HEALTHY NATION 2012
BETTER NUMBERS FOR BETTER HEALTH

MINISTRY OF
HEALTH, ENVIRONMENT,
YOUTH, SPORTS & CULTURE
CAYMAN ISLANDS GOVERNMENT

WHO STEPS
Chronic Disease Risk Factor Survey 2012

CAREC
CARIBBEAN EPIDEMIOLOGY CENTRE

World Health Organization

Pan American Health Organization
Regional Office of the
World Health Organization

MESSAGE FROM THE MINISTER OF HEALTH

Since taking up office in 2009, one of my major concerns has been the amount of money that the government spends on the health care of our residents. Our health care budget is approximately 20 % of our national budget and this in part is due to the prevalence and the increase of non -communicable diseases amongst our residents. There has been a gradual shift in disease patterns over the years from communicable to non -communicable diseases. Diseases such as obesity, diabetes, high blood pressure, stroke and cancers present a major challenge to our health care system.

In order to effectively address this growing problem, we need to have some baseline data that will assist us in the development of programmes, services and policies to ensure that the appropriate interventions are made. With this in mind my Ministry decided to engage the services of PAHO and CAREC to assist the Cayman Islands in the implementation of the STEPS survey of chronic disease risk factors.

The results of the survey identified a large number of the population with three or more risk factors and therefore it is clear that a long term action plan is needed in order to address this growing epidemic of chronic diseases.

This is the first adult population based risk factor survey conducted in the Cayman Islands. I wish to thank our major sponsors, Cayman Islands Insurance Company (CINICO), British Caymanian Insurance Company, Cayman First and our supporting sponsors Fidelity, AON, Aetna and BAF without which this survey would not have been possible.

I would also like to express my sincere appreciation and thanks to the NCD Coordinating Committee, the Economics and Statistics Office, Caribbean Epidemiology Centre (CAREC/PAHO/WHO) for their technical support and guidance.

Let us hope that the findings of the report will urge us to do more and develop urgent action plans to improve the health and quality of life for all our residents.

Honourable J. Mark Scotland, JP
Minister for Health

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

BMI	body mass index
BP	blood pressure
CAREC	Caribbean Epidemiology Centre
CNCD	chronic non communicable disease
DBP	diastolic blood pressure
ESO	Economic and Statistics Office
HSA	Health Services Authority
MET	metabolic equivalent of task
NCD	non communicable disease
PAHO	Pan American Health Organization
PDA	personal digital assistant
SBP	systolic blood pressure
WHO	World Health Organization

EXECUTIVE SUMMARY

The Cayman Islands Non- Communicable Disease STEPS Risk Factor Survey the "Healthy Nation Survey" was the first of its kind conducted in the adult population age 25 -64 years.

The STEPS survey instrument is a tool used to collect data and measure chronic disease risk factors. Non communicable diseases are strongly associated with common lifestyle risk factors such as smoking, alcohol consumption, consumption of fruit and vegetable, a diet rich in fats, sugars and salt and physical inactivity. If, as a country, efforts are not made to mitigate or reduce the occurrence of these diseases, then our mortality and morbidity rates will continue to rise.

The key objectives of the survey were:
- To have a robust and reliable database of the CNCD Risk Factors present in the Cayman Islands;
- To build capacity in the Cayman Islands to conduct future surveys;
- To ascertain the current levels of risk factors for chronic diseases in this population;
- To assess and weight the relative burden of each contributing risk factor;
- To provide baseline data for monitoring and evaluation of future trends; and
- To collect data from which to predict likely future demands for health services.

A stratified random sample was used for the STEPS survey, with households selected from all enumeration areas. There are a total of 277 enumeration areas (EAs) in the Cayman Islands. The number of households selected was proportionate to the district size or number of households in each district. Within selected households the Kish method was used to randomly choose one eligible individual to be interviewed.

The sample frame included all households in the Cayman Islands that were counted in the 2010 Population and Housing Census. There were a total of 22,761 households counted in the Census; of this number 2,105 households were selected over the six districts of the three islands.

It was proposed to conduct Steps 1, 2 and 3 of the survey. Step 1 included core and expanded questions to include basic socio demographic and behavioural information such as age, sex, literacy, tobacco use, alcohol consumption fruit and vegetable consumption and physical activity. Expanded questions included employment status, household income, past 7 days drinking, and oil and fat consumption.

Step 2 also included core and expanded questions and involved physical measurements such as weight, height, waist circumference, blood pressure and heart rate.

Step 3 included the biochemical measurements of blood glucose and cholesterol. Unfortunately, Step 3 was not conducted as there were difficulties with the proposed times to collect the blood samples from the participants, and the availability of nurses.

The overall response rate from the survey was 61.6% representing a total of 1,297 participants.

Behavioral Risk Factors
Approximately 15% of the population currently smoke tobacco. Men (20.7%) were two times more likely than women (9%) to smoke. However, there was no significant difference between the age groups. Among those who currently smoke tobacco, the majority smoke on a daily basis (67.1%). A higher percentage of women (81.8%) than men (61.0%) smoke daily. There were no significant differences between the age groups. Although on average the mean age started smoking was 20 years, the older age group, 55-64 years starting smoking much later at 24 years.   Although, the Tobacco Law and Regulations have been in force since July 2010, approximately 10.8% of the population was exposed to smoke at the workplace on one or more days per week.

Alcohol consumption was high   among men; as was expected, alcohol use in the age group 25 -34 years was the highest among men who were current drinkers (persons who drank alcohol in the past 30 days). There was a significant difference among men (25.7%) and women (14.0%) who engaged in heavy episodic drinking (men who had 5 or more /women who had 4 or more drinks on any day in the past 30 days). There were no differences among the age groups for men; however, among women there was a slight difference among the age groups 55-64 (95%CI; 1.2-11.4) and 25-34 (95%CI; 11.9-27.0).

Most persons (men and women) would consume fruit and vegetable on average 4.7 and 5.1 days per week respectively; however, the servings were well below the recommended levels (recommended guideline is 5 portions of fruit and vegetable per day). When fruit and vegetable were consumed on those days, the mean number of combined fruit and vegetable servings was 1.4 for fruit and 1.5 for vegetable. The majority of the respondents 83.7% ate less than 5 servings of fruit and/or vegetables on average per day. The vast majority (84.9%) of respondents used vegetable oil for meal preparation.

A moderate level of physical activity is defined as 3 or more days of vigorous intensity activity of at least 20 minutes per day or, 5 or more days of moderate intensity activity or, walking of at least 30 minutes per day or, 5 or more days of any combination of walking, moderate or vigorous intensity activities achieving a minimum of at least 600 MET minutes per week.
A high level of physical activity is defined as vigorous intensity activity on at least 3 days per week or 7 or more days of any combination of walking, moderate or vigorous intensity activity.

Physical activity remains a topical issue; how do we get more persons outdoors to keep moving? The survey found that slightly less than half (47.9%) of both male and female respondents are classified as having high levels of physical activity. There were significant differences between male and female, 61.6% and 33.7% respectively in the levels of total physical activity.

More than a third (34.0%) of all respondents reported low levels of physical activity while almost a fifth (18.1%) of all respondents reported moderate levels of physical activity. As with low levels of physical activity, significantly more women (44.2%) were engaged in low levels of physical activity compared to men (24.0%).

Physical Measurements
The Body Mass Index (BMI) is an estimate of body fat and is a good gauge of your risk for diseases that can occur with more body fat. Mean body mass index for both sexes was 28.8kg/m² with no significant differences between sexes or age groups. A person is considered normal weight if their BMI is 18.5-24.9, overweight BMI 25.0-29.9 and obese BMI 30.0 and above. Among both sexes, more than a third (36.6%) were classified as obese and a larger percentage (70.6%) classified as overweight in the BMI classification. There were no significant differences between the sexes in the overweight category.

The mean blood pressure among the population including those currently on medication for raised blood pressure was 124.8/76.1 mmHg. A similar proportion of both men (27.1%) and women (24.2%) were among those with raised blood pressure (≥ 140/90 mmHg) who are currently on medication. Also, among both sexes, 15.8% of the population had raised blood pressure (≥ 140/90mmHg) who were not currently on medication.

Waist circumference helps screen individuals for possible health risks that come with overweight and obesity. A person is at a higher risk for heart disease and type 2 diabetes if most of their fat is around their waist rather than their hip. The mean waist circumference for women was 91.0 cm which is greater than the recommended cut-off point, 88cm (35 inches). The mean waist circumference for men was 93.8cm which is slightly less than the recommended cut off point, 102cm(40 inches).

Summary of Combined Risk Factors
The risk factors examined are as follows:
- Current daily smokers
- Less than 5 servings of fruits and vegetables per day
- Low level of activity
- Overweight (BMI≥ 25kg/m²)
- Raised blood pressure (SBP ≥ 140 and/or DBP ≥ 90 mmHg or currently on medication for raised BP

42.9% of respondents reported having three or more of the above risk factors with no significant differences   between men and women. It is interesting to note that in the most productive age group of 25 to 44 years, 39.2% also have three or more of the above risk factors.   These individuals are at high risk of developing chronic non-communicable diseases.

The Cayman Islands STEPS survey represents a major step towards gathering data that represents national information for the government, policy makers, health insurance providers   and other stakeholders to inform a national strategy for the prevention, control and management of NCDs. The survey has provided valuable information and evidence on risk factors of chronic diseases which support the high prevalence of NCDs seen among adults in the territory. The results indicate an urgent need to target specific groups in the population group with health education and health promotion for the prevention and control of NCDs. Some interventions that are cost effective to help to reduce risk factors for NCDs include enforcing no smoking policies in all public spaces by amending the Tobacco legislation, development of programmes to support smoking cessation, promoting and increasing media messages about diet and physical activity through GIS, create enabling environments that will promote and increase physical activity, encourage the participation of employees through their employer in wellness programmes,   promote annual screenings through the media/public health and encourage persons to get to know their numbers.

To address policy, it is recommended that the Ministry of Health should:

- Identify and earmark funds for ongoing NCD strategy implementation and monitoring.
- Introduce lower tariffs on the importation of fruit and vegetable.
- Increase the level and duration of physical activity in all schools at an early age.
- Improve the approach to primary health care by improving access to health care through full participation of each person at an affordable cost.
- Disseminate the findings of the survey to the health insurance providers, Chamber of Commerce and other non-health government sectors.

1   BACKGROUND

1.1   Population and Economy

The Cayman Islands is a British Overseas Territory located in the western Caribbean Sea, south of Cuba and northwest of Jamaica. It is comprised of three islands, Grand Cayman, Cayman Brac, and Little Cayman. The 2011 population estimates indicate that there were 55,517 persons living in the Cayman Islands of which the majority (95.9%) lived on Grand Cayman.

There are six administrative districts in the Cayman Islands, five of them are on Grand Cayman and the Sister Islands (Cayman Brac and Little Cayman) are considered as one district.   Approximately one half (51.4%) of the population live in George Town, which is also the capital. West Bay accounts for 20.3%, Bodden Town 19.0%, East End 2.7% and North Side 2.5%. The Sister Islands together account for 4.1% of the population.

Cayman Islands residents represent over 100 different nationalities and the official language is English. In 2010, GDP per capita was $46,695.90. The government receives the majority of its income from indirect taxation including duties levied on imported goods, and on financial transactions.   Residents do not pay any direct tax.

1.2   Health System

The Ministry of Health, Environment, Youth, Sports and Culture has the primary responsibility for developing health policies and programs, and providing health services through its various departments and authorities. The Health Services Authority provides direct primary, secondary and tertiary health care at the George Town Hospital and the specialized clinics on Grand Cayman. Primary and secondary services are also offered at Faith Hospital on Cayman Brac, while the four district clinics in Grand Cayman and one in Little Cayman offer primary health care services.

The Health Insurance Law, 2012, requires every resident of the Cayman Islands to have health insurance. Employers are responsible for providing health insurance for all of their employees and dependents who reside in the Cayman Islands. Self-employed persons must provide for their own and their dependents' health insurance. All health insurance coverage must be obtained through an approved health insurance company.

For the period January 2007 to December 2008, US$29M was spent by the Cayman Islands National Insurance Company (CINICO) on overseas patient referrals for healthcare services.   Of this amount USD$9.95M was paid for care related to cardiovascular diseases (CVD). Cardiology referrals accounted for the largest number of patients and the greatest expenditure on overseas care from the Cayman Islands. This cost does not include the amounts paid by other local private health insurance providers.

1.3   Chronic Non-Communicable Diseases, Cayman Islands

Mortality data for 2008 indicate that the leading causes of death were cardiovascular disease, heart disease, cancer, and respiratory diseases. Of the malignant neoplasms, breast cancer was the leading cause of death among women, while prostate and lung cancers were the leading causes of death among men.

With regards to morbidity, auditing of the Cayman Islands Hospital inpatient and outpatient visits for the year of 2008, disclosed that the top five chronic non communicable diseases are *Hypertension, Diabetes, Mental Disorders, Asthma, and Cancer.*

Although there was no population based risk factor data for the chronic non-communicable diseases (CNCD) for adults in the Cayman Islands, data are available for the school age population. In the Cayman Islands, all Year 6 Primary School students are screened as well as all children entering the education system for the first time (School Entry Screening). The screening process, which is undertaken by the Public Health Nurse, measures height and weight of each child and the data are collated by the School Health Coordinator for analysis by the Statistics Department of the Health Services Authority. The results indicated that there was a high level of obesity in this population (see Table 1) using the Centers for Disease Control (CDC) classifications. Such risk factors in the school population are considered sure predictors for the future development of CNCD in the Cayman Islands. Information on other risk factors was unavailable.

Table 1: Percent distribution of all school age children by nutritional Status (based on BMI), 2006 - 2010				
Year	Age	Obese	Overweight	Underweight
2006/2007	3-6 yrs	13.9	12.7	9.4
2007/2008	11-13 yrs	22	15	5.6
2008/2009	3-6 yrs	15.4	11.8	7.2
	11 - 13 yrs	22.6	15	5.5
2009/2010	3-6 yrs	13.5	15.7	8
	10 - 13 yrs	17.2	16.7	7.5
Source: Health Services Authority				

1.4   Chronic Non-Communicable Diseases, Global and Regional

According to the World Health Organization, 63% of all deaths worldwide in 2008 are due to the CNCDs which accounts for 36 million persons annually.   The WHO also predicts that if the present trend continues, this figure will rise to 52 million by the year 2030, and account for seven out of every ten deaths in developing countries by 2020. This also contributes to the years of potential life lost (YPLL), which is an index of the premature death and loss of productivity, as half of the deaths occurred in persons under the age of 70 years, the majority of which are women. The burden of the CNCDs globally has been estimated to be 85% in industrialized nations; 70% in middle income nations and 50% in the lower economic nations. In looking at the distribution of deaths due to CNCDs in the world population, it was seen that in 2008, 80% of deaths due to CNCD occurred in the middle and low income populations while 20% occurred in the higher income populations. Apart from deaths, countries also suffer economic losses due to the CNCDs, when the cost of the treatment, loss of productive time due to illnesses, and absenteeism are taken into account.

As far back as 2002, the WHO identified five risk factors for CNCDs as being among the top ten risks to health. These included raised blood pressure, raised cholesterol, tobacco use, alcohol consumption and being overweight. The social determinants of health were also among the risks identified. It was also estimated that if these primary (modifiable) risk factors were eliminated, 80% of the cases of heart disease, stroke and type 2 diabetes, and 40% of cancers could be eliminated.

In the Caribbean, non-communicable diseases contribute to the greatest burden of disease. The top five major causes of death are heart disease, cancers, diabetes, stroke and hypertension. Premature deaths from chronic diseases far exceed deaths from HIV and AIDS and injuries. Risk factors contributing to these diseases include obesity, sedentary lifestyles, poor nutrition, smoking and alcohol abuse. Recent studies indicate very high prevalence of these risk factors in the Caribbean population. These risk factors are preventable and appropriate interventions are needed if the Caribbean is to reduce the epidemic of chronic diseases.

The Port of Spain Declaration signed by Heads of Government in the Caribbean in September 2007 highlighted the need for planning for the prevention and control of chronic non-communicable diseases by countries based on evidence from the STEPS risk factor surveys.

2   RATIONALE

In order to plan appropriately for the prevention and control of NCDs and to allocate resources adequately, there was a need to conduct a population based survey on risk factors for these conditions. Such information will facilitate the provision of information to ensure adequate planning and allocation of resources for prevention and control of

chronic non-communicable diseases, and also facilitate the monitoring and evaluation of interventions implemented. The time had come to collect information which could provide information for development of a national action plan to address the increasing prevalence of chronic non-communicable diseases. A risk factor survey had never been conducted in the Cayman Islands and therefore no comprehensive data were available to assist with the planning and development of programmes. This survey, which provides information on the risk factors for chronic diseases, is the first of its kind to be conducted in the Cayman Islands.

The STEPS approach focuses on obtaining core data on the established risk factors that can determine the projected disease burden for chronic non-communicable diseases. It provides an entry point for low and middle income countries to get started on chronic disease surveillance activities and assist countries to build and strengthen their capacity to conduct surveillance.

The risk factors examined in the survey were the non-modifiable (demographics) and the modifiable risk factors (e.g. smoking, overweight/obesity, raised blood pressure, diet, physical activity, alcohol use, fruit and vegetable consumption, body mass index, waist circumference, etc.) which are behavioral.

Goals and objectives

- To have a robust and reliable database of the CNCD Risk Factors present in the Cayman Islands;
- To build capacity in the Cayman Islands to conduct future surveys;
- To ascertain the current levels of risk factors for chronic diseases in this population;
- To assess and weight the relative burden of each contributing risk factor;
- To provide baseline data for monitoring and evaluation of future trends; and
- To collect data from which to predict likely future demands for health services.

A Steering Committee was established for the purpose of guiding the preparation and conduct of the Steps Survey. Preparation for the Health Risk Factor Survey started with the convening of a Committee meeting in November 2011 which included representatives from the Ministry of Health, the Health Services Authority and the Economic and Statistics Office. This committee was responsible for preparing the survey documents and procedures.

An implementation plan (survey proposal document) was developed, which included a budget of $135,000. A communication strategy was also prepared with the assistance of the Government Information Services. This strategy included arrangements for use of

electronic and print media (TV and radio talk shows, internet advertisement) and posters for promotion of the survey.

3   METHODOLOGY

The STEPS methodology is a standardized approach to data collection of risk factors for chronic disease. It involves the assessment of behavioral and biological risk factors and is hierarchical, consisting of three steps as follows:

- Step 1: information on demographics, alcohol use, fruit and vegetable consumption, physical activity and tobacco smoking, dietary salt, family history of chronic disease conditions, among others;
- Step 2: measurements of weight, height, waist circumference and blood pressure; and
- Step 3: biochemical measurements of blood glucose and total cholesterol.

In the Caribbean, it is recommended that all countries conduct Step 1 and Step 2 of the survey, and to include Step 3 if resources are available.   The Cayman Islands committee agreed to include Steps 1, 2 and 3 in the survey.

3.1   Study Population

The Committee agreed that the study population will include the 25 to 64 years old population as was recommended by the Caribbean Epidemiology Centre (CAREC/PAHO/WHO).

The Pan American STEPS questionnaire (Appendix 1) was adopted along with the expanded questions and optional modules on the following:

- Demographic information and expanded questions
- Tobacco Use and expanded questions
- Alcohol Consumption and expanded questions
- Diet and expanded questions
- Fruit and vegetable consumption
- Physical activities and expanded questions
- History of Raised Blood Pressure and expanded questions
- History of Diabetes and expanded questions
- History of Raised Cholesterol
- Family History
- Dietary: Knowledge, attitudes and behavior towards dietary salt
- Health Screening for the prevention of cancer and included prostate and rectal examination, breast cancer knowledge, breast exam, mammogram and pap test screening)
- Tobacco Policy Module

The section on demographic information was modified to include a question on Caymanian Status and the revised options on ethnic groups and household income.

The completed questionnaire was uploaded on personal digital assistants (PDA) which were used to administer the questionnaire. A set of flash cards (Appendix 2) showing standard servings of fruit and vegetable, and the different types of physical activities were also developed to use during the interview.

Step 2 included the physical measurements:

- Height
- Weight
- Waist circumference
- Blood Pressure

One of the expanded questions, Heart Rate, was also included since this measurement was automatically given with the blood pressure readings.

The following equipment were purchased for the conduct of Step 2:

- Stadiometers (Seca)
- Digital scales (Seca)
- Tape measure (Seca)
- Blood pressure monitors (OMRON Hem 712C)

Duffle bags were also purchased to transport the equipment.

Step 3 involved biochemical measurements which include:

- Fasting Blood glucose
- Total blood cholesterol

Step 3 ran concurrent with Steps 1 and 2 such that participants were asked to attend (with their consent in writing) one of the clinics at the next available clinic day following the visit by the interviewers.

The blood sample was taken in the mornings at the local district clinic using the equipment recommended; Roche Accutrend Plus to measure fasting blood glucose and lipids. This was performed by a team of nurses under the supervision   of a Registered Nurse or Nurse Practitioner. There were six district clinics across the three islands that participated in the fieldwork for Step 3 of the survey.

3.2 Sampling

Sample design
A stratified random sample design was used for the STEPS Survey, with households selected from all enumeration areas (EAs). There are a total of 277 enumeration areas (EAs) in the Cayman Islands. The number of households selected was proportionate to the district size or number of households in each district. Within selected households the Kish method was used to randomly choose one individual to be interviewed. .

Sample Frame
The sample frame included all households in the Cayman Islands that were counted in the 2010 Population and Housing Census. Households that responded to the census questionnaire, fully or partially, as well as those that refused to respond and where no contacts were made, were counted and included in the sample frame. There were 22,761 households counted in the 2010 Census. A register comprising of detailed addresses for all households in the frame was used to draw the sample.

Sampling Procedure
The sample was selected from the updated Household Register of completed addresses for each dwelling. The data was sorted by district and block and parcel[1], and then the desired number of households selected randomly within districts. The districts are administrative boundaries, identical to parish in most Caribbean countries. The Cayman Islands are divided into six (6) districts. They are as follows:

- George Town
- West Bay
- Bodden Town
- North Side
- East End
- Cayman Brac & Little Cayman

Each selected household was given a unique sample number. This number was assigned based on the ordering of the list of households by district. All households with even numbers were selected for Step 3.

The SPSS complex sample program was used to randomly select 2,105 households from the sample frame. The list was sorted by district and block and parcel, and then the desired number of households selected within each district. The final sample of households was distributed into district as shown below.

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[1] The Lands and Survey Department -operated Land Information System has divided the Cayman Islands into a series of blocks which are further subdivided into parcels. Every spot on the three islands could be defined by a block and parcel number. The Cayman Islands Economics and Statistics Office used this information, in addition to a physical street address, to locate households in the islands.

Sample size

The STEP template for estimating sample size was used, assuming a 75% response rate, and 50% prevalence rate. Random sampling (design effect 1) produced a sample size of 1,957 households using 4 strata, (strata represents the bands of age group) or 4,098 households using eight strata. It was agreed to use the random sampling with four strata, and round up to 2,000 households (see Table 2). The actual sample size of 2,105 households was used for the Steps Risk Factor Survey, Steps 1 and 2, and represented about 9% of all households on the Islands. The optimum size given the prevailing constraint will provide adequate and reliable results for the Islands.

Table 2: Summary of variables used for the sample size	
Variable	**Value**
Response rate	0.75
Design effect	1
Margin of error	0.05
Level of confidence	1.96
Strata	4
Probability	0.5

Only 50% of the households sampled for Steps 1 and 2 were included in Step 3. Therefore, every even numbered household in the overall sample was identified and comprised the 1,053 households that were chosen to participate in Step3.

Table 3: Distribution of total and sampled households by district						
	Total Households		**Sampled Households**		**Final Samle Size**	
District	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Total	**22,765**	**100**	**2,000**	**100**	**2,105**	**100**
George Town	12,239	53.7624	1,084	54.2	1,127	53.5
West Bay	4,579	20.1142	400	20.0	422	20.0
Bodden Town	3,864	16.9734	335	16.8	354	16.8
North Side	553	2.42917	47	2.4	52	2.5
East End	519	2.27982	44	2.2	51	2.4
Sister Islands	1,024	3.92269	90	4.5	99	4.7
Source: Economics and Statistics Office						

The selected household addresses were shaded on enumeration area maps printed by the Cayman Islands Lands and Survey Department. This allowed for easy identification of selected households in the field. Maps were created in duplicates for each enumeration area; one for each team of interviewers and a copy for the field supervisor.

Only one person between the ages of 25 to 64 was selected from each sampled household to respond to the questionnaire (Step 1) and also to participate in Step 2. The following persons were not eligible for selection:

- younger than 25 years or older than 64 years
- Mentally challenged
- Bedridden
- Visibly pregnant

Interviewers recorded in the PDA, the age and sex of all persons in the 25 to 64 age group in the household, and used the Kish Method to randomly select one of the eligible persons for the survey. The interviewer informed that person of all that was involved, including the procedures for all three Steps and got consent from that person before proceeding. If consent was received, the interviewer conducted a face to face interview using the questions uploaded on a Personal Digital Assistant (PDA), and recorded the responses on the same device.

When the interview was completed, the respondent proceeded to complete Step 3, if selected.

3.3   Staff Recruitment and Training

Recruitment of data collectors for the Risk Factor survey began at the end of March 2012. Area Coordinators (ESO staff) were asked to recommend the best interviewers that had worked on the 2010 Census. Committee members were also asked to recommend Health Services Authority (HSA) staff. A total of 60 persons were selected for training, including four (4) as field supervisors, who had worked as Area Coordinators in the 2010 Census. Almost, all of the trainees had fieldwork experience. The selected HSA personnel also participated in the training.

The training of data collectors was scheduled for five (5) days, and started April 23, 2012. Training sessions were held in the evenings from 4:00 – 8:00 p.m. Representatives from CAREC/PAHO/WHO facilitated the training and were assisted by ESO and HSA personnel. The training focused on the use of the Kish method in selecting a participant from a household with more than one eligible participant, administering the questionnaire, use of the PDA, taking measurements of height, weight, waist circumference and blood pressure, and basic interviewing procedures and techniques.

Due to the unavailability of some of the equipment required for training, the last day of training was postponed from April 27 to May 9, 2012 to allow time for purchase and

shipment. CAREC's representatives were not available for the last day of training; however, ESO and HSA personnel facilitated the training on that day.

During the break between training, data collectors were given the PDAs for three (3) days to pilot the questionnaire. On the last day of training, feedback from this exercise was discussed and practical exercises in the use of the stadiometer for measuring height were conducted.

At the end of the training, data collectors were assigned in teams of two and were introduced to their team member and Field Supervisor. Many of the team members had been working together during the training and had developed a working relationship. There were 22 teams of data collectors scheduled to work on Grand Cayman.

The field supervisors distributed survey documents and equipment and arranged meeting schedules with their teams of interviewers. Each Field Supervisor was responsible for the supervision of at least five (5) teams.

A separate training was held in Cayman Brac for four (4) data collectors. The training was facilitated by ESO and HSA personnel, and was held at the Hospital Conference room from May 10 to 11, 2012. The survey documents and equipment were distributed to the two teams on the last day of training. These two teams were scheduled to work in Cayman Brac and Little Cayman.

3.4   Survey Implementation

Data Collection Schedule
Data collection for the Risk Factor survey began on May 14, 2012 and was scheduled for eight (8) weeks. The 2,105 selected households were divided among the 22 teams of data collectors in Grand Cayman and two (2) teams in Cayman Brac (Appendix 3). George Town had 12 teams of data collectors and two field supervisors. West Bay had five (5) teams of data collectors and a field supervisor, and Bodden Town, East End and North Side together had five (5) teams of data collectors and a field supervisor. The two (2) teams of data collectors in Cayman Brac were supervised by the survey coordinator, and they were responsible to conduct interviews in Little Cayman, as well.

Interviewing Procedure
As a part of their assignment, each team was given the following:

- Listing of households, which identified those that should be included for Step 3,
- Maps of the enumeration area
- Other survey documents
- PDA to administer the questionnaire and record responses for Steps 1 and 2
- Equipment for the physical measurements in Step 2

They were also given T-shirts with the survey logo, which made them easily identifiable, as well as identification cards.

Data collectors were required to visit each household on their listing and introduce themselves and the survey. If a household had more than one person age 25 to 64 years, a single person was randomly selected to participate in the survey using the Kish method. If the household had only one eligible person, there was no need to conduct Kish and that person would be the one interviewed. Information concerning the survey was shared with the participant and his consent to participate must have been given by signature before the data collector proceeded with the interview.

If the participant consented to participate in Step 2 (physical measurements), the data collector conducted the required measurements and gave the participant a feedback form with the results of his/her height, weight, waist circumference and blood pressure. If the participant's blood pressure was elevated, or BMI above the required limit, the data collector was advised to refer the participant to the Primary Healthcare Nurse Manager or the Community Dietician for a free medical consultation.

The household listing had preselected households identified by grey shading to indicate the households selected to do Steps 1, 2 and 3. At the time of the visit of the data collectors to these households, the participant was informed that he/she had been selected for Step 3 and consent was sought from the participant for Step 3. Once consent was given, the data collector gave the participant an appointment card to visit the clinic.

In the planning phase it was proposed to have the participants selected for Step 3 attend the clinic between the hours of 7:30am and 8:30am to avoid long waiting times; however, after several discussions it was agreed that the participants would attend the clinic during the normal operational hours.

Once the participant presented a signed consent form for Step 3 at the clinic, they were seen by a Registered Nurse who verified that they have been fasting from 10pm the night before. The Accutrend Plus machine was used to measure the blood glucose and total cholesterol levels. The readings were documented on a survey form which was kept in the clinic and the participant was given the result in writing on the specified form developed for the survey. Any participant whose blood glucose and/ or cholesterol levels were elevated was referred to one of the General Practitioners for an initial free medical consultation.

Fieldwork and supervision
On a weekly basis, data collectors submitted their PDA and Interview Tracking Forms to their field supervisor. For the most part, this was done consistently. Field supervisors revisited households and assisted data collectors who experienced difficulties in administering the questionnaire/measurements, and any other issues encountered in the field.

Field supervisors downloaded the information from the PDAs and entered information from the tracking form into an Excel spreadsheet. The information from the spread sheet was used to get an indication on the progress of the fieldwork.

The survey coordinator reviewed the tracking form information on a weekly basis to monitor the overall progress of the data collection.   Progress reports and issues encountered in the field were discussed at weekly meetings with the survey coordinators and field supervisors. The survey coordinator prepared regular fieldwork notes for the field supervisors who disseminated them to the data collectors. These notes were also copied to others involved in the survey.

At the end of the scheduled eight-week data collection phase, it was agreed that data collection should be extended to allow for at least a 60 % response rate.   A thorough review of the response by team was conducted and special emphasis was placed on those teams that were far below the target. Additional data collectors were assigned to assist in three (3) areas where the teams were below target, and the 'sweep' lasted for two weeks.

3.5   Data processing

Information from the PDA was downloaded on a weekly basis and stored in a file that was created for each team.   At the end of the data collection phase, the 24 files, one for each team, were saved in SPSS and merged into one file. The SPSS merged file was cleaned to identify duplicate records, empty records and to check for consistency of the data. Most of the errors detected were linked to incorrect participant ID numbers and missing information on the number of eligible participants. Also, during the exporting of the data to SPSS some of the information on height was lost due to rounding. All of these were corrected before the survey data were finalized.

3.6   Weighting

Weights are a necessity for all sample-based surveys and these were calculated for the STEPS dataset to allow for the generalization of the results to the entire adult population (25-64 years).

The "Individual" weight was derived by taking the inverse of the probability of selection for each participant. The probability of selection was calculated as the probability of selection for the household in each district multiplied by the probability of selection of the individual in each selected household, that is:

- Individual weight (W1) = (Total number of households in the each district /Number of sample households in the each district) * (Number of eligible persons in the each selected household /1).

A "post-stratification adjustment" weight was also calculated based on the age/sex distribution of the population. This was needed to adjust the age/sex distribution of the sample to the target population. Data from 2011 end-of-year population estimates were obtained by age and sex for persons aged 25-64 years old. Population figures were determined for 8 groups; four 10-year age groups by sex. The formula used for calculating the population weights in each age/sex group is given below:

- Population weight (W2)= (# in age-sex group in population / total population) / (# in age-sex group in sample/ total sample)

The overall weight for each record was comprised of the two weights multiplied together: the individual weight and the population weight, that is:

- Overall weight = W1 * W2.

3.7   Analysis information

The data was first exported from the EpiData software into SPSS. In SPSS each record was checked for completeness. The data was reconciled with the entries on the Interviewer tracking form. There were many cases where the participants ID were incorrectly entered on the PDA and so had to be manually corrected in the data file. Blanks, incomplete records and real duplicate cases were removed. Range checks were performed on some variables and those values corrected, e.g., year of birth, age, height and weight. This process took about one week to complete.

EpiInfo 3.4.3 was used to analyze the data. Using predesigned macros, most of the results generated are presented as means or percentages, with associated standard errors and derived confidence intervals. The results were produced on a one pager Fact Sheet (Appendix 4).

For this report, charts and graphs are present for easier interpretation. Except for the demographics section, weighted data were presented in the report. The counts presented in the tables, however are based on the sample results.

4   LIMITATIONS

4.1   Fieldwork

The first week of data collection was below the expected target due to inclement weather which persisted into the second week. There were also complaints of many 'no

contacts' especially among participants selected by the Kish.   These complaints continued throughout the data collection phase.

4.2   Referrals

Although interviewers were asked to make referrals for free medical consultation when they identified a respondent with elevated blood pressure and/or high BMI, there was no appointment card or anything else in place to facilitate the referral process.   Only if the respondent were randomly selected for Step 3 would an appointment card be issued. This created some problems since those who were not selected for Step 3 but have elevated blood pressure and/or high BMI had no appointment card to take to the clinic. There was a case where an appointment card was issued to a person with elevated blood pressure but that person's sample number was not on the list to be included for Step 3 and service was denied. This was later corrected.

There was a change in the schedule of appointments for Step 3 biochemical measurements, which was not adequately communicated. Furthermore, there were no special arrangements for respondents to get immediate attention when they visited the clinic. They had to join the regular queue at the clinic. Due to this arrangement, a number of persons left the clinic without having their biochemical measurements taken.

4.3   Analysis

Unfortunately, the response to Step 3 was very low and the biochemical measurements collected were not sufficient to make statistical significant analysis. Therefore, the analysis focused only on the results of Steps 1 and 2.

5   RESULTS

5.1   Demographics

Age group and sex
There were a total of 1,295 persons 25-64 years who responded to the chronic disease risk factor survey. Women accounted for 53.9% of the respondents and men 45.9%. There were more women than men in each of the age groups, except among those 55-64 years, which had more men. The highest proportion of women was among the 25 to 34 age group (62.9%).

Table 4a: Age group and sex of respondents 25 to 64 years, 2012					
Age Group	Total	Men		Women	
		n	%	n	%
Total	**1,295**	**595**	**45.9**	**698**	**53.9**
25-34	280	103	36.8	176	62.9
35-44	441	184	41.7	257	58.3
45-54	372	166	44.6	205	55.1
55-64	202	142	70.3	60	29.7
Source: 2012 Health Risk Factor Survey					

Table 4b: End of year population estimated for age group 25 to 64 by sex, 2011					
Age Group	Total	Men		Women	
		#	%	#	%
Total	**37,140**	**18,340**	**49.4**	**18,800**	**50.6**
25-34	10,058	4,882	48.5	5,176	51.5
35-44	13,286	6,875	51.7	6,411	48.3
45-54	9,400	4,671	49.7	4,729	50.3
55-64	4,396	1,912	43.5	2,484	56.5
Source: ESO 2011 Compendium of Statistics					

The age and sex distribution of the respondents was slightly different from the 2011 end of year population estimates, which shows almost equal distribution of men and women for each age group, except for those 55-64 years (Table 4b).

Ethnicity and Caymanian status
Most of the respondents (44.7%) stated that their ethnic group is Black, while 16.1 % said that they are White, and 13.2% Indigenous Caymanian.   Among the 55-64 age group, the Indigenous Caymanians accounted for 20.3%;   this is the highest proportion of Indigenous Caymanians compared to their proportion in other age groups.   The

question on ethnicity is not usually included in the census or the annual Labour Force Surveys. Therefore, there is no other source of recent information on ethnicity for the population of the Cayman Islands for making comparisons.

More non-Caymanians (698) than Caymanians (595) participated in the survey. This was the case in all age groups except among those 55-64 years which had 142 Caymanians compared to 60 non-Caymanians responding to the survey. The distribution by status among the respondents was similar to the 2011 end of years estimates (Table 5b.)

Table 5a: Caymanian status of respondents by age group and sex, 2012

Age Group	Total	Caymanian		Non-Caymanian	
		n	%	n	%
Total	1,293	595	46.0	698	54.0
25-34	279	103	36.9	176	63.1
35-44	441	184	41.7	257	58.3
45-54	371	166	44.7	205	55.3
55-64	202	142	70.3	60	29.7

Source: 2012 Health Risk Factor Survey

Table 5b: End of year population estimated for age group 25 to 64 by status, 2011

Age Group	Total	Caymanian		Non-Caymanian	
		#	%	#	%
Total	37,140	16,969	45.7	20,171	54.3
25-34	10,058	3,444	34.2	6,614	65.8
35-44	13,286	5,419	40.8	7,867	59.2
45-54	9,400	4,803	51.1	4,597	48.9
55-64	4,396	3,302	75.1	1,094	24.9

Source: ESO 2011 Compendium of Statistics

Education
The mean number of years of schooling among respondents was 13 years, and this was the same for both men and women. There was very little difference among the age groups. Nearly half of the respondents have a college/university education (44.8%).

Figure 1: Percent respondents with college/university education by age group and sex, 2012
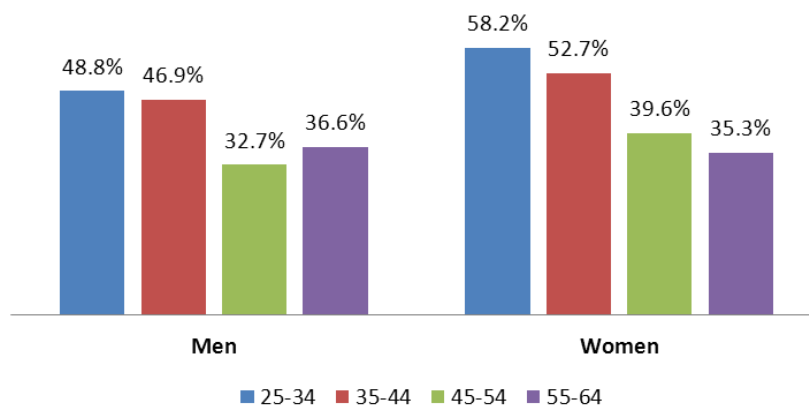
Older respondents were less likely to have a college/university education. The majority of those 25-34 years (54%) and 35-44 years (50.1%) have attained this level of education. However, a lower percentage of those in the older age group 45 to 54 (36.3%) and 55-64 years, (35.8 %.) were educated at this level. The highest percentage of respondents with a college/university education was women 25-34 years (58.2 %).

Marital Status

When asked about their marital status, 54.8% of the respondents stated that they are currently married. The rate was higher among men (62.9%) than women (48.3 %.) A comparison by age group and gender indicates that men 45 to 54 years had the highest rate of marriage (72.2%) among men, while women 35 to 44 years had the highest rate (50.6%) among women. Forty percent of the respondents in the age group 25-34 years reported never been married. A higher percentage of women, compared to men, have been divorced or have never been married.

Employment

The majority (90.2%) of respondents were working during the 12 month reference period. They worked mainly as non-government employees (68%), while 13.5% worked as government employees and 8.7 % were self-employed. Men were more likely than women to have been self-employed, 12.6 % compared to 5.6%. This was the case for all age groups except among those 25-34 years, where the likelihood of being self-employed was the same for men and women. Men 55-64 years (22.2%) were the most likely to report being self-employed (Fig. 2).

**Figure 2: Percent self-employed by age group and sex, 2012**
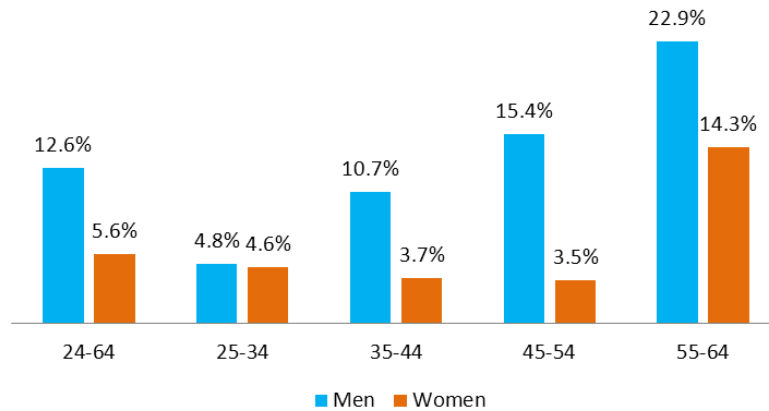
Among the respondents who did not work, most of them stated that they were able to work (34.9%), 33.3% were homemakers, 21.4% retired, and 4% were students. None of the men were engaged as home-makers, compared to 43.5 % of women who were so engaged.

Household income

Results on the estimated household income indicate that more than half of the respondents (53%) lived in households with income amounting to less than $57,600, with just over a quarter (25.6%) in the range of $57, 600 to $115,199 per year (Fig. 3).

**Figure 3: Percent respondents by household income, 2012**

- $0-$19,199
- $19,200 - $57,599
- $57,600 - $115,199
- $115,200 - $191,999
- $192,000 +
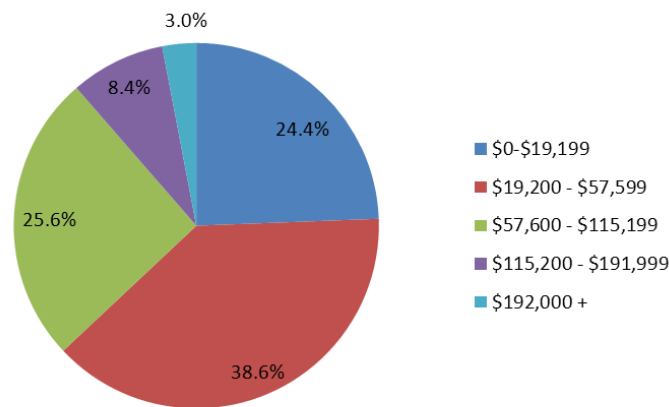
Those with household income of $115,200 or above accounted for 11.4 % of the respondents.

5.2   Tobacco Use

Current Smokers

Results from the survey indicate that 15% of the population 25-64 years currently smoke tobacco. Men were two times more likely than women to smoke tobacco, 20.7%, (95% CI 15.8–25.6)) and 9% (95% CI 5.8 -12.2), respectively, (Fig. 4). However, there was no significant difference between the age groups. Among the 25-34 years, 17.6%, (95%CI 9.7-25.6) of them were currently smoking compared to 14.4% (95%CI 8.3 - 20.6) of those 35-44 years and 15.7% (95%CI 12.0 -19.4) of the 55-64 years age groups.

Figure 4: Percent population 25 to 64 years who currently smoke tobacco, 2012
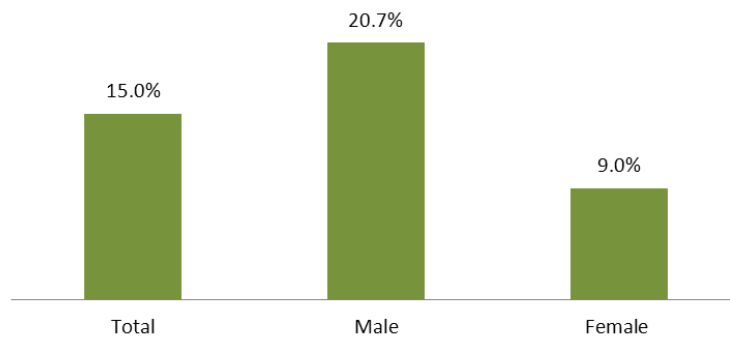
Daily Smokers

Among those that currently smoke,   the majority of them, 67.1% (95%CI 58.3-75.9) smoked tobacco daily. Overall, there was no significant difference in the proportion of men (61.0%, 95%CI 53.7-68.2) and women 81.8% (95%CI 64.5-99.0) who said they smoked daily (Fig.5). Interestingly, more women, 35-44 years, 79.35% (95%CI 72.4-86.3) smoked daily as compared to men 52.4% (95%CI 42.3-62.4) in the same age group (Fig. 5).

Figure 5: Percent current daily smokers among smokers 35 to 44 years by sex, 2012
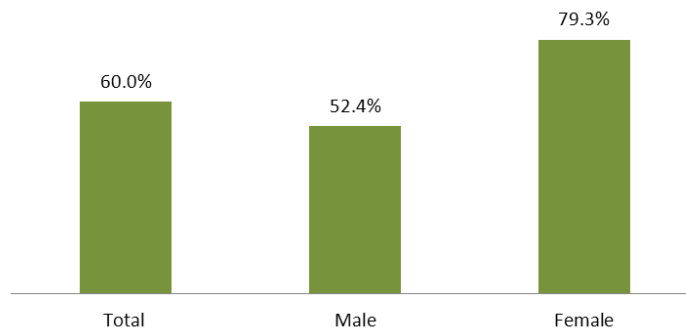
Mean age started smoking and number of cigarettes smoked

For both men and women, current smokers started smoking tobacco at an average age of 20 years. Further analysis by age group shows that those 25-34 years started smoking at approximately 18 years of age, (17.6 years, (95%CI 16.5-18.7)), which is significantly different when compared to when persons in the older age group, 35-44 years (20.3 years, (95% CI 19.4-21.3)) started smoking.

Figure 6: Mean number of cigarettes used by daily smokers by age group, 2012
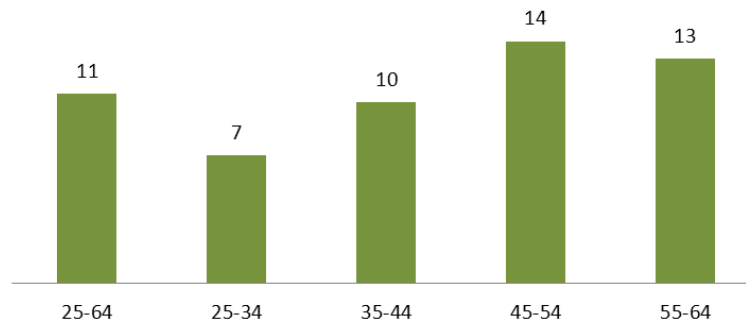
The daily smokers smoked an average of 11 manufactured cigarettes per day. Again, there was no significant difference in the number of cigarettes that men (11.4) (95%CI 9.4-13.4) and women (9.6) (95% CI 7.3-12.0) smoked daily. However, older persons 55-64 years generally reported smoking more cigarettes per day (12.8) (95%CI 10.6-15.1) when compared to the 25-34 years old 7.3 (95% CI 5.0-9.5). (Figure 6)

Ex-daily smokers

Approximately a third (31.8 %, 95%CI 27.6-36.0) of ex-daily smokers 25-64 years quit smoking on average 16.1 years ago (95% CI 13.9-18.3). There was no significant difference in the percentage of men and women ex-daily smokers who reported that they quit smoking. Among men, there were 33.4% (95%CI 27.5-39.4) ex-daily smokers compared to 28.7 % (95%CI 20.6 – 36.7) of women, (Table 6).

Table 6: Percent ex daily smokers by age group and sex, 2012

Age Group(years)	Men		Women	
	% ex daily smokers	95% CI	% ex daily smokers	95% CI
25-34	34.3	12.4-56.2	25.7	19.6-31.8
35-44	29.8	16.5-43.1	24.3	11.9-36.7
45-54	30.4	22.6-38.2	33.8	20.5-47.2
55-64	46.9	37.7-56.0	40.5	24.4-56.7
25-64	33.4	27.5-39.4	28.7	20.6-36.7

Exposure to second-hand smoke

Nine percent of the population reported being exposed to second-hand smoke in their homes, while 10.8 % indicated that they were exposed to second-hand smoke in the work place. There was no difference in exposure to cigarette smoke at home when compared by sex, 10 % of men (10.0% 95% CI 6.6-13.4) compared to 8.2% of women (95%CI 7.3-9.0).   Similarly, there was no difference in exposure to cigarette smoke by sex in the workplace, 13.8% (95%CI 7.8-19.8) of men reported exposure in the workplace compared to 7.7% (95%CI 3.5-11.9) of women.

5.3   Tobacco Policy

More than fifty percent (52.4%, 95%CI 43.0-61.7) of the population reported noticing information on the dangers of smoking cigarettes or that encourages quitting in the newspapers or magazines. An even higher percentage (67.5%, 95%CI 58.2-76.8) reported noticing information about the dangers of smoking cigarettes or that encourages quitting on television. Approximately twenty five percent (24.8%, 95%CI 19.0-30.7) of the population reported noticing advertisements and/or signs promoting cigarettes in stores where cigarettes are sold; on the other hand only a small percentage (≤ 2.5%, 95%CI 1.5-3.5) of the population in both sexes indicated that they noticed any form of cigarette promotion such as free samples, sale prices, special discounts or clothing with branded cigarette logo.

Among the age group 25-64 years, 86.7% (95%CI 77.1-96.4) of both sexes reported noticing health warnings on cigarette packages and of that number 72% (95%CI 61.4-82.6) thought of quitting after reading the warning labels. The cost of a pack of 20 cigarettes varied from a low of $5.50 to a high of $9.10; the mean average price paid for a packet reported by both sexes was $7.40.

5.4   Alcohol Consumption

The percentage of the population who are lifetime abstainers was 22.0% (95%CI 19.8 – 24.0). Less men were likely to be lifetime abstainers 15.8%, (95%CI; 12.3 – 19.3) than women 28.4%, (95%C1; 23.3 – 35.5).   Women age 45 years and older were more likely to be lifetime abstainers than their counterpart. Conversely, there was no significant difference in the lifetime abstinence among the sexes age 25-44 years.

Figure 7: Percent lifetime abstainers from alcohol drinking by age group and sex, 2012
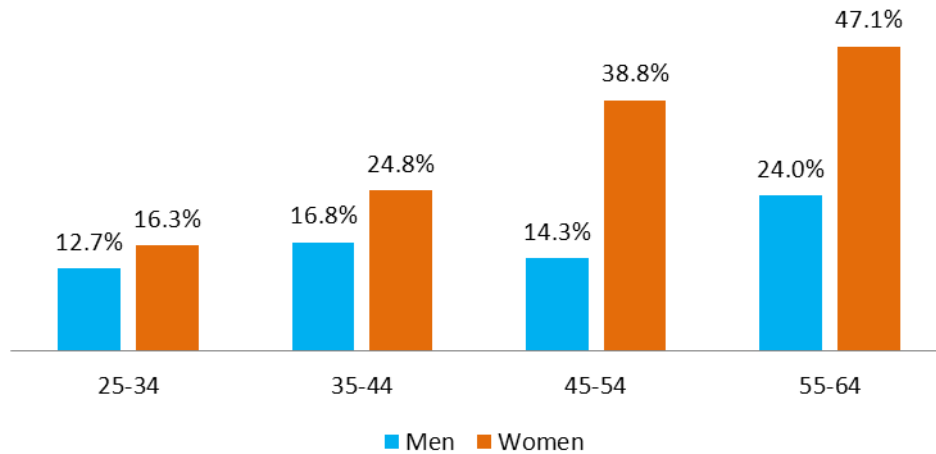
In terms of those who abstained in the past 12 months, 12.7% (95%CI; 11.6-13.9) of the surveyed population reported not having a drink. Overall, there were no significant differences between men and women when it came to abstinence in the past 12 months, 11.4% of men abstained (95%CI; 7.5 – 15.3) compared to 14.2% women (95%CI; 11.1 – 17.3). However, women were more likely to abstain in the past 12 months in the 35-44 age group 14.2% (95%CI; 7.5- 20.9) compared to men 5.1% (95%CI; 4.6-5.6) in the same age group. (Table 7).

Table 7: Percent abstainers in the past 12 months, by age group and sex, 2012

	Men		Women		Both Sexes	
Ager Group (Years)	% Past 12 months abstainer	95% CI	% Past 12 months abstainer	95% CI	% Past 12 months abstainer	95% CI
25-34	9.4	3.6-15.3	9.4	6.4-12.4	9.4	6.8-12.1
35-44	5.1	4.6-5.6	14.2	7.5-20.9	9.2	5.5-13.0
45-54	18.6	7.9-29.3	17.7	15.1-20.3	18.2	12.1-24.3
55-64	20.5	12.7-28.2	18.9	11.4-26.3	19.6	15.9-23.3
25-64	11.4	7.5-15.3	14.2	11.1-17.3	12.7	11.6-13.9

The survey results show that the percentage of the population who reported current alcohol use (drank alcohol in the past 30 days) is 51.5% (95%CI 47.6 – 55.3). More persons in the younger age group, 25-34 (59.7% (95%CI 52.1-67.3) and 35-44 56.4% (95%CI (49.3 – 63.6) reported drinking alcohol in the past 30 days than persons in the 45-54 (44.2% (95%CI 39.5-48.9)) and 55-64 (31.8 %(95%CI 27.2-36.4)) age groups. The highest percentage of current drinkers was reported in the 25-34 year age group, 59.7% (95% CI 52.1-67.3). The lowest percentage of current alcohol use was reported within

the 55-64 year age group, 31.8%, (95%CI 27.2-36.4). More men (43%, 95%CI 36.2-50.8) were likely to consume alcoholic drink in the past 30 days than women (22.3% 95%CI 14.9-29.7) in this age group.

Table 8: Alcohol consumption status by age group, 2012

Age Group	n	% Current drinker (past 30 days)	95% CI
25-34	279	59.7	52.1-67.3
35-44	441	56.4	49.3-63.6
45-54	371	44.2	39.5-48.9
55-64	201	31.8	27.2-36.4
25-64	1292	51.5	47.6-55.3

The proportion of men 63.0% (95% CI; 58.1 – 67.9) who reported current drinking was greater than women 39.4% (95%CI; 31.9 – 46.9).   However, in the highest drinking age group, 25-34 years, there was no significant difference in drinking habits between men and women. There were no significant differences among women in all age categories as it relates to alcohol consumption status. However, almost 40 % said they had consumed alcohol during the past 30 days (CI 95% 31.9-46.9).

Figure 8: Percent current drinker (past 30 days) by age group and sex, 2012
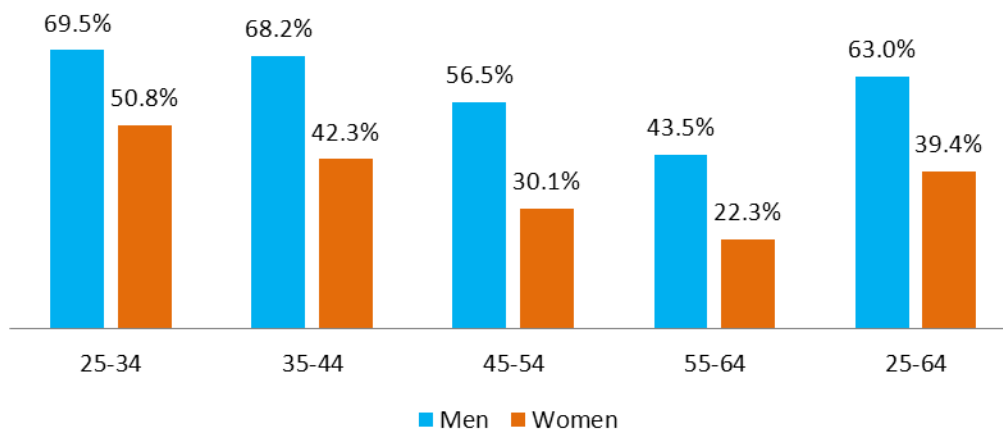
Daily consumption of alcohol among the population was low, reported at 3.8% (95%CI; 2.2-5.4). The highest percentage of daily drinkers were men and women within the ages of 55-64, which account for 15.4% (CI 95% 0.0-31.7) and 7.7% (CI95%; 0.0-21.7) respectively. However, there were no significant differences among the age groups with respect to their consumption patterns (Table 9).

Table 9: Frequency of daily alcohol consumption in the past 12 months

|	Frequency of alcohol consumption in the past 12 months					
	Men		Women		Both Sexes	
Age Group	n	%	n	%	n	%
25-34	101	1.8	112	2.4	213	2.1
35-44	153	3.5	144	1.8	297	2.8
45-54	115	4.8	88	5.3	203	5
55-64	48	15.4	40	7.7	88	12.1
25-64	417	4.2	384	3.1	801	3.8

A larger portion of men, 25.7% (95% CI 16.9-34.6) than women, 14.0% (95%CI 11.5-16.4) engaged in heavy episodic drinking (men who had 5 or more /women who had 4 or more drinks on any day in the past 30 days). Heavy episodic drinking or binge drinking is associated with an increased risk of chronic diseases.

Overall, among both sexes, the average number of drinking occasions in the past 30 days among current drinkers was 5.7 (CI 95%; 5.1-6.3).

5.5   Fruit and vegetable consumption

In a typical week the mean number of days that fruit is consumed is 4.8 and the mean number of days that vegetables are consumed is 5.1 (Fig. 9). Although fruit and vegetable are consumed most days per week, the mean number of servings of fruit and/or vegetable on an average day is 2.8, less than the minimum recommendation of 5 servings of fruit and vegetable per day (Fig. 9). On average all respondents consumed 1.4 servings of fruit and 1.5 servings of vegetables per day (Fig. 9). There were no significant differences by sex or age group with respect to these findings.

Figure 9: Mean number of days in a typical week and mean number of servings on average day that fruits and/or vegetables were consumed, 2012
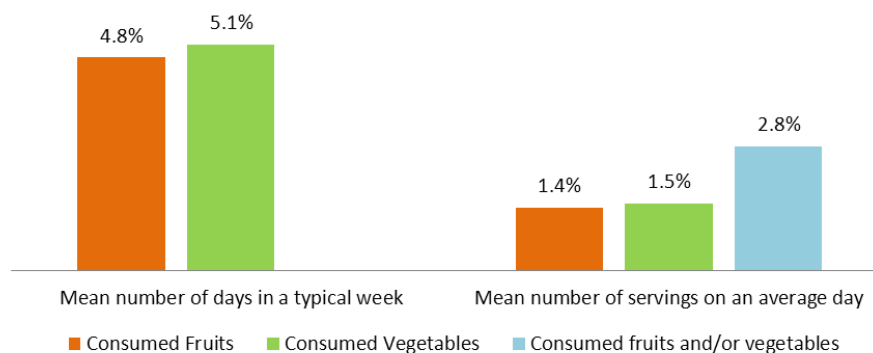
The majority (83.7%) of all respondents said they consumed less than 5 servings of fruit and/or vegetables on an average day. Only 16.3% of respondents consumed 5 or more servings of fruit and/or vegetables per day. The majority of respondents (44.7%) consumed 1-2 servings of fruit and/or vegetable per day. One quarter, (25%) consumed 3 to 4 servings per day, while 14% consume no fruit and/or vegetables per day. (Fig. 10)

Figure 10: Percent population by number of fruits and/or vegetables consumed on average per day, 2012
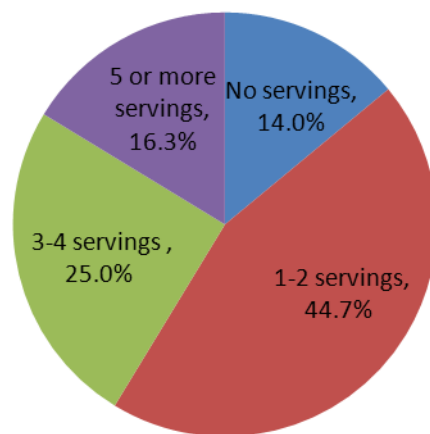
While these findings do not vary by sex, they do differ significantly by age group. A greater proportion of respondents from the youngest age group, 25-34 years old, (87.7%; 95% CI 83.9-91.6) consumed less than 5 servings of fruit and/or vegetables per day as compared to the oldest age group, 55-64 years old (76%; 95% CI 70.7-81.2).

Similarly, a higher percentage from the youngest age group (47.1%; 95% CI 39.4-54.8) consumed only 1-2 servings fruit and/or vegetables per day compared to the oldest age group (31.9%; 95% CI 27.9-35.9). Conversely, a greater proportion of the oldest age group (24%; 95% CI 18.8-29.3) consumed five or more servings fruit and/or vegetables per day versus the youngest age group (12.2%; 95% CI8.4-16.1).
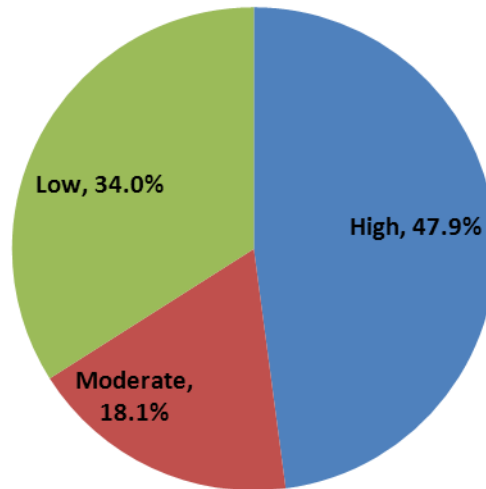
5.6   Physical Activity

Levels of total physical activity
Slightly less than half (47.9%) of both men and women were classified as having high levels of total physical activity (Fig. 11). A high level of physical activity is defined as vigorous-intensity activity on at least 3 days achieving a minimum of 1500 MET (metabolic)-minutes/week or 7 or more days of any combination of walking, moderate,

or vigorous-intensity activities achieving a minimum of at least 3000 MET-minutes per week.

Figure 11: Percent Population by level of physical activity

More than a third (34%) of all respondents are classified as having low levels of physical activity, while almost a fifth (18.1%) of all respondents are classified as having moderate levels (Fig. 11). A moderate level of physical activity is defined as 3 or more days of vigorous-intensity activity of at least 20 minutes per day, or 5 or more days of moderate-intensity activity or walking of at least 30 minutes per day, or 5 or more days of any combination of walking, moderate, or vigorous-intensity activities achieving a minimum of at least 600 MET-minutes per week.

Figure 12: Percent population by level of physical activity and sex, 2012
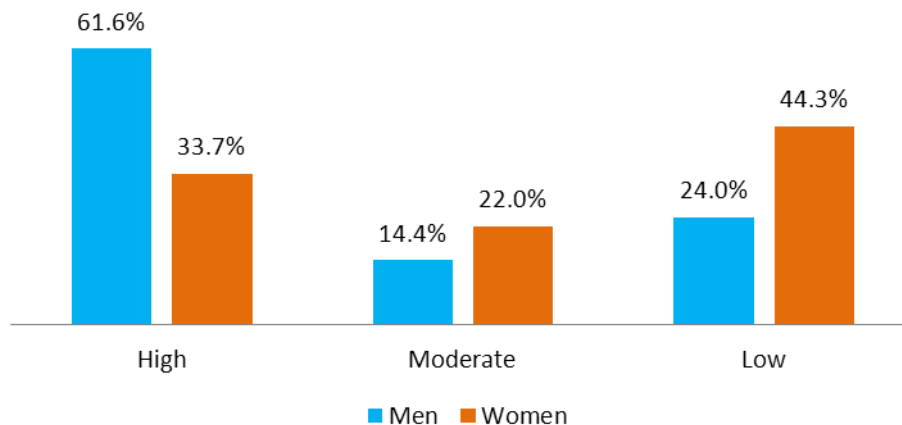
Almost half of women (44.3%; 95% CI 38.1-50.4) are classified as having low levels of physical activity compared to only 24% (95% CI 20.1-27.9) of men, which represents a significant difference. Conversely, significantly more men (61.6%; 95% CI 56.5-66.8) have high levels of physical activity than women (33.7%; 95% CI 29.1-38.3). (Figure 12).

Twenty-two percent (22%; 95% CI 19.3-24.7) of women are classified as having moderate levels of physical activity while 14.4% (95% CI 12.1-16.6) of men have moderate levels. Although this represents a significant difference between sexes, there is no difference among age groups.

A significantly greater proportion of the youngest age group of both sexes, 25-34 years (52.5%; 95% CI 47.3-57.6), have high levels of physical activity in comparison to the oldest age group, 55-64 years old (35.6%; 95% CI24.1-47.1).

Figure 13: Percent population with low level of physical activity by age group and sex, 2012
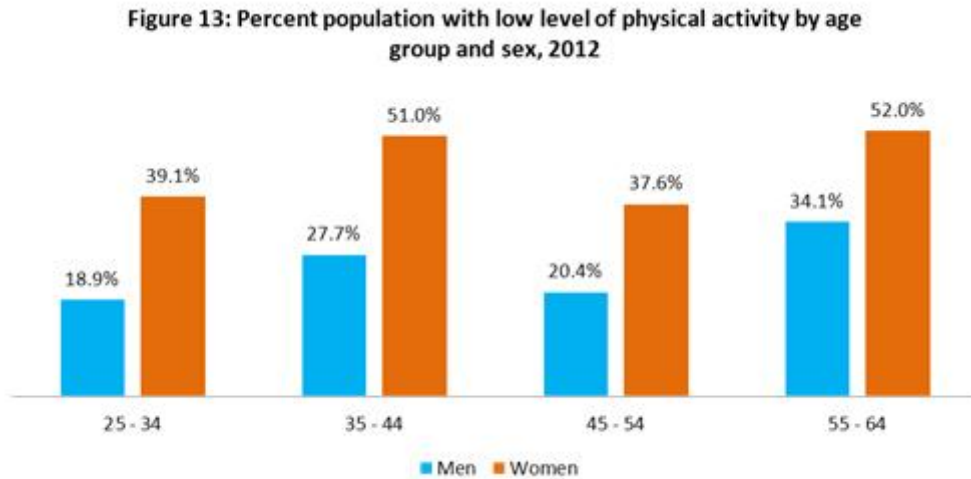
There are no significant differences in low levels of physical activity between age groups in women. As is expected, significantly more of the oldest age group of men, 55-64 years old (34.1%; 95% CI 27.9-40.2), have low levels of physical activity compared to the youngest age group, 25-34 years old (18.9%; 95% CI 15.2-22.5), (Fig. 13).

5.7 History of Raised Blood Pressure, Diabetes, and Raised Cholesterol

The majority of persons (96.3%) reported having had their blood pressure measured at some time, only 3.1% reported never having had their blood pressure measured.

Of those measured, 70.1% reported not being diagnosed with hypertension, and 27.0% admitted being diagnosed with hypertension. The prevalence of self-reported hypertension in the Cayman Islands is 27%.

Almost a fifth (17.1%) reported having their hypertension diagnosed recently (within the past 12 months), with 9.7% indicating that they were diagnosed outside of that period.

Of the persons diagnosed with hypertension, almost half (49.3%) reported to be taking medication and have taken it in the past 2 weeks. There was no significant difference between the sexes in the proportion who reported having taken their medication within that period, but there was a difference within the age groups. The highest proportion is in the age group 55-64 years, (77.5%; 95% CI 70.2-84.9) and the least proportion in the age group 25-34 years (15.4%; 95% CI 6.4-24.3).

With regards to diabetes mellitus (DM), almost a quarter 24.5% (95% CI 22.3-26.8) of the population reported never having had their blood sugar measured. Of those measured, 66.5% reported not being diagnosed with DM, while 10% admitted to having been diagnosed with DM. The prevalence of self-reported diabetes mellitus in the Cayman Islands is 10%.

More persons, 6.8% (95%CI 4.6-9.1) reported having their diabetes diagnosed within the past 12 months than those (2.2%) diagnosed outside of that period. Most persons diagnosed with diabetes mellitus (58.4%; 95% CI 48.8-67.9) reported taking oral medications while a smaller percentage, 13.0% (95% CI 5.1-20.9) reported taking insulin. The proportion of men and women taking insulin are similar, although more men (20.7%; 95% CI 11.3-30.1) reported taking insulin than women (7.5%; 95% CI 0.4-14.6). There were no significant differences between the sexes.

Only a minority of persons 19.0% (95%CI 14.5-23.5) reported that they have been told by a doctor or health worker that they had raised cholesterol. The majority of persons, 58.2% (95%CI 44.7-71.7) who reported having raised cholesterol were diagnosed within the last 12 months. There were no differences between the sexes or within the age groups. A third of the respondents (33.5%; 95%CI 27.9-39.1) diagnosed with raised cholesterol reported to be taking medication.

5.8 Family history of Chronic Disease

In both sexes, a high percentage of persons in the population had a family member who had been diagnosed with one of the following diseased conditions: high blood pressure (61.5%), diabetes mellitus (51.6%), cancer or malignant tumor (41.4%). More than a quarter indicated that they had a family history of raised cholesterol (29.5%) and stroke

(26.7%) with more than ten percent (10.8%) reporting a family history of early myocardial infarction.

Figure 14: Percent population with family history of chronic diseases by type of disease and sex, 2012
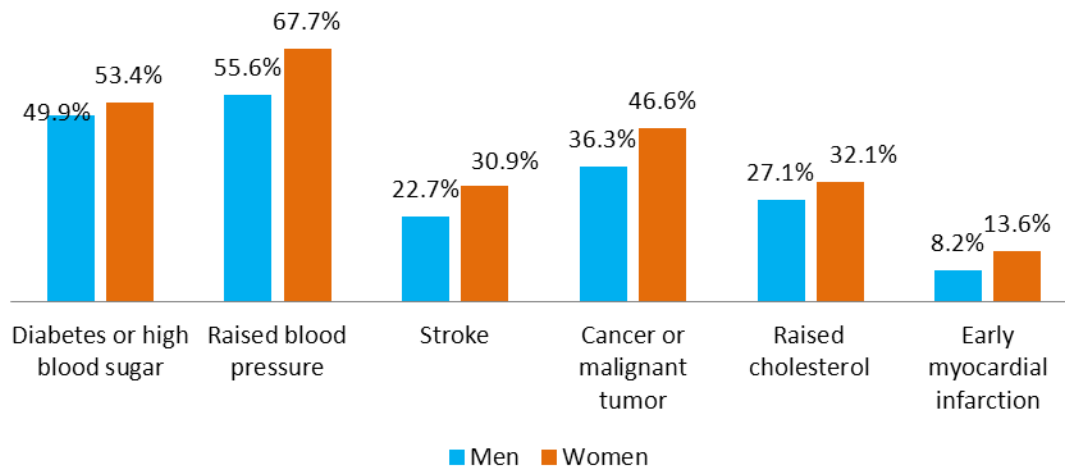
Among women, most of them had a family history of hypertension 67.7%, and diabetes mellitus 53.4%, followed by cancer or malignant tumor 46.6%, raised cholesterol 32.1%, stroke 30.9%, and early myocardial infarction 13.6% (Fig.14).

5.9 Dietary Salt

Just over one-tenth (11.1%, 95%CI 7.8-14.4) of the surveyed population reported adding salt always or often before eating or when eating; however, almost two-thirds of the population (63.6%, 95%CI 60.3-67.0) reported always or often adding salt when cooking or preparing food at home. Reported consumption of processed foods high in salt such as potato chips, instant noodles, spam, corned beef, was 12.4% (95% CI 10.7-14.1) among both sexes of the surveyed population.

It should be noted that 10.8% (95%CI 9.1-12.4) of men think they consume far too much or too much salt, whereas 15.3% (95%CI 11.8-18.7) of women think they consume far too much or too much salt. Just over three-quarters of both sexes (men 77%, 95%CI 69.6-84.3); women 74.9%, 95%CI 71.2-78.7)) think that they consume just the right amount of salt.

The majority of respondents agreed (94.0%, 95%CI 92.3-95.7) that too much salt in one's diet could result in serious health problems. Two-thirds (66.4%, 95%CI 58.0-74.8) of the population reported that it is very important to lower the intake of salt in the diet, but of note is that 90.4% (95%CI 85.2-95.7) of women in the age group 55-64 years reported that it is very important to lower the intake of salt in the diet.

In an effort to control salt intake, more than three-quarters of respondents reported avoiding and/or minimizing consumption of processed foods, having meals without adding salt at the table and used spices other than salt when cooking. Of concern, only 50.3% (95%CI 47.0-53.6) of persons surveyed reported looking at the salt or sodium labels on food when purchasing, buy low salt/sodium alternatives and avoid eating out.

5.10 Health Screening

The survey also investigated issues related to health screening for the prevention of cancer. In relation to screening for the prevention of prostate cancer, as was expected more men in the age groups 45 years and over indicated that they had had a prostate exam compared to men in the younger age groups (25-44 years). It should be noted that in the Cayman Islands, men are advised to get their first prostate exam at age 40 years.

Figure 15: Percent men who have had prostate exam by age group, 2012

Age group	Percent
25-34	20.2%
35-44	22.5%
45-54	55.3%
55-64	58.4%
25-64	34.1%
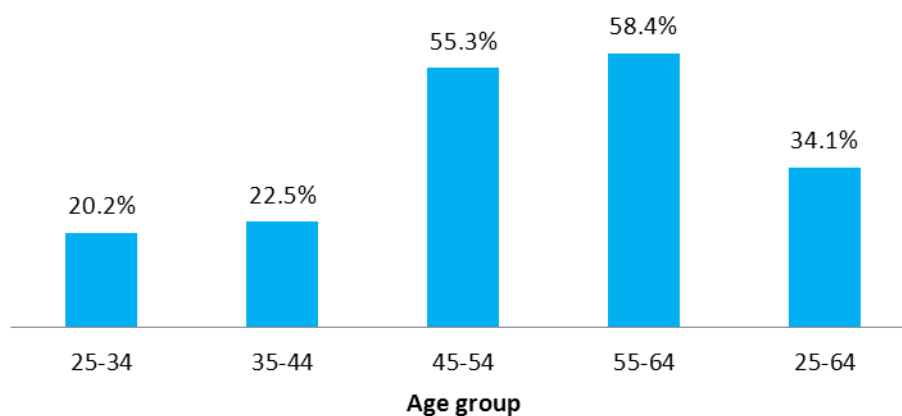
Approximately a quarter (25.5%, 95%CI 20.0-31.1) of the population reported having their faeces checked for hidden blood. Less than 15% (13.8%, 95%CI 12.6-15.1) reported ever having a colonoscopy.

A large percentage of women (85.8%, 95%CI 80.9-90.07) reported having been shown how to examine their breasts but 11.7% (95%CI 8.1-15.4) reported never having had a breast examination. Almost half (46.4%, 95%CI 43.4-49.3) of the women reported never having a mammogram with significant differences among the various age groupings. Approximately, 10% of respondents in the age group 55 – 64 years reported never having had a mammogram and 20% of respondents in the age group 45-54 never having had a mammogram.

Figure 16: Percent women reported taking mammograms, breast exams and cytological test by time tests were last taken, 2012
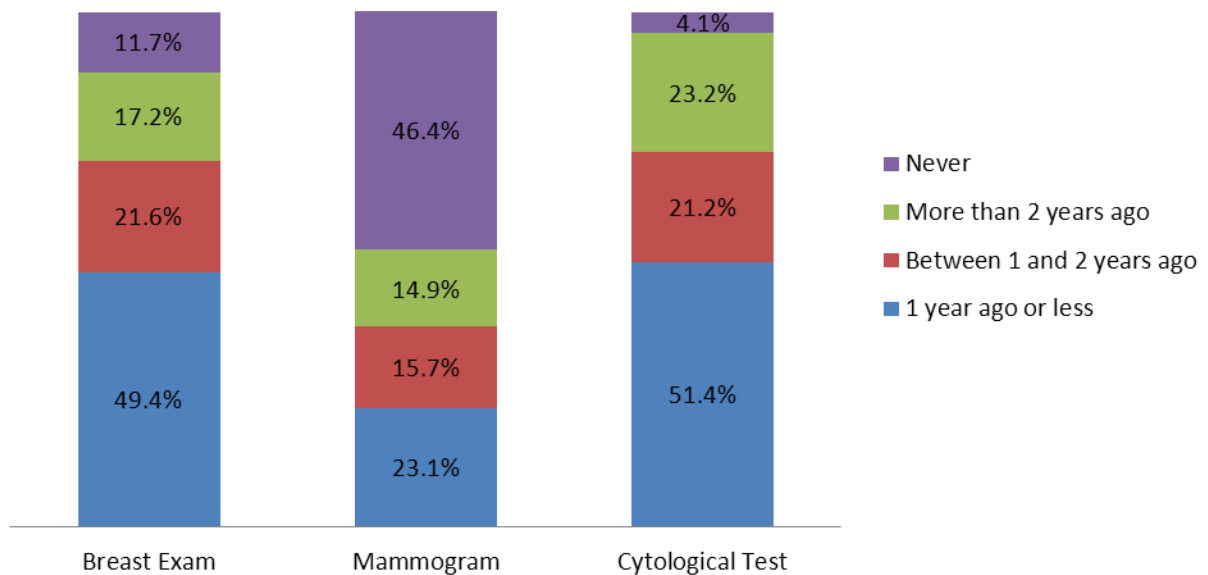
Almost 5 percent (4.1%, 95% CI 2.0-6.2) of women reported never having had a Pap test. Half of the women (51.4%, 95%CI 47.0-55.8) reported having had a Pap test one year ago or less, and a fifth (21.2%) had a Pap test between 1-2 years ago. Almost a quarter 23.2% (95% CI 19.1-27.4) reported having had the test more than two years ago.

5.11   Physical Measurements

Height, weight, and BMI

The mean Body Mass Index (BMI) of those ages 25-64 years was 28.8 kg/m^2 and classified as overweight. Although there were no significant differences between sexes or age groups, the mean BMI in women was 29.8 kg/m2 (95% CI 27.9-31.8), while the mean BMI in men was 27.8 kg/m2 (95% CI 27.6-27.9 kg/m2). (For BMI, normal weight is classified between 18.5-24.9 kg/m², overweight is classified between 25.0 -29.9kg/m² and obese is classified as ≥ 30 kg/m²).

BMI categories

In the age group 25-64 years, more than a third (36.6%) was classified as obese (BMI ≥30 kg/m2). A larger proportion (70.6%), classified as overweight   (BMI 25.0-29.9 kg/m2), with just over a quarter (27.4%) being classified as normal weight (BMI 18.5-24.9 kg/m2), and 1.2% being classified underweight (BMI <18.5 kg/m2).

A significantly greater proportion of the 45-54 year old age group (41.1%; CI 36.5-45.8) were overweight compared to the 25-34 year old age group (29.6%; 95% CI 22.9-36.3) and the 55-64 year old age group (28.7%; 95% CI 23.8-33.6).

Figure 17: Percent population by BMI category and sex. 2012
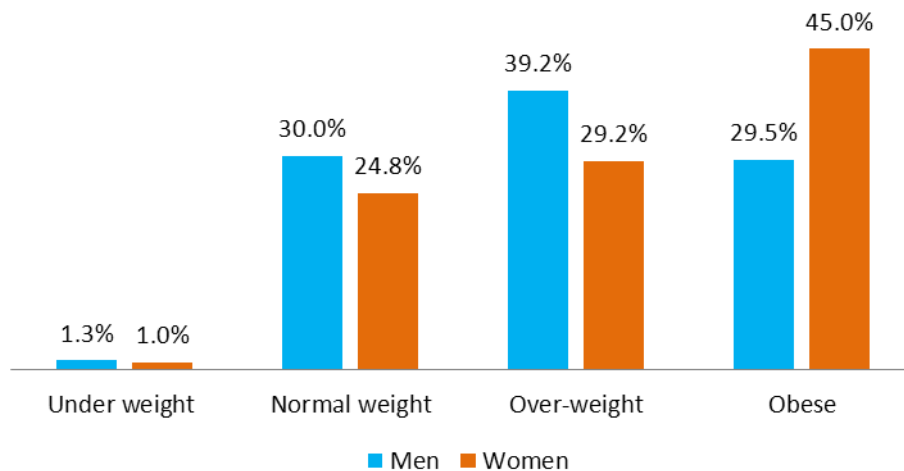
A significantly greater proportion of women were obese (45%; 95% CI 32.5-57.5) than men (29.5%; 95% CI 27.2-31.8). Conversely, a greater proportion of men were overweight (39.2%; 95% CI 36.2-42.1) than women (29.2%; 95% CI24.5-33.9) (Fig. 17).

Amongst men, there were no significant differences among the age groups in the overweight category.

Almost three-quarters, 71.4%, of all respondents are classified as overweight or obese (BMI ≥ 25 kg/m2). There was no significant difference between men (68.7%; 95% CI 66.3-71.0) and women (74.2%; 95% CI 60.9-87.5).

Waist Circumference
The mean waist circumference for women was 91 cm (95% CI 88.2-93.9), and the mean waist circumference for men was 93.8 cm (95% CI 90.1-97.5). Elevated waist circumference is > 88cm for women and > 102cm for men. There was no significant difference in the mean waist circumference between men and women, a finding which is concerning.

5.12 Blood Pressure

Mean blood pressure, including those currently on medication for raised blood pressure was 124.8/76.1 mmHg (Normal BP is classified as 120/80 mmHg and elevated BP is classified as ≥ 140/90 mmHg).

As was expected, further analyses showed the differences between the age groups to be significant, with the mean BP in the lower age groups being less than in the higher age groups in both men and women.

Figure 18: Percent population with raised blood pressure by use of medication and age group, 2012
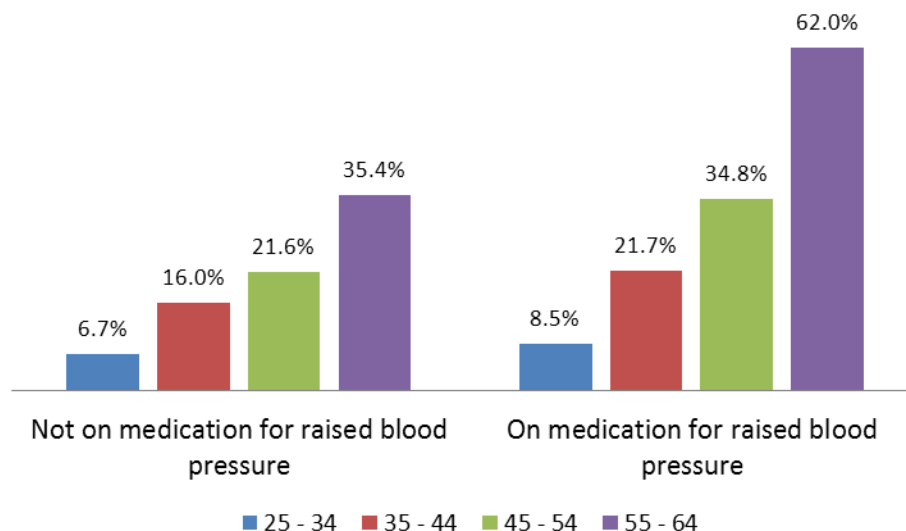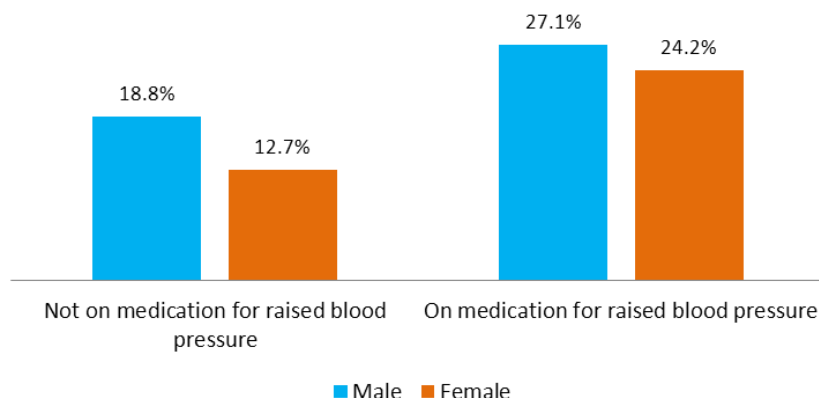
Figure 19: Percent population with raised blood pressure by use of medication and sex, 2012

The results indicated that 15.8% of the population (ages 25- 64 years) had a BP ≥140 and/or DBP ≥ 90 mmHg and were not on medication for raised blood pressure. The majority of these persons are women in the 55-64 years. The most significant difference between men was seen between the age group 25-34 years and those 35-44 years.

5.13 Combined Risk Factors

Five common and Modifiable Risk Factors were investigated during the STEPS Risk Factor Survey. They were

- Daily smoking,
- Eating less than 5 servings of fruits and vegetables,
- Low level of physical activity,
- Overweight (BMI≥ 25kg/m²),
- Raised blood pressure (SBP ≥ 140 and/or DBP ≥ 90 mmHg or currently on medication for raised BP).

Nearly a half of the population (42.9%, 95%CI 37.5-48.3) within the age group 25-64 years had three or more of the five risk factors.

In the age group 25-44 years, more than a third 39.2% (95%CI 30.9-47.5) of the population had three or more of the five risk factors while in the 45-64 years, half 49.4% (95%CI 42.6-56.2) had three or more of the five risk factors (Fig. 20).

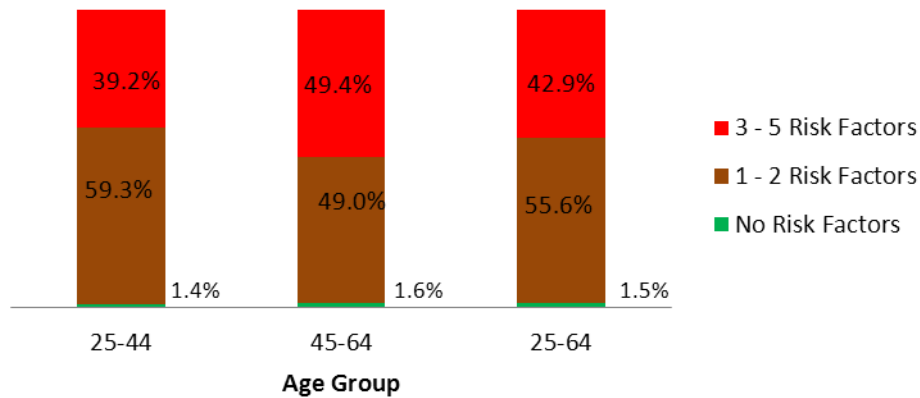## Figure 20: Percent population by number of risk factors and age group, 2012

Legend:
- 3 - 5 Risk Factors
- 1 - 2 Risk Factors
- No Risk Factors

Age Group	25-44	45-64	25-64
3 - 5 Risk Factors	39.2%	49.4%	42.9%
1 - 2 Risk Factors	59.3%	49.0%	55.6%
No Risk Factors	1.4%	1.6%	1.5%

Figure 21: Percent Population by number of risk factors and sex, 2012

Legend:
- 3 - 5 Risk Factors
- 1 - 2 Risk Factors
- No Risk Factors

	Male	Female
3 - 5 Risk Factors	41.2%	46.0%
1 - 2 Risk Factors	57.5%	51.8%
No Risk Factors	1.1%	2.3%
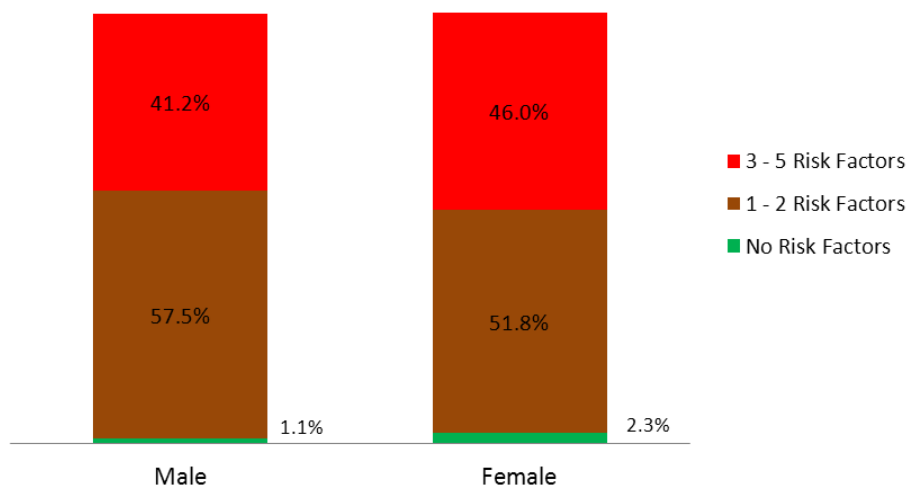
Of note, only 1.5% (95%CI 0.0-3.7) of the surveyed population were classified as low risk for non-communicable chronic diseases i.e. persons with none of the five risk factors; while more than half (59.3%, 95%CI 51.5-67.1) of the productive workforce population age less than 45 years had 1-2 risk factors .

6 DISCUSSION

The STEPS risk factor survey conducted has provided information that will assist the Cayman Islands in programme planning and development. All of the risk factors studied contribute   to the increased risk of chronic non-communicable diseases.

6.1 Smoking

Although only 15% of the population currently smoke, the rate of daily smoking was as high as 67% and even higher among women 81.8%. Smoking is a major risk factor for many chronic diseases and is linked to cancers and heart diseases. Therefore, more education will be required to discourage persons from smoking and to continue to educate young persons and women about the dangers of smoking. The Tobacco Law and Regulations have been in force since July 2010 and the National Drug Council continues to conduct educational sessions in the schools, but as a society even with the gains made, there is much work to be accomplished. Exposure to second-hand smoke is also a concern as persons reported that they were exposed to second-hand smoke in the workplace. Second hand exposure also increases the risk of heart disease. The Cayman Islands through the United Kingdom is a signatory to the Framework Convention on Tobacco Control (FCTC), as such even with the Tobacco legislation in place more enforcement and compliance are necessary to reduce persons exposure to second hand smoking.

6.2 Alcohol

Alcohol consumption remains high among men. This being a modifiable risk factor, there are many policies that can be introduced by the government that may assist with the use and abuse of alcohol. Excessive alcohol consumption has serious health, social, and economic implications. Heavy episodic drinking (binge drinking) is high among both sexes and because of the long term effects of alcohol misuse, this remains a major public health issue. It is recommended that individuals consume low to moderate levels of alcohol to avert increased morbidity and mortality.

6.3 Consumption of fruits and vegetables

Although fruits and vegetables were consumed on most days per week, persons are not aware of what constitutes a serving size; hence the consumption of adequate amounts of fruit and vegetable do not meet the required target of the survey. The recommended guidelines of five servings of fruits and vegetables per day are a protective factor against chronic diseases. The cost of fruit and vegetable are considered expensive by consumers and this may be one of the obstacles for higher consumption. Residents should be encouraged to do "backyard farming" where appropriate and to grow what they eat, since almost all fruit and vegetable are imported. There have been calls to the legislators to reduce the tariff on fruit and vegetable so as to make them more

affordable to the population. It is widely recommended that the Department of Agriculture and the Ministry of Finance partner with the Ministry of Health in this effort to help to lower costs and boost consumption.

6.4   Physical Activity

Although there are many outdoor activities involving physical activity in Cayman, the respondents reported that not many of them are engaged in physical activity. More men are active than women, and as expected, younger persons are more active than older persons. Physical inactivity contributes significantly to the burden of non-communicable diseases; more than half (53.9%) of both sexes reported not engaging in vigorous activity with a statistically significant difference between men and women. There is strong evidence that suggests that individuals who are more active have lower rates of heart disease, high blood pressure, type 2 diabetes and colon and breast cancer. They are also more likely to achieve ideal weight, have a healthier body mass and composition.

6.5   Physical Measurements

Most of respondents are overweight (BMI $\geq$ 25kg/m²), whereas 36.6% are obese (BMI$\geq$ 30kg/m²). 15.8 percent of the survey respondents had raised blood pressure and were not currently on medication. Adult obesity is associated with childhood obesity, if we intend to change and make an impact on the future generation; the change must start with the adults. Based on the findings women are more at risk for developing chronic diseases associated with obesity. With no significant differences in the waist circumference of men and women, and women spending less time in the number of minutes in daily physical activity, women are at an increased risk for developing chronic diseases in the Cayman Islands. Excess fat stored around the mid-section will determine and increase risk for high blood pressure, cardiovascular disease, diabetes and stroke. A modest weight reduction of as little as five percent of body weight can reduce high blood pressure. Obesity is a major risk factor for chronic diseases such as diabetes, heart disease and some cancers. Eating of energy dense foods (foods high in calories)   will cause overweight and obesity as well as low levels of physical activity.
Of great concern is almost three quarters of the population surveyed were overweight; this is a major risk factor for the chronic diseases in the population.

6.6   Blood Pressure and Diabetes History

There is a high percentage of persons with raised blood pressure who are not currently on medication, as well as persons on medication for high blood pressure but are not controlled. If persons have elevated blood pressure and are not on medication or being monitored, this could impact the health system severely when complications arise. The data from the study reported a prevalence of hypertension of 27% and a prevalence of diabetes as 10%. While these figures are consistent within the region, it is no time to be complacent but to educate future generations about the long term debilitating effects of chronic diseases.

The diabetic population were not always informed by their health care provider about taking care of their eyes and feet. Of those diagnosed with diabetes, less than half had an eye examination within the last 2 years and only a third reported having had a foot examination. Loss of sight and lower limbs affect the productivity of the workforce and ultimately increases the economic burden on government and families.

6.7   Family history of Chronic Disease Conditions

The top three conditions reported were diabetes, raised blood pressure and cancers or malignant tumors. This demonstrates that many persons in the Cayman Islands have family members who have been diagnosed with a chronic disease condition. Uncontrolled diabetes and hypertension lead to heart attack and strokes and other cerebrovascular and cardiovascular diseases. Unhealthy lifestyle and behaviours lead to cancers.

6.8   Dietary Salt

While it is encouraging to know that very few persons (10%) added salt to their food before or when eating, it is interesting to note that only a half reported reading food labels for sodium content when purchasing food or choose to purchase foods low in sodium. Too much salt in anyone's diet is a contributor to hypertension and will result in significant health problems in the future. The population should be encouraged to use fresh, natural, herbal ingredients that will offer the same flavor with increased health benefits.

6.9   Health Screening

The majority of women (85.8%) reported that they had been shown how to examine their breasts; however, almost half (46.4%) had never had a mammogram. In the older women (55-64), 10% reported that they never had a mammogram and 20% in the age group 45-54 reported never having had a mammogram. This is reason for concern as there is evidence that early detection and diagnosis increases chances of survival.
Almost three quarters of women had a Pap test within the last two years. However, older women (55-64) were less likely to have screening within the last year. Although target interventions may be at the younger population, it is worthwhile to promote uptake among the older women as well who may still be at risk for cervical cancer.

As was expected, the highest percentage of men who reported having had a prostate examination were those in the age groups 45-54 and 55-64 years. The American Cancer Society recommends that men who are at an average risk for prostate cancer begin screening at age 50, and men who are at a higher than average risk begin screening at age 40 or 45. In the Cayman Islands, our local Cancer Society recommends screening at age 40.
Many local organizations do excellent work in providing cancer screening opportunities for the population. The targeted interventions are seminars and free cancer screenings. Since 2010, a Cancer Registry has been established although the uptake has been low.

There has been discussion on ways to encourage more persons to come forward to be a part of the cancer register.

6.10 Combined Risk Factors

Five risk factors were identified to determine the level of risk in the survey population; they are:
- Current daily smokers
- Less than 5 servings of fruits and vegetables per day
- Low level of activity
- Overweight (BMI$\geq$ 25 kg/m²)
- Raised BP (SBP $\geq$140 and/or DBP $\geq$90 mmHg or currently on medication for raised BP)

Approximately 40% of the population within the age group 25-44 years reported having three or more risk factors. A higher percentage (49.4%) of the population within the age group 45-64 years reported having three or more risk factors. Having three or more risk factors can result in disability and reduced quality of life if preventative measures are not introduced.

7   CONCLUSIONS AND RECOMMENDATIONS

The results of the study indicated that noncommunicable diseases (NCDs) and their risk factors are prevalent in the Cayman Islands. There is also clear evidence that cardiovascular diseases, cancers, and heart disease contribute to the leading causes of mortality and morbidity. With more than 40 % of respondents within the age group 25-64 years having three or more risk factors, if urgent steps are not taken this may result in disability and reduced quality of life for persons affected. It is important that persons take responsibility for their health and continue to take steps to live a healthier lifestyle to mitigate the deleterious effects of these diseases. The messages of safe alcohol intake, appropriate exercise levels, and healthy eating must be addressed if we are to avert the non-communicable disease crisis facing the Cayman Islands.

7.1   Proposed interventions
- Incorporate and disseminate increased media messages through the Government Information Services (GIS) about non-communicable diseases and their risk factors.
- Employ a multidisciplinary approach to the management of chronic diseases between government, private sector and NGOs.
- Identify available resources and promote their use e.g. Cancer Society to assist with smoking cessation.
- Create an enabling environment that will promote and increase physical activity such as parks, walking trails, bike lanes, side-walks in each district.
- Institute regulatory practices that will enable people to make healthy dietary choices such as the requirement for prepared foods in the market place to state their caloric values.
- Enforce ban on all forms of advertising of alcohol.
- Encourage employers to participate in wellness programmes for their employees.
- Promote annual screenings through the media/public health and encourage persons to know their numbers.
- Encourage early detection and screening.
- Improve the primary healthcare approach to the population with emphasis on health promotion.

7.2   Policy
- Evidence based measures/policies should be employed.
- Use international guidelines and best practices to manage NCDs.
- Introduce lower tariffs on the importation of fruits and vegetables.
- Create public/private sector partnerships to facilitate areas under resourced.
- Increase the level and duration of physical activity in all schools from an early age.

- Disseminate findings of the survey to the health insurance providers, Chamber of Commerce, and Government to inform planning and necessary action.
- Encourage fast food franchises to serve healthier options.
- Encourage the creation and maintenance of a National Food Policy in schools.
- Encourage drug education in the school as part of the curriculum.
- Health system strengthening.
- Development of a chronic non communicable disease register.

7.3 Further research

- To further analyze the data on social determinants such as household income, educational level to understand risk factor patterns.
- To include STEP 3 (biochemical measurements) in the survey planned for 2017. The biochemical measurements would determine the prevalence of diabetes and high cholesterol in the surveyed population.

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Appendix 1

Cayman Islands
Questionnaire
Health Risk Factors Survey
May – June 2012

PAN AMERICAN VERSION OF THE WHO STEPWISE APPROACH TO CHRONIC DISEASE RISK FACTOR SURVEILLANCE-V2.1

THE CAYMAN ISLANDS

Survey Information

Location and Date		Response	Code
1	Cluster Number	⌴⌴⌴⌴⌴⌴|	I1
2	District Name		I2
3	Interviewer ID	⌴⌴⌴⌴|	I3
4	Date of completion of the instrument	⌴⌴⌴| ⌴⌴⌴| ⌴⌴⌴⌴| dd mm year	I4

- -

Participant Identification Number ⌴⌴| ⌴⌴⌴⌴⌴| ⌴⌴⌴⌴⌴|

Consent, Interview Language and Name		Response	Code
5	Consent has been read and obtained	Yes 1 No 2 **If NO, END**	I5
6	Interview Language	English 1	I6
7	Time of interview (24 hour clock)	⌴⌴⌴| : ⌴⌴⌴| hrs mins	I7
8	Surname / Last name		I8
9	First Name		I9
Additional Information that may be helpful			
10	Contact phone number where possible		I10

Record and file identification information (I5 to I10) separately from the completed questionnaire.

Step 1   Demographic Information

CORE: Demographic Information		
Question	**Response**	**Code**
11 Sex (*Record Male / Female as observed*)	Male 1 Female 2	C1
12 What is your date of birth? *Don't Know 77 77 7777*	⊔⊔ ⊔⊔ ⊔⊔⊔⊔ *If known, Go to C4* dd mm year	C2
13 How old are you?	Years ⊔⊔⊔	C3
14 In total, how many years have you spent at school or in full-time study (excluding pre-school)?	Years ⊔⊔⊔	C4

EXPANDED: Demographic Information		
15 What is the **highest level of education** you have completed?	No formal schooling 1 Less than primary school 2 Primary school completed 3 Middle School completed 4 High school completed 5 College/University completed 6 Post graduate degree 7 Refused 88	C5
16a Which one of the following best describes your status in the Cayman Islands?	Caymanian 1 Non- Caymanian 2	X1
16b What is your *ethnic group / racial group / cultural subgroup* **background**?	Black 1 Indigenous Caymanian 2 White 3 East Indian 4 Hispanic 5 Asian 6 Mixed 7 Other 8 Don't Know/Not Stated 77 Refused 99	C6
17 What is your **marital status**?	Never married 1 Currently married 2 Separated 3 Divorced 4 Widowed 5 Cohabitating 6 Refused 88	C7
18 Which of the following best describes your **main work status** over the past 12 months? (*USE SHOWCARD*)	Government employee 1 Non-government employee 2 Self-employed 3 Non-paid 4 Student 5 Homemaker 6 Retired 7 Unemployed (able to work) 8 Unemployed (unable to work) 9	C8

		Refused 88	
19	How many people older than 18 years, including yourself, live in your household?	Number of people ⊔⊔⊔	C9

EXPANDED: Demographic Information, Continued

Question		Response	Code
21	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 *(READ OPTIONS)*	$0 - $9,599 1 $9,600 - $19,199 2 $19,200 - $38,399 3 $38,400 - $57,599 4 $57,600 - $86,399 5 $86,400 - $115,199 6 $115,200 - $153,599 7 $153,600 - $191,999 8 $192,000 - $239,999 9 $240,000 + 10 Don't Know 77 Refused 88	C11

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Step 1   Behavioural Measurements

</div>

CORE: Tobacco Use

Now I am going to ask you some questions about various health behaviours. This includes things like smoking, drinking alcohol, eating fruits and vegetables and physical activity. Let's start with tobacco.

	Question	Response	Code
22	Have you **ever smoked** any tobacco products, such as cigarettes, cigars or pipes? *(USE SHOWCARD)*	Yes 1 No 2 *If No, go to T9a*	T1a
23	Do you currently smoke any **tobacco products**, such as cigarettes, cigars or pipes? *(USE SHOWCARD)*	Yes 1 No 2 *If No, go to T6*	T1
24	Do you currently smoke tobacco products **daily**?	Yes 1 No 2 *If No, go to T6a*	T2
25	How old were you when you **first started** smoking daily?	Age (years) Don't know 77 ⊔⊔ *If Known, go to T5a*	T3
26	Do you remember how long ago it was? *(RECORD ONLY 1, NOT ALL 3)* *Don't know 77*	In Years ⊔⊔ *If Known, go to T5a*	T4a
		OR in Months ⊔⊔ *If Known, go to T5a*	T4b
		OR in Weeks ⊔⊔	T4c
27	On average, **how many** of the following do you smoke each day? *(RECORD FOR EACH TYPE, USE SHOWCARD)* *Don't Know 77*	Manufactured cigarettes ⊔⊔	T5a
		Hand-rolled cigarettes ⊔⊔	T5b
		Pipes full of tobacco ⊔⊔	T5c
		Cigars, cheroots, cigarillos ⊔⊔	T5d
		Other ⊔⊔ *If Other, go to T5other, else go to T6a*	T5e
		Other (please specify): ⊔⊔⊔⊔⊔⊔⊔	T5other
28	During the past 12 months, have you tried to **stop smoking**?	Yes 1 No 2	T6a
29	During any visit of 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 T9a* No 2 *If T2=Yes, go to T9a* No visit during the past 12 months 3 *If T2=Yes, go to T9a*	T6b

EXPANDED: Tobacco Use			
Question		**Response**	**Code**
30	In the past, did you **ever** smoke **daily**?	Yes 1 No 2 *If No, go to T9a*	T6
31	How old were you when you **stopped** smoking **daily**?	Age (years) Don't Know 77 └──┴──┘ *If Known, go to T9a*	T7
32	How **long ago** did you stop smoking daily? *(RECORD ONLY 1, NOT ALL 3)* *Don't Know 77*	Years ago └──┴──┘ *If Known, go to T9a*	T8a
		OR Months ago └──┴──┘ *If Known, go to T9a*	T8b
		OR Weeks ago └──┴──┘	T8c
33	Have you **ever** used **smokeless tobacco** products**,** such as *snuff or chewing tobacco* ? *(USE SHOWCARD)*	Yes 1 No 2 *If No, go to T13*	T9a
34	Do you **currently use** any **smokeless tobacco,** such as *snuff or chewing tobacco*? *(USE SHOWCARD)*	Yes 1 No 2 *If No, go to T12*	T9
35	Do you **currently use smokeless tobacco** products **daily?**	Yes 1 No 2 *If No, go to T12*	T10
36	On average, how many **times a day** do you use …. *(RECORD FOR EACH TYPE, USE SHOWCARD)* *Don't Know 77*	Snuff, by mouth └──┴──┘	T11a
		Snuff, by nose └──┴──┘	T11b
		Chewing tobacco └──┴──┘	T11c
		Other └──┴──┘ *If Other, go to T11other, else go to T13*	T11e
		Other (specify) └──┴──┴──┴──┴──┴──┴──┘ *Go to T13*	T11other
37	In the **past**, did you **ever use** smokeless tobacco such as *snuff chewing or tobacco* **daily**?	Yes 1 No 2	T12
38	During the past 7 days, on how many days did someone **in your home** smoke when you were present?	Number of days Don't know 77 └──┴──┘	T13
39	During the past 7 days, on how many days did someone smoke in closed areas **in your workplace** (in the building, in a work area or a specific office) when you were present?	Number of days Don't know or don't work in a closed area 77 └──┴──┘	T14

CORE: Alcohol Consumption			
The next questions ask about the consumption of alcohol.			
Question		**Response**	**Code**
40	Have you **ever** consumed an alcoholic drink such as beer, wine, spirits or fermented cider. *(USE SHOWCARD OR SHOW EXAMPLES)*	Yes 1 No 2 *If No, go to D1*	A1a
41	Have you consumed an alcoholic drink within the **past 12 months**?	Yes 1 No 2 *If No, go to D1*	A1b
42	During the past 12 months, **how frequently** have you had at least one alcoholic drink? *(READ RESPONSES, USE SHOWCARD)*	Daily 1 5-6 days per week 2 1-4 days per week 3 1-3 days per month 4 Less than once a month 5	A2
43	Have you consumed an alcoholic drink within the **past 30 days**?	Yes 1 No 2 *If No, go to D1*	A3
44	During the past 30 days, on how many **occasions** did you have at least one alcoholic drink?	Number Don't know 77 L__I__I__I	A4
45	During the past 30 days, when you drank alcohol, **on average**, how many **standard alcoholic drinks** did you have during one drinking occasion? *(USE SHOWCARD)*	Number Don't know 77 L__I__I__I	A5
46	During the past 30 days, what was the **largest number** of standard alcoholic drinks you had on a single occasion, counting all types of alcoholic drinks together?	Largest number Don't Know 77 L__I__I__I	A6
47	During the past 30 days, how many times did you have for **men**: **five or more** for **women**: **four or more** standard alcoholic drinks in a single drinking occasion?	Number of times Don't Know 77 L__I__I__I	A7

EXPANDED: Alcohol Consumption			
48	During the past 30 days, when you consumed an alcoholic drink, how often was it with meals? Please do not count snacks.	Usually with meals 1 Sometimes with meals 2 Rarely with meals 3 Never with meals 4	A8
49	During each of the **past 7 days**, how many standard alcoholic drinks did you have each day? *(USE SHOWCARD)* *Don't Know 77*	Monday L__I__I__I	A9a
		Tuesday L__I__I__I	A9b
		Wednesday L__I__I__I	A9c
		Thursday L__I__I__I	A9d
		Friday L__I__I__I	A9e
		Saturday L__I__I__I	A9f
		Sunday L__I__I__I	A9g

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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 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
50	In a typical week, on how many days do you **eat fruit**? *(USE SHOWCARD)*	Number of days Don't Know 77	7.3.1.1.1.1.1.1.1	└─┴─┘ *If Zero days, go to D3*	7.3.1.1.1.1.1.1
51	How many **servings** of fruit do you eat on **one** of those days? *(USE SHOWCARD)*	Number of servings Don't Know 77	└─┴─┘		7.3.1.1.1.1.
52	In a typical week, on how many days do you **eat vegetables**? *(USE SHOWCARD)*	Number of days Don't Know 77	7.3.1.1.1.1.1.1.4	└─┴─┘ *If Zero days, go to D5*	D3
53	How many **servings** of vegetables do you eat on one of those days? *(USE SHOWCARD)*	Number of servings Don't know 77	└─┴─┘		D4

EXPANDED: Diet

	Question	Response		Code
54	What type of **oil or fat is most often** used for meal preparation in your household? *(USE SHOWCARD)* *(SELECT ONLY ONE)*	Vegetable oil 1 Lard or suet 2 Butter or ghee 3 Margarine 4 Other 5 *If Other, go to D5 other* None in particular 6 None used 7 Don't know 77		D5
		Other └─┴─┴─┴─┴─┴─┴─┘		D5other
55	On average, how many meals per week do you eat that were not prepared at a home? By meal, I mean breakfast, lunch and dinner.	Number Don't know 77 └─┴─┘		D6

CORE: Physical Activity

Next I am going to ask you about the time you spend doing different types of physical activity in a typical week. Please answer these questions even if you do not consider yourself to be a physically active person.
Think first about the time you spend doing work. Think of work as the things that you have to do such as paid or unpaid work, study/training, household chores, harvesting food/crops, fishing, seeking employment, making thatch work or in net making. 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.

	Question	Response	Code
Work			
56	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? *(USE SHOWCARD)*	Yes 1 No 2 *If No, go to P 4*	7.3.1.1.1.1.1.1
57	In a typical week, on how many days do you do vigorous-intensity activities as part of your work?	Number of days └─┘	7.3.1.1.1.1.
58	How much time do you spend doing vigorous-intensity activities at work on a typical day?	Hours : minutes └──┴──┘ : └──┴──┘ hrs mins	P3 (a-b)
59	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? *(USE SHOWCARD)*	Yes 1 No 2 *If No, go to P 7*	P4
60	In a typical week, on how many days do you do moderate-intensity activities as part of your work?	Number of days └─┘	P5
61	How much time do you spend doing moderate-intensity activities at work on a typical day?	Hours : minutes └──┴──┘ : └──┴──┘ 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.		
62	Do you walk or use a bicycle *(pedal cycle)* for at least 10 minutes continuously to get to and from places?	Yes 1 No 2 *If No, go to P 10*	P7
63	In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places?	Number of days └─┘	P8
64	How much time do you spend walking or bicycling for travel on a typical day?	Hours : minutes └──┴──┘ : └──┴──┘ hrs mins	P9 (a-b)

MINISTRY OF
HEALTH, ENVIRONMENT,
YOUTH, SPORTS & CULTURE
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CORE: Physical Activity, Continued		5-1-10
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 eg. swimming, aerobics and vigorous walking.		
65 Do you do any vigorous-intensity sports, fitness or recreational leisure activities that cause large increases in breathing or heart rate such as running, cricket or football for at least 10 minutes continuously? *(USE SHOWCARD)*	Yes 1 No 2 *If No, go to P 13*	P10
66 In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational *(leisure)* activities?	Number of days └──┘	P11
67 How much time do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?	Hours : minutes └──┴──┘ : └──┴──┘ hrs mins	P12 (a-b)
68 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? *(USE SHOWCARD)*	Yes 1 No 2 *If No, go to P16*	P13
69 In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational leisure activities?	Number of days └──┘	P14
70 How much time do you spend doing moderate-intensity sports, fitness or recreational *(leisure)* activities on a typical day?	Hours : minutes └──┴──┘ : └──┴──┘ hrs mins	P15 (a-b)

EXPANDED: Physical Activity

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, train, reading, playing cards or watching television, but do not include time spent sleeping. *(USE SHOWCARD)*

71	How much time do you usually spend sitting or reclining on a typical day?	Hours : minutes	└──┴──┘ : └──┴──┘ hrs mins	P16 (a-b)

CORE: History of Raised Blood Pressure

Question		Response	Code
72	Have you ever had your blood pressure measured by a doctor or other health worker?	Yes 1 No 2 *If No, go to H6*	H1
73	Have you ever been told by a doctor or other health worker that you have raised blood pressure or hypertension?	Yes 1 No 2 *If No, go to H6*	H2a
74	Have you been told in the past 12 months?	Yes 1 No 2	H2b

EXPANDED: History of Raised Blood Pressure

	7.3.1.1.1.1.1.1.7 Are you currently receiving any of the following treatments/advice for high blood pressure prescribed by a doctor or other health worker?		
75	Drugs (medication) that you have taken in the past two weeks	Yes 1 No 2	H3a
	Advice to reduce salt intake	Yes 1 No 2	H3b
	Advice or treatment to lose weight	Yes 1 No 2	H3c
	Advice or treatment to stop smoking	Yes 1 No 2	H3d
	Advice to start or do more exercise	Yes 1 No 2	H3e
76	Have you ever seen a herbalist for raised blood pressure or hypertension?	Yes 1 No 2	H4
77	Are you currently taking any herbal remedy for your raised blood pressure?	Yes 1 No 2	H5

CORE: History of Diabetes			
Question		**Response**	**Code**
78	Have you ever had your blood sugar measured by a doctor or other health worker?	Yes 1 No 2 *If No, go to L1a*	H6
79	Have you ever been told by a doctor or other health worker that you have raised blood sugar or diabetes?	Yes 1 No 2 *If No, go to L1a*	H7a
80	Have you been told in the past 12 months?	Yes 1 No 2	H7b

EXPANDED: History of Diabetes			
	Are you currently receiving any of the following treatments/advice for diabetes prescribed by a doctor or other health worker?		
81	Insulin	Yes 1 No 2	H8a
	Drugs (medication) that you have taken in the past two weeks	Yes 1 No 2	H8b
	Special prescribed diet	Yes 1 No 2	H8c
	Advice or treatment to lose weight	Yes 1 No 2	H8d
	Advice or treatment to stop smoking	Yes 1 No 2	H8e
	Advice to start or do more exercise	Yes 1 No 2	H8f
82	Have you ever seen a herbalist for diabetes or raised blood sugar?	Yes 1 No 2	H9
83	Are you currently taking any herbal remedy for your diabetes?	Yes 1 No 2	H10
84	When was the last time your eyes were examined as part of your diabetes control?	Within the past 2 years 1 More than 2 years ago 2 Never 3 Don't know 77	H11
85	When was the last time your feet were examined as part of your diabetes control?	Within the past year 1 More than 1 year ago 2 Never 3 Don't know 77	H12

EXPANDED: History of raised total cholesterol			
Questions		**Response**	7.3.1.1.
86	Have you ever had your cholesterol measured by a doctor or other health worker?	Yes 1	L1a
		No 2 *If No, go to F1a*	
87	Have you ever been told by a doctor or other health worker that you have raised cholesterol?	Yes 1	L2a
		No 2 *If No, go to F1a*	
88	Were you told in the past 12 months?	Yes 1	L2b
		No 2	
Are you currently receiving any of the following treatments/advice for raised cholesterol prescribed by a doctor or other health worker?			
89	Oral treatment (medication) taken in the last 2 weeks	Yes 1	L3a
		No 2	
	Special prescribed diet	Yes 1	L3b
		No 2	
	Advice or treatment to lose weight	Yes 1	L3c
		No 2	
	Advice or treatment to stop smoking	Yes 1	L3d
		No 2	
	Advice to start or do more exercise	Yes 1	L3e
		No 2	
90	During the past 12 months have you seen a traditional healer for raised cholesterol?	Yes 1	L4
		No 2	
91	Are you currently taking any herbal or traditional remedy for your raised cholesterol?	Yes 1	L5
		No 2	

EXPANDED: Family history			
Questions		**Response**	7.3.1.1
92	Have some of your family members been diagnosed with the following diseases?		
	Diabetes or raised blood sugar	Yes 1	F1a
		No 2	
	Raised Blood pressure	Yes 1	F1b
		No 2	
	Stroke	Yes 1	F1c
		No 2	
	Cancer or malignant tumor	Yes 1	F1d
		No 2	
	Raised Cholesterol	Yes 1	F1e
		No 2	

	Early Heart attack (below age 55 for men and below age 65 for women)	Yes 1 No 2	F1f

7.3.1.1.1.1.1.1.10 CORE: Dietary salt

The next questions ask about your knowledge, attitudes and behaviour towards dietary salt. Dietary salt includes ordinary table salt, unrefined salt such as sea salt, iodized salt 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 potato chips, Ramin instant noodles, salted pig tail, corn beef, Spam, and questions on controlling your salt intake. Please answer the questions even if you consider yourself to eat a diet low in salt.

Question		Response		7.3.1.1.1.1.1.1.
93	How often do you **add salt** to your food before you eat it or as you are eating it?	Always Often Sometimes Rarely Never Don't know	1 2 3 4 5 77	DS1
94	How often is **salt added** in cooking or preparing foods in your household?	Always Often Sometimes Rarely Never Don't know	1 2 3 4 5 77	DS2
95	How often do you eat **processed food high in salt**, such as *potato chips, Ramin instant noodles, salted pig tail, corn beef, Spam*? *(USE SHOWCARD)*	Always Often Sometimes Rarely Never Don't know	1 2 3 4 5 77	DS3
96	**How much salt** do you think you consume?	Far too much Too much Just the right amount Too little Far too little Don't know	1 2 3 4 5 77	DS4
97	Do you think that too much salt in your diet could cause a serious **health problem**?	Yes No Don't know	1 2 77	DS5
98	How important to you is **lowering the salt** in your diet?	Very important Somewhat important Not at all important Don't know	1 2 3 77	DS6

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7.3.1.1.1.1.1.1.1.12	CORE: Dietary salt, Continued		
Question		**Response**	7.3.1.1.1.1.1
99	Do you do anything of the following on a regular basis to **control your salt intake**? *(RECORD FOR EACH)*		
	Avoid/minimize consumption of processed foods	Yes 1 / No 2	DS7a
	Look at the salt or sodium labels on food	Yes 1 / No 2	DS7b
	Do not add salt on the table	Yes 1 / No 2	DS7c
	Buy low salt/sodium alternatives	Yes 1 / No 2	DS7d
	Do not add salt when cooking	Yes 1 / No 2	DS7e
	Use spices other than salt when cooking	Yes 1 / No 2	DS7f
	Avoid eating out	Yes 1 / No 2	DS7g
	Other	Yes 1 *If Yes, go* / No 2	DS7h
	Other (please specify)	└─┴─┴─┴─┴─┴─┴─┘	DS7other

PAN AMERICAN VERSION OF THE WHO STEPWISE APPROACH TO CHRONIC DISEASE RISK FACTOR SURVEILLANCE- V2.1

5-1-15

Health Screening

Section: Health Screening		Response		Code
100	Have you ever had your feces examined to look for hidden blood?	Yes	1	S1
		No	2	
101	Have you ever had a colonoscopy?	Yes	1	S2
		No	2	
102	**This question is for men only:** Have you ever had an examination of your prostate?	Yes	1	S3
		No	2	
103	**The following questions are for women only:** Have you been shown how to examine your breasts?	Yes	1	S4
		No	2	
104	When was the last time you had an examination of your breasts?	1 year or less	1	S5
		Between 1 and 2 years	2	
		More than 2 years	3	
		Never	4	
		Don't know	77	
105	When was the last time you had a mammogram?	1 year or less	1	S6
		Between 1 and 2 years	2	
		More than 2 years	3	
		Never	4	
		Don't know	77	
106	When was the last time you had a Pap test?	1 year or less	1	S7
		Between 1 and 2 years	2	
		More than 2 years	3	
		Never	4	
		Don't know	77	

Tobacco Policy Module

Tobacco policy		
You have been asked questions on tobacco consumption before. The next questions ask about tobacco control policies. They include questions on your exposure to the media and advertisement, on cigarette promotions, health warnings and cigarette purchase.		

Question		Response	Code
107	During the past 30 days, have you noticed information about the dangers of smoking cigarettes or that encourages quitting in **newspapers** or in **magazines**?	Yes 1 No 2 Don't know 77	TP1
108	During the past 30 days, have you noticed information about the dangers of smoking cigarettes or that encourages quitting on **television**?	Yes 1 No 2 Don't know 77	TP2
109	During the past 30 days, have you noticed any **advertisements** or **signs** promoting cigarettes in stores where cigarettes are sold?	Yes 1 No 2 Don't know 77	TP3
110	During the past 30 days, have you noticed any of the following types of cigarette promotions? *(RECORD FOR EACH)*		
	Free samples of cigarettes	Yes 1 No 2 Don't know 77	TP4a
	Cigarettes at sale prices	Yes 1 No 2 Don't know 77	TP4b
	Coupons for cigarettes	Yes 1 No 2 Don't know 77	TP4c
	Free gifts or special discount offers on other products when buying cigarettes	Yes 1 No 2 Don't know 77	TP4d
	Clothing or other items with a cigarette brand name or logo	Yes 1 No 2 Don't know 77	TP4e
	Cigarette promotions in the mail	Yes 1 No 2 Don't know 77	TP4f

	The next questions TP5 - TP8 are administered to current smokers only.			
111	During the past 30 days, did you notice any **health warnings on cigarette packages**?	Yes No Did not see any cigarette packages Don't know	1 2 *If no, go to TP7* 3 *If "did not see any cigarette packages", go to TP7* 77 *If Don't know, go to TP7*	TP5
112	During the past 30 days, have warning labels on cigarette packages led you to **think about quitting**?	Yes No Don't know	1 2 77	TP6
113	The last time you bought manufactured cigarettes for yourself, **how many cigarettes** did you buy in total?	Number of cigarettes ⌞__⌟__⌟ Don't know or Don't smoke or purchase manufactured cigarettes 77	*If "Don't know or don't smoke or purchase manuf. cigarettes", end section*	TP7
114	In total, **how much money** did you pay for this purchase?	Amount ⌞__⌟__⌟__⌟__⌟ Don't know 77 Refused 88		TP8

Step 2   Physical Measurements

CORE: Height and Weight

Question		Response	Code
115	Interviewer ID	∟_∟_∟_∟	M1
116	Device IDs for height and weight	Height ∟_∟_∟ Weight ∟_∟_∟	M2
117	Height	in Centimetres (cm) ∟_∟_∟_∟ . ∟	M3
118	Weight *If too large for scale 666.6*	in Kilograms (kg) ∟_∟_∟_∟ . ∟	M4
119	**For women:** Are you pregnant?	Yes 1 *If Yes, go to M 8* No 2	M5

CORE: Waist

Question		Response	Code
120	Device ID for waist	∟_∟_∟	M6
121	Waist circumference	in Centimetres (cm) ∟_∟_∟_∟ . ∟	M7

CORE: Blood Pressure

Question		Response	Code
122	Interviewer ID	∟_∟_∟_∟	M8
123	Device ID for blood pressure	∟_∟_∟	M9
124	Cuff size used	Small 1 Medium 2 Large 3	M10
125	Reading 1	Systolic (mmHg) ∟_∟_∟_∟	M11a
		Diastolic (mmHg) ∟_∟_∟_∟	M11b
126	Reading 2	Systolic (mmHg) ∟_∟_∟_∟	M12a
		Diastolic (mmHg) ∟_∟_∟_∟	M12b
127	Reading 3	Systolic (mmHg) ∟_∟_∟_∟	M13a
		Diastolic (mmHg) ∟_∟_∟_∟	M13b
128	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 No 2	M14

EXPANDED: Hip Circumference and Heart Rate			
129	Hip circumference	in Centimeters (cm) └─┴─┴─┴─┘ . └─┴─┘	M15
130	Heart Rate		
	Reading 1	Beats per minute └─┴─┴─┴─┘	M16a
	Reading 2	Beats per minute └─┴─┴─┴─┘	M16b
	Reading 3	Beats per minute └─┴─┴─┴─┘	M16c

Step 3   Biochemical Measurements

CORE: Blood Glucose

	Question	Response	Code
1	During the past 12 hours have you had anything to eat or drink, other than water?	Yes 1 No 2	B1
2	Technician ID	└─┴─┴─┴─┘	B2
3	Device ID	└─┴─┴─┘	B3
4	Time of day blood specimen taken (24 hour clock)	Hours : minutes └─┴─┴─┘ : └─┴─┴─┘ hrs mins	B4
5	Fasting blood glucose	mmol/l └─┴─┴─┘ . └─┴─┴─┘	B5
6	Today, have you taken insulin or other drugs (medication) that have been prescribed by a doctor or other health worker for raised blood glucose?	Yes 1 No 2	B6

CORE: Blood Lipids

	Question	Response	Code
7	Device ID	└─┴─┴─┘	B7
8	Total cholesterol	mmol/l └─┴─┴─┘ . └─┴─┴─┘	B8
9	During the past two weeks, have you been treated for raised cholesterol with drugs (medication) prescribed by a doctor or other health worker?	Yes 1 No 2	B9

EXPANDED: Triglycerides, HDL Cholesterol and Oral Glucose Tolerance

			Code
10	Triglycerides	mmol/l └─┴─┴─┘ . └─┴─┴─┘	B10
11	HDL Cholesterol	mmol/l └─┴─┘ . └─┴─┴─┘	B11
12	Oral Glucose Tolerance	mmol/l └─┴─┴─┘ . └─┴─┴─┘	B12

APPENDIX 2: FLASH CARDS

School Cross-Reference Chart

Code	School Level
1	No formal schooling
2	Less than primary school
3	Primary school completed
4	Middle School completed
5	High school completed
6	College/University completed
7	Post graduate degree
88	Refused

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[2] Question: 15   Code: C5

INCOME CROSS-REFERENCE CHART

CODE	WEEKLY	FORTNIGHTLY	MONTHLY	ANNUAL
1	$0 - $199	$0 - $399	$0 - $799	$0 - $9,599
2	$200 - $399	$400 - $799	$800 - $1,599	$9,600 - $19,199
3	$400 - $ 799	$800 - $1,599	$1,600 - $3,199	$19,200 - $38,399
4	$800 - $1,199	$1,600 - $2,399	$3,200 - $4,799	$38,400 - $57,599
5	$1,200 - $1,799	$2,400 - $3,599	$4,800 - $7,199	$57,600 - $86,399
6	$1,800 - $2,399	$3,600 - $4,799	$7,200 - $9,599	$86,400 - $115,199
7	$2,400 - $ 3,199	$4,800 - $6,399	$9,600 - $12,799	$115,200 - $153,599
8	$3,200 - $3,999	$6,400 - $7,999	$12,800 - $15,999	$153,600 - $191,999
9	$4,000 - $4,999	$8,000 - $9,999	$16,000 - $ 19,999	$192,000 - $239,999
10	$5,000+	$10,000+	$20,000+	$240,000+

[3] Question: 21   Code: C11

[4]Tobacco Products are considered to be:	
Cigarettes	
Cigars	
Pipes	

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[4] Question: 22-23   Code: T1a- T1

[5]Smokeless - Tobacco Products are considered to be:	
Snuff Tobacco	
Chewing Tobacco	

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[5] Question: 33-34   Code: T9a- T9
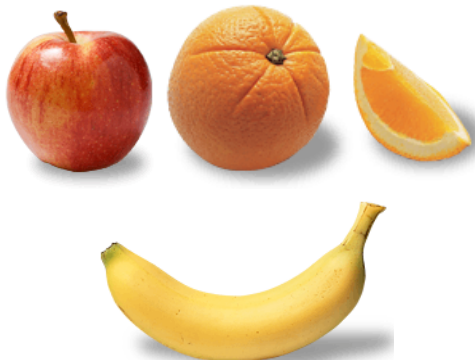
	1 Standard Drink =	Examples
	[6]Alcoholic Beverages <u>are considered to be:</u>	
Beer / Mix Drinks	1 Bottle 1 Glass	12 oz Lager Beer 1 Alcopop
Spirits / Wine	1 Glass	4 oz Wine
Fermented Cider	1 Glass	

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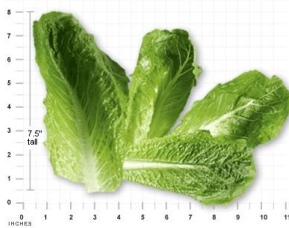
[6] Questions: 40 - 49   Code: A1a – A9g

[7]**Fruits** are considered to be:		
	1 Serving =	Examples
Apple, banana, orange, guava, star fruit	1 Cup	
Chopped, cooked, canned fruit	½ Cup	
Fruit juice *(Juice from fruit, not artificially flavoured)*	½ Cup	

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[7] Questions: 50 - 51   Code: D1 – D2

[8]**Vegetables** are considered to be:		
	1 Serving =	Examples
Raw Green Leafy Vegetables	1 Cup	
Other vegetables, cooked or chopped raw	½ Cup	
Vegetable juice	½ Cup	

[8] Questions: 52 - 53   Code: D3 – D4

[9]Oils & Fats Products are considered to be:	
Vegetable Oil	
Lard or shortening	
Butter or ghee	
Margarine	

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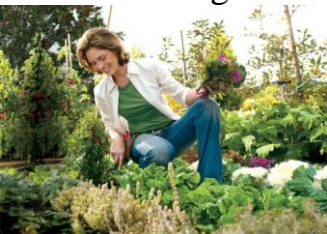
[9] Question: 54   Code: D5

[10] **Processed food high in salt** <u>are considered to be:</u>	
Potato Chips	
Ramin Instant Noodles	
Salted Pig Tail	
Corn Beef / Spam	

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[10] Question: 95   Code: DS3

Physical Activity Can be work or recreational activities		
	=	Examples
High Intensity work activities[11]	Causes large increase in breathing or heart rate	Construction Farming, etc
Moderate Intensity Work[12]	Causes small increase in heart rate or breathing	Walking Gardening, etc

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[11] Question: 56   Code: P1
[12] Question: 59   Code: P4

Recreational activities is considered to be: Sports, fitness etc.		
	=	**Examples**
Vigorous Intensity Sports for at least 10 minutes continuously[13]	Causes large increases in breathing or heart rate	Football Rugby
Moderate Intensity Sports[14]	Causes small increases in heart rate and breathing	Volleyball
Sedentary Behavior[15]	Watching TV Reading, Computer or desk work, sitting, relaxing	Watching TV

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[13] Question: 65   Code: P10
[14] Question: 68   Code: P13
[15] Question: 71   Code: P16

APPENDIX 3: LIST OF INTERVIEWS AND FIELD SUPERVISORS

LIST OF INTERVIEWERS AND FIELD SUPERVISORS				
District:	**George Town 1**		**District:**	**West Bay**
Field Supervisor	**Theodore Thampson**		**Field Supervisor:**	**Nicole Emmanuel Jones**
Team 1	Sherine Barnes		Team 13	Cherry Watt
	Eressia Ramoon			Brenda Woods-Tatum
Team 2	Ivan McLean		Team 14	Wayne Green
	Jackie Neil			Elsa Martin-Wallace
Team 3	Nola Sanders		Team 15	Prudence Ebanks
	Alma McCoy			Shelita Ebanks
Team 4	Reul Haughton		Team 16	Camille Beckford
	Fayanne Elliot			Rena Hydes
Team 5	Janet Harris		Team 17	Herbert Mitchell
	Horace Parker			Yvonne Warwick
Team 6	Junior Allan			
	Tatiana Allen		**District:**	**Bodden Town, East End and North Side**
			Field Supervisor:	**Adolphus Laidlow**
District:	**George Town 2**		Team 18	Maxine Anglin
Field Supervisor	**Crispin Boney**			Ricardo Sealy
Team 7	Herman Talbert		Team 19	Hazel Gordon-Fletcher
	Helen Reynolds-Arana			Sharon Crawford
Team 8	Joslin Marshall		Team 20	Marcia Atherley
	Jackie Palmer			Marcia Robinson
Team 9	Marcia James-Smith		Teal 21	Sonia Campbell
	Althia Warner-Pryce			Jane Ebanks
Team 10	Vicky Woods		Team 22	Inga Morrison
	Pedro Calzado			Nodeane Robatham
Team 11	Elena Calzado			
	Avadeen Ebanks		**District:**	**Sister Islands**
Team 12	Rupert Hoilet		**Field Supervisor:**	**Elizabeth Talbert**
	Annadurai Richards		Team 23	Annie Rose Scott
				Marcia Rankin
Technical staff	Walters, Travis		Team 24	Keisha Martin-Melbourne
Technical staff	Watt, Joseph			Agnes Green-Ferguson

Cayman Islands STEPS Survey 2012

Fact Sheet – Total Population

The STEPS survey of chronic disease risk factors in Cayman Islands was carried out from May 2012 to July 2012. The Cayman Islands carried out Step 1, Step 2 and Step 3. Socio demographic and behavioural information was collected in Step 1. Physical measurements such as height, weight and blood pressure were collected in Step 2. Biochemical measurements were collected to assess blood glucose and cholesterol levels in Step 3. The STEPS survey in The Cayman Islands, was a population-based survey of adults aged 25–64. A simple random sample design was used to produce representative data for that age range in the Cayman Islands. A total of 2,105 adults were selected to participate in the Cayman Islands STEPS survey. The overall response rate was 61.6%. A repeat survey is planned for 2017.

| Results for adults aged 25–64 years (incl. 95% CI) (adjust if necessary)	Both Sexes	Males	Females
Step 1 Tobacco Use			
Percentage who currently smoke tobacco	**15.0%** (10.9 – 19.0)	**20.7%** (15.8 – 25.6)	**9.0%** (5.8 – 12.2)
Percentage who smoke tobacco daily among current smokers	**67.1%** (58.3 - 75.9)	**61.0%** (53.7 - 68.2)	**81.8%** (64.5 - 99.0)
For those who smoke tobacco daily			
Average age started smoking (years)	**20.1 years** (19.1 – 21.1)	**20.4 years** (18.6 – 22.1)	**19.7 years** (17.2 – 22.2)
Percentage of daily smokers smoking manufactured cigarettes	**97.6%** (94.6 – 100.0)	**97.6%** (93.7 – 100.0)	**97.8%** (90.2 – 100.0)
Mean number of manufactured cigarettes smoked per day (by smokers of manufactured cigarettes)	**10.8** (9.0 – 12.6)	**11.4** (9.4 – 13.4)	**9.6** (7.3 – 12.0)
Percentage exposed to smoke at home on 1 or more days per week	**9.1%** (7.5 – 10.7)	**10.0%** (6.6 – 13.4)	**8.2%** (7.3 – 9.0)
Percentage exposed to smoke at workplace on 1 or more days per week	**10.8%** (8.1 – 13.5)	**13.8%** (7.8 – 19.8)	**7.7%** (3.5 – 11.9)
Step 1 Alcohol Consumption			
Percentage who are lifetime abstainers	**22.0%** (19.8 – 24.0)	**15.8%** (12.3 – 19.3)	**28.4%** (23.3 – 35.5)
Percentage who are past 12 month abstainers	**12.7%** (11.6 – 13.9)	**11.4%** (7.5 – 15.3)	**14.2%** (11.1 – 17.3)
Percentage who currently drink (drank alcohol in the past 30 days)	**51.5%** (47.6 – 55.3)	**63.0%** (58.1 – 67.9)	**39.4%** (31.9 – 46.9)
Percentage who engage in heavy episodic drinking (men who had 5 or more / women who had 4 or more drinks on any day in the past 30 days)		**25.7%** (16.9 – 34.6)	**14.0%** (11.5 – 16.4)
Step 1 Fruit and Vegetable Consumption (in a typical week)			
Mean number of days fruit consumed	**4.7 days** (4.6 – 4.9)	**4.6 days** (4.4 – 4.9)	**4.9 days** (4.7 – 5.1)
Mean number of servings of fruit consumed on average per day	**1.4 servings** (1.2 – 1.6)	**1.3 servings** (1.0 – 1.6)	**1.5 servings** (1.3 – 1.6)
Mean number of days vegetables consumed	**5.1 days** (4.9 – 5.3)	**5.1 days** (4.8 – 5.4)	**5.1 days** (4.9 – 5.2)
Mean number of servings of vegetables consumed on average per day	**1.5 servings** (1.4 – 1.6)	**1.4 servings** (1.3 – 1.6)	**1.5 servings** (1.4 – 1.6)
Percentage who ate less than 5 servings of fruit and/or vegetables on average per day	**83.7%** (79.8 – 87.6)	**85.6%** (80.8 – 90.4)	**81.8%** (78.4 – 85.2)
Step 1 Physical Activity			
Percentage with low levels of activity (defined as < 600 MET–minutes per week)*	**34.0%** (30.9 – 37.2)	**24.0%** (20.1 – 27.9)	**44.2** (38.1 – 50.4)
Percentage with high levels of activity (defined as ≥ 3000 MET–minutes per week)*	**47.9%** (45.3 – 50.4)	**61.6%** (56.5 – 66.8)	**33.7%** (29.1 – 38.3)
Median time spent in physical activity on average per day (minutes) (presented with inter–quartile range)	**68.6 minutes** (15.0 – 342.9)	**147.9 minutes** (32.1 – 428.6)	**38.6 minutes** (2.9 – 197.1)
Percentage not engaging in vigorous activity	**53.9%** (51.7 – 56.0)	**36.1%** (27.4 – 44.8)	**72.0%** (66.7 – 77.4)

Cayman Islands STEPS Survey 2012

Preliminary Fact Sheet – Total Population

Results for adults aged 25–64 years (incl. 95% CI) *(adjust if necessary)*	Both Sexes	Males	Females
Step 2 Physical Measurements			
Mean body mass index – BMI (kg/m^2)	**28.8** kg/m^2 (27.7 – 29.9)	**27.8** kg/m^2 (27.7 – 28.0)	**29.8** kg/m^2 (27.9 – 31.8)
Percentage who are overweight (BMI ≥ 25 kg/m^2)	**70.6%** (63.6 – 77.6)	**67.6%** (65.8 – 69.3)	**73.7%** (58.9 – 88.6)
Percentage who are obese (BMI ≥ 30 kg/m^2)	**36.6%** (30.1 – 43.2)	**29.2%** (27.3 – 31.0)	**44.3%** (32.1 – 56.5)
Average waist circumference (cm)		**93.8** cm (90.1 – 97.5)	**91.0** cm (88.2 – 93.9)
Average waist circumference (inches)		**36.9** inches (35.5 – 38.4)	**35.8** inches (34.7 – 37.0)
Mean systolic blood pressure – SBP (mmHg), including those currently on medication for raised BP	**124.8** mmHg (123.6 – 125.9)	**128.2** mmHg (127.7 – 128.7)	**121.2** mmHg (118.3 – 124.1)
Mean diastolic blood pressure – DBP (mmHg) , including those currently on medication for raised BP	**76.1** mmHg (75.3 – 77.0)	**76.7** mmHg (76.3 – 77.1)	**75.5** mmHg (73.8 – 77.3)
Percentage with raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg or currently on medication for raised BP)	**25.7%** (21.1 – 30.3)	**27.1%** (24.4 – 29.8)	**24.2%** (15.3 – 33.1)
Percentage with raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg) who are not currently on medication for raised BP	**15.8%** (11.7 – 19.9)	**18.8%** (15.4 – 22.2)	**12.7%** (4.33 – 21.0)
Step 3 Biochemical Measurement			
Mean fasting blood glucose, including those currently on medication for raised blood glucose [choose accordingly: mmol/L or mg/dl]			
Percentage with impaired fasting glycaemia as defined below • plasma venous value ≥6.1 mmol/L (110 mg/dl) and <7.0 mmol/L (126 mg/dl) • capillary whole blood value ≥5.6 mmol/L (100 mg/dl) and <6.1 mmol/L (110 mg/dl)			
Percentage with raised fasting blood glucose as defined below or currently on medication for raised blood glucose • plasma venous value ≥ 7.0 mmol/L (126 mg/dl) • capillary whole blood value ≥ 6.1 mmol/L (110 mg/dl)			
Mean total blood cholesterol, including those currently on medication for raised cholesterol [choose accordingly: mmol/L or mg/dl]			
Percentage with raised total cholesterol (≥ 5.0 mmol/L or ≥ 190 mg/dl or currently on medication for raised cholesterol)			
Summary of combined risk factors			
• current daily smokers • less than 5 servings of fruits & vegetables per day • low level of activity • overweight (BMI ≥ 25 kg/m^2) • raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg or currently on medication for raised BP)			
Percentage with none of the above risk factors	**1.5%** (*)	**1.1%** (*)	**2.3%** (*)
Percentage with three or more of the above risk factors, aged 25 to 44 years	**39.2%** (30.9 – 47.5)	**36.1%** (25.9 – 46.4)	**44.8%** (23.5 – 66.0)
Percentage with three or more of the above risk factors, aged 45 to 64 years	**49.4%** (42.6 – 56.2)	**49.8%** (40.3 – 59.4)	**48.4%** (42.2–54.6)
Percentage with three or more of the above risk factors, aged 25 to 64 years	**42.9%** (37.5 – 48.3)	**41.2%** (33.2 – 49.6)	**46.0%** (30.2 – 61.8)

(*) Too few responses for valid confidence intervals

For additional information, please contact:
Dr. Anna Matthews (anna.matthews@hsa.ky)
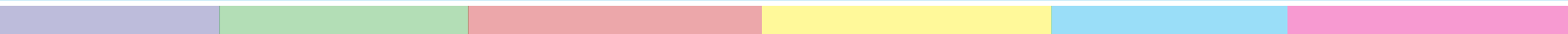
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