



# Tuvalu

# NCD Risk Factors

# STEPS REPORT 2015

in collaboration with the World Health Organization (WHO)



## Acknowledgements

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Tuvalu mote Atua.

Julie Elisala, NCD Coordinator (2015)

Tuvalu Ministry of Health

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## LIST OF ABBREVIATIONS

BMI	Body Mass Index
BP	Blood Pressure
CI	Confidence Interval
CVD	Cardiovascular Diseases
DBP	Diastolic Blood Pressure
DM	Diabetes Mellitus
FBS	Fasting Blood Sugar
FPC	Finite Population Correction
GDP	Gross Domestic Product
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 value)
MoH	Ministry of Health
NCD	Noncommunicable diseases
SBP	Systolic Blood Pressure
WHO	World Health Organization

## Foreword by the Ministry of Health

Noncommunicable diseases are the leading cause of death in the Pacific and in Tuvalu. The growing burden of NCDs on the health system requires scaled up effort. Information related to NCD behavioral and intermediate risk factors is necessary for planning and addressing NCDs effectively and efficiently.

The Tuvalu NCD STEPS survey carried out in 2015 was a successful undertaking. Approximately 1155 adults, aged between 18-69 years from across Tuvalu participated in the survey, which included a questionnaire on behavior, physical measurements, and biochemical measurements.

Behavioral risk factors such as tobacco use and excessive salt consumption are high in Tuvalu. Nearly 40% of adults have high blood pressure. Approximately 64% of adults have at least three to five risk factors for NCDs (i.e., current daily smoking, consuming less than 5 servings of fruits and vegetables per day, low level of activity, overweight or obese, and raised blood pressure).

We must continue to strengthen multi-sectoral strategies to support the prevention and management of NCDs. As such, the results of the Tuvalu NCD STEPS survey shall serve as a basis for concentrated multi-sectoral action through the National Noncommunicable Diseases Strategic Plan (2017-2021).

I would like to express my appreciation and gratitude to the many dedicated staff of the Tuvalu Ministry of Health and community partners who have worked very hard in conducting the survey, compiling the data and preparing this report. Furthermore, I would like to acknowledge the World Health Organization (WHO) for support in completing this report.

Let us use the recommendations in this report to strengthen our collaborative efforts to prevent and manage NCDs.

Minister of Health  
Ministry of Health, Tuvalu

Director of Health  
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## Foreword by the World Health Organisation



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NCDs are the leading cause of premature death in the Pacific islands. In 2013, the World Health Assembly adopted a comprehensive global monitoring framework with nine targets and 25 indicators. Six of these nine targets are assessed primarily through population-based risk factor surveys, including WHO's STEPwise approach to Surveillance of NCD Risk Factors (STEPS).

Tuvalu undertook the STEPS survey in 2015, intending to assess the status of NCD risk factors among the adult population. This report summarizes the findings of this survey. This survey included 18-69 year olds and followed the standard analysis protocol, and was undertaken as a census survey. Some of the key findings of this survey are:

- 35% of the population were current smokers, with men more likely to smoke than women;
- 20.5% had drunk alcohol in the last 30 days, with younger adults and men most likely to have consumed alcohol;
- 95.8% did not meet the recommended 5 minimum serves a day of fruits and vegetables;
- 74.7% were categorised as not meeting WHO recommendations on physical activity for health;
- 62.2% were found to be obese;
- 39.6% had raised blood pressure;
- 9.9% had raised fasting blood glucose;
- 13% were defined as having a 30% or more risk of cardiovascular disease in the next ten years.

These results clearly document that NCDs are a burden for Tuvalu, and emphasise the need for increased focus on both prevention and management. Increasing levels of NCDs will put further strain on the health system. Regular surveillance of NCDs is critical to monitor trends and to guide the interventions.

WHO is pleased to collaborate with the Tuvalu Ministry of Health in undertaking and reporting on this important survey.

## Executive Summary

The Tuvalu NCD STEPS survey provides the baseline data on noncommunicable diseases and their associated risk factors. Data were collected from September until November 2015, led by the Ministry of Health with technical and financial support from the World Health Organization.

The key objectives of the NCD STEPS survey were:

- To document the prevalence and magnitude of key NCDs and their modifiable risk factors among adults aged 18-69
- To compare NCDs and their risk factors across two age groups and between men and women
- To monitor progress towards achieving the 9 voluntary global targets by 2025

A total of 1155 individuals, 99% Tuvaluans and 1% other ethnicities (mainly Fijian) participated in the survey. The survey respondents included 628 (54.4%) women. Men and women had similar mean number of years of education (10.6 years and 11.0 years respectively). Majority have completed at least secondary school level of education and about 16.8% have college or post-graduate degrees. More than half were in unpaid work (non-paid, studying, conducting home duties, retired) or unemployed; 21.4% were employed by the government, 12.7% were non-government employees and 8.2% were self-employed.

Tuvalu has a Strategic Health Plan 2009-2018 and a National Strategic Plan for NCDs 2011-2015, which involves multiple sectors in addressing NCDs. A comprehensive multisectoral NCD prevention and control programme is needed to reduce these risk factors and these strategic plans may need to be updated to reflect priorities identified from this report.

### Behavioural risk factors

More than one third of the population (35%) were current smokers with 48.6% of men and 22.4% of women being current smokers. Men smoked twice the number of manufactured cigarettes than women (8.7 compared to 4.3).

The mean age when smoking was initiated was 18.4 years with a difference between men and women - at 17.4 years and women at 20.7 years. Six in 10 current smokers reported that they attempted to quit smoking in the past 12 months; and 37.3% have been advised by a doctor or health worker to stop smoking. Although there was no difference between male and female current smokers who attempted to quit smoking, a significantly higher percentage of younger female current smokers aged 18-44 years tried to stop compared to those aged 45-69 years.

Slightly more than half of the population (52.6%) have been exposed to second-hand smoke in homes and 41.8% in workplaces during the past 30 days. In homes, all were similarly exposed to second-hand smoke. In workplaces however, more men than women were exposed to second-hand smoke.

Many Tuvaluans do not drink – 69.7% of were lifetime abstainers, 20.5% were current drinkers, 5.5% drank in the past 12 months and 4.4% abstained from alcohol in the past 12 months. Younger men and women aged 18-44 years were more likely to be drinkers than those aged 45-69 years – in the younger age groups, 26.8% of them were current drinkers and 6.8% were occasional drinkers; and in the older age groups, 6.6% were current drinkers and 2.5% were occasional drinkers. Significantly more men than women were current drinkers and significantly more women than men were lifetime abstainers. With regards to binge drinking, men were much more likely to do so than women (36.1% compared to 2.7%); and those aged 18-44 years were 4 times more likely to binge drink than those aged 45-69 years (24.5% compared to 6.1%).

Kava consumption is not very common in Tuvalu with 9.4% of the population having ever tried or drunk kava in their lifetime. Younger Tuvaluans aged 18-44 years were more likely to have tried or consumed kava than those aged 45-69 years (11.5% among those aged 18-44 years and 5.0% among those aged 45-69 years) years. A significantly higher proportion of men than women have also tried or consumed kava (18.3% of men and 1.2% of women); and almost half of kava drinkers, especially men, were likely to drink alcohol after drinking kava.

The majority (95.8%) of adults consumed less than five servings of fruit and/or vegetables – 95.9% of men and 95.7% of women. More than half (63.9%) did not consume any fruit and/or vegetables; 27.2% consumed 1-2 servings; 4.8% consumed 3-4 servings; and 4.2% consumed more than 5 servings on average per day. The mean number of days fruit was consumed in a typical week was 2.0 days and 1.9 days for vegetables; and the mean number of servings of fruit and/or vegetables consumed on average per day was 1.3.

Less than half (41.8%) of the population always or often added salt before eating or when eating, and 54.3% when cooking or preparing food at home. In terms of consumption of processed food high in salt, 22.5% of the population always or often consumed processed food high in salt with no significant differences between men and women. Younger women aged 18-44 years however, were more likely to consume processed food high in salt (27.9%) than older women aged 45-69 years (12.8%).

About 3.0 servings of sugary drinks were consumed per day; the survey found that an average 4.0 teaspoons of sugar were added to drinks per day. There were no significant differences between men and women and between the two age groups.

About a quarter of the population did not meet the WHO recommendations on physical activity for health; particularly older Tuvaluans aged 45-69 years and women. About half (51.6%) were engaged in high levels of physical activity, 31.6% in low levels and 16.8% in moderate levels. Significantly more women (43.4%) than men (18.8%) engaged in low levels of physical activity; and the converse is true where more than two-thirds of men and one-third of women were engaged in high levels of physical activity.

The mean minutes of total physical activity Tuvaluans engaged in on average per day was 155.4 minutes, with work-related physical activity being the major contributor and recreation and transport as secondary contributors. Men engaged in more than twice the amount of physical activity (224.7 minutes) than women (91.9 minutes); and younger Tuvaluans aged 18-44 years also engaged in significantly more physical activity (175.8 minutes) than older Tuvaluans aged 45-69 years (110.7 minutes). Younger men engaged in more physical activity than older men but there was no difference between younger and older women. On the other hand, the mean number of minutes Tuvaluans spent in sedentary activities was 193.7, with no significant differences between men and women as well as older and younger Tuvaluans.

## Historical risk factors

The survey found that 45.9% of the population had never had their blood pressure measured, 40.8% had been measured but not diagnosed, 2.9% had been diagnosed but not within the past 12 months, and 10.3% were diagnosed within the past 12 months. There were no significant differences between men and women and between the two age groups. Of those previously diagnosed with raised blood pressure, only 37.6% were currently taking medications prescribed by a doctor or health worker, with significantly more older than younger Tuvaluans taking medication. A small percentages (3.6%) had seen a traditional healer and 6.0% were currently taking traditional medicine.

More than half (56.5%) of those aged 18-69 years had never had their blood sugar measured, 35.6% were measured but not diagnosed, 2.4% were diagnosed but not within the past 12 months and 5.5% were diagnosed within the past 12 months. A higher proportion of women than men and a higher proportion of older than younger Tuvaluans had a diagnosis of having elevated blood sugar within the past 12 months. Younger Tuvaluans were less likely to have had their blood sugar measured. Of those previously diagnosed with diabetes,

46.0% were taking drugs and 38.1% were taking insulin as prescribed by a doctor or other health worker. Some (8.0%) had seen a traditional healer and 9.1% were currently taking herbal or traditional treatment.

The majority (86.4%) of the population had never had their cholesterol measured, 9.5% had been measured but not diagnosed, 0.9% had been diagnosed but not within the past 12 months and 3.1% were diagnosed within the past 12 months. There were no significant differences between men and women and between the two age groups.

In terms of receiving lifestyle advice from a doctor or health worker: (1) 46.0% of the population had been advised to quit using tobacco or not start; (2) 52.8% had been advised to reduce salt in the diet; (3) 51.5% had been advised to eat at least five servings of fruit and/or vegetables each day; (4) 56.1% had been advised to reduce fat in the diet; (5) 58.5% had been advised to do more physical activity; and (6) 56.5% had been advised to maintain a healthy body weight or to lose weight.

Among women, it was found that only 22.1% had ever been tested for cervical cancer – 28.9% among those aged 45-69 years and 18.0% among those aged 18-44 years.

## Mental health

In the past 12 months, 5.1% had seriously considered attempting suicide with no significant differences between men and women and between the two age groups. Among women, however, those aged 18-44 years were more likely to have seriously considered attempting suicide in the last 12 months (7.5%) than those aged 45-69 years (2.2%).

With regards to the state of mental well-being, 77.3% of Tuvaluans were likely to be well, 14.9% had a mild mental disorder, 3.8% had a moderate mental disorder and 4.0% had a severe mental disorder. There were no statistically significant differences between men and women and between the two age groups.

## Physical risk factors

The mean systolic blood pressure (SBP) was 133.9 mm Hg and the mean diastolic blood pressure (DBP) was 83.8 mm Hg, which borders on having raised blood pressure. The mean SBP and DBP increased with age.

The survey found 42.2% with raised blood pressure of SBP  $\geq$ 140 mm Hg and/or DBP  $\geq$  90 mmHg were currently on medication; 17.5% had raised blood pressure of SBP  $\geq$ 160 and/or DBP  $\geq$  100 mmHg or were currently on medication. Prevalence increased with age.

The mean body mass index (BMI) was 32.6 kg/m<sup>2</sup> – women were found to have a higher mean BMI than men (34.6 for women and 30.9 for men); and Tuvaluans aged 45-69 years also had a higher mean than those aged 18-44 years (33.8 compared to 31.9).

According to the BMI risk categories, 62.2% of the Tuvalu adult population were classified as obese, 23.2% as overweight, 14.3% as normal weight, and 0.3% as underweight. A higher proportion of women (70.7%) than men (55.2%) as well as older Tuvaluans aged 45-69 years (68.8%) than those aged 18-44 years (58.2%) were classified as obese. Younger Tuvaluans aged 18-44 years were more likely to be classified as having normal weight (18.6%) than those aged 45-69 years (7.1%).

The mean waist circumference of women was 101.2 cm and 97.2 cm for men; and the mean hip circumference of women was 114.9 cm and 105.8 cm for men. The mean waist-hip ratio of men and women was the same (0.9) with no significant differences between the two age groups as well between men and women.

## Biochemical risk factors

The mean fasting plasma glucose was 4.8 mmol/L or 87.0 mg/dl, and older Tuvaluans aged 45-69 years had a significantly higher mean than those aged 18-44 years. A small proportion (4.3%) were categorized as having impaired fasting glycaemia; 9.9% had raised blood glucose or were currently on medication for diabetes and 4.8% were currently on medication for diabetes.

The mean total cholesterol was 4.1 mmol/L or 157.5 mg/dl, and was significantly higher among older Tuvaluans aged 45-69 years and women. The survey found that 17.3% had total cholesterol of  $\geq 5.0$  mmol/L or  $\geq 190$  mg/dl or were currently on medication for raised cholesterol and 4.2% had total cholesterol  $\geq 6.2$  mmol/L or  $\geq 240$  mg/dl or were currently on medication for raised cholesterol.

## Combined risk factors

In Tuvalu, 13.0% of those aged 40-69 already had an existing CVD or had a more than 30% chance of a CVD event in the next 10 years, with no significant differences between men and women and the two age groups.

The majority had multiple risk factors – 64.0% had 3-5 risk factors and 35.6% had 1-2 risk factors. Only 0.4% had no risk factors. Among respondents aged 45-69 years, more than 3 in 4 had 3-5 risk factors; and among those aged 18-44 years, more than half had 3-5 risk factors. Significantly higher proportion of younger men aged 18-44 years had 1-2 risk factors (40.1%) than older men aged 45-69 years (24.4%); and higher proportion of older men aged 45-69 years had 3-5 risk factors (74.9%) than younger men aged 18-44 years (59.1%).

## Conclusion

The situation in Tuvalu is similar to many other Pacific island countries and areas where there are high prevalence of overweight and obesity, physical inactivity, consumption of sugary drinks and diabetes, and relatively high prevalence of tobacco use and exposure to second-hand smoke.

Tuvalu has a Strategic Health Plan 2009-2018 and a National Strategic Plan for NCDs 2011-2015, which calls for implementation and collaboration across ministries to enable healthier choices. The plans aim to use health promotion and education campaigns to reduce rates of tobacco and alcohol use, increase physical activity and promote healthy diets. These will have to be updated to reflect priorities identified in this survey report and to ensure a comprehensive multisectoral approach that goes beyond health promotion and education campaigns to include regulatory mechanisms, financial incentives and changes to settings. Health system and community support are also essential in ensuring early diagnosis as well as access to and adherence to treatment regimens.

## Recommendations

General programmatic recommendations are:

- 1) Repeat NCD STEPS survey at 5- to 7-year intervals, preferably in 2020 and 2025.
  - Utilize other surveillance mechanisms and evaluation methods to measure effectiveness of strategies and interventions (e.g. school-based surveys, cross-sectional surveys).
- 2) Accelerate implementation of the WHO Framework Convention on Tobacco Control, the WHO Global Strategy on Diet, Physical Activity and Health, the WHO Set of Recommendations on the Marketing of Food and Non-Alcoholic Beverages to Children and the WHO Global Strategy to Reduce Harmful Use of Alcohol.
  - Consider use of multiple strategies such as policy, legislation and regulations, taxation, civil society engagement, and strategy development for specific areas such as reducing salt intake.
- 3) Ensure access to NCD services and support including access to screening to enable early diagnosis.
- 4) Consider differences in risks of morbidity and mortality between men and women, across different age

# 1. INTRODUCTION

## 1.1 Background and Rationale

Noncommunicable diseases are now the leading causes of morbidity and mortality in many countries including Tuvalu. NCDs were responsible for 68% of the world's deaths in 2012; and out of the 38 million deaths worldwide due to NCDs, more than 40% were premature, affecting people under 70 years of age. It has been estimated that between 2011 and 2025, the economic losses from NCDs, if nothing changed, would be US\$7 trillion. This far exceeds the annual cost of US\$11.2 billion to implement a set of high-impact interventions.<sup>i</sup>

In 2011, world leaders committed to addressing NCDs through the Political Declaration of the High-Level Meeting of the General Assembly on the Prevention and Control of NCDs. Subsequently in 2013, the World Health Assembly (WHA) adopted a comprehensive global monitoring framework and nine voluntary global targets to be attained by 2025. The WHA had also endorsed a set of actions, outlined in the WHO Global action plan for the prevention and control of noncommunicable diseases 2013-2020, to be implemented by Member States and WHO.<sup>ii</sup>

Tuvalu has a Strategic Health Plan 2009-2018 which aimed to reduce burden from NCDs by decreasing smoking and alcohol rates and promoting physical activity and healthy diets. Tuvalu also has the National Strategic Plan for NCDs 2011-2015, which calls for collaboration with different government ministries and sectors to achieve the goal of healthy living for Tuvaluans.<sup>iii</sup> However, NCDs are still the leading causes of mortality and morbidity in Tuvalu. Like many other countries, Tuvalu is affected by the forces of globalization and urbanization. Tackling NCDs will require effective behavior change strategies, strong leadership at the highest level of government and policy coherence across different government departments will also be essential.<sup>iv</sup>

For Tuvalu to achieve the overarching 25% reduction of premature mortality from the four major NCDs by 2025, it first needs to know the prevalence of risk factors contributing to NCDs. As such, this survey was conducted to provide baseline estimates on NCDs and its risk factors, inform development of policies and programmes, and assess progress and effectiveness of strategies and interventions. Repeated surveys will enable Tuvalu to map trends and report on progress made in attaining the nine voluntary global targets.

## 1.2 The national context

### 1.2.1 Geography

Tuvalu is a small nation in the Pacific, midway between Australia and Hawaii, and is comprised of nine coral islands. The total land area is 26 square kilometres. There are two seasons: wet from November to April and dry from May to October.<sup>vii</sup>

### 1.2.2 Population and culture

The population of Tuvalu was estimated to be 9,916 in 2015.<sup>v</sup> The total fertility rate was estimated at 3.0 in 2013. About 30% are in the 0-14 year age groups, 61% in the 15-64 year age groups and 9% are 65 years or older. Life expectancy at birth is currently 68 years.<sup>vi</sup>

The Tuvaluan language is the primarily language spoken by all. English is also an official language, but is not spoken in daily use. Parliamentary and official functions are conducted in Tuvaluan.<sup>vii</sup>

### 1.2.3 Government

Tuvalu is a parliamentary democracy and governed as a constitutional monarchy and Commonwealth realm. The Head of Government is the Prime Minister, elected by members of Parliament. Each of the nine islands has its own high-chief, sub-chiefs and community council, and exercises their own informal authority.

## 1.2.4 Economy

Tuvalu is classified by the World Bank as a upper middle-income country.<sup>ix</sup> Tuvalu's gross national income was US\$5,720 in 2014.<sup>x</sup> The economy is dominated by the public sector and revenues come from fishing licenses and fish exports. Tuvaluans rely on remittances from families living in Australia and New Zealand. Other than working as seaman, most Tuvaluans are involved in subsistence agriculture and fishing.

## 1.2.5 Health infrastructure and health status

Tuvalu has free medical and health services. Serious cases are sent to Fiji or New Zealand under the Tuvalu Medical Treatment Scheme.<sup>xi</sup> Data from 2005-2009 indicated that Tuvalu has 69.1 skilled health professionals per 100,000 population.<sup>xii</sup> Data collected in 2008 showed that health worker to population ratio was 1:971 for doctors, 1:180 for nurses, and 1:4762 for dentists. Princess Margaret Hospital is the only hospital in Tuvalu.<sup>xiii</sup>

NCDs are the leading causes of morbidity and mortality, and the Ministry of Health has the Strategic Health Plan 2009-2018 and the National Strategic Plan for NCDs 2011-2015 to target tobacco use, alcohol use, physical inactivity and unhealthy diet. Communicable diseases remain a major cause of morbidity.<sup>xiv</sup> Tuberculosis incidence, for example, was estimated at 190 per 100,000 in 2014, higher than many countries in the WHO Western Pacific Region.<sup>xv</sup>

According to the 2013-2017 WHO Country Cooperation Strategy, the island is faced with several challenges: (1) Tuvalu is vulnerable to climate change; (2) there is limited availability and access to safe and nutritious food; (3) limited knowledge and expertise in the health sector; (4) high costs of referrals and specialized clinical care; (5) growing burden of NCDs and their impact on the health system. There are opportunities however to alleviate the situation: (1) improved collaboration with donor agencies and development partners; (2) strong awareness of healthy living and strong health promotion activities; and (4) the recently built hospital.<sup>xvi</sup>

## 1.3 Developing NCD STEPS in Tuvalu

There is currently minimal information on NCD risk factors and burden in adults in Tuvalu. Recognizing the gap in information, the Ministry of Health decided to conduct the survey in 2015. The survey was supported by the WHO.

## 2. OBJECTIVES

The overall aim of the NCD STEPS risk factor survey is to investigate the prevalence of key NCDs and their associated risk factors.

The STEPS survey:

- Documents the prevalence and magnitude of key NCDs among adults
- Documents 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.
- Compares NCDs and their risk factors groups.

## 3. METHODOLOGY

### 3.1 Survey structure

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

- Step 1: A questionnaire-based (interview) survey on tobacco use, alcohol 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.

The Tuvalu NCD STEPS Survey used Version 3.1. Similar to other NCD STEPS surveys conducted in the Pacific region, the Tuvalu survey collected core information across all three steps. NCD STEPS standardized survey methodology was followed. Differences between age groups or sexes are statistically significant if 95% Confidence Intervals (CI) do not overlap.

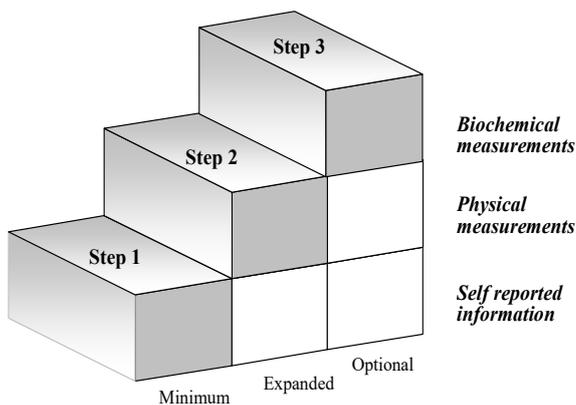


Figure 1. The WHO STEPwise approach to surveillance of NCDs.

### 3.2 Sample size

A sample size of 1526 was calculated, according to the WHO standard formula for STEPS to ensure national representativeness and based on random household sampling.

### 3.3 Survey sampling methodology

The Tuvalu STEPS Survey was a population based cross-sectional survey of 18-69 year olds. The decision was to use two age groups: 18-44 and 45-69 years for men and women using the following corrections:

- Design Effect of 1.0 (only clustering at Household level)
- 95% confidence interval; p value .05
- 80% response rate
- Baseline: .50
- FPC – 10% adjustment.

### 3.4 Data collection process

In general, the survey personnel obtained informed consent from survey participants, gave fasting instructions to those participating in STEP 3, and made appointment times for those who consented to participate in the survey. Various venues were organised around the island for participants to access for data collection for steps 1, 2 and 3. Participants were notified of the venues at time of contact and this information was also advertised on television, radio and newspaper.

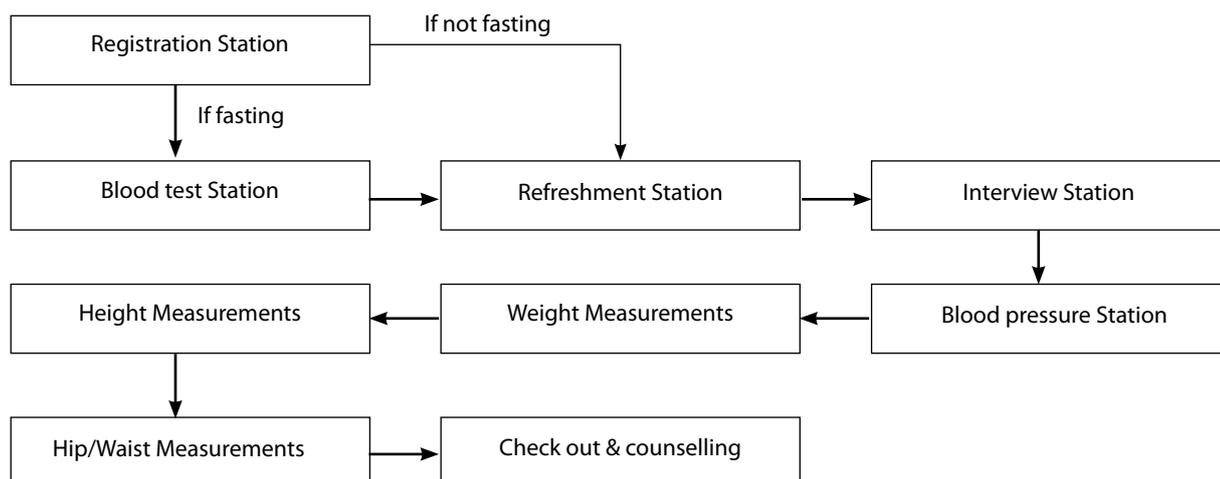


Figure 2: Sequence of data collection and stations at the survey base.

#### 3.4.1 Registration of participants

At the registration station, survey personnel:

- Confirmed consent of the participant to be involved in the survey.
- Ensured that participants understood steps 1, 2 and 3 involved in the survey.
- Obtained participant's date of birth and confirmed that they were within their target group.
- Confirmed fasting status of the participant.
- Directed the participant to the appropriate station depending on their fasting status.

#### 3.4.2 Step 1 - Behavioural risk factors interviews

All participants took part in a face-to-face interview in which questions were asked on smoking, alcohol, fruit and vegetable consumption, salt, fat and sugar consumption, physical activity, history of chronic conditions and medications, cervical cancer screening and mental health. All expanded questions were included (except those on chewing/smokeless tobacco) including additional questions on kava use, coconut cream and intake of sugar-sweetened beverages. Survey staff also asked questions on demographic indicators, including education level, work status and household income. The questionnaire was administered through a personal digital assistant (PDA).

#### 3.4.3 Step 2 - Physical measurements

Survey staff obtained 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 in 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 centimetre and the Seca scale 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 pregnant participants was not measured.

#### 3.4.4 Step 3 - Biochemical measurements

The survey included assessments of fasting blood glucose and 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 finger prick method. The Cardio Chek<sup>(R)</sup> were used to measure cholesterol and glucose in samples.

A subsample of participants was also invited to provide a urine sample to measure salt intake; and haemoglobin was tested on all women of reproductive age.

#### 3.4.5 Check-out station

All participants received health advice and counseling 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 to the Princess Margaret Hospital for residents of Funafuti and the NCD clinic of health centres for outer island residents for a follow-up clinical examination.

### 3.5 Data management and analysis

#### 3.5.1 Data entry

Hand-held PDAs were used to record data as collected. When shortages of PDAs in some sites occurred, data was collected initially by hard copy and then transferred to PDAs when possible.

#### 3.5.2 Data analysis

Data analyses were conducted using the Epi Info Version 3.5.1. Analysis was undertaken by the Division of Pacific Technical Support, and verified by WHO HQ NCD surveillance team.

## 4. RESULTS

The results presented below are supplemented by additional information in the Complete Data Book presented at Appendix 2

### 4.1 Characteristics of the survey population

The survey respondents (1155 participants) were divided into two age groups: 18-44 years (636 participants) and 45-69 years (519 participants); and women made up more than half of the respondents (54.4%).

The mean per capita annual income calculated based on 316 participants who responded to the survey question was AUD 4815.8.

Table 1. Demographics of survey respondents

age groups and sex of respondents						
Age groups (years)	Men		Women		Both sexes	
	N	%	n	%	n	%
18-44	301	47.3	335	52.7	636	55.1
45-69	226	43.5	293	56.5	519	44.9
18-69	527	45.6	628	54.4	1155	100.0

Table 2 shows that the survey respondents were primarily Tuvaluan (99%) with the rest composed of Fijian and others (1%).

Table 2. Ethnicity of survey respondents

Ethnic group of respondents				
Age groups (years)	Both sexes			
	n	% Tuvaluan	% Fijian	% Others
18-44	636	99.1	0.5	0.5
45-69	519	99.0	0.2	0.8
18-69	1155	99.0	0.3	0.7

Table 3 shows that the younger age groups (18-44 years) has slightly more years of education – 11.7 years compared to 9.8 years. Men and women have similar mean number of years of education (10.6 years and 11.01 years respectively) which suggests equal access to education in Tuvalu.

Table 3. Mean number of years of education

Mean number of years of education						
Age groups (years)	Men		Women		Both sexes	
	n	Mean	n	Mean	n	Mean
18-44	300	11.4	334	12.0	634	11.7
45-69	225	9.7	288	10.0	513	9.8
18-69	525	10.6	622	11.0	1147	10.9

Table 4 shows that majority have completed at least secondary school level of education and about 16.8% have college or post-graduate degrees. For the highest level of education among men or women, please see appendix 2.

Table 4. Highest level of education attained, both sexes combined

Highest level of education						
Age groups (years)	Both sexes					
	N	% No formal schooling	% Less than primary school	% Primary school completed	% Secondary school completed	% College/Post graduate University completed
18-44	636	0.2	1.4	28.1	47.3	23.0
45-69	517	1.4	5.4	59.6	24.4	9.3
18-69	1153	0.7	3.2	42.2	37.0	16.8

Table 5 shows that most respondents are currently married (73.3%), 19.0% have never married and 7.8% are of other marital status (separated, divorced or widowed). For marital status among men or women, please see appendix 2.

Table 5. Marital status, both sexes combined

Marital status							
Age groups (years)	Both sexes						
	n	% Never married	% Currently married	% Separated	% Divorced	% Widowed	% Cohabiting
18-44	636	29.1	68.1	1.1	1.1	0.6	-
45-69	519	6.6	79.8	0.8	3.3	9.6	-
18-69	1155	19.0	73.3	1.0	2.1	4.7	-

Table 6 shows that more than half of the survey respondents are in unpaid work (non-paid, studying, conducting home duties, retired) or unemployed. One fifth (21.4%) are employed by the government, 12.7% are non-government employees and 8.2% are self-employed.

A greater proportion of women than men are in unpaid work (70.2% of women vs. 42.9% of men). Among women, 19.7% are employed by the government, 6.7% are non-government employees and 3.4% are self-employed. Among men, 23.5% are employed by the government, 19.7% are non-government employees and 13.9% are self-employed. For employment status by sex, please see tables in appendix 2.

Table 6. Employment status, both sexes combined

Employment status					
Age groups (years)	Both sexes				
	N	% Government employee	% Non government employee	% Self employed	% Unpaid
18-44	634	25.9	15.0	7.9	51.3
45-69	518	16.0	9.8	8.5	65.6
18-69	1152	21.4	12.7	8.2	57.7

Table 7 shows that among those engaged in unpaid work, majority were home-makers (44.2%), 7.8% were students, 5.0% were retired and 2.7% were not paid. Among the unemployed, 29.0% were able to work whilst 11.3% were unable.

Among women who were unpaid or unemployed, most were home-makers (59.7%), 30.1% were unemployed and the rest were either students, retirees or engaged in non-paid work. Among men, most were unemployed (60.2%), 14.2% were home-makers and the rest were in non-paid work, students or retirees. For details on type of unpaid or unemployment status by sex, please see appendix 2.

Table 7. Unpaid work and unemployment, both sexes combined

Unpaid work and unemployed							
Age groups (years)	Both sexes						
	n	% Non-paid	% Student	% Homemaker	% Retired	Unemployed	
						% Able to work	% Not able to work
18-44	325	2.5	16.0	37.8	0.9	37.5	5.2
45-69	340	2.9	0	50.3	8.8	20.9	17.1
18-69	665	2.7	7.8	44.2	5.0	29.0	11.3

## 4.2 Tobacco use

This section elaborates on tobacco consumption status, levels and patterns in Tuvalu. The questionnaire asked whether participants smoked tobacco products and were then categorized into the following:

- Current smokers – those who currently smoke any tobacco products (such as cigarettes, cigars or pipes).
- Current daily smokers – those who currently smoke tobacco products daily.
- Current non-daily smokers – those who currently smoke tobacco products but not daily.
- Non-smokers – those who have never smoked any tobacco products.

Table 8 shows that one third of the Tuvalu population (35.0%, 95%CI= 29.3-40.7) were current smokers. Significantly more men (48.6%, 95%CI= 38.6-58.7) than women (22.4%, 95%CI= 19.9-24.8) were current smokers.

There was no statistically significant difference in smoking prevalence between the two age groups.

Table 8. Percentage of current smokers

Percentage of current smokers									
Age groups (years)	Men			Women			Both sexes		
	n	% Current smoker	95% CI	n	% Current smoker	95% CI	n	% Current smoker	95% CI
18-44	301	49.9	37.8-62.0	335	18.8	12.8-24.7	636	35.1	26.3-43.9
45-69	226	44.9	37.6-52.1	292	28.5	18.7-38.4	518	34.7	30.6-38.9
18-69	527	48.6	38.6-58.7	627	22.4	19.9-24.8	1154	35.0	29.3-40.7

Table 9 shows that 46.9% (95%CI= 35.3-58.5) of men were current daily smokers, 1.8% (95%CI= 0.1-3.5) were current non-daily smokers, 6.8% (95%CI= 5.2-8.3) were former smokers and 44.6% (95%CI= 34.8-54.3) had never smoked any tobacco products. There was no statistically significant difference between the two age groups.

Table 9. Smoking status among men

Smoking status									
Age groups (years)	Men								
	n	Current smoker				Non-smokers			
		% Daily	95% CI	% Non-daily	95% CI	% Former smoker	95% CI	% Never smoker	95% CI
18-44	301	48.2	34.5-61.9	1.7	0.0-3.5	6.3	4.4-8.1	43.9	31.0-56.7
45-69	226	42.9	34.8-51.0	1.9	0.1-3.7	8.3	3.7-13.0	46.8	42.0-51.6
18-69	527	46.9	35.3-58.5	1.8	0.1-3.5	6.8	5.2-8.3	44.6	34.8-54.3

Table 10 shows that the majority of women were non-smokers – 71.6% (95%CI= 69.0-74.1) were never smokers, 6.0% (95%CI= 3.3-8.8) were former smokers, and the remaining 20.0% (95%CI= 17.6-22.3) current daily smokers and 2.4% (95%CI=1.5-3.4) current non-daily smokers. There was no statistically significant difference between the two age groups.

Table 10. Smoking status among women

Smoking status									
Age groups (years)	Women								
	n	Current smoker				Non-smokers			
		% Daily	95% CI	% Non-daily	95% CI	% Former smoker	95% CI	% Never smoker	95% CI
18-44	335	16.7	11.5-22.0	2.0	0.8-3.3	5.1	3.4-6.8	76.2	71.4-80.9
45-69	292	25.4	18.0-32.8	3.1	0.5-5.7	7.6	2.0-13.3	63.8	50.0-77.7
18-69	627	20.0	17.6-22.3	2.4	1.5-3.4	6.0	3.3-8.8	71.6	69.0-74.1

Table 11 shows that more than half overall indicated that they were non-smokers – 58.6% (95%CI= 54.2-63.0) were never smokers and 6.4% (95%CI= 4.5-8.2) were former smokers. The rest were current smokers – 32.9% (95%CI= 26.2-39.6) were daily smokers and 2.1% (95%CI= 1.1-3.2) were non-daily smokers.

There was no statistically significant difference between the two age groups. Significantly more men than women were current daily smokers whilst significantly more women than men were never smokers (compare tables 9 and 10).

Table 11. Smoking status, both sexes combined

Smoking status									
Age groups (years)	Both sexes								
	n	Current smoker				Non-smokers			
		% Daily	95% CI	% Non-daily	95% CI	% Former smoker	95% CI	% Never smoker	95% CI
18-44	636	33.3	23.8-42.7	1.9	1.0-2.7	5.7	4.5-6.9	59.2	50.8-67.6
45-69	518	32.1	28.6-35.5	2.7	0.7-4.7	7.9	2.8-13.0	57.4	50.4-64.3
18-69	1154	32.9	26.2-39.6	2.1	1.1-3.2	6.4	4.5-8.2	58.6	54.2-63.0

Table 12 shows that among current smokers, 94.0% (95%CI= 90.0-97.9) smoke daily – 96.4% (95%CI= 92.2-100.0) of men and 89.1% (95%CI= 84.9-93.4) of women; and 94.7% (95%CI= 91.2-98.2) of those aged 18-44 years and 92.3% (95%CI= 86.9-97.7) of those aged 45-69 years. There were no statistically significant differences between men and women and between the two age groups.

Table 12. Percentage of current smokers who smoke daily

Current daily smokers among smokers									
Age groups (years)	Men			Women			Both sexes		
	n	% Daily smokers	95% CI	n	% Daily smokers	95% CI	n	% Daily smokers	95% CI
18-44	161	96.6	92.2-100.0	60	89.2	83.9-94.6	221	94.7	91.2-98.2
45-69	104	95.7	91.4-100.0	71	89.0	83.4-94.7	175	92.3	86.9-97.7
18-69	265	96.4	92.2-100.0	131	89.1	84.9-93.4	396	94.0	90.0-97.9

Table 13 shows that the mean age of initiating smoking was 18.4 (95%CI= 17.1-19.7) years. Female smokers started smoking at a later age (20.7 years, 95%CI= 18.8-22.6) than male smokers (17.4 years, 95%CI= 16.0-18.7). The difference in the mean age of smoking initiation between men and women was statistically significant.

Table 13. Mean age started smoking

Mean age started smoking									
Age groups (years)	Men			Women			Both sexes		
	n	Mean age	95% CI	n	Mean age	95% CI	n	Mean age	95% CI
18-44	156	17.1	16.2-18.0	52	19.2	17.9-20.6	208	17.6	16.8-18.4
45-69	98	18.4	15.3-21.5	63	22.3	19.3-25.3	161	20.3	18.0-22.6
18-69	254	17.4	16.0-18.7	115	20.7	18.8-22.6	369	18.4	17.1-19.7

Table 14 shows that the mean duration of smoking overall was 19.3 years – 18.3 years (95%CI= 16.2-20.5) for men and 21.4 years (95%CI= 18.3-24.6) for women; and 12.7 years (95%CI= 11.6-13.8) for those aged 18-44 years and 34.6 years (95%CI= 32.2-37.0) for those aged 45-69 years. Older Tuvaluans smoked significantly longer than younger Tuvaluans. There was no statistically significant difference between men and women.

Table 14. Mean duration of smoking

Mean duration of smoking									
Age groups (years)	Men			Women			Both sexes		
	n	Mean duration	95% CI	n	Mean duration	95% CI	n	Mean duration	95% CI
18-44	156	13.5	12.4-14.6	52	10.1	8.4-11.8	208	12.7	11.6-13.8
45-69	98	35.0	31.9-38.1	63	34.2	31.3-37.0	161	34.6	32.2-37.0
18-69	254	18.3	16.2-20.5	115	21.4	18.3-24.6	369	19.3	18.3-20.3

Table 15 shows that majority (90.5%, 95%CI= 80.8-100.0) of current daily smokers smoked manufactured cigarettes – 92.3% (95%CI= 84.4-100.0) of male current daily smokers and 86.8% (95%CI= 70.9-100.0) of female current daily smokers; and 92.1% (95%CI= 82.6-100.0) of those aged 18-44 years and 87.0% (95%CI= 76.9-97.0) of those aged 45-69 years. There were no statistically significant differences between the two age groups and between men and women.

Table 15. Percentage of current daily smokers who smoked manufactured cigarettes

Manufactured cigarette smokers among daily smokers									
Age groups (years)	Men			Women			Both sexes		
	n	% Manufactured cigarette smoker	95% CI	n	% Manufactured cigarette smoker	95% CI	n	% Manufactured cigarette smoker	95% CI
18-44	156	92.9	84.6-100.0	53	89.7	73.7-100.0	209	92.1	82.6-100.0
45-69	99	90.3	82.2-98.3	65	83.5	65.1-100.0	164	87.0	76.9-97.0
18-69	255	92.3	84.4-100.0	118	86.8	70.9-100.0	373	90.5	80.8-100.0

Table 16 shows that 90.4% (95%CI= 80.0-100.0) of current smokers smoked manufactured cigarettes – 92.6% (95%CI= 84.8-100.0) of male current smokers and 86.2% (95%CI= 68.5-100.0) of female current smokers; and 92.1% (95%CI= 82.4-100.0) of those aged 18-44 years and 86.7% (95%CI= 74.7-98.7) of those aged 45-69 years. There were no statistically significant differences between the two age groups and between men and women.

Table 16. Percentage of current smokers who smoked manufactured cigarettes

Manufactured cigarette smokers among current smokers									
Age groups (years)	Men			Women			Both sexes		
	n	% Manufactured cigarette smoker	95% CI	n	% Manufactured cigarette smoker	95% CI	n	% Manufactured cigarette smoker	95% CI
18-44	161	93.1	84.9-100.0	60	89.2	73.8-100.0	221	92.1	82.4-100.0
45-69	104	90.7	82.8-98.6	71	82.8	60.2-100.0	175	86.7	74.7-98.7
18-69	265	92.6	84.8-100.0	131	86.2	68.5-100.0	396	90.4	80.0-100.0

Table 17 shows that the mean amount of tobacco used by current daily smokers were: 7.3 (95%CI= 6.6-7.9) manufactured cigarettes, 3.4 (95%CI= 2.5-4.3) hand-rolled cigarettes, 0.2 (95%CI= 0.0-0.4) piped tobacco, 0.3 (95%CI= 0.1-0.4) cigars, cheroots or cigarillos and 0.7 (95%CI= 0.3-1.1) of other types of tobacco. There is no information on use of shisha.

Men smoked twice the number of manufactured cigarettes (8.7 cigarettes, 95%CI= 7.6-9.8) compared to women (4.3 cigarettes, 95%CI= 3.3-5.3), which was statistically significant. The difference in the number of hand-rolled cigarettes smoked by men and women was not statistically significant. Please see Appendix 2 for details.

Table 17. Mean amount of tobacco used by daily smokers by type and age, both sexes combined

Mean amount of tobacco used by daily smokers by type									
Age Group (years)	Both sexes								
	n	Mean # of manufactured cig.	95% CI	n	Mean # of hand-rolled cig.	95% CI	n	Mean # of pipes of tobacco	95% CI
18-44	209	7.8	6.8-8.7	209	3.5	2.0-5.0	208	0.2	0.0-0.6
45-69	163	6.2	4.7-7.7	164	3.3	2.5-4.0	164	0.1	0.0-0.2
18-69	372	7.3	6.6-7.9	373	3.4	2.5-4.3	372	0.2	0.0-0.4

Mean amount of tobacco used by daily smokers by type (continued)									
Age Group (years)	Both sexes								
	n	Mean # of cigars, cheroots, cigarillos	95% CI	n	Mean # of shisha sessions	95% CI	n	Mean # of other type of tobacco	95% CI
18-44	209	0.3	0.0-0.6	-	-	-	206	0.7	0.2-1.1
45-69	164	0.1	0.0-0.5	-	-	-	162	0.7	0.3-1.0
18-69	373	0.3	0.1-0.4	-	-	-	368	0.7	0.3-1.1

Table 18 shows that the two most common products current smokers smoked were manufactured cigarettes and hand-rolled cigarettes. Among current smokers, 90.4% (95%CI= 80.0-100.0) smoked manufactured cigarettes and 77.3% (95%CI= 69.8-84.7) smoked hand-rolled cigarettes. A smaller percentage of current smokers used piped tobacco, cigars, cheroots and cigarillos (2.8, 95%CI= 0.8-4.8), and 18.9% (95%CI= 10.5-27.3) used other types of tobacco products.

For more details on the types of tobacco products men and women smoke, please see Appendix 2.

Table 18. Percentage of current smokers smoking the different types of tobacco products, both sexes combined

Percentage of current smokers smoking each of the following products							
Age groups (yrs)	Both						
	n	% Manuf. cigs.	95% CI	% Hand-rolled cigs.	95% CI	% Pipes of tobacco	95% CI
18-44	221	92.1	82.4-100.0	81.5	74.3-88.6	1.7	0.0-3.8
45-69	175	86.7	74.7-98.7	68.0	50.8-85.3	1.8	0.0-6.2
18-69	396	90.4	80.0-100.0	77.3	69.8-84.7	1.7	0.2-3.2

Percentage of current smokers smoking each of the following products (continued)					
Age groups (yrs)	Both sexes				
	n	% Cigars, cheroots, cigarillos	95% CI	% Other	95% CI
18-44	221	3.0	0.4-5.6	13.7	3.5-23.9
45-69	175	2.4	0.5-4.2	30.5	18.7-42.4
18-69	396	2.8	0.8-4.8	18.9	10.5-27.3

Table 19 shows that one third (29.9%, 95%CI= 22.5-37.2) of current daily smokers smoked less than five cigarettes each day, 27.1% (95%CI= 19.8-34.5) smoked 5-9 cigarettes, 20.2% (95%CI= 13.0-27.4) smoked 10-14 cigarettes, 12.1% (95%CI= 9.3-14.9) smoked 15-24 cigarettes, and 10.7% (95%CI= 6.8-14.5) were heavy smokers who smoked more than 25 cigarettes a day.

Among male current daily smokers, the most common quantity of manufactured or hand-rolled cigarettes smoked each day was 5-9 cigarettes (27.7%, 95%CI= 22.0-33.4) and 13.9% (95%CI= 7.6-20.1) were heavy smokers. Among female current daily smokers, half (50.3%, 95%CI= 37.4-63.3) were light smokers smoking less than 5 cigarettes a day and 3.6% (95%CI= 1.9-5.3) were heavy smokers smoking more than 25 cigarettes a day. For more details on the quantity smoked by men and women, please see Appendix 2.

Table 19. Percentage of current daily smokers smoking the given quantities of manufactured or hand-rolled cigarettes each day

Percentage of daily smokers smoking given quantities of manufactured or hand-rolled cigarettes per day											
Age groups (yrs)	Both sexes										
	n	% <5 Cigs.	95% CI	% 5-9 Cigs.	95% CI	% 10-14 Cigs.	95% CI	% 15-24 Cigs.	95% CI	% ≥ 25 Cigs.	95% CI
18-44	199	27.1	20.4-33.9	27.7	19.7-35.8	20.8	11.5-30.1	13.0	9.8-16.1	11.4	5.9-16.9
45-69	149	36.4	15.2-57.6	25.7	10.7-40.8	18.8	14.5-23.0	10.2	1.6-18.7	8.9	4.9-12.9
18-69	348	29.9	22.5-37.2	27.1	19.8-34.5	20.2	13.0-27.4	12.1	9.3-14.9	10.7	6.8-14.5

Table 20 shows that 63.5% of current smokers have tried to quit smoking in the past twelve months – 63.8% (95%CI= 50.7-76.9) of men and 63.0% (95%CI= 55.5-70.4) of women; and 64.7% (95%CI= 53.5-75.9) of those aged 18-44 years and 60.8% (95%CI= 52.6-69.1) of those aged 45-69 years. There were no statistically significant differences between the two age groups and between men and women.

Among male current smokers, there was no statistically significant difference between the two age groups. However, among female current smokers a significantly higher percentage of those aged 18-44 years (73.8%, 95%CI= 64.6-83.1) have tried to stop smoking compared to those aged 45-69 years (50.9%, 95%CI= 37.4-64.4).

Table 20. Percentage of current smokers who have tried to stop smoking

Current smokers who have tried to stop smoking									
Age groups (years)	Men			Women			Both sexes		
	n	% Tried to stop smoking	95% CI	n	% Tried to stop smoking	95% CI	n	% Tried to stop smoking	95% CI
18-44	161	61.6	47.1-76.1	60	73.8	64.6-83.1	221	64.7	53.5-75.9
45-69	104	71.1	58.1-84.1	71	50.9	37.4-64.4	175	60.8	52.6-69.1
18-69	265	63.8	50.7-76.9	131	63.0	55.5-70.4	396	63.5	56.2-70.8

Table 21 shows that only one third of current smokers (37.3%, 95%CI= 28.2-46.3) have been advised by a doctor or health worker to stop smoking – 36.8% (95%CI= 26.1-47.6) among men and 38.4% (95%CI= 25.9-50.9) among women; and 31.8% (95%CI= 23.5-40.1) of those aged 18-44 years and 52.3% (95%CI= 39.0-65.5) of those aged 45-69 years. There were no statistically significant differences between men and women and between the two age groups.

Table 21. Percentage of current smokers who have been advised by a doctor or health worker to quit smoking

Current smokers who have been advised by doctor to stop smoking									
Age groups (years)	Men			Women			Both sexes		
	n	% Advised to stop smoking	95% CI	n	% Advised to stop smoking	95% CI	n	% Advised to stop smoking	95% CI
18-44	141	30.9	20.1-41.8	50	34.5	18.5-50.6	191	31.8	23.5-40.1
45-69	90	56.9	38.7-75.1	57	45.0	32.1-57.9	147	52.3	39.0-65.5
18-69	231	36.8	26.1-47.6	107	38.4	25.9-50.9	338	37.3	28.2-46.3

Table 22 shows that slightly more than half overall (52.6%, 95%CI= 48.8-56.4) have been exposed to second-hand smoke in homes during the past 30 days – 53.4% (95%CI= 48.0-58.8) of men and 51.9% (95%CI= 45.8-58.0) of women; and 53.5% (95%CI= 49.3-57.6) of those aged 18-44 years and 50.7% (95%CI= 45.1-56.4) of those aged 45-69 years. There were no statistically significant differences between men and women and between the two age groups.

Table 22. Percentage who reported exposure to second-hand smoke in homes during the past 30 days

Exposed to second-hand smoke in home during the past 30 days									
Age groups (years)	Men			Women			Both sexes		
	n	% Ex-posed	95% CI	n	% Ex-posed	95% CI	n	% Ex-posed	95% CI
18-44	301	55.2	50.9-59.6	335	51.5	45.0-58.0	636	53.5	49.3-57.6
45-69	226	47.8	34.5-61.1	293	52.5	42.3-62.7	519	50.7	45.1-56.4
18-69	527	53.4	48.0-58.8	628	51.9	45.8-58.0	1155	52.6	48.8-56.4

Table 23 shows that 41.8% (95%CI= 35.0-48.7) overall reported exposure to second-hand smoke in the workplace during the past 30 days. A significantly higher proportion of men (50.0%, 95%CI= 42.4-57.7) than women (33.4%, 95%CI= 26.4-40.5) have been exposed to second-hand smoke in the workplace. There was no statistically significant difference between the two age groups.

Table 23. Percentage who reported exposure to second-hand smoke in the workplace during the past 30 days

Exposed to second-hand smoke in the workplace during the past 30 days									
Age groups (years)	Men			Women			Both sexes		
	n	% Ex-posed	95% CI	n	% Exposed	95% CI	n	% Ex-posed	95% CI
18-44	254	50.8	43.9-57.7	264	37.9	30.6-45.2	518	44.8	38.2-51.5
45-69	188	47.8	34.5-61.1	217	24.7	17.7-31.6	405	34.6	26.1-43.0
18-69	442	50.0	42.4-57.7	481	33.4	26.4-40.5	923	41.8	35.0-48.7

### 4.3 Alcohol consumption

This section elaborates on alcohol consumption status, levels and patterns. Respondents were asked whether they consumed alcohol and were then categorized into the following:

- Current drinkers – those who consumed alcohol in the past 30 days.
- Occasional drinkers – those who consumed alcohol in the past 12 month but not in the past 30 days.
- Past 12 months abstainers – those who have consumed alcohol but had not done so in the past 12 months.
- Non-drinkers or lifetime abstainers – those who have never consumed alcohol in his/her lifetime.

Table 24 shows that 47.7% (95%CI= 35.1-60.3) of Tuvaluan men have never consumed alcohol, 38.9% (95%CI= 26.5-51.2) were current drinkers, 8.1% (95%CI= 4.8-11.4) had consumed alcohol in the past 12 months and 5.3% (95%CI= 3.6-7.0) had not consumed alcohol in the past 12 months.

Older men aged 45-69 years were significantly more likely to be non-drinkers (75.3%, 95%CI= 64.2-86.3) than younger men aged 18-44 years (38.6%, 95%CI= 30.0-47.2). Younger men aged 18-44 years were more likely to be current drinkers (46.2%, 95%CI= 35.6-56.8) compared to older men aged 45-69 years (16.8%, 95%CI= 9.5-24.2).

Table 24. Alcohol consumption status of men

Alcohol consumption status									
Age groups (years)	Men								
	n	% Current drinker (past 30 days)	95% CI	% Drank in past 12 months, not current	95% CI	% Past 12 months abstainer	95% CI	% Lifetime abstainer	95% CI
18-44	301	46.2	35.6-56.8	9.3	5.0-13.5	5.9	4.0-7.9	38.6	30.0-47.2
45-69	226	16.8	9.5-24.2	4.5	1.3-7.6	3.4	0.5-6.4	75.3	64.2-86.3
18-69	527	38.9	26.5-51.2	8.1	4.8-11.4	5.3	3.6-7.0	47.7	35.1-60.3

Table 25 shows that majority of women (90.0%, 95%CI= 83.5-96.4) have never consumed alcohol, 3.4% (95%CI= 0.7-6.2) were current drinkers, 3.1% (95%CI= 0.8-5.4) had consumed alcohol in the past 12 months and 3.5% (95%CI= 1.8-5.2) abstained from alcohol in the past 12 months.

Similar to the trend among men, older women aged 45-69 years were significantly more likely to be non-drinkers (98.3%, 95%CI= 96.8-99.9) compared to younger women aged 18-44 years (85.0%, 95%CI= 76.7-93.3); and younger women aged 18-44 years were more likely to be current drinkers (5.3%, 95%CI= 1.2-9.4) than those aged 45-69 years (0.3%, 95%CI= 0.0-1.1). There were statistically significant differences between men and women in terms of the percentage of current drinkers and lifetime abstainers.

Table 25. Alcohol consumption status of women

Alcohol consumption status									
Age groups (years)	Women								
	n	% Current drinker (past 30 days)	95% CI	% Drank in past 12 months, not current	95% CI	% Past 12 months abstainer	95% CI	% Lifetime abstainer	95% CI
18-44	335	5.3	1.2-9.4	4.1	1.5-6.8	5.6	3.2-8.0	85.0	76.7-93.3
45-69	292	0.3	0.0-1.1	1.4	0.0-3.2	0.0	0.0-0.0	98.3	96.8-99.9
18-69	627	3.4	0.7-6.2	3.1	0.8-5.4	3.5	1.8-5.2	90.0	83.5-96.4

Table 26 shows that 69.7% (95%CI= 60.6-78.8) overall were lifetime abstainers, one-fifth (20.5%, 95%CI= 13.3-27.6) were current drinkers, 5.5% (95%CI= 3.8-7.2) drank in the past 12 months and 4.4% (95%CI= 2.9-5.9) abstained from alcohol in the past 12 months.

Younger people aged 18-44 years were significantly more likely to be drinkers than those aged 45-69 years – 26.8% (95%CI= 19.0-34.5) and 6.8% (95%CI= 4.9-8.8) were occasional drinkers. Older people aged 45-69 years were significantly more likely to be lifetime abstainers (89.5%, 95%CI= 86.1-93.0) compared to 60.6% (95%CI= 52.0-69.2) of those aged 18-44 years.

Table 26. Alcohol consumption status, both sexes combined

Alcohol consumption status									
Age groups (years)	Both sexes								
	n	% Current drinker (past 30 days)	95% CI	% Drank in past 12 months, not current	95% CI	% Past 12 months abstainer	95% CI	% Lifetime abstainer	95% CI
18-44	636	26.8	19.0-34.5	6.8	4.9-8.8	5.8	4.1-7.4	60.6	52.0-69.2
45-69	518	6.6	4.8-8.4	2.5	0.8-4.3	1.3	0.4-2.3	89.5	86.1-93.0
18-69	1154	20.5	13.3-27.6	5.5	3.8-7.2	4.4	2.9-5.9	69.7	60.6-78.8

Table 27 shows that drinking 1-2 days per week is very common with 46.1% (95%CI= 38.2-53.9) doing so – 47.7% (95%CI= 42.0-53.4) of those aged 18-44 years and 32.6% (95%CI= 9.0-56.1) of those aged 45-69 years. This is followed by 41.7% who consumed alcohol infrequently – 26.9% (95%CI= 19.1-34.6) drank alcohol less than once a month and 14.8% (95%CI= 11.6-17.9) drank 1-3 days per month; and 12.4% drank frequently – 4.0% (95%CI= 1.8-6.1) drank daily, 4.2% (95%CI= 0.2-8.2) drank 5-6 days per week and 4.2% (95%CI= 2.0-6.3) drank 3-4 days per week.

The number of respondents aged 45-69 years was too small to report on this indicator

For details on the frequency of alcohol consumption for men and women, please see Appendix 2.

Table 27. Frequency of alcohol consumption among those who drank in the last 12 months, both sexes combined

Frequency of alcohol consumption in the past 12 months													
Age groups (yrs)	Both sexes												
	n	% Daily	95% CI	% 5-6 days/week	95% CI	% 3-4 days/week	95% CI	% 1-2 days/week	95% CI	% 1-3 days/mth	95% CI	% < once a mth	95% CI
18-44	180	2.7	1.5-3.9	3.5	0.2-6.8	4.2	2.1-6.4	47.7	42.0-53.4	15.2	12.3-18.0	26.7	20.5-32.8
45-69	51	14.4	0.5-28.4	9.5	0.0-20.9	3.9	0.0-13.1	32.6	9.0-56.1	11.2	0.3-22.0	28.4	5.7-51.1
18-69	231	4.0	1.8-6.1	4.2	0.2-8.2	4.2	2.0-6.3	46.1	38.2-53.9	14.8	11.6-17.9	26.9	19.1-34.6

Table 28 shows that the mean number of drinking occasions among current drinkers was 4.4 (95%CI= 2.7-6.1) in the past 30 days. The number of respondents was too small to report on any statistically significant difference between the two age groups, please see Appendix 2 for more details.

Table 28. Mean number of drinking occasions in the past 30 days among current drinkers

Mean number of drinking occasions in the past 30 days among current (past 30 days) drinkers									
Age groups (years)	Men			Women			Both sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-69	166	4.5	2.7-6.3	16	-	-	182	4.4	2.7-6.1

Table 29 shows that the mean number of standard drinks current drinkers consumed at each occasion was 9.1 (95%CI= 4.9-13.3). The number of respondents aged 45-69 years was too small to report on this indicator.

Table 29. Mean number of standard drinks consumed on a drinking occasion among current drinkers

Mean number of standard drinks per drinking occasion among current (past 30 days) drinkers									
Age groups (years)	Men			Women			Both sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-69	164	9.3	4.9-13.8	15	-	-	179	9.1	4.9-13.3

Table 30 shows that 92.1%, (95%CI= 86.6-97.5) of current drinkers engaged in lower-end level of drinking, 5.9% (95%CI= 0.3-11.6) in high-end level and 2.0% (95%CI= 1.2-2.9) in intermediate level of drinking. The number of respondents aged 45-69 years was too small to report on this indicator. For details on drinking levels of male and female current drinkers, please see Appendix 2.

Table 30. Percentage of current drinkers with different drinking levels, both sexes combined

High-end, intermediate, and lower-end level drinking among current (past 30 days) drinkers							
Age groups (years)	Both sexes						
	n	% high-end	95% CI	% intermediate	95% CI	% lower-end	95% CI
18-44	142	5.1	0.0-11.8	1.6	0.8-2.3	93.4	86.8-99.9
45-69	37	-	-	-	-	-	-
18-69	179	5.9	0.3-11.6	2.0	1.2-2.9	92.1	86.6-97.5

Table 31 shows that the mean largest number of standard drinks current drinkers consume on one occasion in the past 30 days was 14.2 (95%CI= 10.6-17.7). The number of respondents aged 45-69 years was too small to report on this indicator, please refer to Appendix 2.

Table 31. Mean maximum number of standard drinks consumed on one occasion in the past 30 days among current drinkers

Mean maximum number of standard drinks consumed on one occasion in the past 30 days									
Age groups (years)	Men			Women			Both sexes		
	n	Mean maximum number	95% CI	n	Mean maximum number	95% CI	n	Mean maximum number	95% CI
18-69	163	14.5	10.8-18.3	15	-	-	178	14.2	10.6-17.7

Table 32 shows that 18.7% overall had six or more drinks on a single occasion at least once in the past 30 days – men were significantly more likely to binge drink (36.1%, 95%CI= 25.0-47.1) than women (2.7%, 95%CI= 0.7-4.7). The table also shows that those aged 18-44 years were 4 times more likely to binge drink (24.5%, 95%CI= 17.8-31.1) than those aged 45-69 years (6.1%, 95%CI= 4.4-7.8).

Table 32. Percentage who had six or more drinks on a single occasion at least once during the past 30 days

Six or more drinks on a single occasion at least once during the past 30 days among total population									
Age groups (years)	Men			Women			Both sexes		
	n	% ≥ 6 drinks	95% CI	n	% ≥ 6 drinks	95% CI	n	% ≥ 6 drinks	95% CI
18-44	301	42.8	33.5-52.2	335	4.1	1.0-7.2	636	24.5	17.8-31.1
45-69	226	15.5	8.6-22.4	292	0.3	0.0-1.1	518	6.1	4.4-7.8
18-69	527	36.1	25.0-47.1	627	2.7	0.7-4.7	1154	18.7	12.5-24.9

Table 33 shows that the mean number of times current drinkers consumed six or more drinks on a single occasion in the past 30 days was 3.1 (95%CI= 2.7-3.5). The number of respondents aged 45-69 years was too small to report on this indicator, please refer to Appendix 2.

Table 33. Mean number of times current drinkers consumed six or more drinks on a single occasion in the past 30 days

Mean number of times with six or more drinks during a single occasion in the past 30 days among current drinkers									
Age groups (years)	Men			Women			Both sexes		
	n	Mean number of times	95% CI	n	Mean number of times	95% CI	n	Mean number of times	95% CI
18-69	160	3.1	2.6-3.5	13			173	3.1	2.7-3.5

Table 34 shows that in the past 7 days, 55.8% (95%CI= 41.7-70.0) of current drinkers reported drinking 1-2 days, 15.6% (95%CI= 11.4-19.8) did not drink, 13.1% (95%CI= 8.6-17.5) drank 3-4 days, 12.8% (95%CI= 0.6-24.9) drank daily and 2.7% (95%CI= 0.0-6.1) drank 5-6 days. The number of respondents aged 45-69 years was too small to report on this indicator. For details on the frequency of alcohol consumptions among male and female current drinkers in the past 7 days, please see Appendix 2.

Table 34. Frequency of alcohol consumption among current drinkers in the past 7 days, both sexes combined

Frequency of alcohol consumption among current drinkers in the past 7 days											
Age groups (yrs)	Both sexes										
	n	% Daily	95% CI	% 5-6 days	95% CI	% 3-4 days	95% CI	% 1-2 days	95% CI	% 0 days	95% CI
18-69	179	12.8	0.6-24.9	2.7	0.0-6.1	13.1	8.6-17.5	55.8	41.7-70.0	15.6	11.4-19.8

Table 35 shows that current drinkers consumed on average 5.2 (95%CI= 1.5-9.0) standard drinks per day in the past 7 days. The number of respondents aged 45-69 years was too small to report on this indicator, please refer to Appendix 2 for more details.

Table 35. Mean number of standard drinks current drinkers consumed on average per day in the past 7 days

Mean number of standard drinks consumed on average per day in the past 7 days among current drinkers									
Age groups (years)	Men			Women			Both sexes		
	n	Mean number	95% CI	n	Mean number	95% CI	n	Mean number	95% CI
18-69	164	5.4	1.6-9.2	15	-	-	179	5.2	1.5-9.0

Table 36 shows that 8.9% (95%CI= 6.3-11.6) of current drinkers consumed unrecorded alcohol in the past 7 days. Unrecorded alcohol includes alcohol brewed at home, brought over the border, not intended for drinking or that is untaxed. The number of respondents aged 45-69 years was too small to report on this indicator. See Appendix 2.

Table 36. Percentage of current drinkers who consumed unrecorded alcohol in the past 7 days

Consumption of unrecorded alcohol in the past 7 days among current drinkers									
Age groups (years)	Men			Women			Both sexes		
	n	% consuming unrecorded alcohol	95% CI	n	% consuming unrecorded alcohol	95% CI	n	% consuming unrecorded alcohol	95% CI
18-69	170	8.8	6.0-11.6	16	-	-	186	8.9	6.3-11.6

Table 37 shows that 38.1% (95%CI= 31.5-44.7) of past 12 month drinkers had experienced being unable to stop drinking monthly or more frequently and 17.2% (95%CI= 5.4-29.1) experienced it less than monthly. Most (44.7%, 95%CI= 33.0-56.3) have never experienced being unable to stop drinking.

The number of respondents aged 45-69 years was too small to report on this indicator. See Appendix 2.

Table 37. Percentage of past 12 month drinkers who were not able to stop drinking once started during the past year, both sexes combined

Frequency of not being able to stop drinking once started during the past 12 months among past 12 month drinkers							
Age groups (years)	Both sexes						
	n	% monthly or more frequently	95% CI	% less than monthly	95% CI	% never	95% CI
18-69	242	38.1	31.5-44.7	17.2	5.4-29.1	44.7	33.0-56.3

Table 38 shows that during the past 12 months, nearly monthly or more frequently, 36.0% (95%CI= 28.4-43.6) of past 12 month drinkers reported failing to do what was normally expected from them because of drinking; and 20.2% (95%CI= 6.6-33.7) reported failing to do so less than monthly. Slightly less than half (43.8%, 95%CI= 30.4-57.2) of past 12 month drinkers had never failed to do what was normally expected from them.

The number of respondents aged 45-69 years was too small to report on this indicator.

Table 38. Frequency of past 12 month drinkers failing to do what was normally expected from them because of drinking during the past 12 months, both sexes combined

Frequency of failing to do what was normally expected from you during the past 12 months among past 12 month drinkers							
Age groups (years)	Both sexes						
	n	% monthly or more frequently	95% CI	% less than monthly	95% CI	% never	95% CI
18-44	189	37.7	29.8-45.7	19.8	6.8-32.9	42.4	29.3-55.5
45-69	53	-	-	-	-	-	-
18-69	242	36.0	28.4-43.6	20.2	6.6-33.7	43.8	30.4-57.2

Table 39 shows that nearly half (95%CI= 42.0-59.7) of the past 12 month drinkers needed a first drink in the morning to get going: 31.4% (95%CI= 22.3-40.4) monthly or more frequently and 17.8% (95%CI= 9.4-26.2) less than monthly. The number of respondents aged 45-69 years was too small to report on this indicator.

Table 39. Frequency of past 12 month drinkers needing a first drink in the morning to get going during the past 12 months, both sexes combined.

Frequency of needing a first drink in the morning to get going during the past 12 months among past 12 month drinkers							
Age groups (years)	Both sexes						
	n	% monthly or more frequently	95% CI	% less than monthly	95% CI	% never	95% CI
18-44	189	31.9	22.5-41.3	18.1	9.9-26.3	50.0	40.8-59.3
45-69	53	-	-	-	-	-	-
18-69	242	31.4	22.3-40.4	17.8	9.4-26.2	50.9	42.0-59.7

## 4.4 Kava consumption

As kava is an integral part of the Pacific Islands religious, political and social life. Although not traditionally part of Tuvaluan culture, kava drinking has been adopted by some. Therefore, it is important to know the proportion of Tuvaluans who consume this drink. This section also aims to give insights into whether there is any relationship between kava consumption and alcohol and tobacco use.

Table 40 shows that 9.4% (95%CI= 6.7-12.1) overall have ever tried or drunk kava in their lifetime. A significantly higher proportion of Tuvaluans aged 18-44 years (11.5%, 95%CI= 8.5-14.5) has ever tried or drunk kava compared to those aged 45-69 years (5.0%, 95%CI= 1.7-8.3).

A significantly higher proportion of men (18.3%, 95%CI= 12.9-23.8) than women (1.2%, 95%CI= 0.0-2.7) has consumed kava. For details on the kava consumption status of men and women, please see Appendix 2.

Table 40. Percentage who consumed kava, both sexes combined

Kava consumption status					
Age groups (years)	Both sexes				
	n	% Drank Kava	95% CI	% abstainer	95% CI
18-44	636	11.5	8.5-14.5	88.5	85.5-91.5
45-69	519	5.0	1.7-8.3	95.0	91.7-98.3
18-69	1155	9.4	6.7-12.1	90.6	87.9-93.3

Table 41 shows that those who drank in the last 30 days consumed kava only on 0.4 days (95%CI= 0.2-0.6).

Table 41. Frequency (mean days) of kava consumption among those who drank in the last 30 days

Mean days Kava consumed in last 30 days									
Age groups (years)	Men			Women			Both sexes		
	n	Mean days	95% CI	n	Mean days	95% CI	n	Means days	95% CI
18-44	301	0.9	0.6-1.2	335	0.1	0.0-0.2	636	0.5	0.3-0.7
45-69	226	0.3	0.2-0.4	293	0.0	-	519	0.1	0.1-0.1

18-69	527	0.7	0.5-1.0	628	0.0	0.0-0.1	1155	0.4	0.2-0.6
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## 4.5 Fruit and vegetable consumption

WHO recommends at least five portions (approximately 400 grams) of fruits and vegetables a day to reduce the risk of NCDs. Respondents' fruit and vegetable intake was assessed by asking how many days they consumed fruit and vegetables in a typical week, and how many servings of each type they consumed on one of those days.

Table 42 shows that the mean number of days fruit was consumed in a typical week was 2.0 days (95%CI= 1.9-2.0).

Women consumed fruits significantly more often than men – 2.2 days (95%CI= 2.1-2.3) compared to 1.7 days (95%CI= 1.7-1.8) for men. Tuvaluans aged 45-69 years also consumed fruits significantly more often: 2.4 days (95%CI= 2.1-2.8) among those aged 45-69 years and 1.8 days (95%CI= 1.7-1.8) among those aged 18-44 years.

Table 42. Mean number of days fruit was consumed in a typical week

Mean number of days fruit consumed in a typical week									
Age groups (years)	Men			Women			Both sexes		
	n	Mean number of days	95% CI	N	Mean number of days	95% CI	n	Mean number of days	95% CI
18-44	300	1.6	1.5-1.7	335	1.9	1.7-2.0	635	1.8	1.7-1.8
45-69	225	2.0	1.9-2.1	293	2.7	2.3-3.1	518	2.4	2.1-2.8
18-69	525	1.7	1.7-1.8	628	2.2	2.1-2.3	1153	2.0	1.9-2.0

Table 43 shows that the mean number of days vegetables was consumed in a typical week was 1.9 days (95%CI= 1.7-2.2).

There were no statistically significant differences between men and women and between the two age groups.

Table 43. Mean number of days vegetables was consumed in a typical week

Mean number of days vegetables consumed in a typical week									
Age groups (years)	Men			Women			Both sexes		
	n	Mean number of days	95% CI	N	Mean number of days	95% CI	n	Mean number of days	95% CI
18-44	300	1.8	1.5-2.0	335	2.0	1.8-2.2	635	1.9	1.6-2.1
45-69	225	1.8	1.5-2.1	293	2.2	1.8-2.6	518	2.1	1.7-2.5
18-69	525	1.8	1.6-2.0	628	2.1	1.8-2.4	1153	1.9	1.7-2.2

Table 44 shows that the mean number of servings of fruit and/or vegetables consumed on average per day was 1.3 (95%CI= 0.9-1.6).

There were no statistically significant differences between men and women and between the two age groups in terms of the mean number of servings of fruit and/or vegetables consumed on average per day.

The mean number of servings of fruit consumed on average by day was similar to that of vegetables. Older Tuvaluans aged 45-69 years consumed a significantly higher number of serving of fruits (0.9, 95%CI= 0.6-1.2) compared to those aged 18-44 years (0.5, 95%CI= 0.4-0.5).

There was no statistical difference in servings of fruits consumed between men and women. As for the mean number of servings of vegetables consumed, there was no statistically significant difference between men and women and between the two age groups.

Please see Appendix 2 for more details.

Table 44. Mean number of servings of fruit and/or vegetables on average per day

Mean number of servings of fruit and/or vegetables on average per day									
Age groups (years)	Men			Women			Both sexes		
	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI
18-44	300	1.0	0.7-1.3	335	1.2	0.9-1.5	635	1.1	0.8-1.4
45-69	225	1.4	0.8-2.0	292	1.6	1.2-2.1	517	1.6	1.0-2.1
18-69	525	1.1	0.8-1.4	627	1.4	1.1-1.7	1152	1.3	0.9-1.6

Table 45 shows that more than half (63.9%, 95%CI= 57.5-70.2) did not consume any fruit and/or vegetables; 27.2% (95%CI= 24.3-30.0) consumed 1-2 servings; 4.8% (95%CI= 1.8-7.8) consumed 3-4 servings; and 4.2% (95%CI= 1.8-6.5) consumed more than 5 servings on average per day.

By gender, 68.7% (95%CI= 59.2-78.1) of men and 59.4% (95%CI= 54.3-64.5) of women consumed no fruit and/or vegetables. Among women, 29.2% (95%CI= 23.2-35.1) consumed 1-2 servings, 7.2% (95%CI= 2.8-11.5) consumed 3-4 servings, and 4.3% (95%CI= 2.1-6.4) consumed more than 5 servings. Among men, 25.0% (95%CI= 19.3-30.7) consumed 1-2 servings; 2.2% (95%CI= 0.6-3.8) consumed 3-4 servings; and 4.1% (95%CI= 1.5-6.8) consumed more than 5 servings. For additional details, please see Appendix 2.

There were no statistically significant differences between men and women and between the two age groups.

Table 45. Percentage who consumed the specified number of servings of fruit and/or vegetables on average per day, both sexes combined

Number of servings of fruit and/or vegetables on average per day									
Age groups (years)	Both sexes								
	n	% no fruit and/or vegetables	95% CI	% 1-2 servings	95% CI	% 3-4 servings	95% CI	% ≥5 servings	95% CI
18-44	635	66.6	60.5-72.7	26.5	22.9-30.1	2.7	1.7-3.8	4.2	1.3-7.0
45-69	517	57.8	47.3-68.4	28.7	24.2-33.2	9.2	0.0-18.4	4.3	2.1-6.4
18-69	1152	63.9	57.5-70.2	27.2	24.3-30.0	4.8	1.8-7.8	4.2	1.8-6.5

Table 46 shows that 95.8% (95%CI= 93.5-98.2) consumed less than five servings of fruit and/or vegetables – 95.9% (95%CI= 93.2-98.5) of men and 95.7% (95%CI= 93.6-97.9) of women; and 95.8% (95%CI= 93.0-98.7) of those aged 18-44 years and 95.8% (95%CI= 93.6-97.9) of those aged 45-69 years.

There were no statistically significant differences between men and women and between the two age groups.

Table 46. Percentage who consumed less than five servings of fruit and/or vegetables on average per day

Less than five servings of fruit and/or vegetables on average per day									
Age groups (years)	Men			Women			Both sexes		
	n	% < five servings per day	95% CI	n	% < five servings per day	95% CI	n	% < five servings per day	95% CI
18-44	300	96.3	93.9-98.6	335	95.4	91.7-99.0	635	95.8	93.0-98.7
45-69	225	94.8	90.6-98.9	292	96.4	94.0-98.7	517	95.8	93.6-97.9
18-69	525	95.9	93.2-98.5	627	95.7	93.6-97.9	1152	95.8	93.5-98.2

## 4.6 Dietary salt

WHO recommends less than 5 g of salt (approximately 1 teaspoon) per day to reduce risk of high blood pressure and consequently risk of heart disease and stroke. Respondents were asked how much and how often they added salt or salty sauce, how much salty processed food they consumed, their knowledge of salt and its health consequences, and actions they have taken to control salt intake.

Table 47 shows that 41.8% (95%CI= 30.7-52.8) of Tuvaluans always or often added salt before eating or when eating – 43.8% (95%CI= 32.5-55.0) of women and 39.6% (95%CI= 28.5-50.7) of men; and 47.4% (95%CI= 37.8-56.9) of those aged 18-44 years and 29.6% (95%CI= 16.3-42.8) of those aged 45-69 years.

There were no statistically significant differences between men and women and between the two age groups.

Table 47. Percentage who add salt always or often before eating or when eating

Add salt always or often before eating or when eating									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	300	44.5	35.3-53.8	334	50.5	39.9-61.1	634	47.4	37.8-56.9
45-69	225	24.5	12.2-36.8	293	32.6	17.4-47.9	518	29.6	16.3-42.8
18-69	525	39.6	28.5-50.7	627	43.8	32.5-55.0	1152	41.8	30.7-52.8

Table 48 shows that 54.3% (95%CI= 44.0-64.7) overall always or often added salt when cooking or preparing food at home – 52.0% (95%CI= 41.9-62.0) of men and 56.5% (95%CI= 44.9-68.2) of women; and 57.3% (95%CI= 48.3-66.4) of Tuvaluans aged 18-44 years and 47.8% (95%CI= 33.8-61.8) of those aged 45-69 years.

There were no statistically significant differences between men and women and between the two age groups.

Table 49. Percentage who add salt always or often when cooking or preparing food at home

Add salt always or often when cooking or preparing food at home									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	299	56.1	46.9-65.2	334	58.7	49.2-68.2	633	57.3	48.3-66.4
45-69	225	39.5	26.9-52.0	293	52.9	34.7-71.1	518	47.8	33.8-61.8
18-69	524	52.0	41.9-62.0	627	56.5	44.9-68.2	1151	54.3	44.0-64.7

Table 50 shows that 22.5% (95%CI= 16.1-28.9) always or often consumed processed food high in salt – 22.9% (95%CI= 15.0-30.7) of men and 22.2% (95%CI= 16.6-27.9) of women; and 26.2% (95%CI= 19.3-33.1) of those aged 18-44 years and 14.6% (95%CI= 9.8-19.4) of those aged 45-69 years.

Table 50. Percentage who always or often consumed processed food high in salt

Always or often consume processed food high in salt									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	300	24.6	15.9-33.3	334	27.9	21.0-34.8	634	26.2	19.3-33.1
45-69	225	17.6	9.1-26.2	292	12.8	9.8-15.9	517	14.6	9.8-19.4
18-69	525	22.9	15.0-30.7	626	22.2	16.6-27.9	1151	22.5	16.1-28.9

Table 51 shows that 14.0% (95%CI= 9.3-18.8) thought that they consumed far too much or too much salt – 15.3% (95%CI= 9.8-20.8) among women and 12.7% (95%CI= 8.0-17.4) among men. Three times more men and women aged 18-44 years thought that they consumed far too much or too much salt compared to those aged 45-69 years, which was a significant difference.

Table 51. Percentage who think they consumed far too much or too much salt

Think they consume far too much or too much salt									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	299	15.2	10.4-20.0	334	20.3	13.4-27.1	633	17.6	12.3-22.9
45-69	220	5.0	3.3-6.7	290	6.9	3.6-10.3	510	6.2	3.7-8.7
18-69	519	12.7	8.0-17.4	624	15.3	9.8-20.8	1143	14.0	9.3-18.8

Breaking the figures down further, table 52 shows that 2.4% (95%CI= 1.1-3.6) reported that they consumed far too much salt and 11.7% (95%CI= 7.6-15.8) reported that they consumed too much salt. Majority (70.8%, 95%CI= 63.7-77.8) reported that they consumed just the right amount of salt, 9.8% (95%CI= 6.5-13.1) that they consumed too little and 5.4% (95%CI= 3.1-7.7) consumed far too little.

Tuvaluans aged 18-44 years were significantly more likely to state that they consumed too much or far too much salt. There were no statistically significant differences between age groups for the other categories.

Table 52. Percentage who self-reported how much salt they consumed, both sexes combined

Self-reported quantity of salt consumed											
Age groups (years)	Both sexes										
	n	% Far too much	95% CI	% Too much	95% CI	% Just the right amount	95% CI	% Too little	95% CI	% Far too little	95% CI
18-44	633	3.2	1.8-4.6	14.4	9.6-19.2	71.3	64.2-78.5	8.1	5.7-10.5	3.0	1.4-4.6
45-69	510	0.5	0.1-0.9	5.7	3.2-8.2	69.6	59.9-79.3	13.5	7.5-19.5	10.7	4.6-16.8
18-69	1143	2.4	1.1-3.6	11.7	7.6-15.8	70.8	63.7-77.8	9.8	6.5-13.1	5.4	3.1-7.7

Table 53 shows that 86.7% (95%CI= 83.2-90.1) stated that lowering salt in diet was very important, 8.9% (95%CI= 7.0-10.8) as somewhat important and 4.4% (95%CI= 2.4-6.5) as not at all important. There were no statistically significant differences between the two age groups and between men and women. For more details on the responses of men and women, please see Appendix 2.

Table 53. Percentage who stated the different importance of lowering salt in diet, both sexes combined

Importance of lowering salt in diet							
Age groups (years)	Both sexes						
	n	% Very important	95% CI	% Somewhat important	95% CI	% Not at all important	95% CI
18-44	625	85.5	82.3-88.8	9.0	7.1-10.9	5.5	3.2-7.7
45-69	514	89.1	84.7-93.5	8.7	5.3-12.0	2.2	0.6-3.8
18-69	1139	86.7	83.2-90.1	8.9	7.0-10.8	4.4	2.4-6.5

Table 54 shows that 89.2% (95%CI= 86.1-92.3) thought that consuming too much salt could cause serious health problems, significantly more so among women (94.0%, 95%CI= 91.8-96.1) than men (84.0%, 78.6-89.5). There was no statistically significant difference between the two age groups.

Table 54. Percentage who think that consuming too much salt could cause serious health problems

Think consuming too much salt could cause serious health problem									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	300	82.1	76.6-87.6	334	95.3	91.6-98.9	634	88.3	84.9-91.8
45-69	225	90.0	85.5-94.4	293	91.8	86.6-96.9	518	91.1	87.2-95.0
18-69	525	84.0	78.6-89.5	627	94.0	91.8-96.1	1152	89.2	86.1-92.3

Table 55 shows that 80.5% (95%CI= 71.2-89.7) overall limited consumption of processed foods to control salt intake – 81.0% (95%CI= 73.2-88.8) among men and 80.0% (95%CI= 68.5-91.5) among women; and 79.8% (95%CI= 69.9-89.7) of those aged 18-44 years and 81.8% (95%CI= 73.3-90.3) of those aged 45-69 years.

There were no statistically significant differences between men and women and between the two age groups.

Table 55. Percentage who limited consumption of processed foods to control salt intake

Limit consumption of processed foods									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	300	81.8	75.3-88.2	334	77.7	62.3-93.1	634	79.8	69.9-89.7
45-69	225	78.6	67.1-90.1	293	83.8	76.6-90.9	518	81.8	73.3-90.3
18-69	525	81.0	73.2-88.8	627	80.0	68.5-91.5	1152	80.5	71.2-89.7

Table 56 shows that overall, 54.5% (95%CI= 40.3-68.6) looked at the salt or sodium content on food labels – 57.7% (95%CI= 42.5-72.9) of men and 51.5% (95%CI= 37.7-65.3) of women; and 55.8% (95%CI= 40.8-70.8) of those aged 18-44 years and 51.5% (95%CI= 37.7-65.3) of those aged 45-69 years.

There were no statistically significant differences between men and women and between the two age groups.

Table 56. Percentage who looked at the salt or sodium content on food labels

Look at the salt or sodium content on food labels									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	300	58.1	43.5-72.7	334	53.3	36.6-69.9	634	55.8	40.8-70.8
45-69	225	56.4	39.2-73.5	293	48.5	35.5-61.6	518	51.5	37.7-65.3
18-69	525	57.7	42.5-72.9	627	51.5	37.7-65.3	1152	54.5	40.3-68.6

Table 57 shows that 52.4% (95%CI= 37.5-67.3) bought low salt or sodium alternatives – 54.0% (95%CI=37.0-71.0) of men and 50.1% of women (95%CI= 35.7-64.6); and 51.8% (95%CI= 35.4-68.2) of those aged 18-44 years and 52.4% (95%CI= 37.5-67.3) of those aged 45-69 years.

There were no statistically significant differences between men and women and between the two age groups.

Table 57. Percentage of who bought low salt or sodium alternatives

Buy low salt/sodium alternatives									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	300	53.9	37.3-70.6	334	49.4	32.2-66.6	634	51.8	35.4-68.2
45-69	225	54.1	35.4-72.8	293	51.4	37.1-65.6	518	52.4	37.5-67.3
18-69	525	54.0	37.0-71.0	627	50.1	35.7-64.6	1152	52.0	36.7-67.3

Table 58 shows that 67.5% (95%CI= 56.2-78.8) used spices other than salt when cooking – 67.4% (95%CI= 60.4-74.4) of men and 67.6% (95%CI= 51.0-84.1) of women; and 67.5% (95%CI= 58.2-76.9) of those aged 18-44 years and 67.4% (95%CI= 51.6-83.3) of those aged 45-69 years.

There were no statistically significant differences between men and women and between the two age groups.

Table 58. Percentage who used spices other than salt when cooking

Use spices other than salt when cooking									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	300	67.8	60.7-74.9	334	67.2	53.8-80.6	634	67.5	58.2-76.9
45-69	225	66.2	58.3-74.1	293	68.2	45.2-91.2	518	67.4	51.6-83.3
18-69	525	67.4	60.4-74.4	627	67.6	51.0-84.1	1152	67.5	56.2-78.8

Table 59 shows that 67.9% (95%CI= 54.6-81.3) avoided eating foods prepared outside a home – 69.1% (95%CI= 52.5-85.8) of men and 66.8% (95%CI= 55.8-77.9) of women; and 68.9% (95%CI= 52.2-85.5) of those aged 18-44 years and 65.9% (95%CI= 57.7-74.1) of those aged 45-69 years.

There were no statistically significant differences between men and women and between the two age groups.

Table 59. Percentage of who avoided eating foods prepared outside a home

Avoid eating foods prepared outside of a home									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	300	69.3	50.1-88.6	334	68.3	53.6-83.1	634	68.9	52.2-85.5
45-69	225	68.5	57.3-79.6	293	64.3	56.3-72.4	518	65.9	57.7-74.1
18-69	525	69.1	52.5-85.8	627	66.8	55.8-77.9	1152	67.9	54.6-81.3

Table 60 shows that 48.6% (95%CI= 36.5-60.6) have done other things specifically to control salt intake – 51.2% (38.1-64.3) of men and 46.1% (95%CI= 33.9-58.4) of women; and 50.1% (95%CI= 37.4-62.9) of those aged 18-44 years and 45.2% (95%CI= 33.6-56.7) of those aged 45-69 years.

There were no statistically significant differences between men and women and between the two age groups.

Table 60. Percentage who have done other things specifically to control salt intake

Do other things specifically to control your salt intake									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	300	50.6	35.8-65.4	334	49.6	38.0-61.3	634	50.1	37.4-62.9
45-69	225	53.1	42.5-63.7	293	40.3	26.5-54.2	518	45.2	33.6-56.7
18-69	525	51.2	38.1-64.3	627	46.1	33.9-58.4	1152	48.6	36.5-60.6

## 4.7 Dietary fat

WHO recommends reducing total fat intake to prevent unhealthy weight gain. Fat intake can be reduced by removing fatty part of the meat, using vegetable oil, boiling, steaming or baking, avoiding eating processed food with trans fat, and limiting consumption of food with high amounts of saturated fats. Respondents were asked what type of oil or fat they used for preparing meals, how often they ate outside, and how often they consumed meals containing coconut, cream or lolo.

Table 61 shows that majority of the households surveyed (96.8%, 95%CI= 93.0-100.0) used vegetable oil, 1.7% (95%CI=0.0-4.6) used lard and 1.2% (95%CI= 0.0-2.7) used other types of oil or fat.

Table 61. Type of oil or fat most often used for meal preparation in household

Type of oil or fat most often used for meal preparation in household								
n (house-holds)	% Vegetable oil	95% CI	% Lard	95% CI	% Other	95% CI	% None	95% CI
1152	96.8	93.0-100.0	1.7	0.0-4.6	1.2	0.0-2.7	-	-

Table 62 shows that Tuvaluans ate 1.4 meals (95%CI= 0.9-1.9) outside a home on average per week – 1.5 (95%CI= 0.8-2.3) among men and 1.3 (95%CI= 0.8-1.8) among women; 1.5 (95%CI= 1.0-2.0) among those aged 18-44 years and 1.1 (95%CI= 0.5-1.8) among those aged 45-69 years.

There were no statistically significant differences between men and women and between the two age groups.

Table 62. Mean number of meals eaten outside a home on average per week

Mean number of meals eaten outside a home on average per week									
Age groups (years)	Men			Women			Both sexes		
	n	mean	95% CI	n	mean	95% CI	n	mean	95% CI
18-44	300	1.6	0.7-2.5	334	1.4	0.7-2.2	634	1.5	1.0-2.0
45-69	225	1.3	0.8-1.8	293	1.0	0.2-1.9	518	1.1	0.5-1.8
18-69	525	1.5	0.8-2.3	627	1.3	0.8-1.8	1152	1.4	0.9-1.9

## 4.8 Sugar consumption

WHO recommends reducing sugar intake to prevent unhealthy weight gain and risk of dental caries. Sugar intake can be reduced by limiting consumption of food and drinks containing high amounts of sugar, and eating fresh fruits and vegetables as snacks. In this section, survey respondents were asked how often and how many sugary drinks were consumed as well as how much sugar was added. Sugary drinks include fizzy drinks (excluding pure unsweetened fruit juice), cordials or drink mixes, milo and homemade drinks with added sugar; and one serving of sugary drink refers to one can of drink or one large glass.

Table 63 shows that Tuvaluans consumed a mean of 3.0 servings (95%CI= 2.5-3.4) of sugary drinks per day – 2.9 (95%CI= 2.4-3.5) among men and 3.0 (95%CI= 2.6-3.3) among women; and 3.0 (95%CI= 2.6-3.4) among those aged 18-44 years and 2.9 (95%CI= 2.4-3.4) among those aged 45-69 years. There were no statistically significant differences between men and women and between the two age groups.

Table 63. Mean number of servings of sugary drinks is being consumed per day

Mean number of servings sugary drinks is being consumed per day									
Age groups (years)	Men			Women			Both sexes		
	n	mean	95% CI	n	mean	95% CI	n	mean	95% CI
18-44	298	3.0	2.5-3.6	333	2.9	2.6-3.3	631	3.0	2.6-3.4
45-69	221	2.6	2.0-3.3	289	3.1	2.6-3.5	510	2.9	2.4-3.4
18-69	519	2.9	2.4-3.5	622	3.0	2.6-3.3	1141	3.0	2.5-3.4

Table 64 shows that Tuvaluans added 4.0 teaspoons of sugar (95%CI= 3.0-5.1) to drinks per day – 4.5 (95%CI= 2.8-6.2) among men and 3.6 (95%CI= 3.2-4.1) among women; and 4.3 teaspoon of sugar added (95%CI= 2.9-5.7) among those aged 18-44 years and 3.6 teaspoons of sugar added (95%CI= 3.9-5.3) among those aged 45-69 years. Drinks that they could have added sugar to include milo, tea or coffee.

There were no statistically significant differences between men and women and between the two age groups.

Table 64. Mean number of teaspoon of sugar added to drinks per day

Mean number of times sugar is added to drinks per day									
Age groups (years)	Men			Women			Both sexes		
	n	mean	95% CI	n	mean	95% CI	n	mean	95% CI
18-44	297	4.7	2.5-7.0	330	3.7	3.1-4.4	627	4.3	2.9-5.7
45-69	219	3.7	2.8-4.6	286	3.5	2.5-4.4	505	3.6	2.8-4.3
18-69	516	4.5	2.8-6.2	616	3.6	3.2-4.1	1132	4.0	3.0-5.1

## 4.9 Physical activity

### Introduction

A population's physical activity (or inactivity) can be described in different ways. The two most common ways used for analyzing Global Physical Activity Questionnaire (GPAQ) data are:

1. to estimate a population's mean or median physical activity using a continuous indicator such as MET-minutes per week or time spent in physical activity; and
2. to classify the population into specific groups by setting cut-off points for a specific amount of physical activity.

### Continuous indicator: Metabolic Equivalent (MET)

METs are commonly used to express the intensity of physical activities; and applying MET values to activity levels allows us to calculate total physical activity. MET is the ratio of a person's working metabolic rate relative to the resting metabolic rate. One MET is defined as the energy cost of sitting quietly, and is equivalent to a caloric consumption of 1 kcal/kg/hour. Guidelines have been adopted for the analysis of GPAQ data: It is estimated that, compared to sitting quietly, a person's caloric consumption is four times as high when being moderately active, and eight times as high when being vigorously active. For the calculation of a person's total physical activity using GPAQ data, the following MET values are used:

Domain	MET value
Work	<ul style="list-style-type: none"><li>▪ Moderate MET value = 4.0</li><li>▪ Vigorous MET value = 8.0</li></ul>
Transport	<ul style="list-style-type: none"><li>▪ Cycling and walking MET value = 4.0</li></ul>
Recreation	<ul style="list-style-type: none"><li>▪ Moderate MET value = 4.0</li><li>▪ Vigorous MET value = 8.0</li></ul>

Categorical indicator: WHO global recommendations on physical activity for health

Calculation of the recommended amount of physical activity for health takes into account the total time spent in physical activity during a typical week and the intensity of the physical activity.

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

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

The three levels of physical activity for classifying populations were low, moderate and high. The criteria for these levels are shown below.

High	Moderate	Low
<p>A person who meets the following criteria:</p> <ul style="list-style-type: none"> <li>Vigorous-intensity activity on at least 3 days achieving a minimum of at least 1,500 MET-minutes/week</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>7 or more days of any combination of walking, moderate- or vigorous-intensity activities achieving a minimum of at least 3,000 MET-minutes per week</li> </ul>	<p>A person who does not meet the criteria for the “high” category but meets the following:</p> <ul style="list-style-type: none"> <li>3 or more days of vigorous-intensity activity of at least 20 minutes per day</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>5 or more days of moderate-intensity activity or walking of at least 30 minutes per day</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>5 or more days of any combination of walking, moderate- or vigorous-intensity activities achieving a minimum of at least 600 MET-minutes per week.</li> </ul>	<p>A person who does not meet any of the abovementioned criteria.</p>

Table 65 shows that 25.3% (95%CI= 18.5-32.1) of Tuvaluans did not meet the WHO recommendations on physical activity for health. A significantly higher proportion of Tuvaluans aged 45-69 years (38.4%, 95%CI= 27.1-49.8) did not meet the recommendations compared to those aged 18-44 years (19.3%, 95%CI= 12.5-26.1). Significantly higher proportion of women (35.3%, 95%CI= 23.7-47.0) than men (14.4%, 95%CI= 10.9-17.9) also did not meet the recommendations.

Table 65. Percentage who did not meet WHO global recommendations on physical activity for health

Not meeting WHO global recommendations on physical activity for health									
Age groups (years)	Men			Women			Both sexes		
	n	% not meeting recs	95% CI	n	% not meeting recs	95% CI	n	% not meeting recs	95% CI
18-44	298	10.1	7.4-12.8	332	29.4	17.3-41.5	630	19.3	12.5-26.1
45-69	224	27.1	16.8-37.5	290	45.3	31.2-59.5	514	38.4	27.1-49.8
18-69	522	14.4	10.9-17.9	622	35.3	23.7-47.0	1144	25.3	18.5-32.1

Table 66 shows that 69.9% (95%CI= 65.4-74.4) of men were engaged in high levels of physical activity, 11.3% (95%CI= 8.9-13.7) in moderate levels and 18.8% (95%CI= 15.7-21.9) in low levels.

A significantly higher proportion of men aged 18-44 years were engaged in high levels of physical activity (76.2%, 95%CI= 73.6-78.9) compared to those aged 45-69 years (50.8%, 95%CI= 37.4-64.2). Conversely, a significantly higher proportion of those aged 45-69 years (34.1%, 95%CI= 24.1-44.0) than those aged 18-44 years (13.7%, 95%CI= 11.1-16.4) were engaged in low levels of physical activity.

There were no statistically significant differences between the two age groups in terms of moderate levels of physical activity.

Table 66. Classification of men according to their total physical activity level

Level of total physical activity according to WHO global recommendations							
Age groups (years)	Men						
	n	% Low	95% CI	% Moderate	95% CI	% High	95% CI
18-44	298	13.7	11.1-16.4	10.0	7.9-12.2	76.2	73.6-78.9
45-69	224	34.1	24.1-44.0	15.1	10.4-19.7	50.8	37.4-64.2
18-69	522	18.8	15.7-21.9	11.3	8.9-13.7	69.9	65.4-74.4

Table 67 shows that 43.4% (95%CI= 33.9-52.9) of women were engaged in low levels of physical activity, 21.9% (95%CI= 20.5-23.2) in moderate levels and 34.8% (95%CI= 24.9-44.6) in high levels.

Significantly more women (43.4%, 95%CI= 33.9-52.9) than men (18.8%, 95%CI= 15.7-21.9) were physically inactive. There was no statistically significant difference between the two age groups.

Table 67. Classification of women according to their total physical activity level

Level of total physical activity according to WHO global recommendations							
Age groups (years)	Women						
	n	% Low	95% CI	% Moderate	95% CI	% High	95% CI
18-44	332	38.5	29.3-47.7	23.2	18.6-27.8	38.3	26.8-49.8
45-69	290	51.6	37.4-65.8	19.7	12.2-27.1	28.8	19.3-38.2
18-69	622	43.4	33.9-52.9	21.9	20.5-23.2	34.8	24.9-44.6

Table 68 shows that 51.6% (95%CI= 45.8-57.4) were engaged in high levels of physical activity, 31.6% (95%CI= 25.9-37.3) in low levels and 16.8% (95%CI= 15.7-17.9) in moderate levels.

A significantly higher proportion of Tuvaluans aged 18-44 years were engaged in high levels of physical activity (58.2%, 95%CI= 52.2-64.2) compared to those aged 45-69 years (37.2%, 95%CI= 27.1-47.2). Conversely, a significantly higher proportion of Tuvaluans aged 45-69 years were engaged in low levels of physical activity (44.9%, 95%CI= 33.1-56.7) compared to those aged 18-44 years (25.5%, 95%CI= 20.2-30.9).

There were no statistically significant differences between the two age groups in terms of moderate levels of physical activity.

Table 68. Classification of Tuvaluans according to their total physical activity level, both sexes combined

Level of total physical activity according to WHO global recommendations							
Age groups (years)	Both sexes						
	n	% Low	95% CI	% Moderate	95% CI	% High	95% CI
18-44	630	25.5	20.2-30.9	16.3	14.4-18.2	58.2	52.2-64.2
45-69	514	44.9	33.1-56.7	17.9	13.7-22.1	37.2	27.1-47.2
18-69	1144	31.6	25.9-37.3	16.8	15.7-17.9	51.6	45.8-57.4

Table 69 shows that the mean minutes of total physical activity Tuvaluans engaged in on average per day was 155.4 minutes (95%CI= 133.7-177.2). Men engaged in more than twice the amount of physical activity (224.7 minutes, 95%CI= 180.3-269.0) than women (91.9 minutes, 95%CI= 59.9-123.8), which was a significant difference. Younger Tuvaluans aged 18-44 years also engaged in significantly more physical activity (175.8 minutes, 95%CI= 155.4-196.3) than those aged 45-69 years (110.7 minutes, 95%CI= 83.6-137.8). Younger men also engaged in significantly more physical activity than older men; however, there was no significant difference in amount of physical activity between older and younger women.

Table 69. Mean minutes of total physical activity on average per day

Mean minutes of total physical activity on average per day									
Age groups (years)	Men			Women			Both sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
18-44	298	248.2	213.5-283.0	332	96.3	69.2-123.3	630	175.8	155.4-196.3
45-69	224	153.5	108.2-198.7	290	84.4	40.7-128.1	514	110.7	83.6-137.8
18-69	522	224.7	180.3-269.0	622	91.9	59.9-123.8	1144	155.4	133.7-177.2

Table 70 shows that the median minutes of total physical activity Tuvaluans engaged in per day was 90.0 minutes. Men engaged in physical activity three times longer on average per day than women (158.6 compared to 48.6 minutes); and Tuvaluans aged 18-44 years engaged in physical activity two times longer on average per day (105.0 minutes) than those aged 45-69 years (42.6 minutes).

Table 70. Median minutes of total physical activity on average per day

Median minutes of total physical activity on average per day									
Age groups (years)	Men			Women			Both sexes		
	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)
18-44	298	214.3	79.3-368.6	332	57.1	12.9-130.7	630	105.0	30.0-269.3
45-69	224	85.7	15.0-85.7	290	30.0	4.3-98.6	514	42.6	5.7-138.6
18-69	522	158.6	51.4-342.9	622	48.6	7.1-122.1	1144	90.0	17.1-234.3

Table 71 shows that mean minutes of work-related physical activity Tuvaluans engaged in on average per day was 70.1 minutes (95%CI= 60.6-79.6).

Men engaged in twice the number of minutes of work-related physical activity (98.1 minutes, 95%CI= 81.3-114.8) compared to women (44.4 minutes, 95%CI= 25.5-63.3).

There was no statistically significant difference between the two age groups – 75.3 minutes (95%CI= 67.0-83.6) among those aged 18-44 years and 58.6 minutes (95%CI= 43.1-74.2) among those aged 45-69 years.

Table 71. Mean minutes of work-related physical activity on average per day

Mean minutes of work-related physical activity on average per day									
Age groups (years)	Men			Women			Both sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
18-44	298	103.9	89.2-118.7	332	43.8	25.3-62.4	630	75.3	67.0-83.6
45-69	224	80.3	60.4-100.2	290	45.3	23.4-67.2	514	58.6	43.1-74.2

18-69	522	98.1	81.3-114.8	622	44.4	25.5-63.3	1144	70.1	60.6-79.6
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Table 72 shows that the mean minutes of transport-related physical activity Tuvaluans engaged in on average per day was 33.6 minutes (95%CI= 20.8-46.5) – 42.0 minutes (95%CI= 30.9-53.0) among men and 26.0 minutes (95%CI= 9.9-42.1) among women; and 34.1 minutes (95%CI= 23.1-45.0) among those aged 18-44 years and 32.7 minutes (95CI= 14.4-50.9) among those aged 45-69 years.

There were no statistically significant differences between men and women and between the two age groups.

Table 72. Mean minutes of transport-related physical activity on average per day

Mean minutes of transport-related physical activity on average per day									
Age groups (years)	Men			Women			Both sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
18-44	298	44.5	33.1-55.9	332	22.6	11.3-33.9	630	34.1	23.1-45.0
45-69	224	34.3	20.6-48.0	290	31.7	7.3-56.1	514	32.7	14.4-50.9
18-69	522	42.0	30.9-53.0	622	26.0	9.9-42.1	1144	33.6	20.8-46.5

Table 73 shows that the mean minutes of recreation-related physical activity Tuvaluans engaged in on average per day was 51.7 minutes (95%CI= 36.4-67.1).

There were statistically significant differences between men and women as well as between the two age groups. Younger Tuvaluans aged 18-44 years engaged in three times more recreation-related physical activity (66.5 minutes, 95%CI= 53.4-79.5) compared to those aged 45-69 years (19.4 minutes, 95%CI= 9.4-29.4). Men engaged in four times more recreation-related physical activity (84.6 minutes, 57.1-112.2) than women (21.5 minutes, 95%CI= 16.6-26.4).

Table 73. Mean minutes of recreation-related physical activity on average per day

Mean minutes of recreation-related physical activity on average per day									
age groups (years)	Men			Women			Both sexes		
	n	Mean minutes	95% CI	n	Mean minutes	95% CI	n	Mean minutes	95% CI
18-44	298	99.8	79.2-120.4	332	29.9	24.8-34.9	630	66.5	53.4-79.5
45-69	224	38.9	12.7-65.1	290	7.4	4.3-10.6	514	19.4	9.4-29.4
18-69	522	84.6	57.1-112.2	622	21.5	16.6-26.4	1144	51.7	36.4-67.1

Table 74 shows that the median minutes of work-related physical activity Tuvaluans engaged in on average per day was 25.7 minutes – 47.1 minutes for men and 12.9 minutes for women; and 30.0 minutes for Tuvaluans aged 18-44 years and 10.0 minutes for those aged 45-69 years.

Table 74. Median minutes of work-related physical activity on average per day

Median minutes of work-related physical activity on average per day									
Age groups (years)	Men			Women			Both sexes		
	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)
18-44	298	51.4	0-132.9	332	17.1	0-51.4	630	30.0	0-90.0
45-69	224	30.0	0-115.7	290	4.3	0-55.7	514	10.0	0-68.6
18-69	522	47.1	0-124.3	622	12.9	0-51.4	1144	25.7	0-90.0

Table 75 shows that the median minutes of transport-related physical activity Tuvaluans engaged in was 10.0 minutes – 17.3 minutes for men compared to 4.3 minutes for women; and 10.7 minutes for those aged 18-44 years and 6.4 minutes for those aged 45-69 years.

Table 75. Median minutes of transport-related physical activity on average per day

Median minutes of transport-related physical activity on average per day									
Age groups (years)	Men			Women			Both sexes		
	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)
18-44	298	17.1	0-60.0	332	4.3	0-25.7	630	10.7	0-38.6
45-69	224	8.6	0-30.0	290	4.3	0-25.7	514	6.4	0-30.0
18-69	522	17.1	0-60.0	622	4.3	0-25.7	1144	10.0	0-32.1

Table 76 shows that the median minutes of recreation-related physical activity Tuvaluans engaged in on average per day was 2.1 minutes and 38.6 minutes for Tuvaluan men. It is important to note that no one aged 45-69 years and no women engaged in any recreation-related physical activity.

Table 76. Median minutes of recreation-related physical activity on average per day

Median minutes of recreation-related physical activity on average per day									
Age groups (years)	Men			Women			Both sexes		
	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)	n	Median minutes	Inter-quartile range (P25-P75)
18-44	298	64.3	0-154.3	332	0	0-34.3	630	19.2	0-102.9
45-69	224	0	0-21.4	290	0	0-0	514	0	0-1.4
18-69	522	38.6	0-128.6	622	0	0-15.0	1144	2.1	0-67.1

Table 77 shows that 33.9% (95%CI= 30.3-37.5) were classified as having no work-related physical activity.

A significantly higher proportion of women (38.9%, 95%CI= 33.6-44.2) than men (28.5%, 95%CI= 25.5-31.5) were classified as having no work-related physical activity.

There was no statistically significant difference between the two age groups – 31.0% (95%CI= 26.3-35.8) among Tuvaluans aged 18-44 years and 40.2% (95%CI= 35.0-45.4) among those aged 45-69 years.

Table 77. Percentage classified as having no work-related physical activity

No work-related physical activity									
Age groups (years)	Men			Women			Both sexes		
	n	% no activity at work	95% CI	n	% no activity at work	95% CI	n	% no activity at work	95% CI
18-44	298	25.8	22.4-29.3	332	36.8	29.3-44.3	630	31.0	26.3-35.8
45-69	224	36.5	27.0-46.0	290	42.5	33.3-51.7	514	40.2	35.0-45.4
18-69	522	28.5	25.5-31.5	622	38.9	33.6-44.2	1144	33.9	30.3-37.5

Table 78 shows that 37.4% (95%CI= 28.9-46.0) overall were classified as having no transport-related physical activity – 31.3% (95%CI= 23.5-39.1) of men and 43.1% (95%CI= 33.8-52.4) of women; and 37.5% (95%CI= 26.9-48.1) of those aged 18-44 years and 37.4% (95%CI= 30.4-44.4) of those aged 45-69 years. There were no statistically significant differences between men and women and between age groups.

Table 78. Percentage classified as having no transport-related physical activity

No transport-related physical activity									
Age groups (years)	Men			Women			Both sexes		
	n	% no activity for transport	95% CI	n	% no activity for transport	95% CI	n	% no activity for transport	95% CI
18-44	298	30.1	20.4-39.9	332	45.6	33.7-57.5	630	37.5	26.9-48.1
45-69	224	34.8	25.7-44.0	290	38.9	32.0-45.8	514	37.4	30.4-44.4
18-69	522	31.3	23.5-39.1	622	43.1	33.8-52.4	1144	37.4	28.9-46.0

Table 79 shows that 49.4% (95%CI= 43.3-55.4) overall were classified as having no recreation-related physical activity, with significantly higher proportion of Tuvaluans aged 45-69 years being classified as such (74.7%, 95%CI= 67.1-82.4) compared to those aged 18-44 years (37.8%, 95%CI= 33.2-42.3). Significantly higher proportion of women (63.8%, 95%CI= 58.5-69.1) than men (33.6%, 95%CI= 26.5-40.8) were also classified as having no recreation-related physical activity.

Table 79. Percentage classified as having no recreation-related physical activity

No recreation-related physical activity									
Age groups (years)	Men			Women			Both sexes		
	n	% no activity at recreation	95% CI	n	% no activity at recreation	95% CI	n	% no activity at recreation	95% CI
18-44	298	23.4	19.5-27.2	332	53.6	48.1-59.2	630	37.8	33.2-42.3
45-69	224	64.6	54.2-74.9	290	81.0	72.6-89.4	514	74.7	67.1-82.4
18-69	522	33.6	26.5-40.8	622	63.8	58.5-69.1	1144	49.4	43.3-55.4

Table 80 shows that for men, work contributed to 41.0% (95%CI= 36.4-45.6) of total physical activity, leisure to 36.0% (95%CI= 26.5-45.5) and transport to 23.0% (95%CI= 17.6-28.4).

There were differences between the age groups as to which activity contributed the most and least to total physical activity. For men aged 18-44 years, leisure contributed most to total physical activity (41.4%, 95%CI= 33.8-49.0), followed by work (38.7%, 95%CI= 35.5-42.0) then transport (19.9%, 95%CI= 13.9-25.9). For men aged 45-69 years, work contributed most to total physical activity (48.7%, 95%CI= 40.0-57.4), followed by transport (33.6%, 95%CI= 29.6-37.6) then leisure (17.7%, 95%CI= 10.8-24.5).

Table 80. Composition of work, transport and leisure activity to total physical activity for men

Composition of total physical activity							
Age groups (years)	Men						
	n	% Activity from work	95% CI	% Activity for transport	95% CI	% Activity during leisure time	95% CI
18-44	279	38.7	35.5-42.0	19.9	13.9-25.9	41.4	33.8-49.0
45-69	185	48.7	40.0-57.4	33.6	29.6-37.6	17.7	10.8-24.5
18-69	464	41.0	36.4-45.6	23.0	17.6-28.4	36.0	26.5-45.5

Table 81 shows that for women, work contributed 46.7% (95%CI= 44.3-49.1) of total physical activity, transport to 33.3% (95%CI= 27.5-39.0) and leisure to 20.0% (95%CI= 14.3-25.7).

There were no significant differences between age groups as to which activity contributed the most and least to total physical activity though there were differences in the proportions.

For both men and women, work contributed the most to total physical activity. However, for women, the next contributor was transport then leisure; and for men, it was leisure then transport.

Table 81. Composition of work, transport and leisure activity to total physical activity for women

Composition of total physical activity							
Age groups (years)	Women						
	n	% Activity from work	95% CI	% Activity for transport	95% CI	% Activity during leisure time	95% CI
18-44	271	45.5	41.7-49.4	28.1	24.6-31.7	26.3	21.2-31.4
45-69	208	48.8	43.4-54.3	42.5	33.2-51.8	8.7	3.0-14.3
18-69	479	46.7	44.3-49.1	33.3	27.5-39.0	20.0	14.3-25.7

Table 82. shows that for Tuvaluans, work contributed 43.8% (95%CI= 40.8-46.8) to total physical activity, leisure to 28.2% (95%CI= 20.6-35.8) and transport to 28.0% (95%CI= 22.5-33.5).

There were differences between age groups as to which activity contributed the most and least to total physical activity. For Tuvaluans aged 18-44 years, work contributed most to total physical activity (41.7%, 95%CI= 39.0-44.5), followed by leisure (34.7%, 95%CI= 28.3-41.2) then transport (23.5%, 95%CI= 18.7-28.4). For Tuvaluans aged 45-69 years, work also contributed the most to total physical activity (48.8%, 95%CI= 45.3-52.2), followed by transport (39.0%, 95%CI= 34.6-43.4) then leisure (12.3%, 95%CI= 6.7-17.8).

Table 82. Composition of work, transport and leisure to total physical activity, both sexes combined

Composition of total physical activity							
Age groups (years)	Both sexes						
	n	% Activity from work	95% CI	% Activity for transport	95% CI	% Activity during leisure time	95% CI
18-44	550	41.7	39.0-44.5	23.5	18.7-28.4	34.7	28.3-41.2
45-69	393	48.8	45.3-52.2	39.0	34.6-43.4	12.3	6.7-17.8
18-69	943	43.8	40.8-46.8	28.0	22.5-33.5	28.2	20.6-35.8

Table 83 shows that 46.8% (95%CI= 41.0-52.7) overall did not engage in vigorous physical activity.

There were statistically significant differences between men and women and between the two age groups. A significantly higher proportion of women (65.8%, 95%CI= 56.5-75.0) than men (26.2%, 95%CI= 22.8-29.6) and a significantly higher proportion of Tuvaluans aged 45-69 years (60.0%, 95%CI= 51.4-68.6) than those aged 18-44 years (40.8%, 95%CI= 36.8-44.8) did not engage in vigorous physical activity.

Among men, the proportion of those aged 45-69 years who did not engage in vigorous physical activity (44.8%, 95%CI= 34.7-54.9) were twice those aged 18-44 years (20.1%, 95%CI= 18.1-22.1), which is statistically significant. However, there was no statistically significant difference between younger and older women – 69.3% (95%CI= 53.7-85.0) among those aged 45-69 years and 63.6% (95%CI= 55.5-71.7) among those aged 18-44 years.

Table 83. Percentage who did not engage in vigorous physical activity

No vigorous physical activity									
Age groups (years)	Men			Women			Both sexes		
	n	% no vigorous activity	95% CI	n	% no vigorous activity	95% CI	n	% no vigorous activity	95% CI
18-44	298	20.1	18.1-22.1	332	63.6	55.5-71.7	630	40.8	36.8-44.8
45-69	224	44.8	34.7-54.9	290	69.3	53.7-85.0	514	60.0	51.4-68.6
18-69	522	26.2	22.8-29.6	622	65.8	56.5-75.0	1144	46.8	41.0-52.7

Table 84. shows that the mean number of minutes Tuvaluans spent in sedentary activities was 193.7 (95%CI= 165.3-222.2) and the median was 150.0.

There was no statistically significant difference between the two age groups and between men and women. For men, the mean and median minutes spent in sedentary activities were 182.1 (95% CI 166.5-197.7) and 120.0 respectively. For women, the mean and median minutes spent in sedentary activities were 193.7 (95%CI 165.3-222.2) and 150.0. Please see table in Appendix 2.

Table 84. Minutes spent in sedentary activities on average per day, both sexes combined

Minutes spent in sedentary activities on average per day					
Age groups (years)	Both sexes				
	n	Mean minutes	95% CI	Median minutes	Inter-quartile range (P25-P75)
18-44	634	195.5	167.9-223.2	150.0	60.0-300.0
45-69	518	189.8	159.2-220.5	120.0	90.0-240.0
18-69	1152	193.7	165.3-222.2	150.0	60.0-240.0

## 4.10 History of raised blood pressure

Table 85. shows that 49.5% (95%CI= 44.2-54.9) of men had never had their blood pressure measured by a doctor or health worker, 39.7% (95%CI= 33.6-45.7) had been measured but not diagnosed, 8.7% (95%CI= 3.6-13.9) were diagnosed within the past 12 months and 2.1% (95%CI= 1.1-3.1) had been diagnosed but not within the past 12 months.

Significantly more younger men aged 18-44 years have never had their blood pressure measured compared to older men aged 45-69 years. However, there were no statistically significant differences between the two age groups for the other categories.

Table 85. Blood pressure measure and diagnosis status of men

Blood pressure measurement and diagnosis									
Age groups (yrs)	Men								
	n	% Never measured	95% CI	% measured, not diagnosed	95% CI	% diagnosed, but not within past 12 months	95% CI	% diagnosed within past 12 months	95% CI
18-44	300	54.7	46.4-62.9	35.3	30.5-40.2	2.3	0.8-3.8	7.7	3.0-12.4
45-69	225	34.1	24.6-43.5	52.8	38.2-67.3	1.3	0.0-3.1	11.8	3.4-20.2
18-69	525	49.5	44.2-54.9	39.7	33.6-45.7	2.1	1.1-3.1	8.7	3.6-13.9

Table 86 shows that 42.6% (95%CI= 37.0-48.2) of women had never had their blood pressure measured, 41.9% (95%CI= 36.0-47.8) had ever been measured but not diagnosed, 3.7% (95%CI= 1.7-5.7) had been diagnosed but not within the past 12 months, and 11.8% (95%CI= 7.5-16.1) were diagnosed within the past 12 months. Significantly more women aged 45-69 years had been diagnosed within the past 12 months compared to those aged 18-44 years. Other than that, there were no statistically significant differences by between the two age groups for the other categories and no significant difference between men and women.

Table 86. Blood pressure measurement and diagnosis status of women

Blood pressure measurement and diagnosis									
Age groups (yrs)	Women								
	n	% Never measured	95% CI	% measured, not diagnosed	95% CI	% diagnosed, but not within past 12 months	95% CI	% diagnosed within past 12 months	95% CI
18-44	334	47.9	41.5-54.2	41.8	36.6-47.0	3.3	1.5-5.0	7.0	1.8-12.3
45-69	293	33.8	20.1-47.4	42.1	28.1-56.1	4.4	1.5-7.3	19.8	13.6-25.9
18-69	627	42.6	37.0-48.2	41.9	36.0-47.8	3.7	1.7-5.7	11.8	7.5-16.1

Table 87 shows that overall, 45.9% (95%CI= 41.8-50.0) had never had their blood pressure measured, 40.8% (95%CI= 35.6-46.1) had been measured but not diagnosed, 2.9% (95%CI= 1.8-4.1) had been diagnosed but not within the past 12 months, and 10.3% (95%CI= 5.8-14.8) were diagnosed within the past 12 months. There were no statistically significant differences between men and women and between the two age groups.

Table 87. Blood pressure measurement and diagnosis status, both sexes combined

Blood pressure measurement and diagnosis									
Age groups (yrs)	Both sexes								
	n	% Never measured	95% CI	% measured, not diagnosed	95% CI	% diagnosed, but not within past 12 months	95% CI	% diagnosed within past 12 months	95% CI
18-44	634	51.4	45.0-57.9	38.4	35.5-41.3	2.8	1.9-3.7	7.4	2.4-12.3
45-69	518	33.9	22.7-45.1	46.1	31.7-60.6	3.2	1.2-5.2	16.7	10.4-23.1
18-69	1152	45.9	41.8-50.0	40.8	35.6-46.1	2.9	1.8-4.1	10.3	5.8-14.8

Table 88 shows that 37.6% (95%CI= 26.0-49.1) of Tuvaluans previously diagnosed with raised blood pressure were currently taking drugs prescribed by a doctor or health worker. The number of respondents for men was too small to report on this indicator. See Appendix 2 for more details.

Table 88. Percentage previously diagnosed with raised blood pressure currently taking drugs prescribed by doctor or health worker

Currently taking drugs (medication) for raised blood pressure prescribed by doctor or health worker among those previously diagnosed									
Age groups (years)	Men			Women			Both sexes		
	n	% taking meds	95% CI	n	% taking meds	95% CI	n	% taking meds	95% CI
18-69	57	-	-	111	38.3	22.2-54.4	168	37.6	26.0-49.1

Table 89 shows that 3.6% (95%CI= 0.0-7.5) of Tuvaluans previously diagnosed with raised blood pressure had seen a traditional healer. The number of respondents for men was too small to report on this indicator. See Appendix 2 for more details.

Table 89. Percentage previously diagnosed with raised blood pressure who had seen a traditional healer

Seen a traditional healer among those previously diagnosed									
Age groups (years)	Men			Women			Both sexes		
	n	% seen trad. healer	95% CI	n	% seen trad. healer	95% CI	n	% seen trad. healer	95% CI
18-69	57	-	-	111	4.6	1.9-7.3	168	3.6	0.0-7.5

Table 90 shows that 6.0% (95%CI= 3.0-9.1) of Tuvaluans previously diagnosed with raised blood pressure were currently taking traditional medicine.

Significantly more older Tuvaluans aged 45-69 years (10.8%, 95%CI= 4.6-17.0) were currently taking traditional medicine than those aged 18-44 years (1.8%, 95%CI= 0.0-4.1).

There was no statistically significant difference between men and women as the number of respondents for men was too small to report on this indicator. See Appendix 2 for more details.

Table 90. Percentage previously diagnosed with raised blood pressure currently taking herbal or traditional remedy

Currently taking herbal or traditional remedy for raised blood pressure among those previously diagnosed									
Age groups (years)	Men			Women			Both sexes		
	n	% taking trad. meds	95% CI	n	% taking trad. meds	95% CI	n	% taking trad. meds	95% CI
18-69	57	-	-	111	5.1	2.5-7.6	168	6.0	3.0-9.1

## 4.11 History of diabetes

Table 91 shows that 61.0% (95%CI= 55.3-66.7) of men had never had their blood sugar measured, 33.3% (95%CI= 27.3-39.3) were measured but not diagnosed, 1.7% (95%CI= 0.7-2.7) were diagnosed but not within the past 12 months and 4.0% (95%CI= 2.7-5.2) were diagnosed within the past 12 months.

Younger men aged 18-44 years were significantly more likely to have never had their blood sugar measured (67.3%, 95%CI= 60.1-74.5) compared to older men aged 45-69 years (42.0%, 95%CI= 32.9-51.1). On the other hand, older men aged 45-69 years were significantly more likely to have been diagnosed within the past 12 months (10.2%, 95%CI= 4.7-15.6) than younger men aged 18-44 years (1.9%, 95%CI= 0.7-3.1).

There were no statistically significant differences between the two age groups in the other categories.

Table 91. Blood sugar measurement and diagnosis status of men

Blood sugar measurement and diagnosis									
Age groups (yrs)	Men								
	n	% Never measured	95% CI	% measured, not diagnosed	95% CI	% diagnosed, but not within past 12 months	95% CI	% diagnosed within past 12 months	95% CI
18-44	300	67.3	60.1-74.5	29.2	22.5-35.8	1.6	0.6-2.6	1.9	0.7-3.1
45-69	225	42.0	32.9-51.1	45.9	35.5-56.3	1.9	0.5-3.4	10.2	4.7-15.6
18-69	525	61.0	55.3-66.7	33.3	27.3-39.3	1.7	0.7-2.7	4.0	2.7-5.2

Table 92 shows that 52.3% (95%CI= 47.1-57.5) of women had never had their blood sugar measured, 37.7% (95%CI= 33.1-42.2) were measured but not diagnosed, 3.0% (95%CI= 1.7-4.3) were diagnosed but not within the past 12 months and 7.0% (95%CI= 5.6-8.3) were diagnosed within the past 12 months.

Older women aged 45-69 years were significantly more likely to have been diagnosed within the past 12 months (12.5%, 95%CI= 8.1-16.9) than younger women aged 18-44 years (3.7%, 95%CI= 2.7-4.6).

There were no significant differences between the two age groups in the other categories.

Table 92. Blood sugar measurement and diagnosis status of women

Blood sugar measurement and diagnosis									
Age groups (yrs)	Women								
	n	% Never measured	95% CI	% measured, not diagnosed	95% CI	% diagnosed, but not within past 12 months	95% CI	% diagnosed within past 12 months	95% CI
18-44	334	58.5	50.6-66.4	35.3	28.7-42.0	2.5	1.2-3.8	3.7	2.7-4.6
45-69	292	42.0	32.0-52.0	41.6	29.6-53.6	3.9	1.9-5.8	12.5	8.1-16.9
18-69	626	52.3	47.1-57.5	37.7	33.1-42.2	3.0	1.7-4.3	7.0	5.6-8.3

Table 93 shows that overall, 56.5% (95%CI= 51.5-61.5) had never had their blood sugar measured, 35.6% (95%CI= 30.8-40.3) were measured but not diagnosed, 2.4% (95%CI= 1.6-3.2) were diagnosed but not within the past 12 months and 5.5% (95%CI= 4.6-6.5) were diagnosed within the past 12 months. Significantly more women (7.0%, 95%CI= 5.6-8.3) than men (4.0%, 95%CI= 2.7-5.2) were diagnosed within the past 12 months (compare tables 98 and 99).

A significantly higher proportion of Tuvaluans aged 18-44 years (63.1%, 95%CI= 55.8-70.4) had never had their blood sugar measured compared to those aged 45-69 years (42.0%, 95%CI= 34.1-49.9); and a significantly higher proportion of those aged 45-69 years (11.6%, 95%CI= 7.8-15.5) had been diagnosed within the past 12 months compared to those aged 18-44 years (2.8%, 95%CI= 1.9-3.6). There were no statistically significant differences between the two age groups in the other categories.

Table 93. Blood sugar measurement and diagnosis status in both sexes combined

Blood sugar measurement and diagnosis									
Age groups (yrs)	Both sexes								
	n	% Never measured	95% CI	% measured, not diagnosed	95% CI	% diagnosed, but not within past 12 months	95% CI	% diagnosed within past 12 months	95% CI
18-44	634	63.1	55.8-70.4	32.1	25.9-38.2	2.0	1.1-2.9	2.8	1.9-3.6
45-69	517	42.0	34.1-49.9	43.2	32.5-53.9	3.1	1.9-4.4	11.6	7.8-15.5
18-69	1151	56.5	51.5-61.5	35.6	30.8-40.3	2.4	1.6-3.2	5.5	4.6-6.5

## 4.12 History of raised total cholesterol

Table 94 shows that majority of men had never had their cholesterol measured (90.4%, 95%CI= 84.6-96.3), 7.8% had been measured but not diagnosed (95%CI= 2.5-13.0) and 1.8% (95%CI= 0.7-2.9) were diagnosed within the past 12 months.

There was no statistically significant difference between the two age groups.

Table 94. Total cholesterol measurement and diagnosis status of men

Total cholesterol measurement and diagnosis									
Age groups (yrs)	Men								
	n	% Never measured	95% CI	% measured, not diagnosed	95% CI	% diagnosed, but not within past 12 months	95% CI	% diagnosed within past 12 months	95% CI
18-44	300	92.4	88.6-96.3	5.8	2.0-9.6	-	-	1.8	0.2-3.5
45-69	225	84.5	70.9-98.0	13.8	0.7-26.8	-	-	1.8	0.0-4.2
18-69	525	90.4	84.6-96.3	7.8	2.5-13.0	-	-	1.8	0.7-2.9

Table 95 shows that 82.7% (95%CI= 74.9-90.5) of women had never had their cholesterol measured, 11.2% (95%CI= 5.6-16.8) had been measured but not diagnosed, 1.7% (95%CI= 0.6-2.9) had been diagnosed but not within the past 12 months and 4.3% (95%CI= 2.0-6.7) were diagnosed within the past 12 months.

There was no statistically significant difference between the two age groups.

Table 95. Total cholesterol measurement and diagnosis status of women

Total cholesterol measurement and diagnosis									
Age groups (yrs)	Women								
	n	% Never measured	95% CI	% measured, not diagnosed	95% CI	% diagnosed, but not within past 12 months	95% CI	% diagnosed within past 12 months	95% CI
18-44	334	87.3	81.0-93.5	8.4	4.4-12.4	1.4	0.1-2.6	3.0	0.7-5.3
45-69	292	75.1	64.3-85.9	15.9	7.6-24.2	2.4	0.0-4.9	6.6	3.2-10.0
18-69	626	82.7	74.9-90.5	11.2	5.6-16.8	1.7	0.6-2.9	4.3	2.0-6.7

Table 96 shows that overall, 86.4% (95%CI= 79.8-93.1) had never had their cholesterol measured, 9.5% (95%CI= 4.6-14.5) had been measured but not diagnosed, 0.9% (95%CI= 0.3-1.5) had been diagnosed but not within the past 12 months and 3.1% (95%CI= 1.5-4.8) were diagnosed within the past 12 months.

There was no significant difference between men and women and between the two age groups.

Table 96. Total cholesterol measurement and diagnosis status, both sexes combined

Total cholesterol measurement and diagnosis									
Age groups (yrs)	Both sexes								
	n	% Never measured	95% CI	% measured, not diagnosed	95% CI	% diagnosed, but not within past 12 months	95% CI	% diagnosed within past 12 months	95% CI
18-44	634	90.0	85.1-94.8	7.0	3.4-10.7	0.6	0.1-1.2	2.4	0.8-4.0
45-69	517	78.7	68.2-89.1	15.1	7.7-22.5	1.5	0.0-3.0	4.8	2.5-7.0
18-69	1151	86.4	79.8-93.1	9.5	4.6-14.5	0.9	0.3-1.5	3.1	1.5-4.8

### 4.13 History of cardiovascular diseases

Table 97 shows that overall, 14.6% (95%CI= 10.4-18.8) reported having ever had a heart attack or chest pain from heart disease or a stroke – 12.9% (95%CI= 7.7-18.1) of men and 16.2% (95%CI= 11.6-20.7) of women; and 14.6% (95%CI= 9.0-20.2) of Tuvaluans aged 18-44 years and 14.5% (95%CI= 7.5-21.6) of those aged 45-69 years. There were no significant differences between men and women and between the two age groups.

Table 97. Percentage who have ever had a heart attack or chest pain from heart disease or a stroke

Having ever had a heart attack or chest pain from heart disease or a stroke									
Age groups (years)	Men			Women			Both sexes		
	n	% CVD history	95% CI	n	% CVD history	95% CI	n	% CVD history	95% CI
18-44	300	13.5	7.4-19.6	334	15.9	10.6-21.3	634	14.6	9.0-20.2
45-69	225	11.1	7.3-14.8	293	16.6	6.2-27.1	518	14.5	7.5-21.6
18-69	525	12.9	7.7-18.1	627	16.2	11.6-20.7	1152	14.6	10.4-18.8

Table 98 shows that 2.1% (95%CI= 1.3-3.0) were currently taking aspirin regularly to prevent or treat heart disease, with negligible differences between the two age groups and between men and women.

Table 98. Percentage currently taking aspirin regularly to prevent or treat heart disease

Currently taking aspirin regularly to prevent or treat heart disease									
Age groups (years)	Men			Women			Both sexes		
	n	% taking aspirin	95% CI	n	% taking aspirin	95% CI	n	% taking aspirin	95% CI
18-44	300	2.2	0.8-3.7	334	2.0	0.3-3.7	634	2.1	1.1-3.2
45-69	225	1.6	0.5-2.8	293	2.5	1.5-3.5	518	2.2	1.2-3.2
18-69	525	2.1	1.0-3.2	627	2.2	0.9-3.5	1152	2.1	1.3-3.0

Table 99 shows that overall, 1.3% (95%CI= 0.3-2.3) were currently taking statins regularly to prevent or treat heart disease, with negligible differences between men and women and between the two age groups.

Table 99 Percentage currently taking statins regularly to prevent or treat heart disease

Currently taking statins regularly to prevent or treat heart disease									
Age groups (years)	Men			Women			Both sexes		
	n	% taking statins	95% CI	n	% taking statins	95% CI	n	% taking statins	95% CI
18-44	300	1.1	0.2-2.1	334	1.4	0.2-2.5	634	1.2	0.2-2.3
45-69	225	1.9	0.0-3.8	293	1.2	0.2-2.3	518	1.5	0.4-2.7
18-69	525	1.3	0.3-2.4	627	1.3	0.3-2.3	1152	1.3	0.3-2.3

## 4.14 Lifestyle advice

In this section, survey respondents were asked whether they had been advised by a doctor or health worker to quit or not start on tobacco, to reduce salt in the diet, to eat at least five servings of fruit and/or vegetable, to reduce fat in the diet, to start or do more physical activity, and to maintain a healthy body weight or to lose weight.

Table 100 shows that overall, 46.0% (95%CI= 42.1-49.8) had been advised by a doctor or health worker to quit using tobacco or not start – 48.5% (95%CI= 44.8-52.2) of men and 43.6% (95%CI= 36.0-51.2) of women; and 46.4% (95%CI= 42.6-50.2) of Tuvaluans aged 18-44 years and 45.0% (95%CI= 38.2-51.8) of those aged 45-69 years.

There were no statistically significant differences between men and women and between the two age groups.

Table 100. Percentage advised by doctor or health worker to quit using tobacco or not start

Advised by doctor or health worker to quit using tobacco or don't start									
Age groups (years)	Men			Women			Both sexes		
	n	% advised	95% CI	n	% advised	95% CI	n	% advised	95% CI
18-44	300	47.7	43.2-52.1	334	45.0	35.7-54.3	634	46.4	42.6-50.2
45-69	225	51.1	44.6-57.7	293	41.3	32.6-49.9	518	45.0	38.2-51.8
18-69	525	48.5	44.8-52.2	627	43.6	36.0-51.2	1152	46.0	42.1-49.8

Table 101 shows that overall, 52.8% (95%CI= 46.6-59.0) had been advised by a doctor or health worker to reduce salt in the diet – 50.5% (95%CI= 46.5-54.5) of men and 54.9% (95%CI= 45.5-64.3) of women; and 53.0% (95%CI= 46.7-59.3) of Tuvaluans aged 18-44 years and 52.4% (95%CI= 44.2-60.7) of those aged 45-69 years.

There were no statistically significant differences between men and women and between the two age groups.

Table 101. Percentage advised by doctor or health worker to reduce salt in the diet

Advised by doctor or health worker to reduce salt in the diet									
Age groups (years)	Men			Women			Both sexes		
	n	% advised	95% CI	n	% advised	95% CI	n	% advised	95% CI
18-44	300	49.9	45.5-54.3	334	56.4	45.9-66.8	634	53.0	46.7-59.3
45-69	225	52.3	45.3-59.3	293	52.5	41.7-63.3	518	52.4	44.2-60.7
18-69	525	50.5	46.5-54.5	627	54.9	45.5-64.3	1152	52.8	46.6-59.0

Table 102 shows that overall, 51.5% (95%CI= 47.2-55.7) had been advised by a doctor or health worker to eat at least five servings of fruit and/or vegetables each day – 50.3% (95%CI= 46.2-54.4) of men and 52.5% (95%CI= 46.7-58.3) of women; and 50.6% (95%CI= 47.1-54.0) of Tuvaluans aged 18-44 years and 53.4% (95%CI= 45.6-61.2) of those aged 45-69 years.

There were no significant differences between men and women and between the two age groups.

Table 102. Percentage advised by doctor or health worker to eat at least five servings of fruit and/or vegetables each day

Advised by doctor or health worker to eat at least five servings of fruit and/or vegetables each day									
Age groups (years)	Men			Women			Both sexes		
	n	% advised	95% CI	n	% advised	95% CI	n	% advised	95% CI
18-44	300	49.1	45.5-52.7	334	52.2	47.6-56.9	634	50.6	47.1-54.0
45-69	225	54.0	46.9-61.0	293	53.0	42.1-63.9	518	53.4	45.6-61.2
18-69	525	50.3	46.2-54.4	627	52.5	46.7-58.3	1152	51.5	47.2-55.7

Table 103 shows that overall, 56.1% (95%CI= 51.1-61.1) had been advised by a doctor or health worker to reduce fat in the diet – 54.5% (95%CI= 50.7-58.3) of men and 57.6% (95%CI= 49.5-65.7) of women; and 55.0% (95%CI= 49.9-60.1) of Tuvaluans aged 18-44 years and 58.6% (95%CI= 51.7-65.5) of those aged 45-69 years.

There were no significant differences between men and women and between the two age groups.

Table 103. Percentage advised by doctor or health worker to reduce fat in the diet

Advised by doctor or health worker to reduce fat in the diet									
Age groups (years)	Men			Women			Both sexes		
	n	% advised	95% CI	n	% advised	95% CI	n	% advised	95% CI
18-44	300	52.9	49.5-56.4	334	57.2	46.8-67.7	634	55.0	49.9-60.1
45-69	225	59.3	51.0-67.6	293	58.1	49.9-66.3	518	58.6	51.7-65.5
18-69	525	54.5	50.7-58.3	627	57.6	49.5-65.7	1152	56.1	51.1-61.1

Table 104 shows that overall, 58.5% (95%CI= 53.8-63.2) had been advised by a doctor or health worker to start or do more physical activity – 57.9% (95%CI= 53.5-62.3) of men and 59.0% (95%CI= 53.0-65.0) of women; and 59.1% (95%CI= 53.7-64.4) of Tuvaluans aged 18-44 years and 57.2% (95%CI= 51.3-63.1) of those aged 45-69 years.

There were no statistically significant differences between men and women and between the two age groups.

Table 104. Percentage advised by doctor or health worker to start or do more physical activity

Advised by doctor or health worker to start or do more physical activity									
Age groups (years)	Men			Women			Both sexes		
	n	% advised	95% CI	n	% advised	95% CI	n	% advised	95% CI
18-44	300	58.0	53.6-62.4	334	60.2	52.6-67.8	634	59.1	53.7-64.4
45-69	225	57.5	50.9-64.2	293	57.0	49.7-64.2	518	57.2	51.3-63.1
18-69	525	57.9	53.5-62.3	627	59.0	53.0-65.0	1152	58.5	53.8-63.2

Table 105 shows that overall, 56.5% (95%CI= 52.2-60.7) had been advised by a doctor or health worker to maintain a healthy body weight or to lose weight – 55.7% (95%CI= 52.1-59.2) of men and 57.2% (95%CI= 50.7-63.7) of women; and 57.3% (95%CI= 52.5-62.1) of Tuvaluans aged 18-44 years and 54.6% (95%CI= 47.1-62.2) of those aged 45-69 years.

There were no significant differences between men and women and between the two age groups.

Table 105. Percentage advised by doctor or health worker to maintain a healthy body weight or to lose weight

Advised by doctor or health worker to maintain a healthy body weight or to lose weight									
Age groups (years)	Men			Women			Both sexes		
	n	% advised	95% CI	n	% advised	95% CI	n	% advised	95% CI
18-44	300	56.5	53.2-59.8	334	58.2	49.4-67.0	634	57.3	52.5-62.1
45-69	225	53.2	46.5-59.9	293	55.5	45.4-65.6	518	54.6	47.1-62.2
18-69	525	55.7	52.1-59.2	627	57.2	50.7-63.7	1152	56.5	52.2-60.7

## 4.15 Cervical cancer screening

Table 106 shows that only 22.1% (95%CI= 17.3-26.9) of women had ever been tested for cervical cancer, with no significant difference between the two age groups.

Table 106. Percentage of females ever tested for cervical cancer

Age groups (years)	Women		
	n	% ever tested	95% CI
18-44	333	18.0	14.6-21.4
45-69	292	28.9	18.9-38.9
18-69	625	22.1	17.3-26.9

## 4.16 Mental health and suicide

In this section, survey respondents were asked whether they had seriously considered attempting suicide, details about and extent of their suicide attempt and their family history of suicide attempts.

Table 107 shows that overall, 5.1% (95%CI= 3.8-6.4) had seriously considered attempting suicide in the last 12 months – 4.7% (95%CI= 2.3-7.1) of men and 5.5% (95%CI= 3.9-7.2) of women; and 5.9% (95%CI= 4.2-7.5) of Tuvaluans aged 18-44 years and 3.5% (95%CI= 2.4-4.5) of those aged 45-69 years.

There were no significant differences between men and women and between the two age groups. Among women however, those aged 18-44 years were significantly more likely to have seriously considered attempting suicide in the last 12 months (7.5%, 95%CI= 5.2-9.8) compared to older women aged 45-69 years (2.2%, 95%CI= 0.9-3.5). There was no significant difference between older and younger men.

Table 107. Percentage who had seriously considered attempting suicide in the last 12 months

Percentage having seriously considered attempting suicide in the last 12 months									
Age groups (years)	Men			Women			Both sexes		
	n	% considered attempting suicide	95% CI	n	% considered attempting suicide	95% CI	n	% considered attempting suicide	95% CI
18-44	299	4.4	1.7-7.1	333	7.5	5.2-9.8	632	5.9	4.2-7.5
45-69	224	5.6	3.0-8.2	291	2.2	0.9-3.5	515	3.5	2.4-4.5
18-69	523	4.7	2.3-7.1	624	5.5	3.9-7.2	1147	5.1	3.8-6.4

Table 108 shows that overall, 1.9% had made a plan on how to attempt suicide in the last 12 months, with no significant differences between men and women and between the two age groups.

Table 108. Percentage who had made a plan on how to attempt suicide in the last 12 months

Percentage who had planned how to attempt suicide in the past 12 months									
Age groups (years)	Men			Women			Both sexes		
	n	% planned how to attempt suicide	95% CI	n	% planned how to attempt suicide	95% CI	n	% planned how to attempt suicide	95% CI
18-44	299	2.1	0.9-3.4	332	2.3	0.4-4.3	631	2.2	1.2-3.2
45-69	224	2.6	0.0-5.8	291	0.4	0.0-0.9	515	1.2	0.0-2.5
18-69	523	2.2	0.5-4.0	623	1.6	0.5-2.7	1146	1.9	1.0-2.9

Table 109 shows that overall, 1.3% (95%CI= 0.6-1.9) had ever attempted suicide.

Younger Tuvaluans were more likely to have ever attempted suicide than older ones – 1.7% (95%CI= 0.9-2.5) of those aged 18-44 years compared to 0.2% (95%CI= 0.0-0.5) of those aged 45-69 years have ever attempted suicide.

There was no significant difference between men and women.

Table 109. Percentage who had ever attempted suicide

Percentage having ever attempted suicide									
Age groups (years)	Men			Women			Both sexes		
	n	% attempted suicide	95% CI	n	% attempted suicide	95% CI	n	% attempted suicide	95% CI
18-44	300	1.8	0.7-2.9	332	1.6	0.6-2.7	632	1.7	0.9-2.5
45-69	223	0.3	0.0-1.1	290	0.1	0.0-0.4	513	0.2	0.0-0.5
18-69	523	1.4	0.6-2.3	622	1.1	0.4-1.8	1145	1.3	0.6-1.9

Table 110 shows that 6.7% (95%CI= 5.2-8.3) of the population had ever had a close family (i.e. mother, father, brother, sister or children) attempt suicide, with no significant differences between men and women and between the two age groups.

Table 110. Percentage who had ever had a close family member attempt suicide

Percentage having close family who attempted suicide									
Age groups (years)	Men			Women			Both sexes		
	n	% close family attempt suicide	95% CI	n	% close family attempt suicide	95% CI	n	% close family attempt suicide	95% CI
18-44	300	6.4	3.6-9.1	332	8.8	5.5-12.0	632	7.5	5.8-9.2
45-69	225	7.3	4.3-10.3	291	3.7	2.1-5.2	516	5.1	3.3-6.8
18-69	525	6.6	4.0-9.2	623	6.8	4.4-9.3	1148	6.7	5.2-8.3

Table 111 shows that overall, 6.1% (95%CI= 4.4-7.9) had ever had a close family die from suicide, with no significant differences between men and women and between the two age groups.

Table 111. Percentage who had ever had a close family die from suicide

Percentage having close family who died from suicide									
Age groups (years)	Men			Women			Both sexes		
	n	% close family died from suicide	95% CI	n	% close family died from suicide	95% CI	n	% close family died from suicide	95% CI
18-44	300	6.8	4.7-8.8	333	7.6	4.7-10.5	633	7.2	5.0-9.4
45-69	225	5.5	2.7-8.3	292	2.8	1.3-4.3	517	3.8	2.7-5.0
18-69	525	6.5	4.3-8.7	625	5.8	4.0-7.6	1150	6.1	4.4-7.9

## 4.17 Mental health disorder

Table 112 shows that 80.3% (95%CI= 71.8-88.8) of men were classified as well, 12.5% (95%CI= 7.7-17.4) had mild mental disorder, 3.4% (95%CI= 0.8-5.9) had moderate mental disorder and 3.8% (95%CI= 0.0-7.8) had severe mental disorder. There was no significant difference between the two age groups.

Table 112. Percentage of men in each mental health disorder category

Percentage of mental health disorder									
Age groups (years)	Men								
	n	% likely to be well <20	95% CI	% Mild mental disorder 20-24	95% CI	% Moderate mental disorder 25-29	95% CI	% severe mental disorder ≥30	95% CI
18-44	300	80.5	72.6-88.3	13.7	9.1-18.2	3.4	0.8-6.1	2.4	0.0-6.0
45-69	225	79.8	68.5-91.1	9.1	0.5-17.7	3.1	0.7-5.6	7.9	0.8-15.1
18-69	525	80.3	71.8-88.8	12.5	7.7-17.4	3.4	0.8-5.9	3.8	0.0-7.8

Table 113 shows that 74.6% (95%CI= 67.4-81.7) of women were classed as well, 17.0% (95%CI= 11.3-22.7) had mild mental disorder, 4.2% (95%CI= 1.6-6.8) had moderate mental disorder and 4.2% (95%CI= 0.0-8.5) had severe mental disorder. There was no significant difference between the two age groups.

Table 113. Percentage of women in each mental health disorder category

Percentage of mental health disorder									
Age groups (years)	Women								
	n	% likely to be well <20	95% CI	% Mild mental disorder 20-24	95% CI	% Moderate mental disorder 25-29	95% CI	% severe mental disorder ≥30	95% CI
18-44	334	75.1	68.4-81.8	14.3	9.7-18.9	5.6	2.5-8.7	5.0	0.3-9.7
45-69	293	73.7	63.5-83.9	21.5	11.4-31.6	1.9	0.0-5.1	2.9	0.0-6.3
18-69	627	74.6	67.4-81.7	17.0	11.3-22.7	4.2	1.6-6.8	4.2	0.0-8.5

Table 114 shows that overall, 77.3% (95%CI= 70.5-84.2) were classified as well, 14.9% (95%CI= 10.8-18.9) had a mild mental disorder, 3.8% (95%CI= 1.8-5.8) had a moderate mental disorder and 4.0% (95%CI= 0.0-8.1) had a severe mental disorder.

There were no statistically significant differences between men and women and between the two age groups.

Table 114. Prevalence of mental health disorders, both sexes combined

Percentage of mental health disorder									
Age groups (years)	Both sexes								
	n	% likely to be well <20	95% CI	% Mild mental disorder 20-24	95% CI	% Moderate mental disorder 25-29	95% CI	% severe mental disorder ≥30	95% CI
18-44	634	77.9	71.0-84.8	14.0	9.8-18.1	4.5	2.4-6.5	3.7	0.0-7.5
45-69	518	76.0	67.3-84.8	16.8	11.3-22.4	2.4	0.0-4.9	4.8	0.0-9.6
18-69	1152	77.3	70.5-84.2	14.9	10.8-18.9	3.8	1.8-5.8	4.0	0.0-8.1

## 4.18 Physical measurements

### 4.18.1 Blood pressure and heart rate

As part of the STEP 2 protocol, survey participants had their blood pressure measured. Participants were also asked whether they have ever had their blood pressure measured by a doctor or other health worker, whether they have ever been told that they have high blood pressure, whether they have been told in the last 12 months, whether they were currently receiving any treatment for raised blood pressure, and whether they have sought treatment from a traditional healer.

The STEPS protocol considers those of having a raised blood pressure if they have:

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

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

those considered to have hypertension.

Table 115 shows that overall, the mean systolic blood pressure was 133.9mm Hg (95%CI= 130.5-137.3).

Older Tuvaluans aged 45-69 years had a significantly higher mean systolic blood pressure of 143.4 (95%CI= 138.4-148.3) than younger ones aged 18-44 years with a mean of 127.9 (95%CI= 126.6-129.3).

There was no statistically significant difference between men and women.

Table 115. Mean systolic blood pressure

Mean systolic blood pressure (mmHg)									
Age groups (years)	Men			Women			Both sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-44	285	131.8	129.7-133.9	314	122.5	119.5-125.6	599	127.9	126.6-129.3
45-69	218	141.3	137.3-145.3	278	145.2	135.8-154.5	496	143.4	138.4-148.3
18-69	503	135.0	133.1-137.0	592	132.6	125.8-139.5	1095	133.9	130.5-137.3

Table 116 shows that overall, the mean diastolic blood pressure was 83.8 (95%CI= 81.2-86.3).

Older Tuvaluans aged 45-69 years had a significantly higher mean diastolic blood pressure of 87.5 (95%CI= 84.5-90.5) compared to younger ones aged 18-44 years with a mean of 81.4 (95%CI= 79.5-83.3).

There was no statistically significant difference between men and women.

Table 116. Mean diastolic blood pressure

Mean diastolic blood pressure (mmHg)									
Age groups (years)	Men			Women			Both sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-44	285	82.0	80.1-83.8	314	80.7	76.8-84.6	599	81.4	79.5-83.3
45-69	218	86.7	83.6-89.9	278	88.2	83.1-93.3	496	87.5	84.5-90.5
18-69	503	83.6	81.6-85.5	592	84.0	79.3-88.8	1095	83.8	81.2-86.3

Table 117 shows that overall, 39.6% (95%CI= 31.7-47.6), excluding those on medication, had raised blood pressure of SBP  $\geq$ 140 and/or DBP  $\geq$  90 mmHg.

A significantly higher proportion of older Tuvaluans aged 45-69 years (57.7%, 95%CI= 49.3-66.0) had raised blood pressure compared to younger ones aged 18-44 years (28.9%, 95%CI= 23.4-34.5).

The difference between men and women were negligible.

Table 117. Percentage with raised blood pressure SBP  $\geq$ 140 and/or DBP  $\geq$  90 mmHg, excluding those on medication

SBP $\geq$ 140 and/or DBP $\geq$ 90 mmHg, excluding those on medication for raised blood pressure									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	280	32.6	27.8-37.3	310	23.9	13.6-34.3	590	28.9	23.4-34.5
45-69	205	54.1	43.4-64.7	250	61.0	45.3-76.8	455	57.7	49.4-66.0
18-69	485	39.5	34.1-44.9	560	39.8	26.3-53.3	1045	39.6	31.7-47.6

Table 118 shows that 42.2% (95%CI= 35.0-49.4) overall had raised blood pressure of SBP  $\geq$ 140 and/or DBP  $\geq$  90 mmHg or were currently on medication for raised blood pressure.

More than twice the proportion of those aged 45-69 years (61.2%, 95%CI= 53.5-68.8) had raised blood pressure or were currently on medication compared to those aged 18-44 years (30.2%, 95%CI= 25.1-35.4).

There was no significant difference between men and women.

Table 118. Percentage with raised blood pressure SBP  $\geq$ 140 and/or DBP  $\geq$  90 mmHg or were currently on medication for raised blood pressure

SBP $\geq$ 140 and/or DBP $\geq$ 90 mmHg or currently on medication for raised blood pressure									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	285	34.0	29.3-38.6	314	25.1	15.6-34.5	599	30.2	25.1-35.4
45-69	218	57.5	45.3-69.7	278	64.5	49.9-79.0	496	61.2	53.5-68.8
18-69	503	41.9	36.8-47.0	592	42.6	29.6-55.6	1095	42.2	35.0-49.4

Table 119 shows that 13.8% (95%CI= 9.3-18.3) overall, excluding those on medication, had raised blood pressure of SBP  $\geq$ 160 and/or DBP  $\geq$  100 mmHg.

There were nearly two times more women (19.0%, 95%CI= 12.2-25.8) with raised blood pressure than men (9.4%, 95%CI= 6.5-12.2). Older Tuvaluans aged 45-69 years were also more likely to have raised blood pressure (25.4%, 95%CI= 19.5-31.3) than those aged 18-44 years (7.0%, 95%CI= 4.4-9.5).

Table 119. Percentage with raised blood pressure SBP  $\geq$ 160 and/or DBP  $\geq$  100 mmHg, excluding those on medication for raised blood pressure

SBP $\geq$ 160 and/or DBP $\geq$ 100 mmHg, excluding those on medication for raised blood pressure									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	280	5.8	3.9-7.7	310	8.6	4.6-12.7	590	7.0	4.4-9.5
45-69	205	16.8	11.8-21.8	250	33.1	24.0-42.1	455	25.4	19.5-31.3
18-69	485	9.4	6.5-12.2	560	19.0	12.2-25.8	1045	13.8	9.3-18.3

Table 120 shows that 17.5% (95%CI= 13.3-21.7) overall had raised blood pressure SBP  $\geq$ 160 and/or DBP  $\geq$  100 mmHg or currently on medication for raised blood pressure.

A significantly higher proportion of women (22.9%, 95%CI= 15.6-30.2) than men (12.9%, 95%CI= 10.4-15.3) had raised blood pressure or were currently on medication. Older Tuvaluans aged 45-69 years were also more likely to have raised blood pressure or be on medication (31.5%, 95%CI= 24.0-39.0) than those aged 18-44 years (8.7%, 95%CI= 6.6-10.7).

Table 120. Percentage with raised blood pressure SBP  $\geq$ 160 and/or DBP  $\geq$  100 mmHg or currently on medication for raised blood pressure

SBP $\geq$ 160 and/or DBP $\geq$ 100 mmHg or currently on medication for raised blood pressure									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	285	7.7	5.9-9.5	314	10.0	6.3-13.6	599	8.7	6.6-10.7
45-69	218	23.0	14.7-31.2	278	39.0	28.4-49.6	496	31.5	24.0-39.0
18-69	503	12.9	10.4-15.3	592	22.9	15.6-30.2	1095	17.5	13.3-21.7

Table 121 shows that among men who had raised blood pressure of SBP $\geq$ 140 and/or DBP $\geq$ 90 or were currently on medication, majority (90.5%, 95%CI= 83.1-97.9) were not on medication and had raised blood pressure of SBP $\geq$ 140 and/or DBP $\geq$ 90; 8.0% (95%CI= 0.4-15.6) were on medication and had raised blood pressure of SBP $\geq$ 140 and/or DBP $\geq$ 90; and 1.5% (95%CI= 0.0-3.8) were on medication and had SBP $<$ 140 and DBP $<$ 90. There was no difference between the two age groups.

Table 121. Percentage of males with treated and/or controlled raised blood pressure

Males with treated and/or controlled raised blood pressure							
Age groups (years)	Men						
	n	% On medication and SBP $<$ 140 and DBP $<$ 90	95% CI	% On medication and SBP $\geq$ 140 and/or DBP $\geq$ 90	95% CI	% Not on medication and SBP $\geq$ 140 and/or DBP $\geq$ 90	95% CI
18-44	90	0.7	0.0-2.5	5.7	0.7-10.8	93.6	89.2-97.9
45-69	129	2.4	0.0-5.4	10.5	0.0-21.9	87.1	75.1-99.2
18-69	219	1.5	0.0-3.8	8.0	0.4-15.6	90.5	83.1-97.9

Table 122 shows that among women who had raised blood pressure of SBP $\geq$ 140 and/or DBP $\geq$ 90 or were currently on medication, majority (88.8%, 95%CI= 81.5-96.1) were not on medication and had raised blood pressure of SBP $\geq$ 140 and/or DBP $\geq$ 90; 8.8% (95%CI= 2.6-14.9) were on medication and had raised blood pressure of SBP $\geq$ 140 and/or DBP $\geq$ 90; and 2.4% (95%CI= 0.0-6.1) were on medication and had SBP $<$ 140 and DBP $<$ 90.

Table 122. Percentage of females with treated and/or controlled raised blood pressure

Females with treated and/or controlled raised blood pressure							
Age groups (years)	Women						
	n	% On medication and SBP $<$ 140 and DBP $<$ 90	95% CI	% On medication and SBP $\geq$ 140 and/or DBP $\geq$ 90	95% CI	% Not on medication and SBP $\geq$ 140 and/or DBP $\geq$ 90	95% CI
18-44	85	-	-	-	-	-	-
45-69	194	2.2	0.0-5.5	11.6	1.8-21.4	86.2	76.0-96.5
18-69	279	2.4	0.0-6.1	8.8	2.6-14.9	88.8	81.5-96.1

Table 123 shows that among those who had raised blood pressure of SBP $\geq$ 140 and/or DBP $\geq$ 90 or were currently on medication, majority (89.7%, 95%CI= 83.1-96.4) were not on medication and had raised blood pressure of SBP $\geq$ 140 and/or DBP $\geq$ 90; 8.4% (95%CI= 2.8-13.9) were on medication and had raised blood pressure of SBP $\geq$ 140 and/or DBP $\geq$ 90; and 1.9% (95%CI= 0.1-3.7) were on medication and had SBP $<$ 140 and DBP $<$ 90. There were no significant differences between men and women and between the two age groups.

Table 123. Percentage with treated and/or controlled raised blood pressure, both sexes combined

Percentage with treated and/or controlled raised blood pressure							
Age groups (years)	Both sexes						
	n	% On medication and SBP $<$ 140 and DBP $<$ 90	95% CI	% On medication and SBP $\geq$ 140 and/or DBP $\geq$ 90	95% CI	% Not on medication and SBP $\geq$ 140 and/or DBP $\geq$ 90	95% CI
18-44	175	1.5	0.3-2.7	4.7	0.8-8.7	93.8	89.1-98.5
45-69	323	2.3	0.0-4.6	11.1	3.2-18.9	86.6	77.5-95.8
18-69	498	1.9	0.1-3.7	8.4	2.8-13.9	89.7	83.1-96.4

#### 4.18.2 Height and Weight

Height and weight of each participant (excluding pregnant women) was measured following the standardized STEPS protocol. The body mass index (BMI) of each participant was calculated by dividing weight (kilograms) by square of height (metres<sup>2</sup>). BMI risk categories are 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

Table 124 shows that the mean height of women was 161.4 cm (95%CI= 160.5-162.4) and 172.6 cm (95%CI= 171.7-173.6) for men.

There were statistical differences in mean height between men and women and between the two age groups.

Table 124. Mean height (cm)

Mean height (cm)						
Age groups (years)	Men			Women		
	n	Mean	95% CI	n	Mean	95% CI
18-44	270	174.0	172.8-175.2	290	162.6	162.0-163.1
45-69	210	170.1	169.2-170.9	264	159.8	158.4-161.2
18-69	480	172.6	171.7-173.6	554	161.4	160.5-162.4

Table 125 shows that the mean weight of females was 91.6 kg (95%CI= 89.2-94.1) and 93.1 kg (95%CI= 90.7-95.4) for males.

There were no statistical differences in mean weight between men and women and between the two age groups.

Table 125. Mean weight (kg)

Age groups (years)	Mean weight (kg)					
	Men			Women		
	n	Mean	95% CI	n	Mean	95% CI
18-44	270	93.0	90.9-95.1	290	91.2	88.6-93.8
45-69	210	93.2	89.4-97.1	264	92.2	89.0-95.4
18-69	480	93.1	90.7-95.4	554	91.6	89.2-94.1

Table 126 shows that the mean BMI overall was 32.6 kg/m<sup>2</sup> (95%CI= 32.0-33.2). Women had a significantly higher mean BMI (34.6, 95%CI= 33.8-35.4) than men (30.9, 95%CI= 30.2-31.7). Older Tuvaluans aged 45-69 years also had a significantly higher mean BMI (33.8, 95%CI= 33.3-34.2) than those aged 18-44 years (31.9, 95%CI= 31.1-32.6).

Table 126. Mean BMI (kg/m<sup>2</sup>)

Age groups (years)	Mean BMI (kg/m <sup>2</sup> )								
	Men			Women			Both sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-44	267	30.5	29.6-31.3	285	33.8	32.8-34.8	552	31.9	31.1-32.6
45-69	207	31.9	31.1-32.7	261	35.6	34.8-36.5	468	33.8	33.3-34.2
18-69	474	30.9	30.2-31.7	546	34.6	33.8-35.4	1020	32.6	32.0-33.2

#### 4.18.3 Body Mass Index and Weight Categories

Table 127 shows that 55.2% (95%CI= 49.1-61.4) of men were classified as obese, 27.0% (95%CI= 21.9-32.1) as overweight and 17.7% (95%CI= 11.4-24.1) as normal weight.

There was no statistically significant difference between the two age groups.

Table 127. Percentage of men in the specific BMI classifications

Age groups (years)	BMI classifications								
	Men								
	n	% Under-weight <18.5	95% CI	% Normal weight 18.5-24.9	95% CI	% Overweight 25.0-29.9	95% CI	% Obese ≥30.0	95% CI
18-44	267	-	-	21.2	14.7-27.8	26.7	20.8-32.7	52.0	45.6-58.4
45-69	207	-	-	11.0	7.4-14.7	27.6	21.3-34.0	61.3	54.6-68.1
18-69	474	-	-	17.7	11.4-24.1	27.0	21.9-32.1	55.2	49.1-61.4

Table 128 shows that 70.7% (95%CI= 65.0-76.4) of women were classified as obese, 18.5% (95%CI= 14.8-22.3) as overweight, 10.0% (95%CI= 7.0-13.1) as normal weight and 0.7% (95%CI= 0.3-1.1) as underweight.

A significantly higher proportion of younger females aged 18-44 years were classified as having normal weight compared to those aged 45-69 years. There was no statistically significant difference between the two age groups for the other BMI categories.

A significantly higher proportion of women than men were classified as obese. There was no statistically significant difference between men and women for the other BMI categories (compare tables 139 and 140).

Table 128. Percentage of women in the specific BMI classifications

BMI classifications									
Age groups (years)	Women								
	n	% Under-weight <18.5	95% CI	% Normal weight 18.5-24.9	95% CI	% Overweight 25.0-29.9	95% CI	% Obese ≥30.0	95% CI
18-44	285	0.7	0.0-1.5	15.1	10.7-19.4	17.6	15.0-20.1	66.7	61.4-72.0
45-69	261	0.8	0.0-2.0	3.2	0.8-5.6	19.9	12.6-27.1	76.2	69.1-83.2
18-69	546	0.7	0.3-1.1	10.0	7.0-13.1	18.5	14.8-22.3	70.7	65.0-76.4

Table 129 shows that overall, 62.2% (95%CI= 57.4-67.0) were classified as obese, 23.2% (95%CI= 20.6-25.8) as overweight, 14.3% (95%CI= 10.0-18.5) as normal weight, and 0.3% (95%CI= 0.2-0.5) as underweight.

A significantly higher proportion of older Tuvaluans aged 45-69 years were classified as obese (68.8%, 95%CI= 64.8-72.8) compared to those aged 18-44 years (58.2%, 95%CI= 53.5-62.9); and a significantly higher proportion of younger Tuvaluans aged 18-44 years (18.6%, 95%CI= 14.0-23.3) were classified as having normal weight than those aged 45-69 years (7.1%, 95%CI= 5.7-8.4). The differences between the two age groups were not significant for the other BMI categories.

Table 129 Percentage in the specific BMI classifications, both sexes combined

BMI classifications									
Age groups (years)	Both sexes								
	n	% Under-weight <18.5	95% CI	% Normal weight 18.5-24.9	95% CI	% Overweight 25.0-29.9	95% CI	% Obese ≥30.0	95% CI
18-44	552	0.3	0.0-0.6	18.6	14.0-23.3	22.9	19.9-25.8	58.2	53.5-62.9
45-69	468	0.4	0.0-1.0	7.1	5.7-8.4	23.7	20.3-27.1	68.8	64.8-72.8
18-69	1020	0.3	0.2-0.5	14.3	10.0-18.5	23.2	20.6-25.8	62.2	57.4-67.0

Table 130 shows that overall, 85.4% (95%CI= 81.2-89.7) were classified as overweight (BMI≥25).

Overweight prevalence was significantly higher among older Tuvaluans aged 45-69 years (92.5%, 95%CI= 91.1-93.9) compared to those aged 18-44 years (81.1%, 95%CI= 76.1-86.0). There was no significant difference between men and women.

Table 130. Percentage classified as overweight (BMI $\geq$ 25)

Age groups (years)	BMI $\geq$ 25								
	Men			Women			Both sexes		
	n	% BMI $\geq$ 25	95% CI	n	% BMI $\geq$ 25	95% CI	n	% BMI $\geq$ 25	95% CI
18-44	267	78.8	72.2-85.3	285	84.3	79.6-88.9	552	81.1	76.1-86.0
45-69	207	89.0	85.3-92.6	261	96.0	93.1-99.0	468	92.5	91.1-93.9
18-69	474	82.3	75.9-88.6	546	89.3	86.2-92.3	1020	85.4	81.2-89.7

#### 4.18.4 Waist and hip circumference

Waist circumference is a measure of central obesity and a measure of the risk of cardiovascular diseases. The WHO cut-off points for increased risk of NCDs are: waist circumference  $\geq$ 102cm for men and  $\geq$  88cm for women; waist-hip ratio of  $\geq$  0.90 for men and  $\geq$  0.85 for women.

Table 131 shows that the mean waist circumference of women was 101.2 cm (95%CI= 98.2-104.3) and 97.2 cm (95%CI= 95.4-98.9) for men. There was no statistically significant difference in mean waist circumference between men and women.

Older men aged 45-69 years had a significantly higher mean waist circumference (102.5 cm, 95%CI= 100.3-104.7) than younger men aged 18-44 years (94.4 cm, 95%CI= 92.7-96.0). The difference between older and younger women was not statistically significant.

Table 131. Mean waist circumference (cm)

Age groups (years)	Mean waist circumference (cm)					
	Men			Women		
	n	Mean	95% CI	n	Mean	95% CI
18-44	274	94.4	92.7-96.0	296	100.1	97.4-102.7
45-69	214	102.5	100.3-104.7	270	102.7	97.8-107.6
18-69	488	97.2	95.4-98.9	566	101.2	98.2-104.3

Table 132 shows that the mean hip circumference of women was 114.9 cm (95%CI= 113.1-116.6) and 105.8 cm (95%CI= 103.9-107.8) for men. Women had significantly higher mean hip circumference than men.

There was no significant difference between the two age groups.

Table 132. Mean hip circumference (cm)

Mean hip circumference (cm)						
Age groups (years)	Men			Women		
	n	Mean	95% CI	n	Mean	95% CI
18-44	274	104.9	102.7-107.1	296	116.0	112.5-119.5
45-69	214	107.6	105.4-109.7	270	113.5	110.8-116.2
18-69	488	105.8	103.9-107.8	566	114.9	113.1-116.6

Table 133 shows that the mean waist-hip ratio of men and women was the same (0.9, 95%CI= 0.9-0.9), with no significant differences between men and women and between the two age groups.

Table 133. Mean waist-hip ratio

Mean waist / hip ratio						
Age groups (years)	Men			Women		
	n	Mean	95% CI	n	Mean	95% CI
18-44	274	0.9	0.9-0.9	296	0.9	0.9-0.9
45-69	214	1.0	0.9-1.0	270	0.9	0.9-0.9
18-69	488	0.9	0.9-0.9	566	0.9	0.9-0.9

## 4.19 Biochemical measurements

### 4.19.1 Fasting blood glucose and diabetes

To measure fasting blood sugar levels, capillary whole blood was drawn using the finger prick method. Non-fasting participants were excluded for these measures in STEP 3. Estimates of elevated blood glucose prevalence were calculated based on the capillary whole blood glucose test results and by following the WHO guidelines for defining and elevated fasting plasma blood glucose:

- fasting capillary plasma equivalent value of glucose was  $\geq 7.0$  mmol/L (126 mg/dl) AND whether or not they have previously been told by a health worker that they have diabetes, OR
- normal capillary plasma equivalent value of glucose was  $< 7.0$  mmol/L AND were currently receiving anti-diabetes medication prescribed by a health worker.

Note that these calculated values do not reflect diabetes rates. A second raised fasting blood glucose result is required to confirm diagnosis. As such, the term elevated blood glucose is used in this report. Participants who have been advised by a health worker that they have diabetes but who had normal fasting blood glucose, and who were NOT on anti-diabetes medication or on a special diet prescribed by a health worker, were NOT included among those considered as having elevated blood glucose.

Table 134 shows that the mean fasting plasma glucose overall was 4.8 mmol/L.

Older Tuvaluans aged 45-69 years had a significantly higher mean fasting plasma glucose (5.6 mmol/L, 95%CI= 5.0-6.2) than younger ones aged 18-44 years (4.4 mmol/L, 95%CI= 4.1-4.6).

There was no statistically significant difference between men and women.

Table 134. Mean fasting plasma glucose (mmol/L)

Mean fasting plasma glucose (mmol/L)									
Age groups (years)	Men			Women			Both sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-44	263	4.3	3.9-4.6	293	4.5	4.3-4.7	556	4.4	4.1-4.6
45-69	207	5.3	4.6-6.0	267	5.9	5.3-6.4	474	5.6	5.0-6.2
18-69	470	4.6	4.3-5.0	560	5.1	4.9-5.3	1030	4.8	4.6-5.1

Table 135 shows that overall, 4.3% (95%CI= 3.1-5.5) were categorized as having impaired fasting glycaemia – 3.3% (95%CI= 2.5-4.1) of men and 5.5% (95%CI= 3.0-8.0) of women; and 2.8% (95%CI= 1.4-4.2) of Tuvaluans aged 18-44 years and 6.7% (95%CI= 3.1-10.3) of those aged 45-69 years.

There were no statistically significant differences between men and women and between the two age groups.

Table 135. Percentage categorized as having impaired fasting glycaemia

Impaired Fasting Glycaemia*									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	263	2.9	1.5-4.3	293	2.7	0.3-5.1	556	2.8	1.4-4.2
45-69	207	4.0	1.3-6.8	267	9.3	4.2-14.3	474	6.7	3.1-10.3
18-69	470	3.3	2.5-4.1	560	5.5	3.0-8.0	1030	4.3	3.1-5.5

\*Impaired fasting glycaemia is defined as either plasma venous value:  $\geq 6.1$ mmol/L (110mg/dl) and  $< 7.0$ mmol/L (126mg/dl)

Table 136 shows that overall, 9.9% (95%CI= 8.5-11.2) had raised blood glucose or were currently on medication for diabetes.

A significantly higher proportion of older Tuvaluans aged 45-69 years (19.0%, 95%CI= 12.2-25.8) had raised blood glucose or were currently on medication compared to younger ones aged 18-44 years (4.2%, 95%CI= 3.4-5.1).

There was no statistically significant difference between men and women.

Table 136. Percentage categorized as having raised blood glucose or were currently on medication for diabetes

Raised blood glucose or currently on medication for diabetes**									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	263	4.0	2.1-6.0	293	4.5	2.7-6.3	556	4.2	3.4-5.1
45-69	207	16.6	7.2-26.1	267	21.3	15.5-27.2	474	19.0	12.2-25.8
18-69	470	8.4	5.5-11.2	560	11.7	8.9-14.4	1030	9.9	8.5-11.2

\*\* Raised blood glucose is defined as plasma venous value:  $\geq 7.0$  mmol/L (126 mg/dl)

Table 137 shows that overall, 4.8% (95%CI= 4.0-5.6) were currently on medication for diabetes.

A significantly higher proportion of Tuvaluans aged 45-69 years (10.1%, 95%CI= 7.7-12.4) were on medication compared to those aged 18-44 years (1.7%, 95%CI= 1.0-2.4).

There was no statistically significant difference between men and women.

Table 137. Percentage currently on medication for diabetes

Currently on medication for diabetes									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	301	1.1	0.1-2.1	335	2.5	1.7-3.3	636	1.7	1.0-2.4
45-69	226	8.2	3.8-12.6	293	11.7	6.4-17.1	519	10.1	7.7-12.4
18-69	527	3.4	2.2-4.6	628	6.5	4.2-8.8	1155	4.8	4.0-5.6

#### 4.19.2 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 respondents as being at higher risk for coronary artery disease.

Table 138 shows that overall, the mean total cholesterol overall was 4.1 mmol/L (95%CI= 3.9-4.2).

There were statistically significant differences between men and women and between the two age groups. Women had higher mean total cholesterol (4.3 mmol/L, 95%CI= 4.2-4.4) than men (3.9 mmol/L, 95%CI= 3.7-4.1); and older Tuvaluans aged 45-69 years also had higher mean total cholesterol (4.4 mmol/L, 95%CI= 4.3-4.6) than younger Tuvaluans aged 18-44 years (3.8 mmol/L, 95%CI= 3.7-4.0).

Table 138. Mean total cholesterol (mmol/L)

Mean total cholesterol (mmol/L)									
Age groups (years)	Men			Women			Both sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-44	263	3.7	3.6-3.9	293	4.0	3.9-4.1	556	3.8	3.7-4.0
45-69	208	4.2	3.9-4.4	267	4.7	4.6-4.9	475	4.4	4.3-4.6
18-69	471	3.9	3.7-4.1	560	4.3	4.2-4.4	1031	4.1	3.9-4.2

Table 139 shows that overall, 17.3% (95%CI= 14.8-19.7) had total cholesterol of  $\geq 5.0$  mmol/L or  $\geq 190$  mg/dl or were currently on medication for raised cholesterol.

There were statistically significant differences between men and women and between the two age groups. Nearly twice the proportion of women had total cholesterol of  $\geq 5.0$  mmol/L or  $\geq 190$  mg/dl or were on medication (23.9%, 95%CI= 20.8-27.0) than men (11.8%, 95%CI= 7.9-15.7). Furthermore, more than twice the proportion of older Tuvaluans aged 45-69 years had total cholesterol of  $\geq 5.0$  mmol/L or  $\geq 190$  mg/dl (27.0%, 95%CI= 22.6-31.4) or were currently on medication than younger ones aged 18-44 years (11.3%, 95%CI= 9.6-12.9).

Table 139. Percentage with total cholesterol  $\geq 5.0$  mmol/L or  $\geq 190$  mg/dl or who were currently on medication for raised cholesterol

Total cholesterol $\geq 5.0$ mmol/L or $\geq 190$ mg/dl or currently on medication for raised cholesterol									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	263	8.8	5.9-11.7	293	14.7	12.6-16.8	556	11.3	9.6-12.9
45-69	208	17.5	10.6-24.4	267	36.4	32.8-40.0	475	27.0	22.6-31.4
18-69	471	11.8	7.9-15.7	560	23.9	20.8-27.0	1031	17.3	14.8-19.7

Table 140 shows that overall, 4.2% (95%CI= 2.5-5.9) had total cholesterol  $\geq$  6.2 mmol/L or  $\geq$  240 mg/dl or were currently on medication for raised cholesterol.

A significantly higher proportion of older Tuvaluans aged 45-69 years (7.7%, 95%CI= 4.6-10.8) had total cholesterol of  $\geq$  6.2 mmol/L or  $\geq$  240 mg/dl or were currently on medication compared to younger ones aged 18-44 years (2.0%, 95%CI= 0.4-3.5).

There was no statistically significant difference between men and women.

Table 140. Percentage with total cholesterol  $\geq$  6.2 mmol/L or  $\geq$  240 mg/dl or who were currently on medication for raised cholesterol

Total cholesterol $\geq$ 6.2 mmol/L or $\geq$ 240 mg/dl or currently on medication for raised cholesterol									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
18-44	263	2.0	0.3-3.6	293	2.0	0.6-3.5	556	2.0	0.4-3.5
45-69	208	4.5	0.4-8.5	267	10.9	8.1-13.7	475	7.7	4.6-10.8
18-69	471	2.8	0.6-5.0	560	5.8	4.0-7.6	1031	4.2	2.5-5.9

#### 4.19.3 High density lipoprotein (HDL)

HDL cut-off points of  $<$ 1.03mmol/L or  $<$ 40 mg/dl for men and HDL  $<$ 1.29mmol/L or  $<$ 50 mg/dl for women were used to classify respondents as being at higher risk for coronary artery disease.

Table 141 shows that overall, the mean HDL was 0.7 mmol/L (95%CI= 0.6-0.8) with no significant differences between men and women and between the two age groups.

Table 141. Mean HDL (mmol/L)

Mean HDL (mmol/L)									
Age groups (years)	Men			Women			Both sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-44	262	0.6	0.5-0.7	292	0.8	0.6-1.0	554	0.7	0.6-0.9
45-69	207	0.6	0.5-0.8	266	0.7	0.6-0.8	473	0.7	0.6-0.8
18-69	469	0.6	0.5-0.8	558	0.8	0.6-0.9	1027	0.7	0.6-0.8

Table 142 shows that 93.6% (95%CI= 88.1-99.1) of men had low HDL  $<$ 1.03mmol/L or  $<$ 40 mg/dl – 94.5% (95%CI= 90.0-99.0) of men aged 18-44 years and 91.9% (95%CI= 83.3-100.0) of men aged 45-69 years.

Among women, 92.7% (95%CI= 87.9-97.5) had low HDL  $<$ 1.29mmol/L or  $<$ 50 mg/dl – 91.0% (95%CI= 84.7-97.2) of women aged 18-44 years and 95.1% of women aged 45-69 years (95%CI= 92.0-98.1).

There was no statistically significant difference between the two age groups both among men and women.

Table 142. Percentage of males with HDL <1.03mmol/L or <40 mg/dl and percentage of females with HDL <1.29mmol/L or <50 mg/dl

Percentage of males with HDL <1.03mmol/L or <40 mg/dl				Percentage of females with HDL <1.29mmol/L or <50 mg/dl		
Age groups (years)	Men			Women		
	n	%	95% CI	n	%	95% CI
18-44	262	94.5	90.0-99.0	292	91.0	84.7-97.2
45-69	207	91.9	83.3-100.0	266	95.1	92.0-98.1
18-69	469	93.6	88.1-99.1	558	92.7	87.9-97.5

## 4.20 Cardiovascular disease risk

The combination of the following risk factors from STEP 1, 2 and 3 allows the estimation of a 10-year risk of developing cardiovascular diseases (CVD) in those aged 40-69 years. Those who have a 30% or greater risk to develop CVD in the next ten years have the highest risk.

- Current daily smoker
- Raised BP (SBP  $\geq$  140 and/or DBP  $\geq$  90 mmHg or currently on medication for raised BP).
- Raised blood glucose (plasma equivalent value  $\geq$ 7mmol/L or currently on medication for raised diabetes)

Table 143 shows that 13.0% (95%CI= 9.7-16.3) of those aged 40-69 years had a 10-year CVD risk  $\geq$ 30% or had existing CVD – 11.9% (95%CI= 6.9-16.8) of men and 14.3% (95%CI= 7.9-20.6) of women; and 10.8% (95%CI= 7.2-14.3) of those aged 40-54 and 16.2% (95%CI= 9.3-23.2) of those aged 55-69.

There were no statistically significant differences between men and women and between the two age groups.

Table 143. Percentage aged 40-69 with a 10-year CVD risk  $\geq$ 30% or with existing CVD

Percentage aged 40-69 with a 10-year CVD risk $\geq$ 30%*** or with existing CVD									
Age groups (years)	Men			Women			Both sexes		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
40-54	140	7.1	3.9-10.2	162	15.2	4.6-25.7	302	10.8	7.2-14.3
55-69	108	19.5	9.1-29.9	145	13.1	6.4-19.9	253	16.2	9.3-23.2
40-69	248	11.9	6.9-16.8	307	14.3	7.9-20.6	555	13.0	9.7-16.3
***A 10-year CVD risk of $\geq$ 30% is defined according to age, sex, blood pressure, smoking status (current smokers OR those who quit smoking less than 1 year before the assessment), total cholesterol, and diabetes (previously diagnosed OR a fasting plasma glucose concentration >7.0 mmol/l (126 mg/dl)).									

## 4.21 Combined risk factors

The combination of risk factors for NCDs from STEP 1 and STEP 2 describes the percentage of survey participants 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 or obese (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).

Table 144 shows that 64.5% (95%CI= 56.5-72.6) of men had 3-5 risk factors, 34.7% (95%CI= 27.1-42.2) had 1-2 risk factors and only 0.8% (95%CI= 0.2-1.4) had no risk factors.

The number of risk factors men have increased with age. A significantly higher proportion of younger men aged 18-44 years (40.1%, 95%CI= 31.9-48.2) had 1-2 risk factors compared to older men aged 45-69 years (24.4%, 95%CI= 18.3-30.6). However, a significantly higher proportion of older men aged 45-69 years (74.9%, 95%CI= 69.6-80.2) had 3-5 risk factors compared to younger men aged 18-44 years (59.1%, 95%CI= 50.0-68.2).

Table 144.. Percentage of males with 0, 1-2, or 3-5 of risk factors

Summary of Combined Risk Factors							
Age groups (years)	Men						
	n	% with 0 risk factors	95% CI	% with 1-2 risk factors	95% CI	% with 3-5 risk factors	95% CI
18-44	263	0.9	0.0-1.9	40.1	31.9-48.2	59.1	50.0-68.2
45-69	206	0.7	0.0-2.1	24.4	18.3-30.6	74.9	69.6-80.2
18-69	469	0.8	0.2-1.4	34.7	27.1-42.2	64.5	56.5-72.6

Table 145 shows that 36.8% (95%CI= 28.8-44.7) of females had 1-2 risk factors, 63.2% (95%CI= 55.3-71.2) had 3-5 risk factors and 0% had no risk factors.

Table 145. Percentage of females with 0, 1-2, or 3-5 of risk factors

Summary of Combined Risk Factors							
Age groups (years)	Women						
	n	% with 0 risk factors	95% CI	% with 1-2 risk factors	95% CI	% with 3-5 risk factors	95% CI
18-44	282	-		50.2	42.5-58.0	49.8	42.0-57.5
45-69	254	-		18.0	8.7-27.3	82.0	72.7-91.3
18-69	536	-		36.8	28.8-44.7	63.2	55.3-71.2

Table 146 shows that overall, 64.0% (95%CI= 56.8-71.1) had 3-5 risk factors, 35.6% (95%CI= 28.7-42.5) had 1-2 risk factors and 0.4% (95%CI= 0.1-0.8) had no risk factors.

The number of risk factors Tuvaluans have increased with age. A significantly higher proportion of Tuvaluans aged 18-44 years had 1-2 risk factors (44.4%, 95%CI= 37.6-51.1) compared to those aged 45-69 years (21.2%, 95%CI= 15.5-26.9). However, a significantly higher proportion of those aged 45-69 years had 3-5 risk factors (78.5%, 95%CI= 73.3-83.6) compared to those aged 18-44 years (55.1%, 95%CI= 47.8-62.5).

Table 146. Percentage with 0, 1-2, or 3-5 of risk factors, both sexes combined

Summary of Combined Risk Factors							
Age groups (years)	Both sexes						
	n	% with 0 risk factors	95% CI	% with 1-2 risk factors	95% CI	% with 3-5 risk factors	95% CI
18-44	545	0.5	0.0-1.1	44.4	37.6-51.1	55.1	47.8-62.5
45-69	460	0.3	0.0-1.1	21.2	15.5-26.9	78.5	73.3-83.6
18-69	1005	0.4	0.1-0.8	35.6	28.7-42.5	64.0	56.8-71.1

## 4.22 Anaemia

Anaemia is defined as having haemoglobin levels of <12.0g/dL or <120 g/L in females.

Table 147 shows that the mean haemoglobin levels of women of reproductive age was 13.3 g/dL.

Table 147. Mean haemoglobin (g/dL) of women

Age groups (years)	Mean Haemoglobin (g/dL)		
	Women		
	n	g/dL	95% CI
18-49 years (women of reproductive age)	322	13.1	12.8-13.4

Table 148 shows that 15.0% (95%CI= 10.6-19.3) of reproductive age women had anaemia defined as hemoglobin <12.0g/dL.

Table 148. Percentage with anaemia – haemoglobin <12.0g/dL

Age groups (years)	Percentage with haemoglobin <12.0g/dL		
	Women		
	n	%	95% CI
18-49 years (women of reproductive age)	322	17.0	10.6-23.4

## 5. DISCUSSION AND CONCLUSIONS

This section summarizes key findings on the noncommunicable disease risk factors in Tuvalu, which will provide an indication of the potential disease burden from developing and dying from a noncommunicable disease.

Almost all adults in Tuvalu have several NCD risk factors – 64.0% had 3-5 risk factors and 35.6% had 1-2 risk factors. With 3 in 4 of those aged 45-69 years and more than 1 in 2 of those aged 18-44 years having 3-5 risk factors, Tuvalu faces a high risk of bearing a substantial disease burden from NCDs.

### Behavioural risk factors

More than one third of the Tuvalu population aged 18-69 years (35%) were current smokers with nearly half of men and a quarter of women being current smokers. As younger men aged 18-44 years and older women aged 45-69 years were more likely to be current smokers, tobacco control measures and cessation support could be targeted at these groups. As only one-third have ever been advised by a doctor or health worker to stop smoking, more can be done to encourage provision of brief cessation advice. There is also a need to prevent sale of tobacco to minors and to prevent early smoking initiation as initiation ages have gone from 20.3 years to 17.6 years; and to reduce the affordability of tobacco such as prohibiting single cigarettes sales and increasing taxes on all tobacco products. Efforts to strengthen legislation and enforcement to promote smoke-free environments will likely make positive impact on changing social norms considering 52.6% of respondents reported being exposed to second-hand smoke in homes and 41.8% in workplaces during the past 30 days.

Although many Tuvaluans do not drink alcohol (69.7% were defined as lifetime abstainers), 36.1% of Tuvaluan men (42.8% being aged 18-44 years) have had six or more drinks on a single occasion at least once during the past 30 days. Nearly half (46.1%) overall drink 1-2 days per week, and the mean number of standard drinks current drinkers consume at each occasion was 9.1 (9.3 for men and 6.8 for women). Among past 12-month drinkers, 38.1% of them have experienced impaired control monthly or more frequently; 36.0% failed to do what was normally expected from them because of drinking monthly or more frequently; and 31.4% needed a first drink

in the morning to get going monthly or more frequently. With one-third of past 12-month drinkers experiencing the above symptoms, attention needs to be paid to address the underlying causes and prevent deterioration which could affect families, communities and productivity.

The consumption of fruit and vegetables in Tuvalu is extremely low – 63.9% consumed none; 27.2% consumed 1-2 servings; 4.8% consumed 3-4 servings; and only 4.2% consumed more than 5 servings on average per day. The mean number of days fruit was consumed in a typical week was 2.0 days and 1.9 days for vegetables. Efforts to increase supply and affordability of fruit and vegetables in Tuvalu are needed.

Nearly half of the adult population 18-69 years always or often added salt before and when eating and when cooking or preparing food at home; and 22.5% always or often consumed processed food high in salt, more so among those aged 18-44 years. Majority (70.8%) thought they consumed just the right amount, 14.0% thought they consumed far too much, 9.8% thought they consumed too little and 5.4% thought they consumed far too little. Nearly 9 in 10 understood the importance of lowering salt in the diet and that consuming too much could lead to health problems; 80.5% limited consumption of processed foods to reduce salt intake; 54.5% looked at salt or sodium content on food labels; and 52.4% bought low salt or sodium alternatives. Tuvalu will have to take appropriate steps to reduce salt intake.

Consumption of sugary drinks is high - on average consumption was 3.0 servings of sugary drinks consumed per day and about 4.0 teaspoons of sugar were added to drinks per day. There were no significant differences between men and women and between the two age groups.

About a quarter of Tuvaluan adults did not meet the WHO recommendations on physical activity for health, particularly among those aged 45-69 years and women. Among those who were physically active, the mean minutes of total physical activity was 155.4 minutes on average per day. Work-related physical activity was the major contributor and recreation and transport were secondary contributors. Additionally the mean number of spent in sedentary activities was 193.7, higher among women aged 18-44 years and men aged 45-69 years. Programmes need to be designed that encourages and enables particularly younger women and older men to participate in physical activity.

## Historical risk factors

Overall in Tuvalu, most (ranging from 49.5-86.4%) have never had their blood pressure, blood sugar or cholesterol measured. As such, a strong health system, community and family support may be needed to enhance early diagnosis. Doctors or health workers can provide brief advice or counselling to prompt people to adopt healthy lifestyles; though environments and settings also need to be modified to enable healthier choices.

## Mental Health

Mental health is also an important factor that affects behavioural risks and self-care. Although 77.3% were assessed as well according to responses to the questions, mental well-being needs to be promoted and adequate counseling services as well as campaigns to reduce stigma surrounding mental disorders need to be implemented. Health and social work professionals also need to pay attention to emerging trends that may stress specific population groups, and take prompt action to address them.

## Physical risk factors

In Tuvalu adults aged 18-69 years, 42.2% had raised blood pressure of SBP  $\geq$ 140 and/or DBP  $\geq$  90 mmHg or were currently on medication; and 17.5% had raised blood pressure of SBP  $\geq$ 160 and/or DBP  $\geq$  100 mmHg or were currently on medication. Among those with raised blood pressure or were currently on medication, 89.7% were not on medication and had raised blood pressure, 8.4% were on medication and had raised blood pressure, and only 1.9% were on medication and had normal blood pressure. As mentioned in an earlier section, a strong health system, community and family support may be needed to improve adherence to the treatment regimen.

As 85.4% were classified as overweight or obese, with older Tuvaluans aged 45-69 years and women having higher body mass indices (BMIs), additional measures are needed in Tuvalu to reduce overweight and obesity. Strategies can include modifying the physical environment, taxation measures to reduce affordability of unhealthy products, changing social norms regarding portion sizes, changing attitudes towards processed food and increasing availability and affordability of fresh fruit and vegetables, and supporting weight management programmes among others.

## Biochemical risk factors

Overweight and obesity also has implications on prevalence of diabetes – 4.3% of those aged 18-69 years were categorized as having impaired fasting glycaemia, particularly among older Tuvaluans aged 45-69 years and women; 9.9% had raised blood glucose or were currently on medication for diabetes; and 4.8% were currently on medication for diabetes.

The same population interventions apply to reducing cholesterol and triglycerides levels, particularly among older Tuvaluans aged 45-69 years and women, so as to reduce the risk of developing coronary artery disease. Of those aged 18-69 years, 17.3% had total cholesterol of  $\geq 5.0$  mmol/L or  $\geq 190$  mg/dl or were currently on medication for raised cholesterol; 4.2% had total cholesterol  $\geq 6.2$  mmol/L or  $\geq 240$  mg/dl or were currently on medication for raised cholesterol.

This report provides baseline information on the prevalence and magnitude of key NCDs and their modifiable risk factors. Repeating the NCD STEPS survey in the future will allow Tuvalu to monitor progress towards achieving the 9 voluntary global targets, allow mapping of trends over time, and inform interventions and strategic modifications required to reduce NCDs in the population.

Data in this report will also be useful for identifying priorities and interventions for development of an updated National Health Strategic Plan and a National Strategic Plan for NCDs. The key is to go beyond health promotion and education strategies and to leverage on resources from other sectors to implement cross-cutting interventions. Further to primary prevention strategies, health systems strengthening to improve early diagnosis and treatment will also be critical.

## 6. RECOMMENDATIONS

In accordance to the objectives outlined in the global and regional action plans to reduce NCDs, the following strategies are recommended for Tuvalu:

### Strengthen governance and leadership

- 1) Evaluate progress in implementation of the National Strategic Health Plan 2009-2018 and the National Strategic Plan for NCDs 2011-2015 with all relevant stakeholders (e.g. ministries, civil society, communities).
- 2) Develop new multisectoral strategic health plan and strategic plan for NCDs. Involve stakeholders from different sectors throughout the process to ensure ownership and buy-in.
- 3) Elicit highest level of political commitment and mobilize financial and human resources. For example, consider establishment of an appropriate multisectoral governance and/or implementation mechanism (e.g. foundations, task forces, committees or coalitions) for shared leadership, policy coherence and mutual accountability.
- 4) Secure adequate and sustained resources for health promotion and action to prevent and manage NCDs.

### Support quality surveillance and public health information system and practices

- 1) Establish an ongoing and robust NCD STEPS surveillance system. Repeat NCD STEPS survey at 5- to 7-year intervals, preferably in 2020 and 2025.
- 2) Monitor trends and determinants of NCDs, and use data for action.
- 3) Utilize and strengthen other surveillance mechanisms and evaluation methods to measure effectiveness of strategies and interventions (e.g. school-based surveys, cross-sectional surveys).

### Implement strategies to address NCD risk factors

- 1) Accelerate implementation of the WHO Framework Convention on Tobacco Control.
  - establish an excise tax or increase taxes on tobacco products
  - adopt amendments to expand smoke-free environments
  - implement mass media campaigns
  - further strengthen bans on tobacco advertising, promotion and sponsorship
  - provide cessation services
- 2) Advance the implementation of the WHO Global Strategy to Reduce Harmful Use of Alcohol.
  - regulate availability of alcohol
  - restrict or ban alcohol advertising, promotion and sponsorship
  - increase tax
  - strengthen drink-driving policies and countermeasures
- 3) Implement the WHO Global Strategy on Diet, Physical Activity and Health.
- 4) Develop guidelines or policy measures that engage relevant sectors to:
  - reduce level of salt or sodium in prepared or processed food
  - reduce free and added sugars in food and non-alcoholic beverages
  - implement taxes on sugar-sweetened beverages
  - reduce portion size and energy density of foods
  - increase availability and affordability of fruit and vegetables
- 5) Promote physical activity through:
  - Adopt and implement national guidelines on physical activity
  - Develop policy measures to promote physical activity in different settings (e.g. transport, workplace, schools)
- 3) Create health-enabling environments and settings (e.g. villages, workplaces, schools, clinics) and offer healthier options.
- 4) Employ strategies sensitive to differences in risks of morbidity and mortality between men and women, across different age groups and across ethnic populations (if relevant).

### Establish and maintain coalitions and partnerships

- 1) Build coalitions and partnerships across sectors to address NCD risk factors that are beyond the authority of the Ministry of Health, such as food importation, trade, tax, commercial investment and agriculture.
- 2) Collaborate with media organizations, faith-based organizations and nongovernmental organizations to implement programmes and support advocacy and education.

### Strengthen health systems

- 1) Promote universal health coverage as a means of preventing and controlling NCDs.
- 2) Create a responsive health care system through strengthening the role of primary and secondary

# WHO STEPS Instrument

## Tuvalu 2014



**The WHO STEPwise approach to noncommunicable disease risk factor surveillance (STEPS)**



World Health Organization

20 Avenue Appia, 1211 Geneva 27, Switzerland

*For further information:* [www.who.int/chp/steps](http://www.who.int/chp/steps)

# WHO STEPS Instrument for Noncommunicable Disease Risk Factor Surveillance

## Tuvalu

### Survey Information

Location and Date	Response	Code
Cluster/Centre/Village ID	_ _ _ _ _	I1
Cluster/Centre/Village name		I2
Interviewer ID	_ _ _ _	I3
Date of completion of the instrument	_ _ _ _ _ dd mm year	I4
Consent, Interview Language and Name	Response	Code
Consent has been read and obtained	Yes 1 No 2 If NO, END	I5
Interview Language [Insert Language]	English 1 Tuvaluan 2	I6
Time of interview (24 hour clock)	_ _ _ : _ _ _ hrs mins	I7
Family Surname		I8
First Name		I9
Contact phone number where possible		I10

## Step 1 Demographic Information

### CORE: Demographic Information

Question	Response	Code
Sex (Record Male / Female as observed)	Male    1	C1
	Female    2	
What is your date of birth?  Don't Know 77 77 7777	If known, Go to C4  dd            mm            year	C2
How old are you?	Years	C3
In total, how many years have you spent at school and in full-time study (excluding pre-school)?	Years	C4
What is the highest level of education you have completed?	No formal schooling    1	C5
	Less than primary school    2	
	Primary school completed    3	
	Secondary school completed    4	
	College/University completed    5	
	Post graduate degree    6	
	Refused    88	
What is your ethnic group / racial group] background?	Tuvaluan    1	C6
	Fijian    2	
	Others    3	
	Refused    88	
What is your marital status?	Never married/single    1	C7
	Currently married    2	
	Separated    3	
	Divorced    4	
	Widowed    5	
	Cohabiting/de facto    6	
	Refused    88	
Which of the following best describes your main work status over the past 12 months?  (USE SHOWCARD)	Government employee    1	C8
	Non-government employee    2	
	Self-employed    3	
	Non-paid    4	
	Student    5	
	Homemaker (housewife)    6	
	Retired    7	
	Unemployed (able to work)    8	
	Unemployed (unable to work/ disability)    9	
	Refused    88	

How many people older than 18 years, including yourself, live in your household?	Number of people	<input type="text"/>	C9
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Question	Response		Code
Taking the past year, can you tell me what the average earnings of the household have been?  (RECORD ONLY ONE, NOT ALL 3)	Per week	<input type="text"/> Go to T1	C10a
	OR per month	<input type="text"/> Go to T1	C10b
	OR per fortnight		
	OR per year	<input type="text"/> Go to T1	C10c
	Refused	88	C10d
If you don't know the amount, can you give an estimate of the annual household income if I read some options to you? Is it  [INSERT QUINTILE VALUES IN LOCAL CURRENCY]  (READ OPTIONS)	$\leq 250$ ) 1	1	C11
	More than 250, $\geq$ Q 300	2	
	More than 300, $\leq$ 350	3	
	More than 350, $\leq$ Q 400	4	
	More than Q 4	5	
	Don't Know	77	
	Refused	88	

## Step 1 Behavioural Measurements

CORE: Tobacco Use			
Now I am going to ask you some questions about tobacco use.			
Question	Response		Code
Do you currently smoke any tobacco products, such as cigarettes, cigars or pipes?  (USE SHOWCARD)	Yes	1	T1
	No	2 If No, go to T8	
Do you currently smoke tobacco products daily?	Yes	1	T2
	No	2	
How old were you when you first started smoking?	Age (years)	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> If Known, go to T5a/T5aw	T3
	Don't know 77		
Do you remember how long ago it was?  (RECORD ONLY 1, NOT ALL 3)	In Years	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> If Known, go to T5a/T5aw	T4a
	OR in Months	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> If Known, go to T5a/T5aw	T4b
	OR in Weeks	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	T4c
Don't know 77		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
On average, how many of the following products do you smoke each day/week?  (IF LESS THAN DAILY, RECORD WEEKLY)  (RECORD FOR EACH TYPE, USE SHOWCARD)	DAILY↓      WEEKLY↓		
	Manufactured cigarettes	<input type="text"/>	T5a/T5aw
	Hand-rolled cigarettes	<input type="text"/>	T5b/T5bw
	Pipes full of tobacco	<input type="text"/>	T5c/T5cw
	Cigars, cheroots, cigarillos	<input type="text"/>	T5d/T5dw
		<input type="text"/>	T5e/T5ew
	Other	<input type="text"/>	T5f/T5fw
Don't Know 7777	Other (please specify):	<input type="text"/>	T5other/ T5otherw
During the past 12 months, have you tried to stop smoking?	Yes	1	T6
	No	2	
During any visit to a doctor or other health worker in the past 12 months, were you advised to quit smoking tobacco?	Yes	1 If T2=Yes, go to T12; if T2=No, go to T9	T7
	No	2 If T2=Yes, go to T12; if T2=No, go to T9	
	No visit during the past 12 months	3 If T2=Yes, go to T12; if T2=No, go to T9	
In the past, did you ever smoke any tobacco products? (USE SHOWCARD)	Yes	1	T8
	No	2 If No, go to T12	
In the past, did you ever smoke daily?	Yes	1 If T1=Yes, go to T12, else go to T10	T9
	No	2 If T1=Yes, go to T12, else go to T10	

Question	Response		Code
How old were you when you stopped smoking?	Age (years)		T10
	Don't Know 77	┌┐┌ If Known, go to T12	
How long ago did you stop smoking?  (RECORD ONLY 1, NOT ALL 3)  Don't Know 77	Years ago	┌┐┌ If Known, go to T12	T11a
	OR Months ago	┌┐┌ If Known, go to T12	T11b
	OR Weeks ago	┌┐┌	T11c
During the past 30 days, did someone smoke in your home?	Yes	1	T17
	No	2	
During the past 30 days, did someone smoke in closed areas in your workplace (in the building, in a work area or a specific office)?	Yes	1	T18
	No	2	
	Don't work in a closed area	3	

### CORE: Alcohol Consumption

The next questions ask about the consumption of alcohol.

Question	Response		Code
Have you ever consumed any alcohol such as beer, wine, spirits, homebrew or kao (fermented coconut)]?  (USE SHOWCARD OR SHOW EXAMPLES)	Yes	1	A1
	No	2 If No, go to A16	
Have you consumed any alcohol within the past 12 months?	Yes	1 If Yes, go to A4	A2
	No	2	
Have you stopped drinking due to health reasons, such as a negative impact on your health or on the advice of your doctor or other health worker?	Yes	1 If Yes, go to A16	A3
	No	2 If No, go to A16	
During the past 12 months, how frequently have you had at least one standard alcoholic drink?  (READ RESPONSES, USE SHOWCARD)	Daily	1	A4
	5-6 days per week	2	
	3-4 days per week	3	
	1-2 days per week	4	
	1-3 days per month	5	
	Less than once a month	6	
Have you consumed any alcohol within the past 30 days?	Yes	1	A5
	No	2 If No, go to A13	
During the past 30 days, on how many occasions did you have at least one standard alcoholic drink?	Number		A6
	Don't know 77	┌┐┌	
During the past 30 days, when you drank alcohol, how many standard drinks on average did you have during one drinking occasion?  (USE SHOWCARD)	Number		A7
	Don't know 77	┌┐┌	
During the past 30 days, what was the largest number of standard drinks you had on a single occasion, counting all types of alcoholic drinks together?	Largest number		A8
	Don't Know 77	┌┐┌	

During the past 30 days, how many times did you have six or more standard drinks in a single drinking occasion?	Number of times Don't Know 77	<input type="text"/>	A9
During each of the past 7 days, how many standard drinks did you have each day?  (USE SHOWCARD)	Monday	<input type="text"/>	A10a
	Tuesday	<input type="text"/>	A10b
	Wednesday	<input type="text"/>	A10c
	Thursday	<input type="text"/>	A10d
	Friday	<input type="text"/>	A10e
	Saturday	<input type="text"/>	A10f
	Sunday	<input type="text"/>	A10g
Don't Know 7	7		

**CORE: Alcohol Consumption, continued**

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

Question	Response		Code
During the past 7 days, did you consume any homebrewed alcohol, any alcohol brought over the border/from another country, any alcohol not intended for drinking or other untaxed alcohol?  [AMEND ACCORDING TO LOCAL CONTEXT]  (USE SHOWCARD)	Yes	1	A11
	No	2 If No, go to A13	
On average, how many standard drinks of the following did you consume during the past 7 days?  [INSERT COUNTRY-SPECIFIC EXAMPLES]  (USE SHOWCARD)	Homebrew	<input type="text"/>	A12a
	Fermented coconut kao	<input type="text"/>	A12b
	Alcohol brought over the border/from another country	<input type="text"/>	A12c
	Alcohol not intended for drinking, e.g. alcohol-based medicines, perfumes, after shaves	<input type="text"/>	A12d
	Other untaxed alcohol in the country	<input type="text"/>	A12e
Don't Know 77			

During the past 12 months, how often have you found that you were not able to stop drinking once you had started?	Daily or almost daily	1	A13
	Weekly	2	
	Monthly	3	
	Less than monthly	4	
	Never	5	
During the past 12 months, how often have you failed to do what was normally expected from you because of drinking?	Daily or almost daily	1	A14
	Weekly	2	
	Monthly	3	
	Less than monthly	4	
	Never	5	
During the past 12 months, how often have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Daily or almost daily	1	A15
	Weekly	2	
	Monthly	3	
	Less than monthly	4	
	Never	5	

During the past 12 months, have you had family problems or problems with your partner due to someone else's drinking?	Yes, more than monthly	1	A16
	Yes, monthly	2	
	Yes, several times but less than monthly	3	
	Yes, once or twice	4	
	No	5	

### Additional Section : Kava (Section K)

Question [Fesili]	Response [Tali]		Code [Napa]
Have you ever tried or drunk kava in the past 12 months? [Kai tami aka koe io me ne inu ite qankona ite 12 masina ko teka?]	Yes [Ao]	1	X1
	No [Ikai]	2	
During the last 30 days, on how many days did you drink kava? [Ite 30 aso ko teka, mata e fia aso ne inu Yaqona ei koe?]	Number of days [Napa o aso]	<input type="text"/>	X2
	Don't Know [Seiloa ne au] 77		
Do you usually drink alcohol during or after drinking kava? [Koe masani o inu kava taimi koi inu yaqona io me ma oti ne inu yagona?]	Yes [Ao]	1	X3
	No [Ikai]	2	
Do you usually smoke during or after drinking kava? [Koe pusi taimi e inu yaqona koe io me ma oti ne inu yaqona?]	Yes [Ao]	1	X4
	No [Ikai]	2	

### CORE: Diet

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

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

### Dietary salt

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

<p>How often do you add salt or a salty sauce such as soya sauce to your food right before you eat it or as you are eating it?</p> <p>(SELECT ONLY ONE)</p> <p>(USE SHOWCARD)</p>	Always	1	D5
	Often	2	
	Sometimes	3	
	Rarely	4	
	Never	5	
	Don't know	77	
<p>How often is salt, salty seasoning or a salty sauce (eg soya sauce, tomato sauce) added in cooking or preparing foods in your household?</p>	Always	1	D6
	Often	2	
	Sometimes	3	
	Rarely	4	
	Never	5	
	Don't know	77	
<p>How often do you eat processed food high in salt? By processed food high in salt, I mean foods that have been altered from their natural state, such as packaged salty snacks, instant noodles, salted fish, canned salty food, salty food prepared at a fast food restaurant (eg salted chips), cheese, bacon and processed meat (USE SHOWCARD)</p>	Always	1	D7
	Often	2	
	Sometimes	3	
	Rarely	4	
	Never	5	
	Don't know	77	
<p>How much salt or salty sauce do you think you consume?</p>	Far too much	1	D8
	Too much	2	
	Just the right amount	3	
	Too little	4	
	Far too little	5	
	Don't know	77	

Question	Response	Code	
<p>How important to you is lowering the salt in your diet?</p>	Very important	1	D9
	Somewhat important	2	
	Not at all important	3	
	Don't know	77	
<p>Do you think that too much salt or salty sauce in your diet could cause a health problem?</p>	Yes	1	D10
	No	2	
	Don't know	77	
<p>Do you do any of the following on a regular basis to control your salt intake? (RECORD FOR EACH)</p>			
<p>Limit consumption of processed foods</p>	Yes	1	D11a
	No	2	
<p>Look at the salt or sodium content on food labels</p>	Yes	1	D11b
	No	2	
<p>Buy low salt/sodium alternatives</p>	Yes	1	D11c
	No	2	
<p>Use spices other than salt when cooking</p>	Yes	1	D11d
	No	2	
<p>Avoid eating foods prepared outside of a home</p>	Yes	1	D11e
	No	2	
<p>Do other things specifically to control your salt intake</p>	Yes	1 If Yes, go to D11other	D11f
	No	2	

Other (please specify)	<input type="checkbox"/>	D11other																
The next questions ask about the oil or fat that is most often used for meal preparation in your household, and about meals that you eat outside a home.																		
<p>What type of oil or fat is most often used for meal preparation in your household?</p> <p>(USE SHOWCARD)</p> <p>(SELECT ONLY ONE)</p>	<table border="1"> <tr><td>Vegetable oil</td><td>1</td></tr> <tr><td>Lard (pork fat)</td><td>2</td></tr> <tr><td>Butter</td><td>3</td></tr> <tr><td>Margarine</td><td>4</td></tr> <tr><td>Other</td><td>5 If Other, go to D12 other</td></tr> <tr><td>None in particular</td><td>6</td></tr> <tr><td>None used</td><td>7</td></tr> <tr><td>Don't know</td><td>77</td></tr> </table>	Vegetable oil	1	Lard (pork fat)	2	Butter	3	Margarine	4	Other	5 If Other, go to D12 other	None in particular	6	None used	7	Don't know	77	D12
Vegetable oil	1																	
Lard (pork fat)	2																	
Butter	3																	
Margarine	4																	
Other	5 If Other, go to D12 other																	
None in particular	6																	
None used	7																	
Don't know	77																	
	<p>Other</p> <p><input type="checkbox"/> <input type="checkbox"/></p>	D12other																
<p>On average, how many meals per week do you eat that were not prepared at a home? By meal, I mean breakfast, lunch and dinner.</p>	<p>Number</p> <p>Don't know 77</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>	D13																
<p>How often do you have meals containing coconut cream/lolo</p>	<p>More than once a day</p> <p>Everyday</p> <p>More than once a week</p> <p>Less than once a week</p> <p>Rarely</p> <p>Never</p> <p>Don't know</p>	D14/X5																
<p>In the last week, on how many days did you have a drink containing sugar including fizzy drinks, juice drinks (excluding pure unsweetened fruit juice), cordials/drink mixes, milo and homemade drinks with added sugar</p>	<p>Number of days</p> <p>Don't know 77</p>	X6																

On the days when you had a drink containing sugar, how many serves did you have (one serve being one can of drink, one large glass)	Number of servings Don't know 77	X7
In the last week, how often did you have a drink to which you added sugar, like milo, tea or coffee (use showcard). (If had more than one drink a day, please include this eg 10 times in last week)	Number of days Don't Know 77	<input type="text"/> <input type="text"/> If Zero days, go to
How many teaspoons of sugar did you add, on average, to each of these drinks	Number of teaspoons Don't know 77	<input type="text"/> <input type="text"/>
		X8
		X9

CORE: Physical Activity			
<p>Next I am going to ask you about the time you spend doing different types of physical activity in a typical week. Please answer these questions even if you do not consider yourself to be a physically active person.</p> <p>Think first about the time you spend doing work. Think of work as the things that you have to do such as paid or unpaid work, study/training, household chores, harvesting food/crops, fishing or hunting for food, seeking employment. [Insert other examples if needed]. In answering the following questions 'vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate, 'moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.</p>			
Question	Response		Code
<b>Work</b>			
Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like [carrying or lifting heavy loads, digging or construction work] for at least 10 minutes continuously?  [INSERT EXAMPLES] (USE SHOWCARD)	Yes	1	P1
	No	2 If No, go to P 4	
In a typical week, on how many days do you do vigorous-intensity activities as part of your work?	Number of days	<input type="text"/>	P2
How much time do you spend doing vigorous-intensity activities at work on a typical day?	Hours : minutes	<input type="text"/> : <input type="text"/> hrs mins	P3 (a-b)
Does your work involve moderate-intensity activity, that causes small increases in breathing or heart rate such as brisk walking [or carrying light loads] for at least 10 minutes continuously?  [INSERT EXAMPLES] (USE SHOWCARD)	Yes	1	P4
	No	2 If No, go to P 7	
In a typical week, on how many days do you do moderate-intensity activities as part of your work?	Number of days	<input type="text"/>	P5
How much time do you spend doing moderate-intensity activities at work on a typical day?	Hours : minutes	<input type="text"/> : <input type="text"/> hrs mins	P6 (a-b)

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

CORE: Physical Activity, Continued			
Question	Response		Code
Recreational activities			
The next questions exclude the work and transport activities that you have already mentioned.			
Now I would like to ask you about sports, fitness and recreational activities (leisure), [Insert relevant terms].			
Do you do any vigorous-intensity sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate like [running or football] for at least 10 minutes continuously?  [INSERT EXAMPLES] (USE SHOWCARD)	Yes	1	P10
	No	2 If No, go to P 13	
In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational (leisure) activities?	Number of days	<input type="text"/>	P11
How much time do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?	Hours : minutes	<input type="text"/> : <input type="text"/> hrs mins	P12 (a-b)
Do you do any moderate-intensity sports, fitness or recreational (leisure) activities that cause a small increase in breathing or heart rate such as brisk walking, [cycling, swimming, volleyball] for at least 10 minutes continuously?  [INSERT EXAMPLES] (USE SHOWCARD)	Yes	1	P13
	No	2 If No, go to P16	
In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational (leisure) activities?	Number of days	<input type="text"/>	P14
How much time do you spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day?	Hours : minutes	<input type="text"/> : <input type="text"/> hrs mins	P15 (a-b)

Sedentary behaviour			
The following question is about sitting or reclining at work, at home, getting to and from places, or with friends including time spent sitting at a desk, sitting with friends, traveling in car, bus, reading, playing cards or watching television, but do not include time spent sleeping.			
[INSERT EXAMPLES] (USE SHOWCARD)			
How much time do you usually spend sitting or reclining on a typical day?	Hours : minutes	<input type="text"/> : <input type="text"/> hrs mins	P16 (a-b)

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

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

CORE: History of Raised Total Cholesterol			
Question	Response		Code
Have you ever had your cholesterol (fat levels in your blood) measured by a doctor or other health worker?	Yes	1	H12
	No	2 If No, go to H17	
Have you ever been told by a doctor or other health worker that you have raised cholesterol?	Yes	1	H13a
	No	2 If No, go to H17	
Have you been told in the past 12 months?	Yes	1	H13b
	No	2	
In the past two weeks, have you taken any oral treatment (medication) for raised total cholesterol prescribed by a doctor or other health worker?	Yes	1	H14
	No	2	

Have you ever seen a traditional healer for raised cholesterol?	Yes	1	H15
	No	2	
Are you currently taking any herbal or traditional remedy for your raised cholesterol?	Yes	1	H16
	No	2	

### CORE: History of Cardiovascular Diseases

Have you ever had a heart attack or chest pain from heart disease (angina) or a stroke (cerebrovascular accident or incident)?	Yes	1	H17
	No	2	
Are you currently taking aspirin regularly to prevent or treat heart disease?	Yes	1	H18
	No	2	
Are you currently taking statins (Lovastatin/Simvastatin/Atorvastatin or any other statin) regularly to prevent or treat heart disease?	Yes	1	H19
	No	2	

### CORE: Lifestyle Advice

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

(RECORD FOR EACH)

Quit using tobacco or don't start	Yes	1	H20a
	No	2	
Reduce salt in your diet	Yes	1	H20b
	No	2	
Eat at least five servings of fruit and/or vegetables each day	Yes	1	H20c
	No	2	
Reduce fat in your diet	Yes	1	H20d
	No	2	
Start or do more physical activity	Yes	1	H20e
	No	2	
Maintain a healthy body weight or lose weight	Yes	1 If C1=1 go to M1	H20f
	No	2 If C1=1 go to M1	

### CORE (for women only): Cervical Cancer Screening

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

Question	Response		Code
Have you ever had a screening test for cervical cancer, using any of these methods described above?	Yes	1	CX1
	No	2	
	Don't know	77	

### Optional Module: Mental health / Suicide

The next questions ask about thoughts, plans, and attempts of suicide. Please answer the questions even if no one usually talks about these issues.

Question	Response		Code
During the past 12 months, have you seriously considered attempting suicide?	Yes	1	MH1
	No	2 If No, go to MH3	
	Refused	88	
Did you seek professional help for these thoughts?	Yes	1	MH2
	No	2	
	Refused	88	
During the past 12 months, have you made a plan about how you would attempt suicide?	Yes	1	MH3
	No	2	
	Refused	88	
Have you ever attempted suicide?	Yes	1	MH4
	No	2 If No, go to MH9	
	Refused	88	
During the past 12 months, have you attempted suicide?	Yes	1	MH5
	No	2	
	Refused	88	

<p>What was the main method you used the last time you attempted suicide?</p> <p>(SELECT ONLY ONE)</p>	<p>1</p> <p>2</p> <p>Razor, knife or other sharp instrument</p> <p>3</p> <p>Overdose of medication (e. g. prescribed, over-the-counter)</p> <p>Hanging</p> <p>Poisoning with pesticides (e.g. rat poison, insecticide, weed-killer)</p> <p>4</p> <p>Other poisoning (e.g. plant/seed, house product-kerosene)</p> <p>Other</p> <p>Refused</p> <p>5</p> <p>7 If Other, go to MH6other</p> <p>88</p>		<p>MH6</p>
	<p>ther (specify)</p>	<p>_____</p>	<p>MH6 other</p>
<p>Did you seek medical care for this attempt?</p>	<p>Yes</p> <p>No</p> <p>Refused</p>	<p>1</p> <p>2 If No, go to MH9</p> <p>88</p>	<p>MH7</p>
<p>Were you admitted to hospital overnight because of this attempt?</p>	<p>Yes</p> <p>No</p> <p>Refused</p>	<p>1</p> <p>2</p> <p>88</p>	<p>MH8</p>

Has anyone in your close family (mother, father, brother, sister or children) ever attempted suicide?	Yes	1	MH9
	No	2	
	Refused	88	
Has anyone in your close family (mother, father, brother, sister or children) ever died from suicide?	Yes	1	MH10
	No	2	
	Refused	88	

### Additional Module: Mental Health K10]

Question	Response		Code
In the past 4 weeks, about how often did you feel tired out for no good reason?	None of the time	1	X10
	A little of the time	2	
	Some of the time	3	
	Most of the time	4	
	All of the time	5	
In the past 4 weeks, about how often did you feel nervous?	None of the time	1	X11
	A little of the time	2	
	Some of the time	3	
	Most of the time	4	
	All of the time	5	
In the past 4 weeks, about how often did you feel so nervous that nothing could calm you down?	None of the time	1	X12
	A little of the time	2	
	Some of the time	3	
	Most of the time	4	
	All of the time	5	
In the past 4 weeks, about how often did you feel hopeless?	None of the time	1	X13
	A little of the time	2	
	Some of the time	3	
	Most of the time	4	
	All of the time	5	
In the past 4 weeks, about how often did you feel restless or fidgety?	None of the time	1	X14
	A little of the time	2	
	Some of the time	3	
	Most of the time	4	
	All of the time	5	

In the past 4 weeks, about how often did you feel so restless you could not sit still?	None of the time A little of the time Some of the time Most of the time All of the time	1 2 3 4 5	X15
In the past 4 weeks, about how often did you feel depressed?	None of the time A little of the time Some of the time Most of the time All of the time	1 2 3 4 5	X16
In the past 4 weeks, about how often did you feel that everything was an effort?	None of the time A little of the time Some of the time Most of the time All of the time	1 2 3 4 5	X17
In the past 4 weeks, about how often did you feel so sad that nothing could cheer you up?	None of the time A little of the time Some of the time Most of the time All of the time	1 2 3 4 5	X18
In the past 4 weeks, about how often did you feel worthless?	None of the time A little of the time Some of the time Most of the time All of the time	1 2 3 4 5	X19

## Step 2 Physical Measurements

CORE: Blood Pressure			
Question	Response		Code
Interviewer ID		_ _ _ _ _	M1
Device ID for blood pressure		_ _ _	M2
Cuff size used	Small	1	M3
	Medium	2	
	Large	3	
Reading 1	Systolic ( mmHg)	_ _ _ _ _	M4a
	Diastolic (mmHg)	_ _ _ _ _	M4b
Reading 2	Systolic ( mmHg)	_ _ _ _ _	M5a
	Diastolic (mmHg)	_ _ _ _ _	M5b
Reading 3	Systolic ( mmHg)	_ _ _ _ _	M6a
	Diastolic (mmHg)	_ _ _ _ _	M6b
During the past two weeks, have you been treated for raised blood pressure with drugs (medication) prescribed by a doctor or other health worker?	Yes	1	M7
	No	2	
CORE: Height and Weight			
For women: Are you pregnant?	Yes	1 If Yes, go to END	M8
	No	2	
Interviewer ID		_ _ _ _ _	M9
Device IDs for height and weight	Height	_ _ _	M10a
	Weight	_ _ _	M10b
Height	in Centimetres (cm)	_ _ _ _ _ . _	M11
Weight If too large for scale 666.6	in Kilograms (kg)	_ _ _ _ _ . _	M12
CORE: Waist			
Device ID for waist		_ _ _	M13
Waist circumference	in Centimetres (cm)	_ _ _ _ _ . _	M14
Hip Circumference and Heart Rate			
Hip circumference	in Centimeters (cm)	_ _ _ _ _ . _	M15
Heart Rate			M16a
Reading 1	Beats per minute	_ _ _ _ _	
Reading 2	Beats per minute	_ _ _ _ _	
Reading 3	Beats per minute	_ _ _ _ _	

### Step 3 Biochemical Measurements

CORE: Blood Glucose			
Question	Response		Code
During the past 12 hours have you had anything to eat or drink, other than water?	Yes	1	B1
	No	2	
Technician ID		_ _ _ _ _	B2
Device ID		_ _ _	B3
Time of day blood specimen taken (24 hour clock)	Hours : minutes	_ _ _ : _ _ _ hrs       mins	B4
Fasting blood glucose [CHOOSE ACCORDINGLY: MMOL/L OR MG/DL]	mmol/l	_ _ _ . _ _ _	B5
	mg/dl	_ _ _ _ . _	
Today, have you taken insulin or other drugs (medication) that have been prescribed by a doctor or other health worker for raised blood glucose?	Yes	1	B6
	No	2	
CORE: Blood Lipids			
Device ID		_ _ _	B7
Total cholesterol [CHOOSE ACCORDINGLY: MMOL/L OR MG/DL]	mmol/l	_ _ _ . _ _ _	B8
	mg/dl	_ _ _ _ . _	
During the past two weeks, have you been treated for raised cholesterol with drugs (medication) prescribed by a doctor or other health worker?	Yes	1	B9
	No	2	
CORE: Urinary sodium and creatinine			
Had you been fasting prior to the urine collection?	Yes	1	B10
	No	2	
Haemoglobin	g/dl	_ _ _ . _ _ _	X20
EXPANDED: HDL Cholesterol			
Question	Response		Code
HDL Cholesterol [CHOOSE ACCORDINGLY: MMOL/L OR MG/DL]	mmol/l	_ . _ _ _	B17
	mg/dl	_ _ _ _ . _	

## APPENDIX 2

### 4.1 Demographic Information

Table 1. Highest level of education attained, by men

Highest level of education							
age groups (years)	Men						
	n	% No formal schooling	% Less than primary school	% Primary school completed	% Secondary school completed	% College/ University completed	% Post graduate degree completed
18-44	301	0	0.7	34.6	48.5	15.0	1.3
45-69	226	0.9	1.3	61.9	27.0	7.5	1.3
18-69	527	0.4	0.9	46.3	39.3	11.8	1.3

Table 2. Highest level of education attained, by women

Highest level of education							
age groups (years)	Women						
	n	% No formal schooling	% Less than primary school	% Primary school completed	% Secondary school completed	% College/ University completed	% Post graduate degree completed
18-44	335	0.3	2.1	22.4	46.3	27.2	1.8
45-69	291	1.7	8.6	57.7	22.3	7.9	1.7
18-69	626	1.0	5.1	38.8	35.1	18.2	1.8

Table 3. Marital status, by men

Marital status							
age groups (years)	Men						
	n	% Never married	% Currently married	% Separated	% Divorced	% Widowed	% Cohabiting
18-44	301	39.5	58.1	1.3	0.7	0.3	-
45-69	226	7.1	85.4	0.4	4.0	3.1	-
18-69	527	25.6	69.8	0.9	2.1	1.5	-

Table 4. Marital status, by women

Marital status							
age groups (years)	Women						
	n	% Never married	% Currently married	% Separated	% Divorced	% Widowed	% Cohabiting
18-44	335	19.7	77.0	0.9	1.5	0.9	-
45-69	293	6.1	75.4	1.0	2.7	14.7	-
18-69	628	13.4	76.3	1.0	2.1	7.3	-

Table 5. Employment status, by men

age groups (years)	Men				
	n	% Government employee	% Non-government employee	% Self-employed	% Unpaid
18-44	301	23.9	21.6	14.0	40.5
45-69	226	23.0	17.3	13.7	46.0
18-69	527	23.5	19.7	13.9	42.9

Table 6. Employment status, by women

Employment status					
age groups (years)	Women				
	n	% Government employee	% Non-government employee	% Self-employed	% Unpaid
18-44	333	27.6	9.0	2.4	61.0
45-69	292	10.6	4.1	4.5	80.8
18-69	625	19.7	6.7	3.4	70.2

Table 7. Unpaid work and unemployment, by men

Unpaid work and unemployed							
age groups (years)	Men						
	n	% Non-paid	% Student	% Home-maker	% Retired	Unemployed	
						% Able to work	% Not able to work
18-44	122	5.7	17.2	9.0	2.5	58.2	7.4
45-69	104	8.7	0	20.2	17.3	38.5	15.4
18-69	226	7.1	9.3	14.2	9.3	49.1	11.1

Table 8. Unpaid work and unemployment, by women

Unpaid work and unemployed							
age groups (years)	Women						
	n	% Non-paid	% Student	% Home-maker	% Retired	Unemployed	
						% Able to work	% Not able to work
18-44	203	0.5	15.3	55.2	0	25.1	3.9
45-69	236	0.4	0	63.6	5.1	13.1	17.8
18-69	439	0.5	7.1	59.7	2.7	18.7	11.4

## 4.2 Tobacco use

Table 9. Mean amount of tobacco used by daily smokers by type and age, by men

Mean amount of tobacco used by daily smokers by type									
age groups (years)	Men								
	n	Mean # of manufactured cig.	95% CI	n	Mean # of hand-rolled cig.	95% CI	n	Mean # of pipes of tobacco	95% CI
18-44	156	8.7	7.3-10.0	156	3.6	2.3-4.9	155	0.3	0.0-0.8
45-69	98	8.8	7.2-10.3	99	4.6	3.0-6.2	99	0.1	0.0-0.2
18-69	254	8.7	7.6-9.8	255	3.8	2.6-5.1	254	0.3	0.0-0.6

Mean amount of tobacco used by daily smokers by type									
age groups (years)	Men								
	n	Mean # of cigars, cheerots, cigarillos	95% CI	n	Mean # of shisha sessions	95% CI	n	Mean # of other type of tobacco	95% CI
18-44	156	0.4	0.0-0.8	-	-	-	154	0.8	0.3-1.3
45-69	99	0.3	0.0-0.9	-	-	-	98	0.3	0.0-0.8
18-69	255	0.4	0.1-0.6	-	-	-	252	0.7	0.3-1.1

Table 10. Mean amount of tobacco used by daily smokers by type and age, by women

Mean amount of tobacco used by daily smokers by type									
age groups (years)	Women								
	n	Mean # of manufactured cig.	95% CI	n	Mean # of hand-rolled cig.	95% CI	n	Mean # of pipes of tobacco	95% CI
18-44	53	4.9	3.6-6.2	53	3.1	1.1-5.1	53	0.0	-
45-69	65	3.6	2.7-4.4	65	1.9	0.5-3.3	65	0.0	0.0-0.2
18-69	118	4.3	3.3-5.3	118	2.5	2.1-3.0	118	0.0	0.0-0.1

Mean amount of tobacco used by daily smokers by type									
age groups (years)	Women								
	n	Mean # of cigars, cheerots, cigarillos	95% CI	n	Mean # of shisha sessions	95% CI	n	Mean # of other type of tobacco	95% CI
18-44	53	-	-	-	-	-	52	0.3	0.1-0.5
45-69	65	-	-	-	-	-	64	1.0	0.5-1.5
18-69	118	-	-	-	-	-	116	0.6	0.2-1.0

Table 11. Percentage of current smokers smoking the different types of tobacco products, by men

Percentage of current smokers smoking each of the following products							
age groups (years)	Men						
	n	% Manuf. cigs.	95% CI	% Hand-rolled cigs.	95% CI	% Pipes of tobacco	95% CI
18-44	161	93.1	84.9-100.0	84.0	72.8-95.3	2.2	0.0-5.1
45-69	104	90.7	82.8-98.6	90.7	84.5-96.9	3.0	0.0-9.4
18-69	265	92.6	84.8-100.0	85.6	76.7-94.4	2.4	0.2-4.5

Percentage of current smokers smoking each of the following products							
age groups (year)	Men						
	n	% Cigars, che-roots, cigarillos	95% CI			% Other	95% CI
18-44	161	4.0	0.6-7.5			12.9	0.0-26.0
45-69	104	3.7	0.3-7.0			14.0	0.2-27.7
18-69	265	4.0	1.1-6.8			13.2	1.4-24.9

Table 12. Percentage of current smokers smoking the different types of tobacco products, by women

Percentage of current smokers smoking each of the following products							
age groups (years)	Women						
	n	% Manuf. cigs.	95% CI	% Hand-rolled cigs.	95% CI	% Pipes of tobacco	95% CI
18-44	60	89.2	73.8-100.0	73.8	56.3-91.4	0.0	0.0-0.0
45-69	71	82.8	60.2-100.0	46.2	23.5-68.8	0.7	0.0-2.9
18-69	131	86.2	68.5-100.0	60.7	39.0-82.4	0.3	0.0-1.3

Percentage of current smokers smoking each of the following products							
age groups (years)	Women						
	n	% Cigars, che-roots, cigarillos	95% CI			% Other	95% CI
18-44	60	0.0	0.0-0.0			15.9	4.3-27.5
45-69	71	1.1	0.0-2.4			46.5	31.5-61.5
18-69	131	0.5	0.0-1.2			30.4	15.0-45.9

Table 13. Percentage daily smokers smoking given quantities of manufactured or hand-rolled cigarettes per day, by men

Percentage of daily smokers smoking given quantities of manufactured or hand-rolled cigarettes per day											
age groups (years)	Men										
	n	% <5 Cigs.	95% CI	% 5-9 Cigs.	95% CI	% 10-14 Cigs.	95% CI	% 15-24 Cigs.	95% CI	% ≥ 25 Cigs.	95% CI
18-44	149	21.4	14.1-28.6	27.0	18.9-35.2	24.4	14.7-34.1	13.7	9.8-17.7	13.5	7.6-19.5
45-69	93	18.0	9.4-26.6	30.1	22.3-38.0	20.6	13.8-27.4	16.2	6.7-25.6	15.1	5.7-24.5
18-69	242	20.6	15.5-25.7	27.7	22.0-33.4	23.5	15.8-31.3	14.3	11.5-17.0	13.9	7.6-20.1

Table 14. Percentage daily smokers smoking given quantities of manufactured or hand-rolled cigarettes per day, by women

Percentage of daily smokers smoking given quantities of manufactured or hand-rolled cigarettes per day											
age groups (years)	Women										
	n	% <5 Cigs.	95% CI	% 5-9 Cigs.	95% CI	% 10-14 Cigs.	95% CI	% 15-24 Cigs.	95% CI	% ≥ 25 Cigs.	95% CI
18-44	50	45.3	38.0-52.6	30.0	18.0-42.0	9.4	0.0-21.0	10.6	3.7-17.4	4.7	0.1-9.3
45-69	56	56.4	29.6-83.2	20.9	0.0-44.7	16.8	9.2-24.5	3.6	0.0-10.2	2.3	0.0-7.3
18-69	106	50.3	37.4-63.3	25.9	12.0-39.8	12.8	5.0-20.5	7.4	3.7-11.2	3.6	1.9-5.3

Table 15. Percentage former daily smokers among all respondents, by gender

Former daily smokers among all respondents									
age groups (years)	Men			Women			Both Sexes		
	n	% Former daily smokers	95% CI	n	% Former daily smokers	95% CI	n	% Former daily smokers	95% CI
18-44	301	4.9	3.4-6.5	335	1.6	0.9-2.3	636	3.4	2.5-4.3
45-69	226	7.5	2.3-12.6	292	5.7	1.0-10.5	518	6.4	1.7-11.1
18-69	527	5.6	4.3-6.8	627	3.2	1.4-4.9	1154	4.3	3.0-5.7

Table 16. Percentage former daily smokers among ever daily smokers, by gender

Former daily smokers among ever daily smokers									
age groups (years)	Men			Women			Both Sexes		
	n	% Former daily smokers	95% CI	n	% Former daily smokers	95% CI	n	% Former daily smokers	95% CI
18-44	168	9.3	6.1-12.4	61	8.9	3.2-14.6	229	9.2	5.8-12.6
45-69	115	14.8	4.2-25.4	80	18.5	6.8-30.1	195	16.6	5.8-27.5
18-69	283	10.6	6.6-14.6	141	13.7	5.7-21.7	424	11.6	6.5-16.7

Table 17. Mean years since cessation by gender

Mean years since cessation									
age groups (years)	Men			Women			Both Sexes		
	n	Mean years	95% CI	n	Mean years	95% CI	n	Mean years	95% CI
18-44	15	4.9	2.2-7.5	18	6.4	5.2-7.5	33	5.5	3.6-7.3
45-69	18	17.9	11.2-24.7	23	23.2	18.8-27.5	41	21.1	15.8-26.4
18-69	33	8.9	5.2-12.6	41	14.3	10.8-17.8	74	11.5	7.7-15.3

## 4.3 Alcohol consumption

Table 18. Frequency of alcohol consumption in the past 12 months, by men

Frequency of alcohol consumption in the past 12 months													
age groups (years)	Men												
	n	% Daily	95% CI	% 5-6 days/ week	95% CI	% 3-4 days/ week	95% CI	% 1-2 days/ week	95% CI	% 1-3 days/ month	95% CI	% < once a month	95% CI
18-44	158	3.0	1.6-4.4	3.9	0.3-7.5	3.8	1.2-6.3	50.3	43.0-57.6	13.3	10.3-16.3	25.7	19.2-32.2
45-69	47	-	-	-	-	-	-	-	-	-	-	-	-
18-69	205	4.5	1.9-7.0	4.4	0.4-8.4	3.8	1.1-6.5	48.5	39.0-57.9	13.3	9.9-16.6	25.6	16.6-34.6

Table 20. Percentage of current drinkers with different drinking levels, by men

High-end, intermediate, and lower-end level drinking among current (past 30 days) drinkers							
age groups (years)	Men						
	n	% high-end (≥60g)	95% CI	% intermediate (40-59.9g)	95% CI	% lower-end (<40g)	95% CI
18-44	128	5.4	0.0-12.7	1.1	0.2-2.1	93.5	86.8-100.0
45-69	36	-	-	--	-	-	-
18-69	164	6.3	0.2-12.4	1.7	0.6-2.8	92.0	86.5-97.5

Table 21. Mean number of drinking occasions in the past 30 days among current drinkers

Mean number of drinking occasions in the past 30 days among current (past 30 days) drinkers									
age groups (years)	Men			Women			Both sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-44	130	4.3	2.1-6.5	15			145	4.2	2.1-6.2
45-69	36	6.4	2.4-10.4	1			37	6.3	2.2-10.3
18-69	166	4.5	2.7-6.3	16	-	-	182	4.4	2.7-6.1

Table 22. Mean number of standard drinks consumed on a drinking occasion among current drinkers

Mean number of standard drinks per drinking occasion among current (past 30 days) drinkers									
age groups (years)	Men			Women			Both sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-44	128	9.4	4.7-14.0	14			142	9.1	4.8-13.4
45-69	36	8.9	4.7-13.1	1			37	9.2	5.0-13.4
18-69	164	9.3	4.9-13.8	15	-	-	179	9.1	4.9-13.3

Table 23. Mean maximum number of standard drinks consumed on one occasion in the past 30 days among current drinkers

Mean maximum number of standard drinks consumed on one occasion in the past 30 days									
age groups (years)	Men			Women			Both sexes		
	n	Mean maximum number	95% CI	n	Mean maximum number	95% CI	n	Mean maximum number	95% CI
18-44	127	14.4	10.1-18.6	14			141	14.0	10.0-17.9
45-69	36	16.0	10.8-21.1	1			37	16.0	11.1-21.0
18-69	163	14.5	10.8-18.3	15			178	14.2	10.6-17.7

Table 24. Mean number of times current drinkers consumed six or more drinks on a single occasion in the past 30 days

Mean number of times with six or more drinks during a single occasion in the past 30 days among current drinkers									
age groups (years)	Men			Women			Both sexes		
	n	Mean number of times	95% CI	n	Mean number of times	95% CI	n	Mean number of times	95% CI
18-44	126	3.0	2.6-3.5	12			138	3.1	2.7-3.4
45-69	34	3.2	2.5-3.9	1			35	3.3	2.6-4.0
18-69	160	3.1	2.6-3.5	13			173	3.1	2.7-3.5

Table 25. Percentage of current drinkers who consumed unrecorded alcohol in the past 7 days

Consumption of unrecorded alcohol in the past 7 days among current drinkers									
age groups (years)	Men			Women			Both sexes		
	n	% consuming unrecorded alcohol	95% CI	n	% consuming unrecorded alcohol	95% CI	n	% consuming unrecorded alcohol	95% CI
18-44	133	8.6	5.0-12.2	15			148	8.8	5.5-12.1
45-69	37	10.6	3.9-17.3	1			38	10.3	4.0-16.6
18-69	170	8.8	6.0-11.6	16			186	8.9	6.3-11.6

Table 26. Percentage of past 12 month drinkers who were not able to stop drinking once started during the past year, both sexes combined

Frequency of not being able to stop drinking once started during the past 12 months among past 12 month drinkers							
age groups (years)	Both sexes						
	n	% monthly or more frequently	95% CI	% less than monthly	95% CI	% never	95% CI
18-44	189	38.5	32.0-45.0	17.4	5.0-29.7	44.1	32.0-56.3
45-69	53	35.0	23.7-46.3	16.1	4.9-27.3	48.9	37.5-60.2
18-69	242	38.1	31.5-44.7	17.2	5.4-29.1	44.7	33.0-56.3

Table 27. Frequency of alcohol consumption among current drinkers in the past 7 days, by men

Frequency of alcohol consumption in the past 7 days											
age groups (years)	Men										
	n	% Daily	95% CI	% 5-6 days	95% CI	% 3-4 days	95% CI	% 1-2 days	95% CI	% 0 days	95% CI
18-44	130	12.3	0.5-24.1	2.3	0.0-7.0	12.7	9.5-16.0	59.5	42.7-76.4	13.2	8.3-18.0
45-69	34	24.5	7.0-42.1	8.5	0.0-17.4	10.4	0.5-20.2	43.4	23.2-63.6	13.2	2.1-24.3
18-69	164	13.6	1.1-26.0	2.9	0.0-6.6	12.5	8.6-16.4	57.8	41.5-74.2	13.2	7.8-18.6

\*\* For women N<30.

Table 28. Percentage of past 12 month drinkers who were not able to stop drinking once started during the past year, by men

Frequency of not being able to stop drinking once started during the past 12 months among past 12 month drinkers							
age groups (years)	Men						
	n	% monthly or more frequently	95% CI	% less than monthly	95% CI	% never	95% CI
18-44	164	40.2	32.7-47.6	19.1	5.3-32.9	40.7	29.0-52.5
45-69	49	37.1	23.0-51.1	18.2	6.2-30.1	44.8	35.9-53.6
18-69	213	39.8	32.1-47.6	19.0	5.9-32.1	41.2	30.6-51.8

Table 29. Percentage of past 12 month drinkers who were not able to stop drinking once started during the past year, by women

Frequency of not being able to stop drinking once started during the past 12 months among past 12 month drinkers							
age groups (years)	Women						
	n	% monthly or more frequently	95% CI	% less than monthly	95% CI	% never	95% CI
18-44	25	27.6	15.4-39.7	6.1	2.7-9.5	66.3	56.2-76.5
45-69	4	18.8	0.0-79.4	0.0	0.0-0.0	81.3	20.6-100.0
18-69	29	26.7	12.5-40.9	5.5	2.5-8.6	67.8	55.9-79.6

Table 30. Frequency of past 12 month drinkers failing to do what was normally expected from them because of drinking during the past 12 months, by men

Frequency of failing to do what was normally expected from you during the past 12 months among past 12 month drinkers							
age groups (years)	Men						
	n	% monthly or more frequently	95% CI	% less than monthly	95% CI	% never	95% CI
18-44	164	40.5	31.3-49.8	21.6	6.9-36.4	37.8	25.7-50.0
45-69	49	25.2	12.9-37.5	25.9	3.9-47.8	49.0	27.2-70.7
18-69	213	38.8	30.0-47.6	22.1	7.0-37.2	39.1	26.8-51.3

Table 31. Frequency of past 12 month drinkers failing to do what was normally expected from them because of drinking during the past 12 months, by men

Frequency of failing to do what was normally expected from you during the past 12 months among past 12 month drinkers							
age groups (years)	Women						
	n	% monthly or more frequently	95% CI	% less than monthly	95% CI	% never	95% CI
18-44	25	19.4	3.7-35.1	8.2	3.6-12.7	72.4	60.3-84.6
45-69	4	0.0	0.0-0.0	0.0	0.0-0.0	100.0	100.0-100.0
18-69	29	17.5	3.1-31.9	7.4	3.3-11.5	75.1	63.7-86.4

Table 32. Frequency of past 12 month drinkers needing a first drink in the morning to get going during the past 12 months, by men

Frequency of needing a first drink in the morning to get going during the past 12 months among past 12 month drinkers							
age groups (years)	Men						
	n	% monthly or more frequently	95% CI	% less than monthly	95% CI	% never	95% CI
18-44	164	33.8	22.1-45.5	19.3	9.7-28.9	46.9	37.4-56.4
45-69	49	28.0	15.6-40.3	17.5	0.0-36.2	54.5	39.1-70.0
18-69	213	33.2	21.6-44.8	19.1	9.4-28.7	47.8	38.7-56.8

Table 33. Frequency of past 12 month drinkers needing a first drink in the morning to get going during the past 12 months, by women

Frequency of needing a first drink in the morning to get going during the past 12 months among past 12 month drinkers							
age groups (years)	Women						
	n	% monthly or more frequently	95% CI	% less than monthly	95% CI	% never	95% CI
18-44	25	19.4	3.7-35.1	10.2	4.5-15.9	70.4	59.0-81.8
45-69	4	18.8	0.0-79.4	0.0	0.0-0.0	81.3	20.6-100.0
18-69	29	19.3	1.6-37.0	9.2	4.1-14.3	71.4	58.0-84.9

Table 34. Frequency of family/partner problems due to someone else's drinking during the past 12 months among all respondents, by men

Frequency of family/partner problems due to someone else's drinking during the past 12 months among all respondents							
age groups (years)	Men						
	n	% monthly or more frequently	95% CI	% less than monthly	95% CI	% never	95% CI
18-44	301	0.7	0.2-1.2	10.7	6.5-14.9	88.6	83.9-93.4
45-69	226	1.2	0.0-2.7	2.2	0.3-4.2	96.6	93.4-99.8
18-69	527	0.8	0.2-1.4	8.6	4.3-12.9	90.6	85.8-95.4

Table 35. Frequency of family/partner problems due to someone else's drinking during the past 12 months among all respondents, by women

Frequency of family/partner problems due to someone else's drinking during the past 12 months among all respondents							
age groups (years)	Women						
	n	% monthly or more frequently	95% CI	% less than monthly	95% CI	% never	95% CI
18-44	335	0.5	0.0-1.0	9.9	3.8-16.1	89.6	83.0-96.3
45-69	293	0.2	0.0-0.5	2.6	0.8-4.4	97.2	95.1-99.3
18-69	628	0.4	0.0-0.8	7.2	2.4-11.9	92.5	87.3-97.6

Table 36. Frequency of family/partner problems due to someone else's drinking during the past 12 months among all respondents, both sexes combined

Frequency of family/partner problems due to someone else's drinking during the past 12 months among all respondents							
age groups (years)	Both Sexes						
	n	% monthly or more frequently	95% CI	% less than monthly	95% CI	% never	95% CI
18-44	636	0.6	0.1-1.1	10.3	5.3-15.4	89.1	83.5-94.6
45-69	519	0.6	0.0-1.2	2.5	0.9-4.0	97.0	94.9-99.0
18-69	1155	0.6	0.1-1.1	7.9	3.4-12.3	91.6	86.7-96.4

## 4.4 Kava consumption

Table 37. Percentage who consumed kava, by men

Kava consumption status					
age groups (years)	Men				
	n	% Drank Kava	95% CI	% ab-stainer	95% CI
18-44	301	20.5	14.3-26.6	79.5	73.4-85.7
45-69	226	11.9	3.5-20.3	88.1	79.7-96.5
18-69	527	18.3	12.9-23.8	81.7	76.2-87.1

Table 38. Percentage who consumed kava, by women

Kava consumption status					
age groups (years)	Women				
	n	% Drank Kava	95% CI	% ab-stainer	95% CI
18-44	335	1.5	0.0-3.2	98.5	96.8-100.0
45-69	293	0.7	0.0-1.7	99.3	98.3-100.0
18-69	628	1.2	0.0-2.7	98.8	97.3-100.0

## 4.5 Fruit and vegetables consumption

Table 39. Mean number of servings of fruit on average per day, both sexes combined

Mean number of servings of fruit on average per day									
age groups (years)	Men			Women			Both Sexes		
	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI
18-44	300	0.5	0.4-0.6	335	0.5	0.4-0.6	635	0.5	0.4-0.5
45-69	225	0.7	0.5-1.0	292	1.0	0.7-1.3	517	0.9	0.6-1.2
18-69	525	0.6	0.4-0.7	627	0.7	0.6-0.8	1152	0.6	0.5-0.7

Table 39. Mean number of servings of vegetables on average per day, both sexes combined

Mean number of servings of vegetables on average per day									
age groups (years)	Men			Women			Both Sexes		
	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI	n	Mean number of servings	95% CI
18-44	300	0.5	0.4-0.7	335	0.8	0.4-1.1	635	0.6	0.4-0.9
45-69	225	0.7	0.3-1.0	291	0.6	0.4-0.9	516	0.6	0.4-0.9
18-69	525	0.6	0.4-0.7	626	0.7	0.4-1.0	1151	0.6	0.4-0.9

Table 40. Percentage who consumed the specified number of servings of fruit and/or vegetables on average per day, by men

Number of servings of fruit and/or vegetables on average per day									
age groups (years)	Men								
	n	% no fruit and/or vegetables	95% CI	% 1-2 servings	95% CI	% 3-4 servings	95% CI	% ≥5 servings	95% CI
18-44	300	69.6	58.8-80.5	24.7	17.3-32.1	1.9	0.4-3.5	3.7	1.4-6.1
45-69	225	65.8	55.0-76.5	26.0	18.4-33.6	3.0	0.4-5.6	5.2	1.1-9.4
18-69	525	68.7	59.2-78.1	25.0	19.3-30.7	2.2	0.6-3.8	4.1	1.5-6.8

Table 41. Percentage who consumed the specified number of servings of fruit and/or vegetables on average per day, by women

Number of servings of fruit and/or vegetables on average per day									
age groups (years)	Women								
	n	% no fruit and/or vegetables	95% CI	% 1-2 servings	95% CI	% 3-4 servings	95% CI	% ≥5 servings	95% CI
18-44	335	63.3	56.7-69.8	28.5	20.6-36.3	3.7	2.1-5.2	4.6	1.0-8.3
45-69	292	53.0	41.8-64.2	30.3	26.2-34.5	13.0	0.5-25.5	3.7	1.3-6.0
18-69	627	59.4	54.3-64.5	29.2	23.2-35.1	7.2	2.8-11.5	4.3	2.1-6.4

## 4.6 Dietary salt

Table 42. Percentage who self-reported how much salt they consumed, by men

Self-reported quantity of salt consumed											
age groups (years)	Men										
	n	% Far too much	95% CI	% Too much	95% CI	% Just the right amount	95% CI	% Too little	95% CI	% Far too little	95% CI
18-44	299	3.9	2.3-5.4	11.4	7.4-15.4	73.8	67.5-80.1	8.1	5.9-10.4	2.8	1.3-4.4
45-69	220	0.3	0.0-0.8	4.7	3.0-6.4	71.2	61.6-80.7	14.4	9.3-19.5	9.4	2.8-16.0
18-69	519	3.0	1.7-4.3	9.7	5.8-13.6	73.2	67.3-79.1	9.7	7.1-12.2	4.5	2.5-6.4

Table 43. Percentage who self-reported how much salt they consumed, by women

Self-reported quantity of salt consumed											
age groups (years)	Women										
	n	% Far too much	95% CI	% Too much	95% CI	% Just the right amount	95% CI	% Too little	95% CI	% Far too little	95% CI
18-44	334	2.5	1.0-4.0	17.8	11.0-24.5	68.5	59.4-77.7	8.1	5.1-11.1	3.1	1.0-5.2
45-69	290	0.6	0.0-1.5	6.3	2.7-9.9	68.6	56.7-80.5	13.0	5.3-20.6	11.5	4.9-18.1
18-69	624	1.8	0.4-3.2	13.5	8.2-18.7	68.6	59.2-77.9	9.9	5.4-14.5	6.2	3.0-9.4

Table 44. Percentage who stated the different importance of lowering salt in diet, by women

Importance of lowering salt in diet							
age groups (years)	Men						
	n	% Very important	95% CI	% Somewhat important	95% CI	% Not at all important	95% CI
18-44	294	85.3	81.9-88.7	9.1	6.4-11.9	5.6	3.8-7.3
45-69	221	90.1	85.2-95.1	7.9	3.5-12.3	2.0	0.0-4.0
18-69	515	86.5	83.5-89.5	8.8	6.5-11.2	4.7	2.7-6.6

Table 45. Percentage who stated the different importance of lowering salt in diet, by women

Importance of lowering salt in diet							
age groups (years)	Women						
	n	% Very important	95% CI	% Somewhat important	95% CI	% Not at all important	95% CI

18-44	331	85.8	81.2-90.4	8.9	6.6-11.2	5.4	2.1-8.6
45-69	293	88.5	83.3-93.6	9.1	5.2-13.1	2.4	0.5-4.3
18-69	624	86.8	82.1-91.5	9.0	6.4-11.5	4.2	1.5-7.0

## 4.9 Physical Activity

Table 46. Minutes spent in sedentary activities on average per day, by men

Minutes spent in sedentary activities on average per day					
age groups (years)	Men				
	n	Mean minutes	95% CI	Median minutes	Inter-quartile range (P25-P75)
18-44	300	179.5	164.6-194.4	120.0	60.0-240.0
45-69	225	190.1	159.3-221.0	120.0	90.0-240.0
18-69	525	182.1	166.5-197.7	120.0	60-240.0

Table 47. Minutes spent in sedentary activities on average per day, by women

Minutes spent in sedentary activities on average per day					
age groups (years)	Women				
	n	Mean minutes	95% CI	Median minutes	Inter-quartile range (P25-P75)
18-44	334	213.3	165.9-260.7	180.0	80.0-300.0
45-69	293	189.7	156.6-222.7	150.0	90.0-240.0
18-69	627	204.4	161.7-247.2	170.0	80.0-300.0

## 4.11 History of diabetes

Table 48. Percentage of those previously diagnosed with diabetes who had seen a traditional healer, both sexes combined

Currently taking herbal or traditional treatment for diabetes among those previously diagnosed									
age groups (years)	Men			Women			Both sexes		
	n	% taking trad. meds	95% CI	n	% taking trad. meds	95% CI	n	% taking trad. meds	95% CI
18-44				22	9.4	0.0-25.2	31	5.7	0.0-16.1
45-69				48	14.0	6.0-22.0	71	9.6	4.8-14.5
18-69				70	12.2	4.4-20.0	102	8.0	3.0-13.0

Table 49. Percentage of those previously diagnosed with diabetes who were currently taking herbal or traditional treatment

Currently taking herbal or traditional treatment for diabetes among those previously diagnosed									
age groups (years)	Men			Women			Both sexes		
	n	% taking trad. meds	95% CI	n	% taking trad. meds	95% CI	n	% taking trad. meds	95% CI

18-44	9			22	14.1	0.3-27.9	31	8.6	0.0-17.9
45-69	23			48	11.5	5.5-17.5	71	9.4	5.6-13.3
18-69	32			70	12.5	4.7-20.3	102	9.1	4.3-13.9

## 4.18 Physical measurements

Table 50. Minutes spent in sedentary activities on average per day, both sexes combined

Mean heart rate (beats per minute)									
age groups (years)	Men			Women			Both Sexes		
	n	mean	95% CI	n	mean	95% CI	n	mean	95% CI
18-44	285	73.8	72.5-75.1	314	78.0	76.3-79.7	599	75.6	74.3-76.9
45-69	218	76.6	74.2-79.0	278	75.8	74.4-77.2	496	76.2	74.5-77.9
18-69	503	74.8	73.7-75.9	592	77.0	76.0-78.1	1095	75.8	74.8-76.8

## 4.19 Physical measurements

Table 51. Mean fasting plasma glucose (mg/dl)

Mean fasting plasma glucose (mg/dl)									
age groups (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-44	263	77.2	71.1-83.2	293	81.2	77.6-84.7	556	78.8	74.1-83.6
45-69	207	94.7	82.1-107.3	267	105.5	96.2-114.8	474	100.2	89.5-110.8
18-69	470	83.2	77.0-89.4	560	91.5	87.8-95.2	1030	87.0	82.3-91.6

Table 52. Mean total cholesterol (mg/dl)

Mean total cholesterol (mg/dl)									
age groups (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-44	263	144.5	137.8-151.2	293	154.4	151.0-157.8	556	148.6	143.5-153.8
45-69	208	161.2	152.1-170.4	267	182.4	176.4-188.4	475	171.9	164.9-178.9
18-69	471	150.3	143.5-157.1	560	166.3	162.6-170.0	1031	157.5	152.5-162.5

Table 53. Mean HDL (mg/dl)

Mean HDL (mg/dl)									
age groups (years)	Men			Women			Both Sexes		
	n	Mean	95% CI	n	Mean	95% CI	n	Mean	95% CI
18-44	262	24.8	20.8-28.9	292	32.0	24.9-39.0	554	27.8	22.6-33.1
45-69	207	24.4	18.3-30.6	266	28.4	24.1-32.7	473	26.4	21.3-31.5
18-69	469	24.7	19.9-29.5	558	30.5	24.5-36.5	1027	27.3	22.0-32.6

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