ 100 mmHg) (excluding those on medication was 7.6% (men 6.8% and women 8.4%). Approximately it increased tenfold with age from 2.4% in age group 18-19 to 23.4% in the age group 60-69 years Table 3.4.10.

Table 3.4. 10: Prevalence of raised blood pressure (SBP ≥160 and/or DBP ≥ 100 mmHg) excluding those on medication distributed by age group and sex.

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	694	2.3	1.0-3.5	1662	2.6	1.8-3.5	2356	2.4	1.6-3.2
30-44	861	6.5	4.7-8.2	1827	10.2	8.5-11.9	2688	8.3	7.0-9.5
45-59	682	15.7	12.7-18.7	893	17.3	14.0-20.6	1575	16.4	14.2-18.6
60-69	309	24.5	19.1-29.9	286	21.8	15.8-27.9	595	23.4	19.5-27.4
18-69	2546	6.8	5.8-7.9	4668	8.4	7.5-9.4	7214	7.6	6.8-8.3

The majority (86.7%) of respondents with RBP were **not** on medication while only 13.3% were on medication. Of the latter approximately only one third (4.8%) were controlled while the other two thirds were not controlled Table 3.4.11.Among men 90.1% **were not** on medication as compared to 82.8% among women. However among the 17.2 % women on medication only 5.7% were controlled. The highest percentage (22.0%) of being on medication but not controlled were in the age group 60-69 years.

Table 3.4. 11: Percentage Distribution of Participants with RBP on medication by age group and sex.

Age Group (years)	Both Sexes						
	n	% On medication: SBP<140 /DBP<90	95% CI	%On medication: SBP≥140 and/or DBP≥90	95% CI	%Not on medication :SBP≥140 and/or DBP≥90	95% CI
18-29	456	4.9	2.4-7.4	1.5	0.2-2.7	93.7	90.7-96.6
30-44	952	2.9	1.6-4.3	7.4	5.1-9.7	89.7	87.1-92.2
45-59	855	5.7	4.1-7.3	12.3	9.6-14.9	82.1	79.0-85.1
60-69	447	8.1	4.1-12.1	22.9	17.3-28.5	69.0	62.2-75.8
18-69	2710	4.8	3.7-5.9	8.5	7.2-9.9	86.7	84.8-88.5

Cont…

*Table 3.4.11: Percentage Distribution of Participants with RBP on medication by age group and sex Cont…

Age Group (years)	n	%On medication: SBP<140 /DBP<90	95% CI	%On medication: SBP≥140 and/or DBP≥90	95% CI	%Not on medication :SBP≥140 and/or DBP≥90	95% CI
				Men			
18-29	156	4.9	1.3-8.5	1.6	0.0-3.5	93.5	89.3-97.7
30-44	299	1.6	0.3-2.8	4.8	2.1-7.5	93.6	90.6-96.7
45-59	337	4.5	1.9-7.1	6.8	4.1-9.5	88.6	85.1-92.2
60-69	204	6.8	1.9-11.6	21.4	13.8-29.0	71.8	63.4-80.3
18-69	996	4.0	2.5-5.5	5.9	4.4-7.5	90.1	87.6-92.5
				Women			
Age Group (years)	n	%On medication: SBP<140 /DBP<90	95% CI	%On medication: SBP≥140 and/or DBP≥90	95% CI	%Not on medication :SBP≥140 and/or DBP≥90	95% CI
18-29	300	4.9	1.5-8.2	1.3	0.0-2.7	93.9	90.2-97.5
30-44	653	4.3	2.0-6.6	9.9	6.3-13.4	85.8	81.9-89.8
45-59	518	6.8	4.6-9.0	17.7	13.7-21.8	75.5	71.2-79.8
60-69	243	9.7	5.2-14.1	24.8	17.7-31.9	65.6	56.9-74.2
18-69	1714	5.7	4.0-7.4	11.5	9.5-13.5	82.8	80.3-85.4

Mean heart rate (beats per minute)

The mean heart rate for all respondents by age groups is described on table (3.4.12). In general the mean heart rate for all participants is 79.8 beats per minute. No significant difference between participants in different age groups of same gender. The mean heart rate for women (83.9 beats per minute) is higher than the men (76.3 beats per minute). A higher Mean heart rate observed among women across all groups.

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Table 3.4. 12: Mean heart rate (beats per minute)

Mean heart rate (beats per minute)									
Age Group (years)	Men			Women			Both Sexes		
	N	mean	95% CI	n	mean	95% CI	n	mean	95% CI
18-29	706	75.2	73.9-76.6	1679	85.4	84.5-86.2	2385	79.6	78.7-80.5
30-44	882	77.1	76.0-78.3	1908	83.5	82.8-84.3	2790	80.3	79.5-81.0
45-59	721	77.7	76.7-78.7	1025	81.8	81.0-82.6	1746	79.6	79.0-80.3
60-69	360	77.7	76.4-78.9	371	81.6	80.1-83.1	731	79.3	78.3-80.3
18-69	2669	76.3	75.5-77.1	4983	83.9	83.4-84.4	7652	79.8	79.2-80.4

Raised Blood Pressure by region:

The mean SBP for the six regions ranged from 126.1 in Eastern Region to 129.5 in Central Region Table 3.4.13A. The mean DBP ranged from 80.9 in Darfur to 84.7 in Northern Region. The prevalence of RBP including those on medication was 37.2% in Northern, 36.5% in Khartoum, 35.9% in Central, 29.5% in Eastern, 27.4% in Darfur and 27.0 in Kordofan as compared to the national prevalence of 31.5%. The highest percentages of participants with RBP who are not currently on medication were reported from Darfur (93.2%) and Kordofan (92.0%) regions, while the lowest was reported from Khartoum region (76.5%).

Table 3.4. 13A: Distribution of mean BP and prevalence of RBP by Region

Adults(18-69 years)	Total	Central	Darfur	Eastern	Khartoum	Kordofan	Northern
Mean SBP (mmHg)/ including those currently on medication	127.6 (127.0-128.3)	129.5 (128.4-130.7)	127.0 (125.7-128.3)	126.1 (124.9-127.4)	127.3 (125.9-128.7)	127.5 (125.8-129.2)	129.4 (127.3-131.6)
Mean DBP (mmHg), including those currently on medication.	82.8 (82.4-83.2)	84.3 (83.5-85.2)	80.9 (80.1-81.6)	82.6 (81.6-83.5)	84.6 (83.4-85.7)	81.7 (80.8-82.5)	84.7 (83.3-86.1)
Percentage with RBP or currently on medication.	31.5% (29.8-33.2)	35.9% (32.2-39.5)	27.4% (24.2-30.6)	29.5% (25.4-33.6)	36.5% (31.6-41.4)	27.0% (23.4-30.5)	37.2% (31.1-43.3)
Percentage with RBP who are not currently on medication.	86.7% (84.8-88.5)	84.6% (80.7-88.5)	93.2 % (90.0-96.5)	87.9% (82.1-93.7)	76.5% (72.2-80.9)	92.0% (88.2-95.8)	89.2 (83.3-95.1)

Raised Blood Pressure Rural v Urban

The overall mean SBP was (127.6) in rural and (127.8) in urban settings. It was higher among rural and urban males 129.6 and 129.5 than among women125.2 and 125.7 respectively. The overall

mean DBP was higher in urban settings (83.8) as compared to rural settings 82.6% (Table 3.4.13B). Females in urban setting reported the highest percentage of mean diastolic blood pressure (84.8)followed by male in urban settings (82.9)then females in rural setting (82.6%) and males in rural settings (82%).Having raised blood pressure is significantly higher among urban resident (35.5%) compared to the rural resident (29.1%). Urban females have the highest percentage of raised blood pressure (38.0%) followed by urban male (33.5%) with rural males (29.5%) and rural females (28.6%) placing third and fourth. The percentages of those who are not taking medication among those with raised blood pressure is higher in rural residents (92.0%) compared to urban residents (79.4%).

Table 3.4. 13B: Distribution of mean BP and prevalence of RBP by rural and urban and by sex

Results for adults aged 18-69 years	Rural			Urban		
	Males	Females	Both Sexes	Males	Females	Both Sexes
Mean systolic blood pressure - SBP (mmHg), including those currently on medication for raised BP	129.6 (128.4-130.7)	125.2 (124.3-126.2)	127.6 (126.8-128.4)	129.5 (128.2-130.7)	125.7 (124.3-127.2)	127.8 (126.8-128.8)
Mean diastolic blood pressure - DBP (mmHg), including those currently on medication for raised BP	82.0 (81.3-82.7)	82.6 (81.9-83.2)	82.3 (81.7-82.8)	82.9 (81.9-84.0)	84.8 (83.9-85.6)	83.8 (83.0-84.5)
Percentage with raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg or currently on medication for raised BP)	29.5 (27.38-31.56)	28.6 (27.04-30.14)	29.1 (27.82-30.32)	33.5 (30.31-36.68)	38.0 (35.63- 40.21)	35.5 (33.68-37.39)
Percentage with raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg) who are not currently on medication for raised BP	93.3% (90.5-96.1)	90.3% (87.8-92.8)	92.0% (89.8-94.1)	85.2% (80.8-89.5)	73.4% (68.8-78.0)	79.4% (76.2-82.5)

3.5 Biochemical Measurement

3.5.1 Raised Blood glucose

Medical history of raised blood glucose

Overall 85 % of participants never had their blood sugar measured, 88.4% among men and 81.7% among women Table 3.5.1. Among the 14.7% measured 3.8% were diagnosed with diabetes, 3.1% and 4.5% among men and women respectively.

Table 3.5. 1: Percentage Distribution of Blood Glucose measurement and diagnosis by sex and age group.

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	721	94.7	92.8-96.6	4.8	3.0-6.6	0.0	0.0-0.0	0.5	0.0-1.1
30-44	894	90.4	87.9-92.8	7.4	5.3-9.6	1.2	0.4-1.9	1.0	0.3-1.7
45-59	727	74.3	70.0-78.7	16.0	12.6-19.4	4.9	3.1-6.6	4.8	3.2-6.4
60-69	365	67.3	60.8-73.9	21.6	16.3-26.9	3.0	1.3-4.7	8.1	4.1-12.0
18-69	**2707**	**88.4**	**86.7-90.2**	**8.4**	**7.0-9.8**	**1.3**	**0.9-1.8**	**1.8**	**1.2-2.4**
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	1689	90.5	88.4-92.6	8.6	6.5-10.7	0.2	0.0-0.3	0.8	0.3-1.3
30-44	1921	81.1	78.3-83.9	15.2	12.8-17.7	1.5	0.6-2.5	2.2	1.3-3.1
45-59	1032	67.6	63.5-71.7	20.4	17.1-23.6	3.4	2.1-4.7	8.6	6.5-10.7
60-69	373	60.8	54.0-67.7	26.8	20.8-32.8	4.8	2.7-7.0	7.5	4.1-10.9
18-69	**5015**	**81.7**	**79.6-83.7**	**13.9**	**12.2-15.6**	**1.5**	**1.0-1.9**	**3.0**	**2.4-3.6**
Both Sexes									
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	2410	92.9	91.4-94.4	6.4	5.0-7.9	0.1	0.0-0.1	0.6	0.1-1.1
30-44	2815	85.8	83.8-87.8	11.2	9.5-13.0	1.4	0.8-1.9	1.6	1.0-2.1
45-59	1759	71.1	67.9-74.4	18.1	15.5-20.7	4.2	3.0-5.3	6.6	5.2-8.0
60-69	738	64.6	59.3-69.9	23.8	19.8-27.7	3.8	2.4-5.2	7.8	5.0-10.7
18-69	**7722**	**85.4**	**83.7-87.0**	**10.9**	**9.5-12.2**	**1.4**	**1.1-1.7**	**2.4**	**1.9-2.8**

Among those who reported being diagnosed with raised blood glucose, 72.9% are currently taking medication Table 3.5.2., 71.9 % among women 74.1% among men.

Table 3.5. 2: Percentage Distribution of Participants Currently on medication among those previously diagnosed with Raised Blood Glucose

Age Group (years)	Men			Women			Both Sexes		
	N	% taking meds	95% CI	n	% taking meds	95% CI	n	% taking meds	95% CI
18-29	2	60.3	0.0-100.0	16	76.1	55.8-96.4	18	69.7	38.7-100.0
30-44	24	59.0	37.5-80.5	62	56.4	39.7-73.2	86	57.4	44.2-70.6
45-59	81	76.3	65.4-87.1	124	74.9	66.6-83.2	205	75.5	68.7-82.4
60-69	38	88.9	79.4-98.4	50	89.4	81.7-97.1	88	89.1	82.9-95.3
18-69	**145**	**74.1**	**65.6-82.6**	**252**	**71.9**	**65.1-78.7**	**397**	**72.9**	**67.8-78.0**

The overall percentage of respondents who are currently on medication and who are taking insulin was 26.0%, 28% among women and 23.6% among men Table 3.5.3. Among women 41.5% of participants in the age group 18-29 years are taking insulin.

Table 3.5. 3. Percentage Distribution of Participants Currently taking insulin by age group and sex.

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	16	41.5	12.6-70.3	18	24.6	5.2-44.1
30-44	24	21.7	2.4-40.9	62	36.6	18.5-54.7	86	30.9	17.5-44.3
45-59	81	27.7	16.5-38.8	124	23.1	14.5-31.7	205	25.2	18.0-32.5
60-69	38	23.2	9.1-37.3	50	19.6	6.3-33.0	88	21.6	12.6-30.7
18-69	**145**	**23.6**	**15.6-31.6**	**252**	**28.0**	**20.2-35.8**	**397**	**26.0**	**20.4-31.5**

The overall percentage of participants who had visited a traditional healer for treatment of diabetes was 15.5%, 12.1% among women and 19.5% among men Table 3.5.4. Moreover 22.5% are currently taking herbal medication or traditional medicine, 23.7% among men and21.5% among men Table 3.5.5 .It increases with age from 10.9% among age group 18-29 to30.0% among age group 60-69 years.

Table 3.5. 4: Percentage distribution of Participants who visited a traditional healer by age group and sex.

Seen a traditional healer for diabetes 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	2	60.3	0.0-100.0	16	19.3	0.0-40.5	18	35.9	3.0-68.8
30-44	24	22.4	5.4-39.5	62	9.7	0.0-20.2	86	14.5	5.4-23.7
45-59	81	13.7	6.2-21.2	124	11.5	5.5-17.5	205	12.5	7.9-17.2
60-69	38	17.0	3.0-31.1	50	14.8	2.8-26.9	88	16.0	6.4-25.7
18-69	**145**	**19.5**	**8.4-30.6**	**252**	**12.1**	**6.8-17.5**	**397**	**15.5**	**9.6-21.4**

Table 3.5. 5: Percentage Distribution of Participants currently taking herbal or traditional treatment for diabetes by sex and age group.

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	2	0.0	0.0-0.0	16	18.3	0.0-38.9	18	10.9	0.0-25.1
30-44	24	28.9	9.5-48.4	62	19.7	7.9-31.6	86	23.3	12.8-33.7
45-59	81	23.0	12.1-34.0	124	20.4	11.1-29.7	205	21.6	14.7-28.6
60-69	38	29.1	9.9-48.4	50	31.2	14.5-47.9	88	30.0	17.1-43.0
18-69	**145**	**23.7**	**16.1-31.4**	**252**	**21.5**	**14.4-28.5**	**397**	**22.5**	**17.0-28.0**

Fasting Blood Glucose Measurement

Impaired Fasting Glycaemia

Participants had their capillary whole blood glucose measured after at least 10-12 hours of fasting. Impaired Fasting Glycaemia (IFG) is defined as capillary or whole blood glucose value of ≥5.6mmol/L (100mg/dl) and <6.1mmol/L (110mg/dl). The overall prevalence of IFG was 3.4%, 3.2% among men and 3.6% among women Table 3.5.6.It increases approximately threefold with age, from2.5% among the age group 18-29 to 7.8% among age group 60-69 years.

Table 3.5. 6: Prevalence of Impaired Fasting Glycaemia by sex and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	619	2.5	1.1-4.0	1518	2.5	1.5-3.6	2137	2.5	1.5-3.5
30-44	802	3.1	1.7-4.4	1773	2.6	1.7-3.4	2575	2.8	2.0-3.6
45-59	652	4.2	2.1-6.2	947	6.6	4.6-8.5	1599	5.3	3.9-6.7
60-69	330	6.8	3.7-9.9	336	9.2	4.0-14.4	666	7.8	4.7-11.0
18-69	2403	3.2	2.2-4.2	4574	3.6	2.8-4.4	6977	3.4	2.7-4.1

Raised Fasting Blood Glucose

The raised fasting Blood glucose (RFBG) is defined as having capillary whole blood value: ≥ 6.1 mmol/L (110 mg/dl). The overall, prevalence of RFBG or currently on medication was 6.0% (women 7% and men 5.1%) Table 3.5.7 and Fig.3.5.2. This percentage increased with age to reach an overall percentage of 14.3% in age group 45-59 while it reached 15.7% among women in the same age group. Fig.3.5.1 and Table 3.5.7.

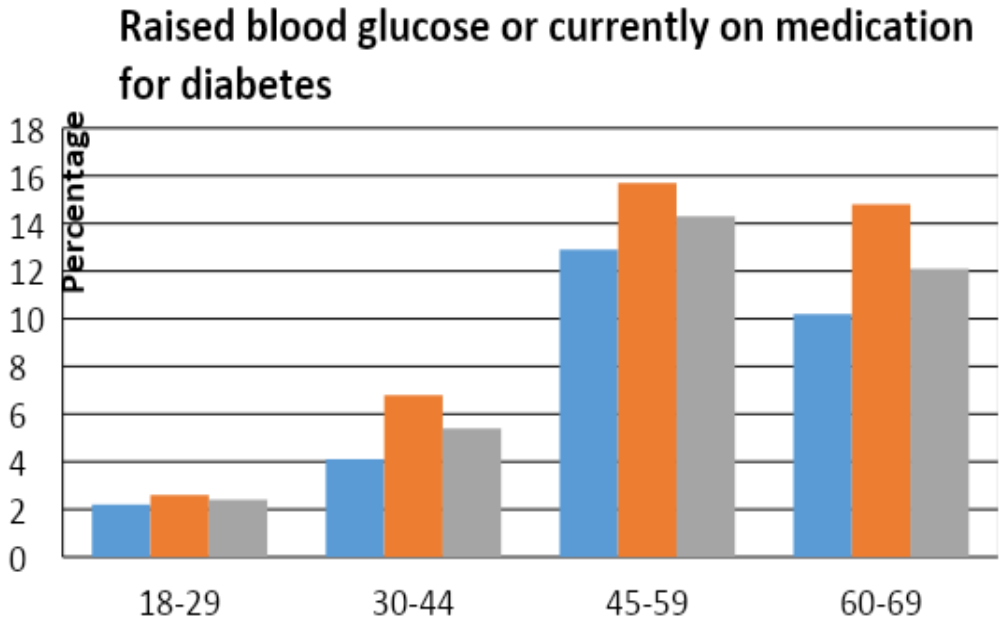


Figure 3.5. 1: Percentage Distribution of RFBG/on medication by age group and sex

Table 3.5. 7: Prevalence of RBG or currently on medication by age and sex

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	619	2.2	0.7-3.7	1518	2.6	1.6-3.5	2137	2.4	1.4-3.3
30-44	802	4.1	2.6-5.7	1773	6.8	5.3-8.3	2575	5.4	4.3-6.6
45-59	652	12.9	9.5-16.2	947	15.7	12.7-18.8	1599	14.3	11.8-16.7
60-69	330	10.2	6.2-14.2	336	14.8	10.3-19.3	666	12.1	9.0-15.3
18-69	2403	5.1	3.9-6.3	4574	7.0	6.0-8.1	6977	6.0	5.1-6.9

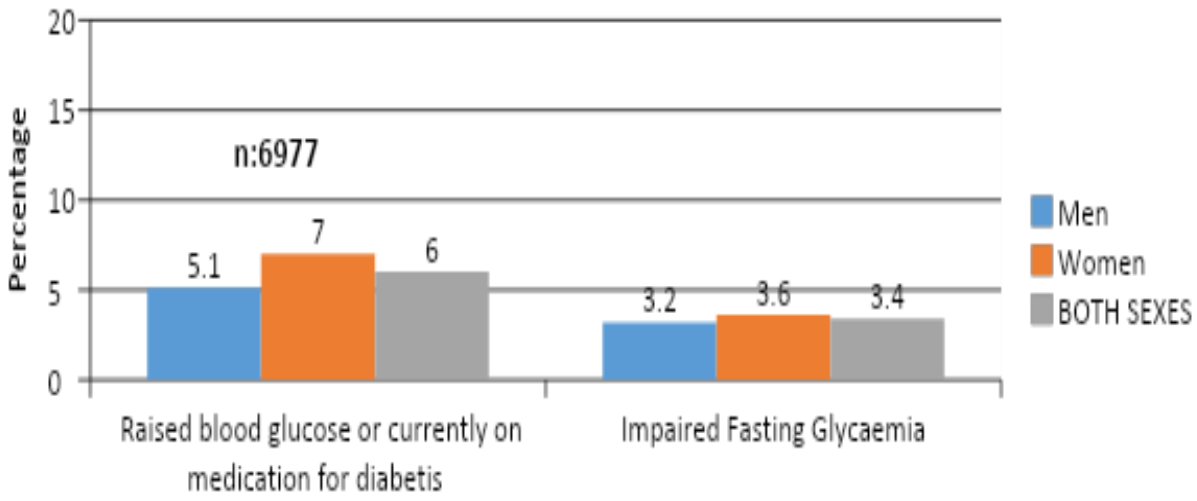


Figure 3.5. 2: Percentage Distribution of RFBG and IFG by sex

Raised Fasting Blood Glucose by Region

Table (3.5.8) shows the mean fasting blood glucose, percentage with impaired fasting glycaemia and percentage with raised fasting blood glucose or currently on medication by region. The overall mean fasting blood glucose was 4.5mmol/L. The highest percentage of raised FBG or currently on medication was recorded in Khartoum region (11.6%), while Darfur region had the lowest percentage (2.0%). The percentage of impaired fasting glucose was highest in Khartoum (7.0%) and lowest in Darfur (1.7%) (Fig.3.5.3).

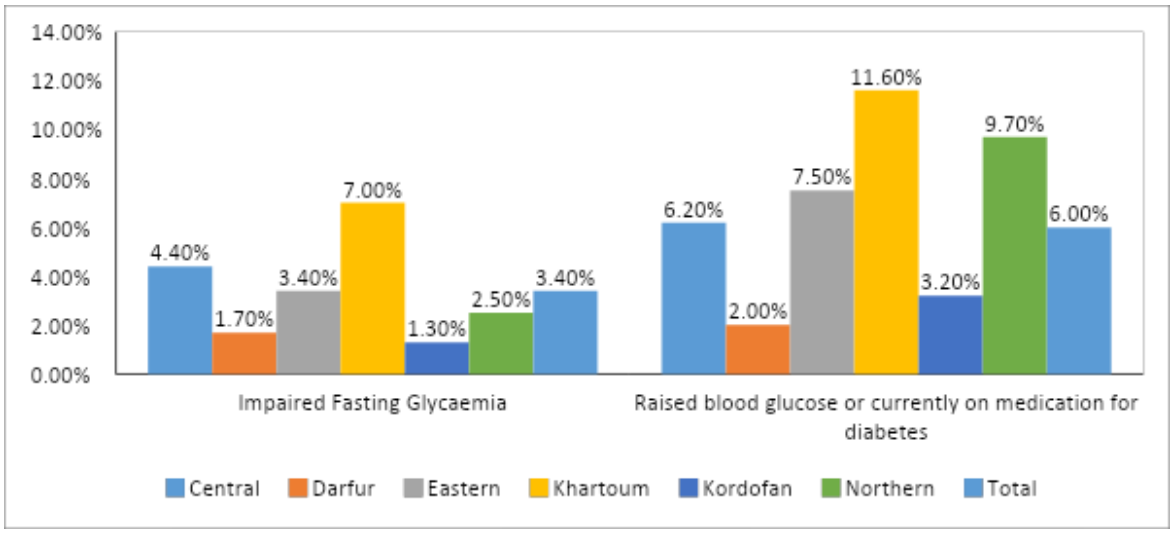


Figure 3.5. 3: Prevalence of IFG and RFBG among 18-69 years old by Region

Table 3.5. 8A: Distribution of status of Fasting Blood Glucose measurements among 18-69 years old by Region

Adults (18-69 yrs.)	Total	Central	Darfur	Eastern	Khartoum	Kordofan	Northern
Mean FBG mmol/L	4.5 (4.4-4.6)	4.7 (4.6-4.8)	4.1 (4.0-4.3)	4.4 (4.1-4.7)	5.1 (4.9-5.4)	4.2 (4.0-4.4)	4.9 (4.5-5.4)
%with IFG	3.4 (2.7-4.1)	4.4 (3.0-6.0)	1.7 (0.5-2.9)	3.4 (1.8-5.0)	7.0 (4.6-9.4)	1.3 (0.6-2.1)	2.5 (1.1-3.9)
% with RFBG/or currently on medication	6.0 (5.1-6.9)	6.2 (4.9-7.6)	2.0 (1.1-3.0)	7.5 (4.3-10.7)	11.6 (9.1-14.1)	3.2 (1.7-4.6)	9.7 (5.0-14.5)

Raised Fasting Blood Glucose Rural v Urban

The mean FBG is (**4.8**mmol/L) in urban and (**4.4**mmol/L) in rural settings. There was a difference between females in urban settings (4.9mmol/L) and females in rural settings (4.4 mmol/L). The overall prevalence of IFG was (4.7%) in urban (2.7%) in rural settings. The

prevalence among urban females was 5.0% as compared to 2.8% among rural females .The overall prevalence of FFBG was (8.7%) as compared to (4.4%) in rural areas. It was (11.2%) and (4.7%) among urban and rural females respectively Table.

Table3.5.8B: Distribution of status of Fasting blood glucose measurements by rural and urban and by sex.

Adults18-69 years	Rural			Urban		
	Males	Females	Both Sexes	Males	Females	Both Sexes
Mean FBG mmol/L	4.3 (4.1-4.4)	4.4 (4.3-4.6)	4.4 (4.2-4.5)	4.6 (4.4-4.9)	4.9 (4.7-5.1)	4.8 (4.6-5.0)
% with IFG	2.5 (1.75- 3.25)	2.8 (2.25- 3.42)	2.7 (2.2 - 3.11)	4.4 (2.95 - 5.9)	5.0 (3.92- 6.12)	4.7 (3.82- 5.57)
%with RFBG or currently on medication	4.2 (3.28- 5.21)	4.7 (3.92- 5.42)	4.4 (3.85- 5.03)	6.5 (4.72- 8.26)	11.2 (9.65- 12.83)	8.7 (7.49- 9.81)

3.5.2 Raised Total Cholesterol

History of Raised Total Cholesterol

Tables (3.5.9) show the percentage of participants who had their total cholesterol measured and, diagnosed. The majority of the respondents (94.8%) reported that their cholesterol had never been measured by health care workers. Among those who had the measurement 0.8% were diagnosed as having raised blood cholesterol during the past 12 month while 0.4% were diagnosed before 12 month. Among those diagnosed 52.7% were on oral medications prescribed by doctor or health worker (Table 3.5.10) .However9.5% of those who were diagnosed have seen traditional healers Table 3.5.11 and 14.2% were on herbal or traditional medications table 3.5.12.

Table 3.5. 9: Distribution of Total cholesterol measurement and diagnosis by sex and age group

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	721	97.2	95.8-98.5	2.7	1.4-4.1	0.0	0.0-0.0	0.1	0.0-0.3
30-44	894	96.7	95.3-98.1	2.5	1.4-3.7	0.3	0.0-0.6	0.5	0.0-1.2
45-59	727	91.8	89.3-94.2	5.9	4.0-7.9	0.9	0.0-1.9	1.4	0.4-2.4
60-69	365	89.3	85.3-93.3	5.8	3.2-8.3	2.1	0.5-3.8	2.8	0.3-5.2
18-69	2707	95.7	94.6-96.7	3.4	2.5-4.2	0.4	0.1-0.6	0.6	0.2-0.9
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	1689	96.2	94.8-97.6	3.3	2.0-4.7	0.3	0.0-0.6	0.2	0.0-0.4
30-44	1921	93.9	92.5-95.3	4.9	3.5-6.2	0.4	0.1-0.8	0.8	0.3-1.3
45-59	1032	90.1	87.6-92.6	6.5	4.5-8.5	0.9	0.3-1.6	2.4	1.4-3.4
60-69	373	85.1	79.6-90.5	9.7	5.3-14.0	0.4	0.0-0.8	4.9	1.8-8.1
18-69	5015	93.8	92.6-94.9	4.7	3.7-5.8	0.5	0.2-0.7	1.0	0.7-1.4
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	2410	96.8	95.7-97.8	3.0	1.9-4.0	0.1	0.0-0.3	0.1	0.0-0.3
30-44	2815	95.3	94.3-96.3	3.7	2.7-4.6	0.4	0.1-0.6	0.6	0.2-1.1
45-59	1759	91.0	89.2-92.8	6.2	4.8-7.6	0.9	0.3-1.6	1.9	1.2-2.6
60-69	738	87.6	84.1-91.0	7.4	5.0-9.8	1.4	0.4-2.4	3.7	1.5-5.8
18-69	7722	94.8	93.9-95.7	4.0	3.3-4.8	0.4	0.2-0.6	0.8	0.5-1.0

Results of Total Cholesterol Measurement

The mean level of total cholesterol (TC) among all respondents was 3.8mmol/L (men 3.5 mmol/L and women 4.1 mmol/L) table 3.5.10. The highest mean recorded was in the older age group 60-69 (4.3mmol/L)

Table 3.5. 10: Distribution of the mean level of total cholesterol (mmol/L) by sex and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	N	Mean	95% CI	n	Mean	95% CI
18-29	648	3.2	3.1-3.3	1571	3.8	3.7-3.9	2219	3.5	3.4-3.6
30-44	837	3.7	3.6-3.8	1814	4.1	4.0-4.2	2651	3.9	3.8-4.0
45-59	672	4.0	3.9-4.1	965	4.5	4.4-4.6	1637	4.2	4.1-4.3
60-69	345	4.0	3.8-4.2	350	4.7	4.5-4.8	695	4.3	4.1-4.4
18-69	2502	3.5	3.5-3.6	4700	4.1	4.0-4.1	7202	3.8	3.7-3.8

Table (3.5.11) shows that 13.6% of respondents had raised total cholesterol (≥ 5.0 mmol/L or ≥ 190 mg/dl) and/or currently on medication .Women have significantly higher percentage (19.5%) compared to men (8.8%). Raised total cholesterol levels increased steadily by age in both sexes.

Table 3.5. 11: Percentage distribution of respondents with high Total cholesterol ≥ 5.0 mmol/L or ≥ 190 mg/dl or currently on medication by sex and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	N	%	95% CI	n	%	95% CI
18-29	648	5.2	2.4-7.9	1571	11.9	9.9-13.9	2219	8.0	6.2-9.9
30-44	837	8.4	6.2-10.6	1814	19.4	16.8-21.9	2651	13.8	11.9-15.6
45-59	672	16.7	13.0-20.4	965	33.5	29.4-37.7	1637	24.7	21.7-27.6
60-69	345	17.9	11.8-24.0	350	33.6	26.9-40.2	695	24.5	19.3-29.6
18-69	2502	8.8	7.1-10.5	4700	19.5	17.6-21.4	7202	13.6	12.2-15.1

Total Cholesterol Measurement by Region

The highest mean level of total cholesterol (4.1 mmol/L) was recorded in Khartoum State and the lowest (3.5mmol/L) in Kordofan Region. The highest prevalence (24.2%) of high total cholesterol was in Khartoum and the lowest (8.8%) was in Kordofan Region Table3.5.12.

Table 3.5. 12: Distribution of mean level of Total Cholesterol and prevalence of high Total Cholesterol by region.

Results for adults aged 18-69 years	Total	Central	Darfur	Eastern	Khartoum	Kordofan	Northern
Biochemical Measurement							
Mean total blood cholesterol, in mmol/L	3.8 (3.7-3.8)	3.9 (3.8-4.0)	3.7 (3.6-3.8)	3.6 (3.4-3.7)	4.1 (4.0-4.3)	3.5 (3.4-3.6)	3.8 (3.6-4.1)
%of raised total cholesterol (≥ 5.0 mmol/L or ≥ 190 mg/dl or currently on medication).	13.6 (12.2-15.1)	17.0 (14.0-19.9)	9.2 (6.3-12.1)	10.0 (7.3-12.6)	24.2 (19.6-28.7)	8.8 (6.6-10.9)	13.3% (8.2-18.3)

Total Cholesterol Measurement Rural v Urban

In general urban population had higher mean cholesterol (4.0 mmol/L) compared to rural population (3.7 mmol/L). The overall prevalence of high total cholesterol was19.2% and 10.4% in urban and rural areas respectively. The prevalence among urban females was 25% as compared to 16.3% among rural females (25%) Table 3.5.13.

Table 3.5. 13: Distribution of mean level of Total Cholesterol and Prevalence of High Total Cholesterol by rural V urban and by sex.

Results for adults aged 18-69 years	Rural			Urban		
	Males	Females	Both Sexes	Males	Females	Both Sexes
Mean total blood cholesterol mmol/L	**3.4 (3.4-3.5)**	**4.0 (3.9-4.0)**	**3.7 (3.6-3.7)**	**3.7 (3.6-3.8)**	**4.3 (4.2-4.4)**	**4.0 (3.8-4.1)**
% with raised total cholesterol (≥ 5.0 mmol/L or ≥ 190 mg/dl or currently on medication	**5.4 (4.29- 6.42)**	**16.3 (15.01- 17.6)**	**10.4 (9.51- 11.23)**	**14.6 (12.09 - 17.03)**	**25.0 (22.83- 27.11)**	**19.2 (17.64- 20.82)**

Among participants who had raised total cholesterol, 3.6% had levels greater or equal to (6.2 mmol/ 240 mg/dl), 5.5% among women and 2.1% among men (Table 3.5.14).

Table 3.5. 14: Total cholesterol ≥ 6.2 mmol/L or ≥ 240 mg/dl or currently on medication for raised cholesterol

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-29	648	1.0	0.1-1.9	1571	2.5	1.4-3.6	2219	1.7	1.0-2.3
30-44	837	2.0	0.8-3.1	1814	4.6	3.4-5.9	2651	3.3	2.3-4.2
45-59	672	3.7	2.1-5.4	965	11.2	8.5-13.9	1637	7.3	5.7-8.9
60-69	345	6.5	2.7-10.4	350	15.6	9.9-21.2	695	10.3	7.1-13.6
18-69	2502	2.1	1.4-2.7	4700	5.5	4.5-6.4	7202	3.6	3.0-4.3

3.6. Cardiovascular Disorders

History of Cardiovascular Diseases (CVD)

Table (3.6.1) shows that 0.9% of respondents had a heart attack or chest pain (women1.2 % and men 0.6%). Events of CVD increase with age for both sexes

Table 3.6. 1 Distribution of Occurrence of heart attack or chest pain by sex/ age group

Age Group (years)	Men			Women			Both Sexes		
	n	% CVD history	95% CI	n	% CVD history	95% CI	n	% CVD history	95% CI
18-29	721	0.5	0.0-1.1	1689	0.4	0.0-0.8	2410	0.5	0.1-0.8
30-44	894	0.6	0.0-1.1	1921	1.4	0.7-2.1	2815	1.0	0.5-1.5
45-59	727	0.9	0.1-1.7	1032	1.8	0.8-2.8	1759	1.3	0.7-1.9
60-69	365	1.2	0.1-2.3	373	4.0	1.0-7.0	738	2.4	1.0-3.8
18-69	2707	0.6	0.3-1.0	5015	1.2	0.8-1.6	7722	0.9	0.6-1.2

Table (3.6.2) shows that 1.9% of participants are currently taking aspirin regularly to prevent or treat heart disease, women (2.6%) as compared to men (1.3%). Among respondents aged 60 – 69 years 9.4% taking aspirin. Overall 1.0% population are currently taking statins to prevent or treat heart disease with no significant difference between sexes (Table 3.6.3).

Table 3.6. 2: Percentage Distribution of Participants currently taking aspirin regularly to prevent or treat heart disease by gender and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	% taking aspirin	95% CI	n	% taking aspirin	95% CI	n	% taking aspirin	95% CI
18-29	721	0.1	0.0-0.3	1689	1.0	0.4-1.6	2410	0.5	0.2-0.8
30-44	894	0.7	0.0-1.3	1921	2.9	1.9-4.0	2815	1.8	1.2-2.4
45-59	727	2.7	1.3-4.2	1032	4.6	3.2-6.0	1759	3.6	2.5-4.7
60-69	365	10.7	6.2-15.2	373	7.5	4.1-10.8	738	9.4	6.0-12.7
18-69	2707	1.3	0.9-1.7	5015	2.6	2.0-3.3	7722	1.9	1.5-2.3

Table 3.6. 3: Percentage Distribution of Participants Currently taking statins regularly to prevent or treat heart disease by gender and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	% taking statins	95% CI	n	% taking statins	95% CI	n	% taking statins	95% CI
18-29	721	0.8	0.1-1.6	1689	0.6	0.1-1.1	2410	0.7	0.2-1.2
30-44	894	0.4	0.0-0.9	1921	0.8	0.3-1.3	2815	0.6	0.1-1.0
45-59	727	1.9	0.7-3.1	1032	2.4	1.3-3.5	1759	2.1	1.3-2.9
60-69	365	2.7	0.6-4.8	373	3.0	0.9-5.2	738	2.8	1.3-4.4
18-69	2707	1.0	0.4-1.5	5015	1.1	0.7-1.5	7722	1.0	0.7-1.4

Cardiovascular Disease Risk:

A 10-year cardiovascular disease risk(CVDR) of ≥30% is defined according to age, sex, blood pressure, smoking status (current smokers or those who quit smoking less than 1 year before the assessment), raised total cholesterol, and diabetes (previously diagnosed or a fasting plasma glucose concentration >7.0 mmol/l (126 mg/dl)).

The percentage of respondents aged 40-69 years with a 10-year CVDR ≥30% or with existing CVD is shown on table (3.6.4). Overall percentage of ≥30% risk was 3.5%. Women had a higher percentage (4.2%) than men (2.9%). However the overall CVDR(7.1%) among respondents in the age group 55-69 was approximately fourfold time higher than the CVDR (1.9%) among the age group 40-54yearsTable 3.6.4.

Table 3.6. 4: Percentage of respondents with a 10-year CVD risk ≥30% or with existing CVD

Percentage of respondents with a 10-year CVD risk ≥30% or with existing CVD[2]									
Age Group (years)	Men			Women			Both Sexes		
	N	%	95% CI	N	%	95% CI	n	%	95% CI
40-54	753	1.7	0.7-2.8	1176	2.1	1.1-3.1	1929	1.9	1.2-2.6
55-69	498	5.5	3.3-7.8	563	9.2	6.1-12.2	1061	7.1	5.2-9.0
40-69	1251	2.9	1.9-4.0	1739	4.2	3.0-5.3	2990	3.5	2.7-4.3

Table (3.6.5) shows percentage of eligible persons (defined as aged 40-69 years with a 10-year (CVDR) risk ≥30%, including those with existing CVD) receiving drug therapy and counseling to prevent heart attacks and strokes. Only 41.4% of eligible respondents received drug therapy and counseling. Men had lower percentage (36.8%) as compared to women (45.2%). No significant difference observed between the age groups.

Table 3.6. 5: Percentage Distribution of eligible persons receiving drug therapy and counseling to prevent heart attacks and strokes*

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	14	38.8	9.1-68.5	28	49.6	27.4-71.9	42	44.4	26.3-62.5
55-69	34	35.4	14.6-56.3	47	42.6	25.3-59.9	81	39.5	25.8-53.2
40-69	48	36.8	18.6-55.0	75	45.2	31.4-59.0	123	41.4	30.3-52.5

**Eligible persons receiving drug therapy and counseling to prevent heart attacks and strokes: Counseling is defined as receiving advice from a doctor or other health worker to quit using tobacco or not start, reduce salt in diet, eat at least five servings of fruit and/or vegetables per day, reduce fat in diet, start or do more physical activity, maintain a healthy body weight or lose weight. Therapy includes glycemic control.*

[2]

3.7 Cervical Cancer Screening

Only 1.4% of female respondents had ever had a screening test for cervical cancer Table 3.7.1. However among the 2143 women in the age group30-49 years only 1.7% were ever screened for cervical cancer.

Table 3.7. 1: Percentage Distribution of female respondents who had ever had a screening test for cervical cancer by age group

Age Group (years)	Women		
	n	% ever tested	95% CI
18-29	1558	1.1	0.6-1.7
30-44	1747	1.5	0.8-2.1
45-59	963	1.6	0.5-2.7
60-69	338	1.9	0.2-3.6
18-69	4606	1.4	0.9-1.8

Further analysis shows that among women aged 30-49 years, 2.6% (CI: 1.29-2.62) urban females had screening for cervical cancer as compared to 1.0 %(CI: 0.63-1.35).

3.8 Healthy Life Advice

Participants were asked if they had been given a life style advice by a doctor or health care worker during the past three years. Only 8.5% received advice to quit smoking or never start, men (11.3%) as compared to women (5.2%) Table 3.8.1. However 22.3%received advice to take less salt in their diet, men 21.3% and women 23.5, (Table 3.8.2). The percentage of those who received advice for salt reduction increased with age to reach 34.4% in age group 60-69 for both sexes.

Furthermore 17.9% of the all participants received advice from a care provider to maintain healthy diet by eating at least five servings of fruit and/or vegetables each day (men 16% and women 17.5%) Table 3.8.3. Advice for reduction of fat in the diet was received by 21% of participants (19.8% men and 22.5% women) Table 3.8.4. The percentage of participants that were advised to reduce fat intake increased with age to reach 30.6% in age group 60-69 for both sexes. As for physical activity 16.9% received advice to start or do more physical activity with no observed difference between men (16.8) and women (16.9%) Table 3.8.5. In addition 13.0% of all participants were advised to maintain a healthy body weight or to lose weight (men 12.6% and women 13.5%) Table 3.8.6.

Overall less than 25% of the participants received advice regarding health life style. The percentage of those received advice to reduce salt and fat increased with age in both sexes. Men tend to receive more advice regarding quitting smoking or never to start than females.

Table 3.8. 1: Percentage Distribution of Participants Advised by a doctor or health worker to quit smoking or never start by gender and age group

Age Group (years)	Men			Women			Both Sexes		
	n	% advised	95% CI	n	% advised	95% CI	n	% advised	95% CI
18-29	721	8.6	6.1-11.2	1689	4.9	3.4-6.4	2410	7.0	5.2-8.8
30-44	894	14.4	11.1-17.6	1921	5.9	4.1-7.7	2815	10.2	8.1-12.4
45-59	727	12.2	9.0-15.4	1032	5.3	3.3-7.2	1759	8.9	6.9-10.9
60-69	365	15.3	10.6-20.0	373	3.8	1.5-6.0	738	10.5	7.5-13.5
18-69	2707	11.3	9.1-13.5	5015	5.2	4.0-6.5	7722	8.5	7.0-10.1

Table 3.8. 2: Percentage Distribution of Participants Advised by a doctor or health worker to reduce salt in the diet by gender and age group

	Advised by doctor or health worker to reduce salt in the diet								
Age Group (years)	Men			Women			Both Sexes		
	n	% advised	95% CI	n	% advised	95% CI	n	% advised	95% CI
18-29	721	17.7	13.7-21.8	1689	18.0	15.4-20.5	2410	17.8	14.8-20.8
30-44	894	22.2	18.3-26.1	1921	24.1	21.1-27.0	2815	23.1	20.3-26.0
45-59	727	25.8	21.9-29.8	1032	32.4	28.3-36.5	1759	29.0	25.9-32.0
60-69	365	34.4	28.0-40.8	373	34.4	28.0-40.8	738	34.4	29.5-39.3
18-69	2707	21.3	18.3-24.3	5015	23.5	21.3-25.6	7722	22.3	20.0-24.6

Table 3.8. 3: Percentage Distribution of Participants Advised by a doctor or health worker to eat at least five servings of fruit and/or vegetables each day by sex/age group.

Age Group (years)	Men			Women			Both Sexes		
	n	% advised	95% CI	n	% advised	95% CI	n	% advised	95% CI
18-29	721	13.3	9.8-16.7	1689	16.0	13.6-18.4	2410	14.4	11.9-17.0
30-44	894	17.7	14.1-21.2	1921	20.1	17.3-23.0	2815	18.9	16.3-21.5
45-59	727	20.8	17.0-24.5	1032	25.5	21.7-29.2	1759	23.0	20.1-25.9
60-69	365	25.1	19.4-30.9	373	25.5	18.9-32.0	738	25.3	20.9-29.7
18-69	2707	16.5	14.0-18.9	5015	19.6	17.5-21.7	7722	17.9	15.9-19.9

Table 3.8. 4: Percentage Distribution of Participants Advised by a doctor or health worker to reduce fat in the diet by gender and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	% advised	95% CI	N	% advised	95% CI	n	% advised	95% CI
18-29	721	17.8	14.3-21.3	1689	17.5	15.1-20.0	2410	17.7	15.1-20.3
30-44	894	19.1	15.7-22.6	1921	22.4	19.9-25.0	2815	20.7	18.3-23.2
45-59	727	24.1	20.2-27.9	1032	30.9	27.0-34.8	1759	27.3	24.4-30.3
60-69	365	27.7	21.2-34.1	373	34.6	28.0-41.2	738	30.6	25.7-35.4
18-69	2707	19.8	17.3-22.3	5015	22.5	20.5-24.4	7722	21.0	19.1-23.0

Table 3.8. 5: Percentage Distribution of Participants Advised by doctor or health worker to start or do more physical activity by gender and age group

Advised by doctor or health worker to start or do more physical activity									
Age Group (years)	Men			Women			Both Sexes		
	n	% advised	95% CI	N	% advised	95% CI	n	% advised	95% CI
18-29	721	14.8	11.1-18.4	1689	14.4	11.9-17.0	2410	14.6	12.0-17.2
30-44	894	18.4	14.7-22.0	1921	16.9	14.4-19.4	2815	17.6	15.1-20.1
45-59	727	18.1	14.5-21.8	1032	21.7	17.7-25.7	1759	19.8	16.8-22.8
60-69	365	23.2	17.1-29.4	373	21.2	15.1-27.2	738	22.4	17.8-26.9
18-69	2707	16.8	14.2-19.5	5015	16.9	14.9-18.9	7722	16.9	14.8-18.9

Table 3.8. 6: Percentage Distribution of Participants Advised by doctor or health worker to maintain a healthy body weight or to lose weight by gender and age group.

Advised by doctor or health worker to maintain a healthy body weight or to lose weight									
Age Group (years)	Men			Women			Both Sexes		
	n	% advised	95% CI	N	% advised	95% CI	n	% advised	95% CI
18-29	721	10.9	7.4-14.5	1689	9.7	7.6-11.7	2410	10.4	7.9-12.8
30-44	894	13.7	10.3-17.2	1921	14.5	11.8-17.2	2815	14.1	11.6-16.6
45-59	727	14.5	11.3-17.7	1032	19.3	15.2-23.3	1759	16.8	14.0-19.6
60-69	365	15.2	9.5-20.9	373	18.7	12.8-24.5	738	16.7	12.1-21.2
18-69	2707	12.6	10.0-15.1	5015	13.5	11.5-15.5	7722	13.0	11.0-15.0

3.9 Combined Risk Factors:

The major risk factors are: Current daily smoking; Consuming less than 5 servings of fruits and vegetables per day; having insufficient physical activity; Being overweight (BMI >_ 25 kg/m2) and Having Raised BP (SBP >-140 mmHg and /or DBP>_ mmHG or currently on medication). A high risk person is anyone having three or more of these risk factors.

The overall prevalence of high risk is 20.6 % Table 3.9.1. The prevalence is higher among women than men (24.0% vs. 18.0%).The overall prevalence of high risk increases with age, it reaches 37.4% in the age group 45-69years (men 32.6% and women 43.0%) as compared to15.3% in the age group 18-44 years (men 13.6% and women 17.5%).Women had higher risk than men in both age groups.

Table 3.9. 1: Percentage Distribution of Combined Risk Factors among participants by gender and age group.

Age Group (years)	n	% with 0 risk factors	95% CI	% with 1-2 risk factors	95% CI	% with 3-5 risk factors	95% CI
			Men				
18-44	1547	1.7	0.9-2.5	84.7	82.3-87.1	13.6	11.3-16.0
45-69	1051	0.3	0.0-0.8	67.1	63.3-70.9	32.6	28.8-36.4
18-69	2598	1.4	0.8-2.0	80.6	78.4-82.9	18.0	15.7-20.2
			Women				
Age Group	n	% with 0 RF	95% CI	% with 1-2 RF	95% CI	% with 3-5 RF	95% CI
18-44	3070	2.4	1.6-3.2	80.1	77.9-82.3	17.5	15.4-19.6
45-69	1330	0.7	0.0-1.3	56.4	52.3-60.5	43.0	38.9-47.0
18-69	4400	1.9	1.3-2.6	74.0	71.8-76.2	24.0	21.9-26.2
			Both Sexes				
Age Group (years)	n	% with 0 risk factors	95% CI	% with 1-2 risk factors	95% CI	% with 3-5 risk factors	95% CI
18-44	4617	2.0	1.4-2.6	82.7	80.9-84.5	15.3	13.6-17.0
45-69	2381	0.5	0.0-0.9	62.2	59.1-65.3	37.4	34.3-40.4
18-9	6998	1.6	1.1-2.1	77.8	76.0-79.6	20.6	18.8-22.4

Combined Risk Factors Rural v Urban

The overall percentage of those with three or more risk factors was 28.4% among urban participants as compared to rural participants (15.8%) Table 3.9.2. Urban females had a prevalence of (34.1%) as compared 17.6% among rural females. The prevalence of no risk factor was similar in both rural and urban settings (1.6%).

Table 3.9. 2: Distribution of Combined risk factors by rural/urban settings and by sex.

Adults aged 18-69 years	**Rural**			**Urban**		
	Males	**Females**	**Both sexes**	**Males**	**Females**	**Both sexes**
% with no risk factors	**1.4 (0.83- 1.91)**	**1.9 (1.43- 2.45)**	**1.6 (1.25- 1.98)**	**1.4 (0.59- 2.18)**	**2.0 (1.28-2.65)**	**1.6 (1.14- 2.15)**
% with three or more risk factors	**14.4 (12.76-16.04)**	**17.6 (16.17 - 18.98)**	**15.8 (14.7-16.81)**	**24.0 (21.06 - 26.86)**	**34.1 (31.73-36.39)**	**28.4 (26.65 - 30.24)**

3.10 Oral Health

Overall, 89.2% percent of adults have 20 or more natural teeth .The prevalence is 91% among men and 87% among women Table 3.10.1

Table 3.10. 1: Percentage Distribution of participants with natural teeth by sex and age group.

	Men								
Age Group (years)	n	% No natural teeth	95% CI	% 1 - 9 natural teeth	95% CI	% 10 - 19 natural teeth	95% CI	% ≥ 20 natural teeth	95% CI
18-29	703	0.5	0.0-1.00	0	-	4.1	2.5-5.8	95.3	93.6-97.0
30-44	865	0.1	0.0-1.00	0.5	0.0-1.00	9.1	11.9-0.7	90.3	87.4-93.2
45-59	707	0.3	0.0-1.00	1.6	0.2-3.0	13.3	10.0-16.7	85.0	81.0-88.6
60-69	355	1.9	0.0-1.00	3.2	1.2-5.2	18.3	13.8-22.9	260	71.4-81.8
18-69		**0.4**	**0.0-0.8**	**0.6**	**0.3-0.9**	**7.9**	**6.3-9.5**	**91.0**	**89.4-92.8**
	Women								
Age Group (years)	n	% No natural teeth	95% CI	% 1 - 9 natural teeth	95% CI	% 10 - 19 natural teeth	95% CI	% ≥ 20 natural teeth	95% CI
18-29	1666	0.5	0.0-100	0.2	0.0-0.5	5.0	3.4-6.6	94.3	92.5-96.0
30-44	1885	0.2	0.1-0.6	0.9	1.4-2.7	12.0	9.6-14.4	86.9	84.3-89.4
45-59	1018	0.4	0.0-0.9	3.3	1.9-4.7	19.2	16.2-22.2	77.1	73.5-80.7
60-69	365	2.1	0.2-4.1	7.8	4.3-11.3	30.2	24.0-36.3	59.9	52.8-66.9
18-69	4934	0.5	0.0-0.9	1.4	1.0-1.8	11.2	9.6-12.7	87.0	85.2-88.8
	Both Sexes								
Age Group (years)	n	% No natural teeth	95% CI	% 1 - 9 natural teeth	95% CI	10 - 19 natural teeth	95% CI	% ≥ 20 natural teeth	95% CI
18-29	2369	0.5	0.2-1.2	0.1	0.1-0.2	4.5	3.3-5.8	95.0	93.5-96.3
30-44	2750	0.2	0.1-0.4	0.7	0.3-1.1	10.5	8.4-12.6	88.6	86.4-90.8
45-59	1725	0.4	0.0-0.7	2.4	1.4-3.4	16.2	13.7-18.7	81.1	78.2-84.0
60-69	720	2.0	0.5-3.5	5.1	3.2-7.1	23.3	19.4-27.2	69.6	65.0-74.1
18-69	**7564**	0.5	**0.1-0.8**	**0.9**	**0.7-1.2**	**9.4**	**8.0-6.9**	**89.2**	**87.7-90.7**

STATUS OF TEETH

Only 7.1 percent of the respondents reported to have poor or very poor state of teeth, women 11.1% as compared to men 3.8% (Table 3.10.2). Women in the age group 60-69 years reported the highest percentage (32.3%).

Table 3.10. 2: Distribution of prevalence of poor or very poor teeth by sex and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	% having poor or very poor state of teeth	95% CI	n	% having poor or very poor state of teeth	95% CI	n	% having poor or very poor state of teeth	95% CI
18-29	717	2.4	1.0-3.8	1677	5.1	3.8-6.4	2394	3.6	2.5-4.6
30-44	883	3.1	1.7-4.5	1909	11.3	1.0-9.3	2792	7.1	5.8-8.5
45-59	720	6.9	4.5-9.3	1023	19.5	16.1-22.9	1743	12.9	10.6-15.2
60-69	358	9.6	6.2-13.0	364	32.3	3.3-25.8	722	19.1	15.3-22.9
18-69	**2678**	**3.8**	**2.8-4.7**	**4974**	**11.1**	**9.8-12.5**	**7651**	**7.1**	**6.2-8.0**

Overall 7.1% of the respondents reported having poor or very poor state of gums among those with natural teeth Table 3.10.5. Women in the age group 60-69 reported the highest percentage (11.7%).

Table 3.10. 3: Distribution of prevalence of poor or very poor status of gums by sex and age group

Age Group (years)	Men			Women			Both Sexes		
	n	% having poor or very poor state of gums	95% CI	n	% having poor or very poor state of gums	95% CI	n	% having poor or very poor state of gums	95% CI
18-29	716	0.70	0.0-100	1678	2.11	1.2-3.0	2394	1.3	0.8-1.8
30-44	884	1.2	0.1-2.3	1909	4.3	3.1-5.6	2793	2.7	2.1-3.3
45-59	718	2.9	0.7-1.4	1025	6.4	4.5-8.3	1743	4.5	3.5-5.5
60-69	358	4.8	2.3-7.3	364	11.7	7.8-15.6	722	7.7	5.8-9.6
18-69	**2676**	**1.4**	**0.9-2.0**	**4976**	**4.1**	**3.3-4.8**	**678**	**7.1**	**5.2-9.0**

Overall, 1.3 percent of the respondents have removable dentures Table 3.10.4., women (1.5%) as compared to men (1%). Women aged 60-69 years had the highest percentage (6.1%) The majority were upper dentures (59.1%), women (73.9%) and men (40.5%).

Table 3.10. 4: Percentage Distribution of respondents with removable dentures by sex and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	% Having removable dentures	95% CI	n	% Having removable dentures	95% CI	n	% Having removable dentures	95% CI
18-29	721	0.70	0.0-1.4	1689	0.5	0.1-0.9	2410	0.6	0.2-1.0
30-44	894	1.5	0..5-2.5	1921	1.6	0.9-2.3	2815	1.6	0.8-2.3
45-59	727	0.5	0.0-1.0	1032	2.7	1.4-4.0	1759	1.6	0.9-2.2
60-69	365	3.1	0.8-5.4	373	6.1	2.9-9.3	738	4.3	2.5-6.2
18-69	**2707**	**1.0**	**0.5-1.5**	**5015**	**1.5**	**1.1-2.0**	**7722**	**1.3**	**0.9-1.6**

History of Pain and Discomfort

Overall 23.1% of the respondents reported having oral and dental pain or discomfort in the past 12 months, women (29.9%) more than men (17.5%) Table 3.10.5.

Table 3.10. 5: Percentage Distribution of participants having oral pain or discomfort in the past 12 months.

Age Group (years)	Men			Women			Both Sexes		
	n	% Having oral pain or discomfort	95% CI	n	% Having oral pain or discomfort	95% CI	n	% Having oral pain or discomfort	95% CI
18-29	721	13.4	10.4-16.5	1689	21.6	19.0-24.2	2410	16.9	14.7-19.2
30-44	894	20.2	17.0-23.5	1921	34.6	31.4-37.9	2815	27.3	24.6-29.9
45-59	727	22.7	19.0-26.3	1032	39.0	34.9-43.1	1759	30.5	27.4-33.6
60-69	365	21.8	16.3-27.2	373	37.6	31.4-43.8	738	28.4	24.1-32.7
18-69	**2707**	**17.5**	**15.4-19.5**	**5015**	**29.9**	**27.8-32.0**	**7722**	**23.1**	**21.3-25.0**

Oral Health Behavior and Risk Factors:

Dental visits

Overall 13.4% of the respondents have visited a dentist in the last 12 months, women (17 %) as compared to men (11 %). Among men, respondents in the age group 60-69% had the highest percentage of visits (14.5%) while in women the highest (21.9%) was in the age group 45-59 years (Table 3.10.6).

Table 3.10. 6: Percentage Distribution of Dental Visits during the past 12 months by gender and age group

Age Group (years)	Men			Women			Both Sexes		
	n	%visited a dentist in past12 months	95% CI	n	%visited a dentist in past 12 months	95% CI	n	%visited a dentist in pas12 months	95% CI
18-29	721	8.9	6.4-11.4	1689	12.5	10.3-14.7	2410	10.4	8.5-12.3
30-44	894	12.0	9.5-14.5	1921	18.6	16.1-21.1	2815	15.2	13.3-17.2
45-59	727	12.6	9.7-15.6	1032	21.9	18.6-25.2	1759	17.0	14.7-19.4
60-69	365	14.5	9.9-19.0	373	19.3	13.6-25.0	738	16.5	13.1-19.8
18-69	**2707**	**10.7**	**9.1-12.4**	**5015**	**16.6**	**14.9-18.3**	**7722**	**13.4**	**12.0-14.8**

Overall, 64.6 percent of the respondents had never received dental care, men (70.6 percent) and women (57.5 percent) Table 3.10.7.

Table 3.10. 7: Percentage Distribution of Participants who had never received dental care by gender and age group.

Percentage of respondents who have never received dental care									
Age Group (years)	Men			Women			Both Sexes		
	n	% never received dental care	95% CI	n	% never received dental care	95% CI	n	% never received dental care	95% CI
18-29	721	78.2	74.0-82.4	1689	70.6	66.8-74.3	2410	74.9	73.2-76.6
30-44	894	68.3	64.1-72.6	1921	53.9	49.9-58.0	2815	61.3	59.5-63.1
45-59	727	58.0	52.9-63.1	1032	38.9	34.4-43.4	1759	48.9	46.6-51.2
60-69	365	54.4	47.7-61.2	373	35.9	29.4-42.4	738	46.7	43.1-50.3
18-69	**2707**	**70.6**	**67.3-73.8**	**5015**	**57.5**	**54.1-60.8**	**7722**	**64.6**	**63.5-65.7**

Reasons for Visiting Dentist:

The overall reasons for visiting a dentist were as follows: pain of teeth or gums (66.9%), follow up treatment (22.5%), Check up 5.0% and consultation 4.5% (Table 3.10.8).For men they were 65.9%, 19.7%, 6.5% and 6.6% respectively; and for women they were 67.8%, 24.8%, 3.7% and 2.7% respectively.

Table 3.10. 8: Percentage Distribution for reasons for visiting a dentist by sex and age group

Men											
Age Group (years)	n	% Consul-tation/ advice	95% CI	% Pain or trouble with teeth or gums	95% CI	% Follow-up treatment	95% CI	% Routine check-up treatment	95% CI	% Other	95% CI
18-29	138	11.5	4.5-18.5	64.0	54.2-73.8	13.7	6.5-21.0	9.6	3.7-15.5	1.2	0.0-3.0
30-44	292	4.8	1.1-8.6	68.3	61.5-75.1	21.3	15.2-27.3	4.1	1.3-7.0	1.4	0.0-2.9
45-59	304	2.4	0.4-4.4	66.2	59.1-73.3	25.8	19.0-32.7	4.3	1.0-7.6	1.2	0.0-2.9
60-69	156	4.9	1.2-8.7	64.3	53.8-74.9	21.1	12.9-29.3	7.9	1.5-14.4	1.7	0.0-5.0
18-69	**890**	**6.6**	**3.6-9.7**	**65.9**	**60.5-71.4**	**19.7**	**15.4-24.0**	**6.5**	**3.8-9.2**	**1.3**	**0.2-2.4**
Women											
Age Group (years)	n	% Consul-tation/ advice	95% CI	% Pain or trouble with teeth or gums	95% CI	% Follow-up treatment	95% CI	% Routine check-up treatment	95% CI	% Other	95% CI
18-29	431	4.2	2.1-6.2	69.6	63.6-75.6	18.9	13.5-24.3	6.8	3.3-10.4	0.5	0.0-1.1
30-44	863	2.9	1.5-4.2	64.9	60.2-69.6	27.8	23.4-32.2	3.1	1.6-4.6	1.4	0.0-2.7
45-59	599	1.5	0.4-2.6	68.2	62.5-73.9	27.8	22.4-33.1	1.7	0.6-2.8	0.8	0.0-1.7
60-69	223	0.3	0.0-0.9	73.1	66.1-80.2	23.7	16.8-30.6	1.1	0.0-2.9	1.8	0.0-4.3
18-69	**2116**	**2.7**	**1.8-3.6**	**67.8**	**63.8-71.8**	**24.8**	**21.1-28.5**	**3.7**	**2.2-5.2**	**1.0**	**0.1-1.9**
Both Sexes											
Age Group (years)	n	% Consul-tation/ advice	95% CI	% Pain or trouble with teeth or gums	95% CI	% Follow-up treatment	95% CI	% Routine check-up treatment	95% CI	% Other	95% CI
18-29	569	7.8	4.1-11.5	66.8	60.2-73.4	16.3	11.1-21.6	8.2	4.2-12.2	0.8	0.0-1.9
30-44	1155	3.7	1.9-5.5	66.3	61.9-70.8	25.1	21.0-29.1	3.5	1.8-5.2	1.4	0.3-2.5
45-59	903	1.9	0.8-2.9	67.4	62.1-72.6	26.9	21.8-32.1	2.9	1.3-4.4	1.0	0.1-1.9
60-69	379	2.6	0.7-4.5	68.8	62.2-75.3	22.4	16.7-28.1	4.5	1.1-7.9	1.7	0.0-3.8
18-69	**3006**	**4.5**	**3.0-6.0**	**66.9**	**62.9-71.0**	**22.5**	**19.0-25.9**	**5.0**	**3.2-6.8**	**1.1**	**0.4-1.9**

Teeth Cleaning

Overall, 97.9 % of the respondents clean their teeth once daily. The percentage of those who clean at least daily is slightly higher in younger generations Table 3.10.9.

Table 3.10. 9: Percentage Distribution of Cleaning Teeth at least once a day by sex and age group

Percentage of respondents cleaning their teeth at least once a day									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	no	%	95% CI	n	%	95% CI
18-29	721	98.8	98.0-99.5	1689	97.9	96.7-99.1	2410	98.4	97.7-99.2
30-44	894	97.4	95.5-99.3	1921	97.5	96.4-98.5	2815	97.4	96.3-98.5
45-59	727	97.7	96.1-99.2	1032	98.4	97.6-99.2	1759	98.0	97.0-99.0
60-69	365	96.0	93.4-98.5	373	95.9	93.7-98.1	738	96.0	94.1-97.8
18-69	**2707**	**98.0**	**97.1-98.9**	**5015**	**97.8**	**96.9-98.6**	**7722**	**97.9**	**97.2-98.6**

Overall, 87.5 percent of the respondents use toothpaste to clean their teeth. The highest percentage (88.2%) of those using toothpaste are in age group 18-29 years Table 3.10.10.

Table 3.10. 10: Percentage distribution of use of tooth paste by gender and age group

Age Group (years)	Men			Women			Both Sexes		
	n	% using toothpaste	95% CI	n	% using toothpaste	95% CI	n	% using toothpaste	95% CI
18-29	720	86.6	82.1-91.1	1688	90.4	87.9-93.0	2408	88.2	85.1-91.4
30-44	893	87.1	83.4-90.8	1919	89.0	86.6-91.4	2812	88.0	85.4-90.7
45-59	727	83.6	79.3-87.8	1031	88.7	85.9-91.6	1758	86.0	83.1-89.0
60-69	364	80.0	74.5-85.4	368	88.4	84.3-92.6	732	83.5	79.5-87.5
18-69	**2704**	**85.9**	**82.4-89.4**	**5006**	**89.5**	**87.5-91.6**	**7710**	**87.5**	**85.0-90.1**

The majority of participants (77.6%) use fluoridated toothpaste (76.7% among men and 78.5% among women) Table 3.10.11.

Table 3.10. 11: Percentage Distribution of use of fluoridated tooth paste by sex and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	% using toothpaste containing fluoride	95% CI	n	% using toothpaste containing fluoride	95% CI	n	% using toothpaste containing fluoride	95% CI
18-29	682	78.3	73.3-83.4	1623	79.0	75.7-82.3	2305	78.6	75.0-82.3
30-44	868	76.6	71.9-81.4	1825	78.5	75.3-81.8	2693	77.6	74.1-81.0
45-59	710	74.3	69.4-79.3	988	78.0	75.3-81.8	1698	76.1	72.4-79.7
60-69	355	71.6	65.4-77.8	354	76.3	69.8-82.9	709	73.5	768.6-78.5
18-69	**2615**	**76.7**	**73.0-80.6**	**4790**	**78.5**	**75.8-81.3**	**7405**	**77.6**	**74.7-80.5**

Overall 17.5% of the respondents reported difficulty in chewing in the past 12 months. 23.4% among women and 12.7% among men Table 3.10.12. It increased with age to 36.3%among women in the age group 60-69 years.

Table 3.10. 12: Percentage Distribution of participants reporting difficulty in chewing in the past 12 months by gender and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	% Difficulty in chewing foods	95% CI	n	% Difficulty in chewing foods	95% CI	n	% Difficulty in chewing foods	95% CI
18-29	721	9.8	7.1-12.5	1689	16.4	14.1-18.6	2410	12.6	10.6-14.6
30-44	894	13.5	10.6-16.4	1921	24.9	22.2-27.7	2815	19.1	16.9-21.2
45-59	727	16.7	13.3-20.1	1032	33.8	29.9-37.7	1759	24.9	22.0-27.7
60-69	365	20.7	15.7-25.7	373	36.3	29.5-43.2	738	27.2	23.0-31.5
18-69	**2707**	**12.7**	**10.7-14.6**	**5015**	**23.4**	**21.5-25.3**	**7722**	**17.5**	**15.9-19.2**

Overall 5.1% reported having difficulty with speech and or trouble pronouncing words during the past 12 months, women 7.8% as compared to men 2.9% (Table 3.10.13).

Table 3.10. 13: Percentage Distribution of Participants having difficulty with Speech and/or pronouncing words by gender and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	% Difficulty with speech/ pronouncing words	95% CI	no	% Difficulty with speech/ pronouncing words	95% CI	n	% Difficulty with speech/ pronouncing words	95% CI
18-29	721	2.6	1.3-3.9	1689	4.9	3.6-6.2	2410	3.6	2.7-4.5
30-44	894	2.2	1.2-3.2	1921	8.7	7.0-10.5	2815	5.4	4.3-6.4
45-59	727	3.8	2.2-5.4	1032	10.6	8.2-13.1	1759	7.1	5.6-8.6
60-69	365	5.3	2.4-8.2	373	17.6	11.9-23.3	738	10.5	7.3-13.6
18-69	**2707**	**2.9**	**2.0-3.7**	**5015**	**7.8**	**6.7-9.0**	**7722**	**5.1**	**4.4-5.9**

Overall 10.2% of the respondents reported feeling tense because of problems with teeth or mouth during the past 12 months. The burden was higher among women (13.5 %) when compared to men (7.4 %) Table 3.10.14.

Table 3.10. 14: Percentage Distribution of feeling Tense due to problems with teeth and/ or mouth by gender and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	% Feeling tense	95% CI	n	% Feeling tense	95% CI	n	% Feeling tense	95% CI
18-29	721	6.2	4.1-8.4	1689	9.9	8.0-11.7	2410	7.8	6.1-9.5
30-44	894	7.4	5.4-9.4	1921	14.9	12.6-17.2	2815	11.1	9.4-12.7
45-59	727	9.2	6.4-12.0	1032	17.9	14.6-21.2	1759	13.3	11.0-15.7
60-69	365	11.1	7.4-14.9	373	20.8	15.6-26.0	738	15.2	12.0-18.3
18-69	**2707**	**7.4**	**5.9-8.8**	**5015**	**13.5**	**12.1-15.0**	**7722**	**10.2**	**8.9-11.4**

Overall 3.5% of the respondents reported being embarrassed because of appearance of teeth during the past 12 months, women (5.3 %) and men (2.0 %) Table 3.10.15.

Table 3.10. 15: Percentage Distribution of Embarrassment due to appearance of Teeth by sex and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	% Embarrassed	95% CI	no	% Embarrassed	95% CI	n	% Embarrassed	95% CI
18-29	721	1.5	0.5-2.4	1689	3.4	2.3-4.4	2410	2.3	1.6-3.0
30-44	894	2.7	1.4-4.1	1921	5.6	4.2-7.0	2815	4.1	3.0-5.3
45-59	727	2.0	1.0-3.1	1032	7.4	5.4-9.5	1759	4.6	3.4-5.8
60-69	365	2.5	0.6-4.3	373	12.1	8.1-16.1	738	6.5	4.4-8.6
18-69	**2707**	**2.0**	**1.4-2.6**	**5015**	**5.3**	**4.4-6.2**	**7722**	**3.5**	**2.9-4.1**

Overall 4.3% of the respondents reported avoiding smiling because of teeth during the past 12 months, women (6.2 %) and men (2.7 %) Table 3.10.16.

Table 3.10. 16: Percentage Distribution of Participants avoiding smiling because of teeth problems during the past 12 months by gender and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	% Avoiding smiling b	95% CI	n	% Avoiding smiling	95% CI	n	% Avoiding smiling	95% CI
18-29	16	1.7	0.8-2.7	78	5.0	3.7-6.3	94	3.1	2.4-3.9
30-44	36	3.9	2.4-5.4	110	6.2	4.8-7.6	146	5.0	3.9-6.1
45-59	27	3.4	2.0-4.7	75	8.0	6.1-10.0	102	5.6	4.3-6.8
60-69	13	3.3	1.1-5.5	36	9.6	6.0-13.2	49	5.9	3.8-8.1
18-69	**92**	**2.7**	**2.0-3.4**	**299**	**6.2**	**5.2-7.1**	**391**	**4.3**	**3.7-4.9**

Overall 13.3% of the respondents reported interruptions in sleep due to teeth problems during the past 12 months, women (18 %) and men (9.4 %) Table 3.10.17.

Table 3.10. 17: Percentage Distribution of Participants having interruptions of sleep due to Teeth problems by gender and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	% Sleep often interrupted	95% CI	n	% Sleep often interrupted	95% CI	n	% Sleep often interrupted	95% CI
18-29	721	7.3	5.1-9.5	1689	14.1	11.7-16.4	2410	10.2	8.5-12.0
30-44	894	10.9	8.5-13.2	1921	19.5	17.1-21.9	2815	15.1	13.2-16.9
45-59	727	11.0	8.0-13.9	1032	23.2	19.6-26.7	1759	16.8	14.4-19.2
60-69	365	14.9	10.5-19.3	373	22.9	17.3-28.6	738	18.3	14.6-21.9
18-69	**2707**	**9.4**	**7.8-11.0**	**5015**	**18.0**	**16.2-19.7**	**7722**	**13.3**	**12.0-14.7**

Overall 6.1% of the respondents reported having days off work because of teeth and/or mouth problems during the past 12 months, women (6.7 %) and men (5.6 %) Table 3.10.18.

Table 3.10. 18: Percentage Distribution of Participants having days off work due to teeth and /or mouth problems during past 12 months by sex and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	% With days off work	95% CI	n	% With days off work	95% CI	n	% With days off work	95% CI
18-29	721	4.7	3.0-6.4	1689	5.6	4.1-7.0	2410	5.1	3.9-6.2
30-44	894	7.7	5.7-9.7	1921	7.9	6.3-9.5	2815	7.8	6.4-9.2
45-59	727	5.0	3.1-6.9	1032	7.2	5.3-9.0	1759	6.0	4.7-7.4
60-69	365	5.0	2.4-7.5	373	6.2	3.3-9.2	738	5.5	3.6-7.4
18-69	**2707**	**5.6**	**4.5-6.8**	**5015**	**6.7**	**5.6-7.7**	**7722**	**6.1**	**5.2-6.9**

Overall 7.0% of the respondents reported having difficulty doing normal activities during the past 12 months due to teeth problems, women (9.9 %) and men (4.6 %) Table 3.10.19.

Table 3.10. 19: Percentage Distribution of Participants having difficulty doing normal activities by gender and age group.

Percentage of respondents having difficulty doing usual activities during the past 12 months									
Age Group (years)	Men			Women			Both Sexes		
	n	% Having difficulty doing usual activities	95% CI	n	% Having difficulty doing usual activities	95% CI	n	% Having difficulty doing usual activities	95% CI
18-29	721	4.2	2.6-5.8	1689	7.8	6.0-9.7	2410	5.8	4.5-7.1
30-44	894	5.6	3.8-7.5	1921	11.0	9.2-12.9	2815	8.3	6.8-9.7
45-59	727	3.6	2.2-5.0	1032	11.8	9.3-14.2	1759	7.5	6.1-8.9
60-69	365	5.2	2.5-7.9	373	13.4	9.0-17.9	738	8.6	6.1-11.2
18-69	**2707**	**4.6**	**3.5-5.7**	**5015**	**9.9**	**8.6-11.2**	**7722**	**7.0**	**6.0-7.9**

Overall 4.8% of the respondents reported having been less tolerant of spouse and/or people close to them due to teeth problems during the past 12 month, women (6.4 %) and men (3.5 %) Table 3.10.20.

Table 3.10. 20: Percentage Distribution of Participants being less tolerance to Spouse and /or people close to them due to teeth problems during last 12 months by sex and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	% less tolerant	95% CI	n	% less tolerant	95% CI	n	% less tolerant	95% CI
18-29	721	3.6	2.1-5.1	1689	5.0	3.6-6.5	2410	4.2	3.1-5.3
30-44	894	3.5	2.1-4.9	1921	7.5	5.7-9.2	2815	5.4	4.2-6.7
45-59	727	3.6	2.0-5.2	1032	7.1	5.2-9.0	1759	5.3	4.0-6.5
60-69	365	2.2	0.5-3.8	373	8.9	5.3-12.5	738	5.0	3.1-6.9
18-69	**2707**	**3.5**	**2.6-4.4**	**5015**	**6.4**	**5.2-7.6**	**7722**	**4.8**	**4.0-5.7**

Overall 5.2% of the respondents reduced their participation in social activities due to teeth problems during the past 12 months, women (7.4 %) and men (3.5 %) Table 3.10.21.

Table 3.10. 21: Percentage Distribution of Participants who reduced participation in social activities due to teeth problems during last 12 months by sex and age group.

Age Group (years)	Men			Women			Both Sexes		
	n	% reduced participation in social activities	95% CI	n	% reduced participation in social activities	95% CI	n	% reduced participation in social activities	95% CI
18-29	721	3.0	1.6-4.3	1689	6.1	4.5-7.7	2410	4.3	3.2-5.4
30-44	894	4.3	2.8-5.8	1921	7.8	6.1-9.5	2815	6.0	4.8-7.2
45-59	727	3.6	2.2-5.1	1032	9.3	7.1-11.5	1759	6.3	5.0-7.7
60-69	365	3.4	1.5-5.3	373	8.1	5.0-11.2	738	5.4	3.5-7.2
18-69	**2707**	**3.5**	**2.5-4.4**	**5015**	**7.4**	**6.2-8.6**	**7722**	**5.2**	**4.4-6.1**

Chapter 4: Discussion

Sudan's National Stepwise survey 2016 is the first national household survey that covers all the six geographical regions (Khartoum, Eastern, Darfur, Kordofan, North and Central regions). Findings are representative to the six regions of Sudan. However, findings for salt in urine analysis were representative for Khartoum state only

Results have been compared to selected Stepwise survey reports. These were Khartoum State 2005 from Sudan, Kuwait 2014 and Egypt 2017 from the Eastern Mediterranean region, Uganda 2014, and Kenya 2015 from the African region.

Demographic characteristics of participants

The proportion of women was higher in this sample. This could have been due to men internally migrating to urban cities and from urban cities to other countries for better work opportunities. The recent economic crisis in Sudan has aggravated the situation considerably. Thus, members of households were mostly women. Furthermore, a discrepancy between age proportions in the sample and the extrapolated proportions from the national census of 2008 was observed. Nevertheless, these issues have been adjusted for at the analysis stage by weighting the sample to produce results for age and gender. Thus, results are generalizable to the whole population.

Response rate in this survey was high (ranging from 95% in Steps 1 and 2 to 88% in Step 3). This was comparable to response rates the national TB and Household Surveys of 2014, 85.8% and more than 90%, respectively

Behavioural Risk Factors

Tobacco Use

The overall prevalence of smoking was 9.6%, almost similar to Kenyan (10.1%) and Ugandan (9.6%) estimates, but much lower than some countries from the Eastern Mediterranean region; Egypt (22.7%) and Kuwait (20.5%). Smoking among women was found to be much lower when compared to men (0.7% vs. 17.1%, respectively). This trend is not very different to reports from Kenya, Uganda, Egypt and Kuwait. Khartoum state STEPWISE survey reported a smoking prevalence of 24.7% in 2005 among males. Reports from this survey show a lower prevalence for Khartoum 22.3%. This could be interpreted as decline in smoking in Khartoum state however; variation in the analysis methodology should be taken into account. Consumption of smokeless tobacco showed a similar variation, where men were higher consumers; men versus women (14.3% vs. 0.2%), respectively. The overall prevalence of smokeless tobacco (snuff dipping) use was very high (7.9 %) compared to reports from Egypt (0.2%), Kuwait (0.3%), Kenya (3.6%) and Uganda (3.2%).

More than one in four Sudanese men (27.9%) was either smokers or snuff dippers.

Mean age of initiation of tobacco smoking was higher in Sudan (mean age 19.5yrs), compared to global estimates (mean age 15 yrs "https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0201881"). Mean initiation age has been consistent with the Khartoum state STEPWISE survey of 2005 (19.1 yrs). Nevertheless in this survey, initiation in the younger age group (18-29) started at an earlier age (16.9 yrs.). Smoking was higher in urban (12.4%) when compared to rural settings (8%).

The overall pattern of second-hand smoking at home (24.6%) was higher than at work (22.1%). Both were similar to reports from neighbouring countries.

This survey showed that the sources of information about the dangers of smoking were approximately 38% from television and radio. However, among the literate population 35.6% gained such information from newspapers. In Khartoum state newspapers (47.3%) were the most common communication channel. In the northern state radio (55%) and television (54%) were the most common channels. These observations can be used in selection of channel and the design of relevant health information messages.

On the other side, approximately 7% of the overall population observed an advertisement promoting smoking, however, this was highest in the Eastern state (10.2%).

Health warning on tobacco packages was effective. This was demonstrated in the high proportion of smokers (71.8%) who considered quitting after noticing the warning.

The willingness to quit among current smokers (65%) is not well addressed by the health care system, since only 34% of the smokers received advice from their doctors on how to quit.

Alcohol consumption

In general, although prevalence of current alcohol drinkers in Sudan was found to be low (3.6% for men), similar to reports from Egypt, binge drinking was very high (3.2%). This thus puts almost the entire population of drinkers at high risk.

It is worthwhile noting that proportion of reported lifetime abstainers is very high in Sudan. Highest consumption was reported in the Darfur region, for both current drinkers and heavy episodic drinking. This could be a result of the strict alcohol consumption laws in the country.

Dietary Pattern

In general, the recommendation of healthy diet, in essence to consume 5 portions of vegetables and fruits combined, was not met by 94.7% of the population. This finding was consistent across all regions and in urban and rural settings. For Khartoum region in particular, the fruit consumption in this study is lower by almost half when compared to estimates reported in Khartoum STEPWISE survey of 2005. However, vegetable consumption remained almost the same. The consumption of fruits and vegetables in 2005 could have been an over-estimate.

Salt Consumption

Around one third of the participants reported adding salt always, similar to Kuwait estimates (36.1%), higher than Kenyan (23%) and Ugandan populations (22%) but lower than estimates from Egypt (47%). With respect to consumption of processed food Sudan (13%) was much higher than Uganda 4.8, Kenya 4.3% but lower than Egypt 17.1%.

The urine analysis results in Khartoum region (8.2g) demonstrates a high salt intake, which could be associated with the high prevalence of raised blood pressure; making the reduction of salt a high priority.

Despite salt consumption being high, there is a general awareness among the population that it is important to reduce salt intake (91.8%). This finding highlights the challenge in translating knowledge into behavioural change.

Sugar Consumption

Sugar consumption was reported to be seemingly within the WHO recommended daily intake of 50g, 12 leveled teaspoons. However, although the daily added sugar (mean 6.3 teaspoons per day) seemed to be low, the consumption of sugary drinks and other sugary foods were not included in this estimate. Therefore, stronger evidence is needed to estimate the average consumption of sugar.

Oil consumption

Although vegetable oil was the most commonly consumed type of oil, this study did not provide information regarding the hydrogenated and non- hydrogenated oils. Therefore, further studies are needed.

Physical Activity

WHO recommends 150 minutes of exercise of moderate and high intensity per week. In this aspect, physical activity of at least 10 minutes included walking, some household chores and work-related activity as moderate exercise. According to this definition, fourteen percent of the population reported insufficient physical activity. Inactivity was higher among urban respondents, especially women (22%). The subjective estimation could have over-estimated the reported physical activity. In the Khartoum survey of 2005, physical inactivity was reported at 87%. This dramatic difference could be due to the discrepancy in the measurement of physical activity. In the previous survey, strenuous activities like sports were only included, but in the present study all forms of activity were measured as described above.

Anthropometric Measurements

Twenty-eight percent of the populations were overweight or obese. However, there was an evident variation between genders and urban/rural settings. These estimate although comparable to Kenya (27.9%), it is much lower than reports from Egypt (63%) and Kuwait (77.2%).

More than half of the women in urban settings were overweight, with half of them reaching obesity level. Khartoum region demonstrated the highest prevalence of overweight or obese respondents (48.0%). This was not very different from Khartoum's stepwise survey of 2005 (53.9%).

Overweight and/or obesity was least prevalent in Kordofan (13%). There was noticeably high prevalence of underweight respondents (22.5%) in young populations (18-21yrs) in both men and women. This may be explained as a continuation of the high under 5 rates of malnutrition.

Physical measurement (RBP)

Prevalence of raised blood pressure among adults was found to be high in Sudan (31.5%), and higher in urban populations than rural. It is comparable to the prevalence in Egypt (29.5%). WHO's projected estimate for Sudan in 2015 was 26.9% and prevalence in Kenya (23.8%) were much lower. RBP for Khartoum region has increased from 23.6% in 2005 to 36.5% in the present study. However, the definition of RBP in Khartoum stepwise 2005 is not clear, which can present as a discrepancy in this comparison.

Almost 9 in every 10 with RBP were not on medication (86.7%), which is higher than Egypt (71.5%) and Kuwait (47.4%) but slightly less than reports from Kenya (91.8%). Furthermore, 61% of all respondents have never measured their blood pressure before.

Biochemical Measurement

Blood Glucose

The prevalence of raised fasting blood glucose (6%) is close to the projected WHO estimate for 2015 (7%). There is a large difference between prevalence in rural/urban and gender, with the highest estimates among women in urban setting (11.2%).

Khartoum region report the highest prevalence of 11.6% which is comparable to Kuwait (14.6%) and Egypt (15.5%), while the lowest prevalence was reported in Darfur region (2%) which is comparable to Kenya (1.9%) and Uganda (1.4%). This difference could be related to the diverse ethnic groups in Sudan and their different dietary and lifestyle habits.

Khartoum Stepwise survey of 2005 reported a prevalence of 19.2%. However, comparisons need to be made carefully, because the measurement and target population were different.

Treatment compliance was in 72.9% among people with known diabetic status.

Cholesterol

About 95% of the respondents did not measure their cholesterol level in the past. Results have shown high level of total cholesterol (TC) especially among women. Almost a third of the women aged 45 and above had high level of TC (≥ 5.0 Unit of measurement). This emphasizes the high

proportion of the population who are at risk of cardiovascular disease. The highest levels were also noted in Khartoum state and among urban females. These findings are consistent with the level of physical inactivity and overweight. Kordofan State had the lowest level of TC in addition to low level of physical inactivity and overweight. Among all participants the TC was 13.6%, which is lower than the countries in the region; Egypt and Kuwait where 19.4% and 55.9 %, respectively. But this result is high when compared to Kenya (10.1%) from the African region.

Cardiovascular Disorders

The risk of developing cardiovascular disease, defined by year CVDR ≥ 30 percentage or with existing CVD, is 3.5 %. However, the percentage is notably high in the age group 55-69 as it reaches 7.1%; over three times the risk in the younger age group 40-54 which is 1.9%. The risk is higher among women (9.2%) compared to men (5.5%). This risk is lower in men when compared to Egypt (7.7%), Kenya (7.6%), Kuwait (11.3%) and Uganda (10. 5%). The risk among women was higher than the Kenya (8.8%), Kuwait (8.6%) and Egypt (8.2%) but lower than Uganda (14. 2%).

Less than half of the participants (41.6%) who are eligible for receiving drug therapy and counseling to prevent heart attacks strokes were receiving them. This group included those with CVDR ≥ 30 or previous history of heart attack. The percentage is even lower for men, where only slightly above one third of eligible patients get therapy and counseling. This can be related to the fact that the majority of respondent especially men did not measure their blood pressure ever and the majority of those eligible for medication for hypertension and high cholesterol did not receive it.

Although the overall percentage of those at high risk of cardiovascular disease does not seem to be high when compared to other countries, the finding that the majority of them are not on medication makes their risk of developing these events even higher.

Cervical cancer screening

Less than two percent of women aged 30-49 had been screened for cervical cancer. This low percentage of women screened can be explained by the absence of a national cervical cancer screening program.

Healthy Life Style Advice

The results have shown that the majority of adults did not receive advice on healthy life style from care providers. Less than 25% of all participants had received advice regarding health life style. The people in older age groups reported receiving advice to reduce salt and fat more than others. Men tended to report receiving more advice regarding quitting smoking or never to start than females.

This pattern of being more likely to receive the advice at older age when the NCDs are more prevalent, as indicated from the data, might indicate that the counselling was given as part of the treatment rather than a preventive measure.

Combined risk factors

One fifth of all the participants (20.6%) aged 18-69, had three to five major NCDs risk factors and considered at high risk of developing the diseases. These risk factors defined are current daily smoking, consuming less than five servings of fruits and vegetables per day, having insufficient physical activity, being overweight and having raised BP or currently on medication. This percentage is higher in urban settings were around one third of participants had 3.5 (3-5) risk factors (28.4%). The number of risk factors in urban setting is remarkably high among women (34.5%) compared to men (24%). The percentage of those having high risk reported in Sudan is lower than the one reported in Egypt (45.5%) and Kuwait (57.9%) but higher than Kenya (13.6%) and Uganda (11%).

This high proportion of those at high risk of developing NCDs is a source of concern as it puts even more people at risk of developing NCDs in the future.

Oral health

Eighty nine percent of adults had 28 or more natural teeth, similar to adults in Kenya, with more men retaining their natural teeth. Prevalence of reported poor or very poor state of teeth was 7.1 percent, which is considerably lower than reports from Kenya (12 percent). Poor or very poor state of gums among those having natural teeth was 7.1 percent, similar to Kenya. Only 1.3 percent of Sudanese had removable dentures, suggesting a higher need for treatment in Sudan when compared to Kenya. While a history of oral pain and discomfort in the past 12 months was reported by 23.1%, only 13.4% visited a dentist in the past 12 months. The most common reported reason for visit was because of pain or trouble with gums (66.9%), with only a few going for routine check-ups. Furthermore, although the reported state of oral health was good, the impact on quality of life was high, albeit less than reports from Kenya. Almost 2 in every 10 reported difficulty in chewing, and 3 in 10 reported sleep often interrupted as a results of an oral health problem.

In conclusion, although oral hygiene behaviour in terms of brushing teeth seemed to be good, results have shown that there is a high need for treatment, and a lack of awareness of appropriate attitude towards oral health care. The trend across gender was similar to Kenya; burden was consistently higher among women.

Chapter 5: Conclusion &Recommendations

Conclusion

The Sudan national STEPwise survey 2016 was conducted in the six regions of Sudan (North, East, Khartoum, Central, Kordofan and Darfur) and covered 11 states (River Nile; AlGadarif, Kassala; Khartoum; Algaziera, White Nile, Sinnar; North Kordofan, West Kordofan ; and West Darfur and Central Darfur respectively. The survey shows that NCDs are a major public health challenge in Sudan due to the high prevalence of NCD Risk Factors, and the already great gap between prevalence and management.

To summarize all risk factors, the survey considered the combined risk factors as an integrated risk metric. The major risk factors are: Current daily smoking; Consuming less than 5 servings of fruits and vegetables per day; having insufficient physical activity; Being overweight ((BMI >_ 25 kg/m2) and Having Raised BP (SBP >-140 mmHg and /or DBP>_ mmHg or currently on medication). A high risk person is anyone having three or more of these risk factors. The overall prevalence of high risk is 20.6 % and it increases to 37.4% in the age group 45-69 year. Only 1.6% did not have any of the stated risk factors, while 77.8% had 1-2 risk factors.

Exposure to a single risk factor as well as combination of more risk factors can substantially increase the risk of developing multiple NCDs. However if greater investments in NCD prevention and services are made through the right policies .and public health measures, the imminent NCD epidemic could be controlled.

Recommendations

1- Develop a detailed document titled: "Towards 2025 Strategy and Action Plan to Prevent and Control Non-communicable Diseases in Sudan" at both the national and state levels. It should set out the overarching principles, approaches and strategic directions in line with (WHO) recommendations, and propose a list of actions and targets as we move towards 2025.

2- The Ministries of Health at Federal and State levels should foster co-operation across sectors and work in close partnership with the community and members of the public to build a health-enhancing physical and social environment and promote the health of all Sudanese people.

3- Create equitable health-promoting environments that empower individuals to lead healthy lives e.g. Transform schools into Health Promoting Schools.

4- Strengthen health literacy and capacity of individuals to make healthy choices e.g. by making fruits and vegetable more affordable.

5- Strengthen health systems for optimal management of NCD through primary healthcare and universal health coverage. Create effective partnership with primary care professionals.

6- Monitor progress of NCD prevention and control actions with clear targets and indicators adapted from the WHO's global monitoring framework (GMF).

7- Develop and implement an "Accountability Framework" to measure and monitor NCDs nationally, regionally and at state level. The accountability framework should (a) Recognize government leadership; (b) Build community and cross-sectoral partnerships ;(c) Enhance

health services' response and engage primary care work force for health promotion and NCD reduction;(d) Strengthen surveillance and intelligence capacity; and(e) Secure resources and build professional capacity.

8- To work Together at All Levels to achieve the **following targets by 2025**:-

T 1- A 25% relative reduction in risk of premature mortality from cardiovascular diseases, cancers, diabetes and chronic respiratory diseases

T 2 -At least 10% relative reduction in the prevalence of insufficient physical activity among adolescents and adults

T 3 - A 30% relative reduction in mean population daily intake of salt/sodium.

T 4 - A 30% relative reduction in the prevalence of current tobacco use in persons aged 15+ years.

T 5 - Contain the prevalence of raised blood pressure

T 6 - Halt the rise in diabetes and obesity.

T 7 - Prevent heart attacks and strokes through drug therapy and counseling.

T 8- Improve availability of affordable basic technologies and essential medicines to treat major NCD.

T 9 -Strengthen the delivery of oral health throughout Sudan.

Annex

Annex 1. Questionnaire

استمارة الخطوة الاولى والثانية (**Step 1&2 questionnaire**)		
السؤال(**Label**)	ملحوظة ((**hint**	(**constraint** قيود (_**message**
المكان و الزمان		
1I. الولايه		
2I. المحليه		
I2b. اللجنه الشعبية		
3I. رمز الباحث الميداني		يجب أن يكون الرقم رقم موجب
الموافقة و الاسم		
5I. تمت قرأة الاقرار و أخذ الموافقة على المشاركة في المسح		
8I. اسم رب الاسرة		
9I. اسم الشخص المشترك		
10I. رقم التليفون للاتصال حيث أمكن		
موبايل - 1 :		
موبايل - 2 :		
الخطوة الأولى		
معلومات سكانية		
1C. الجنس		
تاريخ الميلاد		
2C: ما هو تاريخ ميلادك؟	اختار "لا أعرف" في جميع المجالات إذا كان التاريخ الكامل للميلاد غير معروف.	
اليوم		
الشهر		
االسنه		
3C. كم عمرك؟	يجب أن يكون العمر ضمن الفئة العمرية للمسح.	
1XC. هل تقرا وتكتب؟		
4C. ما هو اجمالي عدد السنوات التي قضيتها في الدراسة ؟	إذا كان الجواب لاأعرف ضع 77.	ادخل رقم بين 0 و 30
5C. ما هو أعلى مستوى تعليمي أتممته ؟		
7C. ماهي حالتك الاجتماعية؟		
8C. أي من الفئات الآتية تصنف نوع عملك الأساسي خلال الاثني عشر شهرا الماضية ؟	استخدم الصورالتوضيحيه	

التغذية		
الأسئلة التالية تتعلق بالخضروات والفواكه التي غالباً ما تتناولها. سأقوم بطرح بعض الأسئلةد عن عاداتك المتعلقة بتناول الخضروات والفواكه . الصور الآتية توضح نماذج عن حصة الفواكه والخضروات المشار اليها. المطلوب منك أن تفكر جيدا بالإجابة وتعطي الإجابة عن متوسط الحصص التي تتناولها في خلال الأسبوع العادي في السنة الماضية.		
1D. خلال الأسبوع العادي , كم يوما تتناول الفواكــه ؟	ادخل '77' إذا كان لايعرف.	يجب أن تكون أيام الأسبوع بين 0 و 7
2D. كم حصة فواكه تتناول في يوم واحد من هذه الأيام ؟ (الحصة = فاكهه واحدة او مقدار تصف كباية شوب فواكه مقطعة – سلطة فواكه)	ادخل '77' إذا كان لايعرف.	عدد الحصص يجب أن تكون بين 1 و 20.
3D. خلال الأسبوع العادي , كم يوما تتناول الخضروات مطبوخة او طازجة ؟	ادخل '77' إذا كان لايعرف.	يجب أن تكون أيام الأسبوع بين 0 و 7
صور الخضروات		
4D. كم حصة خضروات تتناول في يوم واحد من هذه الأيام ؟	ادخل '77' إذا كان لايعرف.	عدد الحصص يجب أن تكون بين 1 و 20.
الملح الغذائي		
أونريد الآن أن نعرف المزيد من المعلومات حول تناولك الملح في نظامك الغذائي. المقصود بالملح الغذائي : ملح المائدة العادي، ملح للطهي ، المرق المالح) مكعبات أو مسحوق(،الصلصات المالحة . المرجو الإجابة على هذه الأسئلة، حتى لو كنت تعتبر نفسك لا تستهلك الملح بشكل مفرط		
5D. هل تقوم بإضافة الملح في صحن الطعام أوتتناول المخلل أثناء الاكل؟		
6D.هل تقوم/تقومين بإضافة الملح أو مكعبات مرق عند طهي وجبات الطعام في المنزل؟		
7D. هل تتناول وجبات غنية بالملح مثل المعلبات (البازلاء) , الوجبات السريعة ، بيتزا، الز يتون ، مورتديلا, الجبنة, الفسيخ, الميلوحة ؟	استخدم الامثله	
8D. في رأيك، كيف تقيم كمية الملح التي تأكلها في طعامك؟		
9D. بالنسبة لك، ما مدى أهمية تخفيض تناول الملح؟		
10D. هل تعتقد أن تناول الكثير من الملح مع وجبات الطعام يمكن أن تكون مصدرا لمشاكل صحية؟		
التحكم فى الملح		
11D. للتحكم في تناول الملح هل تتخذ أيا من التدابير التالية ؟		
الحد من استهلاك الأطعمة المالحة ؟		
تجنب تناول الأطعمة الجاهزة خارج المنزل		
اتخاذ اجراءات أخرى خصيصا لمكافحة تناول الملح		
11D يرجى تحديد الأشياء الأخرى التى تقوم بها خصيصا لمكافحة تناول الملح		
الاسئلة القادمة تخص الزيوت والدهون التي تستعمل في تحضير الطعام وعن الوجبات التي تتناولها خارج المنزل		

12D. ما نوع الزيت أو الدهن الذي تستخدمه عادة عند تحضير الوجبات في المنزل (اختر إجابة واحدة – النوع الأكثر استخداماً)		
صورالزيوت و الدهون		
12D . يرجى تحديد الانوع الآخرى من الزيوت المستعملة		
13D . في المتوسط كم عدد الوجبات التي تتناولها في الأسبوع (الوجبات الغير معدة بالمنزل) ؟ المقصود بالوجبة هو: إفطار، غذاء، عشاء	ادخل '77' إذا كان لايعرف.	عدد الوجبات لا يمكن أن يكون أكبر من 30
6XD. فى المتوسط، كم عدد الأيام بالأسبوع التي تتناول بها المشروبات الغازية او عصير مصنع (باستثناء الخـــالية من السعرات الحرارية (لايت) ؟	ادخل '77' إذا كان لايعرف.	يجب أن تكون أيام الأسبوع بين 0 و 7
7XD. فى المتوسط، كم كوب من المشروبات الغازية تشربها خلال اليوم الواحد ؟ (صور توضيحية) ؟		
8XD. فى المتوسط، كم ملعقة سكر صغيرة تتناول خلال اليوم الواحد (مثال في الشاي و القهوة والعصير) ؟	ادخل '77' إذا كان لايعرف.	يجب أن تكونعدد الملاعق بين 0 و 60
النشاط البدني		
والآن سوف أسألك عن الوقت الذي تمضيه بممارسة أنواع مختلفة من النشاط البدني التي تؤديها فى الأسبوع العادي. أرجو الإجابة على هذه الأسئلة حتى لو لم تكن رياضياً. فكر أولاً بالوقت الذي تمضيه في العمل. أكان بأجر أو بدون إجر، أعمال منزلية،او خارج المنزل مثل الزراعة, الرعي أو الصيد. في حالة الإجابة على الأسئلة التالية يمكن تعريف الأعمال التي تتطلب جهدا شاقا على أنها أعمال تسبب زيادة شديدة في التنفس أو إسراع في ضربات القلب والأعمال التي تتطلب الجهد المتوسط على أنها التي تسبب زيادة طفيفة في التنفس وإسراع في ضربات القلب		
1P. هل نمط العمل الذي تقوم به يتوجب نشاطا شاقا يسبب زيادة كبيرة في التنفس وإسراع ضربات القلب مثل (الحمل الثقيل (عتالة)، الحفر، اعمال البناء) لمدة عشرة دقائق متواصلة على الأقل؟	استعين بالامثله استخدم الصور التوضيحية	
PA صورتوضيحبة للنشاط الشاق		
2P. في الأسبوع العادي ، كم عدد الأيام التي تقوم خلالها ببذل نشاط بدني شاق كجزء من عملك ؟	ادخل '77' إذا كان لايعرف.	عدد الأيام يجب أن تكون بين 1 و 7.
3P. كم من الوقت في اليوم العادى تستغرق لإنجاز هذا النشاط الشاق؟	ادخل قيم في كل المجالات. يجب أن يكون الوقت 10 دقائق على الأقل ولكن لا يزيد عن 16 ساعة. أدخل '77' في كلا الحقلين إذا لم يعرف.	
ساعات		
دقائق		
4P. هل يشمل عملك أنشطة متوسطة الجهد لمدة عشر دقائق على الأقل وتسبب زيادة طفيفة في التنفس وضربات القلب مثل (المشي السريع حمل أشياء خفيفة الوزن مثل جركانة ماء، مسح الارض، الكنس، الغسيل بالايدي) ؟	استعين بالامثله استخدم الصور التوضيحية	
PA صور توضيحية للنشاط المتوسط		
5P. في الأسبوع العادي ما هو عدد الأيام التي تقوم بها بنشاط بدني متوسط الشدة كجزء من عملك ؟	ادخل '77' إذا كان لايعرف.	عدد الأيام يجب أن تكون بين 1 و 7.

6P. ما هو الوقت الذي تستغرقه فى بذل نشاط بدني متوسط الشدة كجزء من عملك خلال اليوم العادي ؟	ادخل قيم في كل المجالات. يجب أن يكون الوقت 10 دقائق على الأقل ولكن لا يزيد عن 16 ساعة. أدخل '77' في كلا الحقلين إذا لم يعرف.	
ساعات		
دقائق		
الأسئلة التالية ليس لها علاقة بالنشاط البدني أثناء العمل والتي تم الإجابة عنها في الجزئ السابق . أود أن أسألك الآن عن طريقة تنقلك الاعتيادية من مكان إلى اخر (مثلاً إلى عملك ، للتسوق، ، للصلاة.....).		
7P. هل تتنقل من مكان الى اخر مشيا على الا قدام أو مستعملا دراجة هوائية لمدة لا تقل عن عشر دقائق متواصلة ؟		
8P. عادة، كم عدد الايام في الأسبوع التى تتنقل من مكان الى اخر مشيا على ا قدام أو مستعملا دراجة هوائية لمدة لا تقل عن عشرة دقائق متواصلة	ادخل '77' إذا كان لايعرف.	عدد الأيام يجب أن تكون بين 1 و 7.
9P. ما هو الوقت الذي تستغرقه ماشيا على الا قدام أو مستعملا دراجة هوائية للانتقال من مكان الى اخر في اليوم العادي؟	ادخل قيم في كل المجالات. يجب أن يكون الوقت 10 دقائق على الأقل ولكن لا يزيد عن 16 ساعة. أدخل '77' في كلا الحقلين إذا لم يعرف.	
ساعات		
دقائق		
الأسئلة التالية لا تتضمن النشاط البدني أثناء العمل أو أثناء التنقل بين الأماكن المختلفة والتي تمت الإجابة عليها في الجزئيين السابقين سنسألك ألان بعض الاسئلة المتعلقة بالنشاط البدنى فى اوقات الفراغ مثل الرياضة، اللياقة خطأ املائي البدنيه و الانشطة الترفيهيه		
10P. هل يتضمن وقت الفراغ نشاطاً شاقاً سواء كان للرياضة أو اللياقة البدنية أو النشاط الترفيهي ويتسبب في زيادة شديدة في التنفس وعدد ضربات القلب مثل (مثال: الجرى أو كرة القدم) لمدة عشرة دقائق متواصلة؟	استعين بالامثله استخدم الصور التوضيحية	
PA صورتوضيحبة للنشاط الشاق فى وقت الفرغ		
11P. كم يوماً في الأسبوع العادي تقوم بنشاط شاق كجزء من وقت فراغك؟	ادخل '77' إذا كان لايعرف.	عدد الأيام يجب أن تكون بين 1 و 7.
12P. كم من الوقت في اليوم العادي تستغرق لإنجاز هذا النشاط الشاق؟	ادخل قيم في كل المجالات. يجب أن يكون الوقت 10 دقائق على الأقل ولكن لا يزيد عن 16 ساعة. أدخل '77' في كلا الحقلين إذا لم يعرف.	
ساعات		
دقائق		

13P. هل يشمل وقت فراغك أنشطة متوسطة الجهد، مثل (المشي السريع ، ركوب دراجة أو حمل أشياء خفيفة الوزن – سباحة - كرة اليد) لمدة عشر دقائق على الأقل ؟	استعين بالامثله استخدم الصور التوضيحية	
PA. صورتوضيحبة للنشاط المتوسط فى وقت الفرغ		
14P.كم يوم في الأسبوع تقوم بأنشطة معتدلة كجزء من وقت الفراغ ؟	ادخل '77' إذا كان لايعرف.	عدد الأيام يجب أن تكون بين 1 و 7.
15P. كم من الوقت تستغرق للقيام بهذا النشاط في اليوم عادي ؟	ادخل قيم في كل المجالات. يجب أن يكون الوقت 10 دقائق على الأقل ولكن لا يزيد عن 16 ساعة. أدخل '77' في كلا الحقلين إذا لم يعرف.	
ساعات		
دقائق		
الاسئلة التالية تتعلق بالوقت الذى تستغرقه في وضعية الاستلقاء او الجلوس سواء في العمل أو في المنزل أو أثناء الانتقال من مكان الى اخر) أثناء السفر بالسيارة او الحافلة او القطار(، أثناء القراءة او اللعب بالورق أو بالكمبيوتر أو غيرها من الألعاب الإلكترونية الأخرى أو مشاهدة التلفزيون (لكن لا تشمل أوقات النوم) .		
16P. كم من الوقت تستغرقه في وضعية الجلوس او الاستلقاء (دون ساعات النوم) في اليوم العادي ؟	استخدم الصور التوضيحية ادخل قيم في كل المجالات. يجب أن يكون الوقت 10 دقائق على الأقل ولكن لا يزيد عن 16 ساعة. أدخل '77' في كلا الحقلين إذا لم يعرف.	
ساعات		
دقائق		
1XP. هل تعتقد أن قلة النشاط البدني يمكن أن يكون مصدرا لمشاكل صحية مثل مرض السكري وارتفاع ضغط الدم، والسمنة وما إلى ذلك؟		
استهلاك التبغ		
1T. هل تدخن حاليا أي نوع من انواع التبغ التالية : السجائر، السيجار، الغليون / البايب أو الشيشة ؟		
صورمنتجات التبغ المدخن		
2T. هل تدخن بصفة يومية أي نوع من انواع التبغ ؟		
3T. كم كان عمرك عندما بدأت التدخين لأول مرة ؟	أدخل '77' إن لم يكن معروفا.	يجب أن يكون العمر لا يقل عن 8 ولا يزيد عن الحد الأقصى لعمرالمسح.
4T. هل تذكر منذ متى كان ذلك ؟	اتركه فارغا إن لم يكن معروفا؛ خلاف ذلك، يجب أن تكون	

	الإجابة بين 1 و 61 لسنوات، 1-11 لشهر، أو 1-30 لأسابيع.	
.يرجى تحديد ما إذا كان الجواب بالسنوات أو الشهور، أو الأسابيع، أو ما إذا كان المجيب لا يعرف		
2XT.ماهو السبب الذي جعلك تدخن (لماذا بدأت التدخين) ؟ (أختر إجابه واحدة)		
XT2other. اذكر		
T5a. في المتوسط ماهو عدد السجائر العادية التي تدخنها يوميا ؟	أدخل '77' إن لم يكن المجيب يعرف أو أدخل "0" إذا كان لا يدخن السجائر العاديه يوميا.	يجب أن يكون الرقم بين 0 و 50
T5aw. في المتوسط ماهو عدد السجائر العادية التي تدخنها اسبوعيا ؟	أدخل '777' إن لم يكن المجيب يعرف أو أدخل "0" إذا كان لا يدخن السجائر العاديه اسبوعيا.	يجب أن يكون الرقم بين 0 و 350
T5b. في المتوسط ماهو عدد القمشة- السجائر اللف التي تدخنها يوميا ؟	أدخل '77' إن لم يكن المجيب يعرف أو أدخل "0" إذا كان لا يدخن السجائر اللف يوميا.	يجب أن يكون الرقم بين 0 و 50
T5bw. في المتوسط ماهو عدد القمشة- السجائر اللف التي تدخنها اسبوعيا ؟	أدخل '777' إن لم يكن المجيب يعرف أو أدخل "0" إذا كان لا يدخن السجائر اللف اسبوعيا.	يجب أن يكون الرقم بين 0 و 350
T5c. في المتوسط ماهو عدد المرات التي تدخن فيها الغليون او الكدوس يوميا ؟	أدخل '77' إن لم يكن المجيب يعرف أو أدخل "0" إذا كان لا يدخن الغليون/كدوس يوميا.	يجب أن يكون الرقم بين 0 و 50
T5cw. في المتوسط ماهو عدد المرات التي تدخن فيها الغليون او الكدوس اسبوعيا ؟	أدخل '777' إن لم يكن المجيب يعرف أو أدخل "0" إذا كان لا يدخن الغليون/كدوس اسبوعيا.	يجب أن يكون الرقم بين 0 و 350
T5d. في المتوسط ماهو عدد السيجار الذي تدخنه يوميا ؟	أدخل '77' إن لم يكن المجيب يعرف أو أدخل "0" إذا كان لا يدخن السيجار/السيجار الصغير يوميا.	يجب أن يكون الرقم بين 0 و 50
T5dw. في المتوسط ماهو عدد السيجار الذي تدخنه اسبوعيا ؟	أدخل '777' إن لم يكن المجيب يعرف أو أدخل "0" إذا كان لا يدخن السيجار/السيجار الصغير اسبوعيا.	يجب أن يكون الرقم بين 0 و 350
T5e. فى المتوسط ، ما هوعدد جلسات الشيشه التى تدخنها يوميا؟	أدخل '77' إن لم يكن المجيب يعرف أو أدخل "0" إذا كان لا يدخن الشيشة يوميا.	يجب أن يكون الرقم بين 0 و 50
T5ew. فى المتوسط ، ما هو عدد جلسات الشيشه التى تدخنها اسبوعيا؟	أدخل '777' إن لم يكن المجيب يعرف أو أدخل "0" إذا كان لا يدخن الشيشه اسبوعيا.	يجب أن يكون الرقم بين 0 و 350

T5f. فى المتوسط ، ما هى كميه الانواع الأخرى التى تدخنها يوميا؟	سجل فقط منتجات التبغ الأخرى غير المدرجة في الأسئلة السابقة. أدخل '77' إن لم يكن يعرف أو أدخل "0" إذا لم يكن المجيب يدخن انواع أخرى من منتجات التبغ يوميا.	يجب أن يكون الرقم بين 0 و 50
T5fw. فى المتوسط ، ما هى كميه الانواع الأخرى التى تدخنها اسبوعيا؟	سجل فقط منتجات التبغ الأخرى غير المدرجة في الأسئلة السابقة. أدخل '77' إن لم يكن يعرف أو أدخل "0" إذا لم يكن المجيب يدخن انواع أخرى من منتجات التبغ اسبوعيا.	يجب أن يكون الرقم بين 0 و 350
T5other. ما هي الأنواع الاخرى التى تدخنها؟		
6T. هل حاولت إيقاف التدخين خلال الاثني عشر شهرا الماضية؟		
7T. هل تم توجيه النصيحة إليك بإيقاف التدخين عند أي زيارة للطبيب او كادر صحي اخر خلال الاثني عشر شهرا الماضية؟		
3XT .هل تلقيت رسالة عن مضار التدخين في مكان تجمع (المساجد ، الأندية، الأصدقاء ، الأسرة)		
8T. هل قمت بتدخين أي نوع من منتجات التبغ في الماضي؟		
9T.هل قمت بالتدخين يوميا في الماضي؟		
10T. كم كان عمرك عندما أقلعت عن التدخين؟	أدخل '77' إن لم يكن معروفا.	يجب أن يكون العمر لا يقل عن 8 ولا يزيد عن الحد الأقصى من المسح.
11T. منذ متى أقلعت عن التدخين؟	اتركه فارغا إن لم يكن معروفا؛ خلاف ذلك، يجب أن تكون الإجابة بين 1 و 61 لسنوات، 1-11 لشهر، أو 1-30 لأسابيع.	
.يرجى تحديد ما إذا كان الجواب بالسنوات أو الشهور، أو الأسابيع، أو ما إذا كان المجيب لا يعرف		
12T. هل تستعمل حالياً التبغ بدون دخان/ غير المدخن؟ (تمباك / صعوط / سفة)		
صور منتجات التبغ غير المدخن		
13T. هل تستعمل حالياً هذه الأنواع من التبغ بدون دخان/ غير المدخن -(تمباك / صعوط / سفة/....) بشكل يومى؟		
T14a. كم مرة تقوم بسف الصعوط في اليوم ؟	أدخل '77' إذا كان المجيب لا يعرف أو أدخل "0" إذا كان لا يستخدم السعوط/التمباك/السفه يوميا.	يجب أن يكون الرقم بين 0 و 50
T14aw. كم مرة تقوم بسف الصعوط في الأسبوع ؟	أدخل '777' إذا كان المجيب لا يعرف أو أدخل "0" إذا كان لا يستخدم السعوط/التمباك/السفه اسبوعيا	يجب أن يكون الرقم بين 0 و 350

T14c . ما هو معدل استهلاكك للمضغة من التبغ في اليوم ؟	أدخل '77' إذا المجيب لا يعرف أو أدخل "0" إذا كان لا يستخدم االمضغه يوميا.	يجب أن يكون الرقم بين 0 و 50
T14cw.ما هو معدل استهلاكك الاسبوعي للمضغه من التبغ ؟	أدخل '777' إذا كان المجيب لا يعرف أو أدخل "0" إذا كان لا يستخدم المضغه اسبوعيا	يجب أن يكون الرقم بين 0 و 350
T14e.ما هو معدل استهلاكك االيومي للانواع الاخري من منتجات التبغ غير المدخن؟	أدخل '77' إذا كان المجيب لا يعرف أو أدخل "0" إذا كان لا يستخدم منتجات اخرى من التبغ غير المدخن يوميا.	يجب أن يكون الرقم بين 0 و 50
T14ew. ما هو معدل استهلاكك االاسبوعي للانواع الاخري من منتجات التبغ غير المدخن؟	أدخل '777' إذا كان المجيب لا يعرف أو أدخل "0" إذا كان لا يستخدم منتجات اخرى من التبغ غير المدخن اسبوعيا	يجب أن يكون الرقم بين 0 و 350
T14other. ما هي الانواع الاخرى التى تستخدمها؟		
15T.في الماضي هل سبق أن استخدمت التبغ بدون دخان/ غير المدخن مثل :- تمباك / صعوط / سفة ؟		
16T. في الماضي هل سبق أن تناولت التبغ بدون دخان بصفة يومية مثل : - تمباك / صعوط / سفة ؟		
17T. في خلال الثلاثين يوما الماضية ، هل سبق لاحد ان قام بالتدخين في منزلك؟		
18T. في خلال الثلاثين يوما الماضية، هل دخن أحد في مكان مغلق أثناء وجودك في مكان عملك (في مبني ، منطقة عمل ، مكتب) ؟		
سياسات مكافحة التدخين		
لقد طرحنا عليك بعض الاسئلة من قبل بشأن التدخين واستهلاك التبغ والان سنطرح عليك بعض الاسئلة عن سياسات مكافحة التدخين التبغ وتتضمن اسئلة عن الاعلانات عن التبغ والترويج له و التحذير من مخاطر التدخين على الصحة وسياسات بيع منتجات التبغ .		
معلومات		
1TP. خلال الثلاثين يوما الماضية هل لاحظت أي معلومات تحذيرية عن مخاطر استعمال التبغ (السجائر، الشيشة او الصعوط) او نصائح للتوقف عن التدخين من خلال وسائل الاعلام التالية:		
الصحف و المجلات		
التليفزيون		
الراديو		
2TP. خلال الثلاثين يوما الماضية هل لاحظت اي اعلانات او علامات لترويج او تشجيع السجائر بالمحلات او اماكن بيع السجائر ؟		
الدعاية/ الأعلان		

3TP. خلال الثلاثين يوما الماضية هل لاحظت أي نوع من الانواع التالية لترويج / الدعاية للسجائر:		
توزيع عينات سجائر مجانا		
خصومات على اسعار السجائر		
كوبونات للسجائر		
هدايا مجانية او خصومات على أي بضائع عند شراء السجائر		
قطع ملابس او قطع اخري عليها اسماء او علامات سجائر		
اعلانات تسويقية للسجائر عن طريق البريد		
4TP. خلال الثلاثين يوما الماضية هل لاحظت اي علامات / عبارات تحذر من مخاطر التدخين على الصحة على عبوات السجائر ؟		
5TP. خلال الثلاثين يوما هل ادي وجود العلامات / العبارات التحذيرية على عبوات السجائر الى ان تفكر في التوقف / الاقلاع عن التدخين ؟		
6TP. اخر مرة قمت بشراء السجائر المصنعة لنفسك ماهو عدد السجائر التي قمت بشرائها ؟	أدخل '7777' إذا لم يكن المجيب يعرف او لايدخن سجائر مصنعة	
7TP. اجمالا ما هو السعر الذي دفعته لشراء تلك الكمية من السجائر ؟	ادخل '7777' إذا لم يكن المجيب يعرف أو "8888" اذا رفض الاجابه.	
شرب الكحول		
مجموعة الاسئلة التالية متعلقة بشرب الكحول		
1A. هل سبق ان تناولت اي نوع من انواع المشروبات الكحولية مثل العرقي، المريسة ، البيرة، الويسكي؟		
1XA - حدد نوع المشروب الكحولي الذي تناولته		
XA1a. العرقي		
XA1b. المريسة		
XA1c . البيرة		
XA1d. الويسكي		
XA1e. اخري		
2A. هل سبق لك ان تناولت أي من المشروبات الكحولية خلال الإثنى عشر شهراً الماضية ؟		
3A.هل توقفت عن تناول الكحول لاي سبب من الاسباب الاتية: صحيه، دينيه، اخري (حدد)؟ (أشر على أهم سبب)		
A3other. حدد		
5A.خلال الثلاثين يوماً الماضية هل تناولت أي من المشروبات الكحولية ؟		
9A. خلال الثلاثين يوماً الماضية ، كم مرة تناولت 6 كؤوس أو أكثر من المشروبات الكحولية - مقياس عادي- في المرة أو المناسبة الواحدة ؟	أدخل '77' إذا كان غير معروف	يجب أن يكون الرقم بين 0 و 50
التاريخ المرضى لارتفاع ضغط الدم		
1H. هل سبق أن تم قياس ضغط دمك من قبل طبيب أو كادر صحي ؟		

H2a. هل سبق أن أخبرك الطبيب أو كادر صحي انك تعاني من ارتفاع ضغط دم ؟		
H2b. هل تم اخبارك بذلك خلال الاثني عشر شهرا السابقة ؟		
3H. خلال الاسبوعين الماضيين هل تناولت أي ادويه لعلاج ارتفاع ضغط الدم وصفها لك الطبيب أو أو كادر صحي ؟		
4H. هل سبق لك أن استشرت (زرت) معالجاً تقليديا (فكي، شيخ، معالج بالاعشاب ، عطار) لمعالجة ارتفاع ضغط الدم ؟		
5H. هل تتناول حالياً أي من علاجات الأعشاب أو من العلاجات التقليدية أو وصفات شعبية لمعالجة ارتفاع ضغط الدم ؟		
التاريخ المرضى للسكري		
6H. هل سبق لك قياس نسبة السكر في الدم من قبل طبيب أو كادر صحي آخر ؟		
H7a. هل سبق أن أخبرك الطبيب أو كادر صحي آخر أنك مصاب بمرض السكري ؟		
H7b. هل سبق أن أخبرت بذلك خلال الأثني عشر شهرا الماضية ؟		
8H. خلال الاسبوعين الماضيين هل تناولت أي أدوية لعلاج ارتفاع السكر في الدم وصفها لك الطبيب ؟		
9H.هل تستعمل حاليا أنسولين لمرض السكري تم وصفها لك طبيب ؟		
10H. هل سبق لك أن استشرت (زرت) معالجاً تقليديا (شيخ او فكي، عطار، معالج بالاعشاب) لمعالجة السكري ؟		
11H. هل تتناول حالياً أي من الأعشاب أو من العلاجات التقليدية لمعالجة السكري ؟		
التاريخ المرضى لارتفاع الكوليسترول		
12H. هل سبق لك قياس نسبة الكوليسترول (مستوى الدهون في الدم) في مختبر (معمل)؟		
H13a. هل سبق ان اخبرك الطبيب أن لديك ارتفاع في نسبة الكوليسترول ؟		
H13b. هل سبق أن أخبرت بذلك في الاثني عشر شهرا الماضية ؟		
14H. هل تناولت أي علاجات بالفم (أدوية) من قبل طبيب او اي كادر صحي لارتفاع الكوليسترول الكلي خلال الأسبوعين الماضيين؟		
15H. هل سبق لك استشرت (زرت) معالجاً تقليديا (فكي او شيخ، عطار، معالج بالاعشاب) لمعالجة ارتفاع الكوليسترول ؟		
16H. هل تتناول حالياً أي من علاجات الأعشاب أو من العلاجات التقليدية لمعالجة ارتفاع الكوليسترول ؟		
التاريخ المرضى لأمراض القلب والأوعية الدموية		
H17a. هل سبق ان تم تشخيصك في أي وقت بأزمة قلبية او ذبحة صدرية ؟		
H17b. هل سبق ان تم تشخيصك في أي وقت جلطة دماغية؟		
18H. هل تتناول حاليا الأسبرين بصفة منتظمة لتجنب او معالجة امراض القلب ؟		
19H. هل تتناول حاليا أدوية مضادات الكوليسترول (استاتين/لوفاستاتين / سيمفاستاتين / أتورفاستاتين أو أي نوع آخر من الستاتينات) بصفة منتظمة لمنع أو علاج مرض القلب ؟		

نصائح أنماط الحياة		
20H. خلال السنوات الثلاثة الماضية ، هل تلقيت نصيحة من طبيب او اي كادر صحي بعمل أي من الآتي :		
الإقلاع عن استهلاك التبغ أو عدم البدء في استخدامه		
تقليل الملح في الطعام		
تناول خمس حصص على الأقل من الفاكهة و / أو الخضروات يوميا		
تقليل الدهون في الطعام		
البدء أو القيام بالمزيد من النشاط البدني		
المحافظة على وزن صحي للجسم (طبيعي) أو تقليل الوزن		
(للنساء فقط): الكشف المبكر عن سرطان عنق الرحم		
السؤال التالي يستفسر عن الوقاية من سرطان عنق الرحم. حيث تتم فحوصات الكشف المبكر للوقاية من سرطان عنق الرحم بطرق مختلفة ، بما في ذلك الفحص البصري مع حمض الخليك / الخل (VIA)، مسحة عنق الرحم ، واختبار فيروس الورم الحليمي البشري (HPV) . وإن اختبار VIA هو فحص سطح عنق الرحم بعد استخدام حامض الخليك (أو الخل) . أما بالنسبة لكل من مسحة عنق الرحم واختبار فيروس الورم الحليمي البشري ، يستخدم الطبيب أو الممرضة مسحة من داخل المهبل، ويتم أخذ عينة وإرسالها إلى المختبر. وحتى من الممكن أن يطلب من السيدة أخذ المسحة بنفسها من داخل المهبل. ثم يقوم المختبر بالتحقق من مدي وجود أي تغييرات غير طبيعية بالخلية إذا تم القيام بمسحة عنق الرحم ، وبالتحقق من فيروس HPV إذا أجري اختبار فيروس الورم الحليمي البشري.		
1CX. هل سبق لكي إجراء فحص للكشف المبكر عن سرطان عنق الرحم ، باستخدام أي من الطرق الموضحة سابقا ؟		
تاريخ الامراض الغير معدية الاخري		
1XH. هل سبق ان تم تشخيصك بربو شعبي / حساسية في الصدر/ ازمة - بواسطة طبيب أو كادر صحي اخر ؟		
2XH. اذا نعم هل تم اخبارك بذلك خلال الاثني عشر شهرا السابقة ؟		
3XH. هل سبق ان تم تشخيصك باي نوع من انواع السرطان بواسطة طبيب أو كادر صحي اخر ؟		
4XH. اذا نعم، هل تم اخبارك بذلك خلال الاثني عشر شهرا السابقة ؟		
5XH. هل سبق أن تم تشخيصك بامراض مزمنة للكلى (مثال: الفشل الكلوي) بواسطة طبيب أو كادر صحي اخر؟		
6XH.اذا نعم، هل تم اخبارك بذلك خلال الاثني عشر شهرا السابقة ؟		
صحة الفم		
الاسئلة التالية تخص صحة الفم والعادات المصاحبة		
1O. كم سن طبيعية في فمك؟		
2O. كيف تصف حال اسنانك ؟		
3O. كيف تصف حال اللثة في فمك؟		
4O. هل لديك طقم اسنان متحرك ؟		

اطقم الاسنان المتحركة		
5O. ما هو نوع طقمك المتحرك؟		
طقم اسنان بالفك العلوي		
طقم اسنان بالفك السفلي		
6O. في الاثني عشرشهرا الماضية, هل عانيت من الام او ازعاج بسبب فمك او اسنانك ؟		
7O. متى كانت اخر مرة زرت فيها طبيب اسنان او اي كادر صحي معالج للاسنان ؟		
8O. ماهو سبب زيارتك الاخيرة لطبيب الاسنان او اي كادر صحي معالج للاسنان ؟		
8O سبب اخر: من فضلك حدد سبب الزيارة؟		
9O. في الغالب كم مرة تنظف اسنانك ؟		
10O. هل تستعمل معجون للاسنان عندما تنظف اسنانك؟		
11O. هل تستعمل معجون اسنان به فلور (فلورايد) عندما تغسل اسنانك ؟		
تنظيف الاسنان		
12O. هل تستعمل اي من هذة الادوات لتنظيف اسنانك ؟		
فرشاة اسنان		
مسواك		
اداة اخرى		
12Oأخري: حدد الادوات الاخرى التي تستعملها في نظافة الاسنان		
مشاكل الاسنان		
13O.هل واجهت أي من المشاكل التالية خلال الأشهر ال 12 الماضية بسبب حالة أسنانك؟		
صعوبة في مضغ الأطعمه		
صعوبة في الكلام / نطق بعض الكلمات		
شعرت بالتوتر بسبب مشاكل في الأسنان أو الفم		
الحرج من مظهر الأسنان		
تجنب الابتسام بسبب الأسنان		
اضطراب في النوم		
غياب عن العمل		
صعوبة القيام بالأنشطة المعتاده		
أقل تحملاً أو تسامحاً مع من حولك		
انخفاض المشاركة في الأنشطة الاجتماعيه		
كيف تتصرف اذا اصبت بمشاكل في الفم او الاسنان ؟		
اذهب الى مركز صحي او مستشفى حكومي. 1XO		
اذهب الى مستشفى او عيادة خاصة .2XO		
اذهب الى البصير .3XO		
اعالج نفسي بالمسكنات و المضادات الحيويه .4XO		

علاجات بلدية .5XO		
اخرى .6XO		
هل تمت اخذ موافقة المجيب او المشارك على القياسات البدنيه ؟		
الخطوة الثانية: القياسات البدنية		
قياس ضغط الدم		
1M. رقم الباحث الميداني		يجب أن يكون الرقم رقم موجب
2M. رمز جهاز قياس الضغط		يجب أن يكون الرقم رقم موجب
1 ضغط الدم و معدل ضربات القلب		
1 القرآه الاولى	أدخل '888' في كافة المجالات إذا رفض المشارك.	
M4a. الضغط الانقباضي (مم/ زئبق)		لابد ان يكون الضغط الانقباضي بين 40 و 300 (مم / زئبق).
M4b. الضغط الانبساطي (مم / زئبق)		لابد ان يكون الضغط الانبساطي بين 30 و 200 (مم / زئبق). لايمكن ان يكون الضغط الانبساطي اكبر من الضغط الانقباضى.
M16a. معدل ضربات القلب (نبضة/دقيقة)		لا يمكن أن يكون معدل ضربات القلب (النبض) أقل من bpm30 أو أكثر من bpm200. أدخل '888' في كافة المجالات الثلاثة اذا رفض المجيب
2 ضغط الدم و معدل ضربات القلب		
2 القرآه الثانيه	أدخل '888' في كافة المجالات إذا رفض المشارك.	
M5a. الضغط الانقباضي (مم/ زئبق)	أدخل '888' في كافة المجالات إذا رفضت مشارك.	لابد ان يكون الضغط الانقباضي بين 40 و 300 (مم / زئبق).
M5b.الضغط الانبساطي (مم / زئبق)		لابد ان يكون الضغط الانبساطي بين 30 و 200 (مم / زئبق). لايمكن ان يكون الضغط الانبساطي اكبر من الضغط الانقباضى.

M16b. معدل ضربات القلب (نبضة/دقيقة)		لا يمكن أن يكون معدل ضربات القلب (النبض) أقل من 30bpm أو أكثر من 200bpm. أدخل '888' في كافة المجالات الثلاثة اذا رفض المجيب
3 ضغط الدم و معدل ضربات القلب		
3 القرآه الثالثة	أدخل '888' في كافة المجالات إذا رفض المشارك.	
M6a.الضغط الانقباضي (مم/ زئبق)	أدخل '888' في كافة المجالات إذا رفضت مشارك.	لابد ان يكون الضغط الانقباضي بين 40 و 300 (مم / زئبق).
M6b. الضغط الانبساطي (مم / زئبق)		لابد ان يكون الضغط الانبساطي بين 30 و 200 (مم / زئبق). لايمكن ان يكون الضغط الانبساطي اكبر من الضغط الانقباضي.
M16c. معدل ضربات القلب (نبضة/دقيقة)		لا يمكن أن يكون معدل ضربات القلب (النبض) أقل من 30bpm أو أكثر من 200bpm. أدخل '888' في كافة المجالات الثلاثة اذا رفض المجيب
7M. خلال الاسبوعين السابقين هل تناولت ادوية علاج ارتفاع ضغط الدم وصفة لك طبيب او اي كادر صحي معالج ؟		
قياس الطول والوزن		
8M. هل أنت حامل؟		
9M. رقم الباحث الميداني		يجب أن يكون الرقم رقم موجب
M10a. رمز جهاز الطول		يجب أن يكون الرقم رقم موجب
M10b. رمز جهاز الوزن		يجب أن يكون الرقم رقم موجب
11M. الطول (سم)	أدخل '888' في كافة المجالات إذا رفض المشارك.	يجب أن يكون الطول ما بين 100 و270 سم.
12M. الوزن (كجم)	أدخل "888" إذا رفض المشارك. أدخل "666" في حال الوزن الزائد عن المقياس .	يجب ان بكون الوزن بين 20 و350 kg.
محيط الخصر		

13M. رمز جهاز قياس الخصر		يجب أن يكون الرقم رقم موجب
14M. محيط الخصر (سم)	أدخل '888' في كافة المجالات إذا رفض المشارك.	لابد ان يكون محيط الخصر بين 30 و 200 سم
14M. محيط الخصر (سم)	أدخل '888' في كافة المجالات إذا رفض المشارك.	لابد ان يكون محيط الخصر بين 30 و 200 سم

استمارة الخطوة الثالثة **Step 3 Questionnaire**			
الدهنيات في الدم			
رمز الجهاز			B7
الكوليسترول الكلي ،	م مول/ل	⌐ ⌐⌐. ⌐⌐⌐ ⌐	B8
في خلال الأسبوعين السابقين هل أخذت أي علاج لخفض الكوليسترول بالدم وصف لك من قبل الطبيب أو مهني الصحة ؟	نعم	1	B9
	لا	2	
السكر في الدم			
الأسئلــة		الاجابة	الرمز
هل أكلت أو شربت شيئاً غير الماء خلال الـ 12 ساعة الماضية؟		1	B1
		2	
رمز فني المختبر		⌐⌐⌐⌐	B2
رمز الجهاز		⌐⌐⌐	B3
وقت سحب عينة الدم (توقيت 24 ساعة)		⌐⌐ ساعة	B4
نسبة السكر في الدم (امتناع عن الاكل لمدة12 ساعة(		⌐⌐⌐. ⌐⌐	B5
هل أخذت اليوم حقن أنسولين أو أي علاج للسكر وصفه لك الطبيب أو مهني الصحة لخفض معدل السكر بالدم ؟		1	B6
		2	
الدهنيات في الدم (أساسي)			

رمز الجهاز			B7
الكوليسترول الكلي			B8
في خلال الأسبوعين السابقين هل أخذت أي علاج لخفض الكوليسترول بالدم وصف لك من قبل الطبيب أو كادر صحي ؟	1 2		B9
الدهون الثلاثية والدهون ذات الكثافة العالية (موسعة)			
الدهون الثلاثية			B10
الدهون ذات الكثافة العالية			B11
الدهون ذات الكثافة القليلة			B12
Low density Lipoprotein / cholesterol			

Annex 2. Physical Measurement SOPs (Arabic)

الموجهات القياسية للقياسات البدنية

الغرض من اخذ القياسات البدنية:

- لحساب مؤشر كتلة الجسم
- لقياس سمنة البطن
- لمعرفة ارتفاع ضغط الدم

ادوات القياس:

- مقياس ضغط (ذو مقاس عام)
- مقياس طول ووزن مزدوج
- شريط مقاس (متر)

ترتيب اخذ القياسات

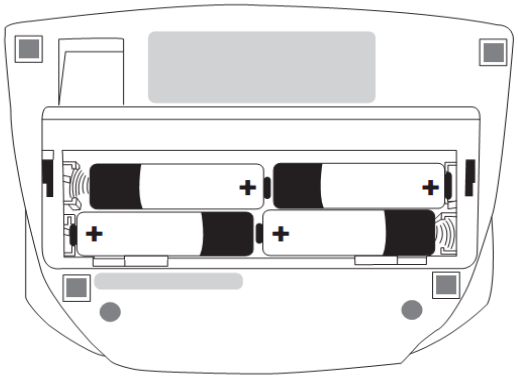
تؤخذ القياسات البدنية بحسب الترتيب التالي:

1. ضغط الدم
2. معدل ضربات القلب
3. الطول
4. الوزن
5. محيط الخصر

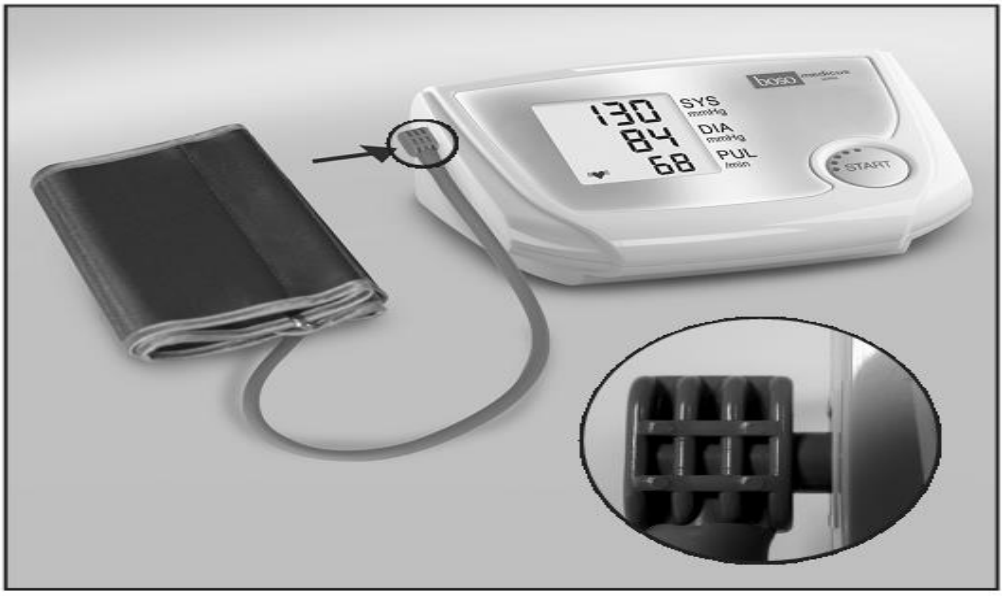
قياس ضغط الدم

يستخدم جهاز قياس ضغط الدم الإلكتروني **medicusunoboso**

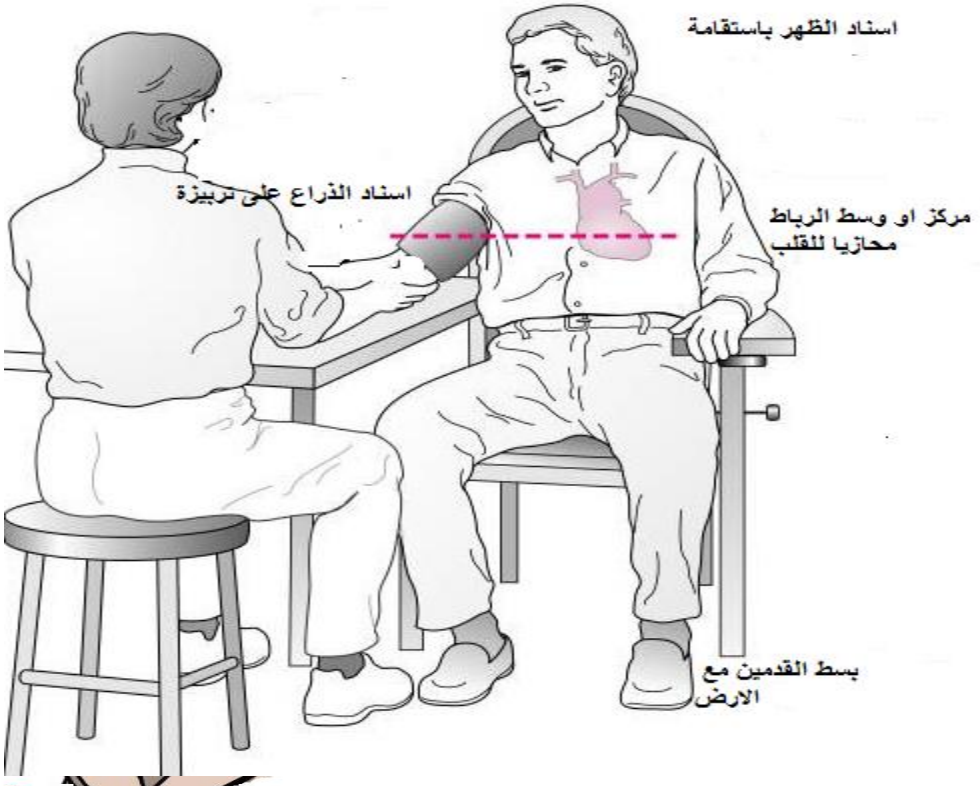
تركيب البطاريات **:**اقلب الجهاز من الخلف وقم بفك الغطاء وتركيب البطاريات



توصيل رباط الجهاز**:**



عند قياس ضغط الدم يجب أخذ الإحتياطات الأتية:



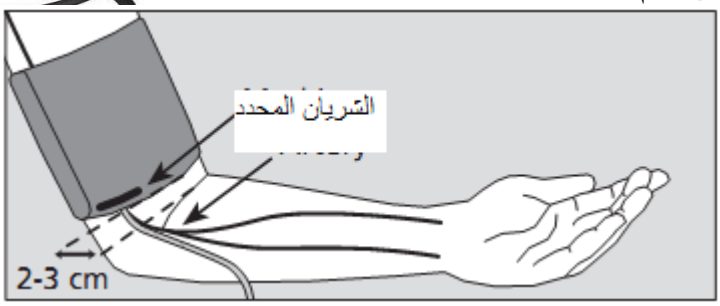
- يجلس المشارك بهدوء لمدة 15 دقيقة مع بسط القدمين.
- يجب أن تكون المثانة فارغة.

- عدم شرب القهوة نصف ساعة قبل القياس.

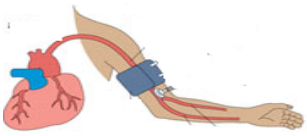
- عدم الكلام اثناء القياس.

- اسناد اليد (المرفق) اثناء القياس
- وضع اليد اليسرى على تربيزة مع ود
- إزالة أو طي الملابس بدون الضغط
- وضع رباط الجهاز فوق مفصل المرف

بحوالى2سم



- لف الرباط بصورة جيدة بدون الضغط الشديد.



- المحافظة على مستوى الرباط مع مستوى القلب .

تشغيل الجهاز و طريقة القراءة:

- افتح زرالتشغيل.
- ستظهر الشاشة كما في الصورة.
- سيبدأ الجهاز القياس تلقائياً.

- سيظهر الضغط الانقباضي أعلى الشاشة والانبساطي أسفلها.

.

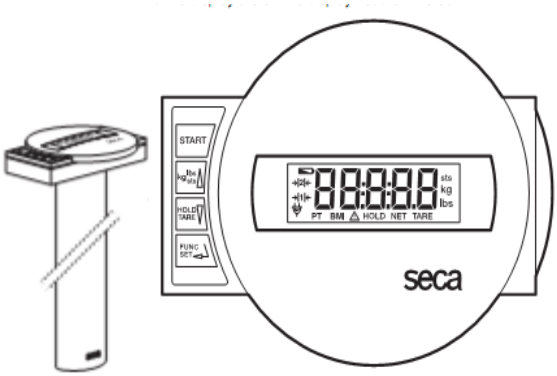
- سيظهر معدل نبضات القلب أسفل الشاشة.
- يجب اخذ ثلاث قراءات ، بين كل قراءة وأخرى 3 دقائق يتم بينهم قفل الجهاز ولكن دون فك الرباط.
- سجل القراءات الثلاث على جهاز التابلت.
- سجل القراءة الثالثة على كرت النتيجة الذي ستعطيه للمشارك.
- سجل الرقم التسلسلي للجهاز الذي قمت بالقياس به على جهاز التابلت

الموجهات القياسية لقياس الطول والوزن

سيتم استخدام جهاز سيكا **"seca"** لقياس الطول والوزن

يتكون الجهاز من :

لوح الوزن



عمود به شاشة عرض

مسماري ربط

غرفة بطاريات

تركيب البطاريات:

قم بقلب اللوح بحذر باتجاه القاعدة

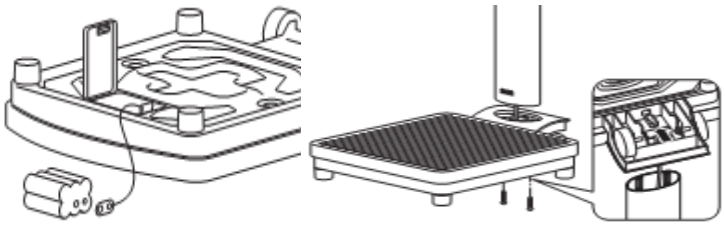
افتح مكان غرفة البطاريات وادخل البطاريات بطريقة سليمة (الموجب والسالب)

ادخل غرفة البطاريات وقم بربط سلك التوصيل

قم باغلاق الغطاء واعد اللوح الى وضعه الصحيح

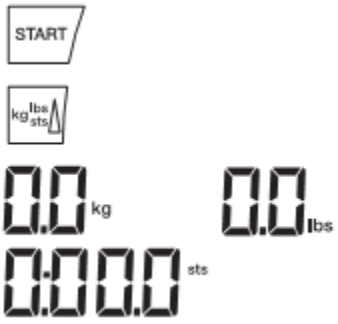
تركيب الجهاز:

قم بتركيب الجهاز على سطح صلب ومستو



تشغيل الجهاز:

ستظهر الشاشة كما في الصورة ادناه:



تاكد ان الجهاز ليس به اي حمل
اطلب من المشارك ان يقوم بخلع حذائه وأي غطاء في الرأس يمكن ان يؤثر على قياس الطول أو الوزن

- اطلب من المشارك أن:
  - يضع قدميه على جانبي الجهاز.
  - لا يتحرك.
  - يتجه للامام.
  - يضع الذراعين على جانبي الجسم.
- سجل الوزن بالكيلوجرام على جهاز التابلت.
- سجل الرقم التسلسلي للجهاز الذي قست به.
- سجل القراءة في كرت النتيجة

قياس الطول

- أطلب من المشارك الاتي:
  - صف الاقدام مع بعضهما.
  - الظهر مقابل للوح الجهاز.
  - الركبتين في وضع الإستقامة.
  - النظر للأمام والرأس مستقيم.
  - العينين بمستوى الأذنين.
- حرك ذراع الجهاز برفق أعلى الرأس وأطلب من المشارك أن يقف مستقيماً.
- اقرأ الطول بالسينتيمتر في النقطة المحددة (مع العلامة الحمراء).
- سجل الطول بالسينتيمتر.
- سجل الرقم التسلسلي للجهاز.
- سجل القراءة في التابلت

- سجل القراءة في كرت النتيجة

قياس محيط الخصر

- استخدم شريط القياس.
- الخصوصية مهمة لإجراء هذا القياس.(وفردرجة الخصوصية التي يطلبها المشارك)
- القياس يكون على الجلد مباشرة أو ملابس لا تؤثر على القياس.

يؤخذ هذا القياس :

- عند نهاية النفس الطبيعي (الزفير).
- الذراعين على جانبي الجسم.

- في منتصف المسافة بين اخر ضلع محسوس وعظم الحوض البارز.
- قف بجاب المشارك وأجعله يقوم بلف شريط القياس حول الخصر
- تاكد بان الشريط مضبوط ولكن غير ضاغط.

- قم بأخذ القراءة عند نقطة العودة للبداية.
- سجل الرقم التسلسلي للجهاز.
- سجل القراءة في التابلت
- سجل القراءة في كرت النتيجة

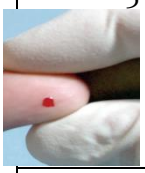
Annex 3. Biochemical measurement SOPs (Arabic)

جهاز فحص الكلسترول و الجلوكوز

المحتويات: الجهاز ، ذاكرة ، أشرطة الفحص ، أنبوبة شعرية ، غطاس ، مسحة او قطن معقمة بالكحول ، قفازات و صندوق أمان

خطوات فحص الدم:

1- تشغيل الجهاز بمفتاح الإدخال الذي توجد به دائرة.
2- اسحب شريط الفحص من العلبة.
3- أدخل الشريط في الجهاز.
4- طابق الرقم الذي يظهر على الجهاز برقم العلبة
5- ارتدي الجونتيات
6- أمسح الأصبع بمسحة معقمة.
7- أترك الأصبع حتى يصبح جافاً
8- أفرك الأصبع اسفل مكان االطعنة حتى يصبح دافي.
9- أطعن جانب الأصبع.
10- أمسح نقطة الدم الاولى.
11- اضغط الأصبع ضغطة خفيفة حتى تظهر نقطة الدم الاخرى .
12- أسحب الدم بالأنبوبة الشعرية حتى الخط الأسود
13- ضع الدم على الشريحة بعد ظهوركلمة : apply sample
14- انتظر لمدة دقيقتين حتى تظهر النتيجة.
15- تخلص من شريط الفحص في صندوق الأمان.
16- اول نتيجة هي الكلسترول
17- اضغط مفتاح الإدخال الثاني الذى توجد به علامة مثلث لقراء النتائج الأخرى.
18- سجل الرقم التسلسلي للجهاز الذي قمت بالقياس به على جهاز التابلت
19- سجل النتيجة على جهاز التابلت
20- سجل النتيجة على كرت النتيجة

خطوات الفحص				
1 	2 	3 	4 	5 
6 	7 	8 		

Annex 4. Instruction for urine collection (Arabic)

التوجيهات العامة لتجميع عينة البول

Participant ID: _____Date----------

التوجيهات العامة لتجميع عينة البول اللحظية:

1/ نطلب منك رجاءا عينة من البول للفحص تجمع عند المساء قبل بدايتك للصيام .

2/ سوف تعطي حاوية صغيرة لجمع العينة , أملأها حتي المنتصف ثم أغليقها جيدا وضعها داخل الكيس البلاستيكي المرفق وأغلقه جيدا . لاتنزع اللاصق الموضوع علي العبوه وحافظ علية جافا.
أكتب الذمن الذي تم فيه أخذ العينة . الساعة.----------

3/ضع الكيس البلاستيكي وبداخله الحاويه في وضع رأسي في مكان جاف وبارد (الثلاجة).

4/ أحضر العبوة معك صباح اليوم التالي عند حضورك لفحص الدم في مكان التجمع الذي سيحدده لك الباحث . أحضر معك هذا الفورم .
نشكر لك حسن تعاونك

Participant ID: _____Date----------

التوجيهات العامة لتجميع عينة البول ل24 ساعة:

1/ نطلب منك رجاءا عينة من البول تجمع خلال 24 ساعة.
2/ سوف تعطي حاوية للتجميع بحجم مناسب لكمية البول المتوقعة.
3/ ضع الحاوية في مكان بارد وجاف نسبيا في الحمام بحيث لايصلها ضوء الشمس المباشر.
4/ أفرغ المثانة في الصباح ثم ابدأ بتجميع العينة من التفريغ الثاني وطوال اليوم حتي صباح اليوم الثاني.
5/ كن حريصا علي تجميع كل البول خلال اليوم ماامكن ذلك وعدم إهدار اي كمية ولو كانت بسيطة.
6/أحضر الحاويه في المكان والذمان الذي سوف يحدده لك جامع البيانات وأحضر معك هذا الفورم.
7/ سجل علي الحوية ذمن بداية التجميع وذمن النهاية.
8/ نشكر لك حسن تعاونك.