

# **Kiribati**

# **NCD Risk Factors**

# **STEPS REPORT**



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The Kiribati NCD Risk Factors STEPS REPORT (referred as “the Report”) is a record of a combined effort of several organizations and individuals. We would like to acknowledge each organization and everyone’s contributions, dedication and determination in completing the survey and finalizing the Report.

The Report is a collaborative effort between the Kiribati Ministry of Health and Medical Services, World Health Organization, the Fiji School of Medicine and the Centre for Physical Activity and Health, University of Sydney.

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## LIST OF ABBREVIATIONS

BMI	Body Mass Index
BP	Blood Pressure
CHD	Coronary Heart Disease
CI	Confidence Interval
CVD	Cardiovascular Disease
DBP	Diastolic Blood Pressure
DM	Diabetes Mellitus
FBS	Fasting Blood Sugar
HTN	Hypertension
MET	Metabolic equivalent
mg/dl	Milligrams per decilitre (unit of blood chemistry values)
mmHg	Millimetres of mercury (unit of blood pressure measurement)
mmol/L	Millimoles per litre (unit for blood chemistry values)
NCD	Noncommunicable disease
PICs	Pacific island countries and areas
SBP	Systolic Blood Pressure
WHO	World Health Organization

## FOREWORD



Noncommunicable diseases (NCDs), including diabetes, cardiovascular diseases and cancer have become a high disease burden in most of the countries in the world. In order to address this growing problem, accurate information about the risk factors that contribute to the development of NCDs is needed. A “risk factor” is any characteristic or exposure that increases a person’s likelihood of developing a NCD. Risk factors include smoking, alcohol use, physical inactivity, obesity, high blood pressure, a raised level of blood glucose or cholesterol, and an unbalanced diet.

To increase our capacity to undertake population risk surveillance, the Ministry of Health and Medical Services, Kiribati (MHMS) joined forces with WHO and other partners to undertake a national NCD Risk Factors STEPS Survey. The STEPS survey has been specifically designed by WHO to assess the prevalence of the common NCDs and their risk factors in a country. The STEPS survey provides important information to develop and implement NCD plans and programs to address the growing epidemic of NCDs. Furthermore, the survey provides a firm foundation for an ongoing surveillance for NCDs and their various risk factors.

This report is the result of the STEPS survey carried out in Kiribati. It shows high prevalence of NCDs and their risk factors among our population and suggests actions to: control and prevent NCDs; provide a supportive physical environment and infrastructure, and improve health service delivery.

This is the first population-based national survey on the prevalence of the NCD risk affecting our population. It represents a milestone in our efforts to address the increasing NCD epidemic affecting our people and marks an increased commitment by MHMS to tackle the NCD challenge. The survey results will enable us to develop more effective health policies and programs in primary and secondary NCD prevention and in monitoring and evaluating our ongoing efforts in NCD prevention.

The WHO STEPS survey in Kiribati would not have been possible without the vision and leadership of our predecessors, the Honorable Bauro Tongai, former Minister of Health and Medical Services and Dr Airambiata Metai, former Acting Director Public Health. Their determination enabled this important survey to be given priority in MHMS.

The Kiribati STEPS survey involved intensive work, long days, and persistence and dedication from the Kiribati team that undertook the survey. We owe each of them our sincere appreciation.

We also wish to thank all the supporting staff in MHMS and our partners - the Fiji School of Medicine for its supervision of the survey team, AusAID for its financial support and WHO for its strong technical support.

This report is dedicated to the hard work and commitment of all those involved from the inception to the completion of the NCD Risk Factors STEPS survey in Kiribati.

The findings and recommendations in this report will guide our actions for improving health for all.



Dr Kautu Tenaua  
Minister for Health and Medical Services  
Republic of Kiribati



Ms Reina Timau  
Permanent Secretary  
Ministry of Health and Medical Services  
Republic of Kiribati



Noncommunicable Diseases (NCDs) are a leading cause of death in Pacific island countries and areas, accounting for approximately 75% of all deaths. Pacific island health ministers have given high priority to NCD prevention, control and surveillance.

The WHO STEPwise Approach to Surveillance of Risk Factors for NCDs (STEPS) is a WHO surveillance tool for chronic disease risk factors and chronic disease-specific morbidity and mortality to be used at national level. To date, 106 countries and territories throughout the world have used the WHO national STEPS tool.

The STEPS approach gathers information on key risk factors in a representative sample of the population using interviews and questionnaires, obtaining simple physical measurements, and collecting blood samples for biochemical assessment. The data gathered enables Governments to put emphasis in the right place when planning and implementing activities to reduce NCD risk factors such as tobacco use, obesity, high blood pressure, diabetes, and physical inactivity. National STEPS results can also be used to evaluate the impact of NCD interventions, monitor national trends and judge a country's overall performance by comparing results with other countries.

The publication of the “Kiribati NCD Risk Factors STEPS REPORT” is a milestone for Kiribati: to provide scientifically sound national data which will assist the government in addressing this emerging public health problem in Kiribati.

The Kiribati STEPS report shows that:

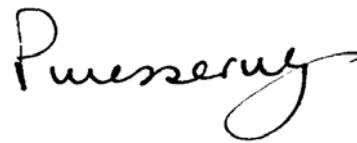
- 59.0% of the population smoked tobacco daily.
- 71.8% of men drank 5 or more standard drinks, 49.2% of women drank 4 or more standard drinks on any day in the past week.
- 99.3% of the population consumed less than five combined servings of fruit and vegetables per day.
- 50.1% of the population was with low level of physical activity.
- 81.5% of the population was overweight, 50.6% was obese.
- 28.1% of the population was diabetic.

The comprehensive assessment of combined risk factors shows that overall 74.6% of the Kiribati population are at high risk of NCDs with men and women between the age of 45 to 64 being a particular concern. Only 0.1% of the population aged 25-64 years in Kiribati was of low risk to NCDs. Effective primary prevention activities to reduce smoking, promote healthy diets, improve physical inactivity and reduce alcohol consumption can reduce the risk of NCDs and need to be scaled in Kiribati to reduce diseases such as diabetes, heart disease, stroke and cancer. Secondary prevention activities also need to be strengthened to prevent complications and disabilities of NCDs such as amputation resulting from diabetes.

WHO through its offices in Tarawa, Suva, Manila and Geneva is honoured to have worked with the following partners to complete the survey and this publication: the Ministry of Health and Medical Services, Kiribati; the Fiji School of Medicine; the Centre for Physical Activity and Health, the University of Sydney; the Australian Agency for International Development and New Zealand Agency for International Development.

A handwritten signature in black ink, appearing to read 'Ken Chen', with a long horizontal line extending to the left.

Dr Chen Ken  
World Health Organization Representative  
in the South Pacific

A handwritten signature in black ink, appearing to read 'Pamela Ann Messervy', written in a cursive style.

Ms Pamela Ann Messervy  
World Health Organization Country Liaison Officer  
for Kiribati

## EXECUTIVE SUMMARY

The Kiribati NCD STEPS survey provides a snapshot on the state of noncommunicable diseases and their risk factors among I-Kiribati (the People of Kiribati). The data are based on a national representative population-wide sample of I-Kiribati. The survey was carried out in South Tarawa and the four outer islands of Butaritari, Makin, Onotoa and Beru from May, 2004 to Sept., 2006. The key objectives of the STEPS survey were:

- To document the prevalence and magnitude of key NCDs among adults
- To document the prevalence and magnitude of major modifiable risk factors for NCDs including tobacco use, excessive alcohol consumption, poor eating patterns, physical inactivity, obesity, high blood pressure, raised blood glucose and cholesterol
- To compare NCDs and their risk factors across different age groups and between men and women.

A total of 1755 individuals (response rate of 88%) participated in the survey. In this report, we presented data for those aged 25-64 years, following the standard age group reporting for WHO STEPS surveys. Additional results for respondents aged 15-24 years were also described in some details at the end of each section of behavioural risk factors of this report.

### Behavioural risk factors

Overall, the prevalence of current smokers was 61.3%. The majority of men (75.7%) were current smokers as compared to just under half (48.3%) of women. Among current smokers, 59.0% smoked daily, with a gender difference of 74.0% of men and 45.4% of women. The mean age at which smoking started was 19.1 years; men started smoking at a marginally younger age than women, 18.2 years and 20.5 years, respectively.

Overall, 25.5% of the I-Kiribati adult population had consumed alcohol in the past 12 months (defined as current drinkers). A significant gender difference of 46.9% of men and 6.1% of women current drinkers was observed. Generally, there were higher proportions of male than female drinkers across all age groups. Among male current drinkers, 71.8% reported 'binge drinking', that is, drinking 5 or more standard drinks on any day in the past week. The highest proportion of binge drinking among men was in the 25-34 years age group. An estimated 21.6% of male current drinkers also reported drinking 20 or more drinks in the past week. Among female current drinkers, 49.2% drank 4 or more standard drinks on any day in the past week.

The overall prevalence of ever tried kava (kawa or nangkona) in the past 12 months was 23.2%. There was a substantial gender difference in kava consumption behaviour with 43.7% of men and only 4.6% of women having tried kava. Generally, kava drinking was more common among men and women aged 25-44 years.

This survey showed that average consumption of fruit and vegetables among I-Kiribati was well below the recommended levels. The mean number of days per week fruit and vegetables were consumed were 1.5 and 1.9 days, respectively. When fruit and vegetables were consumed on those days, the self-reported mean number of combined fruit and vegetables servings was 0.8 serves. The overall prevalence of those consuming less than 5 combined servings of fruit and vegetables per day was 99.3%.

The survey found that 50.1% of I-Kiribati reported low level of total physical activity, that is, engaged in physical activities of less than 600 METminutes per week. 600 METminutes per week are equivalent to 30 minutes of moderate-intensity physical activity for 5 days per week, or 20 minutes of vigorous activity for 3 days per week. A greater proportion of women (57.3%) undertook low level of physical activity compared to men (41.8%). Conversely, a higher proportion of men reported high level of total physical activity (>1500 METminutes per week) compared to women, 30.1% and 16.6%,

respectively. 1500 METminutes per week are equivalent to 1 hour of vigorous physical activity for 3 days per week. The total physical activity performed during work, transport and leisure time averaged 83.3 minutes/day for men and 56.8 minutes/day for women. Work-related physical activities comprised 48.0 minutes/day for men and 31.5 minutes/day for women; transport-related physical activities averaged 28.4 minutes/day for men and 22.5 minutes/day for women, and; leisure-related physical activities averaged 6.8 minutes/day for men and 2.8 minutes/day for women. Thus, most physical activity in Kiribati was undertaken as part of work, and to a lesser extent, as part of transport. Leisure-time physical activity contributed very little to the total time spent in physical activity.

### **Physical risk factors**

The overall prevalence of overweight (BMI  $\geq 25\text{kg/m}^2$ ) was 81.5%, and of obesity (BMI  $\geq 30\text{kg/m}^2$ ) was 50.6%. Among women, 84.6% were overweight with 58.9% of these being obese. Among men, 78.2% were overweight with 41.7% being obese. An estimated 18.0% of the population of I-Kiribati had a normal body mass index ( $18.5 \leq \text{BMI} \leq 24.9$ ): 14.8% of women and 21.6% of men.

Mean waist circumference for women was significantly higher than men, 97.3 cm and 94.2 cm, respectively. Women in all age groups had mean waist circumference values exceeding 80 cm, a cut-off value for women considered to increase their cardiovascular disease risks.

The survey found an estimated 17.3% of I-Kiribati had hypertension (defined as having SBP  $\geq 140$  mmHg and/or DBP  $\geq 90$  mmHg or on medication for raised blood pressure). While raised blood pressure increased with increasing age, this condition was more common among men than women.

### **Biochemical risk factors**

Based on measures of fasting capillary whole blood, the overall prevalence of diabetes (fasting glucose level  $\geq 6.1$  mmol/L or on medication for raised blood glucose) among I-Kiribati aged 25-64 years was 28.1%, with a slightly higher rate among men (29.6%) as compared to women (26.7%).

Overall, 27.7% of the population of I-Kiribati was found to have elevated total blood cholesterol level exceeding 5.0 mmol/L ( $\geq 190$  mg/dl). The prevalence for men was 23.8% and for women was 30.6%.

### **Combined risk factors**

As the number of NCD risk factors an individual has increases, so does his or her risk of developing a particular chronic condition. For this report, the surveyed population was classified into three NCD risk categories: high (with 3-5 risk factors), moderate (with 1-2 risk factors) or low risk (with no risk factor). The combined NCD risk factors included in the computation of NCD risk categories were current daily smokers, overweight (BMI  $\geq 25$  kg/m<sup>2</sup>), raised blood pressure (SBP  $\geq 140$  and/or DBP  $\geq 90$  mmHg or currently on medication), consuming less than five combined servings of fruit and vegetables per day, and low level of physical activity ( $< 600$  METminutes per week).

This survey found that only 0.1% of the population of I-Kiribati had zero risk factor for NCDs, compared with 25.4% at moderate risk and 74.6% at high risk. By aged 25-44 years, the majority of I-Kiribati (72.7%) already reported having 3 or more risk factors. The proportions were highest in the 45-64 years age group for both men (80.4%) and women (77.7%).

### **Conclusion**

The Kiribati STEPS survey represents a significant step forward in gathering national representative and population-wide information for informing health planning services for the prevention, control and management of NCDs. The survey has provided strong evidence that NCDs and related modifiable risk factors are prevalent in Kiribati, with the majority of adults being at heightened risk of developing chronic conditions. In this context, the following recommendations are outlined as priority actions in Kiribati:

### **Addressing policy, organizational and environmental factors**

- Increase resources to implement the WHO Framework Convention on Tobacco Control.
- Generate resources to national health institutions.
- Develop policies supporting importation of healthy foods.
- Improve availability of fruit and vegetables.
- Develop policies to establish physical activity-friendly environments.
- Increase the capacity of the healthcare system for early detection and management of individuals with chronic diseases.
- Establish sustainable government funding mechanism and health infrastructure to support NCD strategy implementation and monitoring.
- Develop NCD related coalitions, networks and partnerships, e.g., Kiribati NCD Working Committee, Kiribati National Food and Nutrition Committee, for preventing and managing NCDs.

### **Addressing NCD behavioural risk factors**

- Comprehensive anti-smoking campaigns to reduce smoking rates across all age groups and in both genders, particularly targeting the younger age groups to prevent smoking uptake.
- Comprehensive smoking cessation programs to reduce smoking rates across all age groups in both genders.
- Comprehensive health promotion campaigns to reduce alcohol (and at-risk kava) consumption, particularly targeting binge drinking among men.
- Comprehensive health promotion campaigns promoting the recommended levels of fruit and vegetable consumption across all age groups and in both genders, and increasing public awareness of the adverse effects of excessive consumption of high-fat, high-salt, and high-sugar foods.
- Develop and implement cultural-appropriate programs to promote daily incidental physical activity and encourage more moderate-intensity physical activity in all age groups, particularly among women.
- Public health programs to emphasize reduction in the prevalence of the five critical NCD risk factors (current daily smoking, being overweight or obese, having raised blood pressure, eating less than five combined servings of fruit and vegetables per day, and having a low level of physical activity).

### **Establishing a coordinated approach to noncommunicable disease management system**

- Increase public awareness of the importance of regular monitoring and screening of blood pressure, blood cholesterol and blood sugar level.
- Establish and/or strengthen existing coordinated care and management of individuals with diagnosed chronic conditions, including providing a system of integrated care across multiple providers (primary health care and clinical care) and multiple chronic conditions that will reduce length of hospitalization and improving quality of life.
- Establish a coordinated NCD program supporting chronic disease care, including supporting patient self-management, self-monitoring of conditions, medications and lifestyle changes.

### **Maintaining quality surveillance and public health information**

- Establish strong leadership and secure political and financial commitments to maintain a systematic and rigorous approach to national STEPS data collection – supported by workforce trained in implementing the survey, infrastructure and financial capacity - on an ongoing basis that will evolve to a robust STEPS surveillance system in Kiribati.

# 1. INTRODUCTION

## 1.1 Background and Rationale

Countries across a broad spectrum of economic development are experiencing an unprecedented rise in noncommunicable diseases (NCDs)<sup>1</sup> including cardiovascular conditions such as heart disease and stroke, Type 2 diabetes, some cancers, and chronic respiratory conditions. The NCDs affect all levels of socioeconomic and ethnic groups and have been estimated to account for approximately 60% of all deaths globally. It has also been estimated that around 80% of NCD-related deaths occur in low- and middle-income countries<sup>2</sup>. In the Western Pacific Region, the NCD conditions are contributing to a large share of death and disability<sup>3</sup>, with significant social and economic consequences on all levels of the society.

Timely and valid surveillance of data relating to the magnitude and extent of NCDs and their risk factors are critical for informing healthcare spending, and for developing appropriate preventive public health programs to respond effectively to the growing burden of NCDs. As part of the regional and global effort to meet the emerging challenges posed by the NCD epidemics, the World Health Organization (WHO) is supporting a number of Pacific island countries and areas (PICs) to implement country-wide STEPwise approach to surveillance of NCD risk factors<sup>4</sup>. Countries implementing the STEPS surveys agreed to use standardised STEPS measures and protocols for assessing the following core NCD risk factors: tobacco use, alcohol consumption, fruit and vegetable consumption, physical activity, measured height, weight, waist, and blood pressure. Depending on needs and resources biochemical indicators such as fasting blood cholesterol and blood sugar level are also collected. Self-report and objective methods are used to collect the information.

To facilitate between-country comparability, countries follow a standardised survey methodology, ask a core set of questionnaire items, and use similar technical materials and measurement protocol to support the planning and data collection activities. Countries also have the option of adding additional questionnaire items depending on local relevance and resource availability; these can include assessing kava consumption for example. Countries are also encouraged and supported to repeat the STEPS surveys to enable monitoring of NCD status over time.

## 1.2 The National Context

### 1.2.1 Geography

The Republic of Kiribati<sup>1</sup> is an island nation with a total land area of 811km<sup>2</sup> shared across approximately 33 low-lying coral atolls. Kiribati is considered to be one of the smallest island nations in the world. However, Kiribati is also considered to be the largest atoll country in the world, with its Exclusive Economic Zone spreading across 3.5 million km<sup>2</sup> in the Central Pacific Ocean, and straddling the Equator. Being one of the most physically remote island countries make transportation and telecommunications within country and with the rest of the world time consuming, difficult and expensive.

The 33 atolls of Kiribati are divided into three island groups: the Gilbert Islands (including Banaba), the Phoenix Islands, and the Line Islands. Most of the islands are vulnerable to sea level rising because they are low-lying and flat.

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<sup>1</sup> Formerly the Gilbert Islands.

## 1.2.2 Population and Living Environment

The majority of the 93,000 (UN 2008 est.) inhabitants of Kiribati<sup>2</sup> are Micronesians. Kiribati is the ethnic language but English is the official language; both are widely spoken in the country. 53% of the population is Roman Catholic, followed by 41% of Protestant and other religious groups (6%).

Population growth rate in Kiribati is approximately 1.9% per annum (WHO est.). However, in recent years there has been significant in-migration of people from the outer islands to the capital island of South Tarawa looking for employment opportunities. Consequently, around half of the population now lives in the capital atoll. This has resulted in an urban population growth rate of 5.2% in South Tarawa, placing great stress on the natural resources and the infrastructure of an already overcrowded island.

The demographic profile of Kiribati is typical of a developing country; around 35% of the population is aged under 15 years and only 5% are aged over 64 years (WHO).

## 1.2.3 Government, Culture and the Economy

The Kiribati government is made up of a two-tier system: central and local government levels. The central government comprises 42 democratically elected members led by the President. The local government level consists of 23 elected Councils located in three urban areas and 20 in the outer islands.

The Kiribati people place great value on family and community connectedness. Sharing goods and living spaces along the kinship lines is an important cultural practice. Consequently, large households containing extended families are not uncommon in Kiribati. Each village or community is built around a traditional *maneaba* or meeting place – usually a rectangular building with a thatched roof and no walls. Cultural ceremonies and village events take place in the *maneaba*. Churches provide the focus of community social activities. The government is regarded as the key provider of health and education services.

Kiribati has a low capita gross national product (GNP of less than US\$1000), coupled with weak infrastructure and limited human resources, is classified as a least-developed country. The primary sources of income are fishing license revenues, grants and loans, and workers' remittances.

## 1.2.4 Noncommunicable Disease Health Status and Health Infrastructure

The average life expectancy at birth in Kiribati was estimated at 58.9 for men and 63.1 for women (2005 WHO est.). While respiratory infections, nutritional deficiency disorders and diarrhoea continue to contribute to the burden of illnesses among children, the emerging incidences of NCDs have also gained the attention of health authorities in recent years.

However, an epidemiological study conducted in early 1980s (n=2938, ≥20 years) of non-insulin-dependent diabetes mellitus (NIDDM) in Kiribati found a relatively high prevalence of impaired glucose tolerance (10.6% of men and 13.7% of women in the rural sample)<sup>5</sup>. The study also found the age-standardised prevalence of NIDDM to be twice as high in the urban sample as compared with the rural sample (9.1% vs. 3.0% in men; 8.7% vs. 3.3% in women). To date, no other comprehensive epidemiological population-based surveys have been carried out in Kiribati to examine the extent and scope of NCD risks since those earlier surveys.

Kiribati has one main government hospital located in South Tarawa. Government-run health clinics or dispensaries located on outer islands provide primary health care services. Because of limited medical supplies, the clinics mainly manage minor illnesses and injuries and refer major cases to the main hospital. The majority of doctors are located in the main hospital, while village health workers staff the dispensaries.

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<sup>2</sup> The people of Kiribati are referred to as 'I-Kiribati' (pronounced 'ee-Kiribass').

### 1.3 Developing WHO STEPS Survey in Kiribati

At the time of writing no population-wide epidemiological data on NCD risk factors have been collected in Kiribati. Recognizing the gap in knowledge on the magnitude of major NCDs and their risk factors for planning and policy development in the country, a number of agencies came together to implement the WHO STEPS survey in 2004. The survey was conducted by the Kiribati Ministry of Health and Medical Services, with technical support provided by the Fiji School of Medicine and the World Health Organization.

## 2. OBJECTIVES

The Kiribati STEPS survey seeks to document the prevalence and magnitude of key NCDs and their risk factors. The survey will provide representative data on key indicators of risk factors that are linked to several chronic conditions. The data will inform whole-of-government approach to health services planning and the development of an integrated strategy for preventing and managing NCDs. Specifically, the survey aimed to:

- Document the prevalence and magnitude of key NCDs among adults
- Document the prevalence and magnitude of major modifiable risk factors for NCDs including smoking, alcohol consumption, poor eating patterns, physical inactivity, obesity, high blood pressure, raised blood glucose and cholesterol
- Compare NCDs and their risk factors by age and sex groups.

## 3. METHODOLOGY

### 3.1 Survey Structure

The Kiribati STEPS survey followed a sequential three-step process as follows (Figure 1):

Step 1: A questionnaire-based (interview) survey on tobacco use, alcohol drinking, kava drinking, fruit and vegetable consumption, and physical activity.

Step 2: Physiological measures of blood pressure, height, weight, and waist circumference.

Step 3: Biochemical measures of fasting blood glucose and total cholesterol.

Similar to other STEPS surveys conducted in the Pacific region, the Kiribati survey collected core information across the three steps. STEPS standardised survey methodology was also followed. Such approach will ensure that Kiribati has available population-wide and representative data for between-country comparisons as well as within-country comparisons. For future surveys, Kiribati could add more questions or measurements to the core questions, depending on local needs.

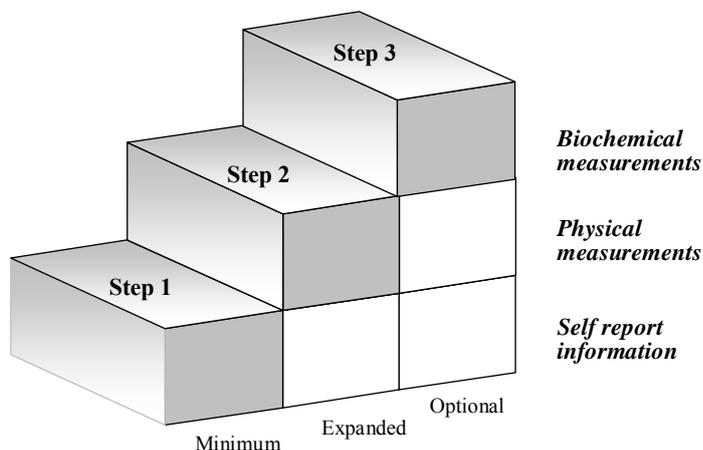


Figure 1 The WHO STEPwise approach to surveillance of NCDs

### 3.2 Survey Sampling Methodology

Following the WHO STEPwise guideline, the Kiribati STEPS study implemented a population-based cross-sectional survey. The survey was conducted in South Tarawa and four outer islands: Butaritari, Makin, Onotoa and Beru. Using the 2004 Public Health Nurses' Census, a list of all potential participants from each survey area was stratified into the age-sex groups: 15-24, 25-34, 35-44, 45-54 and 55-64 years (Figure 2).

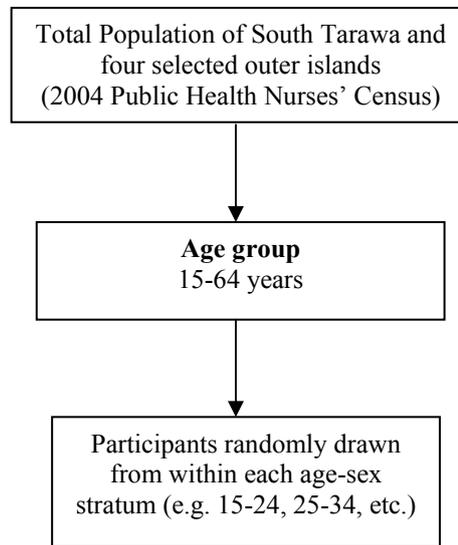


Figure 2 Survey sampling methodology and sampling frame

### 3.3 Sample size

Table A shows the sample sizes for selected areas. The Kiribati survey adopted the STEPS survey guideline, which required a minimum sample size of 2,000. Thus, average 250 adults were randomly drawn from each of the four outer islands and another 1000 adults drawn from South Tarawa, yielding a survey sample size of 2000.

Table A Sample size for selected areas

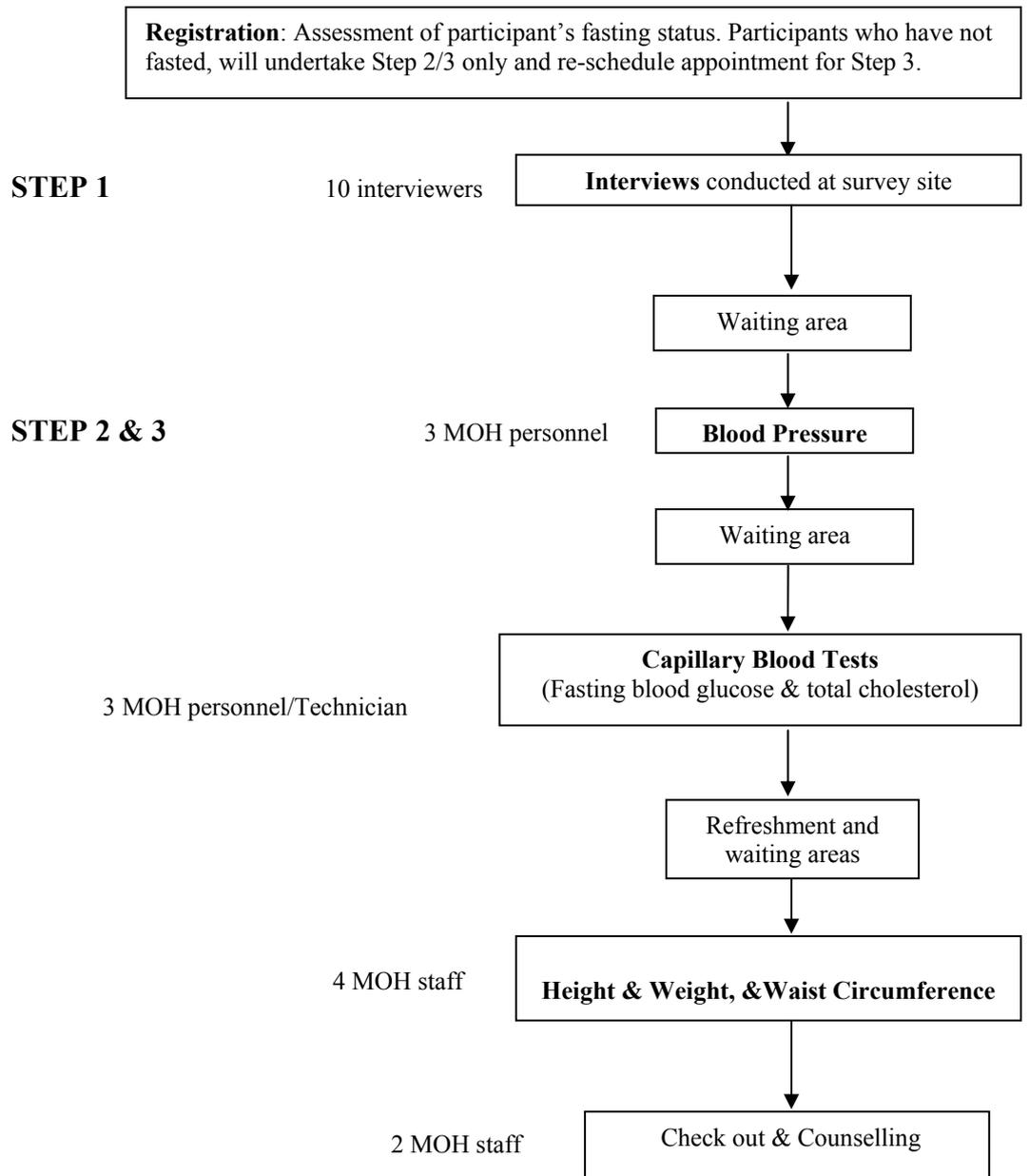
Village/ Islands	Population 15-64 years	Required sample size
South Tarawa	22,777	1000
<b>Sub-total</b>	<b>22,777</b>	<b>1000</b>
<b>Selected Outer Islands (4)</b>		
Butaritari	1,964	360
Makin	959	175
Onotoa	946	175
Beru	1549	290
<b>Sub-total</b>	<b>5418</b>	<b>1000</b>
<b>TOTAL</b>	<b>28,195</b>	<b>2000</b>

### 3.4 Data Collection Procedures

The survey was conducted from May, 2004 through to Sept., 2006. In each survey area:

- The survey approached randomly selected individuals from the list of all potential participants to inform them of the aims of the study and to obtain signed informed consent.
- The survey staff provided fasting instructions to participants and worked through appointment schedules for interviews and measurements.

Data collection activities are outlined in Figure 3.



**Figure 3 Flow chart of data collection activities**

### 3.5 Data Collection Process

#### 3.5.1 Registration of Participants

At the registration station, survey staff confirmed informed consent, participant date of birth, fasting status of the participant, and explained to participants all the steps involved in the survey.



#### 3.5.2 Step 1 - Behavioural Risk Factors Interviews

All participants participated in a face-to-face interview which asked questions on smoking, alcohol consumption, fruit and vegetable consumption, physical activity and history of chronic conditions and medications. Participants were also asked about their socio-demographic status, including education and socioeconomic status. A copy of the questionnaire is presented in Appendix 1. Interviews were conducted in either English or Kiribati.



### 3.5.3 Step 2 - Physical Measurements

Survey staff conducted the physical measurements following the recommended STEPwise protocols. The OMRON M4 Digital Automatic Blood Pressure Monitor was used to measure resting blood pressure. Blood pressure was measured three times; the first reading followed by two more measurements taken with 2-3 minute intervals. The three readings of the blood pressure were recorded, and the average of the second and third readings was used in the analysis.



Height and weight were measured once using the Seca Leicester Height Measure to the nearest whole centimeter and the Siltec PS500L to the nearest 0.1 kg, respectively. Participants were measured without shoes and wearing only light clothing. Waist circumference was measured once using the Figure Finder constant tension tape and recorded to the nearest 0.1 cm. Waist circumference of female pregnant participants was not measured.



#### **3.5.4 Step 3 – Biochemical Measurements**

The Kiribati survey included assessments of fasting blood glucose and fasting total cholesterol. Participants fasted from 10:00pm the previous night until 7:00am the following morning when their capillary blood samples were drawn using the method of finger prick.



### **3.5.5 Check-out Station and Counselling**

All participants received health advice and counselling and were provided with literature about smoking, alcohol drinking, obesity and nutrition, physical activity, hypertension, diabetes, and heart diseases. Participants who were identified as being at high risk of developing or with advanced chronic conditions were referred for follow-up clinical examination.

## **3.6 Data Management and Analyses**

### **3.6.1 Data Entry**

Submitted questionnaires were checked randomly by staff to assess overall quality of data collection and completeness. Data entry was conducted by the survey staff at the Ministry of Health and Medical Services office using the EpiData software configured for double data entry function.

### **3.6.2 Data Weighting and Analysis**

Post-stratification weights were calculated using the 2005 population projections based on Kiribati Census 2000 of the I-Kiribati population aged 15-64 years. This weighting adjusted for certain age/sex stratum being either over- or under-represented in the survey data. Weighted sample means were computed for continuous variables. Frequency distributions were calculated using weighted frequencies for categorical variables. For both weighted frequency estimates and weighted means, 95% confidence intervals were reported by 10-year age groups and gender.

With support from the WHO Office in Suva, WHO Office in Geneva performed final data cleaning, data weighting, and analysis. Data analyses were conducted using the EpiInfo 2002 Version 3.5.1. WHO Office in Suva compiled the whole Data Book.

In this report, we presented data for those aged 25-64 years, following the standard age group reporting for WHO STEPS surveys. Survey results for the age group of 15-24 years were presented at the end of each section of behavioural risk factors.

## 4. RESULTS

### 4.1 Characteristics of Survey Population

The study randomly selected and invited 2000 I-Kiribati aged 15-64 years to participate in the survey. A total of 1755 individuals participated in the survey (response rate of 88%). Data for those aged 25-64 years are reported here, following the standard age group reporting for WHO STEPS surveys.

Table 1 summarises the age and gender distribution of the survey sample. Overall, more women respondents participated in the survey than men: 56.3% and 43.7%, respectively. This pattern is repeated across all age groups. More than half of the survey sample (59%) was aged below 45 years, while only 15.5% of the respondents were in the 55-64 years age group.

**Table 1 Age distribution of survey population by gender**

Age Group (years)	Men		Women		Both Sexes	
	n	%	n	%	n	%
25-34	163	42.0	225	58.0	388	28.2
35-44	186	43.8	239	56.2	425	30.8
45-54	165	47.0	186	53.0	351	25.5
55-64	88	41.1	126	58.9	214	15.5
<b>25-64</b>	<b>602</b>	<b>43.7</b>	<b>776</b>	<b>56.3</b>	<b>1378</b>	<b>100.0</b>

Table 2 summarises the mean years of education of the survey respondents. Both men and women reported similar mean years of education: 8.9 years and 8.2 years, respectively. Years of education are not evenly distributed across the age groups, with the youngest age group (25-34 years) reporting the highest mean years of education (10.2 years), compared with the oldest age group (6.0 years). This pattern is observed for both men and women.

**Table 2 Mean number of years of education by gender and age group**

Age Group (years)	Men		Women		Both Sexes	
	n	Mean	n	Mean	n	Mean
25-34	162	10.0	223	10.3	385	10.2
35-44	186	9.4	237	8.9	423	9.1
45-54	161	7.8	184	6.8	345	7.2
55-64	83	7.4	122	5.1	205	6.0
<b>25-64</b>	<b>592</b>	<b>8.9</b>	<b>766</b>	<b>8.2</b>	<b>1358</b>	<b>8.5</b>

### 4.2 Tobacco Use

Tobacco use was measured by asking participants if they currently smoke tobacco products. Respondents were categorized into the following smoking status:

- Current smokers – those who had smoked any tobacco product (such as cigarettes, cigars or rolled tobacco) in the past 12 months.
- Daily smokers – those who smoke any tobacco product every day.
- Non-daily smokers – those current smokers who do not smoke on a daily basis.

Table 3 shows that 61.3% of respondents were current smokers. The majority of men (75.7%  $\pm$ 4.7) were current smokers, compared to less than half of the women (48.3%  $\pm$ 4.9) surveyed. This gender difference was observed for those aged 25-44 years, with no significant gender difference in people aged 44-64 years. For men, the highest proportion of current smokers was in the 35-44 years age group (80.6%) and for women in the 45-54 years age group (61.6%).

**Table 3 Percentage of current smokers in the study population**

Age Group (years)	Men			Women			Both Sexes		
	n	% Current smoker	95% CI	n	% Current smoker	95% CI	n	% Current smoker	95% CI
25-34	163	74.8	$\pm$ 9.3	225	43.1	$\pm$ 8.1	388	58.1	$\pm$ 6.9
35-44	186	80.6	$\pm$ 6.2	239	46.4	$\pm$ 7.0	425	62.8	$\pm$ 4.4
45-54	164	76.8	$\pm$ 7.1	185	61.6	$\pm$ 8.4	349	69.0	$\pm$ 6.0
55-64	87	62.1	$\pm$ 12.4	126	49.2	$\pm$ 11.0	213	55.1	$\pm$ 8.9
<b>25-64</b>	<b>600</b>	<b>75.7</b>	<b><math>\pm</math>4.7</b>	<b>775</b>	<b>48.3</b>	<b><math>\pm</math>4.9</b>	<b>1375</b>	<b>61.3</b>	<b><math>\pm</math>3.4</b>

Among male current smokers, 74.0% classified themselves as daily smokers. A substantial proportion (74.2%  $\pm$ 9.2) of young men aged 25-34 years were already smoking daily. The proportion of daily smokers peaked at 35-44 years (78.5%  $\pm$ 6.0), decreasing thereafter with a substantial drop occurring in the 55-64 years age group, although the prevalence was still relatively high (59.8%  $\pm$  11.9) (Table 4).

**Table 4 Current smoking status among men in the study population by age group**

Age Group (years)	Men						
	n	Current smoker				% Does not smoke	95% CI
		% Daily	95% CI	% Non-daily	95% CI		
25-34	163	74.2	$\pm$ 9.2	0.6	$\pm$ 1.3	25.2	$\pm$ 9.3
35-44	186	78.5	$\pm$ 6.0	2.2	$\pm$ 1.9	19.4	$\pm$ 6.2
45-54	164	74.4	$\pm$ 8.0	2.4	$\pm$ 2.3	23.2	$\pm$ 7.1
55-64	87	59.8	$\pm$ 11.9	2.3	$\pm$ 3.5	37.9	$\pm$ 12.4
<b>25-64</b>	<b>600</b>	<b>74.0</b>	<b><math>\pm</math>4.9</b>	<b>1.6</b>	<b><math>\pm</math>0.9</b>	<b>24.3</b>	<b><math>\pm</math>4.7</b>

Table 5 shows that among female current smokers, 45.4% were daily smokers. The proportions of daily smokers increased with increasing age, from 40.4% in the youngest age group (25-34 years) to 46.8% in the oldest age group (55-64 years). The highest percentage of daily smokers was within the 45-54 years age group (58.4%).

**Table 5 Current smoking status among women in the study population by age group**

Age Group (years)	Women						
	n	Current smoker				% Does not smoke	95% CI
		% Daily	95% CI	% Non-daily	95% CI		
25-34	225	40.4	$\pm$ 7.6	2.7	$\pm$ 2.0	56.9	$\pm$ 8.1
35-44	239	43.1	$\pm$ 6.3	3.3	$\pm$ 2.5	53.6	$\pm$ 7.0
45-54	185	58.4	$\pm$ 8.4	3.2	$\pm$ 2.7	38.4	$\pm$ 8.4
55-64	126	46.8	$\pm$ 10.7	2.4	$\pm$ 2.7	50.8	$\pm$ 11.0
<b>25-64</b>	<b>775</b>	<b>45.4</b>	<b><math>\pm</math>4.6</b>	<b>3.0</b>	<b><math>\pm</math>1.2</b>	<b>51.7</b>	<b><math>\pm</math>4.9</b>

Table 6 summarises the prevalence of daily, non-daily and non-smokers for men and women combined. Overall, 59.0% of survey respondents were daily smokers, compared with 38.7% of non-smokers and 2.3% of non-daily smokers. The highest proportion of daily smokers (66.2%) was reported in people aged 45-54 years, and the lowest in those aged 55-64 years (52.7%).

**Table 6 Current smoking status among both sexes in the study population by age group**

Age Group (years)	Both Sexes						
	n	Current smoker				% Does not smoke	95% CI
		% Daily	95% CI	% Non-daily	95% CI		
25-34	388	56.4	±6.3	1.7	±1.2	41.9	±6.9
35-44	425	60.0	±4.2	2.8	±1.7	37.2	±4.4
45-54	349	66.2	±6.5	2.9	±1.8	31.0	±6.0
55-64	213	52.7	±8.3	2.3	±1.9	44.9	±8.9
<b>25-64</b>	<b>1375</b>	<b>59.0</b>	<b>±3.4</b>	<b>2.3</b>	<b>±0.7</b>	<b>38.7</b>	<b>±3.4</b>

Among current daily smokers, the mean age of starting smoking for women was 20.5 years (±0.8) and for men was 18.2 years (±0.5), which was significantly lower than women. This gender difference in the mean age of starting smoking was observed in all age groups, with the exception for those people aged 55-64 years. Across both genders, the youngest cohort (25-34 years) reported starting smoking earlier than the older cohorts (Table 7).

**Table 7 Mean age started smoking among current daily smokers**

Age Group (years)	Men			Women			Both Sexes		
	n	Mean age	95% CI	n	Mean age	95% CI	n	Mean age	95% CI
25-34	116	17.4	±0.5	87	18.9	±0.8	203	18.0	±0.5
35-44	135	18.1	±1.0	101	21.1	±1.0	236	19.3	±0.7
45-54	118	19.2	±1.4	107	21.4	±1.3	225	20.2	±1.1
55-64	50	19.8	±2.0	58	21.4	±2.2	108	20.6	±1.4
<b>25-64</b>	<b>419</b>	<b>18.2</b>	<b>±0.5</b>	<b>353</b>	<b>20.5</b>	<b>±0.8</b>	<b>772</b>	<b>19.1</b>	<b>±0.5</b>

Table 8 reveals that among current daily smokers, the mean number of years of smoking was 20.8 years (±0.8). No significant gender difference was noted in the reported duration of smoking, with men smoking for a mean of 21.1 years (±1.0) and women smoking for 20.4 years (±1.0). It should be noted that due to the small numbers of responders in the 55-64 years age group, especially among men, estimates for this age group may be unreliable.

**Table 8 Mean number of years of smoking among current daily smokers**

Age Group (years)	Men			Women			Both Sexes		
	n	Mean duration	95% CI	n	Mean duration	95% CI	n	Mean duration	95% CI
25-34	116	12.2	±0.6	87	11.3	±0.9	203	11.9	±0.5
35-44	135	21.3	±1.0	101	18.2	±1.1	236	20.1	±0.7
45-54	118	29.8	±1.3	107	27.3	±1.4	225	28.7	±1.0
55-64	50	39.0	±2.4	58	37.2	±2.5	108	38.1	±1.5
<b>25-64</b>	<b>419</b>	<b>21.1</b>	<b>±1.0</b>	<b>353</b>	<b>20.4</b>	<b>±1.0</b>	<b>772</b>	<b>20.8</b>	<b>±0.8</b>

Table 9 shows that manufactured cigarettes were the most common cigarettes smoked by current daily smokers: 43.5% (±5.0) of men and 45.7% (±5.4) of women. There were no significant

differences across age groups in the proportions of smokers reporting that they smoked manufactured cigarettes.

**Table 9 Percentage of current daily smokers who smoke manufactured cigarettes**

Age Group (years)	Men			Women			Both Sexes		
	n	% Manufactured cigarette smoker	95% CI	n	% Manufactured cigarette smoker	95% CI	n	% Manufactured cigarette smoker	95% CI
25-34	121	43.0	±9.2	91	51.6	±11.4	212	46.3	±7.5
35-44	146	45.9	±11.7	103	48.5	±8.0	249	46.9	±7.5
45-54	122	41.0	±9.6	108	37.0	±8.4	230	39.2	±5.5
55-64	52	42.3	±9.5	59	39.0	±14.4	111	40.7	±7.3
<b>25-64</b>	<b>441</b>	<b>43.5</b>	<b>±5.0</b>	<b>361</b>	<b>45.7</b>	<b>±5.4</b>	<b>802</b>	<b>44.4</b>	<b>±3.7</b>

Among those aged 15-24 years, 70.9% (±8.0) of men were current smokers compared to 31.8% (±7.9) of women in the same age group. Among current smokers, 46.2% (±5.2) reported smoking on a daily basis. Manufactured cigarettes were smoked by 44.4% of daily smokers.

### 4.3 Alcohol Consumption and Kava Use

This section describes patterns of alcohol consumption and kava use. To assess patterns and prevalence of alcohol consumption, respondents were asked if they ever consumed alcohol, and the frequency and quantity of alcohol consumed. Those who had consumed an alcoholic drink in the past 12 months were classified as current drinkers.

Tables 10-12 summarise the prevalence of alcohol consumption during the past 12 months among men, women and both, respectively. In the 12-month period, 25.5% (±3.5) reported having consumed alcohol (Table 12). There was a significant gender difference in consumption behaviour, with 46.9% (±5.3) of men reported having consumed alcohol in the past 12 months compared with just 6.1% (±2.6) of women (Tables 10 and 11). This pattern was replicated in each age group. Table 10 reveals that the highest proportion of drinking occurred in the 25-34 years age group for men (58.3%) and in the 45-54 years age group for women (8.1%). The prevalence of 12-month drinking decreased with increasing age for men, but for women the proportions tended to fluctuate across age groups; from 7.6% (25-34 years) to 4.2% (35-44 years), peaked to 8.1% (45-54 years) and decreased to 3.2% (55-64 years).

**Table 10 Percentage of alcohol consumption among men during the past 12 months by age group**

Age Group (years)	Men				
	n	% Drank in last 12 months	95% CI	% Abstainer	95% CI
25-34	163	58.3	±8.5	41.7	±8.5
35-44	186	43.5	±8.0	56.5	±8.0
45-54	165	40.0	±10.1	60.0	±10.1
55-64	87	29.9	±10.1	70.1	±10.1
<b>25-64</b>	<b>601</b>	<b>46.9</b>	<b>±5.3</b>	<b>53.1</b>	<b>±5.3</b>

**Table 11 Percentage of alcohol consumption among women during the past 12 months by age group**

Age Group (years)	Women				
	n	% Drank in last 12 months	95% CI	% Abstainer	95% CI
25-34	225	7.6	±4.0	92.4	±4.0
35-44	239	4.2	±3.0	95.8	±3.0
45-54	186	8.1	±4.7	91.9	±4.7
55-64	126	3.2	±3.2	96.8	±3.2
<b>25-64</b>	<b>776</b>	<b>6.1</b>	<b>±2.6</b>	<b>93.9</b>	<b>±2.6</b>

**Table 12 Percentage of alcohol consumption among both sexes during the past 12 months by age group**

Age Group (years)	Both Sexes				
	n	% Drank in last 12 months	95% CI	% Abstainer	95% CI
25-34	388	31.5	±4.9	68.5	±4.9
35-44	425	23.0	±4.7	77.0	±4.7
45-54	351	23.7	±5.9	76.3	±5.9
55-64	213	15.4	±5.9	84.6	±5.9
<b>25-64</b>	<b>1377</b>	<b>25.5</b>	<b>±3.5</b>	<b>74.5</b>	<b>±3.5</b>

**Table 13 Frequency (days) and quantity of drinks consumed in the last 7 days by current (last 30 days) drinker among men**

Age Group (years)	Men						
	n	% Drank on 4+ days	95% CI	% 5+ drinks on any day	95% CI	% 20+ drinks in 7 days	95% CI
25-34	52	7.7	±8.0	76.9	±14.4	25.0	±14.6
35-44	46	8.7	±8.7	69.6	±14.8	21.7	±8.6
45-54	45	4.4	±5.4	71.1	±10.7	13.3	±15.9
55-64	17	11.8	±17.0	52.9	±28.6	23.5	±21.0
<b>25-64</b>	<b>160</b>	<b>7.7</b>	<b>±4.5</b>	<b>71.8</b>	<b>±8.7</b>	<b>21.6</b>	<b>±7.9</b>

Table 13 summarises the frequency (number of drinking days) of alcohol consumed and quantity of drinks consumed (number of drinks on drinking day) by men current drinkers in the last 7 days. Among male current drinkers, 7.7% reported drinking on 4+ days in the last 7 days. Approximately 71.8% (±8.7) reported 'binge drinking', that is drinking 5 or more standard drinks on any day in the past week for males (Table 13). The highest proportion that drank 5 or more standard drinks was in the 25-34 age group (76.9%±14.4). While proportions of binge drinking declined with age, there were no significant differences between groups in the proportions of binge drinking. Table 13 also shows approximately 21.6% of male current drinkers consumed 20 or more drinks during the previous week of the survey. It should be noted that because of the small numbers in this table careful interpretation of the results presented here is required since the estimates are likely to be highly unreliable.

Due to the very small numbers of respondents (n=21), data on the frequency (number of drinking days) of alcohol consumed and quantity of drinks consumed (number of drinks on drinking day) by women current drinkers in the last 7 days are not presented here. In general nearly half (49.2% ±21.8) reported binge drinking, that is consuming 4 or more standard drinks on any day in the last

week for females. This estimate needs careful interpretation because of the small numbers, as evident in the wide confidence intervals.

**Table 14 Number of standard drinks per day among male current drinkers by age group**

Age Group (years)	Men										
	n	% 1 drink	95% CI	% 2-3 drinks	95% CI	% 4-5 drinks	95% CI	% 6+ drinks	95% CI	Mean # standard drinks	95% CI
25-34	94	--	±0.0	1.1	±2.3	11.7	±6.6	87.2	±7.5	12.1	±1.8
35-44	80	2.5	±3.6	2.5	±3.6	15.0	±8.3	80.0	±10.3	11.4	±1.3
45-54	65	--	±0.0	6.2	±9.3	12.3	±6.2	81.5	±9.4	11.1	±1.7
55-64	25	--	±0.0	8.0	±11.5	20.0	±17.7	72.0	±21.9	8.8	±2.4
<b>25-64</b>	<b>264</b>	<b>0.7</b>	<b>±1.1</b>	<b>2.8</b>	<b>±2.7</b>	<b>13.3</b>	<b>±4.3</b>	<b>83.1</b>	<b>±5.7</b>	<b>11.5</b>	<b>±1.0</b>

**Table 15 Number of standard drinks per day among female current drinkers by age group**

Age Group (years)	Women										
	n	% 1 drink	95% CI	% 2-3 drinks	95% CI	% 4-5 drinks	95% CI	% 6+ drinks	95% CI	Mean # standard drinks	95% CI
25-34	17	--	±0.0	5.9	±11.5	29.4	±27.1	64.7	±25.7	8.3	--
35-44	10	20.0	±26.3	20.0	±26.7	20.0	±22.0	40.0	±26.8	5.2	--
45-54	15	6.7	±14.2	33.3	±25.4	26.7	±19.1	33.3	±26.4	6.5	--
55-64	4	25.0	±49.3	25.0	±49.3	---	±0.0	50.0	±56.0	4.5	--
<b>25-64</b>	<b>46</b>	<b>7.5</b>	<b>±8.5</b>	<b>16.9</b>	<b>±12.4</b>	<b>24.9</b>	<b>±14.9</b>	<b>50.7</b>	<b>±14.9</b>	<b>6.9</b>	<b>--</b>

**Table 16 Number of standard drinks per day among current drinkers by age group**

Age Group (years)	Both Sexes										
	n	% 1 drink	95% CI	% 2-3 drinks	95% CI	% 4-5 drinks	95% CI	% 6+ drinks	95% CI	Mean # standard drinks	95% CI
25-34	111	---	±0.0	1.7	±2.5	14.0	±6.2	84.3	±6.8	11.6	±1.6
35-44	90	4.2	±4.2	4.2	±4.8	15.5	±7.1	76.2	±10.5	10.8	±1.4
45-54	80	1.2	±2.2	11.0	±9.3	14.8	±5.9	73.0	±9.6	10.3	±1.5
55-64	29	2.9	±5.7	10.0	±10.5	17.7	±14.3	69.4	±21.5	8.3	±2.3
<b>25-64</b>	<b>310</b>	<b>1.6</b>	<b>±1.3</b>	<b>4.6</b>	<b>±2.8</b>	<b>14.8</b>	<b>±3.4</b>	<b>79.0</b>	<b>±5.0</b>	<b>10.9</b>	<b>±1.0</b>

The survey shows that heavy drinking is more common among I-Kiribati men than women (Tables 14-16). For example, current male drinkers drink an average of 11.5 standard drinks while women drink 6.9 standard drinks per day. The small numbers of female current drinkers (Table 15), however, means that careful interpretation of the results is required since the estimates for this group are likely to be unstable. Among men, more than two thirds (83.1% ±5.7) reported drinking 6 or more drinks per drinking day, followed by a significantly smaller proportion (13.3% ±4.3) who drank 4 to 5 standard drinks. Overall, greater proportions of males in all age groups drank 6 or more standard drinks per drinking day, with the highest proportion found in the 25-34 years age group (87.2%) (Table 14).

**Table 17 Percentage of kava consumption among men during the past 12 months by age group**

Age Group (years)	Men				
	n	% Drank in last 12 months	95% CI	% Abstainer	95% CI
25-34	163	50.3	9.2	49.7	9.2
35-44	186	53.8	8.8	46.2	8.8
45-54	165	28.5	7.9	71.5	7.9
55-64	87	19.5	5.8	80.5	5.8
<b>25-64</b>	<b>601</b>	<b>43.7</b>	<b>5.9</b>	<b>56.3</b>	<b>5.9</b>

**Table 18 Percentage of kava consumption among women during the past 12 months by age group**

Age Group (years)	Women				
	n	% Drank in last 12 months	95% CI	% Abstainer	95% CI
25-34	225	6.2	3.0	93.8	3.0
35-44	239	2.9	2.4	97.1	2.4
45-54	185	4.3	2.6	95.7	2.6
55-64	126	4.0	3.7	96.0	3.7
<b>25-64</b>	<b>775</b>	<b>4.6</b>	<b>1.7</b>	<b>95.4</b>	<b>1.7</b>

**Table 19 Percentage of kava consumption among both sexes during the past 12 months by age group**

Age Group (years)	Both Sexes				
	n	% Drank in last 12 months	95% CI	% Abstainer	95% CI
25-34	388	27.0	5.3	73.0	5.3
35-44	425	27.3	4.9	72.7	4.9
45-54	350	16.2	4.4	83.8	4.4
55-64	213	11.1	3.8	88.9	3.8
<b>25-64</b>	<b>1376</b>	<b>23.2</b>	<b>3.3</b>	<b>76.8</b>	<b>3.3</b>

To determine the prevalence of kava (kawa or nangkona) consumption, respondents were asked if they ever tried or drunk kava in the past 12 months. Overall, 23.2% ( $\pm 3.3$ ) of those surveyed reported having ever tried kava (Table 19). There was a significant gender difference with 43.7% ( $\pm 5.9$ ) of men and 4.6% ( $\pm 1.7$ ) of women reported having tried kava (Tables 17 and 18). Generally, kava drinking was more common among younger men and women (25-44 years) than older cohorts (45-64 years).

The proportion of respondents aged 15-24 years who reported consuming alcohol during the past 12 months was significantly higher in men (66.5%,  $\pm 7.8$ ) than women (14.5%,  $\pm 5.6$ ). Among current drinkers (defined as consumed alcohol in the last 30 days), 74.4% ( $\pm 9.7$ ) of men reported drinking 6 or more drinks on a drinking day, while drinking 2-3 drinks on a drinking day were reported by 39.3% ( $\pm 20.5$ ) of women.

## 4.4 Intake of Fruit and Vegetables

Eating behaviours were assessed by asking respondents how many days they consumed fruit and vegetables in a typical week, and how many servings of each that they consumed on one of those days. Both men and women reported similar mean days of fruits consumed in a typical week, 1.5 ( $\pm 0.2$ ) and 1.6 days ( $\pm 0.1$ ), respectively (Table 20). Across all age groups, men and women reported similar mean days of fruit intake. There were also no significant differences across age groups in mean number of days fruits were consumed.

**Table 20 Mean number of days fruits consumed in a typical week by gender 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
25-34	156	1.6	$\pm 0.3$	213	1.5	$\pm 0.2$	369	1.6	$\pm 0.2$
35-44	173	1.3	$\pm 0.2$	227	1.6	$\pm 0.2$	400	1.5	$\pm 0.2$
45-54	147	1.5	$\pm 0.2$	174	1.5	$\pm 0.2$	321	1.5	$\pm 0.1$
55-64	85	1.5	$\pm 0.4$	113	1.9	$\pm 0.5$	198	1.7	$\pm 0.3$
<b>25-64</b>	<b>561</b>	<b>1.5</b>	<b><math>\pm 0.2</math></b>	<b>727</b>	<b>1.6</b>	<b><math>\pm 0.1</math></b>	<b>1288</b>	<b>1.5</b>	<b><math>\pm 0.1</math></b>

**Table 21 Mean number of days vegetables consumed in a typical week by gender and age group**

Mean number of days vegetables consumed in a typical week									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean number of days	95% CI	n	Mean number of days	95% CI	n	Mean number of days	95% CI
25-34	151	1.9	$\pm 0.3$	193	2.1	$\pm 0.2$	344	2.0	$\pm 0.2$
35-44	161	1.8	$\pm 0.3$	211	2.0	$\pm 0.2$	372	1.9	$\pm 0.2$
45-54	147	1.7	$\pm 0.3$	169	2.3	$\pm 0.3$	316	2.0	$\pm 0.2$
55-64	78	1.7	$\pm 0.3$	107	1.9	$\pm 0.3$	185	1.8	$\pm 0.2$
<b>25-64</b>	<b>537</b>	<b>1.8</b>	<b><math>\pm 0.2</math></b>	<b>680</b>	<b>2.1</b>	<b><math>\pm 0.1</math></b>	<b>1217</b>	<b>1.9</b>	<b><math>\pm 0.1</math></b>

The study population reported an average of 1.9 ( $\pm 0.1$ ) days per week on which vegetables were consumed (Table 21). Overall, the mean days of vegetable consumption was marginally higher among women (2.1 days  $\pm 0.1$ ) than men (1.8 days  $\pm 0.2$ ). For both men and women, the mean number of days of vegetable consumption in a typical week remained stable across age groups.

Tables 22 and 23 show a very low consumption of fruit and vegetables on the day when these food items were eaten. Overall, respondents reported an average of 0.4 servings of fruits and vegetables; both men and women reported consuming the same mean number of fruit and vegetable servings. For fruits intake: men 0.4 serves ( $\pm 0.1$ ) and women 0.4 serves ( $\pm 0.0$ ); and for vegetable intake: men 0.4 serves ( $\pm 0.1$ ) and women 0.4 serves ( $\pm 0.1$ ). Notably, all age groups reported consuming similar mean number of fruit and vegetable servings (0.4 serves).

**Table 22 Mean number of servings of fruits consumed on a day when fruits were eaten**

Age Group (years)	Men			Women			Both Sexes		
	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI
25-34	156	0.5	±0.1	213	0.4	±0.1	369	0.4	±0.1
35-44	173	0.4	±0.1	227	0.4	±0.1	400	0.4	±0.1
45-54	147	0.4	±0.1	174	0.4	±0.1	321	0.4	±0.1
55-64	85	0.4	±0.1	113	0.4	±0.1	198	0.4	±0.1
<b>25-64</b>	<b>561</b>	<b>0.4</b>	<b>±0.1</b>	<b>727</b>	<b>0.4</b>	<b>±0.0</b>	<b>1288</b>	<b>0.4</b>	<b>±0.0</b>

**Table 23 Mean number of servings of vegetables consumed on a day when vegetables were eaten**

Age Group (years)	Men			Women			Both Sexes		
	n	Mean number servings	95% CI	n	Mean number servings	95% CI	n	Mean number servings	95% CI
25-34	151	0.4	±0.1	193	0.4	±0.1	344	0.4	±0.1
35-44	161	0.4	±0.1	211	0.4	±0.1	372	0.4	±0.1
45-54	147	0.4	±0.1	169	0.4	±0.1	316	0.4	±0.1
55-64	78	0.4	±0.1	107	0.4	±0.1	185	0.4	±0.1
<b>25-64</b>	<b>537</b>	<b>0.4</b>	<b>±0.1</b>	<b>680</b>	<b>0.4</b>	<b>±0.0</b>	<b>1217</b>	<b>0.4</b>	<b>±0.0</b>

**Table 24 Mean number of combined servings of fruit and vegetables consumed per day of the week**

Age Group (years)	Men			Women			Both Sexes		
	n	Mean number servings	95% CI	n	Mean number servings	95% CI	n	Mean number servings	95% CI
25-34	158	0.9	±0.2	218	0.7	±0.1	376	0.8	±0.1
35-44	177	0.7	±0.1	233	0.8	±0.1	410	0.8	±0.1
45-54	159	0.7	±0.1	180	0.7	±0.1	339	0.7	±0.1
55-64	85	0.7	±0.1	119	0.7	±0.2	204	0.7	±0.1
<b>25-64</b>	<b>579</b>	<b>0.8</b>	<b>±0.1</b>	<b>750</b>	<b>0.8</b>	<b>±0.1</b>	<b>1329</b>	<b>0.8</b>	<b>±0.1</b>

Table 24 shows that the average servings of combined fruit and vegetables consumption per day were well below the recommended levels across all age groups. Overall, respondents reported consuming an average of 0.8 serves of combined fruit and vegetables. Both men and women reported the same mean number of servings of fruit and vegetables (0.8 serves ±0.1) on a day that fruit and vegetables were eaten. Across both genders, the reported mean numbers of combined fruit and vegetable servings were similar with very marginal and statistically non-significant differences across age groups.

**Table 25 Percentage who consumed less than five combined servings of fruit and vegetables per day of the week**

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	158	98.1	±1.9	218	99.5	±0.9	376	98.9	±1.1
35-44	177	100.0	±0.0	233	99.1	±1.3	410	99.5	±0.7
45-54	159	100.0	±0.0	180	99.4	±1.1	339	99.7	±0.6
55-64	85	98.8	±2.2	119	100.0	±0.0	204	99.5	±1.1
<b>25-64</b>	<b>579</b>	<b>99.2</b>	<b>±0.8</b>	<b>750</b>	<b>99.4</b>	<b>±0.5</b>	<b>1329</b>	<b>99.3</b>	<b>±0.4</b>

Table 25 shows that 99.3% (±0.4) of respondents across both genders consumed less than five combined servings of fruit and vegetables per day of the week. No difference in proportions was noted between men (99.2% ±0.8) and women (99.4% ±0.5). The high proportions of respondents reporting consuming less than the recommended five combined servings of fruit and vegetables per day of the week were constant and similar from younger to older cohorts, ranging from 98.1% to 100.0% among men and from 99.1% to 100.0% among women.

In the age group 15-24 years, men and women reported similar mean days of fruit and vegetables intake in a typical week, averaging 1.7 days (±0.3) and 2.0 days (±0.2), respectively. On the day that fruit and vegetables were consumed, the mean number of fruit servings for both men and women was 0.5 (±0.1) and for vegetables was 0.4 (±0.1). For both genders, 100% of respondents reported consuming less than the recommended amount of five combined servings of fruit and vegetables per given day of the week.

## 4.5 Physical Activity

### 4.5.1 Measurements

Survey participants were asked how often (frequency) and how long (duration) they engaged in three domains of physical activity: during recreation or leisure time, work and transport in a typical week. In the work and leisure domains, respondents were asked how many days per week and how many hours/minutes per day they participate in moderate- and vigorous-intensity activities. In the transport domain, respondents were asked how often and how long they either walk and/ or cycle to and from places.

### 4.5.2 Analyses

The three physical activity domains were first examined separately to determine the proportion of activity undertaken in each domain as a component of the total physical activity. For each domain, three levels of activity were created: low active, moderately active, and highly active<sup>6</sup>. In each domain, the total time participants spent in an activity per week was computed by multiplying the number of days by the duration of the activity. To account for the different levels of energy expenditure required to the activities (i.e. moderate or vigorous), the daily duration of activity was then converted into METminutes per day. The term MET (metabolic equivalent) is used as an indication of the intensity of physical activity. A MET is the ratio of the associated metabolic rate for a specific activity divided by the resting metabolic rate. So the energy cost of sitting is equivalent to a resting metabolic rate of 1 MET.

In this report, the following MET values were allocated to the three physical activity domains:

Moderate physical activity (work and leisure domain) = 4.0 METS  
 Vigorous physical activity (work and leisure domain) = 8.0 METS  
 Travel related walking/cycling = 4.0 METS

The following levels of activity in terms of METminutes were defined as:

Low active: <600 METminutes per week  
 Moderately active: 600-1500 METminutes per week  
 Highly active: >1500 METminutes per week

### 4.5.3 Levels of Physical Activity

Table 26 indicates that 41.8% ( $\pm 3.8$ ) of men reported a low level of total physical activity which combined their physical activity done as part of work, transport and leisure time. Moderate level of physical activity was reported by 28.1% ( $\pm 3.9$ ) and high level of physical activity by 30.1% ( $\pm 5.5$ ) of men. The proportions of low total physical activity generally increased with increasing age, while the proportions reporting moderate level of physical activity fluctuated across age groups. For high level of total physical activity, the proportions declined with increasing age but there was no significant difference across all the age groups.

**Table 26 Categories of total physical activity among men by age group**

Age Group (years)	Men						
	n	% Low	95% CI	% Moderate	95% CI	% High	95% CI
25-34	147	39.5	$\pm 6.9$	28.6	$\pm 8.4$	32.0	$\pm 9.8$
35-44	165	36.4	$\pm 8.6$	33.3	$\pm 7.8$	30.3	$\pm 6.8$
45-54	149	49.7	$\pm 7.4$	20.1	$\pm 7.7$	30.2	$\pm 7.5$
55-64	81	50.6	$\pm 11.0$	25.9	$\pm 7.3$	23.5	$\pm 8.0$
<b>25-64</b>	<b>542</b>	<b>41.8</b>	<b><math>\pm 3.8</math></b>	<b>28.1</b>	<b><math>\pm 3.9</math></b>	<b>30.1</b>	<b><math>\pm 5.5</math></b>

**Table 27 Categories of total physical activity among women by age group**

Age Group (years)	Women						
	n	% Low	95% CI	% Moderate	95% CI	% High	95% CI
25-34	216	54.2	$\pm 7.3$	25.5	$\pm 5.3$	20.4	$\pm 6.5$
35-44	231	59.3	$\pm 7.7$	27.3	$\pm 5.9$	13.4	$\pm 4.6$
45-54	179	61.5	$\pm 7.1$	25.1	$\pm 7.2$	13.4	$\pm 6.0$
55-64	120	55.0	$\pm 7.3$	26.7	$\pm 6.1$	18.3	$\pm 4.7$
<b>25-64</b>	<b>746</b>	<b>57.3</b>	<b><math>\pm 3.4</math></b>	<b>26.1</b>	<b><math>\pm 2.8</math></b>	<b>16.6</b>	<b><math>\pm 3.1</math></b>

A significantly greater proportion of women (57.3%  $\pm 3.4$ ) was classified as engaging in low levels of physical activity, compared to men (41.8%  $\pm 3.8$ ) (Tables 26 and 27, respectively). Approximately 26.1% ( $\pm 2.8$ ) of women reported a moderate level of physical activity, which was not significantly different from that reported by men (28.1%  $\pm 3.9$ ). Only 16.6% ( $\pm 3.1$ ) of women reported a high level of physical activity, a proportion significantly lower than that reported by men (30.1%  $\pm 5.5$ ).

Table 28 shows that overall, about half (50.1%  $\pm 2.5$ ) of the study population reported a low level of physical activity. Just over one quarter (27.0%  $\pm 2.6$ ) of I-Kiribati aged 25-64 years engaged in moderate level of physical activity, and only 22.8% ( $\pm 3.1$ ) participated in high level of physical activity. For both categories of total physical activity, there were no significant differences in reported proportions of moderate or high activity across age groups.

**Table 28 Categories of total physical activity among both sexes by age group**

Age Group (years)	Both Sexes						
	n	% Low	95% CI	% Moderate	95% CI	% High	95% CI
25-34	363	47.5	±4.8	26.9	±5.5	25.7	±5.9
35-44	396	48.8	±5.6	30.0	±4.1	21.1	±4.2
45-54	328	55.9	±4.5	22.8	±4.7	21.3	±5.1
55-64	201	53.0	±5.4	26.3	±4.4	20.6	±4.2
<b>25-64</b>	<b>1288</b>	<b>50.1</b>	<b>±2.5</b>	<b>27.0</b>	<b>±2.6</b>	<b>22.8</b>	<b>±3.1</b>

**Table 29 Mean minutes of total physical activity (mean METminutes per day) by gender and age group**

Age Group (years)	Men			Women			Both Sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
25-34	147	83.8	±18.5	216	66.7	±13.1	363	74.5	±10.4
35-44	165	82.8	±14.6	231	50.0	±10.9	396	65.0	±9.5
45-54	149	82.8	±17.1	179	45.8	±10.1	328	63.3	±10.7
55-64	81	83.3	±28.7	120	60.1	±10.0	201	70.6	±14.4
<b>25-64</b>	<b>542</b>	<b>83.3</b>	<b>±10.9</b>	<b>746</b>	<b>56.8</b>	<b>±6.9</b>	<b>1288</b>	<b>68.9</b>	<b>±6.8</b>

Table 29 summarises mean minutes of total physical activity (across all three domains) in METminutes per day by gender. Overall, the surveyed population reported an average of 68.9 (±6.8) minutes per day spent in total physical activity. There was a significant gender difference with men engaged in physical activity for a mean of 83.3 (±10.9) minutes per day, and women for a mean of 56.8 (±6.9) minutes per day.

Tables 30-32 present results on mean minutes per day engaged in work-, transport- and recreation-related physical activity. Table 30 shows that work-related physical activities comprised 48.0 minutes/day for men and 31.5 minutes/day for women. Across all age groups, men reported engaging in more minutes of physical activity as part of their work than women. Table 31 indicates that transport-related physical activities averaged 28.4 minutes/day for men and 22.5 minutes/day for women. Although men tended to engage in more active transport than women across most age groups, this difference was not statistically significant. Table 32 shows that I-Kiribati engaged in very low levels of leisure-related physical activities, averaging 6.8 minutes/day for men and 2.8 minutes/day for women. Thus, most physical activity in Kiribati was undertaken as part of work, and to a lesser extent, as part of transport. Leisure-time physical activity contributed very little to the total time spent doing physical activity.

**Table 30 Mean minutes of work-related physical activity  
(mean METminutes per day) by gender and age group**

Age Group (years)	Men			Women			Both Sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
25-34	147	43.0	±14.6	216	37.9	±9.5	363	40.2	±7.9
35-44	165	48.0	±11.7	231	27.1	±9.8	396	36.7	±8.3
45-54	149	54.8	±16.1	179	19.5	±9.0	328	36.2	±10.8
55-64	81	52.9	±27.8	120	41.5	±11.2	201	46.7	±14.7
<b>25-64</b>	<b>542</b>	<b>48.0</b>	<b>±9.0</b>	<b>746</b>	<b>31.5</b>	<b>±5.4</b>	<b>1288</b>	<b>39.1</b>	<b>±5.4</b>

**Table 31 Mean minutes of transport-related physical activity  
(mean METminutes per day) by gender and age group**

Age Group (years)	Men			Women			Both Sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
25-34	147	30.6	±11.7	216	23.1	±4.3	363	26.5	±6.9
35-44	165	28.5	±8.5	231	21.1	±5.2	396	24.5	±4.7
45-54	149	24.4	±7.1	179	26.0	±7.7	328	25.2	±5.8
55-64	81	28.3	±12.6	120	18.5	±3.7	201	22.9	±5.6
<b>25-64</b>	<b>542</b>	<b>28.4</b>	<b>±6.1</b>	<b>746</b>	<b>22.5</b>	<b>±3.1</b>	<b>1288</b>	<b>25.2</b>	<b>±3.7</b>

**Table 32 Mean minutes of recreation-related physical activity  
(mean METminutes per day) by gender and age group**

Age Group (years)	Men			Women			Both Sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
25-34	147	10.3	±5.4	216	5.7	±4.4	363	7.8	±3.2
35-44	165	6.3	±3.2	231	1.8	±1.7	396	3.8	±1.9
45-54	149	3.6	±2.3	179	0.3	±0.6	328	1.9	±1.1
55-64	81	2.1	±2.9	120	0.1	±0.2	201	1.0	±1.3
<b>25-64</b>	<b>542</b>	<b>6.8</b>	<b>±2.4</b>	<b>746</b>	<b>2.8</b>	<b>±1.8</b>	<b>1288</b>	<b>4.6</b>	<b>±1.4</b>

For respondents aged 15-24 years, 54.9% (±9.0) of men reported a high level of total physical activity, compared with 22.3% (±6.6) of women in the same age group. Moderate level of total physical activity was reported by 23.8% (±6.7) of men and 35.3% (±7.5) of women. The proportion of low physical activity was significantly higher among women in this age group (42.4% ±8.0) than men (21.3% ±7.2). There was a significant gender difference in the mean minutes of total physical activity per day, with men engaged in total physical activity for an average of 118.6 (±19.6) minutes per day, and women for an average of 75.9 (±13.5) minutes per day.

Also in this age group, work-related physical activities comprised 53.0 (±13.1) minutes per day for men, compared with 31.5 (±11.2) minutes per day for women. For transport-related physical activities, however, both men and women reported similar duration spent engaging in this dimension of physical activities, averaging 34.9 (±9.1) minutes per day and 32.2 (±9.6) minutes per day, respectively. For leisure-related physical activities, women spent less time than men engaging in this physical activity domain, with women reporting doing an average of 12.2 (±6.9) minutes per day of leisure-time

physical activities compared to an average of 30.7 ( $\pm 11.5$ ) minutes per day reported by men. Overall, most physical activity among those aged 15-24 years was undertaken as part of work (for men) and transport (for women). Among women, leisure-time physical activity contributed around 16% to the total mean minutes spent doing physical activity, compared with approximately 26% for men.

## 4.6 Overweight and Obesity

Height and weight of each participant were measured following the standardised STEPS protocol outlined in the Methodology section of this report. The body mass index (BMI) of each participant was computed by dividing the weight (kilograms) by the square of the height (metres<sup>2</sup>). The BMI risk categories were defined as follows:

Underweight	BMI < 18.5
Normal weight	18.5 $\leq$ BMI $\leq$ 24.9
Overweight	BMI $\geq$ 25.0
Obese	BMI $\geq$ 30.0

### 4.6.1 Height and Weight

Tables 33 and 34 indicate that I-Kiribati men aged 25-64 years were significantly taller (169.0cm  $\pm 0.6$ ) and heavier (84.0kg  $\pm 1.6$ ) than women (158.4cm  $\pm 0.5$ , 79.6kg  $\pm 1.3$ ). For both genders, younger cohorts were marginally taller and heavier than the older cohorts. For men, mean weight peaked in the 35-44 year group (86.1kg  $\pm 2.8$ ). For women, those in the 25-34 years age group and in the 45-54 years age group experienced the highest mean weight (80.6kg  $\pm 2.5$  and 80.6  $\pm 2.9$ , respectively) compared to other age groups. With the exception of the 35-44 years age group, there were no significant differences in mean weight between men and women across age groups.

**Table 33 Mean height (cm) by gender and age group**

Age Group (years)	Men			Women		
	n	Mean	95% CI	n	Mean	95% CI
25-34	163	169.8	$\pm 0.8$	225	158.6	$\pm 0.6$
35-44	184	169.3	$\pm 0.9$	239	159.1	$\pm 0.7$
45-54	164	168.1	$\pm 0.9$	186	158.1	$\pm 1.1$
55-64	87	167.3	$\pm 1.5$	125	156.8	$\pm 1.2$
<b>25-64</b>	<b>598</b>	<b>169.0</b>	<b><math>\pm 0.6</math></b>	<b>775</b>	<b>158.4</b>	<b><math>\pm 0.5</math></b>

**Table 34 Mean weight (kg) by gender and age group**

Age Group (years)	Men			Women		
	n	Mean	95% CI	n	Mean	95% CI
25-34	162	84.0	$\pm 2.5$	215	80.6	$\pm 2.5$
35-44	184	86.1	$\pm 2.8$	232	79.9	$\pm 1.9$
45-54	164	82.3	$\pm 2.3$	184	80.6	$\pm 2.9$
55-64	87	81.3	$\pm 3.9$	126	74.5	$\pm 3.2$
<b>25-64</b>	<b>597</b>	<b>84.0</b>	<b><math>\pm 1.6</math></b>	<b>757</b>	<b>79.6</b>	<b><math>\pm 1.3</math></b>

### 4.6.2 Body Mass Index Categories

The distributions of mean BMI for men and women and combined are presented in Table 35. The overall mean BMI of the surveyed population was 30.5 kg/m<sup>2</sup> ( $\pm 0.4$ ). Women had a significantly higher mean BMI (31.5 kg/m<sup>2</sup>  $\pm 0.5$ ) than men (29.4 kg/m<sup>2</sup>  $\pm 0.6$ ). This gender difference was evident

for two age groups: 25-34 and 45-54 years age groups. For men, there were no significant differences in mean BMI across age groups. For women, younger age cohorts (31.9 kg/m<sup>2</sup> ±1.0 for 25-34 years age group and 31.5 kg/m<sup>2</sup> ±0.9 for 35-44 years age group) were significantly greater than their older age cohorts (31.7 kg/m<sup>2</sup> ±0.9 for 45-54 years age group and 30.0 kg/m<sup>2</sup> ±0.9 for 55-64 years age group).

**Table 35 Mean body mass index (kg/m<sup>2</sup>) by gender and age group**

Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
25-34	162	29.1	±0.9	215	31.9	±1.0	377	30.6	±0.6
35-44	184	30.0	±1.0	232	31.5	±0.9	416	30.8	±0.7
45-54	164	29.1	±0.8	182	31.7	±0.9	346	30.4	±0.6
55-64	87	29.0	±1.2	125	30.0	±0.9	212	29.6	±0.8
<b>25-64</b>	<b>597</b>	<b>29.4</b>	<b>±0.6</b>	<b>754</b>	<b>31.5</b>	<b>±0.5</b>	<b>1351</b>	<b>30.5</b>	<b>±0.4</b>

**Table 36 Body mass index classifications among men by age group**

Age Group (years)	n	<18.5		18.5-24.9		≥25.0	
		%	95% CI	%	95% CI	%	95% CI
25-34	162	--	±0.0	24.7	±8.1	75.3	±8.1
35-44	184	0.5	±1.1	19.0	±6.9	80.4	±6.9
45-54	164	0.6	±1.3	20.1	±6.8	79.3	±6.7
55-64	87	--	±0.0	20.7	±10.5	79.3	±10.5
<b>25-64</b>	<b>597</b>	<b>0.3</b>	<b>±0.4</b>	<b>21.6</b>	<b>±4.5</b>	<b>78.2</b>	<b>±4.6</b>

**Table 37 Body mass index classifications among women by age group**

Age Group (years)	n	<18.5		18.5-24.9		≥25.0	
		%	95% CI	%	95% CI	%	95% CI
25-34	215	0.5	±0.9	14.0	±5.5	85.6	±5.6
35-44	232	0.4	±0.9	13.8	±4.2	85.8	±4.4
45-54	182	--	±0.0	12.6	±5.2	87.4	±5.2
55-64	125	2.4	±2.8	23.2	±6.3	74.4	±5.9
<b>25-64</b>	<b>754</b>	<b>0.6</b>	<b>±0.7</b>	<b>14.8</b>	<b>±3.0</b>	<b>84.6</b>	<b>±2.9</b>

**Table 38 Body mass index classifications among both sexes by age group**

Age Group (years)	n	<18.5		18.5-24.9		≥25.0	
		%	95% CI	%	95% CI	%	95% CI
25-34	377	0.2	±0.5	19.1	±4.7	80.6	±4.7
35-44	416	0.5	±0.7	16.3	±4.2	83.2	±4.2
45-54	346	0.3	±0.6	16.3	±4.2	83.4	±4.2
55-64	212	1.3	±1.5	22.0	±6.6	76.7	±6.7
<b>25-64</b>	<b>1351</b>	<b>0.5</b>	<b>±0.4</b>	<b>18.0</b>	<b>±2.7</b>	<b>81.5</b>	<b>±2.7</b>

Tables 36-38 summarise the proportion of the surveyed population in each BMI category for men, women and both sexes. Overall, the proportion of the surveyed population classified as being in the normal weight category (18.5 ≤ BMI ≤ 24.9) was 18.0 (±2.7); 21.6% (±4.5) of men and 14.8% (±3.0) of women. This difference was not statistically significant. The proportion of the population classified

as being overweight ( $\geq 25.0$ ) was 81.5% ( $\pm 2.7$ ). There was a significantly higher proportion of overweight women (84.6%  $\pm 2.9$ ) as compared to overweight men (78.2%  $\pm 4.6$ ).

The prevalence of overweight in women aged 25-34 years was at a relatively high level of 85.6%, increasing to 87.4% in the 45-54 years age group before declining to 74.4% in the 55-64 years age group. The highest prevalence of overweight men was in the 35-44 years age group (80.4%), with the prevalence declining marginally with increasing age to 79.3% in the 55-64 years age group.

**Table 39 Percentage of obesity (BMI $\geq 30$  kg/m<sup>2</sup>) by gender and age group**

Age Group (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	162	37.7	$\pm 10.2$	215	61.4	$\pm 7.4$	377	50.0	$\pm 5.6$
35-44	184	46.7	$\pm 7.2$	232	58.6	$\pm 7.0$	416	52.9	$\pm 5.2$
45-54	164	43.9	$\pm 6.8$	182	60.4	$\pm 7.8$	346	52.3	$\pm 5.2$
55-64	87	36.8	$\pm 11.4$	125	49.6	$\pm 7.0$	212	43.7	$\pm 6.6$
<b>25-64</b>	<b>597</b>	<b>41.7</b>	<b><math>\pm 4.6</math></b>	<b>754</b>	<b>58.9</b>	<b><math>\pm 4.2</math></b>	<b>1351</b>	<b>50.6</b>	<b><math>\pm 3.3</math></b>

Table 39 presents rates of obesity (BMI  $\geq 30$  kg/m<sup>2</sup>) in Kiribati. The overall prevalence of obesity among I-Kiribati was 50.6% ( $\pm 3.3$ ). The obesity rate was significantly higher among women (58.9%  $\pm 4.2$ ) than among men (41.7%  $\pm 4.6$ ). The highest prevalence of obese women (61.4%) was in the youngest age group (25-34 years). For men, this at-risk weight gain peaked slightly later to 46.7% in the 35-44 years age group.

#### 4.6.3 Waist circumference

Considered as a risk factor for cardiovascular diseases, waist circumference was assessed as a measure of central obesity. Table 40 reports the mean waist circumference for both women and men. Women had a significantly higher mean waist circumference (97.3cm  $\pm 1.3$ ) than men (94.2cm  $\pm 1.5$ ). Generally, women reported higher mean waist circumference than men across all age groups, except in the oldest age cohort. While mean waist circumferences increased with age among men, the pattern was more stable for women which peaked to 99.3cm ( $\pm 1.8$ ) in the 45-54 years age group and dropped to 96.4cm ( $\pm 2.3$ ) in the 55-64 years age group.

**Table 40 Mean waist circumference (cm) by gender and age group**

Age Group (years)	Men			Women		
	n	Mean	95% CI	n	Mean	95% CI
25-34	161	91.4	$\pm 2.3$	212	96.8	$\pm 2.2$
35-44	182	95.8	$\pm 2.1$	228	96.9	$\pm 2.1$
45-54	160	95.5	$\pm 2.0$	186	99.3	$\pm 1.8$
55-64	87	96.9	$\pm 3.4$	126	96.4	$\pm 2.3$
<b>25-64</b>	<b>590</b>	<b>94.2</b>	<b><math>\pm 1.5</math></b>	<b>752</b>	<b>97.3</b>	<b><math>\pm 1.3</math></b>

## 4.7 Blood Pressure and Hypertension

As part of the Step 2 protocol, all survey participants had their blood pressure measured. Participants were also asked if they had their blood pressure measured in the last 12 months, within the last 1-5 years or longer, whether they had ever been told in the last 12 months by a health worker that they had high blood pressure, and if they were currently receiving any medical treatment for high blood pressure.

For this report, the prevalence of hypertension was computed to include those with:

- a mean systolic pressure  $\geq 140$  mmHg, whether or not they had previously been told by a health worker that they had high blood pressure, OR
- a mean diastolic pressure  $\geq 90$  mmHg, whether or not they had previously been told by a health worker that they had high blood pressure, OR
- normal mean systolic and diastolic pressures (i.e. normotensive) AND who were currently receiving anti-hypertensive medication, whether or not they had previously been told by a health worker that they had high blood pressure.

Those participants who reported having been previously told by a health worker that they had high blood pressure but who were normotensive and NOT on anti-hypertensive medication were NOT included among those considered to have hypertension.

Tables 41 and 42 indicate a significant gender difference in systolic and diastolic blood pressure, with men having higher mean resting blood pressure (125.1/78.2mmHg) than women (115.2/75.3mmHg). Mean resting systolic blood pressure increased with increasing age in both genders with the oldest age group having the highest systolic blood pressure. Mean resting diastolic blood pressure also increased with age, especially among men while among women the mean diastolic blood pressure peaked in 35-44 years age group to 76.5mmHg and remained at this level throughout the older age groups.

**Table 41 Mean resting systolic blood pressure (mmHg) by gender and age group**

Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
25-34	161	123.0	$\pm 1.6$	223	110.3	$\pm 1.2$	384	116.3	$\pm 1.0$
35-44	178	125.1	$\pm 1.9$	233	116.0	$\pm 1.4$	411	120.3	$\pm 1.1$
45-54	157	125.2	$\pm 2.4$	175	118.9	$\pm 3.0$	332	122.0	$\pm 2.2$
55-64	85	132.0	$\pm 3.9$	118	123.6	$\pm 4.7$	203	127.5	$\pm 2.8$
<b>25-64</b>	<b>581</b>	<b>125.1</b>	<b><math>\pm 0.9</math></b>	<b>749</b>	<b>115.2</b>	<b><math>\pm 1.0</math></b>	<b>1330</b>	<b>119.9</b>	<b><math>\pm 0.7</math></b>

**Table 42 Mean resting diastolic blood pressure (mmHg) by gender and age group**

Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
25-34	161	75.9	$\pm 1.6$	223	73.4	$\pm 1.4$	384	74.6	$\pm 1.1$
35-44	178	79.2	$\pm 1.3$	234	76.5	$\pm 1.5$	412	77.8	$\pm 1.2$
45-54	156	79.9	$\pm 1.9$	175	76.5	$\pm 1.8$	331	78.2	$\pm 1.5$
55-64	85	80.9	$\pm 2.9$	117	76.4	$\pm 2.8$	202	78.5	$\pm 2.2$
<b>25-64</b>	<b>580</b>	<b>78.2</b>	<b><math>\pm 0.9</math></b>	<b>749</b>	<b>75.3</b>	<b><math>\pm 0.9</math></b>	<b>1329</b>	<b>76.7</b>	<b><math>\pm 0.8</math></b>

**Table 43 Percentage with hypertension  
(SBP  $\geq$ 140 and/or DBP  $\geq$  90 mmHg or  
currently on medication for raised blood pressure)**

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	163	14.1	$\pm$ 4.8	225	7.1	$\pm$ 2.7	388	10.4	$\pm$ 2.7
35-44	185	18.9	$\pm$ 4.6	237	16.9	$\pm$ 4.4	422	17.9	$\pm$ 3.3
45-54	164	24.4	$\pm$ 7.5	182	17.6	$\pm$ 6.9	346	20.9	$\pm$ 6.1
55-64	88	43.2	$\pm$ 12.7	124	23.4	$\pm$ 10.3	212	32.6	$\pm$ 8.3
<b>25-64</b>	<b>600</b>	<b>20.9</b>	<b><math>\pm</math>3.4</b>	<b>768</b>	<b>14.0</b>	<b><math>\pm</math>3.0</b>	<b>1368</b>	<b>17.3</b>	<b><math>\pm</math>2.3</b>

Table 43 summarises the prevalence of hypertension among the 25-64 year olds, according to measured blood pressure and those currently on medical for raised blood pressure. Overall, hypertension was more common among men than women, 20.9% ( $\pm$ 3.4) and 14.0% ( $\pm$ 3.0), respectively. The prevalence of hypertension increased with increasing age for both men and women, with nearly a three-fold increase in the prevalence in the oldest age group compared to the youngest age group. That is, for men from 14.1% ( $\pm$ 4.8) in the 25-34 years age group to 43.2% ( $\pm$ 12.7) in the 55-64 years age group, and for women from 7.1% ( $\pm$ 2.7) to 23.4% ( $\pm$ 10.3).

#### 4.8 Fasting Blood Glucose and Diabetes

All participants were asked if they had been told by a health worker that they had diabetes in the previous 12 months, within 1-5 years or longer, and whether they were currently receiving medical treatment for diabetes. Capillary whole blood drawn using the method of finger prick was also collected from participants to assess their fasting blood sugar level.

Estimates of diabetes prevalence were computed based on the capillary whole blood and following the WHO guidelines for defining and classifying diabetes mellitus<sup>7</sup>:

- fasting capillary whole blood value of glucose greater than or equal to  $\geq$ 6.1 mmol/L ( $\geq$ 110 mg/dl) whether or not they had previously been told by a health worker that they had diabetes, OR
- normal capillary whole blood value of glucose  $<$ 6.1 mmol/L ( $<$ 110 mg/dl) AND who were currently receiving anti-diabetes medication prescribed by a health worker.

Those participants who had been advised by a health worker that they had diabetes but who had normal fasting blood glucose, and those who were NOT on anti-diabetes medication or on a special diet prescribed by a health worker, were included among those considered as having diabetes.

**Table 44 Mean fasting blood glucose (mmol/L) by gender and age group**

Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
25-34	137	5.4	$\pm$ 0.2	181	5.3	$\pm$ 0.3	318	5.3	$\pm$ 0.2
35-44	150	6.0	$\pm$ 0.4	190	5.8	$\pm$ 0.3	340	5.9	$\pm$ 0.3
45-54	119	6.8	$\pm$ 0.5	134	6.2	$\pm$ 0.4	253	6.5	$\pm$ 0.4
55-64	67	7.2	$\pm$ 0.8	96	6.6	$\pm$ 0.7	163	6.8	$\pm$ 0.4
<b>25-64</b>	<b>473</b>	<b>6.0</b>	<b><math>\pm</math>0.2</b>	<b>601</b>	<b>5.8</b>	<b><math>\pm</math>0.2</b>	<b>1074</b>	<b>5.9</b>	<b><math>\pm</math>0.2</b>

Table 44 summarises results on mean fasting blood glucose for men and women and both genders. The overall mean fasting blood glucose was 5.9 mmol/L. Men reported a marginally higher mean fasting glucose level (6.0 mmol/L  $\pm$  0.2) than women (5.8 mmol/L  $\pm$  0.2), although this difference was not statistically significant. For both men and women, mean fasting blood glucose levels increased with increasing age and peaked in the oldest age group.

**Table 45 Prevalence of diabetes by gender and age group  
(Raised blood glucose or currently on medication  
for diabetes and/or diagnosed with diabetes\*)**

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	137	12.4	$\pm$ 5.6	183	14.2	$\pm$ 6.2	320	13.3	$\pm$ 4.4
35-44	155	27.7	$\pm$ 6.7	201	27.9	$\pm$ 6.3	356	27.8	$\pm$ 5.1
45-54	133	49.6	$\pm$ 9.7	150	36.7	$\pm$ 6.3	283	43.0	$\pm$ 5.8
55-64	76	57.9	$\pm$ 14.3	111	46.8	$\pm$ 10.0	187	51.9	$\pm$ 7.9
<b>25-64</b>	<b>501</b>	<b>29.6</b>	<b><math>\pm</math>3.9</b>	<b>645</b>	<b>26.7</b>	<b><math>\pm</math>3.5</b>	<b>1146</b>	<b>28.1</b>	<b><math>\pm</math>3.3</b>

\* capillary whole blood value:  $\geq$  6.1 mmol/L (110 mg/dl)

Table 45 shows the overall prevalence of diabetes among I-Kiribati aged 25-64 years was 28.1% ( $\pm$ 3.3). While men indicated a higher diabetes rate than women, this difference was not significant statistically (29.6%  $\pm$ 3.9 and 26.7%  $\pm$ 3.5, respectively). The prevalence of diabetes increased with increasing age across both genders. For men, a substantial and significant increase in diabetes prevalence occurred between the age of 35-44 years and 45-54 years, from 27.7% ( $\pm$ 6.7) to 49.6% ( $\pm$ 9.7), respectively. For women, diabetes prevalence rates between the ages of 25-34 years to 35-44 years almost doubled, from 14.2% ( $\pm$ 6.2) to 27.9% ( $\pm$ 6.3), respectively.

## 4.9 Total Cholesterol

For elevated total blood cholesterol, a cut-off point  $\geq$ 5.0 mmol/L (or  $\geq$ 190 mg/dl) was used to classify participants as being in a high-risk group for coronary artery disease.

**Table 46 Mean total blood cholesterol (mmol/L) by gender and age group**

Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
25-34	58	4.4	$\pm$ 0.1	90	4.6	$\pm$ 0.3	148	4.5	$\pm$ 0.1
35-44	84	4.7	$\pm$ 0.2	141	4.7	$\pm$ 0.1	225	4.7	$\pm$ 0.1
45-54	88	4.5	$\pm$ 0.1	134	4.9	$\pm$ 0.2	222	4.7	$\pm$ 0.1
55-64	55	4.6	$\pm$ 0.2	91	4.9	$\pm$ 0.1	146	4.7	$\pm$ 0.1
<b>25-64</b>	<b>285</b>	<b>4.6</b>	<b><math>\pm</math>0.1</b>	<b>456</b>	<b>4.7</b>	<b><math>\pm</math>0.1</b>	<b>741</b>	<b>4.7</b>	<b><math>\pm</math>0.1</b>

Table 46 shows the overall mean cholesterol level among I-Kiribati adults aged 25-64 years was 4.7 mmol/L; similar mean levels were noted between men (4.6 mmol/L  $\pm$ 0.1) and women (4.7 mmol/L  $\pm$ 0.1). Mean total cholesterol level increased with age among women, peaking in the 45-54 age group (4.9 mmol/L  $\pm$ 0.2) and remaining at this level in the oldest age cohort. Mean total cholesterol levels

among men peaked earlier, in the age 35-44 age group (4.7 mmol/L  $\pm$ 0.2), and thereafter fluctuated between 4.5 mmol/L (45-54 years age group) and 4.6 mmol/L (55-64 years age group).

**Table 47 Percentage with raised total blood cholesterol ( $\geq$  5.0 mmol/L or  $\geq$  190 mg/dl)**

Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	58	15.5	$\pm$ 11.4	90	22.2	$\pm$ 8.3	148	19.3	$\pm$ 6.6
35-44	84	33.3	$\pm$ 12.2	141	24.1	$\pm$ 7.6	225	27.9	$\pm$ 5.9
45-54	88	23.9	$\pm$ 8.9	134	43.3	$\pm$ 10.6	222	35.2	$\pm$ 7.5
55-64	55	20.0	$\pm$ 11.3	91	39.6	$\pm$ 9.4	146	31.3	$\pm$ 6.8
<b>25-64</b>	<b>285</b>	<b>23.8</b>	<b><math>\pm</math>5.0</b>	<b>456</b>	<b>30.6</b>	<b><math>\pm</math>3.8</b>	<b>741</b>	<b>27.7</b>	<b><math>\pm</math>3.1</b>

Table 47 shows that 27.7% of the surveyed population had a raised total cholesterol  $\geq$ 5.0 mmol/L (or  $\geq$ 190 mg/dl). There was a higher proportion of women (30.6%  $\pm$ 3.8) with elevated cholesterol as compared to men (23.8%  $\pm$ 5.0), but this difference was not statistically significant. Among women, the proportions with high-risk cholesterol generally increased with increasing age with the highest proportion being in the 45-54 years age group (43.3%). Among men, the proportion with raised total blood cholesterol doubled from 15.5% ( $\pm$ 11.4) in the 25-34 age group to 33.3% ( $\pm$ 12.2) in the 35-44 years age group, declining thereafter in the older age cohorts.

#### 4.10 Combined Risk Factors

In summary, the Kiribati STEPS survey examined five important risk factors for NCDs:

- current daily smokers,
- overweight (BMI  $\geq$ 25 kg/m<sup>2</sup>),
- raised blood pressure (SBP  $\geq$ 140 and/or DBP $\geq$ 90 mmHg or currently on medication),
- consumed less than five combined servings of fruit and vegetables per day, and
- low level of activity (<600 METminutes per week).

For this report, these five risk factors were summed to indicate the overall risk for NCDs as follows:

- Low risk: 0 of 5 risk factors
- Moderate risk: 1-2 of 5 risk factors
- High risk: 3 or more of 5 risk factors

Table 48 shows that no male respondents were classified as being at low risk for NCDs (i.e. with none of the five risk factors), compared with 0.1% of women (Table 49). Approximately 21.8% of men were at moderate risk (i.e. with 1-2 risk factors), compared with 28.4% of women. Having 3-5 risk factors was more common among men (78.2%) than women (71.5%). 79.0% of I-Kiribati had at least 3-5 risk factors (raised risk) reported by aged 45-64 years.

While the proportion of raised risk (i.e. with 3 or more of the five risk factors) increased with increasing age for both genders, relatively high proportions of the younger cohort (25-44 years) were already at great risk for NCDs, with 77.2% of men and 68.8% of women in this age group being at high risk.

Generally, in Kiribati as the number of risk factors increased, as does the proportions of people reporting having those conditions.

**Table 48 Percentage of noncommunicable disease risk categories among men by age group**

Age Group (years)	Men						
	n	0 risk factor	95% CI	1-2 risk factors	95% CI	3-5 risk factors	95% CI
25-44	298	--	--	22.8	±4.8	77.2	±4.8
45-64	219	--	--	19.6	±6.2	80.4	±6.2
<b>25-64</b>	<b>517</b>	--	--	<b>21.8</b>	<b>±4.1</b>	<b>78.2</b>	<b>±4.1</b>

**Table 49 Percentage of noncommunicable disease risk categories among women by age group**

Age Group (years)	Women						
	n	0 risk factor	95% CI	1-2 risk factors	95% CI	3-5 risk factors	95% CI
25-44	420	0.0	±0.0	31.2	±4.6	68.8	±4.6
45-64	278	0.4	±0.8	21.9	±3.0	77.7	±3.2
<b>25-64</b>	<b>698</b>	<b>0.1</b>	<b>±0.2</b>	<b>28.4</b>	<b>±3.4</b>	<b>71.5</b>	<b>±3.3</b>

**Table 50 Percentage of noncommunicable disease risk categories among both sexes by age group**

Age Group (years)	Both Sexes						
	n	0 risk factor	95% CI	1-2 risk factors	95% CI	3-5 risk factors	95% CI
25-44	718	0.0	±0.0	27.3	±3.1	72.7	±3.1
45-64	497	0.2	±0.4	20.9	±3.5	79.0	±3.7
<b>25-64</b>	<b>1215</b>	<b>0.1</b>	<b>±0.1</b>	<b>25.4</b>	<b>±2.6</b>	<b>74.6</b>	<b>±2.6</b>

## 5. DISCUSSION AND CONCLUSIONS

This section summarises key findings from the STEPS survey and on that basis presents a range of recommended public actions to address the chronic disease problems facing the Republic of Kiribati.

Behavioural risk factors for chronic diseases are common in Kiribati and are a major public health problem at all ages. I-Kiribati women faced similar risk to chronic diseases as I-Kiribati men did. The survey clearly showed that two thirds of the population defined themselves as current smokers, with the majority of those reporting that they smoke on a daily basis. Smoking uptake occurred during late adolescence. Initiatives to delay and prevent the onset of smoking in this group are therefore critical and warrant concerted public health efforts. Given the high prevalence of smoking rates in Kiribati, implementing effective smoking cessation programs should also be considered as a fundamental component of a comprehensive anti-tobacco campaign. Supporting smokers to discontinue their at-risk behaviour will significantly lower their risk of chronic diseases.

The survey showed that excessive alcohol drinking among men is a major concern in Kiribati. About 71.8% of men aged 25-64 years 'binge' drink, that is drinking 5 or more standard drinks on any day in the past week, while 21.6% reported drinking 20 or more drinks on a drinking day in the past week. Of concern was the high proportion of binge drinking among men in the 25-34 years age group. Binge

drinking was also not uncommon among women, with nearly half of those surveyed (49.2%) reported drinking 4 or more standard drinks on any day in the past week.

The survey clearly showed that the majority of I-Kiribati (99.3%) aged 25-64 years was not consuming the recommended five combined servings of fruit and vegetables per day. This low level of fruit and vegetable consumption possibly reflects both the availability and demand issue. The physical remoteness of Kiribati coupled with limited capacity of the country to engage in sustainable production of local produce represent key challenges for addressing the eating behaviour of its population. While efforts to increase availability of quality and affordable nutritious foods are important, better understanding of I-Kiribati food preferences and tastes is also a critical component of comprehensive public health initiatives.

Engaging in health-enhancing physical activity is not a common behaviour reported by I-Kiribati, that is, the majority of I-Kiribati are not achieving the minimum recommended levels of physical activity, which is 30 minutes of moderate-intensity physical activity for 5 days of the week. The survey showed half of I-Kiribati reported a low level of total physical activity not conducive for health. Women were more likely to report low physical activity compared to men. While high levels of physical activity were more common among young men, this dissipated with increasing age. The duration of total physical activity performed as part of work, transport and leisure time averaged 83.3 minutes per day for men and 56.8 minutes per day for women. The primary source of physical activity in Kiribati was work-related, followed by (active) transport such as cycling or walking. Leisure-time physical activity contributed very little to total physical activity.

Similar to findings from other PICs, excessive body weight and consequent chronic conditions remain a critical public health issue in Kiribati. About half (50.6%) of I-Kiribati was found to have a body mass index  $\geq 30$  kg/m<sup>2</sup>. Obesity was common among women as compared to men at all ages. More alarmingly, the high rate of obesity was particularly evident among women aged 25-54 years (ranging from 58.6% to 61.4%). The mean waist circumference of women at all age groups exceeded 80 cm, a cut-off value considered to increase their risk for cardiovascular disease for women.

The survey identified a substantial portion of the population with elevated risk for cardiovascular disease requiring immediate treatment and management. Nearly one in five of I-Kiribati (17.3%) had a raised blood pressure at the time of the survey and/or on medication for hypertension, with this condition being common among men than women. As expected, raised blood pressure generally increased with increasing age for both genders. Nearly one third (27.7%) of the surveyed population was found to have elevated fasting blood cholesterol warranting treatment.

Kiribati faces a high degree of diabetes problem, with 28.1% of the population estimated to have fasting blood sugar level of  $\geq 6.1$  mmol/L. Although the prevalence is lower than that reported for the Federated States of Micronesia (32.1%) and substantially lower than that report in American Samoa (47.3%), it is higher than that found in Nauru (22.7%). As noted in other PICs, the diabetes prevalence generally increases with age. It is interesting to note that unlike other PICs, diabetes is somewhat more common among men than women, especially among those aged 45 years and older.

This report focuses on critical and common NCD risk factors and related NCDs (e.g. diabetes), the results of which have been summarised in a series of succinct tables (to facilitate between-country comparisons of STEPS data). While the behavioural risk factors data were collected from self-report and as such the prevalence of some risk factors can be over-estimated or under-estimated, the key strength of the survey is its population-wide and representative characteristics. Another important strength of the survey is that key physiological and biochemical indicators were measured using objective and clinical techniques by staff trained in the STEPS protocol.

The Kiribati STEPS survey has confirmed that NCDs pose a major public health challenge. A diverse but complementary multi-level and multi-professional approach, combining primary, secondary and tertiary preventative strategies, will be necessary to tackle the prevalent chronic diseases and associated conditions facing the Kiribati people. To be effective, public health and clinical approaches need to be innovative and sensitive to the prevailing social, economical and cultural environments of Kiribati.

## **6. RECOMMENDATIONS**

### **Addressing policy, organizational and environmental factors**

- Increase resources to implement the WHO Framework Convention on Tobacco Control.
- Generate resources to national health institutions, e.g., National Nutrition Centre.
- Develop policies supporting importation of healthy foods.
- Improve availability of fruit and vegetables.
- Develop policies to establish physical activity-friendly environments.
- Establish sustainable government funding mechanism and health infrastructure to support NCD strategy implementation and monitoring.
- Develop NCD related coalitions, networks and partnerships, e.g., Kiribati NCD Working Committee, Kiribati National Food and Nutrition Committee, for preventing and managing NCDs.

### **Addressing NCD behavioural risk factors**

- Comprehensive anti-smoking campaigns to reduce smoking rates across all age groups and in both genders, particularly targeting the younger age groups to prevent smoking uptake.
- Smoking cessation programs to reduce smoking rates across all age groups in both genders.
- Comprehensive health promotion campaigns to reduce alcohol (and at-risk kava) consumption, particularly targeting binge drinking among men.
- Comprehensive health promotion campaigns promoting the recommended levels of fruit and vegetable consumption across all age groups and in both genders, and increasing public awareness of the adverse effects of excessive consumption of high-fat, high-salt, and high-sugar foods.
- Develop and implement cultural-appropriate programs to promote daily incidental physical activity and encourage more moderate-intensity physical activity in all age groups, particularly among women.
- Public health programs to emphasize reduction in the prevalence of the five combined critical NCD risk factors (current daily smoking, being overweight, having raised blood pressure, eating less than five combined servings of fruit and vegetables per day, and having a low level of physical activity).

### **Establishing a coordinated approach to noncommunicable disease management system**

- Increase public awareness of the importance of regular monitoring and screening of blood pressure, blood cholesterol and blood sugar level.
- Establish and/or strengthen existing coordinated care and management of individuals with diagnosed chronic conditions, including providing a system of integrated care across multiple providers (primary health care and clinical care) and multiple chronic conditions that will reduce length of hospitalization and improving quality of life.
- Establish a coordinated NCD program supporting chronic disease care, including supporting patient self-management, self-monitoring of conditions, medications and lifestyle changes.

### **Maintaining quality surveillance and public health information**

- Establish strong leadership and secure political and financial commitments to maintain a systematic and rigorous approach to STEPS data collection – supported by workforce trained in implementing the survey, infrastructure and financial capacity - on an ongoing basis that will evolve to a robust STEPS surveillance system in Kiribati.

# **APPENDICES**

# Appendix 1. Kiribati STEPS Survey Questionnaire



## The WHO STEPwise Approach to Surveillance of Noncommunicable Diseases (STEPS)

<i>Check if the following are completed</i> (to be checked by:)		Yes	No
Fasting status	(Step 2&3 Registration Station)	<input type="checkbox"/>	<input type="checkbox"/>
Checkout	(Step 2&3 Check-out Station)	<input type="checkbox"/>	<input type="checkbox"/>
EpiData data entry	(Data entry personnel)	<input type="checkbox"/>	<input type="checkbox"/>
EpiInfo data entry	(Data entry personnel)	<input type="checkbox"/>	<input type="checkbox"/>
Data entry irregularities	(Data entry personnel)	<input type="checkbox"/>	<input type="checkbox"/>

Identification Information:			
V 1	Is the respondent on the participation list for the survey?	Yes, on the original list 1 Yes, on the replacement list 2 No (if "No", then END) 3	<input type="checkbox"/>
I 1	Island code		<input type="checkbox"/>
I 2	Village name:		
I 3	Village code: (SEE NOTE BELOW)		<input type="checkbox"/> <input type="checkbox"/>
I 4	Interviewer code		<input type="checkbox"/> <input type="checkbox"/>
I 5	Date of completion of the questionnaire		<input type="text"/> / <input type="text"/> /2004 Day Month Year

Respondent ID Number <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>			
Consent			
I 6	Consent has been read out to respondent	Yes 1 No 2	<input type="checkbox"/> If NO, read consent
I 7	Consent has been obtained (verbal or written)	Yes 1 No 2	<input type="checkbox"/> If NO, END
I 8	Interview Language	English 1 Kiribati 2	<input type="checkbox"/>
I 9	Time of interview (24 hour clock)		<input type="text"/> : <input type="text"/> <input type="text"/>
I 10	Family Name		
I 11	First Name		

**Note:** Identification information I6 to I13 should be stored separately from the questionnaire because it contains confidential information. Please note Village Code is required as part of main instrument for data analyses. Date of interview is required to calculate age

## Step 1 Demographic Information

			Coding Column
C1	Sex ( <i>Record Male / Female as observed</i> )	Male 1 Female 2	<input type="checkbox"/>
C2	What is your date of birth? <i>If Don't Know, See Note* below and Go to C3</i>	Day <input type="checkbox"/> <input type="checkbox"/> Month <input type="checkbox"/> <input type="checkbox"/> Year 19 <input type="checkbox"/> <input type="checkbox"/>	
C3	How old are you?	Years	<input type="checkbox"/> <input type="checkbox"/>
C4	In total, how many years have you spent at school or in full-time study (excluding pre-school)?	Years	<input type="checkbox"/> <input type="checkbox"/>
C5	What is your <i>ethnic background</i> ?	Kiribati 1 Other 2 Refused 3	<input type="checkbox"/>
C6	What is the highest level of education you have completed?	No formal schooling 1 Less than primary school 2 Primary school completed 3 Secondary school completed 4 College/University completed 5 Post graduate degree 6	<input type="checkbox"/>
C7	Which of the following best describes your <u>main</u> work status over the last 12 months?	Government employee 1 Non-government employee 2 Self-employed 3 Non-paid 4 Student 5 Homemaker 6 Retired 7 Unemployed (able to work) 8 Unemployed (unable to work) 9	<input type="checkbox"/>
C8	How many people older than 18 years, including yourself, live in your household?	Number of people	<input type="checkbox"/> <input type="checkbox"/>
C9	Taking the <b>past year</b> , can you tell me what the average earnings of the household have been?	Per week <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OR per month <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OR per year <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Refused 1 <input type="checkbox"/>	

**Note\*:** 1) Missing values are not permissible for Village code, Date of Interview and Sex.

2) The **Date of Birth** (C2) or the **age** (C3) or **both** (C2 and C3) have to be filled. CODE "DK" FOR DON'T KNOW or DON'T REMEMBER.

## Step 1 Behavioural Measures

Tobacco Use (Section S)			
Now I am going to ask you some questions about various health behaviours. This includes things like smoking, drinking alcohol, eating fruits and vegetables and physical activity. Let's start with smoking.			
		<b>Response</b>	<b>Coding Column</b>
S 1a	Do you currently smoke any <b>tobacco products</b> , such as cigarettes, cigars or pipes?  <i>(NOTE: CURRENTLY = past 12 months)</i>	Yes 1 No 2	<input type="checkbox"/> <i>If No, go to S4</i>
S 1b	<u>If Yes,</u> Do you currently smoke tobacco products <b>daily</b> ?	Yes 1 No 2	<input type="checkbox"/> <i>If No, go to S4</i>
S 2a	How old were you when you <b>first started</b> smoking daily?	Age (years) Don't remember DK	<input type="checkbox"/> <input type="checkbox"/> <i>If Known, go to S 3</i>

S 2b	Do you remember how long ago it was?  <i>(CODE DK FOR DON'T REMEMBER)</i>	In Years  OR in Months  OR in Weeks	Years <input type="checkbox"/> <input type="checkbox"/> Months <input type="checkbox"/> <input type="checkbox"/> Weeks <input type="checkbox"/> <input type="checkbox"/>	
S 3	On average, <b>how many</b> of the following do you smoke each day? <i>(RECORD FOR EACH TYPE)</i>	Manufactured cigarettes  Hand-rolled cigarettes  Hand-rolled rauara  ← Other (please specify): <hr/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  <input type="checkbox"/> <input type="checkbox"/>  <input type="checkbox"/> <input type="checkbox"/>  <input type="checkbox"/> <input type="checkbox"/>	} Go to A1a
S 4	In the past, did you ever smoke <b>daily</b> ?	Yes 1 No 2	<input type="checkbox"/>	
S 5a	<b>If Yes,</b> How old were you when you <b>stopped</b> smoking daily?	Age (years)  Don't remember DK	<input type="checkbox"/> <input type="checkbox"/>	If Known, go to A1a If DK, go to S 5b
S 5b	How long ago did you stop smoking daily?	Years ago  OR Months ago  OR Weeks ago	Years <input type="checkbox"/> <input type="checkbox"/> Months <input type="checkbox"/> <input type="checkbox"/> Weeks <input type="checkbox"/> <input type="checkbox"/>	

Alcohol Consumption (Section A)				
The next questions ask about the consumption of alcohol.				
		<b>Response</b>	<b>Coding Column</b>	
A 1a	Have you ever consumed a drink that contains alcohol such as beer, wine, spirit, fermented toddy or yeast?	Yes 1 No 2	<input type="checkbox"/>	If No, Go to K1
A 1b	Have you consumed alcohol within the <b>past 12 months</b> ?	Yes 1 No 2	<input type="checkbox"/>	If No, Go to K1
A 2	In the past 12 months, <b>how frequently</b> have you had at least one drink? <i>(READ RESPONSES)</i> <i>USE SHOWCARD</i>	5 or more days a week 1 1-4 days per week 2 1-3 days a month 3 Less than once a month 4	<input type="checkbox"/>	
A 3	When you drink alcohol, <b>on average</b> , how many drinks do you have during one day?	Number	<input type="checkbox"/> <input type="checkbox"/>	
A 4	During each of the <b>past 7 days</b> , how many standard drinks of any alcoholic drink did you have each day? <i>(RECORD FOR EACH DAY)</i> <i>USE SHOWCARD</i>	Monday  Tuesday  Wednesday  Thursday  Friday  Saturday  Sunday	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

**Note:** Code **DK** for "Don't know" or "Don't remember".

Kawa or Nangkona (Section K)			
K1	Have you ever tried or drunk kawa or nangkona in the past 12 months?	Yes 1 No 2	<input type="checkbox"/> <i>If No, go to D 1a</i>
K2	During the last 30 days, on <b>how many days</b> did you drink kawa or nangkona?	Number of days	<input type="checkbox"/> <input type="checkbox"/>
K3	Do you usually drink alcohol during or after drinking kawa or nangkona?	Yes 1 No 2	<input type="checkbox"/>
K4	Do you usually smoke during or after drinking kawa or nangkona?	Yes 1 No 2	<input type="checkbox"/>
Diet (Section D)			
The next questions ask about the fruits and vegetables that you usually eat. I have a nutrition card here that shows you some examples of local fruits and vegetables. Each picture represents the size of a serving. As you answer these questions please think of a typical week in the last year.			
D 1a	In a typical week, on how many days do you eat fruit? <i>USE SHOWCARD</i>	Number of days	<input type="checkbox"/> <i>If Zero days, go to D 2a</i>
D 1b	How many <b>servings</b> of fruit do you eat on one of those days? <i>USE SHOWCARD</i>	Number of servings	<input type="checkbox"/> <input type="checkbox"/>
D 2a	In a typical week, on how many days do you eat vegetables? <i>USE SHOWCARD</i>	Number of days	<input type="checkbox"/> <i>If Zero days, go to D3</i>
D 2b	How many <b>servings</b> of vegetables do you eat on one of those days? <i>USE SHOWCARD</i>	Number of servings	<input type="checkbox"/> <input type="checkbox"/>
D 3	What type of <b>oil or fat</b> is <b>most often</b> used for meal preparation in your household? <i>USE SHOWCARD</i> <i>SELECT ONLY ONE</i>	Vegetable oil 1 Lard or drippings 2 Butter 3 Margarine 4 Coconut cream 5 Coconut oil 6 Other 7 None in particular 8 None used 9 Don't know 10	<input type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/> ←			
D 4	In a typical week, on how many days do you eat <b>fresh fish</b> ?	Number of days	<input type="checkbox"/>
D 5	In a typical week, on how many days do you eat <b>tinned fish</b> ?	Number of days	<input type="checkbox"/>
Physical Activity (Section P)			
Next I am going to ask you about the time you spend doing different types of physical activity. Please answer these questions even if you do not consider yourself to be an active person. Think first about the time you spend doing work. Think of work as the things that you have to do such as paid or unpaid work, household chores, harvesting food, fishing or hunting for food, seeking employment.			
P 1	Does your work involve mostly sitting or standing, with walking for no more than 10 minutes at a time?	Yes 1 No 2	<input type="checkbox"/> <i>If Yes, go to P6</i>
P 2	Does your work involve vigorous activity, like <i>heavy lifting, digging or construction work</i> for at least 10 minutes at a time?	Yes 1 No 2	<input type="checkbox"/> <i>If No, go to P4</i>
P 3a	In a typical week, on how many days do you do vigorous activities as part of your work?	Days a week	<input type="checkbox"/>
P 3b	On a typical day on which you do vigorous activity, how much time do you spend doing such work?	In hours and minutes hrs <input type="checkbox"/> <input type="checkbox"/> : mins <input type="checkbox"/> <input type="checkbox"/> OR in Minutes only or minutes <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

P 4	Does your work involve moderate-intensity activity, like brisk walking or carrying light loads for at least 10 minutes at a time? <i>INSERT EXAMPLES &amp; USE SHOWCARD</i>	Yes No	1 2	<input type="checkbox"/>	If No, go to P6
P 5a	In a typical week, on how many days do you do moderate-intensity activities as part of your work?	Days a week		<input type="checkbox"/>	
P 5b	On a typical day on which you did moderate-intensity activities, how much time do you spend doing such work?	In hours and minutes	hrs <input type="text"/> <input type="text"/> : mins <input type="text"/> <input type="text"/>		
		OR in Minutes only	or minutes <input type="text"/> <input type="text"/> <input type="text"/>		
P 6	How long is your typical work day?	Number of hours	hrs <input type="text"/> <input type="text"/>		
Other than activities that you've already mentioned, I would like to ask you about the way you travel to and from places. For example to work, for shopping, to market, to church.					
P 7	Do you walk or use a bicycle (pedal cycle) for at least 10 minutes continuously to get to and from places?	Yes No	1 2	<input type="checkbox"/>	If No, go to P9
P 8a	In a typical week, on how many days do you walk or bicycle for at least 10 minutes to get to and from places?	Days a week		<input type="checkbox"/>	
P 8b	How much time would you spend walking or bicycling for travel on a typical day?	In hours and minutes	hrs <input type="text"/> <input type="text"/> : mins <input type="text"/> <input type="text"/>		
		OR in Minutes only	or minutes <input type="text"/> <input type="text"/> <input type="text"/>		
The next questions ask about activities you do in your leisure time. Think about activities you do for recreation, fitness or sports. Do not include the physical activities you do at work or for travel mentioned already.					
P 9	Does your leisure time involve mostly sitting, reclining, or standing, with no physical activity lasting more than 10 minutes at a time?	Yes No	1 2	<input type="checkbox"/>	If Yes, go to P 14
P 10	In your leisure time, do you do any vigorous activities like running or strenuous sports, weight lifting for at least 10 minutes at a time? <i>INSERT EXAMPLES &amp; USE SHOWCARD</i>	Yes No	1 2	<input type="checkbox"/>	If No, go to P 12
P 11a	If Yes, In a typical week, on how many days do you do vigorous activities as part of your leisure time?	Days a week		<input type="checkbox"/>	
P 11b	How much time do you spend doing this on a typical day?	In hours and minutes	hrs <input type="text"/> <input type="text"/> : mins <input type="text"/> <input type="text"/>		
		OR in Minutes only	or minutes <input type="text"/> <input type="text"/> <input type="text"/>		
P 12	In your leisure time, do you do any moderate-intensity activities like brisk walking, cycling or swimming for at least 10 minutes at a time? <i>INSERT EXAMPLES &amp; USE SHOWCARD</i>	Yes No	1 2	<input type="checkbox"/>	If No, go to P 14
P 13a	If Yes In a typical week, on how many days do you do moderate-intensity activities as part of [leisure time]?	Days a week		<input type="checkbox"/>	
P 13b	How much time do you spend doing this on a typical day?	In hours and minutes	hrs <input type="text"/> <input type="text"/> : mins <input type="text"/> <input type="text"/>		
		OR in Minutes only	or minutes <input type="text"/> <input type="text"/> <input type="text"/>		
The following question is about sitting or reclining. Think back over the past 7 days, to time spent at work, at home, in leisure, including time spent sitting at a desk, visiting friends, reading, or watching television, but do not include time spent sleeping.					
P 14	Over the past 7 days, how much time did you spend sitting or reclining on a typical day?	In hours and minutes	hrs <input type="text"/> <input type="text"/> : mins <input type="text"/> <input type="text"/>		
		OR in Minutes only	or minutes <input type="text"/> <input type="text"/> <input type="text"/>		

**Note:** Code **DK** for "Don't know" or "Don't remember".

History of High Blood Pressure				
V 2	How many times did you visit the doctor during the last 12 months? <i>(Include hospitalisation or visits to the outpatient department/health clinics; do not include visits to the dentist).</i>	Number of times		<input type="checkbox"/> <input type="checkbox"/>
H 1	When was your blood pressure last measured by a health professional?	Within past 12 months 1-5 years ago Not within past 5 yrs	1 2 3	<input type="checkbox"/>
H 2	During the past 12 months have you been told by a doctor or other health worker that you have elevated blood pressure or hypertension?	Yes No	1 2	<input type="checkbox"/> <i>If No, skip to H6</i>
H 3	Are you currently receiving any of the following treatments for high blood pressure prescribed by a doctor or other health worker?			
H 3a	Drugs (medication) that you have taken in the last 2 weeks	Yes No	1 2	<input type="checkbox"/>
H 3b	Special prescribed diet	Yes No	1 2	<input type="checkbox"/>
H 3c	Advice or treatment to lose weight	Yes No	1 2	<input type="checkbox"/>
H 3d	Advice or treatment to stop smoking	Yes No	1 2	<input type="checkbox"/>
H 3e	Advice to start or do more exercise	Yes No	1 2	<input type="checkbox"/>
H 4	During the past 12 months have you seen a traditional healer for elevated blood pressure or hypertension	Yes No	1 2	<input type="checkbox"/>
H 5	Are you currently taking any herbal or traditional remedy for your high blood pressure?	Yes No	1 2	<input type="checkbox"/>
History of Diabetes				
H 6	When was your blood sugar last measured by a health professional?	Within past 12 months 1-5 years ago Not within past 5 yrs	1 2 3	<input type="checkbox"/>
H 7	Have you ever been told by a doctor or other health worker that you have diabetes?	Yes No	1 2	<input type="checkbox"/> <i>If No, skip to V3</i>
H 8	Are you currently receiving any of the following treatments for diabetes prescribed by a doctor or other health worker?			
H 8a	Insulin	Yes No	1 2	<input type="checkbox"/>
H 8b	Oral drug (medication that you have taken in the last 2 weeks)	Yes No	1 2	<input type="checkbox"/>
H 8c	Special prescribed diet	Yes No	1 2	<input type="checkbox"/>
H 8d	Advice or treatment to lose weight	Yes No	1 2	<input type="checkbox"/>
H 8e	Advice or treatment to stop smoking	Yes No	1 2	<input type="checkbox"/>
H 8f	Advice to start or do more exercise	Yes No	1 2	<input type="checkbox"/>
H 9	During the past 12 months have you seen a traditional healer for diabetes?	Yes No	1 2	<input type="checkbox"/>
H 10	Are you currently taking any herbal or traditional remedy for your diabetes?	Yes No	1 2	<input type="checkbox"/>
Comments: Step 1 (to be answered by the Interviewer)				
V 3	Are there any irregularities or problems with the measurements?	Yes No	1 2	<input type="checkbox"/>

If yes, please describe. \_\_\_\_\_

## Step 2 Physical Measurements

Height and weight				Coding Column	
M 1	Technician ID Code			<input type="checkbox"/> <input type="checkbox"/>	
M 2a & 2b	Device IDs for height and weight	(2a) height	<input type="checkbox"/>	(2b) weight	<input type="checkbox"/>
M 3	Height	(in Centimetres)		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
M 4	Weight <i>If too large for scale, use two scales</i>	(in Kilograms)		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
M 5	<i>(For women)</i> Are you pregnant?	Yes	1	<input type="checkbox"/>	<i>If Yes, Skip Waist</i>
		No	2		

Waist					
M 6	Technician ID			<input type="checkbox"/> <input type="checkbox"/>	
M 7	Device ID for waist			<input type="checkbox"/>	
M 8	Waist circumference	(in Centimetres)		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
M 16	Hip circumference	(in Centimetres)		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

Blood pressure				Coding Column	
M 9	Technician ID			<input type="checkbox"/> <input type="checkbox"/>	
M 10	Device ID for blood pressure			<input type="checkbox"/>	
M 11	Cuff size used	Standard	1	<input type="checkbox"/>	
		Large	2		
		Extra large	3		
M 12a	Reading 1	Systolic BP	Systolic mmHg	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
M 12b		Diastolic BP	Diastolic mmHg	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
M 13a	Reading 2	Systolic BP	Systolic mmHg	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
M 13b		Diastolic BP	Diastolic mmHg	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
M 14a	Reading 3	Systolic BP	Systolic mmHg	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
M 14b		Diastolic BP	Diastolic mmHg	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

Heart Rate					
M 17a	Reading 1	Beats per minute:		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
M 17b	Reading 2	Beats per minute:		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
M 17c	Reading 3	Beats per minute:		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

## Step 3 Biochemical Measurements

Blood glucose			Coding Column
<b>B 1</b>	Since 10pm last night, have you had anything to eat, drink chew or suck, other than water?	Yes 1 No 2	□
<b>B 2</b>	Technician ID Code		□□
<b>B 3</b>	Device ID code		□□
<b>B 4</b>	Time of day blood specimen taken (24 hour clock)		hrs □□ : mins □□
<b>B 5</b>	Blood glucose	OR      Low 1 High 2 Unable to assess 3	mmol/l □□.□  OR      □
Blood Lipids			
<b>B 6</b>	Technician ID Code		□□
<b>B 7</b>	Device ID code		□□
<b>B 8</b>	Total cholesterol	OR      Low 1 High 2 Unable to assess 3	mmol/l □□.□□  OR      □
Haemoglobin			
<b>B 15</b>	<i>(For women age 15-44 years)</i> Are you breastfeeding?	Yes 1 No 2	□
<b>B 16</b>	Technician ID Code		□□
<b>B 17</b>	Device ID code		□□
<b>B 18</b>	Haemoglobin		□□.□
Comments: Step 2 and 3			(to be answered by any Step 2 or 3 technician)
<b>V 4</b>	Are there any irregularities or problems with the measurements?	Yes 1 No 2	□

If yes, please describe. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Appendix 2. The Whole Data Book of the Kiribati STEPS Survey



WHO STEPS

CHRONIC DISEASE  
RISK FACTOR SURVEILLANCE

DATA BOOK FOR  
KIRIBATI

## Demographic Information Results

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**Age group by sex** Description: Summary information by age group and sex of the respondents.  
 Instrument question:

- Sex
- What is your date of birth?

Age group and sex of respondents						
Age Group (years)	Men		Women		Both Sexes	
	n	%	n	%	n	%
25-34	163	42.0	225	58.0	388	28.2
35-44	186	43.8	239	56.2	425	30.8
45-54	165	47.0	186	53.0	351	25.5
55-64	88	41.1	126	58.9	214	15.5
<b>25-64</b>	<b>602</b>	<b>43.7</b>	<b>776</b>	<b>56.3</b>	<b>1378</b>	<b>100.0</b>

---

**Ethnicity** Description: Summary results for the ethnicity of the respondents.

- Instrument Question:
- What is your ethnic background?

Ethnic group of respondents			
Age Group (years)	Both Sexes		
	n	% Kiribati	% Other
25-34	386	99.2	0.8
35-44	422	99.5	0.5
45-54	351	99.4	0.6
55-64	213	98.6	1.4
<b>25-64</b>	<b>1372</b>	<b>99.3</b>	<b>0.7</b>

---

**Education** Description: Mean number of years of education among respondents.

Instrument question:

- In total, how many years have you spent at school or in full-time study (excluding pre-school)?

Mean number of years of education						
Age Group (years)	Men		Women		Both Sexes	
	n	Mean	n	Mean	<i>n</i>	<i>Mean</i>
25-34	162	10.0	223	10.3	385	10.2
35-44	186	9.4	237	8.9	423	9.1
45-54	161	7.8	184	6.8	345	7.2
55-64	83	7.4	122	5.1	205	6.0
<b>25-64</b>	592	8.9	766	8.2	1358	8.5

**Highest level of education** Description: Highest level of education achieved by the survey respondents.  
Instrument question:  
• What is the highest level of education you have completed?

Highest level of education							
Men							
Age Group (years)	n	% No formal schooling	% Less than primary school	% Primary school completed	% Secondary school completed	% College/ University completed	% Post graduate degree completed
25-34	163	0.6	9.8	65.0	20.9	3.7	0.0
35-44	186	0.5	10.2	75.3	11.8	2.2	0.0
45-54	164	6.7	29.3	51.2	9.1	3.0	0.6
55-64	85	8.2	30.6	42.4	10.6	7.1	1.2
<b>25-64</b>	<b>598</b>	<b>3.3</b>	<b>18.2</b>	<b>61.2</b>	<b>13.4</b>	<b>3.5</b>	<b>0.3</b>

Highest level of education							
Women							
Age Group (years)	n	% No formal schooling	% Less than primary school	% Primary school completed	% Secondary school completed	% College/ University completed	% Post graduate degree completed
25-34	225	0.0	9.3	61.8	27.6	1.3	0.0
35-44	239	1.3	15.9	74.5	7.9	0.4	0.0
45-54	186	2.7	42.5	48.9	5.4	0.5	0.0
55-64	125	18.4	44.0	33.6	2.4	0.8	0.8
<b>25-64</b>	<b>775</b>	<b>4.0</b>	<b>24.9</b>	<b>58.1</b>	<b>12.1</b>	<b>0.8</b>	<b>0.1</b>

Highest level of education							
Both Sexes							
Age Group (years)	n	% No formal schooling	% Less than primary school	% Primary school completed	% Secondary school completed	% College/ University completed	% Post graduate degree completed
25-34	388	0.3	9.5	63.1	24.7	2.3	0.0
35-44	425	0.9	13.4	74.8	9.6	1.2	0.0
45-54	350	4.6	36.3	50.0	7.1	1.7	0.3
55-64	210	14.3	38.6	37.1	5.7	3.3	1.0
<b>25-64</b>	<b>1373</b>	<b>3.7</b>	<b>22.0</b>	<b>59.4</b>	<b>12.7</b>	<b>2.0</b>	<b>0.2</b>

**Employment status** Description: Proportion of respondents in paid employment and those who are unpaid. Unpaid includes persons who are non-paid, students, homemakers, retired, and unemployed.

Instrument question:

- Which of the following best describes your main work status over the last 12 months?

<b>Employment status</b>					
<b>Men</b>					
Age Group (years)	n	% Government employee	% Non-government employee	% Self-employed	% Unpaid
25-34	163	25.2	16.0	11.0	47.9
35-44	185	29.2	14.1	12.4	44.3
45-54	165	31.5	13.9	10.9	43.6
55-64	86	11.6	18.6	8.1	61.6
25-64	599	26.2	15.2	11.0	47.6

<b>Employment status</b>					
<b>Women</b>					
Age Group (years)	n	% Government employee	% Non-government employee	% Self-employed	% Unpaid
25-34	223	15.2	9.0	6.7	69.1
35-44	239	8.4	7.9	11.3	72.4
45-54	186	7.0	7.5	14.5	71.0
55-64	126	2.4	4.0	5.6	88.1
25-64	774	9.0	7.5	9.8	73.6

<b>Employment status</b>					
<b>Both Sexes</b>					
Age Group (years)	n	% Government employee	% Non-government employee	% Self-employed	% Unpaid
25-34	386	19.4	11.9	8.5	60.1
35-44	424	17.5	10.6	11.8	60.1
45-54	351	18.5	10.5	12.8	58.1
55-64	212	6.1	9.9	6.6	77.4
25-64	1373	16.5	10.9	10.3	62.3

**Unpaid work and unemployed** Description: Proportion of respondents in unpaid work.  
Instrument question:

- Which of the following best describes your main work status over the last 12 months?

Unpaid work and unemployed							
Age Group (years)	Men						
	n	% Non-paid	% Student	% Home-maker	% Retired	Unemployed	
						% Able to work	% Not able to work
25-34	78	7.7	3.8	43.6	0.0	37.2	7.7
35-44	82	9.8	1.2	45.1	1.2	29.3	13.4
45-54	72	6.9	0.0	37.5	26.4	18.1	11.1
55-64	53	11.3	0.0	17.0	49.1	5.7	17.0
25-64	285	8.8	1.4	37.5	16.1	24.2	11.9

Unpaid work and unemployed							
Age Group (years)	Women						
	n	% Non-paid	% Student	% Home-maker	% Retired	Unemployed	
						% Able to work	% Not able to work
25-34	154	11.0	1.9	52.6	0.6	25.3	8.4
35-44	173	13.9	1.2	57.2	0.0	19.1	8.7
45-54	132	9.8	0.0	56.1	1.5	12.9	19.7
55-64	111	10.8	0.9	55.0	9.0	7.2	17.1
25-64	570	11.6	1.1	55.3	2.3	17.0	12.8

Unpaid work and unemployed							
Age Group (years)	Both Sexes						
	n	% Non-paid	% Student	% Home-maker	% Retired	Unemployed	
						% Able to work	% Not able to work
25-34	232	9.9	2.6	49.6	0.4	29.3	8.2
35-44	255	12.5	1.2	53.3	0.4	22.4	10.2
45-54	204	8.8	0.0	49.5	10.3	14.7	16.7
55-64	164	11.0	0.6	42.7	22.0	6.7	17.1
25-64	855	10.6	1.2	49.4	6.9	19.4	12.5

**Per  
capita  
annual  
income**

Description: Mean reported per capita annual income of respondents in local currency.

Instrument question:

- How many people older than 18 years, including yourself, live in your household?
- Taking the past year, can you tell me what the average earning of the household has been?

<b>Mean annual per capita income</b>	
n	Mean
1226	1882.3

---

## Tobacco Use

**Current smoking** Description: Current smokers among all respondents.

Instrument questions:

- Do you currently smoke any tobacco products, such as cigarettes, cigars, or pipes?

Percentage of current smokers									
Age Group (years)	Men			Women			Both Sexes		
	n	% Current smoker	95% CI	n	% Current smoker	95% CI	n	% Current smoker	95% CI
25-34	163	74.8	65.6 - 84.1	225	43.1	35.0 - 51.3	388	58.1	51.2 - 64.9
35-44	186	80.6	74.5 - 86.8	239	46.4	39.5 - 53.4	425	62.8	58.4 - 67.2
45-54	164	76.8	69.8 - 83.9	185	61.6	53.3 - 70.0	349	69.0	63.1 - 75.0
55-64	87	62.1	49.7 - 74.5	126	49.2	38.2 - 60.2	213	55.1	46.2 - 64.0
25-64	600	75.7	71.0 - 80.4	775	48.3	43.5 - 53.2	1375	61.3	57.9 - 64.8

**Smoking Status** Description: Smoking status of all respondents.

Instrument questions:

- Do you currently smoke any tobacco products, such as cigarettes, cigars, or pipes?
- Do you currently smoke tobacco products daily?

Smoking status							
Men							
Age Group (years)	n	Current smoker				% Does not smoke	95% CI
		% Daily	95% CI	% Non-daily	95% CI		
25-34	163	74.2	65.0 - 83.4	0.6	0.0 - 1.9	25.2	15.9 - 34.4
35-44	186	78.5	72.5 - 84.5	2.2	0.3 - 4.0	19.4	13.2 - 25.5
45-54	164	74.4	66.4 - 82.4	2.4	0.1 - 4.8	23.2	16.1 - 30.2
55-64	87	59.8	47.9 - 71.6	2.3	0.0 - 5.8	37.9	25.5 - 50.3
25-64	600	74.0	69.2 - 78.9	1.6	0.7 - 2.6	24.3	19.6 - 29.0

Smoking status							
Women							
Age Group (years)	n	Current smoker				% Does not smoke	95% CI
		% Daily	95% CI	% Non-daily	95% CI		
25-34	225	40.4	32.9 - 48.0	2.7	0.7 - 4.6	56.9	48.7 - 65.0
35-44	239	43.1	36.8 - 49.4	3.3	0.9 - 5.8	53.6	46.6 - 60.5
45-54	185	58.4	49.9 - 66.8	3.2	0.6 - 5.9	38.4	30.0 - 46.7
55-64	126	46.8	36.2 - 57.5	2.4	0.0 - 5.0	50.8	39.8 - 61.8
25-64	775	45.4	40.8 - 50.0	3.0	1.7 - 4.2	51.7	46.8 - 56.5

Smoking status							
Both Sexes							
Age Group (years)	n	Current smoker				% Does not smoke	95% CI
		% Daily	95% CI	% Non-daily	95% CI		
25-34	388	56.4	50.0 - 62.7	1.7	0.5 - 2.9	41.9	35.1 - 48.8
35-44	425	60.0	55.8 - 64.3	2.8	1.0 - 4.5	37.2	32.8 - 41.6
45-54	349	66.2	59.7 - 72.7	2.9	1.0 - 4.7	31.0	25.0 - 36.9
55-64	213	52.7	44.5 - 61.0	2.3	0.4 - 4.3	44.9	36.0 - 53.8
25-64	1375	59.0	55.6 - 62.4	2.3	1.6 - 3.0	38.7	35.2 - 42.1

**Frequency of smoking** Description: Percentage of current daily smokers among smokers.

Instrument question:

- Do you currently smoke any tobacco products, such as cigarettes, cigars, or pipes?
- Do you currently smoke tobacco products daily?

Current daily smokers among smokers									
Age Group (years)	Men			Women			Both Sexes		
	n	% Daily smokers	95% CI	n	% Daily smokers	95% CI	n	% Daily smokers	95% CI
25-34	122	99.2	97.5 - 100.0	97	93.8	89.6 - 98.1	219	97.1	95.1 - 99.0
35-44	150	97.3	95.0 - 99.7	111	92.8	87.9 - 97.7	261	95.6	92.9 - 98.3
45-54	126	96.8	93.7 - 100.0	114	94.7	90.4 - 99.0	240	95.9	93.1 - 98.6
55-64	54	96.3	90.8 - 100.0	62	95.2	89.9 - 100.0	116	95.7	92.5 - 99.0
25-64	452	97.8	96.6 - 99.1	384	93.9	91.5 - 96.3	836	96.2	95.1 - 97.3

**Manufactured cigarette smokers** Description: Percentage of smokers who use manufactured cigarettes among daily smokers.

Instrument question:

- On average, how many of the following do you smoke each day?

Manufactured cigarette smokers among daily smokers									
Age Group (years)	Men			Women			Both Sexes		
	n	% Manufactured cigarette smoker	95% CI	n	% Manufactured cigarette smoker	95% CI	n	% Manufactured cigarette smoker	95% CI
25-34	121	43.0	33.8 - 52.2	91	51.6	40.3 - 63.0	212	46.3	38.8 - 53.7
35-44	146	45.9	34.2 - 57.6	103	48.5	40.5 - 56.6	249	46.9	39.4 - 54.4
45-54	122	41.0	31.4 - 50.6	108	37.0	28.6 - 45.5	230	39.2	33.7 - 44.7
55-64	52	42.3	32.8 - 51.8	59	39.0	24.6 - 53.4	111	40.7	33.4 - 48.1
25-64	441	43.5	38.5 - 48.5	361	45.7	40.2 - 51.1	802	44.4	40.7 - 48.1

**Amount of tobacco used among smokers by type**

Description: Mean amount of tobacco used by daily smokers per day, by type.

Instrument question:

- On average, how many of the following do you smoke each day?

Mean amount of tobacco used by daily smokers by type												
Men												
Age Group (years)	n	Mean # of manufactured cig.	95% CI	n	Mean # of hand-rolled cig.	95% CI	n	Mean # of pipes of tobacco	95% CI	n	Mean # of other type of tobacco	95% CI
25-34	75	5.4	3.7 - 7.1	50	0.3	--	116	3.6	3.2 - 4.0	44	0.0	--
35-44	87	10.4	7.6 - 13.2	43	0.0	--	137	4.2	3.6 - 4.8	40	0.0	--
45-54	68	11.0	7.6 - 14.4	38	0.0	--	111	4.5	3.6 - 5.4	36	0.6	--
55-64	31	9.6	4.6 - 14.6	15	1.0	--	50	4.7	3.6 - 5.9	13	0.0	--
25-64	261	8.5	7.1 - 9.9	146	0.2	--	414	4.1	3.8 - 4.4	133	0.1	--

Mean amount of tobacco used by daily smokers by type												
Women												
Age Group (years)	n	Mean # of manufactured cig.	95% CI	n	Mean # of hand-rolled cig.	95% CI	n	Mean # of pipes of tobacco	95% CI	n	Mean # of other type of tobacco	95% CI
25-34	61	5.2	3.4 - 7.0	38	0.2	0.0 - 0.4	79	2.9	2.3 - 3.5	35	0.0	--
35-44	63	5.9	4.3 - 7.6	36	0.3	0.0 - 0.7	92	2.8	2.4 - 3.2	35	0.1	--
45-54	69	4.3	2.3 - 6.2	48	0.0	--	103	3.6	3.0 - 4.2	43	0.0	--
55-64	31	3.7	1.8 - 5.6	19	0.0	--	56	3.8	2.7 - 4.8	19	0.2	--
25-64	224	5.0	3.9 - 6.2	141	0.1	0.0 - 0.3	330	3.2	2.7 - 3.6	132	0.1	--

Mean amount of tobacco used by daily smokers by type												
Both Sexes												
Age Group (years)	n	Mean # of manufactured cig.	95% CI	n	Mean # of hand-rolled cig.	95% CI	n	Mean # of pipes of tobacco	95% CI	n	Mean # of other type of tobacco	95% CI
25-34	136	5.3	3.9 - 6.8	88	0.2	0.0 - 0.5	195	3.3	3.0 - 3.7	79	0.0	--
35-44	150	8.7	6.7 - 10.6	79	0.1	0.0 - 0.3	229	3.7	3.2 - 4.2	75	0.1	--
45-54	137	7.7	5.7 - 9.8	86	0.0	--	214	4.1	3.4 - 4.8	79	0.3	--
55-64	62	7.0	4.1 - 9.8	34	0.5	0.0 - 1.3	106	4.3	3.3 - 5.2	32	0.1	--
25-64	485	7.0	6.1 - 8.0	287	0.2	0.0 - 0.3	744	3.7	3.4 - 4.0	265	0.1	--

**Initiation of smoking** Description: Mean age of initiation and mean duration of smoking, in years, among daily smokers (no total age group for mean duration of smoking as age influences these values).

Instrument questions:

- How old were you when you first started smoking daily?
- How long ago did you stop smoking daily?

Mean age started smoking									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean age	95% CI	n	Mean age	95% CI	n	Mean age	95% CI
25-34	116	17.4	16.9 - 17.9	87	18.9	18.1 - 19.8	203	18.0	17.5 - 18.4
35-44	135	18.1	17.1 - 19.1	101	21.1	20.1 - 22.2	236	19.3	18.6 - 20.0
45-54	118	19.2	17.8 - 20.6	107	21.4	20.1 - 22.7	225	20.2	19.1 - 21.3
55-64	50	19.8	17.8 - 21.8	58	21.4	19.1 - 23.6	108	20.6	19.2 - 22.0
25-64	419	18.2	17.7 - 18.7	353	20.5	19.7 - 21.3	772	19.1	18.7 - 19.6

Mean duration of smoking									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean duration	95% CI	n	Mean duration	95% CI	n	Mean duration	95% CI
25-34	116	12.2	11.7 - 12.8	87	11.3	10.3 - 12.2	203	11.9	11.4 - 12.4
35-44	135	21.3	20.2 - 22.3	101	18.2	17.1 - 19.4	236	20.1	19.4 - 20.8
45-54	118	29.8	28.5 - 31.1	107	27.3	25.9 - 28.8	225	28.7	27.6 - 29.7
55-64	50	39.0	36.6 - 41.4	58	37.2	34.7 - 39.6	108	38.1	36.6 - 39.6
25-64	419	21.1	20.1 - 22.2	353	20.4	19.4 - 21.5	772	20.8	20.1 - 21.6

**Percentage of ex daily smokers in the population**

Description: Percentage of ex-daily smokers among all respondents and the mean duration, in years, since ex-daily smokers quit smoking daily.

Instrument question:

- In the past did you ever smoke daily?
- How old were you when you stopped smoking daily?

<b>Ex-daily smokers among all respondents</b>									
Age Group (years)	<b>Men</b>			<b>Women</b>			<b>Both Sexes</b>		
	n	% ex daily smokers	95% CI	n	% ex daily smokers	95% CI	n	% ex daily smokers	95% CI
25-34	42	35.7	16.8 - 54.7	131	17.6	11.2 - 23.9	173	22.7	15.5 - 29.9
35-44	39	28.2	11.4 - 45.0	128	25.0	15.8 - 34.2	167	25.8	18.8 - 32.9
45-54	43	48.8	34.0 - 63.7	73	26.0	17.8 - 34.3	116	34.9	27.5 - 42.3
55-64	34	64.7	50.5 - 78.9	64	34.4	21.7 - 47.1	98	46.3	37.1 - 55.5
25-64	158	41.2	31.9 - 50.5	396	23.1	19.0 - 27.1	554	28.6	24.5 - 32.7

<b>Mean years since cessation</b>									
Age Group (years)	<b>Men</b>			<b>Women</b>			<b>Both Sexes</b>		
	n	Mean years	95% CI	n	Mean years	95% CI	n	Mean years	95% CI
25-34	4	14.3	--	4	14.5	12.1 - 16.9	8	14.4	12.0 - 16.8
35-44	5	18.4	--	9	21.9	17.0 - 26.7	14	20.5	16.3 - 24.7
45-54	4	28.0	--	9	22.8	18.6 - 27.0	13	24.5	20.5 - 28.4
55-64	13	25.2	--	12	21.9	19.2 - 24.6	25	23.8	17.6 - 30.0
25-64	26	21.5	--	34	20.8	18.3 - 23.4	60	21.1	18.4 - 23.8

## Alcohol Consumption

### Alcohol consumption status

Description: Alcohol consumption status of all respondents. Abstainers have not consumed alcohol in the last 12 months.\*

Instrument questions:

- Have you consumed alcohol (such as beer, wine, spirits, fermented cider, or (add other local examples) within the past 12 months?

Alcohol consumption status					
Men					
Age Group (years)	n	% Drank in last 12 months	95% CI	% Abstainer	95% CI
25-34	163	58.3	49.8 - 66.8	41.7	33.2 - 50.2
35-44	186	43.5	35.6 - 51.5	56.5	48.5 - 64.4
45-54	165	40.0	29.9 - 50.1	60.0	49.9 - 70.1
55-64	87	29.9	19.8 - 40.0	70.1	60.0 - 80.2
25-64	601	46.9	41.6 - 52.2	53.1	47.8 - 58.4

Alcohol consumption status					
Women					
Age Group (years)	n	% Drank in last 12 months	95% CI	% Abstainer	95% CI
25-34	225	7.6	3.6 - 11.6	92.4	88.4 - 96.4
35-44	239	4.2	1.2 - 7.2	95.8	92.8 - 98.8
45-54	186	8.1	3.3 - 12.8	91.9	87.2 - 96.7
55-64	126	3.2	0.0 - 6.4	96.8	93.6 - 100.0
25-64	776	6.1	3.5 - 8.7	93.9	91.3 - 96.5

Alcohol consumption status					
Both Sexes					
Age Group (years)	n	% Drank in last 12 months	95% CI	% Abstainer	95% CI
25-34	388	31.5	26.5 - 36.4	68.5	63.6 - 73.5
35-44	425	23.0	18.4 - 27.7	77.0	72.3 - 81.6
45-54	351	23.7	17.8 - 29.6	76.3	70.4 - 82.2
55-64	213	15.4	9.4 - 21.3	84.6	78.7 - 90.6
25-64	1377	25.5	21.9 - 29.0	74.5	71.0 - 78.1

**Frequency of alcohol consumption**

Description: Frequency of alcohol consumption in the last year among those respondents who have drunk in the last 12 months.

Instrument question:

- In the past 12 months, how frequently have you had at least one drink?

Frequency of alcohol consumption in the last 12 months									
Age Group (years)	Men								
	n	% ≥ 5 days p. week	95% CI	% 1-4 days p. week	95% CI	% 1-3 days p. month	95% CI	% < once a month	95% CI
25-34	94	6.4	1.0 - 11.8	24.5	16.0 - 32.9	37.2	30.1 - 44.3	31.9	20.6 - 43.3
35-44	80	8.8	2.5 - 15.0	27.5	17.3 - 37.7	40.0	27.8 - 52.2	23.8	15.2 - 32.3
45-54	66	6.1	1.1 - 11.0	31.8	23.6 - 40.1	37.9	27.7 - 48.0	24.2	14.5 - 33.9
55-64	25	12.0	1.1 - 22.9	32.0	12.6 - 51.4	28.0	12.6 - 43.4	28.0	7.5 - 48.5
25-64	265	7.4	4.2 - 10.6	27.1	21.4 - 32.9	37.5	30.7 - 44.4	27.9	20.1 - 35.8

Frequency of alcohol consumption in the last 12 months									
Age Group (years)	Women								
	n	% ≥ 5 days p. week	95% CI	% 1-4 days p. week	95% CI	% 1-3 days p. month	95% CI	% < once a month	95% CI
25-34	17	--	--	52.9	23.3 - 82.6	--	--	47.1	17.4 - 76.7
35-44	10	10.0	2.4 - 17.6	10.0	0.0 - 28.5	30.0	5.3 - 54.7	50.0	30.4 - 69.6
45-54	15	--	--	20.0	0.0 - 52.5	20.0	0.0 - 42.7	60.0	30.9 - 89.1
55-64	4	--	--	--	--	75.0	29.2 - 100.0	25.0	0.0 - 70.8
25-64	46	2.2	1.3 - 3.0	32.2	11.9 - 52.6	16.0	7.4 - 24.7	49.6	29.3 - 69.9

Frequency of alcohol consumption in the last 12 months									
Age Group (years)	Both Sexes								
	n	% ≥ 5 days p. week	95% CI	% 1-4 days p. week	95% CI	% 1-3 days p. month	95% CI	% < once a month	95% CI
25-34	111	5.6	0.9 - 10.2	28.1	20.9 - 35.4	32.5	25.8 - 39.1	33.9	23.5 - 44.2
35-44	90	8.9	3.2 - 14.5	25.8	16.5 - 35.1	39.0	27.8 - 50.3	26.3	16.9 - 35.6
45-54	81	5.0	0.8 - 9.2	29.8	19.6 - 40.0	34.8	26.0 - 43.5	30.5	21.2 - 39.8
55-64	29	10.6	1.3 - 19.9	28.3	11.4 - 45.2	33.5	16.0 - 50.9	27.7	7.7 - 47.6
25-64	311	6.7	3.8 - 9.7	27.8	22.5 - 33.0	34.8	28.5 - 41.2	30.7	23.2 - 38.2

**Standard drinks per drinking day**

Description: Number of standard drinks consumed on a drinking day among those respondents who have drunk in the last 12 months.

Instrument question:

- When you drink alcohol, on average, how many drinks do you have during one day?

Number of standard drinks consumed on a drinking day												
Age Group (years)	Men										Mean # of standard drinks	95% CI
	n	% 1 drink	95% CI	% 2-3 drinks	95% CI	% 4-5 drinks	95% CI	% 6+ drinks	95% CI			
25-34	94	--	--	1.1	0.0 - 3.3	11.7	5.1 - 18.3	87.2	79.7 - 94.7	12.1	10.3 - 13.9	
35-44	80	2.5	0.0 - 6.1	2.5	0.0 - 6.1	15.0	6.7 - 23.3	80.0	69.7 - 90.3	11.4	10.2 - 12.7	
45-54	65	--	--	6.2	0.0 - 15.5	12.3	6.1 - 18.5	81.5	72.1 - 90.9	11.1	9.4 - 12.9	
55-64	25	--	--	8.0	0.0 - 19.5	20.0	2.3 - 37.7	72.0	50.1 - 93.9	8.8	6.4 - 11.2	
25-64	264	0.7	0.0 - 1.8	2.8	0.1 - 5.5	13.3	9.0 - 17.6	83.1	77.4 - 88.8	11.5	10.5 - 12.5	

Number of standard drinks consumed on a drinking day												
Age Group (years)	Women										Mean # of standard drinks	95% CI
	n	% 1 drink	95% CI	% 2-3 drinks	95% CI	% 4-5 drinks	95% CI	% 6+ drinks	95% CI			
25-34	17	--	--	5.9	0.0 - 17.4	29.4	2.3 - 56.5	64.7	39.0 - 90.4	8.3	--	
35-44	10	20.0	0.0 - 46.3	20.0	0.0 - 46.7	20.0	0.0 - 42.0	40.0	13.2 - 66.8	5.2	--	
45-54	15	6.7	0.0 - 20.9	33.3	8.0 - 58.7	26.7	7.6 - 45.7	33.3	6.9 - 59.8	6.5	--	
55-64	4	25.0	0.0 - 74.3	25.0	0.0 - 74.3	--	--	50.0	0.0 - 100.0	4.5	--	
25-64	46	7.5	0.0 - 16.0	16.9	4.6 - 29.3	24.9	10.0 - 39.8	50.7	35.8 - 65.6	6.9	--	

Number of standard drinks consumed on a drinking day												
Age Group (years)	Both Sexes										Mean # of standard drinks	95% CI
	n	% 1 drink	95% CI	% 2-3 drinks	95% CI	% 4-5 drinks	95% CI	% 6+ drinks	95% CI			
25-34	111	--	--	1.7	0.0 - 4.2	14.0	7.8 - 20.1	84.3	77.5 - 91.2	11.6	10.0 - 13.2	
35-44	90	4.2	0.0 - 8.3	4.2	0.0 - 9.0	15.5	8.4 - 22.6	76.2	65.7 - 86.6	10.8	9.5 - 12.2	
45-54	80	1.2	0.0 - 3.3	11.0	1.6 - 20.3	14.8	8.9 - 20.8	73.0	63.4 - 82.6	10.3	8.8 - 11.8	
55-64	29	2.9	0.0 - 8.6	10.0	0.0 - 20.5	17.7	3.3 - 32.0	69.4	48.0 - 90.9	8.3	6.0 - 10.6	
25-64	310	1.6	0.3 - 2.9	4.6	1.8 - 7.4	14.8	11.4 - 18.2	79.0	74.0 - 84.0	10.9	10.0 - 11.9	

**Heavy drinking**

Description: Frequency and quantity of drinks consumed in the last 7 days by current (last 30 days) drinker, grouped into three categories.

Instrument question:

- During each of the past 7 days, how many standard drinks of any alcoholic drink did you have each day?

Frequency and quantity of drinks consumed in the last 7 days							
Age Group (years)	Men						
	n	% Drank on 4+ days	95% CI	% 5+ drinks on any day	95% CI	% 20+ drinks in 7 days	95% CI
25-34	52	7.7	0.0 - 15.7	76.9	62.5 - 91.3	25.0	10.4 - 39.6
35-44	46	8.7	0.0 - 17.4	69.6	54.8 - 84.4	21.7	13.1 - 30.4
45-54	45	4.4	0.0 - 9.8	71.1	60.4 - 81.9	13.3	0.0 - 29.3
55-64	17	11.8	0.0 - 28.7	52.9	24.3 - 81.6	23.5	2.6 - 44.5
25-64	160	7.7	3.1 - 12.2	71.8	63.1 - 80.5	21.6	13.7 - 29.6

Frequency and quantity of drinks consumed in the last 7 days							
Age Group (years)	Women						
	n	% Drank on 4+ days	95% CI	% 4+ drinks on any day	95% CI	% 15+ drinks in 7 days	95% CI
25-34	7	--	--	57.1	16.0 - 98.3	----	--
35-44	5	--	--	40.0	12.3 - 67.7	----	--
45-54	7	--	--	57.1	21.8 - 92.4	14.3	0.0 - 41.1
55-64	2	--	--	----	--	----	--
25-64	21	--	--	49.2	27.4 - 70.9	3.7	0.0 - 11.6

Frequency and quantity of drinks consumed in the last 7 days			
Age Group (years)	Both Sexes		
	n	% Drank on 4+ days	95% CI
25-34	59	6.9	0.0 - 14.1
35-44	51	8.0	0.0 - 15.9
45-54	52	3.9	0.0 - 8.6
55-64	19	10.7	0.0 - 25.7
25-64	181	6.9	2.8 - 11.0

**Hazardous and harmful drinking**

Description: Percentage of current (last 30 days) drinker engaging in hazardous and harmful drinking in the last 7 days.  
 Harmful drinking is defined as  $\geq 60$ g of pure alcohol on average per day for men and  $\geq 40$  g for women.  
 Hazardous drinking is defined as 40-59.9g of pure alcohol on average per day for men and 20-39.9g for women.  
 A standard drink contains approximately 10g of pure alcohol.

Instrument question:

- During each of the past 7 days, how many standard drinks of any alcoholic drink did you have each day?

Hazardous and harmful drinking in the last 7 days							
Age Group (years)	Men						
	n	% harmful drinking	95% CI	% hazardous drinking	95% CI	% <40g pure alcohol per day	95% CI
25-34	52	5.8	0.0 - 11.6	13.5	2.9 - 24.0	80.8	67.4 - 94.1
35-44	46	4.3	0.0 - 9.9	15.2	6.3 - 24.1	80.4	71.1 - 89.8
45-54	45	2.2	0.0 - 6.8	11.1	0.0 - 23.4	86.7	70.7 - 100.0
55-64	17	5.9	0.0 - 18.6	--	--	94.1	81.4 - 100.0
25-64	160	4.7	1.5 - 7.9	12.5	6.0 - 18.9	82.9	75.3 - 90.5

Hazardous and harmful drinking in the last 7 days							
Age Group (years)	Women						
	n	% harmful drinking	95% CI	% hazardous drinking	95% CI	% <20g pure alcohol per day	95% CI
25-34	7	--	--	--	--	100.0	100.0 - 100.0
35-44	5	--	--	--	--	100.0	100.0 - 100.0
45-54	7	14.3	0.0 - 41.1	--	--	85.7	58.9 - 100.0
55-64	2	--	--	--	--	100.0	100.0 - 100.0
25-64	21	3.7	0.0 - 11.6	--	--	96.3	88.4 - 100.0

## Fruit and Vegetable Consumption

**Mean number of days of fruit and vegetable consumption**

Description: mean number of days fruit and vegetables consumed.

Instrument questions:

- In a typical week, on how many days do you eat fruit?
- In a typical week, on how many days do you eat vegetables?

Mean number of days fruit consumed in a typical week									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean number of days	95% CI	n	Mean number of days	95% CI	n	Mean number of days	95% CI
25-34	156	1.6	1.3 - 1.9	213	1.5	1.3 - 1.7	369	1.6	1.4 - 1.8
35-44	173	1.3	1.1 - 1.5	227	1.6	1.4 - 1.8	400	1.5	1.3 - 1.6
45-54	147	1.5	1.2 - 1.7	174	1.5	1.3 - 1.7	321	1.5	1.3 - 1.6
55-64	85	1.5	1.1 - 1.8	113	1.9	1.4 - 2.4	198	1.7	1.3 - 2.0
25-64	561	1.5	1.3 - 1.6	727	1.6	1.4 - 1.7	1288	1.5	1.4 - 1.7

Mean number of days vegetables consumed in a typical week									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean number of days	95% CI	n	Mean number of days	95% CI	n	Mean number of days	95% CI
25-34	151	1.9	1.6 - 2.1	193	2.1	1.9 - 2.4	344	2.0	1.8 - 2.2
35-44	161	1.8	1.5 - 2.1	211	2.0	1.7 - 2.2	372	1.9	1.7 - 2.1
45-54	147	1.7	1.4 - 2.0	169	2.3	2.0 - 2.5	316	2.0	1.8 - 2.2
55-64	78	1.7	1.4 - 2.0	107	1.9	1.5 - 2.2	185	1.8	1.6 - 2.0
25-64	537	1.8	1.6 - 2.0	680	2.1	1.9 - 2.2	1217	1.9	1.8 - 2.1

**Mean number of servings of fruit and vegetable consumption**

Description: mean number of fruit, vegetable, and combined fruit and vegetable servings on average per day.

Instrument questions:

- In a typical week, on how many days do you eat fruit?
- How many servings of fruit do you eat on one of those days?
- In a typical week, on how many days do you eat vegetables?
- How many servings of vegetables do you eat on one of those days?

Mean number of servings of fruit on average per day									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI
25-34	156	0.5	0.4 - 0.7	213	0.4	0.3 - 0.5	369	0.4	0.4 - 0.5
35-44	173	0.4	0.3 - 0.4	227	0.4	0.3 - 0.5	400	0.4	0.3 - 0.5
45-54	147	0.4	0.3 - 0.5	174	0.4	0.3 - 0.4	321	0.4	0.3 - 0.4
55-64	85	0.4	0.2 - 0.5	113	0.4	0.2 - 0.5	198	0.4	0.3 - 0.5
25-64	561	0.4	0.4 - 0.5	727	0.4	0.3 - 0.4	1288	0.4	0.4 - 0.5

Mean number of servings of vegetables on average per day									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI
25-34	151	0.4	0.3 - 0.6	193	0.4	0.3 - 0.5	344	0.4	0.3 - 0.5
35-44	161	0.4	0.3 - 0.4	211	0.4	0.3 - 0.6	372	0.4	0.3 - 0.5
45-54	147	0.4	0.3 - 0.5	169	0.4	0.4 - 0.5	316	0.4	0.3 - 0.5
55-64	78	0.4	0.3 - 0.5	107	0.4	0.3 - 0.4	185	0.4	0.3 - 0.4
25-64	537	0.4	0.3 - 0.5	680	0.4	0.4 - 0.5	1217	0.4	0.4 - 0.5

Mean number of servings of fruit and/or vegetables on average per day									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI
25-34	158	0.9	0.7 - 1.1	218	0.7	0.6 - 0.9	376	0.8	0.7 - 0.9
35-44	177	0.7	0.6 - 0.8	233	0.8	0.7 - 1.0	410	0.8	0.7 - 0.9
45-54	159	0.7	0.6 - 0.9	180	0.7	0.6 - 0.8	339	0.7	0.6 - 0.8
55-64	85	0.7	0.6 - 0.9	119	0.7	0.5 - 0.9	204	0.7	0.6 - 0.8
25-64	579	0.8	0.7 - 0.9	750	0.8	0.7 - 0.8	1329	0.8	0.7 - 0.8

**Fruit and vegetable consumption per day**

Description: Frequency of fruit and/or vegetable consumption.

Instrument questions:

- In a typical week, on how many days do you eat fruit?
- How many servings of fruit do you eat on one of those days?
- In a typical week, on how many days do you eat vegetables?
- How many servings of vegetables do you eat on one of those days?

Number of servings of fruit and/or vegetables on average per day									
Age Group (years)	Men								
	n	% no fruit and/or vegetables	95% CI	% 1-2 servings	95% CI	% 3-4 servings	95% CI	% ≥5 servings	95% CI
25-34	158	67.7	59.6 - 75.8	27.2	19.9 - 34.5	3.2	0.5 - 5.8	1.9	0.0 - 3.8
35-44	177	74.6	69.5 - 79.6	23.7	19.6 - 27.8	1.7	0.0 - 3.6	--	--
45-54	159	72.3	64.9 - 79.8	25.8	18.9 - 32.6	1.9	0.0 - 4.1	--	--
55-64	85	75.3	67.1 - 83.5	21.2	11.7 - 30.6	2.4	0.0 - 5.6	1.2	0.0 - 3.4
25-64	579	71.6	67.4 - 75.8	25.2	21.5 - 28.8	2.4	1.2 - 3.5	0.8	0.1 - 1.6

Number of servings of fruit and/or vegetables on average per day									
Age Group (years)	Women								
	n	% no fruit and/or vegetables	95% CI	% 1-2 servings	95% CI	% 3-4 servings	95% CI	% ≥5 servings	95% CI
25-34	218	70.2	63.8 - 76.5	27.5	22.3 - 32.7	1.8	0.0 - 4.8	0.5	0.0 - 1.4
35-44	233	70.0	64.3 - 75.6	26.2	20.8 - 31.5	3.0	1.0 - 5.0	0.9	0.0 - 2.1
45-54	180	75.0	69.6 - 80.4	23.9	18.4 - 29.3	0.6	0.0 - 1.7	0.6	0.0 - 1.7
55-64	119	74.0	62.7 - 85.2	25.2	14.4 - 36.0	0.8	0.0 - 2.6	--	--
25-64	750	71.4	68.0 - 74.9	26.2	23.4 - 28.9	1.9	0.5 - 3.2	0.6	0.1 - 1.0

Number of servings of fruit and/or vegetables on average per day									
Age Group (years)	Both Sexes								
	n	% no fruit and/or vegetables	95% CI	% 1-2 servings	95% CI	% 3-4 servings	95% CI	% ≥5 servings	95% CI
25-34	376	69.0	64.4 - 73.6	27.4	23.3 - 31.5	2.5	0.7 - 4.2	1.1	0.1 - 2.2
35-44	410	72.1	68.1 - 76.1	25.0	21.7 - 28.4	2.4	1.2 - 3.6	0.5	0.0 - 1.1
45-54	339	73.7	69.1 - 78.3	24.8	20.4 - 29.2	1.2	0.0 - 2.4	0.3	0.0 - 0.9
55-64	204	74.6	66.8 - 82.4	23.3	15.1 - 31.5	1.5	0.0 - 3.3	0.5	0.0 - 1.6
25-64	1329	71.5	68.9 - 74.1	25.7	23.4 - 28.0	2.1	1.3 - 2.9	0.7	0.3 - 1.1

**Fruit and vegetable consumption per day**

Description: Percentage of those eating less than five servings of fruit and/or vegetables on average per day.

Instrument questions:

- In a typical week, on how many days do you eat fruit?
- How many servings of fruit do you eat on one of those days?
- In a typical week, on how many days do you eat vegetables?
- How many servings of vegetables do you eat on one of those days?

Less than five servings of fruit and/or vegetables on average per day									
Age Group (years)	Men			Women			Both Sexes		
	n	% < five servings per day	95% CI	n	% < five servings per day	95% CI	n	% < five servings per day	95% CI
25-34	158	98.1	96.2 - 100.0	218	99.5	98.6 - 100.0	376	98.9	97.8 - 99.9
35-44	177	100.0	100.0 - 100.0	233	99.1	97.9 - 100.0	410	99.5	98.9 - 100.0
45-54	159	100.0	100.0 - 100.0	180	99.4	98.3 - 100.0	339	99.7	99.1 - 100.0
55-64	85	98.8	96.6 - 100.0	119	100.0	100.0 - 100.0	204	99.5	98.4 - 100.0
25-64	579	99.2	98.4 - 99.9	750	99.4	99.0 - 99.9	1329	99.3	98.9 - 99.7

**Analysis Information:**

- Questions used: D1-D4
- Epi Info program name: Dfiveormore (unweighted); DfiveormoreWT (weighted)

**Type of oil used most frequently**

Description: type of oil or fat most often used for meal preparation in households (presented only for both sexes because results are for the household not individuals).

Instrument question:

- What type of oil or fat is most often used for meal preparation in your household?

Type of oil or fat most often used for meal preparation in household												
n	% Vegetable oil	95% CI	% Lard	95% CI	% Butter	95% CI	% Margarine	95% CI	% None used	95% CI	% Other	95% CI
1330	73.2	68.8 - 77.6	19.8	16.1 - 23.5	--	--	--	--	--	--	7.0	4.7 - 9.2

## Physical Activity

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### Introduction

Analysis physical activity data can be very complicated and the result confusing. The following guidelines will help clarify the results of the physical activity data and will also provide valuable information on the classifications. Make sure you use some of these guidelines when you report physical activity data.

- MET values are applied to vigorous and moderate intensity variables in the work, transport and recreation domains. These have been calculated using an average of the typical types of activity undertaken. Different types of activities have been grouped together and given a MET value based on the intensity of the activity. Applying MET values to types of activities allows us to calculate total physical activity. For more information regarding MET values go the STEPS website at [www.who.int/chp/steps](http://www.who.int/chp/steps).
- The calculations below use multiple questions in the physical activity section. To simplify this a bit the questions have been clustered into four groups (as they appear in the Instrument). In the Instrument questions section of the table, only the group label appears. The specific questions for each group are presented below.

#### Activity at work:

Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like [examples] for at least 10 minutes continuously?

In a typical week, on how many days do you do vigorous-intensity activities as part of your work?

How much time do you spend doing vigorous-intensity activities at work on a typical day?

Does your work involve moderate-intensity activity, that causes small increases in breathing or heart rate such as brisk walking for at least 10 minutes continuously?

In a typical week, on how many days do you do moderate-intensity activities as part of your work?

How much time do you spend doing moderate-intensity activities at work on a typical day?

#### Travel to and from places:

Do you walk or use a bicycle for at least 10 minutes continuously to get to and from places?

In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places?

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## Physical Activity, Continued

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### Introduction (cont.)

How much time do you spend walking or bicycling for travel on a typical day?

#### Recreational activities:

Do you do any involve vigorous-intensity sports, fitness or recreational activities that cause large increases in breathing or heart rate like [examples] for at least 10 minutes continuously?

In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational activities?

How much time do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?

Do you do any involve moderate-intensity sports, fitness or recreational activities that cause large increases in breathing or heart rate like [examples] for at least 10 minutes continuously?

In a typical week, on how many days do you do moderate--intensity sports, fitness or recreational activities?

How much time do you spend doing moderate--intensity sports, fitness or recreational activities on a typical day?

#### Sedentary behaviour :

How much time do you usually spend sitting or reclining on a typical day?

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**Levels of total physical activity**

Description: Percentage of respondents classified into three categories of total physical activity.

Instrument questions:

- activity at work
- travel to and from places
- recreational activities

Level of total physical activity							
Age Group (years)	Men						
	n	% Low	95% CI	% Moderate	95% CI	% High	95% CI
25-34	147	39.5	32.5 - 46.4	28.6	20.2 - 37.0	32.0	22.1 - 41.8
35-44	165	36.4	27.8 - 44.9	33.3	25.5 - 41.1	30.3	23.5 - 37.1
45-54	149	49.7	42.3 - 57.0	20.1	12.5 - 27.8	30.2	22.7 - 37.7
55-64	81	50.6	39.6 - 61.6	25.9	18.6 - 33.2	23.5	15.5 - 31.5
25-64	542	41.8	38.0 - 45.6	28.1	24.2 - 31.9	30.1	24.6 - 35.7

Level of total physical activity							
Age Group (years)	Women						
	n	% Low	95% CI	% Moderate	95% CI	% High	95% CI
25-34	216	54.2	46.8 - 61.5	25.5	20.2 - 30.7	20.4	13.9 - 26.9
35-44	231	59.3	51.7 - 67.0	27.3	21.4 - 33.1	13.4	8.8 - 18.0
45-54	179	61.5	54.4 - 68.6	25.1	17.9 - 32.4	13.4	7.4 - 19.4
55-64	120	55.0	47.7 - 62.3	26.7	20.6 - 32.8	18.3	13.6 - 23.1
25-64	746	57.3	53.9 - 60.6	26.1	23.3 - 29.0	16.6	13.6 - 19.7

Level of total physical activity							
Age Group (years)	Both Sexes						
	n	% Low	95% CI	% Moderate	95% CI	% High	95% CI
25-34	363	47.5	42.7 - 52.2	26.9	21.4 - 32.4	25.7	19.8 - 31.5
35-44	396	48.8	43.3 - 54.4	30.0	26.0 - 34.1	21.1	16.9 - 25.4
45-54	328	55.9	51.4 - 60.4	22.8	18.0 - 27.5	21.3	16.3 - 26.4
55-64	201	53.0	47.6 - 58.5	26.3	21.9 - 30.8	20.6	16.4 - 24.9
25-64	1288	50.1	47.7 - 52.6	27.0	24.4 - 29.6	22.8	19.7 - 26.0

**Total physical activity-mean**

Description: Mean minutes of total physical activity on average per day.

Instrument questions

- activity at work
- travel to and from places
- recreational activities

Mean minutes of total physical activity on average per day									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
25-34	147	83.8	65.4 - 102.3	216	66.7	53.6 - 79.8	363	74.5	64.1 - 85.0
35-44	165	82.8	68.2 - 97.4	231	50.0	39.2 - 60.9	396	65.0	55.5 - 74.5
45-54	149	82.8	65.7 - 99.9	179	45.8	35.7 - 55.9	328	63.3	52.6 - 73.9
55-64	81	83.3	54.7 - 112.0	120	60.1	50.0 - 70.1	201	70.6	56.2 - 85.0
25-64	542	83.3	72.4 - 94.1	746	56.8	49.9 - 63.6	1288	68.9	62.2 - 75.7

**Total physical activity-median**

Description: Median minutes of total physical activity on average per day.

Instrument questions

- activity at work
- travel to and from places
- recreational activities

Median minutes of total physical activity on average per day									
Age Group (years)	Men			Women			Both Sexes		
	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)
25-34	189	51.4	14.3 - 111.4	226	25.7	6.4 - 90.0	415	34.3	10.7 - 98.6
35-44	157	45.0	14.0 - 120.0	187	20.0	0.0 - 60.0	344	30.0	5.7 - 90.0
45-54	100	25.7	8.6 - 105.7	111	20.0	2.9 - 60.0	211	25.0	5.7 - 77.1
55-64	57	21.4	6.4 - 75.7	69	27.9	7.1 - 77.1	125	21.4	6.9 - 77.1
25-64	503	40.0	12.9 - 120.0	593	21.4	4.3 - 70.0	1095	30.0	8.6 - 90.0

**Domain-specific physical activity-mean**

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

Instrument questions:

- activity at work
- travel to and from places
- recreational activities

<b>Mean minutes of work-related physical activity on average per day</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
25-34	147	43.0	28.3 - 57.6	216	37.9	28.4 - 47.5	363	40.2	32.4 - 48.1
35-44	165	48.0	36.3 - 59.7	231	27.1	17.3 - 36.9	396	36.7	28.3 - 45.0
45-54	149	54.8	38.7 - 70.9	179	19.5	10.5 - 28.5	328	36.2	25.3 - 47.0
55-64	81	52.9	25.1 - 80.8	120	41.5	30.3 - 52.7	201	46.7	32.0 - 61.4
25-64	542	48.0	39.0 - 57.0	746	31.5	26.1 - 36.9	1288	39.1	33.6 - 44.5

<b>Mean minutes of transport-related physical activity on average per day</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
25-34	147	30.6	18.9 - 42.3	216	23.1	18.8 - 27.4	363	26.5	19.6 - 33.4
35-44	165	28.5	20.1 - 37.0	231	21.1	16.0 - 26.3	396	24.5	19.8 - 29.3
45-54	149	24.4	17.2 - 31.5	179	26.0	18.3 - 33.8	328	25.2	19.4 - 31.0
55-64	81	28.3	15.7 - 40.8	120	18.5	14.8 - 22.1	201	22.9	17.3 - 28.5
25-64	542	28.4	22.3 - 34.6	746	22.5	19.4 - 25.6	1288	25.2	21.5 - 28.9

<b>Mean minutes of recreation-related physical activity on average per day</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
25-34	147	10.3	4.9 - 15.7	216	5.7	1.3 - 10.1	363	7.8	4.6 - 11.0
35-44	165	6.3	3.1 - 9.5	231	1.8	0.1 - 3.5	396	3.8	2.0 - 5.7
45-54	149	3.6	1.4 - 5.9	179	0.3	0.0 - 0.9	328	1.9	0.8 - 3.0
55-64	81	2.1	0.0 - 5.0	120	0.1	0.0 - 0.3	201	1.0	0.0 - 2.3
25-64	542	6.8	4.4 - 9.2	746	2.8	1.0 - 4.6	1288	4.6	3.2 - 6.0

**Domain-specific physical activity - median**

Description: Median minutes spent on average per day in work-, transport- and recreation-related physical activity.

Instrument questions:

- activity at work
- travel to and from places
- recreational activities

Median minutes of work-related physical activity on average per day									
Age Group (years)	Men			Women			Both Sexes		
	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)
25-34	189	0.0	0.0 - 51.4	226	0.0	0.0 - 30.0	415	0.0	0.0 - 42.9
35-44	157	0.0	0.0 - 68.6	187	0.0	0.0 - 8.6	344	0.0	0.0 - 34.3
45-54	100	0.0	0.0 - 64.3	111	0.0	0.0 - 17.1	211	0.0	0.0 - 34.3
55-64	57	0.0	0.0 - 30.0	69	0.0	0.0 - 42.9	125	0.0	0.0 - 38.6
25-64	503	0.0	0.0 - 55.7	593	0.0	0.0 - 21.4	1095	0.0	0.0 - 38.6

Median minutes of transport-related physical activity on average per day									
Age Group (years)	Men			Women			Both Sexes		
	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)
25-34	189	15.0	4.3 - 34.3	226	11.4	0.0 - 25.7	415	14.0	0.0 - 30.0
35-44	157	15.0	0.0 - 34.3	187	10.0	0.0 - 30.0	344	12.9	0.0 - 30.0
45-54	100	10.7	0.0 - 22.9	111	11.4	0.0 - 28.6	211	11.4	0.0 - 25.7
55-64	57	8.6	0.0 - 21.4	69	11.4	0.0 - 25.7	125	10.0	0.0 - 22.9
25-64	503	14.3	0.0 - 30.0	593	11.4	0.0 - 28.6	1095	12.9	0.0 - 30.0

Median minutes of recreation-related physical activity on average per day									
Age Group (years)	Men			Women			Both Sexes		
	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)
25-34	189	0.0	0.0 - 0.0	226	0.0	0.0 - 0.0	415	0.0	0.0 - 0.0
35-44	157	0.0	0.0 - 0.0	187	0.0	0.0 - 0.0	344	0.0	0.0 - 0.0
45-54	100	0.0	0.0 - 0.0	111	0.0	0.0 - 0.0	211	0.0	0.0 - 0.0
55-64	57	0.0	0.0 - 0.0	69	0.0	0.0 - 0.0	125	0.0	0.0 - 0.0
25-64	503	0.0	0.0 - 0.0	593	0.0	0.0 - 0.0	1095	0.0	0.0 - 0.0

**No physical activity by domain**

Description: Percentage of respondents classified as doing no work-, transport- or recreational-related physical activity.

Instrument questions:

- activity at work
- travel to and from places
- recreational activities

No work-related physical activity									
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
25-34	147	57.1	49.7 - 64.6	216	63.9	57.0 - 70.8	363	60.8	55.7 - 65.9
35-44	165	52.7	43.0 - 62.5	231	73.2	66.2 - 80.1	396	63.8	56.9 - 70.7
45-54	149	55.7	46.4 - 65.0	179	71.0	62.3 - 79.6	328	63.7	57.6 - 69.9
55-64	81	55.6	43.8 - 67.3	120	64.2	55.8 - 72.6	201	60.3	53.9 - 66.7
25-64	542	55.3	49.7 - 60.9	746	68.2	64.3 - 72.0	1288	62.3	58.8 - 65.7

No transport-related physical activity									
Age Group (years)	Men			Women			Both Sexes		
	n	% no activity for transport	95% CI	n	% no activity for transport	95% CI	n	% no activity for transport	95% CI
25-34	147	20.4	13.6 - 27.2	216	28.7	19.6 - 37.8	363	24.9	18.9 - 31.0
35-44	165	27.3	20.1 - 34.4	231	31.6	24.1 - 39.1	396	29.6	24.9 - 34.3
45-54	149	30.9	25.5 - 36.2	179	28.5	21.6 - 35.4	328	29.6	25.0 - 34.2
55-64	81	32.1	25.3 - 38.9	120	30.0	22.5 - 37.5	201	30.9	26.3 - 35.6
25-64	542	25.9	22.3 - 29.6	746	29.7	23.8 - 35.7	1288	28.0	24.2 - 31.8

No recreation-related physical activity									
Age Group (years)	Men			Women			Both Sexes		
	n	% no recr. activity	95% CI	n	% no recr. activity	95% CI	n	% no recr. activity	95% CI
25-34	147	78.2	70.5 - 86.0	216	92.6	88.2 - 97.0	363	86.0	81.7 - 90.3
35-44	165	88.5	83.1 - 93.9	231	96.1	93.1 - 99.2	396	92.6	89.4 - 95.8
45-54	149	91.3	86.8 - 95.7	179	99.4	98.3 - 100.0	328	95.6	93.6 - 97.6
55-64	81	95.1	90.7 - 99.4	120	99.2	97.4 - 100.0	201	97.3	95.1 - 99.5
25-64	542	85.9	82.3 - 89.5	746	95.7	93.6 - 97.9	1288	91.2	89.1 - 93.3

**Composition of total physical activity**

Description: Percentage of work, transport and recreational activity contributing to total activity.

Instrument questions:

- activity at work
- travel to and from places
- recreational activities

Composition of total physical activity							
Men							
Age Group (years)	n	% Activity from work	95% CI	% Activity for transport	95% CI	% Activity during leisure time	95% CI
25-34	134	32.4	26.0 - 38.7	56.3	48.5 - 64.2	11.3	6.9 - 15.7
35-44	141	40.3	33.3 - 47.3	53.3	46.1 - 60.6	6.4	3.5 - 9.3
45-54	126	41.6	33.2 - 50.0	52.6	44.9 - 60.3	5.8	2.6 - 9.0
55-64	65	41.4	31.5 - 51.2	56.0	44.9 - 67.0	2.7	0.0 - 5.4
25-64	466	37.5	33.4 - 41.7	54.6	49.8 - 59.5	7.8	5.8 - 9.8

Composition of total physical activity							
Women							
Age Group (years)	n	% Activity from work	95% CI	% Activity for transport	95% CI	% Activity during leisure time	95% CI
25-34	174	32.1	24.8 - 39.5	63.7	55.3 - 72.0	4.2	1.4 - 7.0
35-44	173	26.6	20.2 - 33.0	70.8	63.8 - 77.8	2.6	0.0 - 5.3
45-54	140	27.6	18.2 - 37.1	72.1	62.5 - 81.6	0.3	0.0 - 0.9
55-64	98	35.8	27.8 - 43.9	63.7	55.5 - 71.8	0.5	0.0 - 1.4
25-64	585	30.1	25.2 - 34.9	67.4	62.1 - 72.7	2.5	0.9 - 4.1

Composition of total physical activity							
Both Sexes							
Age Group (years)	n	% Activity from work	95% CI	% Activity for transport	95% CI	% Activity during leisure time	95% CI
25-34	308	32.2	28.3 - 36.2	60.1	54.5 - 65.7	7.7	5.2 - 10.2
35-44	314	33.3	28.1 - 38.6	62.2	56.7 - 67.8	4.4	2.2 - 6.7
45-54	266	34.5	27.3 - 41.7	62.5	55.7 - 69.3	3.0	1.6 - 4.4
55-64	163	38.3	32.3 - 44.4	60.2	53.8 - 66.6	1.5	0.1 - 2.8
25-64	1051	33.7	30.4 - 37.0	61.2	57.4 - 65.0	5.1	3.8 - 6.4

**No vigorous physical activity**

Description: Percentage of respondents not engaging in vigorous physical activity.

Instrument questions:

- activity at work
- recreational activities

<b>No vigorous physical activity</b>									
Age Group (years)	<b>Men</b>			<b>Women</b>			<b>Both Sexes</b>		
	n	% no vigorous activity	95% CI	n	% no vigorous activity	95% CI	n	% no vigorous activity	95% CI
25-34	147	66.0	57.2 - 74.8	216	89.4	83.8 - 94.9	363	78.7	73.1 - 84.3
35-44	165	73.3	66.4 - 80.3	231	95.7	93.1 - 98.3	396	85.5	81.6 - 89.3
45-54	149	77.2	70.2 - 84.2	179	93.9	89.6 - 98.1	328	86.0	82.3 - 89.6
55-64	81	85.2	78.0 - 92.4	120	95.8	92.3 - 99.4	201	91.0	87.0 - 95.0
25-64	542	72.7	68.0 - 77.4	746	92.9	90.5 - 95.3	1288	83.6	81.2 - 86.0

**Sedentary** Description: Minutes spent in sedentary activities on a typical day.

Instrument question:

- sedentary behaviour

<b>Minutes spent in sedentary activities on average per day</b>					
<b>Men</b>					
Age Group (years)	n	Mean minutes	95% CI	Median minutes	Inter-quartile range (P25-P75)
25-34	87	198.7	173.0 - 224.5	150.0	120.0 - 240.0
35-44	84	195.1	168.4 - 221.8	180.0	90.0 - 255.0
45-54	72	191.2	158.9 - 223.5	180.0	90.0 - 240.0
55-64	32	217.0	152.1 - 281.9	180.0	90.0 - 270.0
25-64	275	197.8	180.2 - 215.5	180.0	90.0 - 240.0

<b>Minutes spent in sedentary activities on average per day</b>					
<b>Women</b>					
Age Group (years)	n	Mean minutes	95% CI	Median minutes	Inter-quartile range (P25-P75)
25-34	108	180.8	157.1 - 204.5	150.0	90.0 - 240.0
35-44	109	169.6	146.8 - 192.4	150.0	90.0 - 210.0
45-54	88	178.3	150.8 - 205.8	150.0	90.0 - 240.0
55-64	51	233.5	180.3 - 286.8	180.0	120.0 - 255.0
25-64	356	182.3	166.5 - 198.0	150.0	90.0 - 240.0

<b>Minutes spent in sedentary activities on average per day</b>					
<b>Both Sexes</b>					
Age Group (years)	n	Mean minutes	95% CI	Median minutes	Inter-quartile range (P25-P75)
25-34	195	189.7	172.1 - 207.4	150.0	105.0 - 240.0
35-44	193	181.8	163.7 - 199.8	150.0	90.0 - 240.0
45-54	160	184.3	163.0 - 205.6	150.0	90.0 - 240.0
55-64	83	226.4	174.2 - 278.6	180.0	120.0 - 300.0
25-64	631	189.7	177.0 - 202.4	150.0	90.0 - 240.0

## Blood Pressure and Diabetes History

**Blood pressure diagnosis and treatment** Description: Raised blood pressure diagnosis and treatment results among all respondents.

Instrument questions:

- During the past 12 months have you been told by a doctor or other health worker that you have elevated blood pressure or hypertension?
- Are you currently receiving any of the following treatments/advice for high blood pressure prescribed by a doctor or other health worker?
- Drugs (medication) that you have taken in the last 2 weeks?

Raised blood pressure diagnosed by doctor or health worker in last 12 months									
Age Group (years)	Men			Women			Both Sexes		
	n	% diagnosed	95% CI	n	% diagnosed	95% CI	n	% diagnosed	95% CI
25-34	160	2.5	0.0 - 5.1	220	5.9	2.5 - 9.4	380	4.3	1.7 - 6.8
35-44	183	9.8	5.6 - 14.1	231	9.5	5.0 - 14.0	414	9.7	6.2 - 13.2
45-54	157	8.9	4.0 - 13.8	177	7.9	3.3 - 12.5	334	8.4	4.7 - 12.1
55-64	86	9.3	1.5 - 17.1	119	16.0	7.3 - 24.7	205	12.8	7.1 - 18.5
25-64	586	6.8	4.0 - 9.7	747	8.6	6.1 - 11.1	1333	7.7	5.6 - 9.9

Currently taking blood pressure drugs prescribed by doctor or health worker									
Age Group (years)	Men			Women			Both Sexes		
	n	% taking meds	95% CI	n	% taking meds	95% CI	n	% taking meds	95% CI
25-34	6	33.3	0.0 - 71.9	18	11.1	0.0 - 26.1	24	17.6	1.7 - 33.5
35-44	21	33.3	12.1 - 54.5	28	14.3	0.6 - 28.0	49	23.2	10.3 - 36.1
45-54	22	36.4	8.6 - 64.1	24	33.3	16.4 - 50.2	46	34.8	17.8 - 51.9
55-64	9	33.3	1.5 - 65.2	26	26.9	7.4 - 46.4	35	28.8	11.2 - 46.4
25-64	58	34.2	16.5 - 52.0	96	20.1	9.8 - 30.3	154	25.8	15.1 - 36.5

**Blood pressure lifestyle advice**

Description: Percentage of respondents who received lifestyle advice from a doctor or health worker to treat raised blood pressure.

Instrument question:

- Are you currently receiving any of the following treatments/advice for high blood pressure prescribed by a doctor or other health worker?

<b>Advised by doctor or health worker to have special prescribed diet</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	6	66.7	34.9 - 98.4	18	83.3	65.7 - 100.0	24	78.5	62.0 - 95.0
35-44	20	70.0	49.9 - 90.1	28	85.7	71.2 - 100.0	48	78.5	68.4 - 88.7
45-54	22	95.5	87.5 - 100.0	24	70.8	52.3 - 89.3	46	83.1	71.5 - 94.7
55-64	9	77.8	45.8 - 100.0	26	84.6	70.8 - 98.4	35	82.6	67.5 - 97.7
25-64	57	78.3	69.0 - 87.7	96	81.7	72.7 - 90.8	153	80.4	73.8 - 86.9

<b>Advised by doctor or health worker to lose weight</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	6	66.7	34.9 - 98.4	18	77.8	59.9 - 95.6	24	74.5	55.6 - 93.5
35-44	20	60.0	37.2 - 82.8	28	64.3	46.6 - 82.0	48	62.3	51.5 - 73.1
45-54	22	68.2	49.9 - 86.5	24	66.7	53.3 - 80.0	46	67.4	56.3 - 78.6
55-64	9	55.6	21.0 - 90.1	26	65.4	47.5 - 83.3	35	62.5	45.5 - 79.5
25-64	57	63.0	54.5 - 71.5	96	68.6	60.2 - 76.9	153	66.3	59.4 - 73.3

<b>Advised by doctor or health worker to stop smoking</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	6	50.0	3.3 - 96.7	18	72.2	54.6 - 89.8	24	65.8	47.1 - 84.4
35-44	20	60.0	40.6 - 79.4	28	64.3	51.4 - 77.2	48	62.3	50.6 - 74.0
45-54	22	68.2	51.8 - 84.6	24	75.0	61.7 - 88.3	46	71.6	61.5 - 81.7
55-64	9	55.6	21.0 - 90.1	26	65.4	50.0 - 80.8	35	62.5	46.4 - 78.5
25-64	57	60.3	45.8 - 74.9	96	68.9	61.5 - 76.3	153	65.4	58.3 - 72.6

<b>Advised by doctor or health worker to start or do more exercise</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	6	66.7	34.9 - 98.4	18	72.2	53.5 - 91.0	24	70.6	52.7 - 88.5
35-44	20	70.0	48.8 - 91.2	28	75.0	59.9 - 90.1	48	72.7	59.5 - 85.9
45-54	22	81.8	58.1 - 100.0	24	75.0	58.9 - 91.1	46	78.4	64.5 - 92.3
55-64	9	66.7	34.8 - 98.5	26	69.2	55.3 - 83.2	35	68.5	53.3 - 83.6
25-64	57	72.7	60.8 - 84.5	96	73.1	64.1 - 82.0	153	72.9	66.2 - 79.6

**Blood pressure advice by a traditional healer**

Description: Percentage of respondents who have sought advice or received treatment from traditional healers for raised blood pressure.

Instrument questions:

- During the past 12 months have you seen a traditional healer for raised blood pressure?
- Are you currently taking any herbal or traditional remedy for your high blood pressure?

<b>Seen a traditional healer in the last 12 months</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	6	16.7	0.0 - 48.8	18	22.2	3.4 - 41.0	24	20.6	1.4 - 39.8
35-44	20	20.0	2.9 - 37.1	28	28.6	10.1 - 47.1	48	24.7	11.3 - 38.0
45-54	22	27.3	8.7 - 45.8	24	45.8	28.3 - 63.3	46	36.6	24.4 - 48.8
55-64	9	44.4	3.4 - 85.5	26	42.3	22.1 - 62.5	35	42.9	21.7 - 64.2
25-64	57	24.9	11.3 - 38.5	96	33.4	22.1 - 44.7	153	30.0	20.7 - 39.3

<b>Currently taking herbal or traditional remedy for high blood pressure</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	6	16.7	0.0 - 48.8	18	11.1	0.0 - 26.3	24	12.7	0.0 - 26.8
35-44	20	25.0	6.3 - 43.7	28	28.6	14.9 - 42.3	48	26.9	14.1 - 39.7
45-54	22	22.7	5.5 - 40.0	24	33.3	15.6 - 51.0	46	28.1	15.8 - 40.3
55-64	9	22.2	0.0 - 53.6	26	23.1	9.8 - 36.3	35	22.8	10.6 - 35.1
25-64	57	22.6	9.0 - 36.2	96	23.8	15.5 - 32.2	153	23.3	16.1 - 30.5

**Diabetes diagnosis and treatment**

Description: Diabetes diagnosis and treatment results among all respondents.

Instrument questions:

- During the past 12 months, have you ever been told by a doctor or other health worker that you have diabetes?
- Are you currently taking any of the following treatments/advice for diabetes prescribed by a doctor or other health worker?

Diabetes diagnosed by doctor or health worker in last 12 months									
Age Group (years)	Men			Women			Both Sexes		
	n	% diagnosed	95% CI	n	% diagnosed	95% CI	n	% diagnosed	95% CI
25-34	51	--	--	100	4.0	0.2 - 7.8	151	2.5	0.2 - 4.7
35-44	92	6.5	2.7 - 10.4	117	14.5	8.1 - 20.9	209	10.7	6.7 - 14.7
45-54	98	17.3	8.2 - 26.5	114	11.4	5.9 - 16.9	212	14.3	8.9 - 19.6
55-64	53	26.4	14.2 - 38.6	75	28.0	17.7 - 38.3	128	27.3	17.9 - 36.7
25-64	294	10.5	6.9 - 14.1	406	12.2	8.6 - 15.7	700	11.4	8.6 - 14.2

Currently taking insulin prescribed for diabetes by doctor or health worker									
Age Group (years)	Men			Women			Both Sexes		
	n	% taking insulin	95% CI	n	% taking insulin	95% CI	n	% taking insulin	95% CI
25-34	1	--	--	10	10.0	0.0 - 28.0	11	8.9	0.0 - 25.2
35-44	7	28.6	0.0 - 65.7	21	14.3	1.2 - 27.4	28	18.3	7.2 - 29.4
45-54	25	12.0	0.0 - 25.4	23	8.7	0.0 - 21.5	48	10.5	1.4 - 19.6
55-64	19	10.5	0.9 - 20.1	29	6.9	0.0 - 17.1	48	8.5	0.2 - 16.8
25-64	52	14.0	2.9 - 25.1	83	10.0	3.4 - 16.7	135	11.6	6.3 - 16.9

Currently taking oral drugs prescribed for diabetes by doctor or health worker									
Age Group (years)	Men			Women			Both Sexes		
	n	% taking meds	95% CI	n	% taking meds	95% CI	n	% taking meds	95% CI
25-34	--	--	--	10	10.0	0.0 - 30.2	10	10.0	0.0 - 30.1
35-44	7	42.9	1.9 - 83.9	22	45.5	16.6 - 74.3	29	44.7	19.9 - 69.6
45-54	25	52.0	28.0 - 76.0	24	62.5	42.8 - 82.2	49	56.9	40.2 - 73.7
55-64	19	36.8	7.7 - 66.0	29	44.8	26.1 - 63.6	48	41.3	29.3 - 53.3
25-64	51	44.9	30.1 - 59.6	85	43.3	30.1 - 56.6	136	43.9	34.0 - 53.8

**Diabetes lifestyle advice**

Description: Percentage of respondents who received lifestyle advice from a doctor or health worker to diabetes.

Instrument question:

- Are you currently taking any of the following treatments/advice for diabetes prescribed by a doctor or other health worker?

<b>Advised by doctor or health worker to have special prescribed diet</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	--	--	--	10	90.0	69.6 - 100.0	10	90.0	69.8 - 100.0
35-44	7	71.4	34.3 - 100.0	23	91.3	78.1 - 100.0	30	86.1	73.6 - 98.5
45-54	25	84.0	68.4 - 99.6	24	75.0	59.5 - 90.5	49	79.8	70.8 - 88.8
55-64	19	78.9	62.3 - 95.6	29	86.2	71.5 - 100.0	48	83.0	71.8 - 94.2
25-64	51	79.9	66.5 - 93.2	86	85.7	77.7 - 93.6	137	83.5	77.1 - 89.9

<b>Advised by doctor or health worker to lose weight</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	--	--	--	10	70.0	39.1 - 100.0	10	70.0	39.3 - 100.0
35-44	7	42.9	1.9 - 83.9	22	63.6	46.7 - 80.6	29	58.0	41.2 - 74.7
45-54	25	64.0	46.9 - 81.1	24	66.7	50.5 - 82.8	49	65.3	53.6 - 77.0
55-64	19	63.2	44.8 - 81.5	29	48.3	34.2 - 62.4	48	54.9	43.0 - 66.8
25-64	51	59.9	49.7 - 70.0	85	61.2	51.7 - 70.8	136	60.7	52.3 - 69.1

<b>Advised by doctor or health worker to stop smoking</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	--	--	--	10	60.0	33.4 - 86.6	10	60.0	33.5 - 86.5
35-44	7	42.9	1.9 - 83.9	22	68.2	48.7 - 87.6	29	61.3	45.4 - 77.2
45-54	25	52.0	33.9 - 70.1	24	58.3	34.9 - 81.8	49	55.0	40.6 - 69.3
55-64	19	63.2	39.2 - 87.2	29	51.7	30.1 - 73.3	48	56.8	40.1 - 73.5
25-64	51	54.4	41.4 - 67.3	85	59.7	46.4 - 73.0	136	57.7	49.2 - 66.2

<b>Advised doctor or health worker to start or do more exercise</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	--	--	--	10	70.0	37.2 - 100.0	10	70.0	37.5 - 100.0
35-44	7	71.4	34.3 - 100.0	22	81.8	62.2 - 100.0	29	79.0	61.7 - 96.3
45-54	25	80.0	66.6 - 93.4	24	70.8	55.4 - 86.3	49	75.7	65.5 - 85.9
55-64	19	73.7	53.3 - 94.0	29	65.5	44.5 - 86.5	48	69.1	56.4 - 81.8
25-64	51	76.2	65.2 - 87.1	85	72.5	60.1 - 84.9	136	73.9	65.1 - 82.6

**Diabetes advice by traditional healer**

Description: Percentage of respondents who are have sought advice or treatment from traditional healers for diabetes.

Instrument questions:

- During the past 12 months have you seen a traditional healer for diabetes?
- Are you currently taking any herbal or traditional remedy for your diabetes?

<b>Seen a traditional healer for diabetes in the last 12 months</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	--	--	--	10	30.0	0.0 - 67.6	10	30.0	0.0 - 67.3
35-44	7	42.9	1.9 - 83.9	22	31.8	10.9 - 52.8	29	34.8	14.7 - 55.0
45-54	25	56.0	33.6 - 78.4	24	33.3	16.7 - 50.0	49	45.3	31.0 - 59.7
55-64	19	36.8	15.5 - 58.2	29	51.7	26.4 - 77.1	48	45.1	31.0 - 59.3
25-64	51	46.7	34.5 - 58.9	85	37.4	25.0 - 49.8	136	40.9	31.9 - 50.0

<b>Currently taking herbal or traditional treatment for diabetes</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	--	--	--	10	30.0	1.5 - 58.5	10	30.0	1.7 - 58.4
35-44	7	14.3	0.0 - 43.5	21	33.3	13.0 - 53.6	28	28.0	12.2 - 43.7
45-54	25	36.0	8.9 - 63.1	24	41.7	21.1 - 62.3	49	38.7	21.7 - 55.6
55-64	19	31.6	5.6 - 57.5	29	41.4	25.4 - 57.3	48	37.0	24.0 - 50.0
25-64	51	30.5	15.8 - 45.1	84	37.1	28.6 - 45.6	135	34.6	27.6 - 41.5

## Physical Measurements

**Height, weight and BMI** Description: Mean height, weight, and body mass index among all respondent (excluding pregnant women for weight and BMI).

Instrument questions:

- Height
- Weight

Mean height (cm)						
Age Group (years)	Men			Women		
	n	Mean	95% CI	n	Mean	95% CI
25-34	163	169.8	169.0 - 170.6	225	158.6	158.0 - 159.2
35-44	184	169.3	168.5 - 170.2	239	159.1	158.4 - 159.8
45-54	164	168.1	167.2 - 169.1	186	158.1	157.0 - 159.1
55-64	87	167.3	165.8 - 168.8	125	156.8	155.6 - 157.9
25-64	598	169.0	168.5 - 169.6	775	158.4	158.0 - 158.9

Mean weight (kg)						
Age Group (years)	Men			Women		
	n	Mean	95% CI	n	Mean	95% CI
25-34	162	84.0	81.5 - 86.5	215	80.6	78.1 - 83.0
35-44	184	86.1	83.3 - 88.9	232	79.9	77.9 - 81.8
45-54	164	82.3	80.0 - 84.6	184	80.6	77.7 - 83.5
55-64	87	81.3	77.3 - 85.2	126	74.5	71.3 - 77.7
25-64	597	84.0	82.5 - 85.6	757	79.6	78.3 - 81.0

Mean BMI (kg/m <sup>2</sup> )									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
25-34	162	29.1	28.2 - 30.0	215	31.9	30.9 - 33.0	377	30.6	30.0 - 31.2
35-44	184	30.0	29.1 - 31.0	232	31.5	30.7 - 32.4	416	30.8	30.1 - 31.5
45-54	164	29.1	28.3 - 29.9	182	31.7	30.8 - 32.6	346	30.4	29.9 - 31.0
55-64	87	29.0	27.8 - 30.2	125	30.0	29.1 - 31.0	212	29.6	28.7 - 30.4
25-64	597	29.4	28.8 - 29.9	754	31.5	31.0 - 32.1	1351	30.5	30.1 - 30.9

**BMI categories** Description: Percentage of respondents (excluding pregnant women) in each BMI category.

Instrument questions:

- Height
- Weight

<b>BMI classifications</b>									
<b>Men</b>									
Age Group (years)	n	% Under-weight <18.5	95% CI	% Normal weight 18.5-24.9	95% CI	% Over-weight 25.0-29.9	95% CI	% Obese ≥30.0	95% CI
25-34	162	--	--	24.7	16.6 - 32.8	37.7	29.7 - 45.6	37.7	27.4 - 47.9
35-44	184	0.5	0.0 - 1.6	19.0	12.1 - 25.9	33.7	27.5 - 39.9	46.7	39.5 - 53.9
45-54	164	0.6	0.0 - 1.9	20.1	13.3 - 27.0	35.4	27.3 - 43.4	43.9	37.1 - 50.7
55-64	87	--	--	20.7	10.2 - 31.2	42.5	30.5 - 54.6	36.8	25.4 - 48.2
25-64	597	0.3	0.0 - 0.7	21.6	17.0 - 26.1	36.5	32.1 - 40.8	41.7	37.1 - 46.2

<b>BMI classifications</b>									
<b>Women</b>									
Age Group (years)	n	% Under-weight <18.5	95% CI	% Normal weight 18.5-24.9	95% CI	% Over-weight 25.0-29.9	95% CI	% Obese ≥30.0	95% CI
25-34	215	0.5	0.0 - 1.4	14.0	8.5 - 19.4	24.2	19.5 - 28.8	61.4	54.0 - 68.7
35-44	232	0.4	0.0 - 1.3	13.8	9.6 - 18.0	27.2	21.3 - 33.0	58.6	51.6 - 65.6
45-54	182	--	--	12.6	7.4 - 17.8	26.9	22.1 - 31.8	60.4	52.7 - 68.2
55-64	125	2.4	0.0 - 5.2	23.2	16.9 - 29.5	24.8	19.4 - 30.2	49.6	42.6 - 56.6
25-64	754	0.6	0.0 - 1.3	14.8	11.8 - 17.7	25.7	23.2 - 28.2	58.9	54.7 - 63.1

<b>BMI classifications</b>									
<b>Both Sexes</b>									
Age Group (years)	n	% Under-weight <18.5	95% CI	% Normal weight 18.5-24.9	95% CI	% Over-weight 25.0-29.9	95% CI	% Obese ≥30.0	95% CI
25-34	377	0.2	0.0 - 0.7	19.1	14.4 - 23.8	30.7	25.8 - 35.5	50.0	44.4 - 55.6
35-44	416	0.5	0.0 - 1.1	16.3	12.1 - 20.5	30.3	26.0 - 34.6	52.9	47.6 - 58.1
45-54	346	0.3	0.0 - 0.9	16.3	12.1 - 20.5	31.1	25.7 - 36.4	52.3	47.1 - 57.5
55-64	212	1.3	0.0 - 2.8	22.0	15.4 - 28.7	32.9	26.7 - 39.2	43.7	37.1 - 50.3
25-64	1351	0.5	0.1 - 0.9	18.0	15.3 - 20.7	30.9	28.4 - 33.4	50.6	47.3 - 53.9

**BMI ≥25** Description: Percentage of respondents being classified as overweight (BMI≥25)

Instrument questions:

- Height
- Weight

Age Group (years)	BMI≥25								
	Men			Women			Both Sexes		
	n	% BMI≥25	95% CI	n	% BMI≥25	95% CI	n	% BMI≥25	95% CI
25-34	162	75.3	67.2 - 83.4	215	85.6	79.9 - 91.2	377	80.6	75.9 - 85.3
35-44	184	80.4	73.6 - 87.3	232	85.8	81.3 - 90.2	416	83.2	79.0 - 87.4
45-54	164	79.3	72.5 - 86.0	182	87.4	82.2 - 92.6	346	83.4	79.2 - 87.5
55-64	87	79.3	68.8 - 89.8	125	74.4	68.5 - 80.3	212	76.7	70.0 - 83.3
25-64	597	78.2	73.5 - 82.8	754	84.6	81.7 - 87.6	1351	81.5	78.8 - 84.2

**Analysis Information:**

- Questions used: M3, M4, M5
- Epi Info program name: Mbmiclass (unweighted); MbmiclassWT (weighted)

**Waist circumference**

Description: Mean waist circumference among all respondents (excluding pregnant women).

Instrument question:

- Waist circumference measurement

Waist circumference (cm)						
Age Group (years)	Men			Women		
	n	Mean	95% CI	n	Mean	95% CI
25-34	161	91.4	89.1 - 93.7	212	96.8	94.6 - 99.0
35-44	182	95.8	93.7 - 97.9	228	96.9	94.8 - 99.0
45-54	160	95.5	93.5 - 97.5	186	99.3	97.5 - 101.1
55-64	87	96.9	93.5 - 100.3	126	96.4	94.2 - 98.7
25-64	590	94.2	92.8 - 95.7	752	97.3	96.0 - 98.5

**Hip circumference**

Description: Mean hip circumference among all respondents (excluding pregnant women).

Instrument question:

- Hip circumference measurement

Hip circumference (cm)						
Age Group (years)	Men			Women		
	n	Mean	95% CI	n	Mean	95% CI
25-34	163	101.2	98.9 - 103.5	212	107.4	105.6 - 109.2
35-44	183	103.1	101.9 - 104.4	229	106.6	105.0 - 108.2
45-54	162	101.2	100.0 - 102.4	186	106.2	104.4 - 107.9
55-64	87	100.6	98.1 - 103.1	126	104.3	102.4 - 106.2
25-64	595	101.7	100.7 - 102.8	753	106.5	105.6 - 107.4

**Waist / hip ratio**

Description: Mean waist-to-hip ratio among all respondents (excluding pregnant women).

Instrument question:

- Waist and hip circumference measurement

Mean waist / hip ratio						
Age Group (years)	Men			Women		
	n	Mean	95% CI	n	Mean	95% CI
25-34	161	0.9	0.9 - 0.9	212	0.9	0.9 - 0.9
35-44	182	0.9	0.9 - 0.9	228	0.9	0.9 - 0.9
45-54	160	0.9	0.9 - 1.0	186	0.9	0.9 - 0.9
55-64	87	1.0	0.9 - 1.0	126	0.9	0.9 - 0.9
25-64	590	0.9	0.9 - 0.9	752	0.9	0.9 - 0.9

**Blood pressure** Description: Mean blood pressure among all respondents, excluding those currently on medication for raised blood pressure.

Instrument question:

- During the past two weeks, have you been treated for raised blood pressure with drugs (medication) prescribed by a doctor or other health worker?
- Reading 1-3 systolic and diastolic blood pressure

<b>Mean systolic blood pressure (mmHg)</b>									
Age Group (years)	<b>Men</b>			<b>Women</b>			<b>Both Sexes</b>		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
25-34	161	123.0	121.4 - 124.7	223	110.3	109.1 - 111.5	384	116.3	115.3 - 117.3
35-44	178	125.1	123.2 - 127.0	233	116.0	114.6 - 117.4	411	120.3	119.2 - 121.4
45-54	157	125.2	122.7 - 127.6	175	118.9	115.9 - 121.9	332	122.0	119.7 - 124.2
55-64	85	132.0	128.1 - 135.9	118	123.6	118.9 - 128.2	203	127.5	124.7 - 130.3
25-64	581	125.1	124.2 - 126.0	749	115.2	114.2 - 116.1	1330	119.9	119.2 - 120.6

<b>Mean diastolic blood pressure (mmHg)</b>									
Age Group (years)	<b>Men</b>			<b>Women</b>			<b>Both Sexes</b>		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
25-34	161	75.9	74.3 - 77.5	223	73.4	72.0 - 74.7	384	74.6	73.4 - 75.7
35-44	178	79.2	77.8 - 80.5	234	76.5	75.0 - 78.0	412	77.8	76.6 - 78.9
45-54	156	79.9	78.0 - 81.8	175	76.5	74.7 - 78.4	331	78.2	76.7 - 79.6
55-64	85	80.9	77.9 - 83.8	117	76.4	73.6 - 79.1	202	78.5	76.2 - 80.7
25-64	580	78.2	77.3 - 79.1	749	75.3	74.4 - 76.1	1329	76.7	75.9 - 77.4

**Raised blood pressure**

Description: Percentage of respondents with raised blood pressure and percentage on medication for raised blood pressure.

Instrument question:

- During the past two weeks, have you been treated for raised blood pressure with drugs (medication) prescribed by a doctor or other health worker?
- Reading 1-3 systolic and diastolic blood pressure

<b>SBP ≥140 and/or DBP ≥ 90 mmHg, excluding those on meds</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	161	13.0	8.5 - 17.6	223	6.3	3.6 - 8.9	384	9.5	6.7 - 12.2
35-44	178	15.7	10.9 - 20.6	233	15.5	11.5 - 19.4	411	15.6	12.3 - 18.8
45-54	156	20.5	13.5 - 27.5	174	13.8	8.3 - 19.3	330	17.1	11.8 - 22.4
55-64	85	41.2	29.0 - 53.3	117	18.8	10.0 - 27.6	202	29.3	21.6 - 37.0
25-64	580	18.4	15.7 - 21.2	747	11.9	9.4 - 14.5	1327	15.0	13.0 - 17.1

<b>SBP ≥140 and/or DBP ≥ 90 mmHg or currently on medication for raised blood pressure</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	163	14.1	9.3 - 18.9	225	7.1	4.4 - 9.8	388	10.4	7.7 - 13.2
35-44	185	18.9	14.4 - 23.5	237	16.9	12.5 - 21.3	422	17.9	14.5 - 21.2
45-54	164	24.4	16.9 - 31.9	182	17.6	10.6 - 24.5	346	20.9	14.9 - 27.0
55-64	88	43.2	30.5 - 55.9	124	23.4	13.1 - 33.7	212	32.6	24.3 - 40.9
25-64	600	20.9	17.5 - 24.2	768	14.0	11.0 - 17.0	1368	17.3	15.0 - 19.6

<b>Currently on medication for raised blood pressure</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	163	1.2	0.0 - 3.0	225	0.9	0.0 - 2.0	388	1.0	0.1 - 2.0
35-44	185	3.8	1.1 - 6.5	237	1.7	0.0 - 3.4	422	2.7	1.1 - 4.3
45-54	164	4.9	0.3 - 9.4	182	4.4	1.7 - 7.1	346	4.6	1.8 - 7.5
55-64	88	3.4	0.0 - 7.4	124	5.6	1.2 - 10.1	212	4.6	1.4 - 7.8
25-64	600	3.0	0.9 - 5.1	768	2.3	1.2 - 3.5	1368	2.7	1.5 - 3.8

**Raised blood pressure**

Description: Percentage of respondents with raised blood pressure and percentage on medication for raised blood pressure.

Instrument question:

- During the past two weeks, have you been treated for raised blood pressure with drugs (medication) prescribed by a doctor or other health worker?
- Reading 1-3 systolic and diastolic blood pressure

<b>SBP ≥160 and/or DBP ≥ 100 mmHg, excluding those on meds</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	161	1.2	0.0 - 3.1	223	1.3	0.0 - 2.8	384	1.3	0.0 - 2.7
35-44	178	4.5	1.2 - 7.8	233	2.6	0.5 - 4.7	411	3.5	1.6 - 5.4
45-54	156	7.7	4.3 - 11.1	174	4.0	1.3 - 6.8	330	5.8	3.6 - 8.1
55-64	85	15.3	8.3 - 22.3	117	6.0	0.3 - 11.7	202	10.4	5.7 - 15.0
25-64	580	5.1	3.6 - 6.5	747	2.7	1.7 - 3.8	1327	3.8	2.8 - 4.8

<b>SBP ≥160 and/or DBP ≥ 100 mmHg or currently on medication for raised blood pressure</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	163	2.5	0.0 - 4.9	225	2.2	0.6 - 3.9	388	2.3	0.9 - 3.8
35-44	185	8.1	4.4 - 11.8	237	4.2	1.2 - 7.3	422	6.1	3.8 - 8.4
45-54	164	12.2	6.6 - 17.7	182	8.2	3.3 - 13.1	346	10.2	6.1 - 14.2
55-64	88	18.2	9.4 - 27.0	124	11.3	2.8 - 19.8	212	14.5	8.1 - 20.8
25-64	600	7.9	5.2 - 10.6	768	5.0	3.4 - 6.7	1368	6.4	4.9 - 7.9

<b>Currently on medication for raised blood pressure</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	163	1.2	0.0 - 3.0	225	0.9	0.0 - 2.0	388	1.0	0.1 - 2.0
35-44	185	3.8	1.1 - 6.5	237	1.7	0.0 - 3.4	422	2.7	1.1 - 4.3
45-54	164	4.9	0.3 - 9.4	182	4.4	1.7 - 7.1	346	4.6	1.8 - 7.5
55-64	88	3.4	0.0 - 7.4	124	5.6	1.2 - 10.1	212	4.6	1.4 - 7.8
25-64	600	3.0	0.9 - 5.1	768	2.3	1.2 - 3.5	1368	2.7	1.5 - 3.8

**Heart rate**

Description: Mean heart rate among all respondents and percentage with a raised heart rate.

Instrument question:

- Heart Rate measurement

<b>Mean beats per minute</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
25-34	161	74.6	72.6 - 76.6	224	75.1	73.9 - 76.2	385	74.9	73.7 - 76.0
35-44	183	74.2	72.9 - 75.4	237	74.0	72.8 - 75.2	420	74.1	73.1 - 75.0
45-54	165	74.8	73.4 - 76.2	181	72.1	71.0 - 73.3	346	73.5	72.5 - 74.4
55-64	88	74.1	72.6 - 75.7	125	72.9	70.9 - 74.9	213	73.5	72.2 - 74.8
25-64	597	74.5	73.5 - 75.5	767	73.9	73.2 - 74.7	1364	74.2	73.5 - 74.9

<b>Percentage with beats per minute over 100</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	161	1.2	0.0 - 3.1	224	1.8	0.3 - 3.3	385	1.5	0.4 - 2.6
35-44	183	0.5	0.0 - 1.7	237	0.8	0.0 - 2.0	420	0.7	0.0 - 1.5
45-54	165	1.2	0.0 - 2.8	181	--	--	346	0.6	0.0 - 1.4
55-64	88	2.3	0.0 - 5.5	125	1.6	0.0 - 3.9	213	1.9	0.0 - 4.2
25-64	597	1.1	0.3 - 2.0	767	1.1	0.4 - 1.9	1364	1.1	0.6 - 1.7

## Biochemical Measurements

**Mean fasting blood glucose** Description: mean fasting blood glucose results excluding those currently on medication for diabetes (Non-fasting recipients excluded).

Instrument questions:

- Are you currently receiving any of the following treatments for diabetes prescribed by a doctor or other health worker?
  - Insulin?
  - Oral drugs (medication) that you have taken in the last 2 weeks?
- During the last 12 hours have you had anything to eat or drink, other than water?
- Blood glucose measurement

Mean fasting blood glucose (mmol/L)									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
25-34	137	5.4	5.2 - 5.6	181	5.3	5.0 - 5.6	318	5.3	5.2 - 5.5
35-44	150	6.0	5.6 - 6.4	190	5.8	5.5 - 6.2	340	5.9	5.7 - 6.2
45-54	119	6.8	6.3 - 7.3	134	6.2	5.8 - 6.6	253	6.5	6.1 - 6.8
55-64	67	7.2	6.4 - 7.9	96	6.6	5.9 - 7.3	163	6.8	6.4 - 7.3
25-64	473	6.0	5.8 - 6.3	601	5.8	5.6 - 6.0	1074	5.9	5.7 - 6.1

Mean fasting blood glucose (mg/dl)									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
25-34	137	97.7	94.4 - 101.0	181	94.9	89.8 - 100.1	318	96.3	92.9 - 99.6
35-44	150	108.7	101.5 - 115.9	190	104.9	99.0 - 110.8	340	106.7	102.1 - 111.4
45-54	119	122.0	112.9 - 131.1	134	112.2	104.8 - 119.5	253	117.0	110.6 - 123.3
55-64	67	129.0	115.4 - 142.6	96	118.4	105.9 - 130.8	163	123.3	115.4 - 131.1
25-64	473	108.9	104.8 - 112.9	601	103.8	100.2 - 107.3	1074	106.2	103.0 - 109.4

**Raised blood glucose**

Description: Categorization of respondents into blood glucose level categories and percentage currently on medication for raised blood glucose (non-fasting recipients excluded).

Instrument questions:

- Are you currently receiving any of the following treatments for diabetes prescribed by a doctor or other health worker?
  - Insulin?
  - Oral drugs (medication) that you have taken in the last 2 weeks?
- During the last 12 hours have you had anything to eat or drink, other than water?
- Blood glucose measurement

<b>Impaired Fasting Glycaemia*</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	137	25.5	18.1 - 33.0	183	10.4	5.4 - 15.4	320	17.7	13.2 - 22.1
35-44	155	32.9	26.2 - 39.7	201	11.9	7.1 - 16.8	356	21.9	17.3 - 26.5
45-54	133	11.3	3.9 - 18.7	150	18.0	12.0 - 24.0	283	14.7	10.7 - 18.8
55-64	76	14.5	5.5 - 23.4	111	15.3	7.8 - 22.9	187	14.9	9.5 - 20.4
25-64	501	23.9	20.1 - 27.7	645	12.9	10.2 - 15.5	1146	18.1	15.8 - 20.4

<b>Raised blood glucose or currently on medication for diabetes and/or diagnosed with diabetes**</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	137	12.4	6.8 - 18.1	183	14.2	8.0 - 20.4	320	13.3	9.0 - 17.7
35-44	155	27.7	21.0 - 34.5	201	27.9	21.6 - 34.1	356	27.8	22.7 - 32.9
45-54	133	49.6	39.9 - 59.3	150	36.7	30.4 - 42.9	283	43.0	37.2 - 48.8
55-64	76	57.9	43.6 - 72.2	111	46.8	36.9 - 56.8	187	51.9	44.0 - 59.7
25-64	501	29.6	25.6 - 33.5	645	26.7	23.2 - 30.2	1146	28.1	24.8 - 31.3

<b>Currently on medication for diabetes</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	137	--	--	183	1.1	0.0 - 2.7	320	0.6	0.0 - 1.4
35-44	155	3.2	0.5 - 5.9	201	5.0	1.4 - 8.6	356	4.1	1.7 - 6.6
45-54	133	10.5	4.2 - 16.8	150	10.0	5.3 - 14.7	283	10.3	6.6 - 14.0
55-64	76	10.5	3.4 - 17.7	111	11.7	6.3 - 17.1	187	11.2	6.9 - 15.4
25-64	501	4.2	2.7 - 5.8	645	5.3	3.5 - 7.0	1146	4.8	3.7 - 5.9

\* Impaired fasting glycaemia is defined as either

- plasma venous value:  $\geq 6.1$ mmol/L (110mg/dl) and  $< 7.0$ mmol/L (126mg/dl)
- capillary whole blood value:  $\geq 5.6$ mmol/L (100mg/dl) and  $< 6.1$ mmol/L (110mg/dl)

\*\* Raised blood glucose is defined as either

- plasma venous value:  $\geq 7.0$  mmol/L (126 mg/dl)
- capillary whole blood value:  $\geq 6.1$  mmol/L (110 mg/dl)

**Total cholesterol**

Description: Mean total cholesterol among all respondents.

Instrument question:

- Total cholesterol measurement

Mean total cholesterol (mmol/L)									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
25-34	58	4.4	4.3 - 4.6	90	4.6	4.4 - 4.9	148	4.5	4.4 - 4.7
35-44	84	4.7	4.5 - 4.9	141	4.7	4.5 - 4.8	225	4.7	4.6 - 4.8
45-54	88	4.5	4.4 - 4.6	134	4.9	4.7 - 5.0	222	4.7	4.6 - 4.8
55-64	55	4.6	4.4 - 4.7	91	4.9	4.7 - 5.0	146	4.7	4.6 - 4.8
25-64	285	4.6	4.5 - 4.7	456	4.7	4.7 - 4.8	741	4.7	4.6 - 4.7

Mean total cholesterol (mg/dl)									
Age Group (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
25-34	58	171.4	166.4 - 176.4	90	179.1	169.3 - 189.0	148	175.7	170.0 - 181.5
35-44	84	183.0	175.7 - 190.4	141	180.7	175.0 - 186.3	225	181.6	177.4 - 185.8
45-54	88	174.9	170.0 - 179.7	134	187.8	181.7 - 193.9	222	182.5	178.2 - 186.7
55-64	55	176.3	168.9 - 183.6	91	188.8	183.6 - 193.9	146	183.5	179.7 - 187.2
25-64	285	176.6	173.4 - 179.9	456	183.2	180.1 - 186.3	741	180.4	178.3 - 182.5

**Raised total cholesterol**

Description: Percentage of respondents with raised total cholesterol.

Instrument question:

- Total cholesterol measurement

<b>Total cholesterol <math>\geq</math> 5.0 mmol/L or <math>\geq</math> 190 mg/dl</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	58	15.5	4.1 - 26.9	90	22.2	14.0 - 30.5	148	19.3	12.7 - 25.8
35-44	84	33.3	21.2 - 45.5	141	24.1	16.5 - 31.7	225	27.9	22.0 - 33.8
45-54	88	23.9	14.9 - 32.8	134	43.3	32.7 - 53.9	222	35.2	27.7 - 42.8
55-64	55	20.0	8.7 - 31.3	91	39.6	30.2 - 49.0	146	31.3	24.4 - 38.1
25-64	285	23.8	18.8 - 28.8	456	30.6	26.7 - 34.4	741	27.7	24.6 - 30.8

<b>Total cholesterol <math>\geq</math> 6.2 mmol/L or <math>\geq</math> 240 mg/dl</b>									
Age Group (years)	Men			Women			Both Sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
25-34	58	--	--	90	2.2	0.0 - 5.5	148	1.2	0.0 - 3.1
35-44	84	4.8	0.0 - 11.7	141	5.0	0.2 - 9.8	225	4.9	1.0 - 8.8
45-54	88	2.3	0.0 - 5.3	134	6.7	2.3 - 11.1	222	4.9	1.7 - 8.0
55-64	55	3.6	0.0 - 8.8	91	3.3	0.0 - 6.8	146	3.4	0.8 - 6.1
25-64	285	2.6	0.2 - 5.0	456	4.4	2.3 - 6.5	741	3.6	2.2 - 5.1

## Raised Risk

- Raised risk** Description: Percentage of respondents with 0, 1-2, or 3-5 of the following risk factors:
- current daily smoker
  - less than 5 servings of fruits & vegetables per day
  - low level of activity (<600 MET -minutes)
  - overweight (BMI  $\geq$  25 kg/m<sup>2</sup>)
  - raised BP (SBP  $\geq$  140 and/or DBP  $\geq$  90 mmHg or currently on medication for raised BP).

Instrument question: combined from Step 1 and Step 2

Raised Risk							
Men							
Age Group (years)	n	% with 0 risk factors	95% CI	% with 1-2 risk factors	95% CI	% with 3-5 risk factors	95% CI
25-44	298	--	--	22.8	18.0-27.6	77.2	72.4-82.0
45-64	219	--	--	19.6	13.4-25.9	80.4	74.1-86.6
<b>25-64</b>	<b>517</b>	<b>--</b>	<b>--</b>	<b>21.8</b>	<b>17.7-26.0</b>	<b>78.2</b>	<b>74.0-82.3</b>

Raised Risk							
Women							
Age Group (years)	n	% with 0 risk factors	95% CI	% with 1-2 risk factors	95% CI	% with 3-5 risk factors	95% CI
25-44	420	--	--	31.2	26.6-35.9	68.8	64.1-73.4
45-64	278	0.4	0.0-1.1	21.9	19.0-24.9	77.7	74.5-80.9
<b>25-64</b>	<b>698</b>	<b>0.1</b>	<b>0.0-0.3</b>	<b>28.4</b>	<b>25.0-31.8</b>	<b>71.5</b>	<b>68.1-74.8</b>

Raised Risk							
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
25-44	718	--	--	27.3	24.3-30.4	72.7	69.6-75.7
45-64	497	0.2	0.0-0.6	20.9	17.4-24.3	79.0	75.3-82.6
<b>25-64</b>	<b>1215</b>	<b>0.1</b>	<b>0.0-0.2</b>	<b>25.4</b>	<b>22.8-27.9</b>	<b>74.6</b>	<b>72.0-77.2</b>

### Appendix 3. List of STEPS Survey Staff from Kiribati

Team Leader	Tinai Iuta
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Interviewer	Buari Tonganibeia
Interviewer	Sr. Rakena Viane
Interviewer	Roote Tong
Interviewer	Tietaake Moote
Interviewer	Meeri Paul
Interviewer	Uriam Erabute
Interviewer	Reenika Taniera
Interviewer	Kaua Eriakim
Interviewer	Mareti Teuee
Interviewer	Teeba Tiaon
Interviewer	Tiantaake Taoaba
Interviewer	Maere Anterea
Interviewer	Ranga Namai
Interviewer	Arote Uriam
Height and Weight Measurement Staff	Karote Tauroba
Waist and Hip Measurement Staff	Eretii Timeon
Questionnaire Reviewer and Counsellor	Tanimwakin Nootii
Blood Test Staff (Tarawa)	Kanimako Ieremia
Blood Test Staff (Tarawa)	Nuukai Tenaua
Blood Test Staff (Outer Islands)	Veronica Tokataam
Blood Test Staff (Outer Islands)	Baibuke Teikake
Blood Test Staff (Outer Islands)	Emeree Tataio
Blood Test Staff (Outer Islands)	Okobeta Kaiea
Blood Test Staff (Outer Islands)	Beia Tabwaia
Blood Test Staff (Outer Islands)	Amota Tebao
Blood Pressure Measurement Staff	Katua Tianuare
Blood Pressure Measurement Staff	Teotiua Puta
Data Entry Staff	Tutu Ueaiti
Data Entry Staff	Ereti Timeon
Data Entry Staff	Tinai Kwong

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