Steps to a Well Bermuda | 2014

PAHO-WHO Non-Communicable Disease Risk Factor Survey

STEPS TO A WELL BERMUDA 2014

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Table of Contents

List of Tables and Figures

Foreword

From the Chief Medical Officer

Completion of Bermuda's first STEPS survey is an accomplishment in which the Ministry of Health, Seniors and Environment takes great pride. We are most proud of its collaborative success: the delicate balancing act required for planning with multiple stakeholders and the coordinated execution needed to implement a complex project. Relationships with health partners matured through this collaboration and will be an enduring legacy of this first STEPS undertaking.

Almost as if by divinely guided processes, health partners appeared and offered to collaborate with the Ministry in January 2013. The specter of escalating chronic non-communicable diseases had the attention of the healthcare community and individually our collaborators had converged on a line of action, which involved data collection for the purpose of describing the extent of the problem. Offers of technical support, logistical assistance, advice and encouragement came from various sources. Most notable was the promise of technical expertise and guidance from the Caribbean Public Health Agency (CARPHA) in Trinidad and Tobago. It was this commitment that made the undertaking possible.

In addition to CARPHA's technical assistance, the STEPS journey was embarked upon with the support of local health partners, particularly the Bermuda Hospitals Board's Chronic Disease Management Centre and the Bermuda Diabetes Association. Additional encouragement was offered by the Bermuda Heart Foundation and Bermuda Cancer and Health Centre.

Initially, our plans for the survey included optional components, which were to be supported by the University of the West Indies, Cave Hill, Barbados, and University of Cumbria in the United Kingdom. The involvement of esteemed academic centers was a source of inspiration and excitement which fueled community enthusiasm for the project. Although the optional items in the STEPS survey were not able to be completed in the end, we remain grateful for the offer of assistance and the energy generated by the commitment from these universities.

The STEPS journey has been an enormously enriching one for the health community in Bermuda, joining the expertise and efforts of staff from the Ministry, including the Department of Health, with professionals and laypersons throughout the island. It unified our purpose around one goal: collecting chronic disease risk factor data on our population. The exhilaration of the early planning stages, the intense detail-orientation of the operational phase, and the challenges of executing a long-term project have allowed the participants in the project to bond in ways which will prove useful in the years ahead. As we make strategic plans and take action based on the information gleaned from the survey experience, we will benefit from the bonds of friendship and trust which enhance all collaborations.

The survey implementation phase, spanning from November 2013 to December 2014, has ended. Now, the community and the collaborators have a priceless opportunity to interpret and act on the data we collected together. This represents a new phase, just as important as the information-gathering phase. It is now the time for collective action to address the threat of chronic non-communicable diseases. A vast amount of community health information is available to us for reflection, priority-setting, decision-making and action. We extend our hands again to our health partners to continue the journey with us.

Information obtained from the STEPS to a Well Bermuda survey has now been analyzed, validated and shared in stages with the community. In the months ahead, we anticipate multiple stakeholder gatherings and an evolving communication plan to assure that every member of the community is informed and involved in helping to take action to prevent and control chronic NCDs by addressing their risk factors. The STEPS to a Well Bermuda journey has been an infinitely valuable learning experience for the Ministry and our collaborators and we cherish it. However, we realize with excitement that the journey has only just begun.

Dr. Cheryl Peek-Ball
Chief Medical Officer
Office of the Chief Medical Officer
Ministry of Health, Seniors and Environment

Executive Summary

STEPS to a Well Bermuda 2014 provides an assessment of selected chronic non-communicable diseases and their risk factors in Bermuda. Data was collected from 1195 persons in STEP 1 (face-to-face interview), 1147 persons in STEP 2 (physical measurements) and 467 persons in STEP 3 (biochemical measurements). This report presents the data and commentary on the main findings. The highlights are presented here:

STEP 1: Behavioural Risk Factors

- 14% were current smokers, either daily (10%) or some days (4%).

- 64% were current drinkers.

- 18% ate five or more servings of fruits and/or vegetables per day.

- 50% drank at least one sugary drink per day.

- 27% did not meet the World Health Organization recommendations of physical activity for health.

- 33% had been told by a doctor or health worker that they had raised blood pressure.

- 12% had been told by a doctor or health worker that they had diabetes.

- 34% had been told by a doctor or health worker they had high cholesterol.

- 6% reported a history of cardiovascular disease (heart attack, angina, or stroke).

- 64% had an immediate family member with high blood pressure.

- 52% had an immediate family member with diabetes.

- 48% had an immediate family member with high cholesterol.

- 47% had an immediate family member with cancer.

- 23% had an immediate family member who had a stroke.

- 14% had an immediate family member who had an early heart attack.

- 44% had been advised to start or do more physical activity.

- 38% had been advised to lose weight or maintain a healthy body weight.

- 31% had been advised to eat at least five servings of fruits and vegetables.

- 25% had been advised to reduce fat in the diet

- 18% had been advised to reduce salt in the diet.

- 12% had been advised to not use tobacco or to quit using tobacco.

- 92% had health insurance coverage

- 17% reported having a chronic non-communicable disease. Of these:

    - 18% had visited a health care facility within 30 days

    - 9% had been hospitalized within a year

    - 4% received home care within 30 days

    - 8% missed usual activity within 30 days

STEP 2: Physical Measurements

- The mean heart rate was 73 beats per minute.
- The mean blood pressure was 123/80mmHg.
- 33% had raised blood pressure.
- The mean waist circumference was 94cm for men and 90cm for women.
- 75% were overweight or obese.

Combined Risk Factors from STEPS 1 and 2

The combined risk factor indicator includes current daily smoking, eating less than five servings of fruits and vegetables, not meeting the WHO recommendation of physical activity for health, raised blood pressure, and overweight or obesity.

- 42% had three or more risk factors indicating increased risk for chronic non-communicable diseases.

STEP 3: Biochemical Measurements

- The mean fasting blood glucose was 92.0mg/dL.
- 9% had impaired fasting glycaemia.
- 10% had raised blood glucose.
- The mean fasting cholesterol was 189 mg/dL.
- 26% had high cholesterol.

The STEPS survey represents a significant step forward in gathering national information for informing the national strategy for the prevention, control and management of NCDs. The survey has provided strong evidence that NCDs and related modifiable risk factors are prevalent in Bermuda. The following recommendations are outlined as priority actions for Bermuda:
- Continue implementation of the WHO Framework Convention on Tobacco Control
- Comprehensive health promotion campaigns to reduce alcohol consumption, particularly targeted at young people and binge drinking
- Develop policies supporting importation of healthy foods and improving the distribution, marketing and availability of fruit and vegetables
- Comprehensive health promotion campaigns promoting the recommended levels of fruit and vegetable consumption and physical activity and increasing public awareness of the adverse effects of excessive consumption of high-fat and high-salt foods and high-sugar foods and drinks and physical inactivity
- Public awareness campaigns on the importance of regular monitoring and screening of blood pressure, blood cholesterol and blood sugar levels
- Increasing availability and delivery of lifestyle advice by health care providers
- Developing a system of community-based care and management of individuals with diagnosed NCDs

All sectors must work together as we endeavour to take greater steps towards a Well Bermuda!

Introduction

This document is the main report of STEPS to a Well Bermuda, a population-based cross-sectional assessment of chronic disease risk factors in adults aged 18 and over. It was carried out from November 2013 through December 2014 using the Pan-American version of the World Health Organization's STEPwise approach to chronic disease risk factor surveillance (STEPS) methodology. STEPS to a Well Bermuda was conducted with the assistance of the Caribbean Public Health Agency (CARPHA) and local public health partners, including the Bermuda Hospitals Board, particularly the Chronic Disease Management Centre, and the Bermuda Diabetes Association.

The Results section provides information on STEPS to a Well Bermuda's significant findings. Additional information is provided in the STEPS to a Well Bermuda 2014 Data Book which is available upon request. The Data Book provides information on every question asked, including counts and confidence intervals. The Survey Instrument is also available upon request. The Trends section compares selected results from STEPS to a Well Bermuda to the Health Survey of Adults and Children in Bermuda 2006 and the Health Survey of Adults in Bermuda 2011. The Discussion section presents the results in context, along with conclusions and recommendations for addressing the priority chronic disease risk factors.

Background

Chronic diseases contribute the greatest proportion of the total burden of disease in the countries of Latin America and the Caribbean, including Bermuda. This burden of chronic diseases has significant health, social, and economic consequences.

In Bermuda, the leading causes of death include heart diseases or diseases of the circulatory system, cancer, diabetes, and diseases of the respiratory system. These chronic diseases accounted for approximately 80% of deaths in 2012 and are contributed to by common, preventable risk factors.

TABLE 1. LEADING CAUSES OF DEATH, BERMUDA, 2012

Underlying Cause of Death	%
Diseases of the Circulatory System	35%
Malignant Neoplasms / Cancers	30%
Endocrine, Nutritional and Metabolic Diseases (including Diabetes)	9%
Diseases of the Respiratory System	6%
External Causes	4%
Certain Infectious and Parasitic Diseases	2%
Other Causes	14%

Prevention and control of these diseases depends on access to accurate and reliable information about the prevalence of their associated risk factors. This information is vital to both informing where resources should best be targeted and for monitoring and evaluating the impact of any actions taken.

STEPS to a Well Bermuda obtained information about eight major behavioural and biological risk factors. The major (modifiable) behavioral risk factors include tobacco use, harmful alcohol consumption, unhealthy diet (low fruit and vegetable consumption), and physical inactivity. The major biological risk factors include overweight and obesity, elevated blood pressure, raised blood glucose, raised cholesterol. Surveillance of these major risk factors is

necessary as they have the greatest impact on chronic disease mortality and morbidity and modification is possible through effective prevention.

The Health Survey of Adults in Bermuda, 2011, used self-reported data obtained through a telephone survey to examine these risk factors. That survey found that in the adult population, 13% were current smokers, 50% currently drank alcoholic beverages, over 80% did not eat at least three servings of fruit or vegetables per day and 18% were sedentary. Additionally, 66% were overweight or obese, 36% had high blood pressure, 11% had diabetes, and 34% had high cholesterol.

STEPwise Approach to Chronic Disease Risk Factor Surveillance (STEPS)

STEPS uses a sequential process to collect chronic disease risk factor information. It starts with gathering information on key risk factors using a questionnaire (STEP 1), then moves to simple physical measurements, such as height, weight, and waist circumference (STEP 2) and then to more complex collection of clinical samples for biochemical analysis (STEP 3). Within each STEP, there are three levels of data collection: core, expanded and optional. All countries should complete the core items. Expanded and optional items can be completed as resources allow.

FIGURE 1. DIAGRAMMATIC REPRESENTATION OF THE STEPWISE APPROACH

STEPS differs from other population health surveys in that the behavioural questionnaire is conducted in face-to-face interviews and show cards are used to clarify what is meant by certain questions. This ensures that all participants have a clear understanding of the terms used in the STEPS Instrument. As solely self-reported data can result in underestimation or overestimation of the prevalence of risk factors, health behaviours, and chronic diseases, self-report data should be supplemented with objective measurement when possible. Therefore, STEPS contains physical measurements (and biochemical assessments) which can add substantially to the information about the state of health of a population.

Purpose

STEPS to a Well Bermuda, using self-reported information and a range of objective physical and biochemical measures, aims to:
- describe the prevalence and distribution of chronic disease risk factors and selected chronic diseases in the population,
- track the direction and magnitude of risk factor trends, and
- provide a sound evidence base to inform public health priorities for the prevention and control of chronic non-communicable diseases.

Methods

The Pan-American Health Organization STEPwise approach to chronic disease risk factor surveillance (PAHO-STEPS) was used in Bermuda. PAHO-STEPS is adapted from the WHO STEPwise approach to chronic disease risk factor surveillance (WHO-STEPS) and is PAHO's recommended tool for surveillance of chronic disease risk factors in adults in the region. A suite of software that allows for the collection of the required STEPS data using Personal Digital Assistants (PDAs), eSTEPS, was used.

Scope of STEPS to a Well Bermuda

The focus of the STEPwise approach to surveillance of chronic disease risk factors is reflected in the core modules of the STEPS Instrument. As such, all core items from STEPS 1, 2 and 3 were included. Additionally, some expanded, optional and Bermuda-specific items were included in STEP 1. The initial scope of the survey also included other optional items from STEPS 1 and 3, however, due to logistical constraints, these optional items were not completed.

FIGURE 2. SCOPE OF STEPS TO A WELL BERMUDA

	Core	Expanded	Optional	Country Specific
STEP 1				
Demographics	Age, gender, education	Race/ethnicity, marital status, work status, household income	Healthcare - coverage and utilization Lost productivity	Bermuda Status Ancestry
Tobacco Use	Daily use, current use, type, initiation, duration, cessation	Exposure to second hand smoke		
Alcohol consumption	Daily use, current use, frequency, binge drinking			
Diet	Fruit and vegetable consumption Dietary salt	Oil and fat consumption		Sugary drink consumption
Physical Activity	By set: work, travel to and from places, recreation	Sedentary behaviour		
History of Non-Communicable Diseases	History of: raised blood pressure, diabetes, raised total cholesterol, cardiovascular disease Lifestyle advice Cervical cancer screening		Oral health status	
STEP 2				
Physical Measurements	Weight and height Waist circumference Blood pressure	Heart rate		
STEP 3				
Biochemical measurements	Fasting blood sugar Total cholesterol			

STEPS 1 and 2 were conducted within the participant's household or other suitable location as determined by the interviewer and participant. Healthcare professionals conducted STEP 3 in a clinical setting.

Study Population, Sample Size and Sampling

The sample size of 2656 households was calculated using the STEPS sample size calculator as applied to the population projections for persons aged 18 years and older for mid-year 2013. The level of confidence and the corresponding margin of error used for the sample size calculations were 95% and 0.05, respectively. As STEPS advises that prior surveys be examined and the risk factor prevalence closest to 50% (0.5) be used as it is most conservative, the prevalence of raised blood pressure (36%) from the 2011 Health Survey was used. The aim was to look at young adults, middle-aged adults and older adults by gender resulting in six age-sex strata. A simple random sample was used (design effect 1). The projected response rate was 80% for STEPS 1 and 2. It was also anticipated that fewer persons would participate in STEP 3 due to the 12-hour fasting requirement.

FIGURE 3. VARIABLES USED FOR THE SAMPLE SIZE CALCULATION

Variable	Value
Level of confidence (95%)	1.96
Margin of error	0.05
Risk factor prevalence	0.36
Design effect	1
Number of age-sex strata	6
Expected response rate	0.8

The Department of Statistics utilized their household sampling frame to provide the selected households by address and individual assessment number. Within each selected household, the Kish Method was used to randomly select one individual aged 18 years and older to participate. Persons with limited capacity to consent and those who were unwilling or unable to participate in STEPS 1, 2 or 3 due to mental and/or physical disability were excluded from participating. Pregnant women were excluded from physical measurements of height, weight, and waist circumference.

Data Collection

Data collectors were recruited in September 2013. Preference was given to applicants with experience in conducting other surveys, including the census. Training was conducted in the evenings for 5 days from 30 September 2013 to 4 October 2013. Representatives from CARPHA facilitated the training with assistance from Department of Health personnel. Department of Health personnel conducted refresher training on 30 October 2013. This also included practical training on the use of equipment that was unavailable during the initial training. Pilot testing occurred on 2 - 3 November 2013 using a convenience sample. The training and pilot testing addressed the following topics:

- Overview and rationale of STEPS
- Approaching selected households and using the Kish method
- Informing participants and obtaining consent
- Interview skills
- Data collection using eSTEPS on PDAs
- Use of show cards
- Taking and recording physical measurements and completion of Participant Feedback forms
- Procedure for referrals for biochemical measurements, including fasting requirements

Upon successful completion of the training, data collection commenced with 28 interviewing teams for STEPS 1 and 2, overseen by six supervisors. Each team was provided with their respective household listings and maps,

other survey documents, an eSTEPS PDA and equipment to conduct the physical measurements for STEP 2. This equipment was provided in a rolling duffle bag and included a stadiometer (height rod), digital scale, BMI wheel, tape measure, and blood pressure monitor (Omron®).

Healthcare professionals conducting STEP 3 biochemical measurements were trained in the use of CardioChek® machines and use of eSTEPS on the PDA to enter the data.

Data collection was extended and occurred from 10 November 2013 through 20 December 2014. Data collection was suspended from 15 December 2013 – 20 January 2014 for the festive season. It was also suspended around holidays such as Cup Match at the end of July and as necessary due to hurricane activity. Data collection was also affected by interviewer availability.

Data processing

Data was downloaded from each PDA as it became available from active interviewers. This data was stored in a file created for each PDA and merged at the end of data collection. Although the use of eSTEPS allowed for immediate error-checking during data collection, additional data cleaning was performed with the assistance of CARPHA. CARPHA also assisted with the data analysis, including weighting. The data was weighted using individual and population weights to adjust for age and sex differences between the sample and population. Data analysis was performed using Epi Info® 3.4.3. STEPS recommended data analysis and reporting tools were used throughout the data analysis and reporting process, including STEPS-developed Epi Info® programmes, fact sheets and data book templates. Except for the demographic variables, weighted data are presented in this report.

Response Rates and Limitations

As 35% of households were either not reached or ineligible, the overall response rate was low. Among the eligible households, the response or cooperation rate was 69% for STEP1, 67% for STEP 2 and 27% for STEP 3.

TABLE 2. RESPONSE RATES

		Overall Response Rates	STEPS Response Rates
Distribution of responses	N	%	%
Number of completed interviews (STEP 1)	1195	45.0%	69.4%
Number or completed physical measurements (STEP 2)	1147	43.2%	66.6%
Number of completed biochemical measurements (STEP 3)	467	17.6%	27.1%
Number of declines	528	19.9%	30.6%
Total eligible households	**1723**	**64.9%**	**100%**
Number of vacant households or businesses	182	6.9%	
Addresses not reached	751	28.3%	
Total Sample Size	**2656**	**100.0%**	

The baseline prevalence used for the sample size calculation was based on the prevalence of hypertension. At 36%, this value was conservative and resulted in a very large sample size. Alternatively, the baseline prevalence of diabetes (11%) could have been used which would have resulted in a smaller sample size of approximately 1130 households. This sample size may have been more practical given the financial and human resources involved in carrying out this type of survey and resulted in a higher response rate. Self-selection bias may have also played a role in STEP 3 participation; persons who may already know their status in regards to the biochemical measurements under study, namely blood glucose and cholesterol levels, may have been less likely to participate in STEP 3.

Results

Demographic Information

There were a total of 1195 respondents for STEP 1, 1147 for STEP 2 and 467 for STEP 3. The demographic information presented here is for STEP 1. The demographics for STEPS 2 and 3 are similar. Overall, the socio-demographics of the respondents are similar to the resident Bermuda population as presented in the 2010 Census on Population and Housing in Bermuda.

The majority of respondents were women (58.7%). The age breakdowns were similar with 34.5% of respondents aged 18-44 years, 30.3% of respondents aged 45-59 years and 35.2% of respondents aged 60 years and older. Among men, the most represented age group was 18-44; among women, it was those aged 60 years and over.

FIGURE 4. AGE DISTRIBUTION OF RESPONDENTS BY GENDER
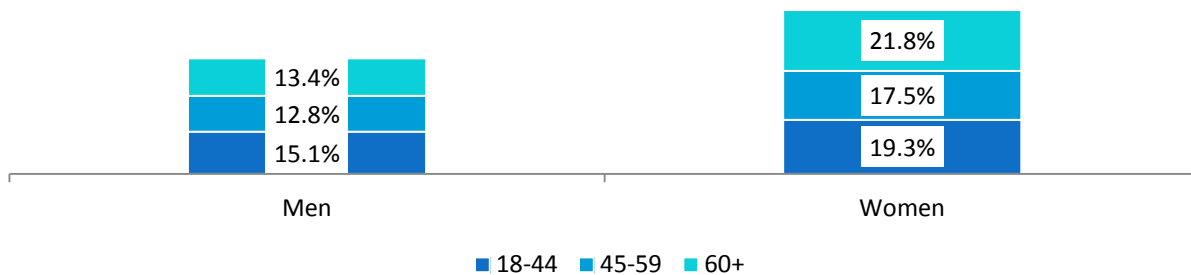
Over half of respondents (55.8%) were black and around a third (32.4%) were white. The remaining ethnicities represented were Asian (2.7%), mixed (6.7%), and other (2.5%). When asked about their ancestry, over half of respondents (54.6%) reported Bermudian ancestry, 11.0% reported West Indian ancestry, 9.6% reported British ancestry and 7.6% reported Portuguese ancestry. Fewer respondents reported having American (3.5%), European (3.1%), Asian (2.6%), or Canadian (3.1%) ancestry. The remaining ancestries represented were African (1.8%), Native American (0.5%) and other (3.3%). The vast majority of respondents (80.6%) were Bermudian. Among the non-Bermudians, 5.3% were Permanent Resident Certificate Holders and 4.5% were spouses of Bermudians. Of all respondents, 25.9% had never been married, 47.4% were currently married, either first time or remarried, 8.5% were divorced and 18.3% were divorced or legally separated.

The majority of respondents (70.5%) were employed. One-fifth (20.8%) of respondents were retired. The remaining respondents were out of work (5.1%), homemakers (2.7%) or students (1.0%). On average, respondents had spent 14.0 years in school or full-time study; however, there was a trend of younger persons having more years of education than older persons. Respondents aged 18-44 had on average 15 years of schooling and respondents aged 45-59 had 14.6 years of schools compared to an average of 12.3 years of schooling in those aged 60 years and older. Very few respondents (0.2%) had no formal schooling, had completed primary school only (2.7%) or had completed up to middle school (4.9%). Overall, 92.4% had completed secondary or higher education. Additionally, just over half of respondents (51.8%) had an estimated household income of less than $72,000.

Tobacco Use

Respondents were asked about current and past cigarette smoking. Overall, 13.9% of respondents reported current smoking, either daily (10.3%) or some days (3.6%). Additionally, 27.6% of respondents were former smokers and 58.5% said they had never smoked. Men (19.8%) were more likely to be current smokers than women (7.5%). Men (14.8%) were also more likely to be daily smokers than women (5.4%). Adults aged 18-44 (66.9%) were more likely to have never smoked than adults aged 60 years and older (45.9%).

FIGURE 5. SMOKING STATUS BY GENDER
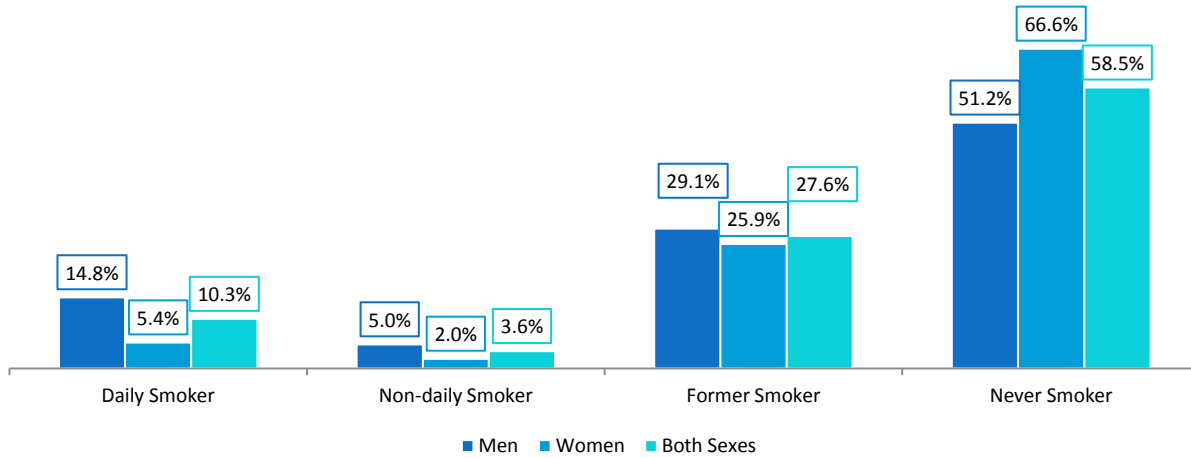
The average age that smokers started smoking was 18 years and the average duration of smoking was 29.5 years; smoking duration is influenced by age.

Among daily smokers, 83.3% of men and 100% of women smoked manufactured cigarettes. Daily smokers smoked an average of 11 manufactured cigarettes per day.

Among current smokers, 78.5% smoke manufactured cigarettes and 17.3% smoke hand-rolled cigarettes. In the 12 months prior, 44.9% of current smokers had been advised by a healthcare provider to quit smoking and 45.4% had tried to quit smoking. For former daily smokers, the average number of years since they had quit smoking was 22.4 years; this was influenced by age with the average being 9.8 years among respondents aged 18-44 years.

Respondents were asked if in the past 7 days someone had smoked in their home or in closed areas in their workplace. Overall, 11.2% reported exposure to second-hand smoke in the home while 12.0% reported exposure to second-hand smoke in the workplace.

Alcohol Consumption

Respondents were asked about whether and how often they drank alcoholic beverages. They were also asked how many times they had consumed six or more alcoholic drinks at a single occasion, which would be considered heavy episodic drinking or binge drinking. Show cards were used to illustrate a standard drink as being equivalent to a 12-ounce beer, a 5-ounce glass of wine or a drink with one shot of liquor.

Overall, 7.6% were lifetime abstainers, 15.0% were 12-month abstainers and 64.0% were current drinkers, having consumed alcohol in the past 30 days. Women (12.7%) were more likely to be lifetime abstainers than men (2.9%) and adults aged 18-44 (7.8%) were least likely to be 12-month abstainers. Men (75.5%) were more likely to be current drinkers than women (51.4%) and adults aged 60 years and older (46.3%) were least likely to be current drinkers.

FIGURE 6. CURRENT DRINKERS BY AGE-GROUP AND GENDER
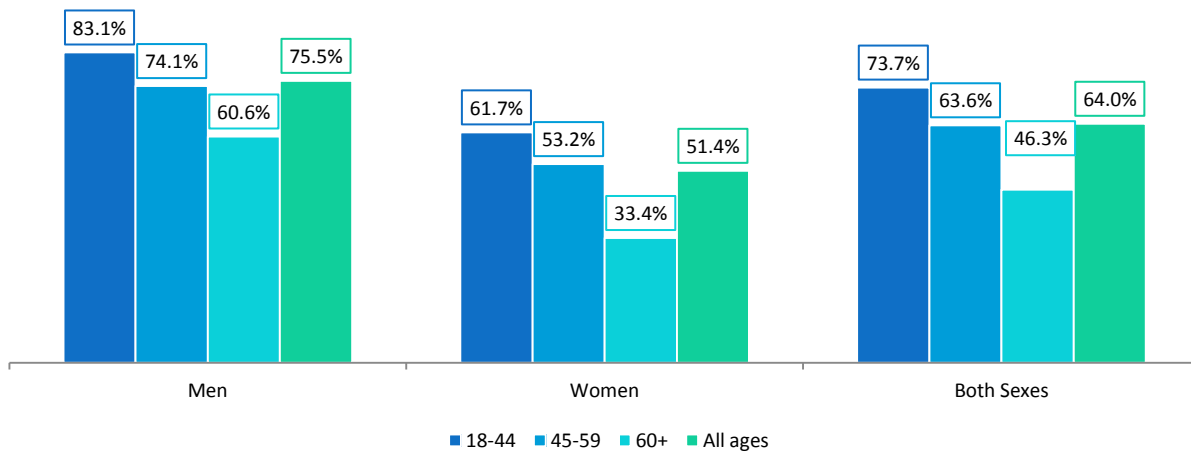
Current drinkers drank on average 11 times during the past 30 days and drank an average of three standard alcoholic drinks on each occasion. On average, the largest number of standard alcoholic drinks was five drinks for men and three drinks for women.

While 13.5% of adults engaged in binge drinking overall, adults aged 60 years and older were least likely to engage in binge drinking (3.5%). Men (21.4%) were more likely to engage in binge drinking than women (4.8%). Men engaged in binge drinking an average of five times in a month.

Among respondents who drank alcohol in the last 12 months, 19.0% drank alcohol daily and 25.1% drank alcohol less than once a month. Women (37.6%) were more likely to drink alcohol less than once a month than men (15.9%).

Among former drinkers, 14.6% had stopped drinking due to health reasons, either negative impact on their health or following the advice of a doctor or health care provider.

Oral Health

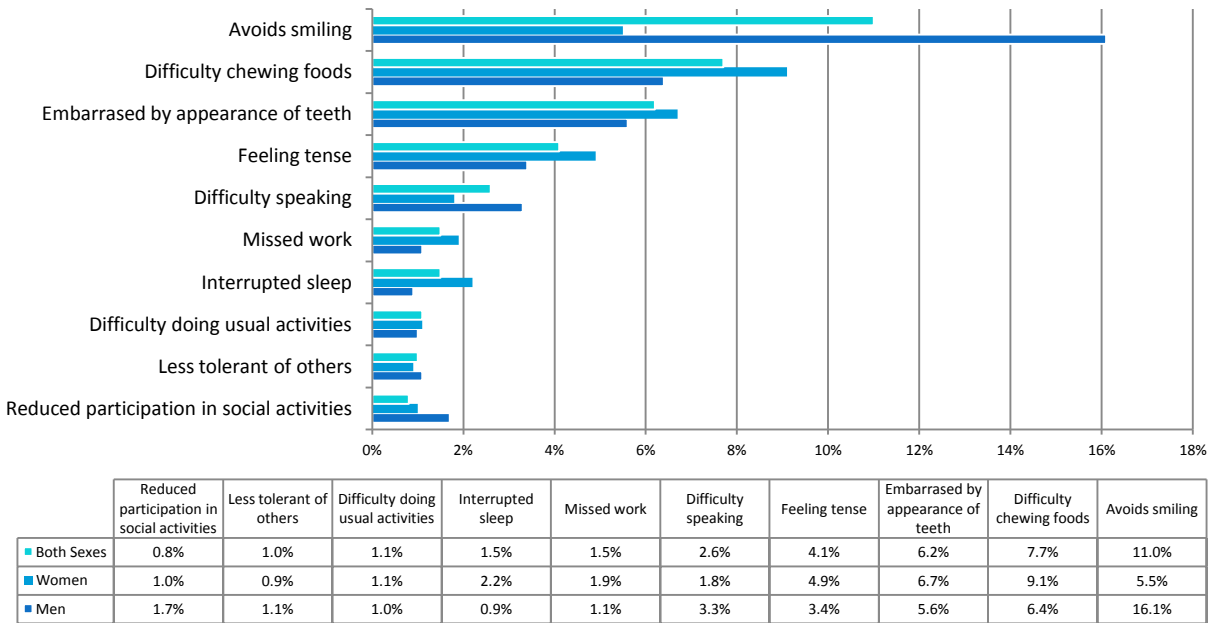Respondents were asked about their oral health status and dental hygiene.

Most of the respondents (86.4%) had 20 or more natural teeth. The proportion of respondents with 20 or more natural teeth decreased with age from 98.6% of adults aged 18-44 years to 89.3% of adults aged 45-59 years to 59.6% of adults aged 60 years and older.

Denture usage among all respondents was 20.2%. Among those with dentures, 90.5% had an upper jaw denture, 74.3% had a lower jaw denture and 66.5% had both an upper jaw and a lower jaw denture.

Less than 1% (0.3%) of respondents had never received dental care while 68.9% had seen a dentist in the previous year. The main reason for dental visits was routine check-up (61.6%), followed by pain or trouble with teeth (14.6%) and follow-up treatments (13.0%). Overall, 19.4% reported having oral pain or discomfort in the previous year. Women (25.7%) were more likely to report oral pain and discomfort than men (13.6%). Few respondents reported having poor or very poor state of teeth (4.2%) or gums (2.8%).

Respondents were asked about specific problems experienced in the past year due to the state of their teeth. The most commonly reported problems included avoiding smiling (11.0%), difficulty in chewing foods (7.7%), and being embarrassed because of the appearance of their teeth (6.2%).

FIGURE 7. PROBLEMS RELATED TO STATE OF TEETH BY GENDER

	Reduced participation in social activities	Less tolerant of others	Difficulty doing usual activities	Interrupted sleep	Missed work	Difficulty speaking	Feeling tense	Embarrased by appearance of teeth	Difficulty chewing foods	Avoids smiling
Both Sexes	0.8%	1.0%	1.1%	1.5%	1.5%	2.6%	4.1%	6.2%	7.7%	11.0%
Women	1.0%	0.9%	1.1%	2.2%	1.9%	1.8%	4.9%	6.7%	9.1%	5.5%
Men	1.7%	1.1%	1.0%	0.9%	1.1%	3.3%	3.4%	5.6%	6.4%	16.1%

Almost all respondents (98.7%) cleaned their teeth at least once per day while 69.2% cleaned their teeth at least twice per day. Among those who cleaned their teeth, 97.5% used toothpaste. Among those that used toothpaste to clean their teeth, 90.4% used toothpaste that contained fluoride. Additionally, 70.7% of respondents used dental floss to clean their teeth.

Dietary Habits

Respondents were asked how many servings of fruit and vegetables they usually eat and how often they eat fruits and vegetables. Show cards were used to demonstrate serving sizes of fruits and vegetables.

The largest proportion (48.3%) reported that they ate one to two servings of fruit and/or vegetables per day. Additionally, 27.1% reported eating three to four servings of fruit and/or vegetables per day. However, 6.5% reported eating less than one serving of fruits and vegetables per day and 18.1% reported eating five or more servings of fruits and/or vegetables per day. Overall, 81.9% are eating less than five servings of fruit and/or vegetables per day.

Separately, respondents reported eating fruits on an average of five days per week and vegetables on average six days per week. On these days, they reported eating an average of one serving of fruit and two servings of vegetables.

FIGURE 8. AVERAGE FRUIT AND VEGETABLE CONSUMPTION PER DAY
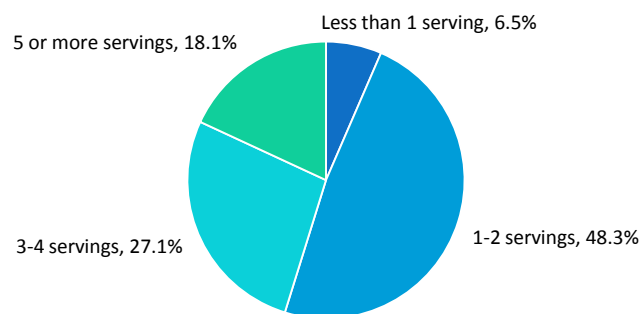
Respondents were also asked about consumption of sugary drinks. Nearly half of all respondents (49.6%) reported having at least one sugary drink per day.

FIGURE 9. AVERAGE SUGARY DRINK CONSUMPTION PER DAY
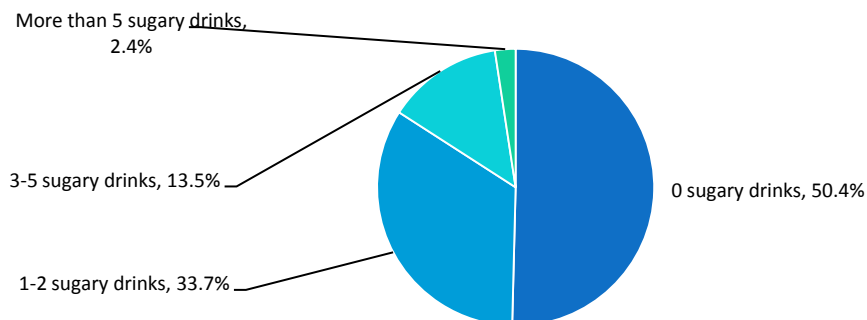
Respondents were asked about types of oils and fats used in meal preparation in their household. The most commonly used oils or fats were olive or canola oil (69.2%) and vegetable oil (20.6%).

All respondents stated that lowering salt in the diet is very important (96.8%) or somewhat important (3.2%). Also, 62.6% thought that consuming too much salt could cause serious health problems. Numerous questions were asked about use of salt, consumption of salt and control of salt intake. Overall, 18.6% thought they consumed far too much or too much salt, 11.6% add salt to their food before they eat it or as they are eating it, 49.4% add salt during cooking or preparing food in their household, and 12.0% always or often consume processed food high in salt. The most common habits that respondents used to control salt intake were avoiding/minimizing the consumption of processed foods (79.9%), buying low salt/sodium alternatives (77.1%) and looking at the salt/sodium labels on food (48.3%). Women (60.1%) were more likely than men (37.5%) to look at the salt/sodium labels. Adults aged 60 years and older (52.3%) were more likely to cook meals without adding salt than adults aged 18-44 years (30.6%).

FIGURE 10. HABITS USED TO CONTROL SALT INTAKE BY GENDER

19
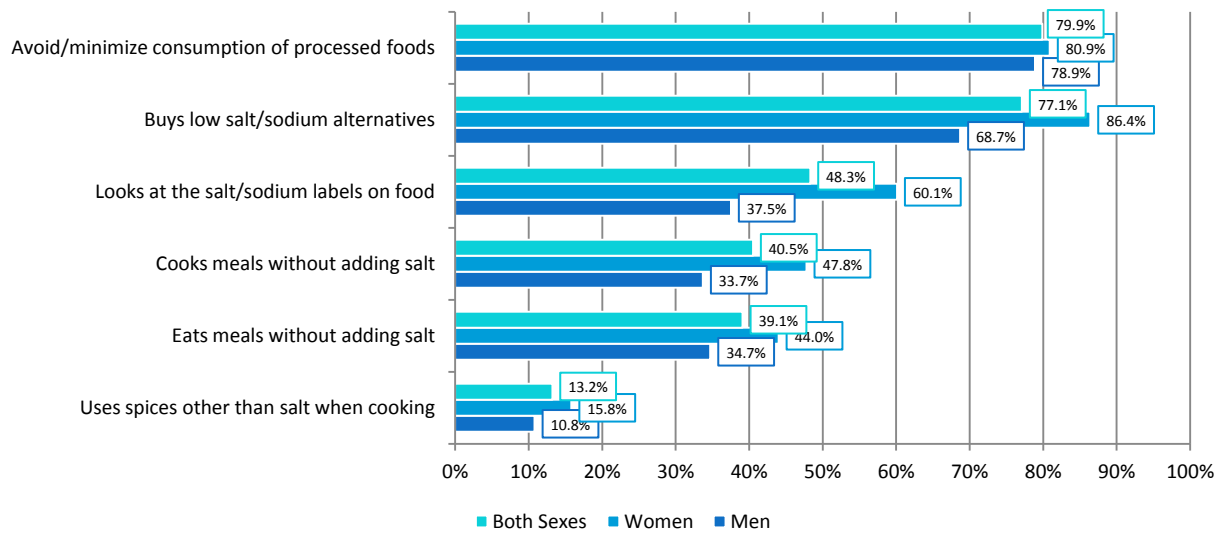
Physical Activity

Respondents were asked numerous questions about their physical activity at work, during transport (such as walking or cycling to or from places), and during recreation. This was used to determine total and relative levels of physical activity.

The World Health Organization (WHO) has recommended that adults engage in no less than 150 minutes of moderate physical activity per week, or equivalent. Overall, 27.1% were not meeting these WHO recommendations on physical activity for health. Women (33.7%) were more likely to not meet the recommendations than men (20.2%).

FIGURE 11. INSUFFICIENT PHYSICAL ACTIVITY FOR HEALTH (WHO RECOMMENDATIONS) BY AGE-GROUP AND GENDER
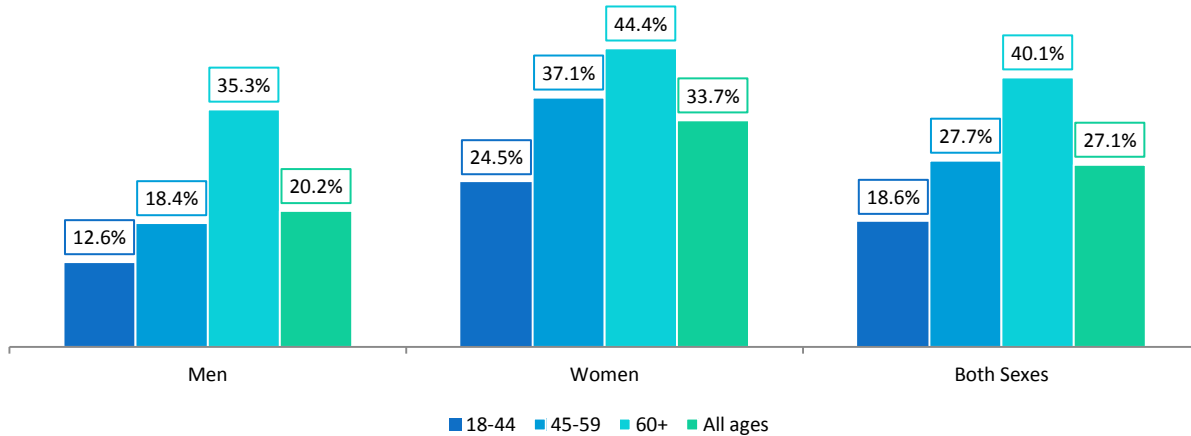
Additionally, 57.6% of respondents did not engage in any vigorous physical activity. There were differences by gender with 45.5% of men not engaging in vigorous physical activity compared to 69.4% of women. Women (68.9%) were also more likely to not engage in physical activity at work then men (50.8%). Overall, 60.0% do not engage in any physical activity at work, 66.6% do not engage in any transport-related physical activity and 39.3% do not engage in any physical activity during recreation. The overall composition of physical activity showed that most physical activity occurred during recreation (45.0%), followed by work (35.6%) and then transport (19.3%). However, there were differences by gender with males engaging in physical activity at work (42.4%) and during recreation (42.1%) almost equally.

FIGURE 12. PHYSICAL ACTIVITY BY TYPE AND GENDER
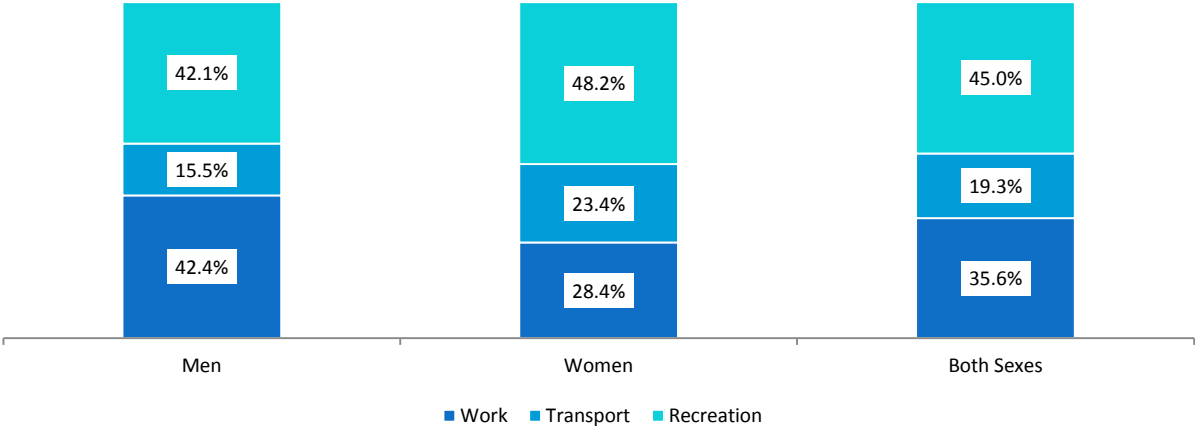
Physical activity can also be divided into low, moderate and high levels. Overall, 37.1% had low levels, 23.6% had moderate levels and 39.3% engaged in physical activity at a high level. Men (52.2%) were more likely to engage in physical activity at a high level than women (26.8%).

FIGURE 13. PHYSICAL ACTIVITY LEVELS BY GENDER
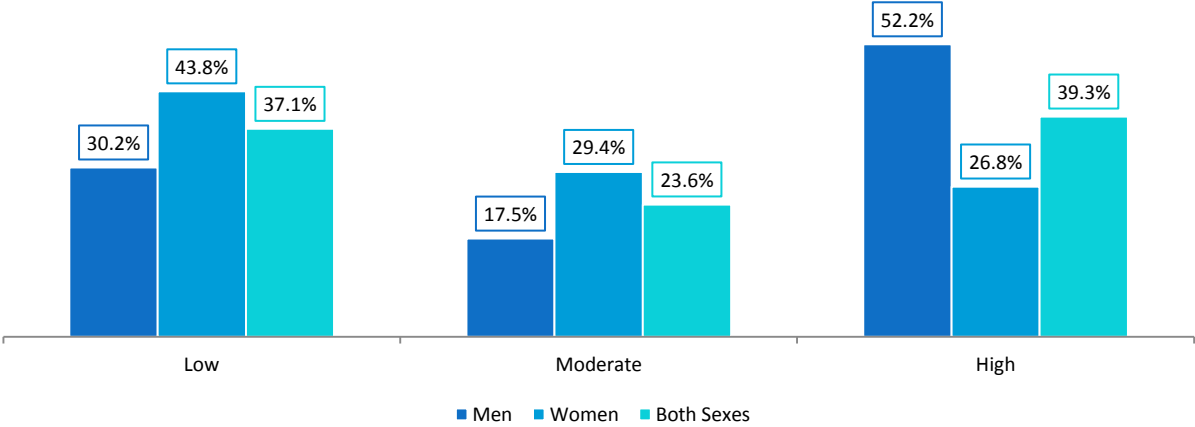
All respondents spent around five hours per day engaged in sedentary activities, such as sitting or reclining.

History of Non-Communicable Diseases

Blood Pressure

Respondents were asked if they had ever had their blood pressure measured by a doctor or other health worker, whether they had ever been told by a doctor or health worker they had raised blood pressure or hypertension, and whether they were currently taking medication prescribed for raised blood pressure.

Only 1.4% reported that they had never had their blood pressure measured. Overall, 66.0% reported that they had their blood pressure measured but had not been told they had raised blood pressure, and 32.7% reported being told by a doctor or health worker that they had raised blood pressure. Specifically, 13.1% had been diagnosed over a year ago and 19.6% had been diagnosed within the past 12 months.

FIGURE 14. SELF-REPORTED HISTORY OF BLOOD PRESSURE MEASUREMENT AND DIAGNOSIS OF RAISED BLOOD PRESSURE OR HYPERTENSION BY AGE-GROUP
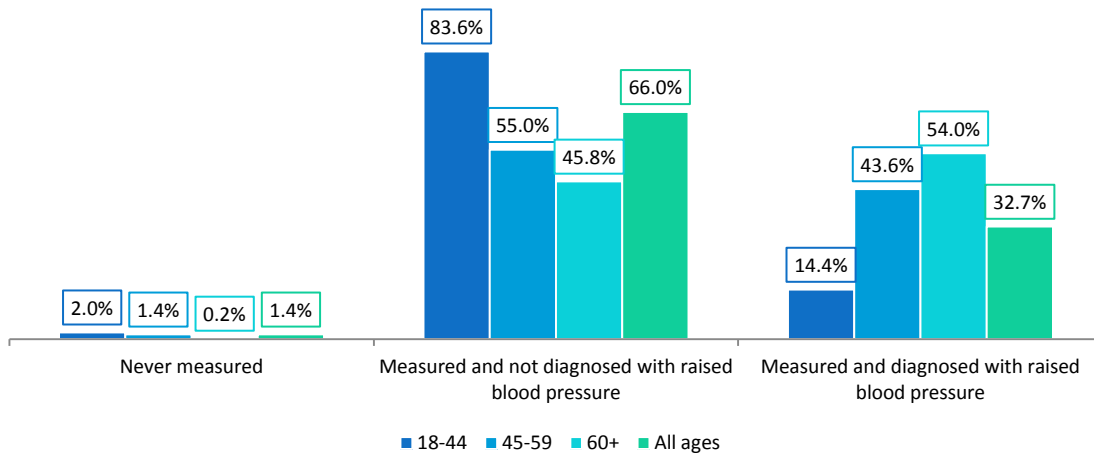
Of those reporting a diagnosis of raised blood pressure, 58.8% reported that they had taken medication for raised blood pressure during the past two weeks. Medication usage increased with age and differed by gender. Among those with high blood pressure, 20.6% of adults aged 18-44 years, 60.5% of those aged 45-59 years and 76.3% of those aged 60 years older had taken medication for raised blood pressure in the past two weeks. More women (69.7%) with raised blood pressure took blood pressure medication than men (47.7%).

Respondents were also asked about use of herbal or traditional remedies for their raised blood pressure. Overall, 8.1% reported taking a herbal or traditional remedy for their raised blood pressure.

FIGURE 15. MEDICATION USAGE FOR RAISED BLOOD PRESSURE, AMONG THOSE WITH SELF-REPORTED DIAGNOSIS OF RAISED BLOOD PRESSURE, BY AGE-GROUP AND GENDER

Legend: 18-44 45-59 60+ All ages
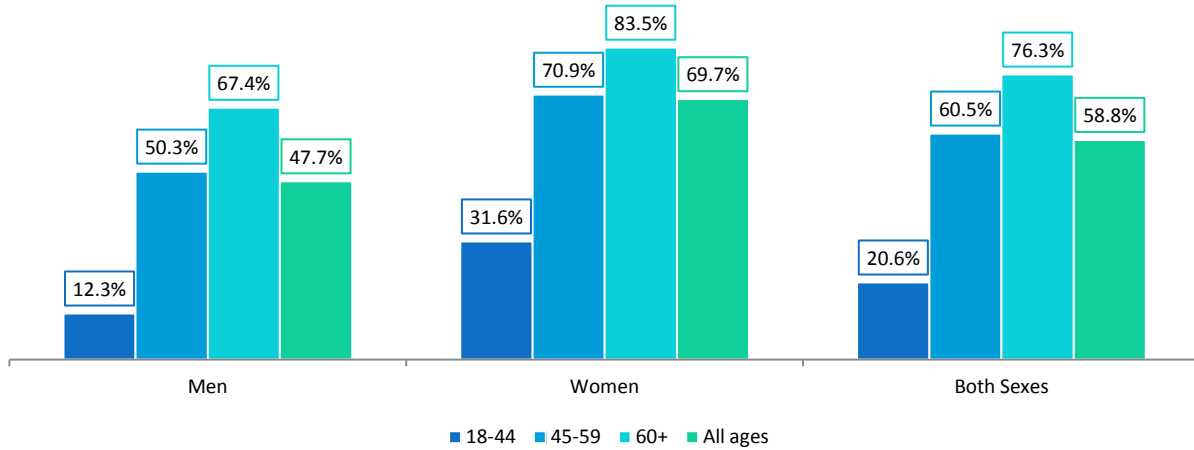
Diabetes

Respondents were asked if they had ever had their blood sugar measured by a doctor or other health worker, whether they had ever been told by a doctor or health worker they had raised blood sugar or diabetes, and whether they were currently taking medication prescribed for diabetes.

Overall, 10.6% reported that they had never had their blood sugar measured. Those aged 18-44 years (16.4%) were more likely to have never had their blood sugar measured than those aged 60 years and older (4.7%). Additionally, 77.2% reported that they had their blood sugar measured but had not been told they had raised blood sugar or diabetes, and 12.2 % had been told they had raised blood sugar or diabetes by a doctor or health worker. Specifically, 4.7% had been diagnosed over a year ago and 7.5% had been diagnosed within the past 12 months.

FIGURE 16. SELF-REPORTED HISTORY OF BLOOD SUGAR MEASUREMENT AND DIAGNOSIS OF RAISED BLOOD SUGAR OR DIABETES BY AGE-GROUP

Legend: 18-44 45-59 60+ All ages

Of those reporting a diagnosis of diabetes, 57.5% reported that they had taken medication for raised blood sugar during the past two weeks and 15.4% reported current use of insulin. These respondents were also asked about eye and foot examinations as part of their diabetes care. Although all respondents reported receiving eye and foot examinations as part of their care, only 5.1 % reported having their eyes examined within the past two years while 93.4% reported having their feet examined within the past year.

Cholesterol
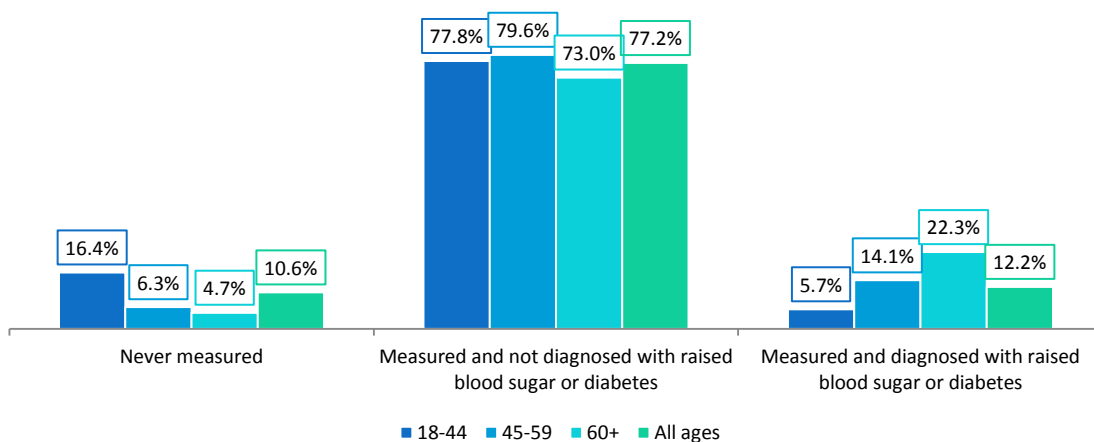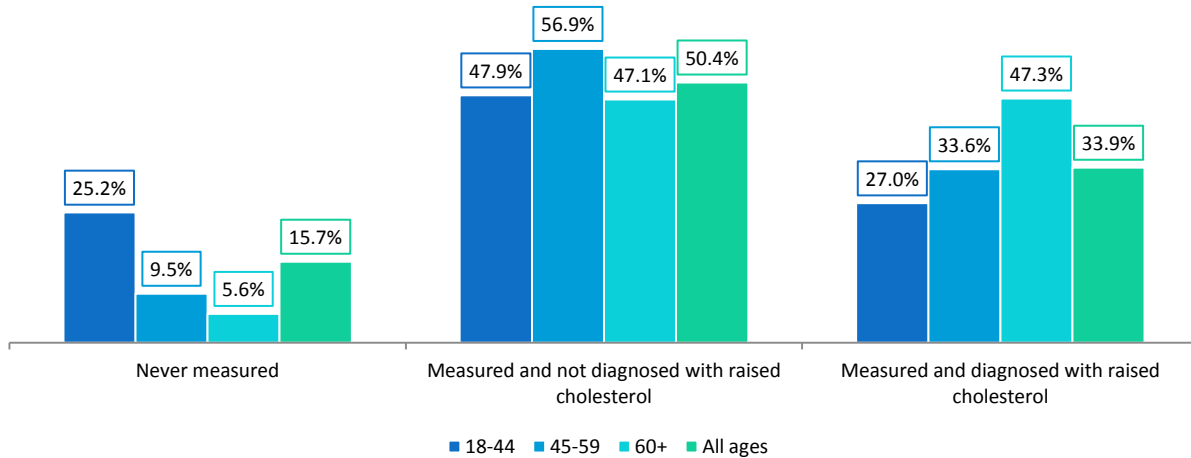
Respondents were asked if they had ever had their cholesterol measured by a doctor or other health worker, whether they had ever been told by a doctor or health worker they had raised cholesterol, and whether they were currently taking medication prescribed for raised cholesterol.

Overall, 15.7% reported that they had never had their cholesterol measured. Additionally, 50.4% reported that they had their cholesterol measured but had not been told they had raised cholesterol and, and 33.9% had been told they had raised cholesterol by a doctor or health worker. Specifically, 14.0% had been diagnosed over a year ago and 19.9% had been diagnosed within the past 12 months.

Of those reporting a diagnosis of raised cholesterol, 33.3% reported that they had taken medication for raised cholesterol during the past two weeks. Respondents were also asked about use of herbal or traditional remedies for their raised cholesterol. Overall, 5.4% reported taking a herbal or traditional remedy for their raised cholesterol.

FIGURE 17. SELF-REPORTED HISTORY OF CHOLESTEROL MEASUREMENT AND DIAGNOSIS OF RAISED CHOLESTEROL BY AGE-GROUP

Cardiovascular Disease

Respondents were asked if they had ever had a heart attack or chest pain from heart disease (angina) or stroke (cerebrovascular accident or incident).

Overall, 6.0% reported a history of cardiovascular disease. This was influenced by age and ranged from 2.0% in persons aged 18-44 years to 6.2% in persons aged 45-59 years to 13.4% in persons aged 60 years and older.

FIGURE 18. SELF-REPORTED HISTORY OF CARDIOVASCULAR DISEASE BY AGE-GROUP AND GENDER
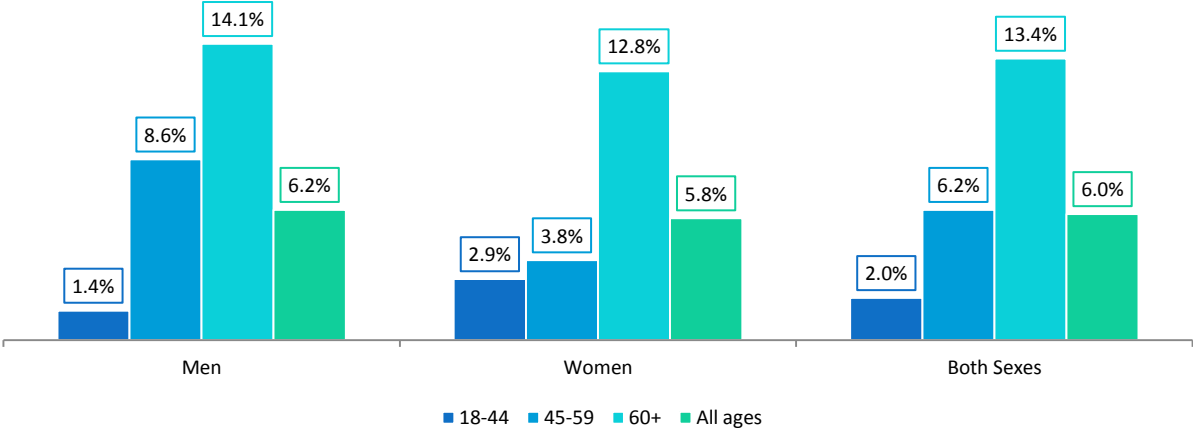
Respondents were also asked about regular use of aspirin or statins to prevent or treat heart disease. Overall, 11.8 % regularly used aspirin and 6.6% regularly used statins. The use of aspirin and statins increased with increasing age.

FIGURE 19. USE OF ASPIRIN OR STATINS TO PREVENT OR TREAT HEART DISEASE BY AGE-GROUP
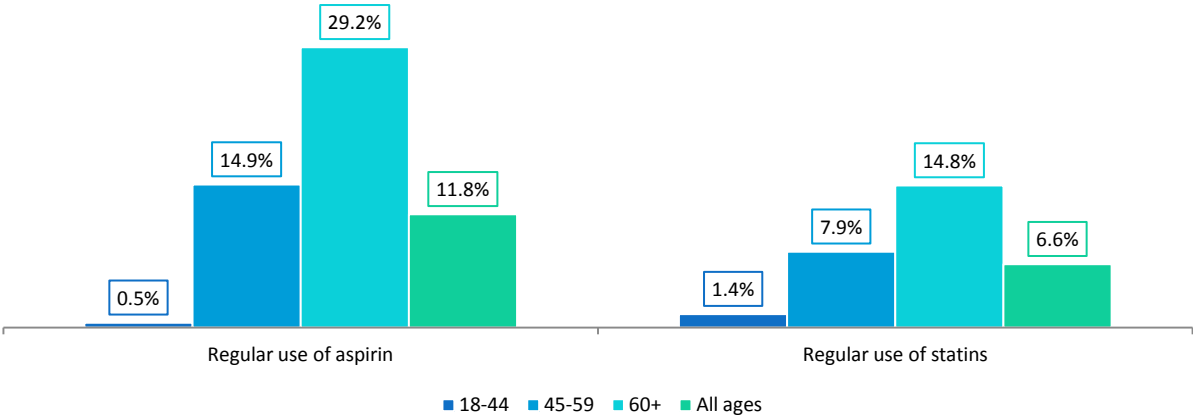
Cervical Cancer Screening

Female respondents were asked about ever having a screening test for cervical cancer. Overall 88.1% had ever had a cervical cancer screening test. This increased to 91.2% when looking at only those respondents between the ages of 30 and 49 years.

Family History of Chronic Disease Conditions

Respondents were asked if any of their immediate family members had been diagnosed with any of the following diseases: diabetes, raised blood pressure, stroke, cancer or malignant tumour, raised cholesterol, or early heart attack (below age 55 for men and below age 65 for women). The most commonly reported chronic diseases or conditions among family members were raised blood pressure (64.3%), diabetes or high blood sugar (52.2%), raised cholesterol (48.1%) and cancer (46.7%).

FIGURE 20. FAMILY HISTORY OF SELECTED CHRONIC DISEASES BY GENDER
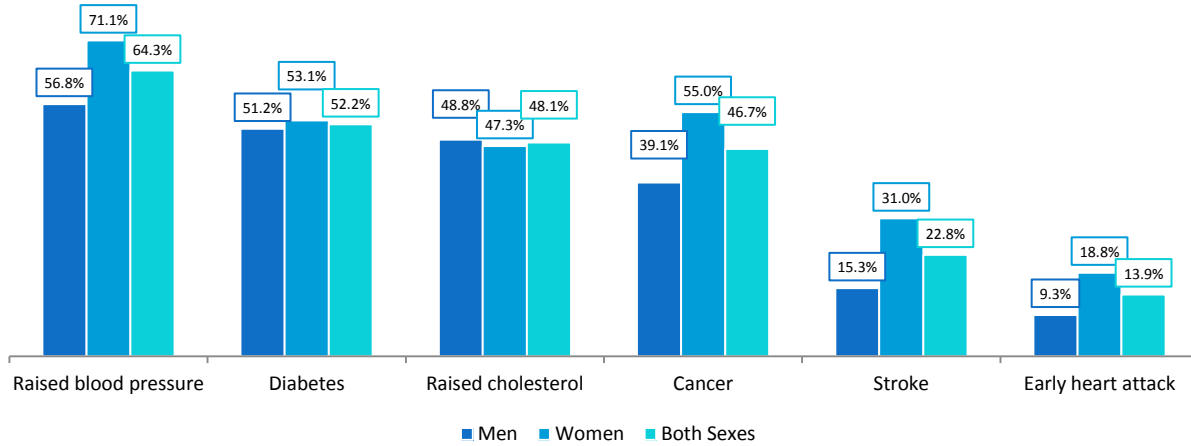
Lifestyle Advice

Respondents were asked if a doctor or health care worker had advised them of certain lifestyle factors to reduce their chronic disease risk during the past three years. These included advice about tobacco use, diet (salt, fat, fruits and vegetables), physical activity and healthy body weight. The most commonly reported advice provided was about physical activity (44.4%) and healthy body weight (38.1%).

FIGURE 21. LIFESTYLE ADVICE PROVIDED BY A DOCTOR OR HEALTH WORKER OVER THE PAST THREE YEARS, BY GENDER
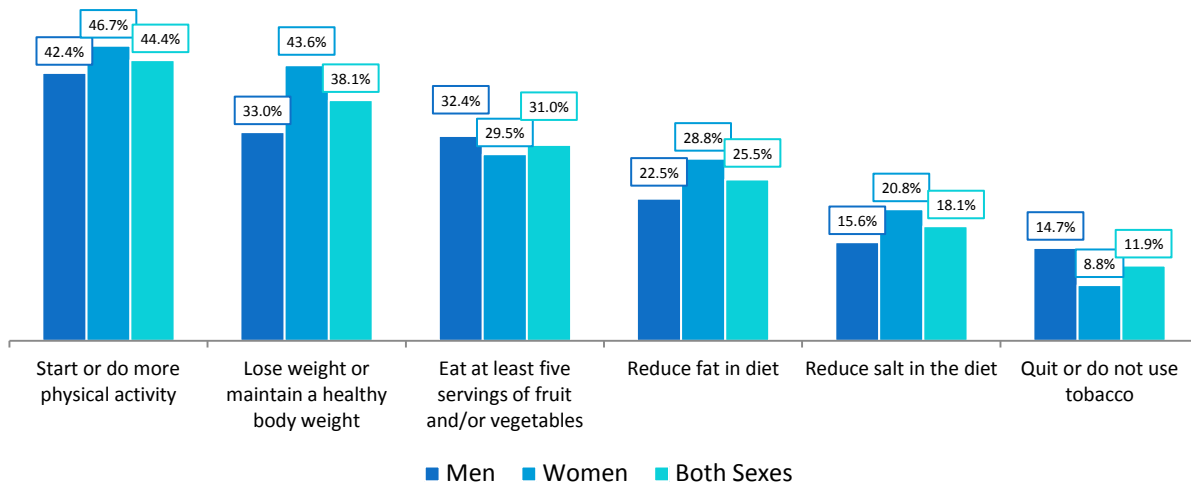
Health Care

Health insurance

Respondents were asked about health insurance coverage by type and reasons for not having coverage. They were also asked about any financial sources used to pay for health expenditures such as medicines, consultations, treatment hospitalizations and patient care.

The vast majority of respondents (92.1%) had some form of health insurance. By type of health insurance, 78.5% had major coverage, 11.0% had private basic coverage and 10.5% had basic coverage administered by the Government of Bermuda.

FIGURE 22. HEALTH INSURANCE COVERAGE BY AGE-GROUP AND GENDER
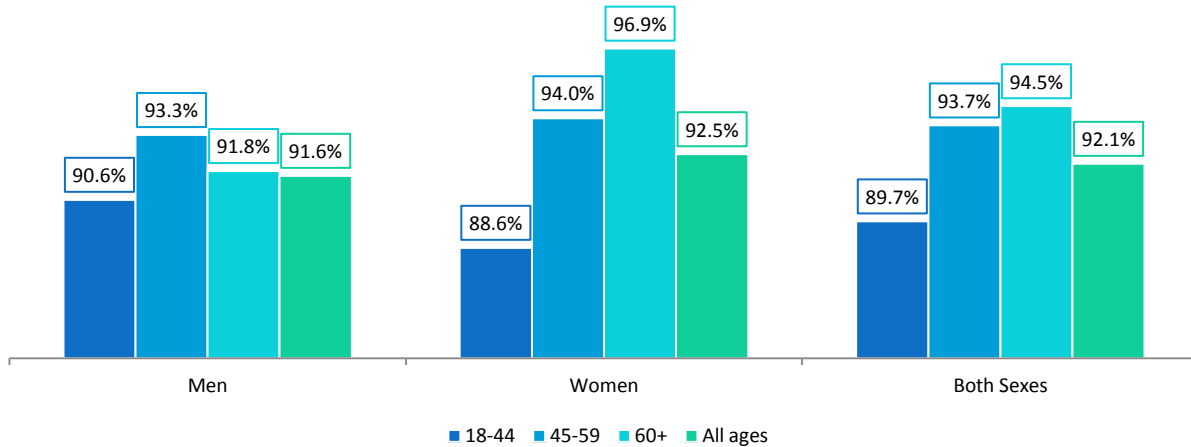
FIGURE 23. TYPES OF HEALTH INSURANCE
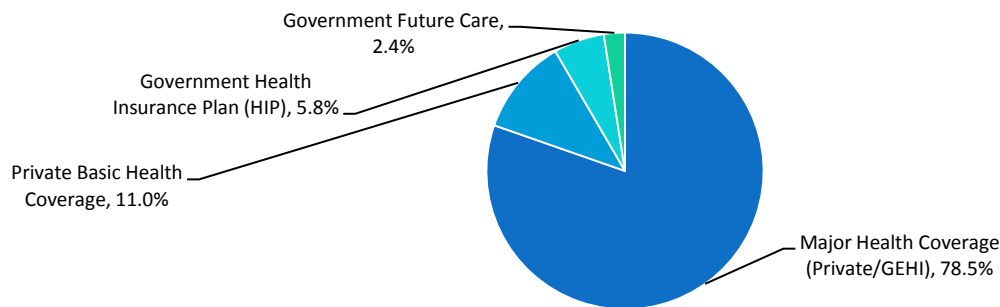
Among those without health insurance, over half (57.2%) stated that they were unable to afford it, 10.7% stated that their employer did not provide it and 6.9% felt that they did not need it. Among those stating other reasons, unemployment was the most common reason.

The main financial sources for health care expenditure were current income (63.4%), reimbursement from health insurance (45.1%) and savings (28.5%). Few respondents reported selling items (0.5%), asking a friend or family member (3.7%) or borrowing from someone (0.9%).

Care for Non-Communicable Diseases

Respondents were asked if they ever had or currently have a non-communicable disease (NCD) such as cardiovascular disease including heart disease and stroke, cancer, chronic respiratory disease or diabetes. These persons were then asked about use of health care services, home care and any missed activity due to their NCD.

Overall, 17.3% reported having any of NCDs in question. Reporting of an NCD increased with age and adults aged 18-44 years (7.3%) were least likely to have an NCD. Of those reporting an NCD, 18.7% visited a health care facility (doctor's office or clinic) during the prior 30 days, 9.4% required hospitalization during the prior 12 months and 3.8% received home care from a family member or friend. Also, 8.2% missed time from usual activity, including work.

FIGURE 24. REPORTED HISTORY OF OR CURRENT NCD BY AGE-GROUP AND GENDER

FIGURE 25. HEALTH CARE USE, HOME CARE AND MISSED USUAL ACTIVITY AMONG THOSE WITH AN NCD BY AGE-GROUP
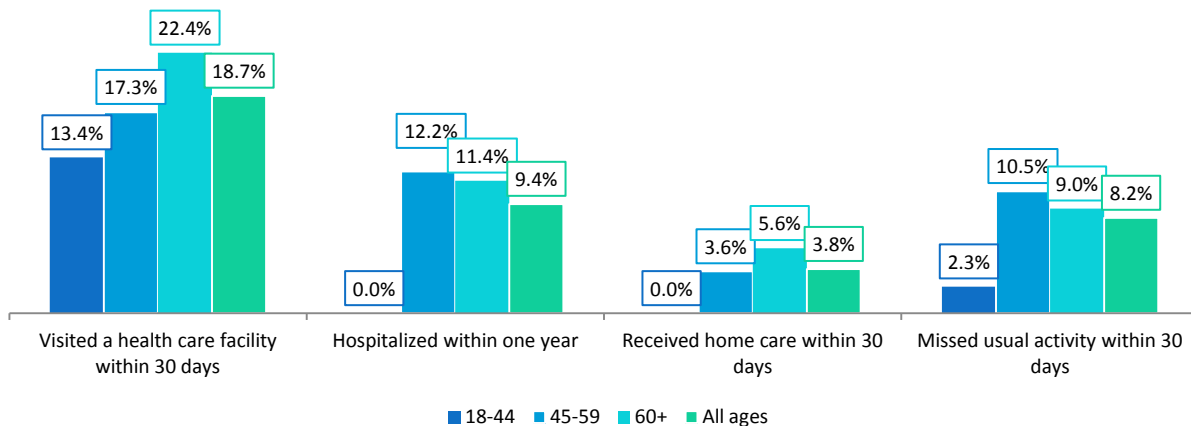
Physical Measurements

Respondents had physical measurements of heart rate, blood pressure, waist circumference, height and weight taken. Height and weight were used to calculate Body Mass Index (BMI).
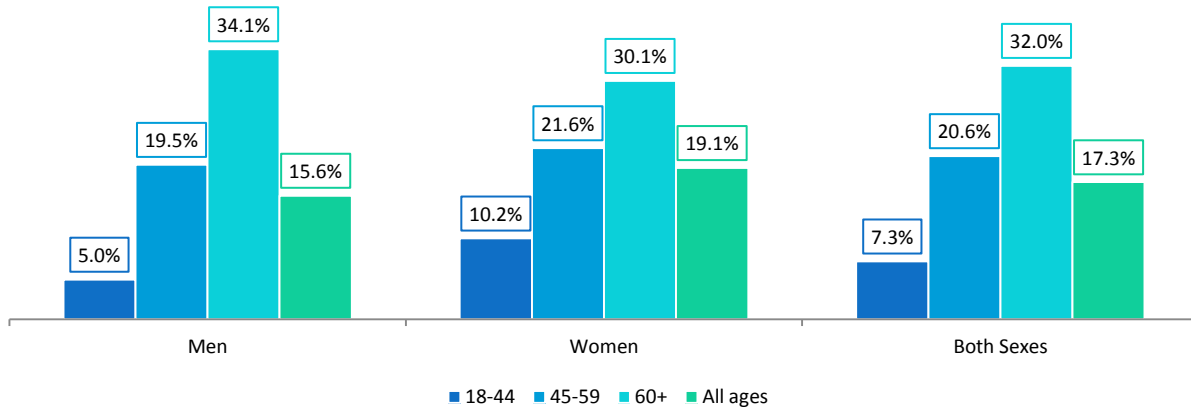
Heart Rate

The mean heart rate (beats per minute) was 73, which is within the normal resting heart rate range for adults of 60 to 100 beats per minute.

Blood pressure

The mean blood pressure, including those currently on medication for raised blood pressure, was 123/80 mmHg. This is higher than the classification for normal blood pressure which is between 90/60mmHg and 119/79 mmHg and below the classification for raised blood pressure which is 140/90mmHg and above. However, the mean blood pressure for adults aged 18-44 was within the normal blood pressure classification at 114/77mmHg. Additionally, mean systolic blood pressure increased with age. The mean diastolic blood pressure was lowest in persons aged 18-44 years.

FIGURE 26. MEAN SYSTOLIC BLOOD PRESSURE BY AGE-GROUP AND GENDER

	18-44	45-59	60+
Men	117	132	140
Women	109	122	136
Both Sexes	114	127	138
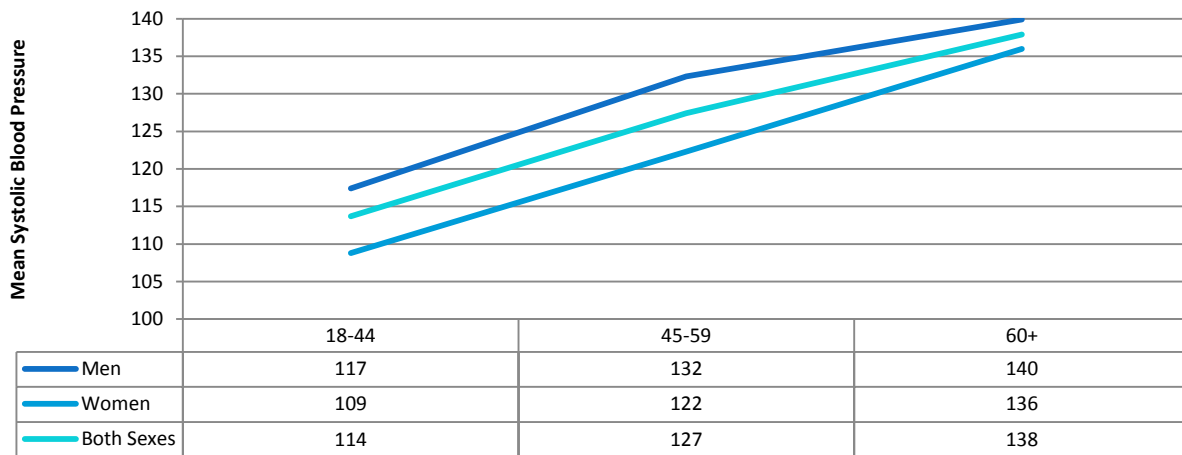
Excluding respondents on medication for raised blood pressure, 21.6% had raised blood pressure measurements of 140/90mmHG or above and 7.0% had raised blood pressure measurements of 160/100mmHG or above. Including those on medication for raised blood pressure, 33.4% had raised blood pressure measurements of 140/90mmHG or above and 21.0% had raised blood pressure measurements of 160/100mmHg or above. There were increases with age for those respondents with raised blood pressure of 140/90mmHg or above.

FIGURE 27. MEASURED RAISED BLOOD PRESSURE (140/90MMHG OR ABOVE) BY AGE-GROUP

Raised blood pressure, excluding those on medication — Raised blood pressure, including those on medication

■ 18-44   ■ 45-59   ■ 60+   ■ All ages
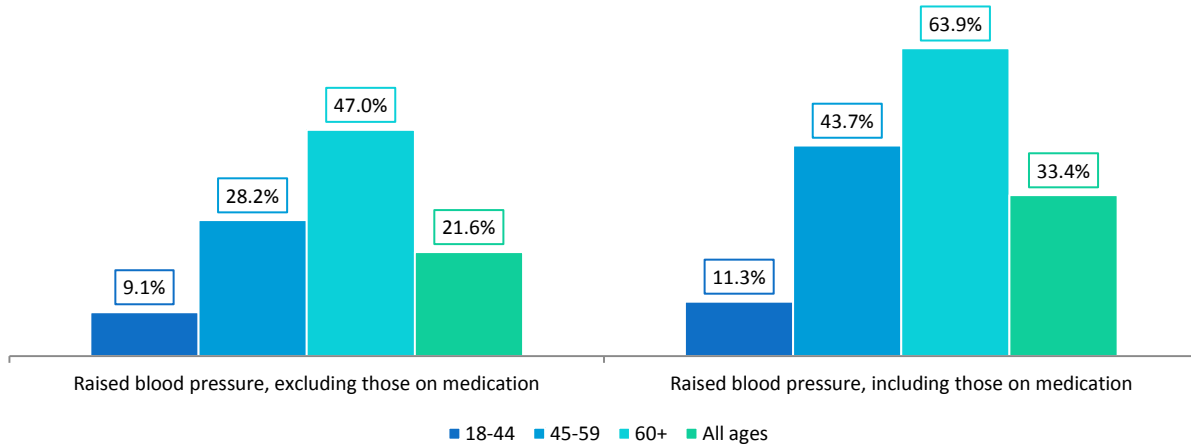
Among those with raised blood pressure (140/90mmHg or above) and/or on treatment for raised blood pressure, 21.9% were on medication and had their blood pressure measured as less than 140/90mmHg. Additionally, 23.1% were on medication and had their blood pressure measured as 140/90mmHg or above, and 55.0% were not on medication and had their blood pressure measured as 140/90mmHg or above. There were differences by gender with men (66.0%) being more likely to have raised blood pressure and not be on medication than women (43.7%).

FIGURE 28. BLOOD PRESSURE TREATMENT AND CONTROL BY GENDER

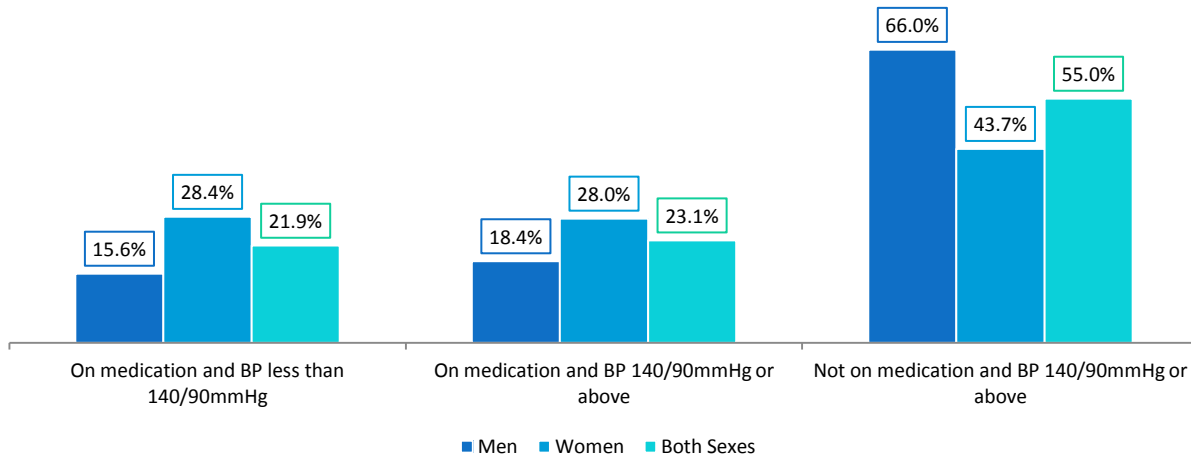On medication and BP less than 140/90mmHg — On medication and BP 140/90mmHg or above — Not on medication and BP 140/90mmHg or above

■ Men   ■ Women   ■ Both Sexes

Waist circumference

The mean waist circumference was 94cm for men and 90cm for women. According to World Health Organization standards, these measurements are within the classification of increased risk for certain non-communicable diseases for both men (greater than or equal to 94cm) and women (greater than or equal to 80cm). Only men aged 18-44 years had a mean waist circumference that was below the classification of increased risk. The mean waist circumference for women aged 45-59 years (93cm) and 60 years and older (92cm) put them at substantially increased risk (greater than or equal to 88cm) for certain non-communicable diseases.

FIGURE 29. MEAN WAIST CIRCUMFERENCE BY AGE-GROUP AND GENDER

	18-44	45-59	60+
Men	91	96	97
Women	86	93	92
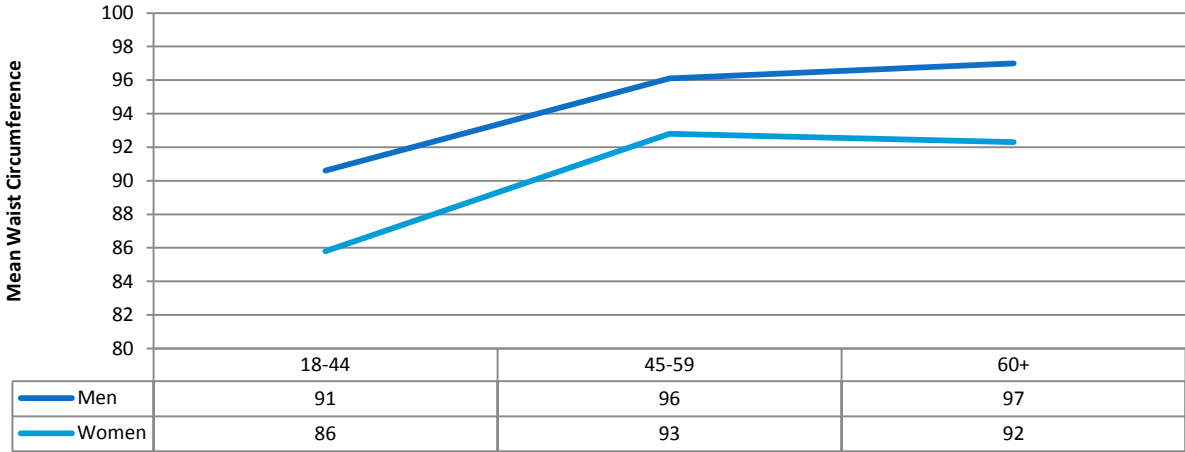
Body Mass Index (BMI)

For BMI, underweight is classified as below 18.5 kg/m2, normal weight is classified between 18.5-24.9 kg/m^2, overweight is classified between 25.0-29.9 kg/m^2, and obese is classified as greater than or equal to 30 kg/m^2. The mean BMI among the respondents was 29.0 kg/m^2. This falls within the classification of overweight. According to BMI classifications, 0.7% were underweight, 24.6% were of normal weight, 40.2% were overweight and 34.4% were obese. Overall, 74.6% are overweight or obese. More men (49.6%) were overweight than women (29.6%).

FIGURE 30. BMI CLASSIFICATIONS BY GENDER
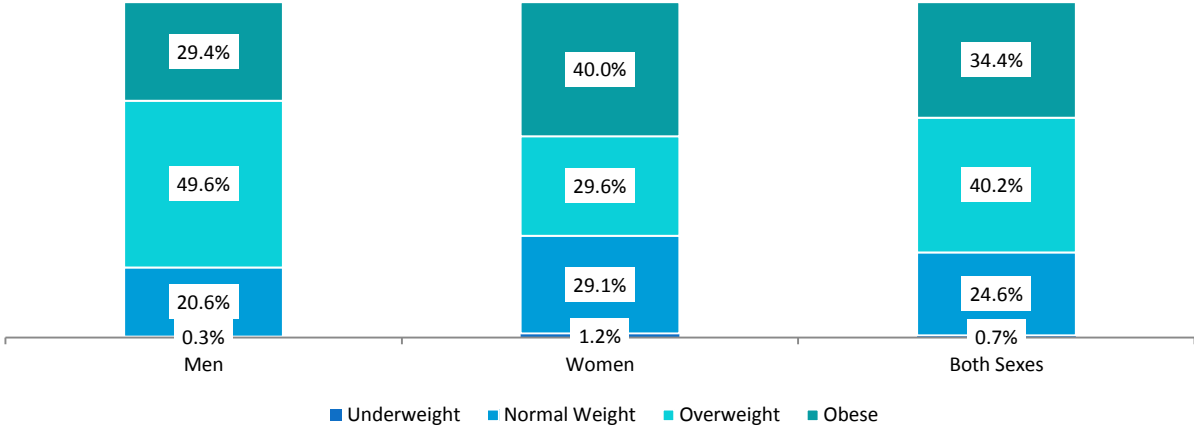
Combined Risk Factors

The World Health Organization has selected five risk factors/conditions that increase the risk of non-communicable diseases. These include:

- Current daily smoking
- Eating less than five servings of fruit and/or vegetables
- Not meeting the WHO recommendations for physical activity for health
- Overweight or obesity
- Raised blood pressure of greater than or equal to 140/90mmHg or currently on medication for raised blood pressure

Over half of all respondents (54.8%) had 1-2 of these risk factors, just under half (42.0%) had 3-5 of these risk factors and 3.2% had none of these risk factors. Women (5.0%) were more likely than men (1.3%) to have none of the selected risk factors. Adults aged 18-44 years were most likely to have 1-2 risk factors (70.8%) and least likely to have 3-5 risk factors (24.8%). The number of risk factors generally increased with age, particularly among women.

FIGURE 31. NUMBER OF SELECTED RISK FACTORS FOR NON-COMMUNICABLE DISEASES

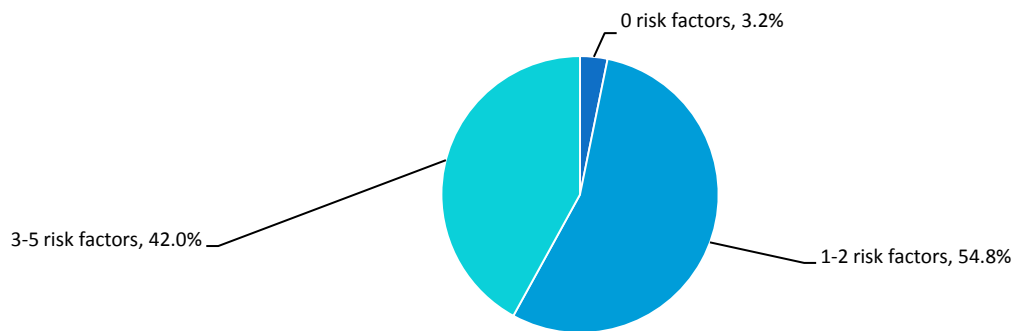FIGURE 32. INCREASED RISK OF NON-COMMUNICABLE DISEASES (3-5 RISK FACTORS) BY AGE-GROUP AND GENDER
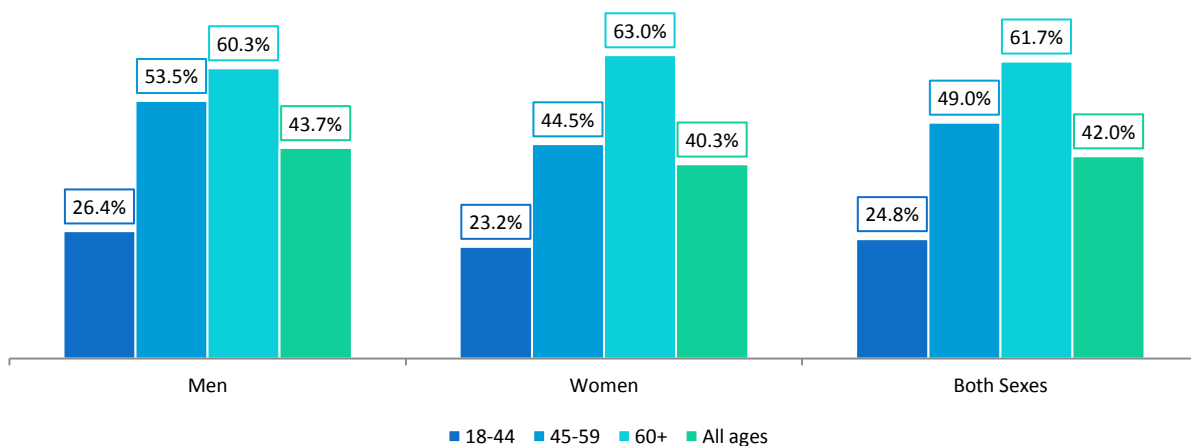
Biochemical Measurements

Fasting Blood Glucose

Fasting blood glucose measurements were taken using capillary whole blood (finger-stick method). Normal blood glucose was defined as less than 100mg/dL. Impaired fasting glycaemia was defined as greater than or equal to 100mg/dl but less than 110mg/dL. Raised blood glucose was defined as greater than or equal to 110mg/dL.

The mean fasting blood glucose value was 92.0 mg/dL. Overall, 8.6% of respondents were classified as having impaired fasting glycaemia. Additionally, 10.3% had raised blood glucose or were currently on medication for diabetes, having taken their medication on the day of the fasting blood glucose test.

FIGURE 33. FASTING BLOOD GLUCOSE LEVELS

Raised blood glucose, 10.3%

Impaired fasting glycaemia, 8.6%

Normal fasting blood glucose, 81.1%
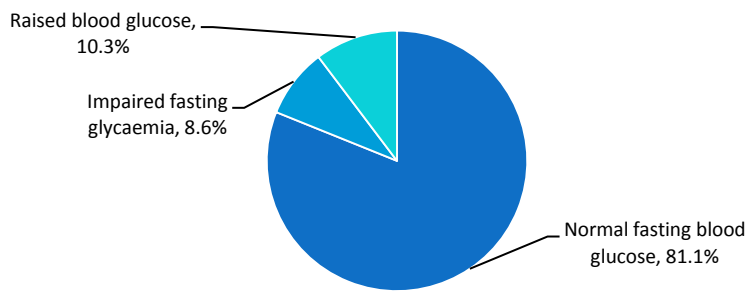
Fasting Total Cholesterol

Fasting total cholesterol measurements were taken using capillary whole blood (finger-stick method). Normal cholesterol was defined as less than 190mg/dL. Elevated cholesterol (borderline high) was defined as greater than or equal to 190mg/dl but less than 240mg/dL. Raised or high cholesterol was defined as greater than or equal to 240mg/dL.

The mean fasting total cholesterol value was 189 mg/dL. Overall, 56.9% of respondents had higher than normal cholesterol levels, including 26.4% with raised or high cholesterol. Adults aged 18-44 years were least likely to have elevated (35.6%) or raised cholesterol (9.9%).

FIGURE 34. FASTING CHOLESTEROL LEVELS

High Cholesterol, 26.4%

Normal Cholesterol, 43.1%

Borderline High Cholesterol, 30.5%
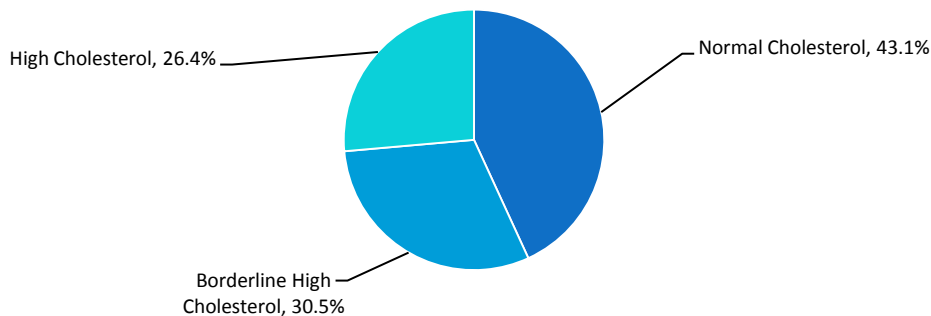
Trends

The trends presented are based on those measures where comparisons are possible from the 2006 and 2011 Health Surveys and STEPS to a Well Bermuda 2014. However, there are differences among the three surveys. The main differences are as follows:

1. The wording of the questions in STEPS to a Well Bermuda 2014 may differ from the other surveys. There are also some instances where the question differed between all three surveys. As such, the questions used for each survey are provided. In most cases, this does not affect the intent of the question and the results remain comparable.
2. STEPS to a Well Bermuda 2014 was conducted face-to-face, which allowed show cards to be used for a clear and common understanding of select questions among respondents. The show cards included depictions of standard drink sizes for alcoholic beverages and serving sizes of various fruits and vegetables. The prior surveys were conducted by telephone with respondents having to estimate estimating drink sizes and serving sizes based on their own understanding.
3. STEPS to a Well Bermuda 2014 included measurements of height and weight (to calculate body mass index [BMI]) and blood pressure. The prior surveys relied on self-reported height and weight and did not measure blood pressure.

It is indicated where the measures may not be directly comparable and where any adjustments or additional analyses were made. The STEP 3 measured results are not included in this section due to the smaller population and differences in methodology.

Tobacco use

The questions used to assess current smoking were as follows:
- *2006:   Do you now smoke cigarettes every day, some days, or not at all?*
- *2011:   Do you now smoke cigarettes every day, some days, or not at all?*
- *2014:   Do you currently smoke any tobacco products, such as cigarettes, cigars, or pipes?*

There have been no significant changes in the overall current use of tobacco from 2006 to 2014. However, during the same time period, current smoking appears to have increased among men and decreased among women.

FIGURE 35. COMPARISON - CURRENT SMOKING (DAILY OR SOME DAYS)
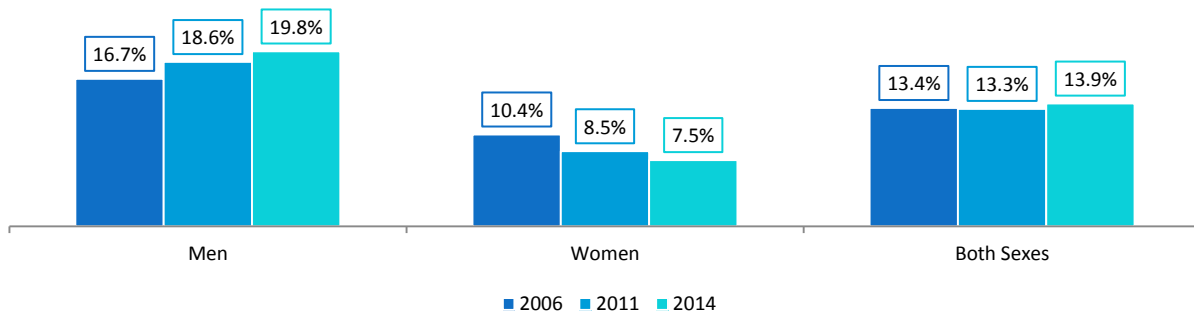
The questions used to assess smoking cessation were as follows:
- *2006:   During the past 12 months, have you stopped smoking for one day or longer because you were trying to quit smoking?*
- *2011:   During the past 12 months, have you stopped smoking for one day or longer because you were trying to quit smoking?*
- *2014:   During the past 12 months, have you tried to stop smoking?*

There appears to be a steady decline in attempts to quit smoking from 2006 to 2014 overall. While attempts to quit have remained relatively stable among men, there was a sharp decline in women attempting to quit from 2006 to 2011, which then remained stable through 2014.

FIGURE 36. COMPARISON - ATTEMPTS TO QUIT SMOKING
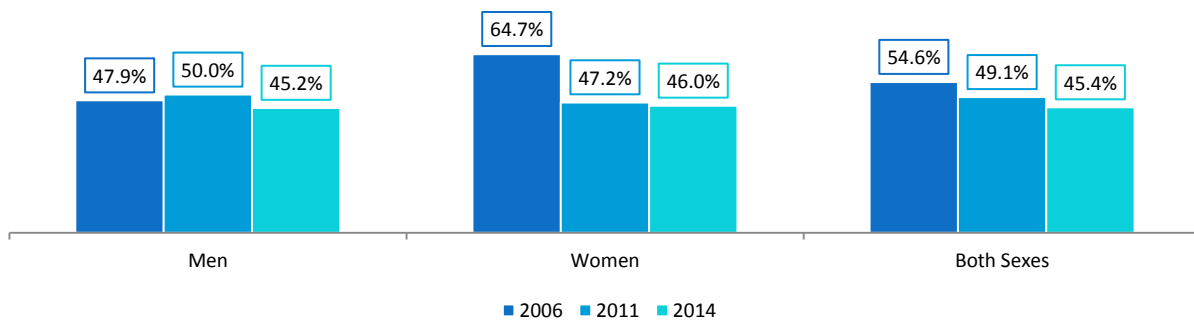
Alcohol Consumption

The questions used to assess current alcohol use were as follows:
- *2006:   During the past 30 days, how many days did you have at least one drink of any alcoholic beverage?*
- *2011:   During the past 30 days, how many days did you have at least one drink of any alcoholic beverage?*
- *2014:   Have you consumed any alcohol in the past 30 days?*

Alcohol use increased in 2014. This increase was sharpest among men although steady increases were seen among women.

FIGURE 37. COMPARISON - CURRENT DRINKING
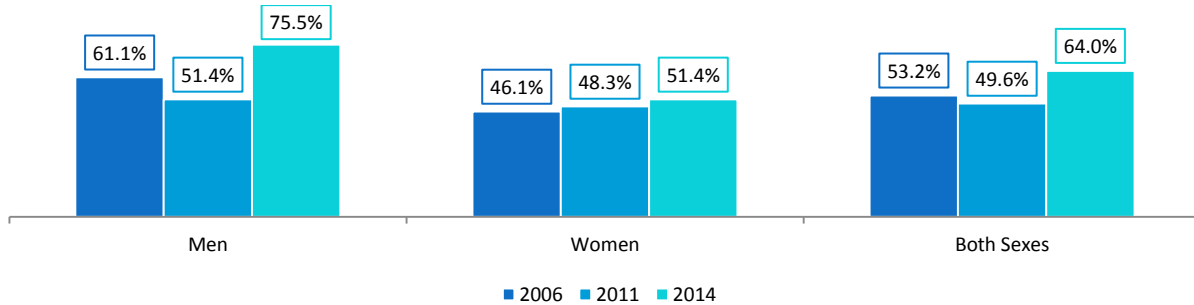
The questions used to assess binge drinking or heavy episodic drinking, among current drinkers, were as follows:
- *2006:   Considering all types of alcoholic beverages, how many times during the past 30 days did you have 5 or more drinks on an occasion?*
- *2011:   Considering all types of alcoholic beverages, how many times during the past 30 days did you have (Men) 5 or more drinks (Women) 4 or more drinks on an occasion?*
- *2014:   During the past 30 days, how many times did you have six or more standard alcoholic drinks in a single drinking occasion? [Show Card used to illustrate standard drink equivalents].*

The definitions of binge drinking changed with each survey, and therefore direct comparisons cannot be made based solely on the above questions.

FIGURE 38. COMPARISON - BINGE DRINKING (VARYING DEFINITIONS)
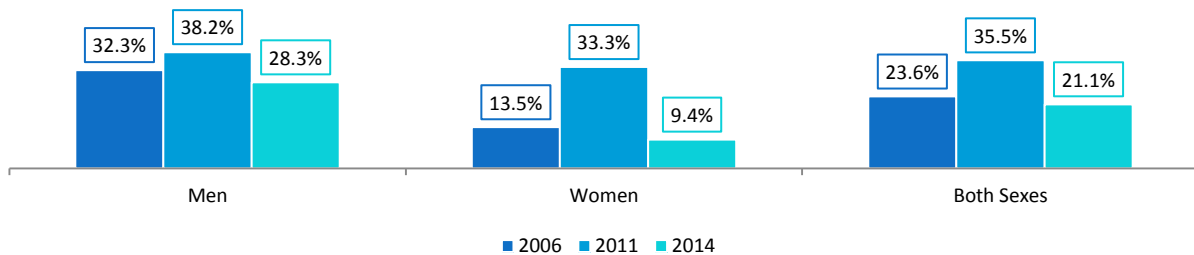
Additional analysis was conducted using the following question:

- *2014:   During the past 30 days, what was the largest number of standard alcoholic drinks you had on a single occasion? [Show Card used to illustrate standard drink equivalents].*

Using the 2006 definition of binge drinking as 5 or more alcoholic drinks in a single occasion for both men and women, there has been a slight increase in binge drinking from 2006 to 2014. Using the 2011 definition of binge drinking as 5 or more alcoholic drinks for men and 4 or more for women in a single occasion, shows a slight decrease. Overall, there has not been significant change in binge drinking.

FIGURE 39. COMPARISON - BINGE DRINKING (COMMON DEFINITION)
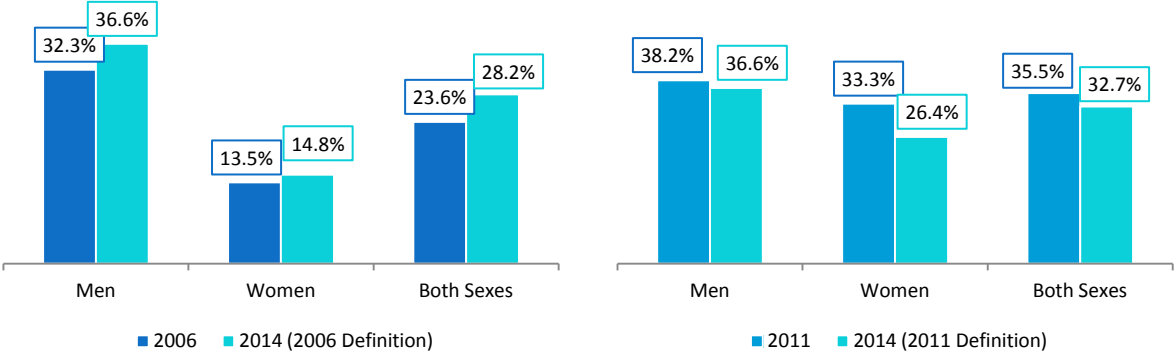
FIGURE 40. SHOW CARD - STANDARD ALCOHOLIC DRINKS
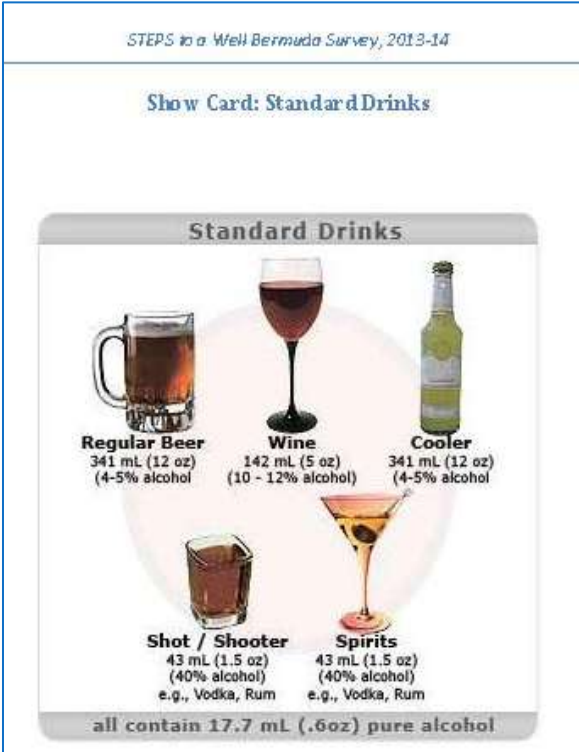
Oral Health

The questions used to assess dental care (visits to dentist) were as follows:
- *2011:   During the past 12 months, about how many times have you consulted a dentist?*
- *2014:   How long has it been since you last saw a dentist?*

There has been no significant change in annual dental visits from 2011 to 2014.

FIGURE 41. COMPARISON - DENTAL VISITS IN PRIOR YEAR
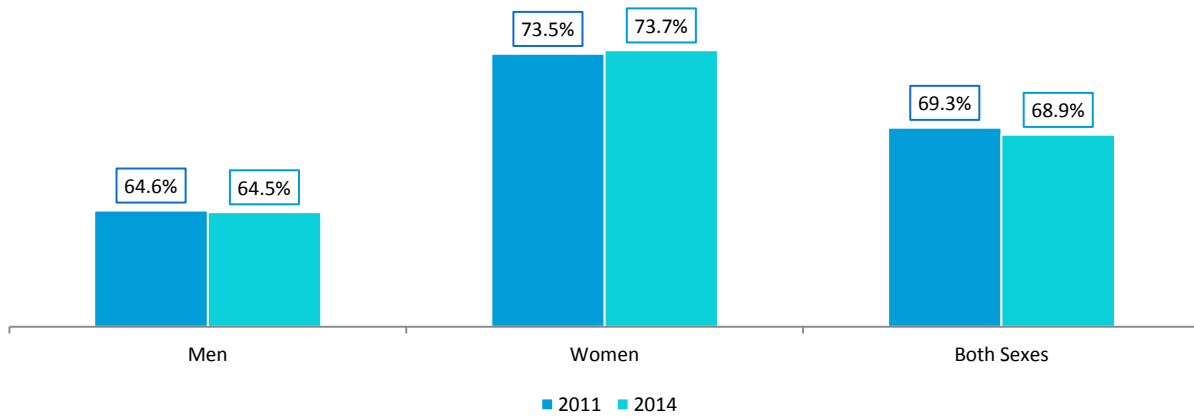
Dietary Habits

The questions used to assess fruit consumption were as follows:

- *2006:   How many servings of fruit do you usually eat (do not count fruit juice)? (For example, a portion of fruit at breakfast would be one serving.) [Respondents could have responded per day, week, month or year.]*
- *2011:   How many servings of fruit do you usually eat (do not count fruit juice)? (For example, a portion of fruit at breakfast would be one serving.) [Respondents could have responded per day, week, month or year.]*
- *2014:   In a typical week, on how many days do you eat fruit? How many servings of fruit do you eat on those days? [Show Card used to illustrate serving sizes.]*

Fruit consumption remains low. Although it appears that fruit consumption declined, the comparison is limited due to the difference in methodology; show cards were used in 2014 to illustrate serving size, unlike prior surveys that relied solely on respondent perception of serving size.

FIGURE 42. COMPARISON - FRUIT CONSUMPTION (3 OR MORE SERVINGS PER DAY)
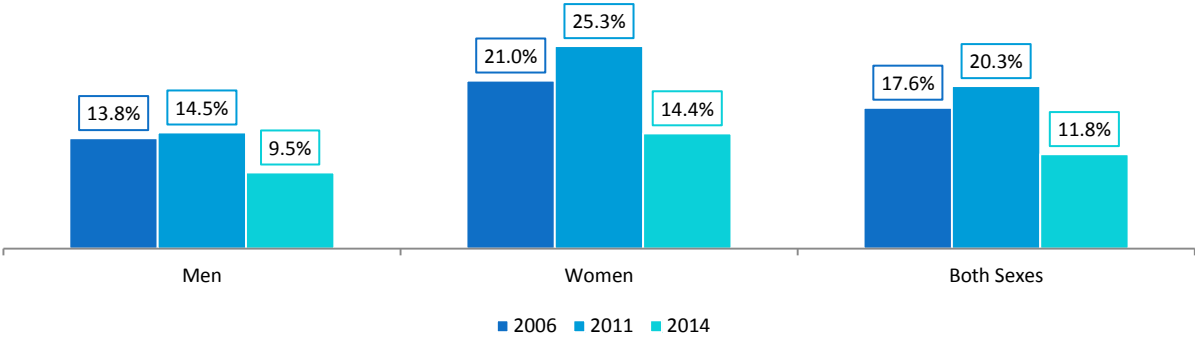
FIGURE 43. SHOW CARD - SERVINGS OF FRUIT

The questions used to assess vegetable consumption were as follows:

- *2006:   How many servings of vegetables do you usually eat? (For example, a serving of vegetables at both lunch and dinner would be two servings.)[Respondents could have responded per day, week, month or year.]*
- *2011:   How many servings of vegetables do you usually eat? (For example, a serving of vegetables at both lunch and dinner would be two servings.)[Respondents could have responded per day, week, month or year.]*
- *2014:   In a typical week, on how many days do you eat vegetables? How many servings of vegetables do you eat on those days? [Show Card used to illustrate serving sizes.]*

Vegetable consumption remains low. Although it appears that vegetable consumption increased, the comparison is limited due to the difference in methodology; show cards were used in 2014 to illustrate serving size, unlike prior surveys that relied solely on respondent perception of serving size.

FIGURE 44. COMPARISON VEGETABLE CONSUMPTION (3 OR MORE SERVINGS PER DAY)
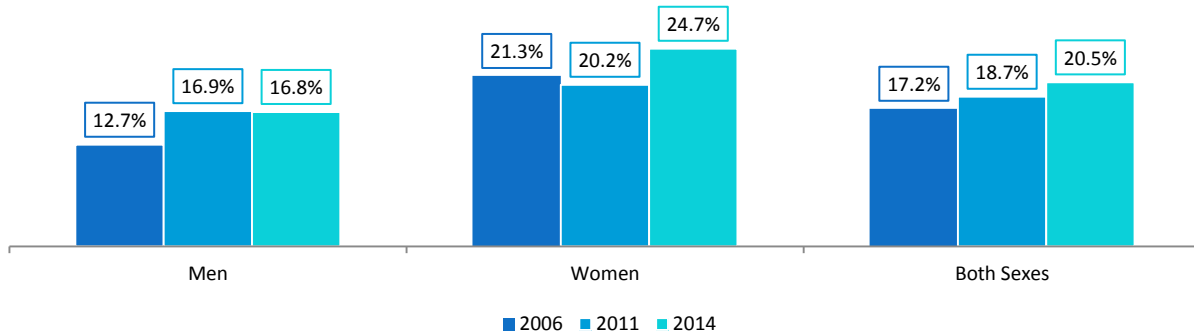
FIGURE 45. SHOW CARD - SERVINGS OF VEGETABLES

Raised Blood Pressure

The questions used to assess raised blood pressure or hypertension were as follows:

- *2006:   Have you ever been told by doctor, nurse, or other health professional that you have high blood pressure?*
- *2011:   Have you ever been told by doctor, nurse, or other health professional that you have high blood pressure?*
- *2014:   Have you ever been told by doctor or other health worker that you have raised blood pressure or hypertension? [Blood pressure was also measured.]*

Overall, the self-reported prevalence of high blood pressure or hypertension increased from 2006 to 2011, followed by a slight decrease in 2014. The 2014 self-reported blood pressure diagnosis was further validated through the blood pressure measurements.

FIGURE 46. COMPARISON - RAISED BLOOD PRESSURE (SELF-REPORT AND MEASURED)

Men: 23.1%, 34.5%, 30.9%, 32.3%
Women: 27.3%, 36.5%, 34.6%, 34.6%
Both Sexes: 25.3%, 35.5%, 32.7%, 33.4%

■ 2006 ■ 2011 ■ 2014 ■ 2014 (measured)
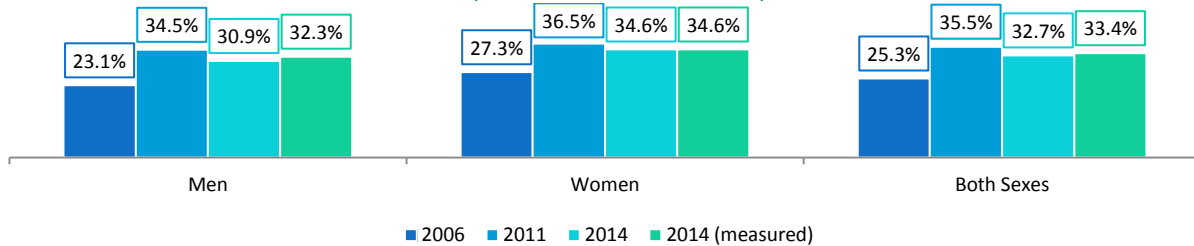
Diabetes

The questions used to assess raised blood sugar or diabetes were as follows:

- *2006:   Have you ever been told by doctor that you have diabetes?*
- *2011:   Has a doctor, nurse, or other health professional ever told you that you have diabetes?*
- *2014:   Have you ever been told by doctor or other health worker that you have raised blood sugar or diabetes?*

Overall, the self-reported prevalence of diabetes decreased slightly from 2006 to 2011, followed by a return to near 2006 levels in 2014. The differences are mainly among men, with the prevalence among women remaining relatively stable.

FIGURE 47. COMPARISON - DIABETES (SELF-REPORT)

Men: 12.3%, 8.0%, 11.1%, 10.9%
Women: 13.0%, 13.5%, 13.6%, 9.8%
Both Sexes: 12.7%, 10.9%, 12.2%, 10.3%

■ 2006 ■ 2011 ■ 2014 ■ 2014 (measured)
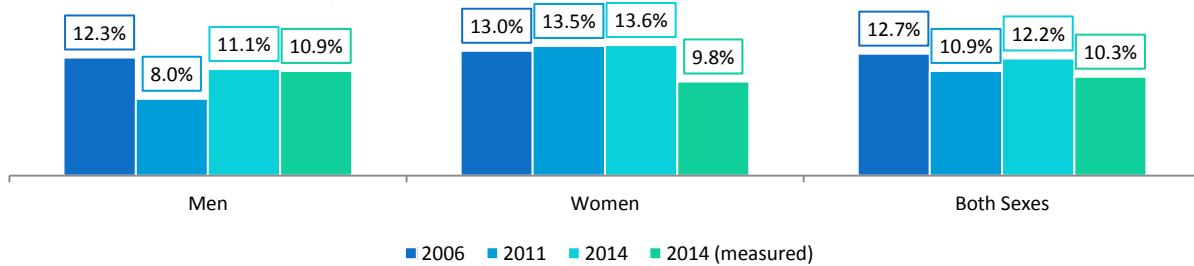
High Cholesterol

The questions used to assess high blood cholesterol were as follows:
- *2006:* *Have you ever been told by doctor, nurse, or other health professional that your blood cholesterol is high?*
- *2011:* *Have you ever been told by doctor, nurse, or other health professional that your blood cholesterol is high?*
- *2014:* *Have you ever been told by doctor or other health worker that you have raised cholesterol?*

Overall, the self-reported prevalence of high cholesterol remained stable from 2006 through 2014. However, the prevalence appears to have increased among men and decreased among women.

FIGURE 48. COMPARISON - HIGH CHOLESTEROL (SELF-REPORT)
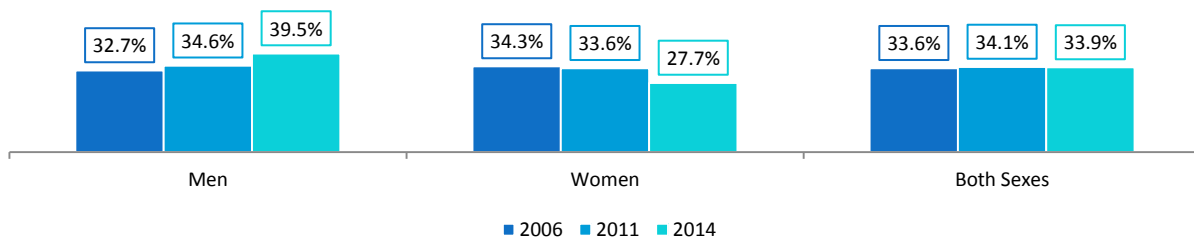
Overweight and Obesity

The questions used to assess overweight and obesity were as follows:
- *2006:* *About how much do you weigh without shoes in pounds? About how tall are you without shoes in feet and inches?*
- *2011:* *About how much do you weigh without shoes in pounds? About how tall are you without shoes in feet and inches?*
- *2014:* *Measured height and weight*

Overweight and obesity levels remain high. Although it appears that the prevalence of overweight and obesity has increased, the comparison is limited due to the difference in methodology; height and weight were measured in 2014, unlike in prior surveys that relied solely on respondent response.

FIGURE 49. COMPARISON - OVERWEIGHT AND OBESITY [BMI≥ 25] (SELF-REPORT AND MEASURED)
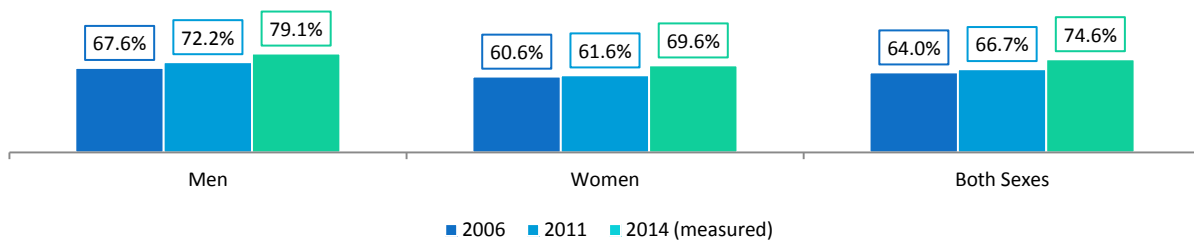
Cervical Cancer Screening

The questions used to assess cervical cancer screening among women were as follows:
- *2006:   A Pap test is a test for cancer of the cervix. Have you ever had a Pap test?*
- *2011:   A Pap test is a test for cancer of the cervix. Have you ever had a Pap test?*
- *2014:   Have you ever had a screening test for cervical cancer?*

There appears to be a decline in women having screening tests for cervical cancer.

FIGURE 50. COMPARISON - CERVICAL CANCER SCREENING
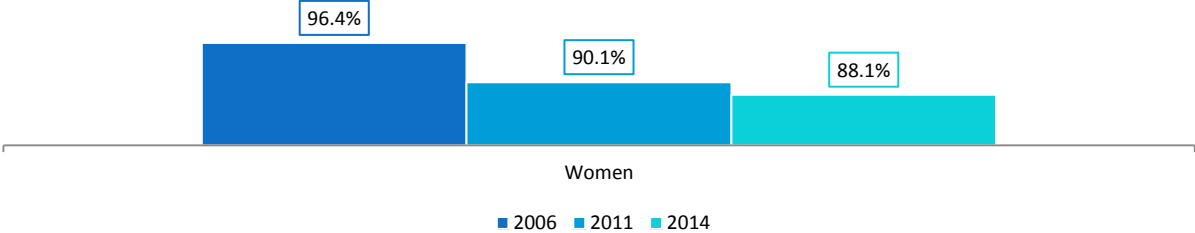
Health Insurance

The questions used to assess health insurance coverage were as follows:
- *2011:   Are you covered by a private or government health insurance plan?*
- *2014:   Do you currently have health insurance?*

There have been small declines in health insurance coverage.

FIGURE 51. COMPARISON - HEALTH INSURANCE COVERAGE
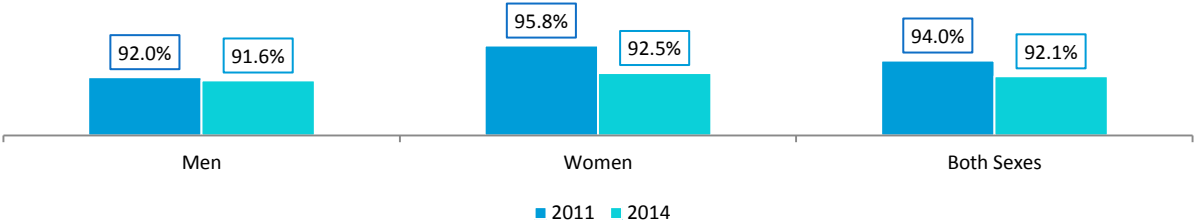
Discussion

The results of STEPS to a Well Bermuda indicate that chronic non-communicable diseases (NCDs) and their related risk factors impact on the health and wellbeing of the residents of Bermuda. The results provide sufficient evidence of the need for directed actions and policies that will assist in preventing and controlling NCDs in Bermuda. These actions are needed to not only improve the overall health and well-being of our residents but also to reduce the financial impact of NCDs on the economy.

Overall Risk of NCDs and Health Care Utilization

Nearly one in five persons (17%) had an NCD such as cardiovascular disease, cancer, chronic respiratory disease or diabetes. This value was 7% in adults aged 18-44 but ranged between 21% in those aged 45-59 years and 32% in those aged over 60 years. This indicates that NCDs may be occurring in similar rates among middle-aged and older adults, implying an earlier age of onset of these diseases. Of those with NCDs, nearly one in five (19%) required a visit to a health facility, doctors office, or clinic, within any given month. Also, nearly one in ten (9%) required hospitalization in the previous year or missed usual activity in the previous month (8%), and one in twenty-five (4%) required home care by a family member or friend. These hospitalizations, missed activities, including work, and need for home care affected the middle-aged adults almost the same as the older adults. This can have a substantive impact on the productivity of the workforce.

A combined risk factor approach was used to assess the level of risk in developing an NCD. This combined risk factor assessment looked at current daily smoking, inadequate fruit and vegetable intake, physical inactivity, being above healthy body weight for height and raised blood pressure. It was found that the risk factor assessment had a similar trend to NCD prevalence by age group. Particularly, a quarter of younger adults aged 18-44 years (25%) had 3 or more risk factors compared to half (49%) of those aged 45-59 years and two-thirds (62%) of those aged 60 years and older. This is concerning as it further demonstrates a greater likelihood of chronic diseases occurring at younger ages and at higher rates within the working-age population. If these risk factors are not addressed, this also has implications for loss of productive workforce. More people may develop NCDs at younger ages.

Behavioural Risk Factors

Smoking

Although most have never smoked (58%) or were former smokers (28%), smoking remains an important public health issue, especially among men where 20% are current smokers. Also of note is that overall, the mean age of smoking initiation was 18 years. In addition, the most commonly used tobacco product was manufactured cigarettes, less than half of current smokers had tried to quit, and more than one in ten persons were exposed to second-hand smoke in the home or workplace. This indicates the need for further implementation, compliance and enforcement of policies to reduce tobacco use and initiation, especially among youth. These policies should be in compliance with the WHO Framework Convention on Tobacco Control and include limiting the access of underage persons to tobacco products, providing support for comprehensive smoking cessation programs, banning tobacco advertising, promotion and sponsorship and raising public awareness of tobacco control issues through education, training and communication.

Alcohol Use

Young adults were less likely than older adults to be lifetime abstainers and least likely to be 12-month abstainers. The working age population, especially men, were also more likely to be current drinkers and engage in binge drinking than those at or near retirement age. Men were also more likely to be daily drinkers. These age and gender differences are reflective of societal norms. For example, it may be considered socially acceptable for men to consume alcohol regularly and at high levels. It is possible that this drinking behaviour is contributed to by "happy hours" which occur at the end of the workweek and costs of alcoholic drinks may be lower. The higher rate of daily drinking among men can also be reflective of a socio-cultural context that rewards a hard day of work, especially manual labour, with a beer or equivalent alcoholic beverage. The public health impact of these alcohol use behaviours is significant as alcohol can lead to and complicate NCDs and often plays a role in traffic collisions, which can result in disability, loss of productivity and premature death. This is especially problematic among younger adults who are less likely to abstain from alcohol.

Oral Health

In general, oral health status was favourable in terms of number of natural teeth, healthy state of teeth and gums, teeth cleaning habits, and access to dental care. However, around one in five (19%) persons experienced oral pain or discomfort. This is important as oral health is integral and essential to general health. Additionally, over one in ten persons (11%) avoided smiling because of the appearance of their teeth which could affect their overall quality of life.

Dietary Habits

Consumption of fruits and vegetables is inadequate with only 18% consuming five or more servings of fruits and vegetables per day. Fruits and vegetables were not consumed every day, and on the days they were consumed, the number of servings was low. Additionally, half (50%) reported drinking at least one sugary drink per day. These poor dietary habits are likely related to the cost of fruits and vegetables relative to other foods and the wide availability of other unhealthy options. On the positive side, all persons were aware of the importance of lowering salt in the diet and 80% reported that they try to avoid or minimize the consumption of processed foods. There were also moderate successes in the use of other habits to control salt intake. It is important to build on these healthy behaviours and extend them into other aspects of diet and healthy living.

Physical Activity

Physical activity, which includes but is not the same as exercise, has significant health benefits and contributes to the prevention of non-communicable diseases. About one in five men (20%) and one in three women (34%) are not engaging in enough physical activity to receive these health benefits. These low levels of physical activity are partly due to the overall environment – increasingly sedentary work environments, accessibility of passive modes of transport and barriers to recreational activities, which can include fear of violence and crime in outdoor areas and limited access to sidewalks and sports/recreation facilities. These issues should be addressed to increase overall physical activity levels.

History of Non-Communicable Diseases (Self-Reported)

Most persons have had their blood pressure, blood sugar and total cholesterol measured at some point in their lives. Through these measurements, it was determined that approximately one in three persons have raised blood pressure (34%) or raised total cholesterol (33%) and more than one in ten persons have raised blood sugar or diabetes (12%). Also interesting is that most (around 60%) of these diagnoses were made within the past year for all of these NCDs. Medication usage varied but use of herbal or traditional remedies was low. Among those with diabetes, very few (5%) had their eyes examined within the last two years in contrast to the vast majority (93%) having their feet examined within the past year. Loss of sight and limbs can affect productivity adding to the economic burden of NCDs.

Fewer persons (6%) have a history of cardiovascular diseases although more than one in ten persons (12%) is taking aspirin to prevent of treat heart disease. Measures such as this should be undertaken in consultation with doctors and other health care workers who can assess the risk and provide appropriate advice.

Doctors and health care workers should also take into consideration family history of NCDs in assessing risk, as many persons have family members with various NCDs. Additionally, it is often the case that family members may also have similar lifestyle risk factors.

Lifestyle Advice

Less than half of persons receive advice on risk factor reduction from their doctor or other health care worker. Increasing both the amount of advice received during consultations with doctors and health care workers and the details of such advice would be beneficial. It was shown that of the advice given, general advice on physical activity (44%) and healthy body weight (38%) was given more regularly than specific advice regarding increasing consumption of fruits and vegetables (31%), reduction of fat and salt in the diet (26% and 18%, respectively) and discouraging the use of tobacco (12%).

Physical Measurements

The average blood pressure measurement, waist circumference, and BMI are all above ideal levels for health. This is significant as these are objective biological indicators of increased risk of NCDs and are likely the result of engaging in a lifestyle that includes a number of the behavioural risk factors already demonstrated to be high in the population, especially insufficient physical activity and inadequate dietary habits. It is of great concern that three out of four persons (75%) are overweight or obese. Also of concern is the considerable number of persons with raised blood pressure who are not on medication (55%) and the number of persons whose high blood pressure is not controlled by their medication (23%).

Biochemical Measurements

The biochemical measurements provided more information on those persons at risk for diabetes and high cholesterol. Nearly one in ten (9%) had impaired fasting glycaemia, or could be classified as pre-diabetic, and nearly one in three (31%) had borderline high cholesterol. Without lifestyle changes, these persons are likely to develop diabetes or high cholesterol in future years.

Trends

Overall, the trends are mixed. For example, overall tobacco use remained stable but less people are trying to quit, and alcohol consumption increased but binge drinking remained stable. Fruit and vegetable consumption remained low and the self-reported prevalence of chronic diseases remained stable. There were slight declines in cervical cancer screening and health insurance coverage and annual dental visits remained stable. Overweight and obesity are consistently high and may be increasing.

Conclusion

Although the health surveys have shown some areas of stability, it is important to recognize that overall, more than 95% of the population have at least one risk factor for an NCD. When looking at the risk factors individually the leading risk factors are inadequate consumption of fruits and vegetables (82%), overweight and obesity (75%), and alcohol consumption (64%). Raised cholesterol (34%) and blood pressure (33%) are also of concern, as is physical inactivity (27%). All of these risk factors and conditions are interrelated and can lead to NCDs. If these risk factors are not addressed then it is very likely that the prevalence of diabetes, heart disease, and other NCDs will increase, thereby increasing the chronic disease burden. This has both health and economic implications. *The risk factors of today are the diseases of tomorrow.*

Recommendations for Action

The following recommendations for action are based on those outlined in the World Health Organization's Global Action Plan for the Prevention and Control of Non-Communicable Diseases 2013-2020. As stated in the Plan, a multisectoral approach is required to deliver evidence-based strategies to prevent and control NCDs in Bermuda.

Overall, the prevention and control of non-communicable diseases should be integrated into health-planning processes, with special attention given to the social determinants of health and the cultivation of health-enabling environments. Environmental and social conditions should be such that the healthy choice is the easy choice. Additionally, there should be a surveillance system to monitor essential NCD data in an ongoing and systematic way. This can be through repeated surveys, the use of Electronic Health Records, and/or the development, maintenance and strengthening of NCD registers for selected conditions, including diabetes and cancer. Health services should be strengthened and oriented towards the prevention and control of NCDs. Social mobilization efforts should be directed towards changing social norms and improving understanding and acceptance of the individual and societal changes needed to address NCDs and their risk factors.

Food and nutrition policy measures should engage various sectors, including retailers, to increase availability, affordability, and acceptability of healthier foods, including fruits and vegetables and products with reduced content of salt/sodium, saturated fatty acids and free sugars. Health promotion efforts should be focused on public campaigns using social marketing techniques to inform consumers about healthy dietary practices and motivates them to adopt such practices. These campaigns should be linked to supporting actions and/or incentives for improved health outcomes. Efforts should continue to be made to create health- and nutrition-promoting environments in schools, healthcare facilities and public and private work-places.

Physical activity should be promoted as part of daily living, for example, "active transport" – walking or cycling to or from places – and efforts should be made to improve the accessibility, acceptability and safety of individuals engaging in such activities. Environments should be promoted that facilitate physical activity and supportive

infrastructures in place that increase access to, and use of, suitable facilities. This includes worksite wellness programs and policies that foster work-life balance. Public campaigns should be conducted that inform the population about the benefits of physical activity for all ages using simple, clear and direct messaging.

In terms of alcohol and tobacco use, a comprehensive and multisectoral approach should be used to end the harmful use of alcohol and tobacco and eliminate environmental exposure to tobacco smoke. Health promotion efforts should be aimed at warning persons about the dangers of alcohol and tobacco use and exposure to environmental tobacco smoke. Social marketing should be utilized to make tobacco use and excessive alcohol consumption socially unacceptable. Smoking cessation programs should also be available and accessible as well as programs that aim to reduce the negative consequences of alcohol intoxication. Marketing of tobacco and alcohol should be restricted. Strict control on the availability of tobacco and alcohol should be strengthened to protect present and future generations.

Health care providers play a critical role in prevention and control of NCDs. Routine contacts with physicians and other health care providers should include practical advice on the benefits of healthy living, including dietary behaviours, physical activity, avoiding or minimizing alcohol and tobacco use. This should be combined with the provision of simple, concise information with specific guidance on increasing fruit and vegetable consumption and reducing consumption of unhealthy fats, salt and sugar. Health-care providers should also work with public health partners to direct patients to skill-building initiatives that increase the likelihood of sustained behaviour change.

Secondary and tertiary prevention is also important in preventing NCD-related complications, loss of productivity, and deaths. Persons with hypertension, high cholesterol and high blood glucose must be appropriately diagnosed and treated so that these conditions can be controlled. Cost-effective non-communicable disease prevention interventions should be available at all levels of care and the health care workforce capacity should be strengthened for the comprehensive management of NCDs.

In summary, Bermuda's current NCD risk factor profile paints an ominous picture. Therefore, there must be multi-sectoral action for the prevention, control and management of non-communicable diseases to reduce overall prevalence and related health care utilizations and costs. All sectors must be determined to create conditions that allow the population to make healthy lifestyle choices so that we can achieve a Well Bermuda!

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