NATIONAL HEALTH & NUTRITION SURVEY

Non-Communicable Disease Risk Factor Surveillance

REPORT FOR ST. VINCENT & THE GRENADINES

MARCH 2015

Submitted To:
The Government of St. Vincent and the Grenadines

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Message from the Ministry for Health, Wellness and the Environment

This is the first WHO STEPS Surveillance to be conducted in St. Vincent and the Grenadines, also referred to in locally as the National Health and Nutrition Survey (NHNS).

It is of national concern that Chronic Non-Communicable Diseases (CNCDs) such as Diabetes, High Blood Pressure, Heart Diseases, Cancers and Kidney Diseases continue to increase in St. Vincent and the Grenadines. This survey aims to understand the impact of the risk factors that contribute to NCDs. By understanding these risk factors the Ministry of Health, Wellness and the Environment can therefore formulate a situation analysis of the problem and devise a response mechanism to tackle the rising scourge of NCDs.

Raising awareness for the promotion of good health and well-being represents an ideal opportunity to draw public attention to the risk factors, sign and symptoms, and complications associated with unhealthy lifestyles. Raising health consciousness and health awareness contribute to intensifying efforts to reverse and reduce the burden of lifestyle diseases and taking serious consideration for 'Prevention' as a key factor for investment in good health.

NCDs conditions and their risk factors, including obesity, diabetes, heart diseases, high blood pressure, strokes and cancer, are a top health priority in St. Vincent and the Grenadines. The prevalence of these diseases is high and increasing; therefore, we have to address these immediately.

The Ministry of Health, Wellness and the Environment will continue to coordinate with stakeholders to advocate for healthy public policies, creating supportive environments, reorienting health services and mobilizing communities and individuals to take action.

The data from this survey will serve as a baseline for the Ministry of Health, Wellness and the Environment, and it is our hope that when the survey is repeated in the not too distant future we can see a substantial reduction in these risk factors for NCD.

I thank everyone for their participation in the survey.

Hon. Clayon Burgin
Minister of Health, Wellness and the Environment
St. Vincent and the Grenadines.

Acknowledgements

Implementing the inaugural St. Vincent and the Grenadines NCD STEPS Survey /National Health and Nutrition Survey was an important activity for Ministry of Health, Wellness and the Environment, which would not be successful without the contributions of many valuable partners who gave of their expertise and the respondents who gave of their time.

The Ministry of Health, Wellness and the Environment would like to acknowledge and thank all the stakeholders who helped in making the inaugural Survey a success:

- The planning committee and country STEP coordinator;
- All data collection and data entry officers, field supervisors;
- All to the participants, without whose time this would be an impossible task;
- CARPHA for providing statistical support, training, resources and result generation;
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- Frame & Associates who verified the results and drafted the NHNS Report; and
- The European Union (EU) under the 10th EDF for their contribution towards this important health exercise in SVG.

Executive Summary

In SVG, NCDs in the form of cancers, diabetes mellitus, diseases of the circulatory system (i.e. ischemic health disease, cerebrovascular diseases, hypertension and hypertensive diseases), injuries and violence are among the top ten causes of death and contribute on average 60%-70% of all deaths. The 2013-2014 WHO STEPS on NCD Risk Factor Surveillance, designated in SVG as the National Health and Nutrition Survey (NHNS) discussed in this report was to develop and strengthen the country's capacity to better monitor non-communicable diseases (NCDs) and their risk factors by implementing a population based survey using the Pan American Version of WHO STEPS.

The NHNS is utilizing the Pan American Version of WHO STEPS version 3.0 to conduct the surveillance of chronic diseases and risk factors. This approach uses tools that collect data and measure chronic disease and risk factors through a sequential process of gathering information about behavioural and biological risk factors across the population: Step1, Step 2 and Step 3 (Core and Expanded). The total survey sample that consents to participate in the survey was required to participate in STEPS 1 and 2 whilst 50% of the total survey sample was selected for STEP 3 and the optional nutrition intake module. The sample size was proportionately divided between the three main reporting strata (St.Vincent/Northern Grenadines/Southern Grenadines). The survey was stratified by sex, age groups 18-29, 30-44 and 45-69 years based on the 2001 national census and by geographical location. A three-stage cluster sampling approach was used and 199 enumeration districts were randomly selected using Probability Proportional to Size (PPS) from the sampling frame. Eligible persons at the household level were randomly selected using the Kish method. If no one was present in the selected household, a notification of visit card was left and the interviewer revisited. The level of confidence and the corresponding margin of error used for the sample size calculations for the survey were 95% and 0.05, respectively. Data analysis was conducted utilizing Epi Info software. The survey was implemented for a 9-month period between January 2013 and December 2014.

The key findings of behavioural risks present the baseline data on various health behaviours, including smoking, drinking alcohol, eating fruits and vegetables, dietary salt consumption, and physical activity. The percentage that currently smokes tobacco products was 12%, with 57% being daily smokers. There was a nine-fold higher current smoking rate among males (21.9%) than females (2.5%). Forty-nine percent (66.9% males; 31.4% females) of respondents reported drinking currently (i.e. in the past 30 days, while an additional 16.3% (13.5% males; 19% females) reported drinking in the past 12 month, but not currently. Overall, fruits and vegetables were consumed an average of 3.3 days and 3.1 days, respectively, with no difference among males and females. Respondents reported consuming an average number of 1.7 servings of fruit and vegetable combined per day with no sex or age differences observed. Only 5.1% of respondents reported consuming five or more servings of fruits and/or vegetables combined (5.9% males; 4.4% females); the majority of respondents reported consuming 1-2 servings (43.3%).

The key findings of physical measurements include blood pressure, weight, height, and waist. An overall mean systolic blood pressure (SBP) and diastolic blood pressure (DBP) of 123.5 mmHg (126.3 mmHg males; 120.8 mmHg females) and 74 mmHg (73.4 mmHg males; 74.6 mmHg females), respectively was found. The proportion of those that were overweight (i.e. BMI of 25.0-29.9) in the study population was 27.3% (28.1% males; 26.4% females), and 26.9% (13.2% males; 40.8% females) recorded as obese (i.e.

BMI of 30 or more). Females weighed more than males, with a mean weight of 78.6 kg and 76.1 kg respectively. Participants with the heaviest weight was recorded in age group 45-69 years. Mean waist circumferences for males was recorded as 85.8 cm and for females 93.2 cm.

Overall 1.8% of the study population demonstrated the lowest risk for NCDs (that is with none of the 5 risk factors), comprising of 2.7% males and 0.9% of females. Although most respondents (71.2%) reported having 1-2 risk factors (77.4% males; 65% females), 26.9% of respondents reported having 3-5 risk factors (19.9% males; 34% females). Participants in age group 45-69 comprised a significantly higher proportion (46.5%) of respondents with 3-5 risk factors.

The recommendations are guided by the WHO "Best Buy" Interventions, which identify key interventions to reduce the public health and economic impact of CNCDs and their risk factors. The specific recommendations emanating from the survey addresses are based on the national context of SVG and the regional context of the Caribbean, and are categorised according to: policy; advocacy and dissemination of the NHNS findings; risk factors; patient management; and NCD surveillance. Ultimately, the battle against NCDs can only be won through a Regional approach involving all sectors of government and society, as that set out in the Caribbean Community (CARICOM) heads of government multisector Port-of-Spain Summit Declaration "Uniting to Stop the Epidemic of Chronic Noncommunicable Diseases," of 15 September 2007.

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List of Acronyms

BMI	Body Mass Index
CI	Confidence Intervals
DALYs	Disability Adjusted Life Years
DBP	Diastolic Blood Pressure
EDS	Enumeration Districts
GSVG	Government of St. Vincent and the Grenadines
GSHS	Global School Health Survey
NCD	Non Communicable Disease
GYTS	Global Youth Tobacco Survey
MoHW	Ministry of Health, Wellness and the Environment
MET	Metabolic Equivalent Time
SBP	Systolic Blood Pressure
SVG	St. Vincent and the Grenadines
WHO	World Health Organization

Introduction

Non-Communicable diseases (NCDs) such as heart disease, stroke, cancer, diabetes, and chronic respiratory diseases are the leading cause of death globally, and were responsible for 38 million (68%) of the world's 56 million deaths in 2012. More than 40% (16 million) of them were premature deaths under age 70 years. Almost three quarters (28 million) of all NCD deaths, and the majority of premature deaths (82%), occur in low- and middle-income countries. Furthermore, loss of productivity due to premature deaths, and the individual and national costs of addressing NCDs are important barriers to poverty reduction and sustainable development. As such, NCDs are one of the major health and development challenges of the 21st century (WHO, 2014).

In the past, NCDs were associated with affluent lifestyles, however, since the start of the 21st century these diseases have become more prevalent and more democratic as a result of forces such as the rapid urbanization; population ageing; and powerful global marketing of unhealthy products like cigarettes, alcohol, sugar-filled beverages, and foods that are rich in unhealthy fats, sugar, and salt (WHO, 2014).

In the Caribbean Region, NCDs are responsible for six of the top ten leading causes of death, and represent a growing proportion of health spending, and impose a large economic burden at the societal, community, and household level. For example, in the Organization of the Eastern Caribbean States (OECS), including St. Vincent and the Grenadines (SVG), the annual cost for treating a diabetic ranges from US$322 to US$769. Some NCD patients spend 36% of their total household expenditure annually for care. Poorer households spend 48% of their per capita expenditure on healthcare (Government of St. Vincent & the Grenadines (GSVG), 2008).

In SVG, NCDs in the form of cancers, diabetes mellitus, diseases of the circulatory system (i.e. ischemic health disease, cerebrovascular diseases, hypertension and hypertensive diseases), injuries and violence are among the top ten causes of death and contribute on average 60%-70% of all deaths (GSVG, 2013). Most of these deaths could have been prevented, and future deaths could be prevented if the Government of SVG heeds the global, regional and national call to action on NCD.

The following is a report of key findings and discussion of the implications of the 2013-2014 WHO STEPS on NCD Risk Factor Surveillance, designated in SVG as the National Health and Nutrition Survey (NHNS). The Report concludes with some recommendations based on the translation of the findings into actionable interventions guided by the WHO Global action plan for prevention and control of non-communicable diseases 2013–2020 and the Strategic Plan of Action for the Prevention and Control of Chronic Non-Communicable Diseases (NCDs) in the Countries of the Caribbean Community (CARICOM) coming from the 2007 CARICOM Summit on Chronic Non-Communicable Diseases in Port-of-Spain Declaration of 2007, Uniting to Stop the Epidemic of Chronic NCDs, which is aligned with the WHO/PAHO plans to prevent and control NCDs.

Goals and Objectives of the Survey

The goals of the WHO STEPS locally referred to in St. Vincent and the Grenadines as the National Health and Nutrition Survey (NHNS) were:

1. To develop and strengthen the country's capacity to better monitor non-communicable diseases (NCDs) and their risk factors by implementing a population based survey using the Pan American Version of WHO STEPS
2. To assess mean energy, nutrient and food intake, nutritional adequacy and dietary patterns in the adult population aged 18-69 years and their relationship to obesity and other NCD risk factors by implementing 24-hour recall methodology

The objectives were to:

i) To collect data on the current levels of risk factors for chronic diseases in St. Vincent and the Grenadines
ii) To collect data on the nutritional intake and dietary patterns of the population in St. Vincent and the Grenadines
iii) To monitor and evaluate the trends of risk factors nationally
iv) To develop standardized tools to enable comparisons over time and across countries
v) To prevent chronic disease epidemics before they occur
vi) To provide information in order to develop a Health & Wellness/Public Awareness Strategy
vii) To assist health services in the planning and determination of public health priorities

Methodology

Scope

The NHNS is utilizing the Pan American Version of WHO STEPS version 3.0 to conduct the surveillance of chronic diseases and risk factors. This approach uses tools that collect data and measure chronic disease and risk factors through a sequential process of gathering information about behavioural and biological risk factors across the population: Step1, Step 2 and Step 3 (Core and Expanded) and optional modules Dietary Salt and nutrition intake (24 hour recall) – the results from the latter optional module is not included in this report, but may be added as an annex upon completion of the analysis and reporting.

The NHNS collected data on:

- Behavioural (diet, physical activity, tobacco and alcohol),
- Physical measurements (blood pressure, height, weight , waist and heart rate)
- metabolic risk factors (fasting blood glucose, blood lipids, triglycerides and HDL cholesterol)
- lifestyle advice,
- cervical cancer screening,
- family history,
- health screening,
- dietary salt
- Nutrition intake.

The total survey sample that consents to participate in the survey was required to participate in STEPS 1 and 2 whilst 50% of the total survey sample was selected for STEP 3 and the optional nutrition intake

module. St. Vincent and the Grenadines used a combination of two (2) methodologies in order to collect data:

1) The Pan American version of the WHO STEPS Instrument; the data collection was done electronically, which involved the use of Personal Digital Assistants (PDAs). As a PDA-based data collection tool, eSTEPS provided the following benefits:

    - immediate error-checking during data collection (e.g. inadvertently skipped questions or out-of-range responses);
    - marked reduction of materials to be carried by data collectors (one PDA vs. hundreds of paper instruments);
    - no data entry needed
    - no cost for data entry;
    - fewer errors arising from data entry;
    - final dataset can be created quickly following completion of data collection

2) A twenty-four (24) hour food recall form adapted from the Caribbean Food and Nutrition Institute (PAHO/CFNI); the data collection will be done manually (paper based).

    Portion-size measurement aids (PSMAs) was used to estimate food quantities eaten over the period. The PSMAs used in this survey was food models, household measures and rulers.

Geographical Coverage

The survey covered the entire island St. Vincent and the Grenadines, and was conducted using the following zoning categories:

1) Mainland (St. Vincent)
2) Northern Grenadines (Bequia and Mustique)
3) Southern Grenadines (Canouan and Union Island)

Sample Size

The target sample size for the NHNS Step 1 and Step 2 was calculated to be 5180 persons and 2590 persons for Step 3 and Nutrition Intake as per table 1 & 2 below. The total sample size was determined based on the population size by island grouping using the 2012 preliminary census data and the 18-69 year old population sizes by island estimated using data from 2001 census. This estimated sample size was calculated based on the following parameters (Table 1):

Table 1 List of parameters and values for sample size calculation

Parameters	Value	Rationale
Level of Confidence Measure	1.96	
Margin of Error (MOE)	0.05	
Baseline levels of the indicators	0.5	Selected to give most conservative sample as no baseline data are available

Design effect (Deff)	1.5	Result of the sampling methodology which will involve cluster sampling
Expected Response Rate	0.80	Based on previous survey response rates experiences in St. St. Vincent & the Grenadines
Number of age/sex Estimates	6	10-year age groups (18-29, 30-44, 45-69 years) for males and for females

Table 2 Breakdown of sample size calculation for NHNS

Island	Census Division	Total Population Size	Population Size 18-69 years (approximated)	Sample Size Calculated (Proportionally Split)	Sample Size required to report for 18-69 population[1]	Final Sample Size[2]
St. Vincent	Mainland	97,564	55,861	3,913	721	3,913
Bequia Mustique	Northern Grenadines	6,184	3,541	248	650	650
Canouan Mayreau Union Island	Southern Grenadines	4,019	2,301	161	617	617
SVG		**107,767**	**61,703**	**4,322**		**5,180**

The Caribbean Public Health Agency (CARPHA) provided support with the sample calculation and the Ministry of Planning and Central Statistical Office in St. Vincent and the Grenadines assisted with the sample selection. This is the most conservative estimate as it assumed a highly variable population and encouraged accurate prevalence estimates for all indicators from the survey results. The estimate is based on the 2001 and 2012 population census data.

Sampling and Recruitment

The sample size was proportionately divided between the three main reporting strata (St.Vincent/Northern Grenadines/Southern Grenadines). The country's most recent age breakdown based on the 2001 national census by St. Vincent was used to approximate the adult population 18-69 years by Island grouping. The survey was stratified by sex, age groups 18-29, 30-44 and 45-69 years and by geographical location – St. Vincent, Northern Grenadines and Southern Grenadines.

[1] Sample size required to obtain accurate results on the single strata 18-69 persons in each island. These results are desirous for this survey.
[2] The larger of the previous two columns is selected.

A three-stage cluster sampling approach was used. Enumeration districts were randomly selected using Probability Proportional to Size (PPS) from the sampling frame. A total of 199 enumeration districts were selected. The sampling frame was developed using the number of households per enumeration district taken from the 2012 preliminary census report; enumeration districts had been subsequently revised (2010-2011) so that no enumeration district containing more than 150 Households would be randomly selected from the selected enumeration districts. The number of households per enumeration district to be selected was 26. Where an enumeration district had been split into 2 or more new enumeration districts the number of households in the previously defined enumeration district was divided equally between the newly revised enumeration districts. The household list for each selected enumeration district was updated prior to selection of households during a re-listing exercise. This was necessary as the existing household listing for each enumeration district was outdated.

Eligible persons at the household level were randomly selected using the Kish method. If no one was present in the selected household, a notification of visit card was left and the interviewer revisited. There was a total of three visits to the household before it was listed as non-response (one initial recruitment visit and two call backs). The interviewer then moved on to the next house on the list in the original order. Although the person selected for interview were to be at least 18 years and not older than 69 years on the last birthday, there were a few instances where some participants were turning 18 or 70 years; those cases were addressed during data cleaning.

Interviewers met participants at home mainly in the evenings and on weekends. The collection of blood samples and the nutrition intake (24 hour recall) was also done at participants' homes in the mornings while participants were fasting and was completed on a revisit.

Eligibility Criteria

Ethical approval in order for the study to be conducted in St. Vincent and the Grenadines was granted by the National Ethics Committee.

In order to be considered eligible to participate in the survey a person:

- Belonged within the age group of 18-69 years old
- Appeared in the interviewer's judgment to be capable of understanding the information provided about the survey and who is therefore able to provide informed consent (i.e. must not be intoxicated, doped sick or cognitively challenged).
- Lived or worked in St. Vincent and the Grenadines at the time of the survey.
- Understood English.

Also, exclusion from the study was acceptable only if persons (within the age criterion) were bedridden or mentally challenged. Pregnant participants were excluded from having waist measurement conducted.

If eligible according to the above criteria, the participant was further eligible to complete an interview if he/she has **not** already participated in the current survey. Informed consent was sought prior to the interview being conducted.

Survey Staff and Training

The overall conceptualization and planning for the NHNS was done via partnership with the Ministry of Health, Wellness and the Environment and Central Planning Department (European Development Fund Office) in St. Vincent and the Grenadines and the Pan American Health Organization Eastern Caribbean Countries Office and the Caribbean Public Health Agency.

The survey team consisted of one field coordinator, 16 field supervisors and approximately 117 interviewers. The training of the field staff was conducted by the Caribbean Public Health Agency, Ministry of Health, Wellness and the Environment personnel and Central Statistical Office personnel. Training was guided by the use of procedural guidelines specific to the implementation of the Pan American Version of WHO STEPS version 3.0 to surveillance of non-communicable diseases (STEPS) and the 24-hour recall methodology.

Data Collection Questionnaire

A questionnaire (see Annex 1) was used to collect the needed information from the survey participants along with the collection of physical measurements. The survey questionnaire was adapted from the tools available from the Caribbean Public Health Agency for standardized surveillance of non-communicable diseases (STEPS) and nutrition (24 hour recall). The questionnaire themes included: socio-demographics, tobacco use, alcohol consumption, diet, physical activity, physical measurements, nutrition and health screening, lifestyle advice, family history, cervical cancer screening and dietary salt. The questionnaire was interviewer administered. The participants' responses were entered directly into a hand-help Personal Digital Assistant (PDA) and a paper based instrument. The field supervisor routinely reviewed the completed questionnaire for completion. The questionnaire was only be offered in English.

Biological samples, testing and Nutrition intake (24 hour recall)

Fifty percent (50%) of the survey participants were asked to provide a biological specimen (finger prick) for Glucose and cholesterol testing using Glucose and Lipid Sampling Kits and respond to the nutrition intake (24 hour recall). The biological sample was only collected with participants' explicit consent; the samples were not stored or used for additional undetermined or undisclosed future testing to which respondents did not agree at the time of participation.

Approaches to Data Analysis

The following reports are the key outputs of the data analysis:

- Fact Sheet (Annex 2)
- Data Book
- Site report

The recommended data analysis software Epi Info (version 3.3 or higher) was used.

The data analysis process ranged from cleaning the database to producing the final results for the site report. Once the data was downloaded from the PDAs, it was cleaned and analysed in Epi Info and the interview tracking information was attached to the survey data.

Prior to production of any reports, there were four (4) main steps of the data analysis process:

1) Data Cleaning
2) Calculating response properties
3) Weighting

4) Finalizing the dataset

Sustainability and future surveys

It is recommended that surveys geared to address risk factor surveillance are repeated every 3-5 years. In St. Vincent and the Grenadines the strategies to combat the development of chronic diseases and encourage behaviour change which will be implemented following completion of the survey must be monitored and evaluated. Systems must therefore be institutionalized to ensure the provision of appropriate resource allocation for such repeat surveys.

Timeframe

The survey was implemented for a 9-month period between January 2013 and December 2014. The preparatory phase took place from September 2011. The field work for the collection of data on risk factors and nutritional intake was conducted during the period October-November 2013. The final report was drafted in March 2015 after consultation with stakeholders on the findings, and a National Launch of the Report is planned to occur by the third quarter of 2015.

Resources

The NHNS was funded under the 10th European Development Fund (EDF) as part of support to the St. Vincent and the Grenadines Health Sector. The technical support for the survey was provided by Pan American Health Organization and the Caribbean Public Health Agency.

Survey Results

Socio-Demographic Information (Step 1)

Table 3 shows the composition of survey participants by age group and sex. The target sample size was 5180, however the total sample included 3,513 respondents (44.2% males; 55.8% females) – a response rate of 68%. Overall, the largest group of respondents comprised of persons in age group 45-69 years (44.6%), followed by age group 30-44 years (33.8%) and 18-29 years (21.6%).

Table 3 Age group and sex of the survey respondents

Age Group (years)	Men		Women		Both Sexes	
	N	%	n	%	n	%
18-29	298	8.5	462	13.2	760	21.6
30-44	487	13.9	699	19.9	1186	33.8
45-69	768	21.9	799	22.7	1567	44.6
18-69	1553	44.2	1960	55.8	3513	100

To ascertain educational levels, all respondents were asked the total number of years spent at school or in fulltime study (excluding pre-school years). The mean number of years of education was 10.7 years. Among both males and females, the mean number of years of education decreased as participants age increased.

Table 4 shows the distribution of the highest level of education attainment. Among all participants, the highest level of education completed was at the primary school level (52%) followed by secondary school level (24.5%) and college/university level (15.9%). However, 5.7% of the sample had less than a primary school level education. More male respondents reported obtaining less than a primary school education (7.5%) or a primary school education (56.5%) compared to females (4.3% and 48.4% respectively). In contrast, a higher proportion of females reported completing secondary school (26.9%) and college/university level education (18.4%) compared to males (21.5% and 12.6% respectively).

Table 4 Highest level of education by age group and sex

Age Group (years)	Sex	n	No formal schooling	Less than primary school	Primary school completed	Secondary school completed	College/ University completed	Post-graduate degree completed
18-29	M	297	0.3	2.4	36.0	42.1	18.5	**0.7**
	F	462	0.2	0.9	26.0	43.9	27.5	**1.5**
30-44	M	486	0.2	6.4	57.0	23.3	11.9	**1.2**
	F	698	0.1	1.7	49.0	28.1	19.9	**1.1**
45-69	M	765	1.0	10.2	64.1	12.4	10.7	**1.6**
	F	797	1.4	8.5	61.0	15.9	11.9	**1.3**
18-69	**Total**	**3505**	**0.7**	**5.7**	**52.0**	**24.5**	**15.9**	**1.3**

Figure 1 shows that the majority (70.8%) of respondents identify as being of African descent/Negro/Black comprised, followed by Mixed (21.7%), Indigenous (5.1%), East Indians (1.1%), White/Caucasian (0.6%), Portuguese (0.5%), Syrian/Lebanese (0.1%), Chinese (0.1%) and other (0.1%).

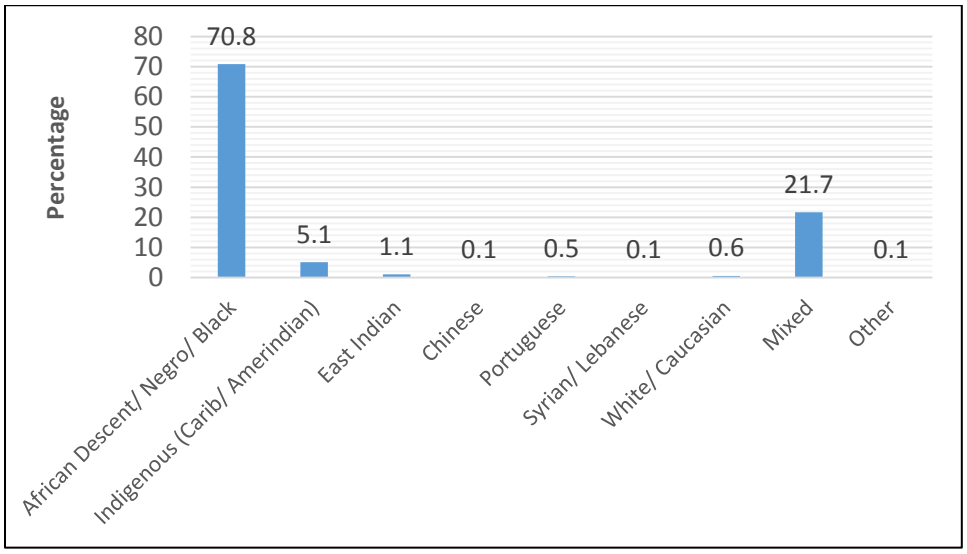

Figure 1 Ethnicity of the survey respondents

Employment status

Table 5 refers to employment status. Overall, 65% of respondents reported being in paid employment, with the majority reporting non-government employment (25.1%), followed by self-employment (24%) and government employment (15.9%). The sex distribution indicate that most women are non-government employees (22.6%), especially among 30-44 years (28.8%) compared to the majority of men

being self-employed (35.5%), especially the 45-69 (42.8%) and 30-44 (36.1%) age groups. Overall, the age group 30-44 years comprised the highest group of paid employees (74.5%).

The Table also shows that 35% of respondents identified as *unpaid* (i.e. persons who are non-paid, students, homemakers, retired, and unemployed), comprising disproportionately of females and persons in age groups 18-29 years and 45-69 years.

Table 5 Employment Status by age group and sex

Age Group (years)	Sex	n	Government employee	Non government employee	%Self-employed	% Unpaid
18-29	M	296	12.5	31.4	15.9	40.2
	F	461	15.2	20.8	5.6	58.4
30-44	M	487	16.4	37.0	36.1	10.5
	F	698	20.2	28.8	15.0	36.0
45-69	M	767	14.9	21.5	42.8	20.9
	F	798	14.3	18.3	20.2	47.2
18-69	**Total**	**3507**	**15.9**	**25.1**	**24.0**	**35.0**

Estimated household earnings

Table 6 shows that almost one-quarter of participants reported an estimated annual household earning of between EC $2500.00-$4999.00, followed by 18.2% with $5000.00-$9999.00, 16.8% with under $2500.00, 13.60% with $10000.00-14999, 12.20% with $15000.00-$24999.00, 10.70% with $25000.00-$49999.00, 4.7% with $50000.00-$74999.00, and 2% earning the highest amount with more than $75000.00.

Table 6 Percent estimated household earnings

N	Under $2500	$2500-$4999	$5000-$9999	$10000-$14999	$15000-24999	$25000-$49999	$50000-$74999	More than $75000
2552	16.8%	21.9%	18.2%	13.60%	12.20%	10.70%	4.70%	2.00%

Behavioral Risk Factors (Step 1)

Tobacco Use

To assess the prevalence of smoking habits in St. Vincent and the Grenadines, respondents were asked about their current and past smoking behaviour. Figure 2 shows the percentage of respondents who reported that they currently smoke any tobacco products, such as cigarettes, cigars or pipes. Overall only 12% of respondents reported currently smoking tobacco products. However, there was a nine-fold

higher current smoking rate among males (21.9%) than females (2.5%). Although there was a higher proportion of males who smoked in all age groups than females, it is noteworthy that among males, the proportion of current smokers was highest among respondents in age group 30-44 years (25.5%) and 45-69 years (21.9%), while the lowest proportion was in age group 18-29 years. In contrast, among females, the high proportion of current smokers was found in age group 45-69 years (3.6%) and lowest among in age group 30-44 years (1.9%).

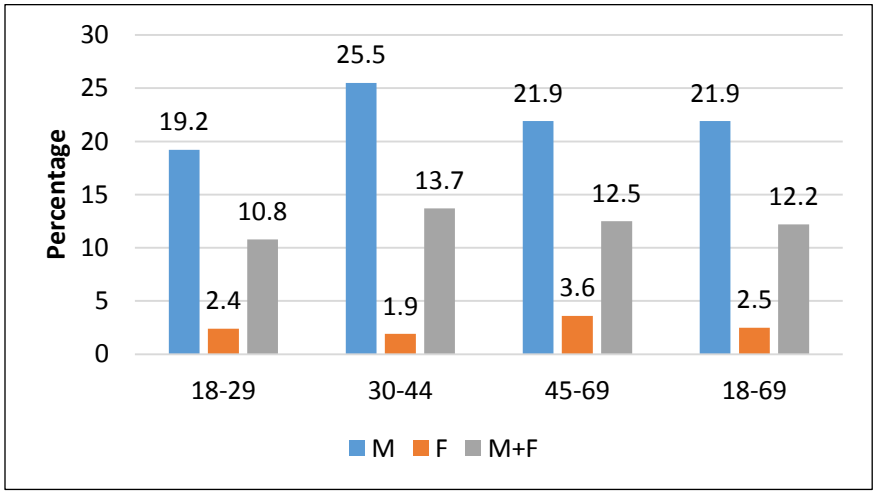

Figure 2 Percentage of current smokers by age and sex

Figure 3 show smoking status, and indicate that the majority (73.3%) of respondents reported never smoking (57% males; 89.4% females). However, over half of all (57%) current smokers smoke daily (57.6% males; 51.8% females). Additionally, 14.5% of responded reported being former smokers, comprising primarily of males (21.1%) than females (8.1%).

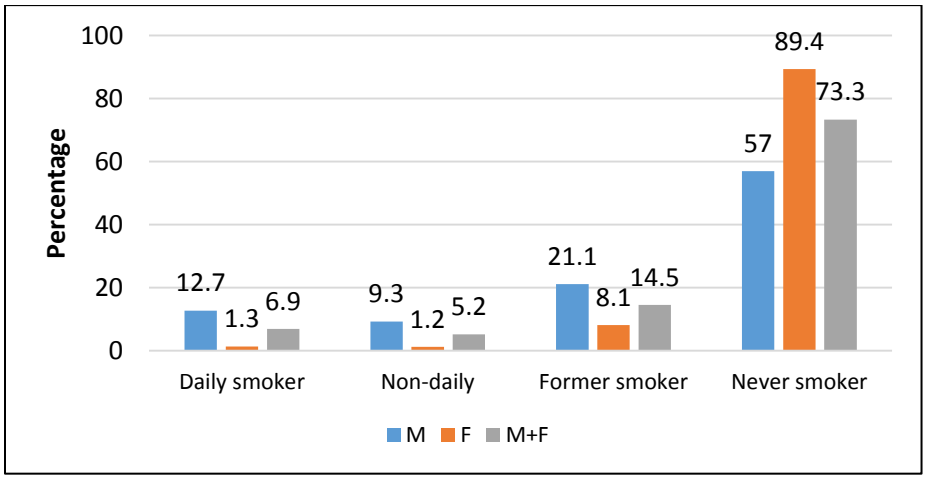

Figure 3 Smoking status by sex

Figure 4 shows the average age of smoking initiation among current smokers. Overall, the average age of smoking initiation reported was age 16.4 years, with an earlier initiation reported among males (age 16.1) than females (age 19). Overall, the average age of smoking initiation increased as age groups increased, with the youngest age of initiation being among males (age 14.7) and females (age 15.6) in age group 18-29 years. The average duration of smoking was reported at 21.4 years.

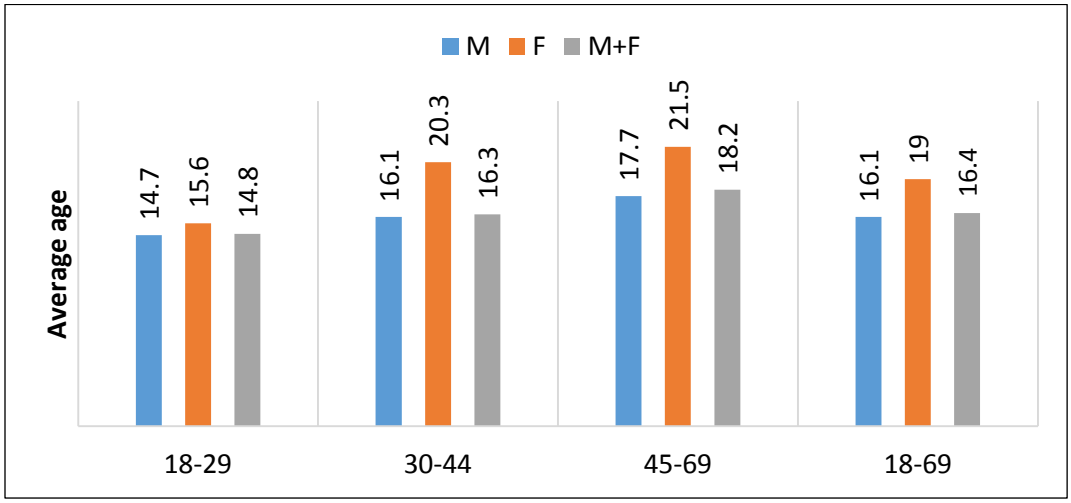

Figure 4 Average age of smoking initiation by age group and sex

Table 7 refers to the percentage of current smokers who smoke a range of tobacco products, such as manufactured and hand-rolled cigarettes, cigars, pipes, shisha. Among current smokers, a significantly higher proportion smoke manufactured (79.1%) cigarettes, hand-rolled cigarettes (20%) and other tobacco products (14.5%) compared to cigars (6.9%), pipes (3.1%) and shisha (0.9%). Males smoke a wider range of cigarette products compared to females.

Table 7 Percentage of current smokers who smoke a range of tobacco products

Age Group (years)	Sex	n	Manufactured cigarettes	Hand rolled cigarettes	Other	Cigars, cheroots, cigarillos	Pipes of tobacco	Shisha
18-29	M	57	79.8	19	16.1	13.8	3.0	0.0
	F	12	91.5	8.4	0.0	5.4	0.0	0.0
30-44	M	125	76.5	22.8	11.4	3.9	0.0	0.9
	F	18	64.7	32.6	9.8	5.3	29.4	5.3
45-69	M	209	86.1	20	11.4	2.2	2.2	1.7
	F	32	53.2	8.7	4.9	2.7	23.8	2.7
18-69	M	391	80.0	20.7	15.5	7.2	1.6	0.7
	F	61	71.6	14.3	4.1	4.4	15.5	2.2
	M+F	**452**	**79.1**	**20**	**14.5**	**6.9**	**3.1**	**0.9**

Table 8 refers to the percentage of daily cigarette smokers who smoke given quantities of manufactured or hand-rolled cigarettes per day. The majority of all daily smokers smoke between 10-14 cigarettes (35.8%) per day, followed by 5-9 cigarettes (29.5%), less than 5 cigarettes (20%), 15-24 cigarettes (13%) and 1.7% smoke 25 or more cigarettes. Examinations of frequency patterns between males and females indicate that more females smoke 10-14 cigarettes per day and less than 5 cigarettes per day, whereas more males smoke 5-9, 15-24 and more than 24 manufactured or hand-rolled cigarettes per day.

Table 8 Frequency of daily smokers smoking quantities of manufactured or hand-rolled cigarette per day

Age Group (years)	Sex	n	<5 Cigs.	5-9 Cigs.	10-14 Cigs.	15-24 Cigs.	≥ 25 Cigs.
18-29	M	22	22.5	31.2	26.2	20.1	0
	F	3	23.4	0	76.6	0	0
30-44	M	64	19.1	37.4	32.2	9	2.2
	F	5	87.4	0	0	12.6	0
45-69	M	110	13.8	24	45.6	13.1	3.4
	F	10	24.7	21.6	35.4	18.4	0
18-69	M	196	18.7	31.7	34.2	13.5	1.9
	F	18	33.9	6.6	52.0	7.6	0
	M+F	**214**	**20**	**29.5**	**35.8**	**13**	**1.7**

Figure 5 shows the percentage of current smokers who tried to stop smoking during the past 12 months, and indicate that 55.1% of all current smokers tried to quit in the recent period preceding the survey. Although no statistically significant trends were observed by age or sex, it is noteworthy that most persons who tried to quit were in age group 30-44 years (59.7%) and female (75.2%).

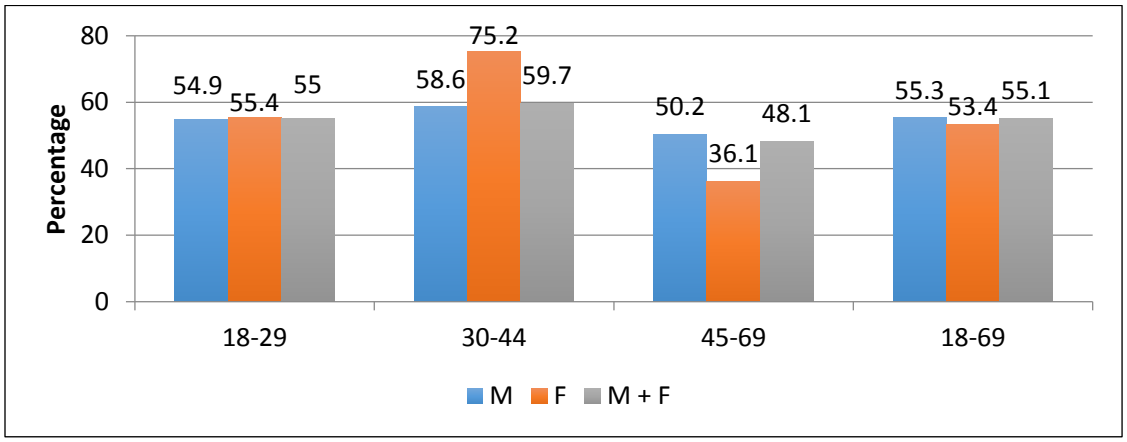

Figure 5 Percentage of current smokers who tried to stop smoking in the past 12 months

Exposure to second-hand smoke in home in past 30 days

Tables 9 refer to environment smoke exposure at home and in the workplace during the past 30 day among all respondents. Overall, 16.9% and 18.8% reported exposure to second-hand smoke in the home and workplace environment respectively, in the past 30 days. More males that females reported exposure to second-hand smoke. Although no trends were observed, the highest proportion of persons exposed in the home consisted of respondents in age group 18-29 years (20.1%), while the highest proportion of respondents exposed in the workplace comprised of respondents in age group 30-44 years (22.1%).

Table 9 Exposure to second-hand smoke at home and in the workplace during the past 30-days

Age group (years)	Sex	n	% Exposed at Home	n	% Exposed in the workplace
18-29	M	295	22.6	265	23
	F	462	17.7	433	10.8
30-44	M	487	17.8	449	28.4
	F	699	13.8	665	15.8
45-69	M	768	11.5	705	25.2
	F	798	13.7	754	11.4
18-69	M	1550	18.4	1419	25.4
	F	1959	15.4	1852	12.6
	M+F	**3509**	**16.9**	**3271**	**18.8**

Alcohol Consumption

Alcohol consumption status

Figure 6 refers to the percentage of alcohol consumed among all survey respondents. Overall, 18.2% (8.9% males; 27.3% females) of respondents reported being *lifetime asbtainers* of alcohol, while 16.6% (10.7% males; 22.3% females) abstained from alcohol in the past 12 months preceding the survey.

Nonetheless, 49% (66.9% males; 31.4% females) of respondents reported being current drinkers (i.e. drinking in the past 30 days), while an additional 16.3% (13.5% males; 19% females) reported drinking in the past 12 month, but not currently. Overall, a significantly lower proportion of respondents in age group 45-69 years (37.2%) reported current drinking compared to age groups 18-29 years (53.6%) and 30-44 years (51.7%); this was consistent among male respondents. However, a significantly lower proportion of females in age group 45-69 years (22.1%) reported current drinking compared to the highest proportion of females in age group 18-29 years (37.1%).

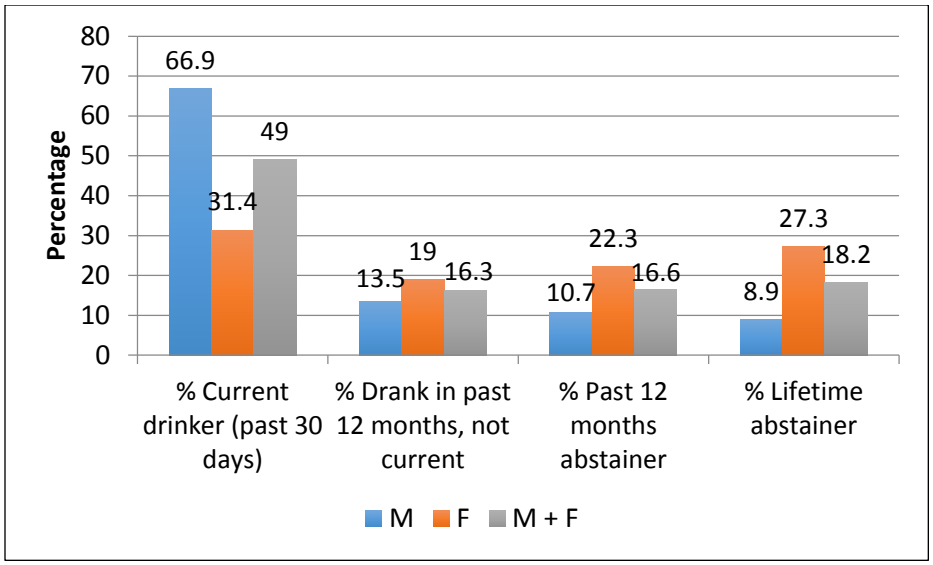

Figure 6 Percentage of alcohol consumed among all survey respondents, 18-69 years

Frequency of alcohol consumption

Figure 7 refers to the frequency of alcohol consumption in the past 12 months among respondents who drank in the past 12 months. A significantly higher proportion of respondents drank less than once per month (38.5%), followed by 1-2 days per week (27.5%), 1-3 times per month (20.1%), 3-4 days per week (6.8%), compared to respondents who drank daily (4%) and 5-6 days per week (3.2%). More females (58.6%) than males (25.9%) drank less than once per month. Additionally, among men, there was a significantly higher proportion of males who drank 1-2 days per week (34.1%), less than once per week (25.9%) and 3-4 days per week (8.7%) compared to other male respondents.

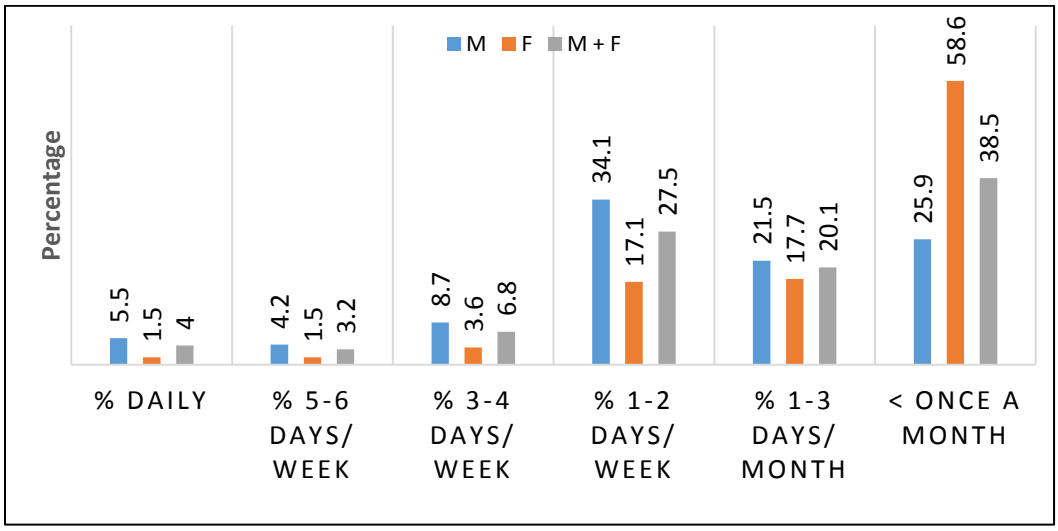

Figure 7 Frequency of alcohol consumption in the past 12 months among all respondents 18-69 years

Drinking occasions in the past 30 days

Figure 8 shows the mean number of occasions where at least one drink was had in the past 30 days among current drinkers. Overall, respondents had an average number of 4.7 drinking occasions in the past 30 days, with males reporting 5.3 drinking occasion and females reporting 3.3 drinking occasions. No significant age group differences were observed.

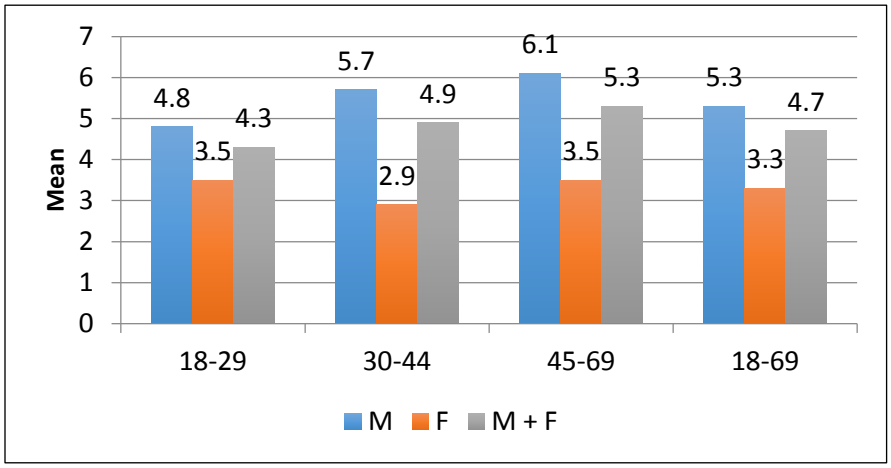

Figure 8 Mean number of occasions for consuming at least one drink in the past 30 days among current drinkers

Average volume drinking levels among current (past 30 days) drinkers

Figure 9 refers to the percentage of current drinkers (i.e. past 30 days drinking) with drinking volumes at the high-end, intermediate and lower-end levels. Overall, a significantly higher (97.6%) proportion of current drinkers reported drinking at the lower-end level (96.9% males; 99% females) compared to the intermediate (1.8%) and high-end (0.6%) levels consumption.

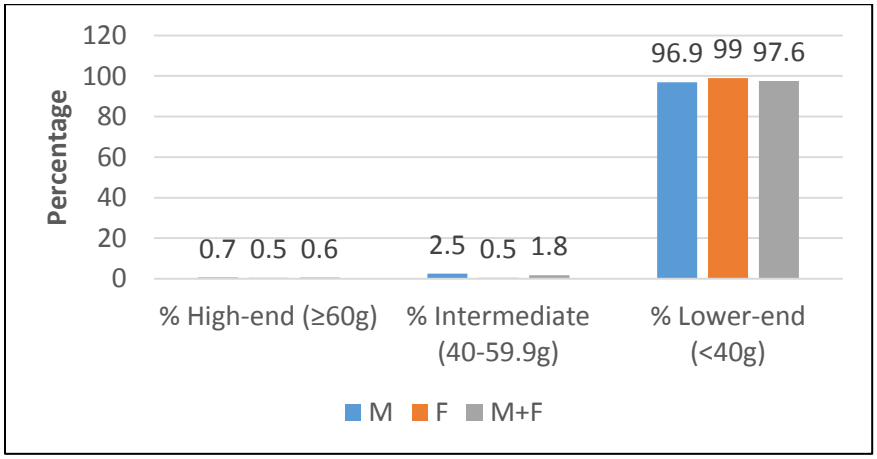

Figure 9 Percentage of current drinkers aged 18-69 years, with drinking volumes at the high-end, intermediate and lower-end levels

Past 7 days drinking

Figure 10 refers to the frequency of alcohol consumption in the past 7 days by current drinkers. The findings indicate a pattern of frequency that was consistent for males and females. Overall, in the past 7 days most (54.4%) current drinkers consumed alcohol 1-2 days (53.9% males; 55.6% females), followed by current drinker who abstained (i.e. 0 days) from alcohol consumption (26.9%), those who drank 3-4 days (10.9%), daily (4.6%) and 5-6 days (3.1%). A significantly higher proportion of respondents in age group 18-29 years abstained (29.6%) from alcohol or drank 1-2 days (57.8%), while a significantly higher proportion of respondents in age group 45-69 years drank daily (11.7%).

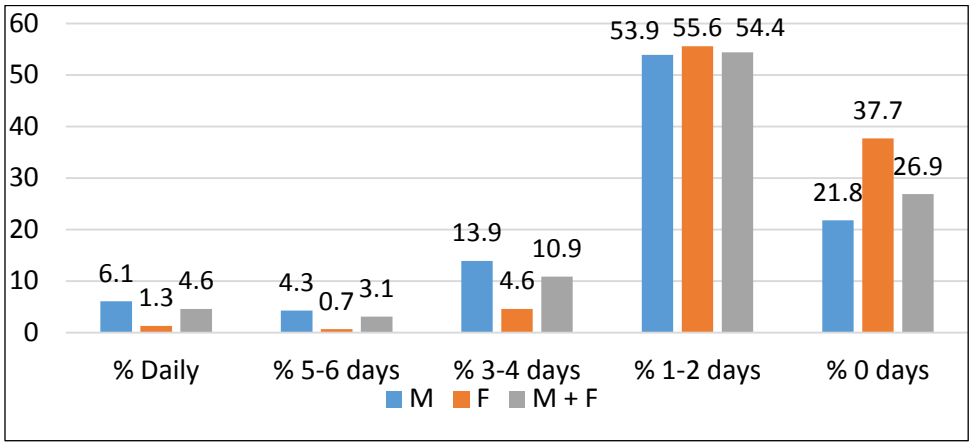

Figure 10 Frequency of past 7-day alcohol consumption among current drinkers by age and sex

Six or more drinks on a single occasion

Among current drinkers, a mean maximum number of 4.1 drinks was consumed (4.6 drinks among males; 2.9 drinks among females). Nonetheless, Figure 11 shows that overall, 9% of respondents drank six or more drinks, with a higher proportion of males (15.1%) than females (3%). Overall and among men, a significantly higher proportion of respondents in age group 30-44 years (11.3% and 19.3%, respectively) drank more than six drinks on a single occasion compared to age group 45-69 years (4.9%).

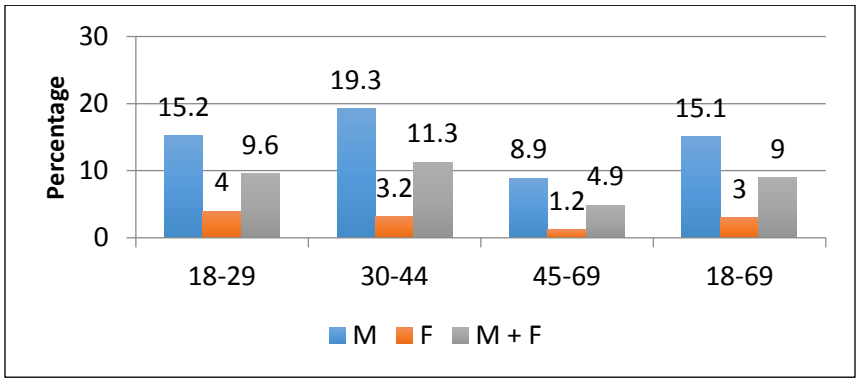

Figure 11 Percentage of all respondents drinking six or more drinks on a single occasion at least once during the past 30 days

It is noteworthy that the majority of respondents did not report problematic behaviours related to their alcohol consumption, such as failing to do what was normally expected (92%) and drinking in the morning to get going (95.8%), as well as, problems with family/partner due to someone else's drinking (97.3%).

Fruit and Vegetable Consumption

Mean number of days of fruit and vegetable consumption

Figure 12 shows the mean number of days fruits were consumed in a typical week. Overall, fruits were consumed an average of 3.3 days, with no difference among males and females. However, fruits were consumed on a significantly higher mean number of days among respondents in age group 45-69 years (3.8 days) compared to those in age group 18-29 years (3 days).

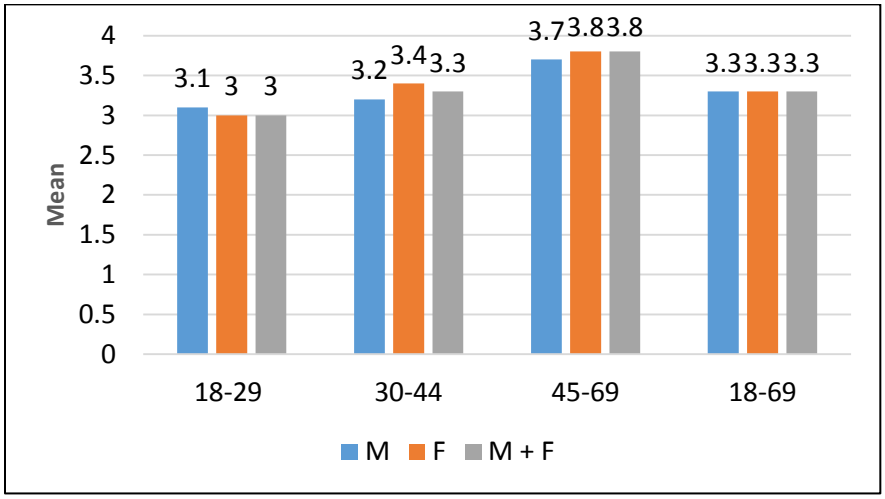

Figure 12 Mean number of days fruit consumed in a typical week by age group and sex

Figure 13 shows the mean number of days vegetables were consumed in a typical week. Overall vegetables were consumed an average of 3.1 days, with no difference among males and females or among the different age groups. Overall, vegetables were consumed on a slightly significantly higher mean number of days among respondents in age group 30-44 years (3.4 days) and 45-69 years (3.4 days) compared to those in age group 18-29 years (2.7 days).

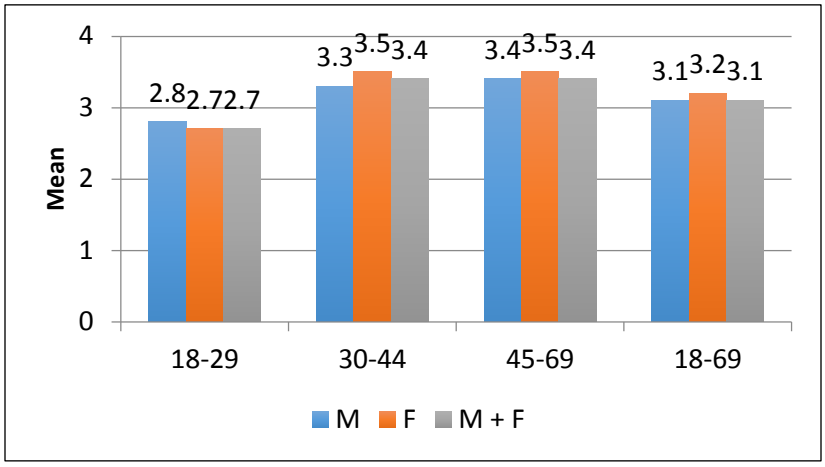

Figure 13 Mean number of vegetables consumed in a typical week by age group and sex

Mean number of servings of fruit and vegetable consumption

Figure 14 indicates that respondents reported consuming an average number of 1.7 servings of fruit and vegetable combined per day (1.8 servings among males; 1.7 servings among females). No age differences were observed.

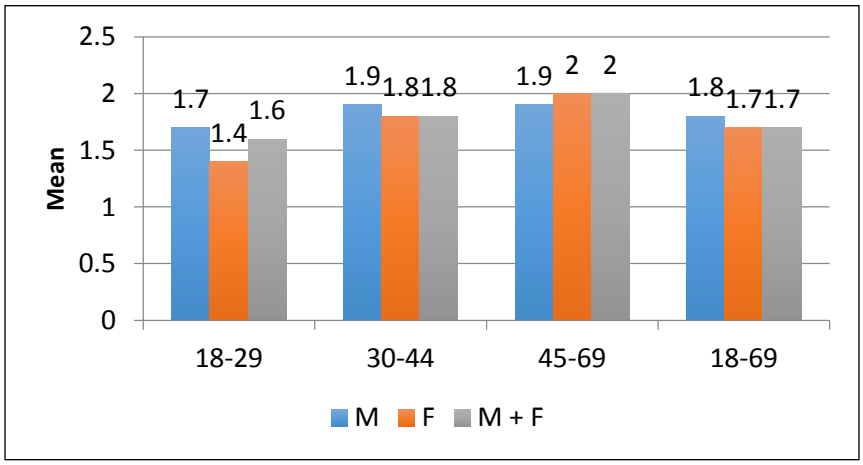

Figure 14 Mean number of servings of fruits and/or vegetables on average per day by age group and sex

Fruit and vegetable consumption per day

Table 10 refers to the frequency of fruit and/or vegetable consumed on average per day. Overall, only 5.1% of respondents reported consuming five or more servings of fruits and/or vegetables combined

(5.9% males; 4.4% females). The majority of respondents reported consuming 1-2 servings (43.3%) followed by no fruit and/or vegetable consumption (37.7%) and 3-4 servings (13.8%). No significant age group differences were observed.

Table 10 Number of servings of fruit and/or vegetables on average per day by age group and sex

Age Group (years)	Sex	n	% no fruit and/or vegetables	% 1-2 servings	% 3-4 servings	% ≥ 5 servings
18-29	M	294	41.6	39.3	12.7	6.3
	F	460	47.2	40.8	8.9	3.1
30-44	M	484	35.6	41	18.5	4.8
	F	694	32.3	49.8	13.4	4.5
45-69	M	764	31.2	46.1	16	6.7
	F	791	30.9	46.6	15.9	6.6
18-69	M	1542	37.2	41.5	15.4	5.9
	F	1945	38.3	45.2	12.1	4.4
	Total	**3487**	**37.7**	**43.3**	**13.8**	**5.1**

Figure 15 shows that overall 94.9% of respondents reported consuming less than 5 servings daily of fruits and/vegetables (94.1% males; 95.6% females), with no significant age group differences observed.

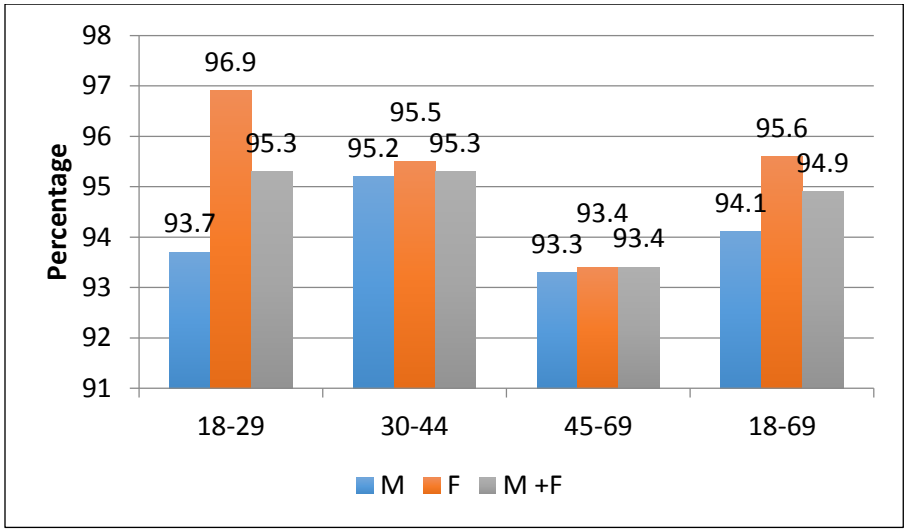

Figure 15 Percentage of respondents consuming less than five servings of fruits and/or vegetables on average per day by age group and gender

Type of oil used most frequently

Figure 16 shows the types of oil or fat most often used for meal preparation in households for all respondents. Overall a significantly high proportion of respondents reported using vegetable oil for meal preparation (73.8%), followed by other (11.9%), margarine (7.2%), butter (4.7%), none in particular (0.8%) and lard (0.3%). An additional 1.2% reported not using any oil or fat for meal preparation.

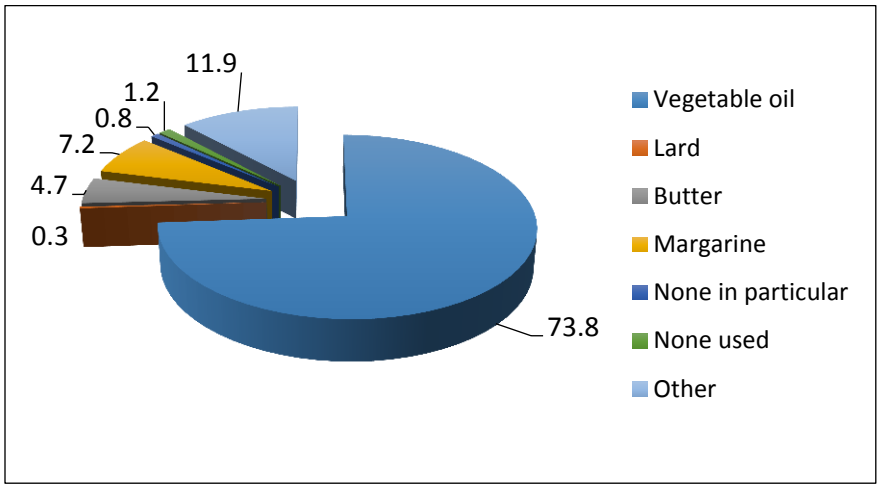

Figure 16 Types of oil or fat most often used for meal preparation in household

Eating outside home

Figure 17 shows the mean number of meals per week eaten outside the home, and indicates that overall an average of 1.4 meals were eaten outside the home. Respondents aged 45-69 years ate significantly fewer meals outside the home (mean of 0.9) compared to respondents aged 30-44 years (mean of 1.5) and 18-29 years (mean of 1.7).

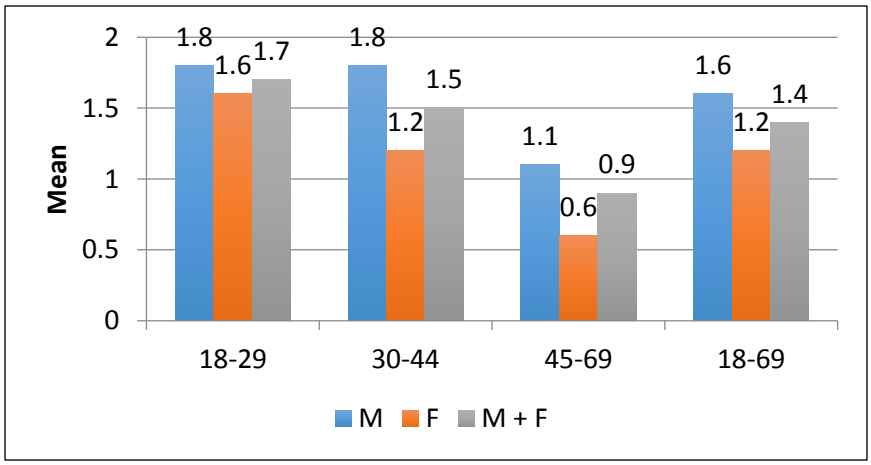

Figure 17 Mean number of meals eaten outside the home

Physical Activity

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

The three physical activity domains were first examined separately to determine the mean minutes of activity per day undertaken in each domain. Taking all domains into account, mean minutes of total activity were computed, as well as three overall levels of activity: low, moderate, and high. To account for the different levels of energy expenditure required for the activities (i.e. moderate and vigorous), the daily duration of activity was converted into MET minutes per day.

The term MET (metabolic equivalent) is used as an indication of the intensity of physical activity. A MET is the ratio of the associated metabolic rate for a specific activity divided by the resting metabolic rate. The energy cost of sitting is equivalent to a resting metabolic rate of 1 MET. Similar to all STEPS Reports, in this report, the following MET values were allocated to the three physical activity domains:

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

The following levels of activity in terms of MET minutes were defined as:

- Low activity: <600 MET minutes per week
- Moderate activity: 600-1500 MET minutes per week
- High activity: >1500 MET minutes per week

Not meeting WHO recommendations on physical activity for health

Figure 18 shows the percentage of respondents who were not meeting the WHO recommendation on physical activity for health. Overall 24.4% (12.5% males; 36.1% females) of respondents were not meeting the WHO recommendations. There were no significant differences among the different age groups, however, females in age group 18-29 years (38.5%) and males in age group 45-69 years (21%) comprised the highest proportion of respondents not meeting the recommendations.

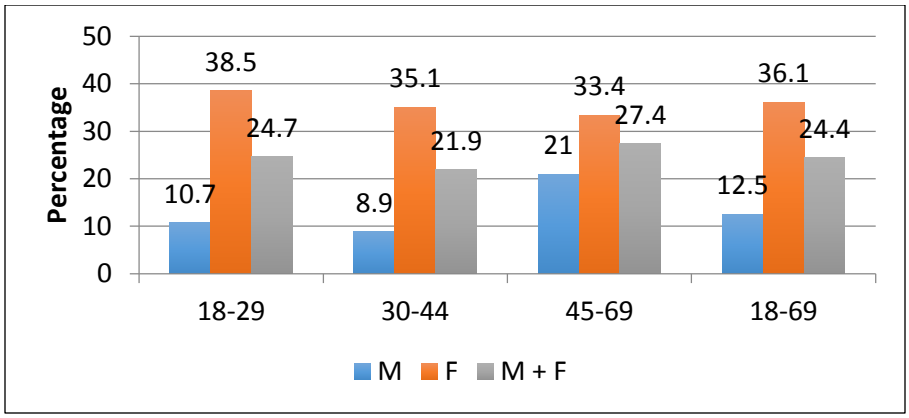

Figure 18 Percentage of respondents not meeting WHO recommendations on physical activity for health by age group and gender

Mean total physical activity

Table 11 shows the mean minutes of total physical activity on average per day. Overall, respondents reported engaging in a mean of 198.3 minutes/day (approx. 3 hours and 18 minutes). Males engaged in 288.4 mean minutes/day (approx. 4 hours and 48 minutes), which was more than twice the 109.7 mean minutes/day (approx. 1 hour and 49 minutes) engaged in by females. No significant age group differences were observed.

Overall an average of 128.8 minutes (2 hours and 8 minutes) was spent on work-related physical activity/day (193.2 minutes among males; 65.5 minutes among females). Respondents in age group 18-29 years engaged in significantly less work-related physical activity compared to respondents in age group 30-44 years. In contrast, an average of 49.6 minutes was spent on transport-related physical activity/day (64 minutes among males; 35.5 minutes among females). Overall, respondents spent the least quantity of time in leisure/recreation-related physical activity, spending an average of 19.9 minutes/day (31.2 minutes among males; 8.7 minutes among females). Age group 45-69 spent significantly less time in leisure-related physical activity than age group 18-29 years.

Table 11 Mean minutes of types of physical activity on average per day by age group and sex

Age Group (years)	Sex	n	Total	Work-related	Transport related	Recreation
18-29	M	292	252.3	142.4	61	48.9
	F	458	96.3	49.5	35	11.8
30-44	M	481	344.5	255.5	68.9	20.1
	F	691	121.6	77.8	35.7	8.1
45-69	M	763	274.2	197.2	62.3	14.7
	F	789	117.4	76.7	36.3	4.3
18-69	M	1536	288.4	193.2	64.0	31.2
	F	1938	109.7	65.5	35.5	8.7
	M+F	**3474**	**198.3**	**128.8**	**49.6**	**19.9**

Composition of total physical activity

Table 12 refers to the percentage of work-, transport-, and leisure-activity contributing to total physical activity. Overall, the largest proportion of respondents (46.9%) spent their time on transport-related physical activity (36.2% males; 58.9% males). The second largest group of respondents (38.7%) engaged in work-related physical activity (47% males; 29.2%). Activity during leisure time (14.4%) comprised the small proportion of respondents (16.6% males; 11.8% females). A significantly lower percentage of respondents in age group 18-29 years (29.4%) compared to age group 30-44 years (47.6%) and 45-69 years (43.2%) reported engaging in activity for work compared to activity for transport (50.3%).

Table 12 Percent composition of total physical activity by age group and sex

Age Group (years)	Sex	n	Work	Transport	Leisure time
18-29	M	283	36.5	38.6	25
	F	386	21.3	63.8	14.9
30-44	M	453	59.2	29.6	11.2
	F	571	34.1	54.8	11.2
45-69	M	703	49.5	41.4	9.1
	F	676	36.7	55.9	7.4
18-69	M	1439	47.0	36.2	16.7
	F	1633	29.2	58.9	11.8
	M+F	**3072**	**38.7**	**46.9**	**14.4**

Sedentary

Figure 19 refers to mean minutes spent in sedentary activities on a typical day. Overall, respondents reported spending an average of 228.3 minutes (3 hours and 48 minutes) in sedentary activities on average/day. Males spent 216.9 mean minutes in sedentary activity while females spent 239.7 mean minutes/day.

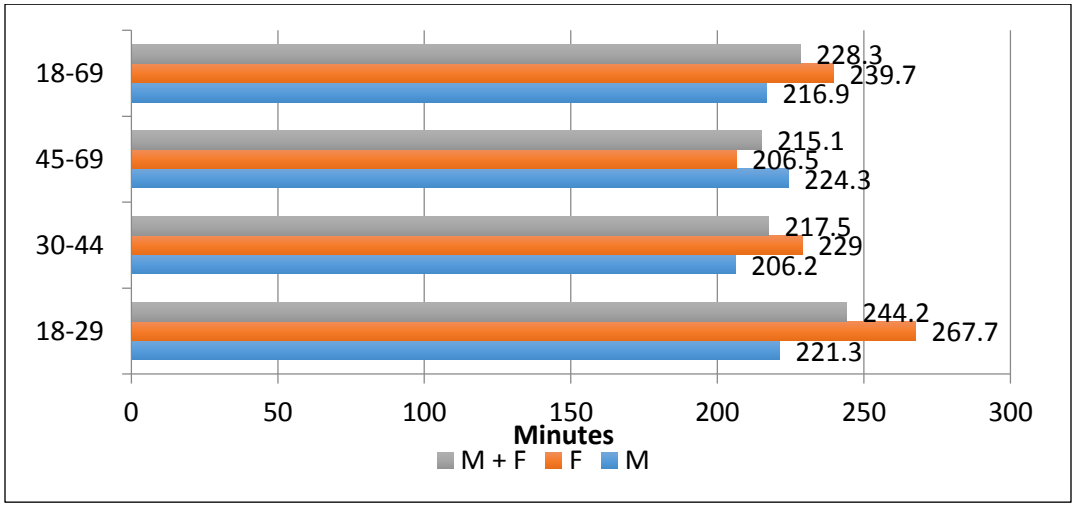

Figure 19 Minutes spent in sedentary activity on average per day by age group and gender

History of Raised Blood Pressure

Blood pressure measurement and diagnosis

Table 13 refers to blood pressure measurement and diagnosis by a doctor or other health worker among all respondents. Overall, the highest proportion of respondents (69.2%) had their blood pressure measured but not diagnosed (70% males; 68.3% females). The second largest proportion of respondents (12.8%) were diagnosed with hypertension within the past 12 months (7.3% males; 18.3% females). Following this, 12.1% of respondents reported never having had their blood pressure measured (18.5% males; 5.7% females). An additional 6% of respondents reported being diagnosed but not within the past 12 months (4.2% males; 7.6% females).

Table 13 Blood Pressure measurement and diagnosis among all respondents by age group and sex

Age Group (years)	Sex	n	% Never measured	% measured, not diagnosed	% diagnosed, but not within past 12 months	% diagnosed within past 12 months
18-29	M	295	27.8	68.9	1.8	1.5
	F	462	11.1	75.6	4.4	8.8
30-44	M	487	14.6	74.2	3.9	7.3
	F	699	2.1	72.2	9.5	16.3
45-69	M	768	7.1	66.1	9.2	17.5
	F	798	1.4	50.7	10.7	37.2
18-69	M	1550	18.5	70.0	4.2	7.3
	F	1959	5.7	68.3	7.6	18.3
	M+F	**3509**	**12.1**	**69.2**	**6**	**12.8**

Dietary Salt

Overall, a minority (3.3%) of respondents reported adding salt always or often before or when eating (3.5% males; 3.2% females). In contrast, more than half (59.6%) of respondents reported always of often adding salt before or when cooking (57.9% males; 61.2% females). Also, 15.1% of respondents reported always or often consuming processed foods high in salt (12.6% males; 17.6% females), with a significantly higher proportion of respondents in age group 18-29 years (20.3%) and 30-44 years (14.7%) reporting always or often consuming high salt processed foods compared to respondents in age group 45-69 years (6.5%).

Regarding the quantity of salt consumption, overall, the largest proportion of respondents reported consuming just the right amount of salt (82.4%). However, 12.9% of respondents reported consuming far too much or too much salt (11.1% males; 14.7% females), with a significantly higher proportion of respondents (15.6%) in age group 18-29 years compared to age group 45-69 years (8.6%).

On respondents knowledge of the health impact of salt consumption, the majority of respondents (81.8%) agreed that consuming too much salt could pose a health threat (82.2% males; 81.4% females), with a significantly higher proportion of respondents (90.7%) in age group 45-69 years compared to those in age group 18-29 years (74.2%). Overall, three-quarters (75%) of respondents reported thinking that lowering salt in the diet is very important, with significantly fewer persons age 18-29 years (65.7%) compared to age group 45-69 years (87.6%).

Table 14 shows that overall, the majority of respondents (72.1%) avoid/minimize consumption of processed foods, with a significantly lower proportion (63.8%) of respondents in age group 18-29 years compared to age group 45-69 years (81.6%). This was followed by 70.5% of respondents who buy low salt/sodium alternatives (68.7% males; 72.4% females), with no significant age differences observed. Following this was 64.9% of respondents who reported cooking meals without adding salt (60.6% males; 69.2% females), with a significantly higher proportion of respondents in age group 45-69 years (76.5%) compared to age groups 18-29 years and 30-44 years. Additionally, 35.4% of respondents reported eating meals without adding salt at the table (33.6% males; 37.2% females), with a significantly higher proportion of respondents in age group 45-69 years (43%) compared to age group 18-29 years (28.6%). This was followed by 34.9% of respondents who reported not looking at the salt/sodium content on food labels (31.2% males; 38.5% females), with a significantly higher proportion of respondents in age group 45-69 years (43.7%) compared to age group 18-29 years (28.2%). The smallest proportion (13.3%) of respondents reported using spices other than salt when cooking (13.6% males; 13.1% females), with no significant age differences observed.

Table 14 Distribution of measures to control salt intake among the respondents by age group and sex

Age Group (years)	Sex	n	% Avoid/ minimize salt	% Buy low salt/ sodium alternatives	% Cook meals w/0 adding salt	% Eat meals w/o adding salt at the table	% Look at the salt or sodium labels on food	% Use spices other than salt when cooking
18-29	M	295	65.3	66.3	53.5	28.1	24.8	14
	F	462	62.3	71	62.2	29.1	31.5	11
30-44	M	487	73.8	70.1	60.2	35.4	32.7	13.2
	F	699	77.9	72.7	71	41.9	41.5	13.7
45-69	M	768	79.8	71	74	41	40.5	13.3
	F	798	83.3	74.3	78.8	44.9	46.7	15.8
18-69	M	1550	71.6	68.7	60.6	33.6	31.2	13.6
	F	1959	72.6	72.4	69.2	37.2	38.5	13.1
	M+F	**3509**	**72.1**	**70.5**	**64.9**	**35.4**	**34.9**	**13.3**

History of Diabetes

Blood sugar measurement and diagnosis

Table 15 refers to blood sugar measurement and diagnosis by a health care provider among all respondents. Overall, the highest proportion (56.1%) of respondents reported having had their blood sugar measured but not diagnosed (49.2% males; 62.9% females). The second highest proportion (37.4%) of respondents reported never having had their blood sugar measured (46.5% males; 28.5% females). Following this, 4.9% of respondents reported being diagnoses in the past 12 months (2.9% males; 6.9% females). Additionally, 1.6% of respondents reported being diagnosed but not within the past 12 months (1.4% males; 1.8% females). Among respondents who reported being diagnosed within the past 12 months, the proportion of respondents significantly increased as age increased; the reverse trend was observed among respondents who reported never having had their blood sugar measured.

Table 15 Blood sugar measurement and diagnosis by age group and sex

Age Group (years)	Sex	n	% Never measured	% measured not diagnosed	% diagnosedbut not within past 12 months	% diagnosed within past 12 months
18-29	M	295	57.6	41.6	0.5	0.2
	F	462	44.4	55.1	0.5	0.0
30-44	M	487	45.2	52.9	0.6	1.2
	F	699	21.1	70.8	2.4	5.7
45-69	M	768	28.0	57.8	3.9	10.2
	F	798	10.9	65.9	3.1	20.1
18-69	M	1550	46.5	49.2	1.4	2.9
	F	1959	28.5	62.9	1.8	6.9
	M+F	**3509**	**37.4**	**56.1**	**1.6**	**4.9**

Table 16 shows the percentage of persons diagnosed with diabetes in the past 12 months and currently on insulin or medication for diabetes. The prevalence of the diagnosed with diabetes is 4.8% (3.0% males; 6.5% females). Overall, among respondents diagnosed in the past 12 months, 69.8% were currently taking insulin (68.3% males; 70.6% females), while 22.3% were taking medication (16.2% males; 25.3% females). The proportion of respondents significantly increased as age increased among all respondents currently taking medication and those diagnosed in the past 12 months taking insulin. In contrast, significantly fewer respondents in age group 18-29 years were taking medication compared to the other age groups among those diagnosed in the past 12 months.

Table 16 Percentage of respondents diagnosed with diabetes in the past 12 months and currently on treatment by age group and sex

Age Group (years)	Sex	Diagnosed with diabetes in the past 12 months and on medication		Currently taking insulin among all diagnosed		Currently taking medication
		n	%	n	%	%
18-29	M	298	0.0	2	0.0	0.0
	F	462	0.0	3	0.0	0.0
30-44	M	487	1.2	12	68.5	24.1
	F	699	4.7	53	44.7	21.1
45-69	M	768	10.9	96	74.6	16.2
	F	799	20.1	173	85.1	28.1
18-69	M	1553	3.0	110	68.3	16.2
	F	1960	6.5	229	70.6	25.3
	Total	**3513**	**4.8**	**339**	**69.8**	**22.3**

History of Raised Total Cholesterol

Cholesterol measurement and diagnosis

Overall, a mean total cholesterol of 4.1 mmol/L was reported for respondents whom biochemical measures were taken (3.9 mmol/L among males; 4.4 mmol/L among females).

Table 17 refers to the total cholesterol measurement and diagnosis by a health care provider among all respondents. The highest proportion (78.5%) of respondents have never had their cholesterol measured (75.4% males; 81.8% females). The second highest proportion of respondents (16.6%) reported having measured but not being diagnosed with cholesterol (15.2% males; 18.1% females). Only 2.5% of respondents reported being diagnosed within the past 12 months (1.7% males; 3.2% females). Additionally, 2.4% of respondents reported being diagnosed but not within the past 12 months (1.5% males; 3.3% females). Significant differences were observed between the different age groups, with the proportion of respondents decreasing as age increased among persons who *never measured,* and the reverse trend observed in the other 3 categories.

Table 17 Percentage of respondents having total cholesterol measurement and diagnosis by age group and sex

Age Group (years)	Sex	n	% Never measured	% measured, not diagnosed	% diagnosed, but not within past 12 months	% diagnosed within past 12 months
18-29	M	295	91.5	8.1	0.4	0
	F	462	90.3	7.5	1.6	0.6
30-44	M	487	80.4	16.5	0.8	2.2
	F	699	74	21.8	2.6	1.6
45-69	M	768	65.1	26.1	4.6	4.2
	F	798	51.8	31.3	7	9.9
18-69	M	1550	81.6	15.2	1.5	1.7
	F	1959	75.4	18.1	3.3	3.2
	M+F	**3509**	**78.5**	**16.6**	**2.4**	**2.5**

Cholesterol treatment among those diagnosed

Table 18 shows cholesterol treatment results and/or results among those previously diagnosed with raised cholesterol by a health care provider and as part of the NHNS biochemical measures. Overall, 23.4% of respondents reported taking medication for raised cholesterol (24.3% males; 23% females).

Regarding respondents with different levels of raised total cholesterol or currently on medication for raised cholesterol, overall, one-fifth (20.7%) of respondents were recorded with total cholesterol ≥ 5.0 mmol/L or ≥ 190 mg/dl or currently on medication for raised cholesterol (13.3% males; 26.7% females). An additional 7.3% of respondents were recorded as having total cholesterol ≥ 6.2 mmol/L or ≥ 240 mg/dl or currently on medication for raised blood pressure (4.6% males; 9.5% females). Overall, for both levels of total cholesterol or currently on medication, the proportion of persons increased with age with a significant difference between participants in age 18-29 years and 45-69 years.

Table 18 Cholesterol treatment for levels of raised cholesterol among those diagnosed by age group and sex

Age Group (years)	Sex	n	% Previously diagnosed & currently taking oral medication	n	% Total cholesterol ≥ 5.0 mmol/L or ≥ 190 mg/dl or currently on medication	% Total cholesterol ≥ 6.2 mmol/L or ≥ 240 mg/dl or currently on medication
18-29	M	1	0.0	72	3.6	0.0
	F	5	0.0	121	16.2	5.5
30-44	M	16	25.9	117	14.5	2.2
	F	32	16.2	219	22.9	7.2
45-69	M	54	25.5	224	24.6	12.8
	F	129	30.4	275	43.3	16.8
18-69	M	71	24.3	413	13.3	4.6
	F	166	23.0	615	26.7	9.5
	M+F	**237**	**23.4**	**1028**	**20.7**	**7.3**

History of Cardiovascular Diseases

Figure 20 shows the percentage of respondents who have ever had a heart attack or chest pain from heart disease (angina) or a stroke (i.e. cardiovascular disease history (CVD)) among all respondents. The findings indicate that 3.6% of respondents reported CVD history (3.2% males; 4.1% females), with no significant age differences observed.

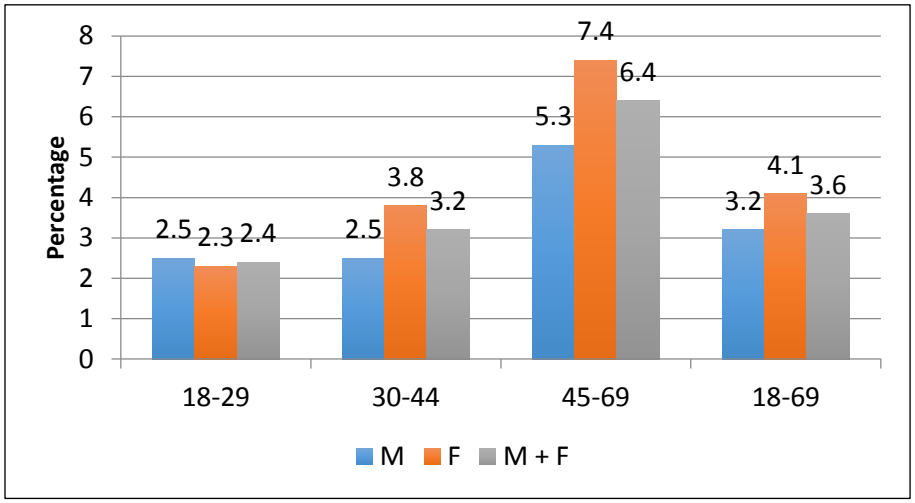

Figure 20 Percentage of respondents who ever had a heart attack or chest pain from heart disease or a stroke

Prevention and treatment of heart disease

Table 19 refers to the percentage of respondents who are currently taking aspirin or statins regularly to prevent or treat heart disease. Overall, 4.1% of respondents reported taking aspirin (3.1% males; 6.4% females). Significant increases in the proportion of respondents taking aspirin was observed as age increased, with 13.4% of respondents in age group 45-69 years. In contrast, overall, only 1.1% or respondents reported taking statins (0.9% males; 1.3% females), with a significantly higher proportion of respondents age 45-69 years reported taking statins (3.3%) compared to those in age 30-44 years (0.5%) and 18-29 years (0.3%).

Table 19 Percentage of respondents currently taking aspirin or statins regularly to prevent or treat heart disease

Age Group (years)	Sex	n	% taking aspirin	% taking statins
18-29	M	295	0.9	0.5
	F	462	0.4	0
30-44	M	487	2.1	0.3
	F	699	5.2	0.8
45-69	M	768	8.3	2.3
	F	798	18.2	4.2
18-69	M	1550	3.1	0.9
	F	1959	6.4	1.3
	M+F	**3509**	**4.7**	**1.1**

Lifestyle Advice

Lifestyle advice

Table 20 refers to the percentage of respondents who received lifestyle advice from a doctor or health worker during the past three years among all respondents for tobacco, salt, fruit and/or vegetable, reduced fat, physical activity, and body weight. The largest proportion of respondents (27.5%) reported receiving advice from a healthcare provider to *eat at least five servings of fruits and/or vegetables each day* (21.6% males; 33.3% females). This was followed by 25% of respondents who reported receiving advice *to maintain a healthy body weight or to lose weight* (17.4% males; 32.5% females). Following this was 24.4% of respondents receiving advice to *start or do more physical activity* (16.8% males; 31.9% females); 21.9% receiving advice to *reduce fat in their diet* (15% males; 28.7% females); 18.4% receiving advice to *reduce salt in their diet* (13.7% males; 23% females); and the smallest proportion of participants (5.8%) reported receiving advice to *quit using or to avoid starting to use tobacco* (8.3% males; 3.3% females).

Table 20 Percentage of respondents advised by a doctor or health worker to change lifestyle by age group and sex

Age Group (years)	Sex	n	% Quit tobacco / don't start	% Reduce salt in diet	% Eat at least five servings of fruit and/or vegetables each day	% Reduce fat in diet	% Start/Do more physical activity	% Maintain a healthy body weight or to lose weight
18-29	M	295	6.9	8.3	17.1	8.7	13.1	14.5
	F	462	3.6	13.3	30.7	18.2	26.3	24.8
30-44	M	487	10.4	12.3	22.3	15.2	15.5	15.3
	F	699	4	20.1	29.8	29.3	30.4	33.9
45-69	M	768	7.8	25.5	28.9	26.2	25.7	25.7
	F	798	1.6	43.3	42.3	45.8	43.3	43.9
18-69	M	1550	8.3	13.7	21.6	15.0	16.8	17.4
	F	1959	3.3	23.0	33.3	28.7	31.9	32.5
	M+F	**3509**	**5.8**	**18.4**	**27.5**	**21.9**	**24.4**	**25**

Cervical Cancer Screening

Cervical cancer screening

Figure 21 shows the percentage of female respondents who have ever had a screening test for cervical cancer among all female respondents and among those 30-44 years. More than half of respondents (58.6%) have ever had a screening test for cervical cancer, with significantly fewer respondents (43.4%) ages 18-29 years reported ever being screened compared with respondents ages 30-44 years and (70.4%) and ages 45-69 year (69.1%).

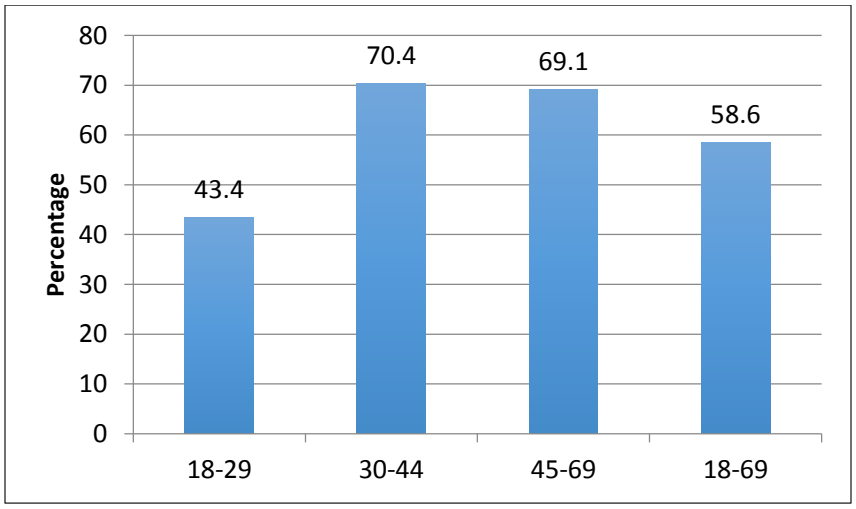

Figure 21 Percentage of women who had ever had a cervical cancer screening

Figure 22 shows that among females respondents age 30-44 years, 70.9% have reported ever having a screening test for cervical cancer.

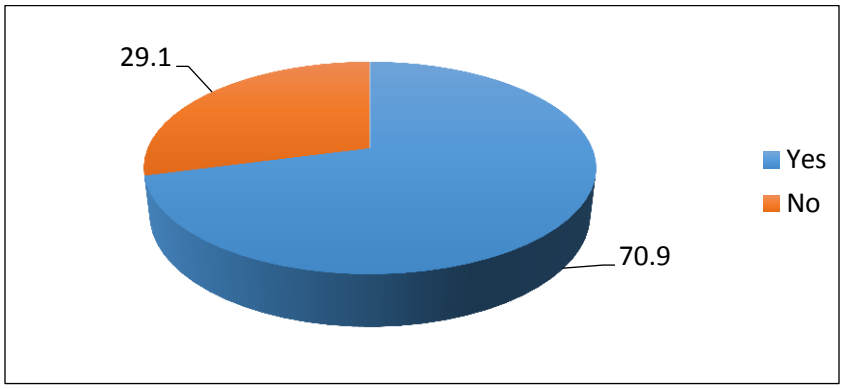

Figure 22 Distribution of women aged 30-49 years who ever ha a cervical screen

Health Screening

Prostate and Rectal Exams

Figure 23 shows the percentage of respondents who had ever had a prostate exam. The findings indicate that 14.4% of males had ever had a prostate exam, with significant increases in the proportion of respondents as age increased – 41.5% of respondents were in age group 45-69 years.

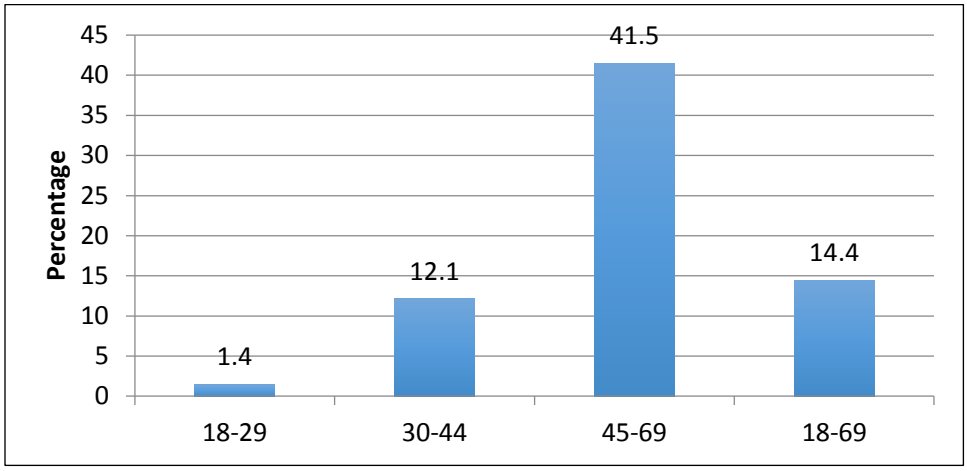

Figure 23 Percentage males have had a prostate exam

Table 21 shows that overall, one-quarter of respondents have had their feces checked for hidden blood (22.5% males; 27.5% females), and 3.4% of respondents have had a colonoscopy (4.2% males; 2.7%

females). There were significant increases in the proportion of respondents as age increased, with 8.2% of respondents in age group 45-69 years.

Table 21 Percentage of respondents who had feces checked for hidden blood and colonoscopy by age group and sex

Age Group (years)	Sex	n	% Had feces checked for hidden blood	% Had colonoscopy
18-29	M	295	13.9	0.7
	F	462	22.9	0.7
30-44	M	487	29.6	4.1
	F	699	28.9	3.1
45-69	M	768	27.9	10.9
	F	798	33.7	5.7
18-69	M	1550	22.5	4.2
	F	1959	27.5	2.7
	Total	**3509**	**25.0**	**3.4**

Breast Cancer – Breast Self-Exam and Mammogram

Almost three-quarters (71.6%) of females reported being shown how to examine their breast, with a slight but significantly higher proportion among respondents in age group 30-44 years (76.9%) compared to age group 18-29 years (65.3%).

Regarding self-breast examination, Table 22 shows that one-third (33.4%) of respondents reported having had their last breast exam 1 year ago or less, followed by 29.4% who reported never having had a breast exam, 25.1% who reported having their last breast exam more than 2 years ago, and 12.1% of respondents who reported having their last breast exam between 1 and 2 years ago. A significantly higher proportion (40.2%) of respondents in age group 18-29 years reported never having had a breast exam compared to age group 30-44 years (20.7%) and 45-69 years (22.8%), and significantly fewer respondents in age group 18-29 years reported having had their last breast exam more than 2 years ago compared to age group 30-44 years (30.6%) and 45-69 years (28.7%).

Regarding date of last mammogram, most females (79.7%) reported *never having had a mammogram*, with the trend showing a significant decrease in the proportion of respondents as age increased – 56.5% among age group 45-69 years. This was followed by 10.9% of respondents reporting having had their last mammogram *more than 2 years ago*, with the trend showing a significant increase in the proportion of respondents as age increased. Additionally, 6% of respondents reported having had a mammogram *1 year or less ago*, and 3.5% of respondents reporting *between 1 and 2 years ago*.

Table 22 Date of last breast exam and mammogram

Age Group (years)	n	% 1 year ago or less		% Between 1 and 2 years ago		% More than 2 years ago		% Never had	
		Last breast exam	Last mammo-gram	Last breast exam	Last mammo-gram	Last breast exam	Last mammo-gram	Last breast exam	Last mammo-gram
18-29	454	28.5	2.0	12.7	1.4	18.6	3.3	40.2	93.2
30-44	692	36.5	6.3	12.3	2.8	30.6	11.1	20.7	79.8
45-69	791	37.8	12.4	10.7	7.7	28.7	23.4	22.8	56.5
18-69	**1937**	**33.4**	**6.0**	**12.1**	**3.5**	**25.1**	**10.9**	**29.4**	**79.7**

Date of last pap test exam

Figure 24 shows the date of last pap test or cytological exam. Overall the highest proportion (32.7%) of respondents reported receiving their last pap test *more than 2 years ago* with significantly fewer (17.7%) persons in age group 18-29 years compared to those in age group 30-44 years (40%) and age group 45-69 years (48.8%). This was followed by 23.6% of respondents who reported having had their last pap *1 year ago or less*, with significantly fewer (20%) in age group 18-29 years compared to those in age group 30-44 years (30.7%).

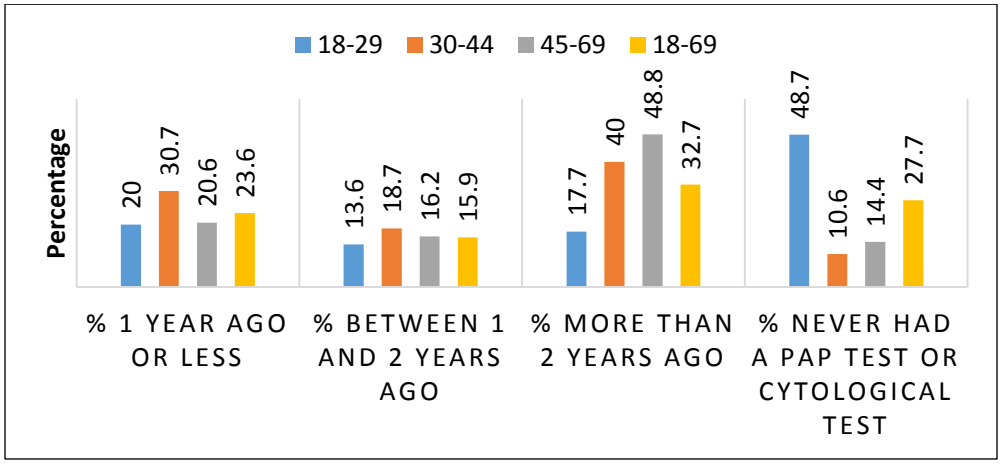

Figure 24 Date of last pap or cytological test

Physical Measurements (Step 3)

Raised blood pressure

Through the conduct of physical blood pressure measurements among a sample of respondents, an overall mean systolic blood pressure (SBP) and diastolic blood pressure (DBP) of 123.5 mmHg (126.3 mmHg males; 120.8 mmHg females) and 74 mmHg (73.4 mmHg males; 74.6 mmHg females), respectively was found. Significant differences in SBP and DBP were found across the different age groups for both

males and females, with the highest mean of 135 systolic and 79.6 diastolic being recorded among age group 45-69 years and getting significantly lower as age decreased.

Table 23 refers to the percentage of respondents with different levels of raised blood pressure. Overall, among respondents not on medication, 13.9% had elevated blood pressure levels with SBP ≥ 140 and/or DBP ≥ 90 mmHg (16.3% males; 11.4% females), while 3.7% had levels with SBP ≥ 160 and/or DBP ≥ 100 mmHg (4.1% males; 3.3% females).

Additionally, overall, among respondents currently on medication, 20.1% had elevated blood pressure levels with SBP ≥ 140 and/or DBP ≥ 90 mmHg (19.7% males; 20.5% females), while 10.6% had levels with SBP ≥ 160 and/or DBP ≥ 100 mmHg (8.0% males; 13.2% females).

Overall, for the different levels of raised blood pressure a significant increase in the proportion of respondents was observed as age increased.

Table 23 Percentage of respondents with different levels of raised blood pressure by medication status

Age Group (years)	Sex	Excluding those on medication			Including those on medication		
		n	SBP ≥ 140 and/or DBP ≥ 90 mmHg	SBP ≥ 160 and/or DBP ≥ 100 mmHg	n	SBP ≥ 140 and/or DBP ≥ 90 mmHg	SBP ≥ 160 and/or DBP ≥ 100 mmHg
18-29	M	292	6	0	294	6.8	0.8
	F	454	2.8	0.5	460	3.9	1.6
30-44	M	468	16.2	4.1	481	17.9	6.1
	F	640	11.9	3.5	690	18.8	11.2
45-69	M	663	38.3	12.6	752	46.3	24
	F	551	31.7	9.6	783	51.6	35.9
18-69	M	1424	16.3	4.1	1527	19.7	8.0
	F	1645	11.4	3.3	1933	20.5	13.2
	M+F	**3068**	**13.9**	**3.7**	**3460**	**20.1**	**10.6**

Treatment and control of raised blood pressure

Table 24 refers to the percentage of respondents with treated and/or controlled raised blood pressure among those with raised blood pressure (SBP ≥ 140 and DBP ≥ 90 mmHg) or currently on medication for raised blood pressure. Overall, the findings indicate that the highest proportion (64.5%) of respondents with raised blood pressure were not on medication, followed by 20.6% of respondents on medication with SBP < 140 and DBP < 90 mmHg, followed by 15% of respondents on medication with SBP ≥ 140 and DBP ≥ 90 mmHg.

Overall, among respondents not on medication and SBP ≥ 140 and DBP ≥ 90 mmHg, a significantly lower proportion of respondents were in age group 30-44 years (72.9%) and 45-69 years (56.7%) compared to

age group 18-29 years (81.6%). In contrast, among respondents on medication and SBP ≥ 140 and DBP ≥ 90 mmHg, a significantly higher proportion of respondents were in age group 30-44 years (15.4%) and 45-69 years (25.8%) compared to age group 18-29 years (7.6%). Among respondents on medication and SBP < 140 and DBP < 90 mmHg, no significant difference was observed between the age groups.

Table 24 Percentage of respondents with treated and/or controlled raised blood pressure by age group and sex

Age Group (years)	Sex	n	% On medication and SBP<140 and DBP<90	% On medication and SBP≥140 and/or DBP≥90	% Not on medication and SBP≥140 and/or DBP≥90
18-29	M	24	3.1	9.2	87.8
	F	22	24.2	5	70.8
30-44	M	95	5.4	6.3	88.4
	F	137	17.8	24.2	58
45-69	M	342	11.1	16.9	72
	F	411	22.8	33.4	43.8
18-69	M	461	8.2	12.5	79.3
	F	570	21.4	28.3	50.3
	M+F	**1031**	**15**	**20.6**	**64.5**

Overweight & Obesity

Height, weight and BMI

Table 25 refers to the mean weight among all respondents (excluding pregnant women). Females weighed more than males, with a mean weight of 78.6 kg and 76.1 kg respectively. Participants in age group 18-29 years had a significantly lower mean weight (73.8 kg females; 74.3 kg males) compared to age group 30-44 years (82.5kg females; 77.3 kg males) and 45-69 years (81.7 kg females; 77.5 kg males).

Table 25 Mean weight (kg) among all respondents by age group and sex

Age Group (years)	M		F	
	n	Mean	n	Mean
18-29	295	74.3	446	73.8
30-44	481	77.3	672	82.5
45-69	754	77.5	787	81.7
18-69	**1530**	**76.1**	**1905**	**78.6**

Figure 25 shows that overall, a mean BMI of 26.8 kg/m^2 was reported, with a higher mean among females (29 kg/m^2) compared to males (24.8 kg/m^2). Overall (25.4 kg/m^2) and by sex, participants in age group 18-29 years had a significantly lower mean BMI compared to age group 30-44 years and 45-69 years.

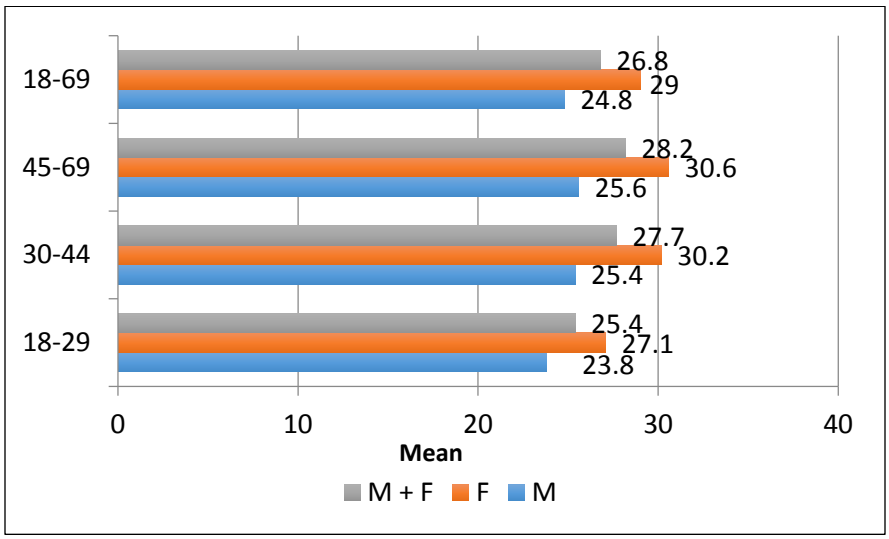

Figure 25 Mean BMI (kg/m2) among all respondents by age group and sex

BMI categories

Table 26 refers to the percentage of respondents (excluding pregnant women) in each BMI category. Overall, the highest proportion (41.7%) of participants were recorded in the normal weight category (18.5-24.9 BMI category), with more males (54.9%) than females (28.5%). This was followed by 27.3% of participants recorded as overweight with a BMI between 25.0-29.9 (28.1% males; 26.4% females). Following this was 26.9% of participants who were recorded as obese with a BMI of 30 or more (13.2% males; 40.8% females). The smallest proportion (4.1%) of participants was recorded in the underweight category with a BMI of less than 18.5 (3.8% males; 4.4% females).

Age group differences observed, for example, a significantly higher proportion of participants in age group 18-29 years (51.7%) were recorded in the normal weight BMI category compared to participants in age group 30-44 years (36%) and 45-69 years (31.8%). The reverse was true among participants recorded in the obese BMI category, whereby there were a significantly smaller proportion of respondents in age group 18-29 years (19.2%) compared to age group 30-44 years (31.9%) and 45-69 years (33.9%). A significantly smaller proportion of respondents in age group 18-29 years (23%) were recorded in the overweight BMI category compared to age group 45-69 years (32.4%), and a significantly higher proportion of participants in age group 18-29 years (6.1%) were recorded in the underweight BMI category compared to age group 45-69 years (1.9%).

Table 26 Percentage of respondents in each BMI classifications by age group and sex

Age Group (years)	Sex	n	% Under-weight <18.5	% Normal weight 18.5-24.9	% Overweight 25.0-29.9	% Obese ≥30.0
18-29	M	294	4.1	64	23.5	8.4
	F	446	8.2	39.1	22.5	30.2
30-44	M	480	4.7	47.8	30.7	16.8
	F	666	1.4	23.7	27.2	47.7
45-69	M	753	2.2	48.1	32.8	16.9
	F	783	1.6	16.6	32	49.8
18-69	M	1527	3.8	54.9	28.1	13.2
	F	1895	4.4	28.5	26.4	40.8
	M+F	**3422**	**4.1**	**41.7**	**27.3**	**26.9**

BMI ≥25

Figure 26 shows the percentage of respondents (excluding pregnant women) classified as overweight (BMI≥25). Overall, a BMI of ≥25 was recorded for more than half (54.2%) of the participants (41.3% males; 67.2% females), with a significant increase in the proportion as age increased – only a slight increase was observed between age groups 30-44 years (60.9%) and 45-69 years (66.3%).

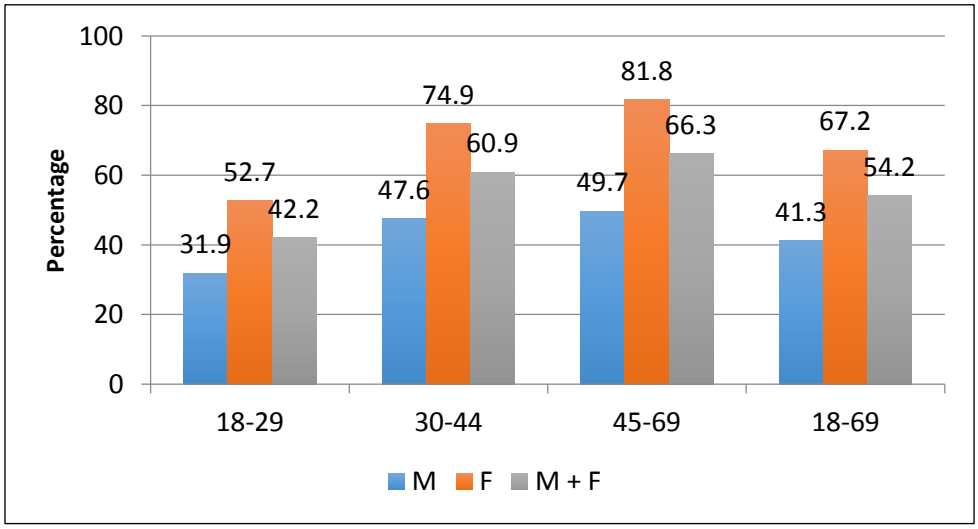

Figure 26 Percentage of respondents with BMI of ≥25 by age group and sex

Waist circumference

Waist circumference was assessed as a measure of central obesity. Figure 27 shows the mean waist circumference among all respondents (excluding pregnant women), with a higher mean among females (93.2 cm) than males (85.8 cm). A significant difference was also observed across age group for both

females and males, whereby mean waist circumference increased as participants age increased. Waist circumferences of greater than 88 cm in women and 102cm in men are generally indicative of central adiposity and greater cardiovascular disease risk.

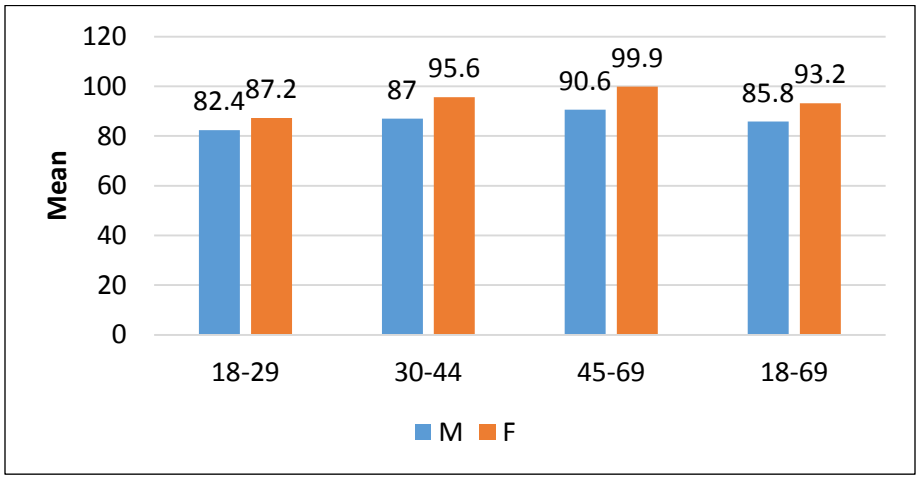

Figure 27 Mean waist circumference by age group and sex

Biochemical Measurement (Step3)

Raised blood glucose

Table 27 refers to categorization of respondents into blood glucose level categories and percentage of respondents currently on medication for raised blood glucose (non-fasting recipients excluded). Overall, 2% of respondents recorded impaired fasting glycaemia (0.9% males; 3.1% females). Overall, raised blood glucose or currently on medication for diabetes was recorded among 6.9% of respondents (4.7% males; 8.7% females).

Table 27 Percentage of respondent with raised blood glucose level categories

Age Group (years)	Sex	n	Impaired fasting glycaemia	Raised blood glucose or currently on medication
18-29	M	76	0.5	0
	F	121	2.6	1.8
30-44	M	114	0	2.1
	F	217	2.5	7.3
45-69	M	221	1.5	14
	F	263	4.5	18.8
18-69	M	411	0.6	4.7
	F	601	3.1	8.7
	M+F	**1012**	**2**	**6.9**

High density lipoprotein (HDL)

Overall, a mean HDL of 1.3 mmol/L was recorded for males and females. Table 28 shows that among males, 39.7% of respondents were recorded as having a low HDL of less than 1.03 mmol/L or 40 mg/dl, while 49.6% of females were recorded as having a low HDL of less than 129 mmol/L or 50 mg/dl.

Table 28 Percentage of respondent according to HDL level by age group and sex

Age Group (Years)	Male Respondents with HDL <1.03mmol/L or <40 mg/dl		Female respondents with HDL <1.29mmol/L or <50 mg/dl	
	n	%	n	%
18-29	77	47.3	125	56.4
30-44	118	37.4	217	50.1
45-69	226	31.3	274	40.7
18-69	**421**	**39.7**	**616**	**49.6**

Triglycerides

Overall, a mean fasting triglyceride of 0.9 mmol/L was recorded (0.9 mmol/L among males; 1.0 mmol/L among females). Table 29 shows the percentage of respondents with fasting triglycerides among all respondents for whom biochemical measures were taken. About 10% of respondents had fasting triglycerides of ≥ 1.7 mmol/L or ≥ 150 mg/dl (9.6 mmol/L among males; 11.3 mmol/L among females), comprising of a significantly higher proportion of participants in age group 45-69 years (15.7%) compared to age group 18-29 years (6.7%). Additionally, 6.1% of participants had a fasting triglycerides of ≥ 2.0 mmol/L or ≥ 180 mg/dl (4.6 mmol/L among males; 7.3 mmol/L among females), with a significant increase in the proportion of respondents as age increased – 10.7% among age group 45-69 years.

Table 29 Percentage of respondents with fasting triglycerides at different levels by age group and sex

Age Group (years)	Sex	n	% with fasting triglycerides ≥ 1.7 mmol/L or ≥ 150 mg/dl	% with fasting triglycerides ≥ 2.0 mmol/L or ≥ 180 mg/dl
18-29	M	64	5.3	2.7
	F	94	8.2	6.4
30-44	M	97	9.5	1.3
	F	191	9.8	4.8
45-69	M	197	15.0	10.1
	F	228	16.3	11.2
18-69	M	358	9.6	4.6
	F	513	11.3	7.3
	M+F	**871**	**10.5**	**6.1**

Summary of Combined Risk Factors

Table 30 refers to the percentage of respondents with 0, 1-2, or 3-5 of the following risk factors:

- Current daily smoking
- Less than five servings of fruit and/or vegetables per day
- Not meeting WHO recommendations on physical activity for health (<150 minutes of moderate activity per week, or equivalent)
- Overweight or obese (BMI ≥ 25 kg/m2)
- Raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg or currently on medication for raised BP).

The findings indicate that overall, the highest proportion (71.2%) of respondents reported having 1-2 risk factors (77.4% males; 65% females), followed by 26.9% of respondents who reported having 3-5 risk factors (19.9% males; 34% females). The smallest proportion of respondents (1.8%) had zero risk factors (2.7% males; 0.9% females). Overall, respondents in age group 45-69 comprised a significantly higher proportion (46.5%) of respondents with 3-5 risk factors compared to age group 18-44 years (20.7%), while those age 18-44 years comprise a significantly higher proportion (77.2%) of respondents with 1-2 risk factors compared to persons in age group 45-69 years (52.6%). No age group difference was observed among participants with zero risk factors.

Table 30 Summary of combined risk factors by age group and sex

Age Group (years)	Sex	n	% with 0 risk factors	% with 1-2 risk factors	% with 3-5 risk factors
18-44	M	759	3.1	82.6	14.3
	F	1089	1.1	71.6	27.3
45-69	M	736	1.4	60.2	38.3
	F	762	0.4	45.3	54.3
18-69	M	1495	2.7	77.4	19.9
	F	1851	0.9	65.0	34.0
	M+F	**3346**	**1.8**	**71.2**	**26.9**

Discussion

Demographics

The findings from the NHNS relating to education level suggest that the majority of the adult population have the ability to read and understand information – an understanding which could potentially be translated into action for behavior change. However, considering that the majority of the population has only a primary school education also suggests that health information, education and communication (IEC) for the general public should be between a primary school and secondary school level. Furthermore, the diverse mix of ethnic groups is worth further examination into whether it has an impact on NCD risk factors, behaviours and health outcomes to guide interventions.

The findings also suggest a high level of poverty among Vincentians, which is consistent with Country Poverty Assessment (Kairi Consultants Ltd, 2008) and discussed in other reports as being related to education level, sex and place of residence – urban vs. rural (SVG, 2014). The high levels of poverty means that NCD interventions should heavily emphasize structural systems rather than individual level interventions, which may result in blaming the victim or placing the onus primarily on the individual to take up the desired behaviours to prevent and control NCDs.

Tobacco Use

Tobacco smoking is an important behavioral risk factor, but is relatively low risk factor in St. Vincent (12.2% current smokers), primarily among men. However, the findings suggest that that Vincentians are initiating smoking at an earlier age compared to past generations. In 2011, the Global Youth Tobacco Survey (GYTS) found that 31% of secondary schools students reported *ever smoking cigarettes* and 19.4% reported currently using tobacco products (WHO/GSVG, 2011). As such, curbing access to tobacco products is very critical, including for new products such as e-cigarettes which have been growing in popularity internationally although the health impact is still unknown.

Another key finding with implications for intervention pertained to smoking cessation. While almost 50% of respondents in the NHNS who *have ever smoked daily* have tried to quit the habit, in 2007, the Global School Health Survey (GSHS) found that 49.9% of secondary school students age 13-15 years who smoke reported trying to stop in the last 12 months (CDC/GSVG, 2007), and in 2011 the GYTS found that 70.1% of secondary students in the same age group reported trying to stop smoke in the last 12 months (WHO/GSVG, 2011b). These findings indicate that there is a need for smoking cessation programs and access to nicotine replacement therapy to address the addictive behaviour of smoking, since a relatively high proportion of adults and increasingly adolescents may be attempting to quit smoking.

Tobacco smoking and second-hand tobacco is associated with cancers of several organs, heart disease, chronic obstructive pulmonary disease, asthma and other health problems. St. Vincent and the Grenadines is a signatory to the Framework Convention on Tobacco Control and is obligated to implement the terms of this convention, as such, should seek to implement bans on smoking in public places, starting with government buildings.

Alcohol Consumption

The findings indicate that alcohol consumption was relatively high (49% were current drinkers) in St. Vincent and the Grenadines. Additionally, findings from the 2007 GSHS suggests a relatively high alcohol consumption among secondary school students, as it found 51.4% of students reported having at least one drink containing alcohol on one or more days during the past 30 days, while 40.5% usually have two or more drinks per day when they drank (CDC/GSVG, 2007). While among adults more males consume alcohol than females, similar proportion of adolescent males and females consume alcohol.

Although heavy episodic drinking (six or more drinks on one occasion) is relatively low (9%), 15% of men engage in this type of drinking. Additionally, current drinkers consumed six or more drinks a mean number of 3.6 times during a single occasion during the past 30 days, raising concern about binge drinking among men and its related health and social problems. Findings indicating the majority (92% - 97.3%) of respondents engage in non-problematic drinking should be interpreted cautiously, as it is likely that respondents may have provided more socially desirable response for behaviours viewed as socially undesirable. It is noteworthy that among students in the GSHS, 17.1% reported getting in trouble or missing school because of drinking, warranting the attention of Ministries ranging from health and education to social development.

Alcohol consumption is a major risk factor for CNCDs, including mental health, alcohol dependence, unintentional and intentional injuries, including those due to road traffic accidents and gender-based violence, cirrhosis of the liver and various cancers. There is also a causal relationship between harmful use of alcohol and incidence of infectious diseases such as, tuberculosis. Furthermore, alcohol consumption by an expectant mother may cause fetal alcohol syndrome and pre-term birth complications.

In 2012, it was estimated that 3.3 million deaths, or 5.9% of all deaths worldwide were attributable to alcohol consumption. More than half of these deaths resulted from NCDs – chiefly cardiovascular diseases and diabetes (33.4%), cancers (12.5%) and gastrointestinal diseases, including liver cirrhosis (16.2%). Therefore it is important for the health sector to take a more proactive role in encouraging and teaching skills for quitting alcohol consumption.

Overall, the findings suggest that interventions are needed to address alcohol consumption during adolescents and the life cycle, as there may be a link between consumption during these early years and in adulthood. Several countries and agencies have officially recommended drinking levels considered to be a low risk to adult men and women, however, these guidelines vary from country to country (ICAP, 2003). For example in the United Kingdom (UK) which is reported as having a higher level of alcohol consumption (10.4 litres of pure alcohol) among persons age 15 and over per GDP during 2008-2010 (WHO, 2014f) than SVG (6.3 litres of pure alcohol), the recommendation for men is 3-4 units[3] per day, not to exceed 21 units per week, and for women the recommendation is 2-3 units per day not to exceed 14 units per week (ICAP, 2003).

[3] One unit equals 10ml or 8g of pure alcohol. The number of units in a drink is based on the size of the drink as well as its alcohol strength (NHS, 2015).

Fruit and Vegetable Consumption

The findings indicated that low fruit and vegetable consumption is a major NCD risk factor among Vincentians. Combined, Vincentians consume a mean of 1.7 servings of fruits and vegetables per day, and only consume fruits and vegetables on average about 3 times per week. Overall, the 37.7% of respondent did not consume any fruits and/or vegetables on average/day, while a mere 5.1% consumed 5 or more servings on average/day.

The cost of fruit and vegetable in St. Vincent and the Grenadines is considered expensive by consumers and this may be one of the obstacles for higher consumption. However, fruit and vegetable cost and consumption are affected by production levels and storage capacity, which are affected by natural and man-made factors, such as Hurricanes and theft of agricultural produce. It is therefore urgent that policy makers and planners implement measures that would facilitate the consumption of more fruits and vegetables.

Fruits and vegetables are very important components of a healthy diet. A minimum of 5 servings of fruits and vegetables per day is needed to provide the body with the fibre, vitamins and minerals needed to control weight, protect against inflammation and chronic non-communicable diseases such as diabetes, heart disease, and cancer.

Type of oil used most frequently

The findings show that a significantly high proportion of respondents reported most frequently using vegetable oil (73.8%), margarine (7.2%), butter (4.7%), and 11.9% use some other types of oil or fat for meal preparation in households. While fats are essential for normal body function, some fats such as polyunsaturated (e.g. canola oil, sunflower oil) and monounsaturated fats (e.g. coconut oil, olive oil) are healthier than *trans* fats (e.g. hydrogenated oils, cookies) and saturated fats (e.g. butter, lard). Therefore, most of the fat consumed should come from unsaturated sources, such as nuts, vegetable oils, and fish (CDC, 2012). These findings suggest that Vincentians are mainly consuming the healthier types of oils and fats. When used in place of saturated fats, polyunsaturated and monounsaturated fats can help to improve blood cholesterol levels, thereby reducing risk for heart disease (CDC, 2012). However, 5% of the population mainly uses saturated fats; however, a diet high in saturated fat has been linked with elevated cholesterol levels and increased risk for heart disease (National Heart Foundation of Australia, 2009). Additionally, almost 12% of the population reported using other types of oil/fat for which we are uncertain whether they are the healthy or unhealthy type.

Physical Activity

In this survey, total physical activity is determined by the intensity and duration of work-, transport- or recreation/leisure-related activities undertaken. Notably, leisure or recreation-related activities comprised the smallest proportion of physical activity, which might help to explain why overall, more than half (60.5%) of respondents reported not engaging in vigorous physical activity. Overall, men reported spending more time engaging in physical activity compared to women, however, considering that more men than women are employed and engage in more laborious work, it is understandable why men are more physically active. Interestingly, more women get their physical activity from transport-related activity.

Across the various age groups, males and females alike were at risk for CNCD due to sedentary activity – on average almost 4 hours daily was spent in sedentary activity. Adding to this concern among adults, the GSHS also indicated that 38.9% of students reported engaging in sedentary activities for 3 or more hours per day during a typical day. With the increasing availability of technologies such as television, computer, video games, tablets, motor vehicles, etc. more of the population are likely to engage in sedentary lifestyle. However, sedentary behaviour developed during childhood is likely to continue during adulthood, unless for example, there is a work-related need to engage in physical activity or a catalyst to promote behaviour change.

There is a need to promote physical activity in the general population, an especially urgent need among women and the elderly. Insufficient physical activity is one of the 10 leading risk factors for global mortality, causing some 3.2 million deaths each year (Lim et al., 2012). Adults who are insufficiently physically active have a 20%−30% increased risk of all-cause mortality compared to those who do at least 150 minutes of moderate-intensity physical activity per week, or equivalent, as recommended by WHO (WHO, 2010). The WHO also promotes regular physical activity as a means of reducing the risk of ischaemic heart disease, stroke, diabetes and breast and colon cancer. Furthermore, regular physical activity is a key determinant of energy expenditure and is therefore fundamental to energy balance, weight control and prevention of obesity (WHO, 2014a).

History of Raised Blood Pressure

Although the mean systolic and diastolic blood pressure for men (126.3 mmHg and 73.4 mmHg) and women (120.8 and 74.6) was within normal limits, a fair proportion of respondents had elevated blood pressure and was not on medication (13.9% with SBP ≥140/DBP ≥90 mmHg; 3.4% with SBP ≥160/DBP≥100 mmHg). Although a smaller percentage, the latter group is concern since they may be unaware of their high risk for high blood pressure. Also of great concerns are those with elevated blood pressure who are on antihypertensive medication (20.1% with SBP ≥140/DBP ≥90 mmHg; 10.6% with SBP ≥160/DBP≥100 mmHg). The final group that raises a concern comprise the 12.1% of respondents who have never had their blood pressure measured and may be completely unaware of their risk. The

The prevalence of raised blood pressure (18.8%) is of great concern, and the NHNS findings raise concerns about medication adherence – whether persons are not taking the medication prescribed, whether there may be inadequate follow-up by health care providers, or both.

Raised blood pressure is one of the leading risk factors for global mortality and is estimated to have caused 9.4 million deaths and 7% of disease burden – as measured in DALYs − in 2010 (Lim, 2012). Raised blood pressure is a major cardiovascular risk factor. If left uncontrolled, hypertension causes stroke, myocardial infarction, cardiac failure, dementia, renal failure and blindness, causing human suffering and imposing severe financial and service burdens on health systems (WHO, 2013; WHO 2007).

History of Diabetes

Although the mean fasting blood glucose of respondents were within normal levels (4.0 mmol/L), 2% of respondents had impaired fasting glycaemia while 6.9% had raised blood glucose or currently on medication. Among persons previously diagnosed, 69.8% are currently taking insulin while 22.3% are taking medication. The prevalence of diabetes is 8.7%, while the prevalence of those currently on

medication for diabetes is 4.8%. The difference in prevalence between those diagnosed and those currently on medication, in addition to those persons on medication whose blood glucose continues to be elevated is a cause for concern about treatment and control. Similar to raised blood pressure, it brings to the fore, considerations about medication adherence.

Considering that almost 40% of respondents reported never having measured their blood sugar levels, it is conceivable that the prevalence in St. Vincent may be more than that identified in this survey.

Diabetes is a well-recognized cause of premature death and disability, increasing the risk of cardiovascular disease, kidney failure, blindness and lower-limb amputation (Levitan, et al., 2004). According to data from the Epidemiology unit in the Ministry of Health and Wellness, between 2008 and 2012, the number of amputations in St. Vincent and the Grenadines had almost doubled from 59 to 110; this will put further economic strain on a struggling economy both in terms of caring for an increased proportion of disabled persons and a reduction in the productive labour force.

Diabetes was directly responsible for 1.5 million deaths in 2012 and 89 million DALYs. The rise in diabetes is largely driven by modifiable risk factors – particularly physical activity, overweight and obesity (Finucane et al., 2011). Population ageing is also an important factor, as glucose intolerance increases with age. Much of the diabetes burden can be prevented or delayed by behavioural changes favouring a healthy diet and regular physical activity.

History of Raised Total Cholesterol

The findings indicate that the mean total cholesterol (4.1 mmol/L) was within normal levels. A total of 28% of respondents had raised cholesterol of ≥5.0 mmol/L or ≥6.2 mmol/L or currently on medication. Similar to persons on medication who continue to have raised blood pressure and blood glucose levels, respondents on medication who continue to have raised cholesterol is a concern. These persons are at an increased risk for heart disease and should be targeted, primarily through primary health care efforts, for interventions to reduce their risk in a holistic manner.

The mean HDL levels reported in the survey are described as poor, which means that a significant proportion of men and women are at a high risk of developing heart disease. Although mean fasting triglyceride was within normal levels, a borderline high fasting triglyceride was recorded among 10.5% of respondents, and high fast triglyceride was reported among 6.1%. The highest levels were reported among age group 45-69 years. These triglycerides are often increased by sweets/sugar and alcohol consumption, and helps to increase cardiovascular disease risk.

History of Cardiovascular Diseases

A prevalence of 3.6% was found for respondents who reported ever having a heart attack or chest pain from heart disease or a stroke (i.e. cardiovascular disease (CVD) history). Overall, 4.1% of respondents were taking aspirin, mainly females, and 1.1% were taking statins. The Ministry of Health, Wellness and the Environment in St. Vincent and the Grenadines are aware of the debates around the use of aspirin and statins, especially among women, and as such there is a need for guidelines to clarify prescribing patterns and to hold physicians accountable.

Of the 17.5 million deaths due to cardiovascular disease in 2012, an estimated 7.4 million were due to heart attacks (ischaemic heart disease) and 6.7 million were due to strokes (WHO, 2014b). Currently, over 80% of cardiovascular deaths occur in low- and middle-income countries. In 2012, heart disease and stroke were among the top three causes of years of life lost due to premature mortality globally (WHO, 2014c).

Lifestyle Advice

The findings indicate that most respondents received advice from a healthcare provider to eat at least five servings of fruits and/or vegetables each day (27.5%), followed by advice to maintain a healthy body weight or to lose weight (25%), start or do more exercise (24.5%), reduce fat in their diet (21.9%), reduce salt in their diet (18.4%), and the smallest proportion (5.8%) reported receiving advice to quit using tobacco or to avoid starting to use tobacco. For all risk behaviours, except tobacco use, more females than males were advised to take-up healthy behaviours to reduce their risk of CNCDs.

In light of the findings discussed in this report, there is scope for healthcare providers to provide advice on the risk factors to a larger segment of the population – some of these may be realized through primary health care reform. However, the country should develop the capacity to teach the skills necessary for behaviour change, as well as, develop the infrastructure to promote and/or support uptake of these behaviours.

The issue of social desirability should also be considered in that more persons may have been advised by a healthcare provider, but did not report it as it may be viewed as socially undesirable to not follow the doctor's advice. Also the stigma attached to having problems warranting the above health advice could result in under-reporting.

Dietary Salt

Although respondents reported engaging in a range of behaviours to control their salt intake, more than half of respondents reported always or often adding salt when cooking or when preparing food at home, and 15.1% reported always or often consuming processed foods high in salt. Not surprising, the majority of respondents (81.8%) agreed that consuming too much salt could pose a health threat, and 75% reported thinking that lowering salt in the diet is very important. However, compared to persons in age group 30-69 years, a smaller percentage of youth (age group 18-29 years) believed that lowering salt in the diet is important, more of them believed that lowering salt in your diet is not at all important, and fewer of them engaged in low-salt consumption practices. Therefore, it is important to encourage practices to control salt intake, including among youth as a strategy to prevent the onset of NCDs associated with excess dietary sodium consumption, such as hypertension and cardiovascular diseases (Mozaffarian et al., 2014; WHO 2003, 2004, 2012b, 2013).

The main dietary source of sodium worldwide is salt. However, sodium can be found in other forms, and the main source of dietary sodium consumption depends on the cultural context and dietary habits of the population, but in many countries processed foods are the main source (WHO, 2014a). It has been estimated that excess sodium intake was responsible for 1.7 million deaths from cardiovascular causes globally in 2010 (Mozaffarian et al., 2014).

Health Screening for Cancers

The survey assessed health screening practices related to cancers, which generally are the leading cause of morbidity and mortality in St. Vincent and the Grenadines. The findings show that only 14.4% of males had ever had a prostate exam, comprising of a significantly higher proportion (41.5%) of males in age group 45-69 years. Considering that prostate cancer is the leading cancer causing morbidity and mortality in SVG, the low rate of prostate examination is concerning. While prostate cancer examinations can be unreliable, early screening can still detect large number of cases for effective treatment.

The findings indicate that almost three-quarters (71.6%) of women reported being shown how to examine their breast, and that about 70% of women have had a breast exam ranging from a one year or less to more than two years ago. However, 29.4% of women reported never having a breast exam, with a significant decrease in proportions as age increase (40.2% among age group 18-29 years). This is a concern since breast exams are an important first step in early screening for breast cancer, while mammograms are the best ways of finding breast cancer early. While the proportion of women who have had a mammogram might appear low, it may be acceptable based on use as a follow-up procedure for persons identified as having abnormal or questionable breast exams. Also the cost of having a mammogram may be prohibitive resulting in its discriminate use.

Regarding cervical cancer screening, more than half (58.6%) of respondents have ever had a screening test for cervical cancer, with significantly more respondents in age group 30-44 years and (70.4%) and 45-69 years (69.1%). Additionally, 72.2% of respondents had their last pap or cytological test between one year or less and more than two years, while 27.7% never had a pap or cytological test. Considering that the Ministry of Health, Wellness and the Environment has reported that cervical cancers are among the main causes of morbidity and mortality in women it is important to ensure that barriers to early screening and testing are removed. While pap or cytological tests are widely conducted in the public sector, regular bottlenecks in testing slow down the timeframe for reporting results back to patients. As a result, patients are often encouraged to utilize pap or cytological testing services in the private sector at a higher cost than in the public sector, which is a hindrance to getting screened.

Overweight and Obesity

To measure overweight and obesity in the population, BMI, weight and height and waist circumference were measured. Overall, a mean BMI of 26.8 kg/m2 was found (24.8 kg/m^2 for males; 29 kg/m^2 for females), which according to international standards suggest that on average the population of St. Vincent and the Grenadines is overweight (BMI 25.0-29.9). More than half (54.2%) of respondents recorded a BMI of ≥25 kg/m^2, comprising of 27.3% classified as being overweight and 26.9% classified as being obese (BMI ≥30). A BMI of ≥25 was recorded mostly among females (67.2%) than males (41.3%), with a significant increase in the proportion of respondents as age increased.

BMI has been used as the universal standard or benchmark for measuring and determining obesity among populations. Although it has been used to approximate the burden of obesity and the risks aligned with this disease there is some debate about its use as a general tool to make comparisons between populations and generalizations altogether. In particular, Blacks or persons of African descent (Afro-Caribbean, Afro-American) generally register higher BMI scores and are more likely to be categorized as overweight or obese based on the standardized BMI cut off points. The BMI measure

does not account for fat or muscle associated weight. For instance, some studies have found that blacks have lower body fat and higher lean muscle mass than whites at the same BMI, and therefore, at the same BMI, may be at lower risk of obesity-related diseases. Researchers concluded that the reliance on the BMI scores as a universal indicator and comparative tool for determining and measuring obesity between ethnic groups may not be appropriate as it "does not provide a consistent reflection of adiposity and fat distribution across ethnic groups" (Rush et al, 2007). The research therefore urges caution in the interpretation of link between BMI and obesity in St. Vincent and the Grenadines where the majority of the population is of African descent.

Nonetheless, the link between obesity, poor health outcomes and all-cause mortality is well established. Obesity increases the likelihood of diabetes, hypertension, coronary heart disease, stroke, certain cancers, obstructive sleep apnea and osteoarthritis. It also negatively affects reproductive performance (WHO, 2014). Overweight and obesity – i.e. BMI ≥25 kg/m2 and ≥30 kg/m2 respectively – were estimated to account for 3.4 million deaths per year and 93.6 million DALYs in 2010 (Lim et al, 2012).

Summary of Risk Factor

The risk factors for NCDs assessed in this study include: current daily smokers, consumption of less than 5 servings of fruits and vegetables per day, not meeting WHO recommendations on physical activity for health, overweight or obesity and raised blood pressure. The survey revealed that 26.9% of the population had three or more of the risk factors for chronic disease. Although the proportion of respondents in age group 45-69 years was more than twice that of age group 18-44 years, the difference between the two age groups are still cause for concern. This difference highlights the very real risk of NCDs that the younger population faces, and also potentially a risk of developing chronic illness at an earlier age compared to their predecessors.

Recommendations

The non-communicable diseases discussed throughout this report account for 68% of death globally, of which 82% of premature deaths occur in low- and middle-income countries. However, a significant proportion of NCDs could be prevented by following the recommendations made at the global level via WHO "Best Buy Intervention" (WHO, 2011c) and the regional level via the Caribbean Community (CARICOM) heads of government multisectoral Port-of-Spain Summit Declaration "Uniting to Stop the Epidemic of Chronic Noncommunicable Diseases," 15 September 2007 (CARICOM, 2011). The following specific recommendations for SVG were guided by these international and regional recommendations, as well as feedback with stakeholders in a national consultation.

Policy directions

The government should:

1. Develop a national NCD policy and action plan that positions NCD interventions at the highest level of the national development agenda;

2. Establish and supports the necessary legal frameworks to guide the implementation of the national NCD policy and plans;

3. Align national NCD strategies with international frameworks and conventions, such as the WHO Framework of Convention on Tobacco Control (FCTC), for example, implement bans on smoking in public places;

4. Create a legislative framework on the importation, sale and use of tobacco and alcohol products in St. Vincent and the Grenadines, including marketing and sale to children and adolescents, as well as the use of tobacco and products among this group. For example, place bans on advertising and sale of alcohol and tobacco products during activities for children (under age 18 years);

5. Encourage collaborations between the Ministry of Health, Wellness and the Environment and the Ministry of Finance to determine whether the recent increase in tobacco levies include the range of tobacco products and are at an acceptable level to act as a deterrent to smoking, especially among young persons and to discourage the introduction of new products on the market, such as e-cigarettes;

6. Encourage collaborations between the Ministry of Agriculture and Ministry of Finance to reduce costs related to the production, storage and retail of fruits and vegetables in St. Vincent and the Grenadines;

7. Encourage regional actions to address the importation and availability of high-sodium content processed food in the Caribbean region, which will include St. Vincent and the Grenadines;

8. Develop policy on the mandatory training and certification of cooks in the school feeding program in the preparation of healthy food options and serving size for school-age children;

9. Develop strategies to increase physical activity in the general population, and address issues such as lighted playing fields and designated community areas/roads that are restricted from motorists for certain morning and evening hours to encourage physical activity; and

10. Develop guidelines on who should be screened for the most frequently occurring types of cancers in St. Vincent and the Grenadines and their treatment options.

Advocacy and Dissemination of NHNS Findings

The Ministry of Health, Wellness and the Environment should:

1. Value the findings of the NHNS and uses this report as a tool to strengthen a national NCD control program with clear targets and focus;

2. Use the NHNS findings to develop targeted NCD interventions focused on risk factor reductions;

3. Take lead role in the coordination of a multi-sectoral plan to engage relevant stakeholders in the fight against NCDs;

4. Collaborate with other government departments, development partners, donors and civil society organizations to render support for a multi-sectoral action, and to build on existing inter-agency programs, for example, health promoting schools and Health and Family Life Education (HFLE) in school settings;

5. Collaborate with media organizations to develop a multi-media communication strategy aimed at creating advocacy, awareness, education and behaviour change for NCD prevention and control; and

6. Disseminate the findings at the community level, as part of awareness raising and health promotion.

Actions for addressing risk factors for NCD Prevention

That the government and stakeholders should address smoking and alcohol:

7. Develop smoking cessation programs targeting older populations and students as the findings indicate that they may already be in a stage of readiness to quit;

8. Develop alcohol and tobacco prevention and intervention programs at the school and community levels to address smoking and alcohol initiation, cessation and environmental smoking;

9. Integrate alcohol and smoking content in the Health and Family Education (HFLE) curriculum; and

10. Encourage retail outlets, bar and clubs, in the absence of policy or legislation, to discourage indoor smoking, and selling alcohol and tobacco products to minors. For example they could post signage which reads: *No Smoking* and *Alcohol & Tobacco Products Will Not Be Sold to Persons Under Age 18 Years.*

The government and stakeholders should address healthy lifestyle related to diet and physical activity:

11. Promote high fruit and vegetable consumption starting at a young age;

12. Incorporate healthy food options in nutrient support programs and poverty reduction programs;

13. Interventions for healthy eating should be targeted at homes, families, schools and eating establishments, including restaurants and roadside eateries and Barbeque vendors to help educate them about healthy meal options, preparation and serving size;

14. Vigorously promote the National Dietary Food Guidelines of SVG, including use of the media to provide demonstration of how to Vincentians can operationalize the guidelines in their daily lives;

15. MoHW, Ministry of Agriculture, and Food and Nutrition Council should work together to create stamps of approval endorsing healthy food options, making it easier for consumers to identify the more nutritious foods in the supermarkets. For example, helping customers to distinguish between healthy and unhealthy fats;

16. Promote physical activity using taken for granted avenues or activities, such as walking or swimming individually or in groups on the beaches, hiking, etc.;

17. Promote physical activity in the general population, an especially urgent need among women and the elderly, and strengthen physical education programs in schools from kindergarten to tertiary level;

18. Promote collaborations between the Ministry of Sports and the Police Force to strengthen after school and work physical activity programs in each community, at a minimum, parish-level progams;

19. Lifestyle advice should go beyond the realm of the health facility and should be part of a larger health promotion drive in range of setting from schools and communities to workplaces;

20. Continue to promote the message of lowering sodium/salt intake among the general population, especially during meal preparation;

21. Vigorously promote the use of spices when cooking rather than salt as it helps to add flavour to the meal with increased health benefits;

22. Develop interventions to address overweight, obesity and underweight starting in childhood and throughout the life cycle; and

23. Continue to use effective labeling which warns about the dangers of tobacco products.

Actions for management of patients

The Ministry of Health, Wellness and the Environment via its health services mechanism should:

24. Undertake a well-developed plan for NCD screening, early diagnosis and initiation of treatment for diabetes, hypertension, high cholesterol, cardiovascular diseases, and the range of

commonly occurring cancers. Screening for one health concern can also be used as an opportunity to encourage and/or screen for related problem, for example, presentation for a pap test, should also be used to co-test for HPV among certain groups of women which are known to cause a significant proportion of cervical cancers. NCD screening should include collaborations between the private sector and NGO for workplace screening of diabetes and hypertension;

25. Strengthen the health care system to effectively respond to NCD management through provision of supplies, staffing, and medicines to sustain patient treatment and referrals, both at hospital level and through an effective primary health care system. For example, it is critical to address the bottlenecks with Pap or cytological testing;

26. Strengthen community-based care of individuals with diagnosed NCDs by supporting primary care facilities to deliver a package of essential NCD interventions. This requires appropriately trained health workers, essential technology and medicines made available at all levels of the health care system;

27. Promote medication adherence among patients with NCDs;

28. Promote a holistic assessment and treatment plan, including lifestyle changes to address the whole person on medication for raised blood pressure, blood sugar and/or cholesterol but continue to have elevated levels. For example, modest weight reduction of as little as five percent of body weight can reduce high blood pressure and should be encouraged; and

29. Prevent NCD-related disability and premature deaths due to NCDs by provision of quality patient care to prevent complications.

Actions for NCD Surveillance

The Ministry of Health, Wellness and the Environment should:

30. Establish and maintain a functional surveillance system to monitor essential NCD data in an ongoing and systematic way as an essential component of the Health Information System, in order to measure NCD disease burden and trends over time;

31. Establish the current baseline for NCDs mortality and morbidity in line with requirements to report on the Caribbean regional goal to reduce NCD premature deaths;

32. Establish strong leadership to maintain a systematic approach to STEPS/NHNS data collection, building on local capacity for implementing the NHNS survey in order to create an ongoing and robust surveillance system;

33. Conduct NCD STEPS surveys at 5 to 7 year intervals supplemented by mini STEPS (i.e. surveys in workplaces and/or with high risk groups) every 2 years to determine the impact of NCD prevention and control measures; and

34. Participate in the comparison of NCD STEPS survey findings across all Caribbean islands that have completed the NCD STEPS survey, and review inter-country interventions that are most amenable to modification.

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Annex 1: STEPS Questionnaire

Annex 2

St. Vincent & the Grenadines
National Health & Nutrition Survey, 2013-2014

Fact Sheet

The National Health and Nutrition Survey of non-communicable disease (NCDs) risk factors in St. Vincent & the Grenadines was carried out from November 2013 to April 2014. St. Vincent & the Grenadines 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 survey was a population-based survey of adults aged 18-69 years**.** A random cluster sample design was used to produce representative data for that age range in St. Vincent & the Grenadines. A total of 3513 adults participated in the survey. The overall response rate was 67.8%. A repeat survey is planned for 2019 if funds permit.

Results for adults aged 18-69 years (incl. 95% CI) *(adjust if necessary)*	**Both Sexes**	**Males**	**Females**
Step 1 Tobacco Use			
Percentage who currently smoke tobacco	**12.2%** (9.8 – 14.5)	**21.9%** (17.9 –26.0)	**2.5%** (1.7 – 3.4)
Percentage who currently smoke tobacco daily	**6.9%** (4.9 - 9.0)	**12.7%** (9.2 - 16.1)	**1.3%** (0.6 - 2.1)
For those who smoke tobacco daily			
Average age started smoking (years)	**16.4 years** (15.5 - 17.3)	**16.1 years** (15.3 - 17.0)	**18.9 years** (14.9 - 22.9)
Percentage of daily smokers smoking manufactured cigarettes	**91.0%** (85.3 – 96.6)	**92.5%** (86.5 – 98.5)	**77.0%** (50.9 – 100.0)
Mean number of manufactured cigarettes smoked per day (by smokers of manufactured cigarettes)	**8.0** (6.6 - 9.5)	**8.1** (6.6 - 9.6)	**7.0** (4.2 - 10.0)
Step 1 Alcohol Consumption			
Percentage who are lifetime abstainers	**18.2%** (13.3 - 23.0)	**8.9%** (6.2 – 11.6)	**27.3%** (20.1 - 34.4)
Percentage who are past 12 month abstainers	**16.6%** (12.9 - 20.2)	**10.7%** (5.9 – 15.5)	**22.3%** (18.9 – 25.7)
Percentage who currently drink (drank alcohol in the past 30 days)	**49.0%** (44.8 - 53.2)	**66.9%** (61.6 - 72.2)	**31.4%** (27.1 – 35.7)
Percentage who engage in heavy episodic drinking (6 or more drinks on any occasion in the past 30 days)	**9.0%** (6.6 – 11.5)	**15.1%** (11.4 – 18.8)	**3.0%** (1.5 – 4.5)

Step 1 Fruit and Vegetable Consumption (in a typical week)			
Mean number of days fruit consumed	**3.3** (3.1 - 3.5)	**3.3** (3.1 - 3.5)	**3.3** (3.1 - 3.5)
Mean number of servings of fruit consumed on average per day	**1.0** (0.8 - 1.1)	**1.0** (0.8 - 1.2)	**0.9** (0.8 - 1.0)
Mean number of days vegetables consumed	**3.1** (2.9 - 3.4)	**3.1** (2.8 - 3.4)	**3.2** (2.9 - 3.5)
Mean number of servings of vegetables consumed on average per day	**0.8** (0.7 - 0.9)	**0.8** (0.6 - 1.0)	**0.8** (0.7 - 0.9)
Percentage who ate less than 5 servings of fruit and/or vegetables on average per day	**94.9%** (93.1 - 96.6)	**94.1%** (91.5 – 96.7)	**95.6%** (94.2 - 97.0)
Step 1 Physical Activity			
Percentage with insufficient physical activity (defined as < 150 minutes of moderate-intensity activity per week, or equivalent)*	**24.4%** (16.0 - 32.8)	**12.5%** (7.1 - 17.9)	**36.1%** (24.9 - 47.3)
Median time spent in physical activity on average per day (minutes) (presented with inter-quartile range)	**94.3** (21.4 - 310.0)	**203.6** (55.7 - 441.4)	**35.7** (8.6 - 145.7)
Percentage not engaging in vigorous activity	**60.5%** (55.8 - 65.3)	**37.9%** (31.8 - 44.1)	**82.7%** (78.5 - 86.9)
Step 1 Cervical Cancer Screening			
Percentage of women aged 30-49 years who have ever had a screening test for cervical cancer			**70.9%** (60.8 – 80.0) -

* For complete definitions of insufficient physical activity, refer to the GPAQ Analysis Guide (http://www.who.int/chp/steps/GPAQ/en/index.html) or to the WHO Global recommendations on physical activity for health (http://www.who.int/dietphysicalactivity/factsheet_recommendations/en/index.html)

St Vincent & the Grenadines
National Health & Nutrition Survey, 2013-2014

Fact Sheet

Results for adults aged 18-69 years (incl. 95% CI) *(adjust if necessary)*	Both Sexes	Males	Females
Step 2 Physical Measurements			
Mean body mass index - BMI (kg/m^2)	**26.8** (26.4 - 27.3)	**24.8** (24.3 - 25.2)	**29.0** (28.4 - 29.6)
Percentage who are overweight (BMI ≥ 25 kg/m^2)	**54.2%** (51.3 - 57.1)	**41.3%** (36.3 - 46.2)	**67.2%** (64.5 - 69.9)
Percentage who are obese (BMI ≥ 30 kg/m^2)	**26.9%** (24.8 - 29.0)	**13.2%** (11.4 - 15.1)	**40.8%** (37.4 - 44.1)
Average waist circumference (cm)		**85.8** (84.8 - 86.8)	**93.2** (91.7 - 94.8)
Mean systolic blood pressure - SBP (mmHg), including those currently on medication for raised BP	**123.5** (122.3 - 124.7)	**126.3** (124.6 - 128.0)	**120.8** (119.3 - 122.3)
Mean diastolic blood pressure - DBP (mmHg), including those currently on medication for raised BP	**74.0** (72.2 - 75.8)	**73.4** (71.1 - 75.7)	**74.6** (73.2 - 80.0)
Percentage with raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg or currently on medication for raised BP)	**20.1%** (16.4 - 23.8)	**19.7%** (15.6 - 23.9)	**20.5%** (16.6 - 24.4)
Percentage with raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg) who are not currently on medication for raised BP	**13.9%** (11.5 - 16.3)	**16.3%** (13.4 - 19.2)	**11.4%** (8.9 - 14.0)
Step 3 Biochemical Measurement			
Mean fasting blood glucose, including those currently on medication for raised blood glucose [mmol/L]	**4.0** (3.7 – 4.2)	**3.7** (3.5 – 3.9)	**4.2** (3.9 – 4.5)
Percentage with impaired fasting glycaemia as defined below • capillary whole blood value ≥5.6 mmol/L (100 mg/dl) and <6.1 mmol/L (110 mg/dl)	**2.0%** (1.2 – 2.8)	**0.6%** (0.1 – 1.2)	**3.1%** (1.9 – 4.4)
Percentage with raised fasting blood glucose as defined below or currently on medication for raised blood glucose • capillary whole blood value ≥ 6.1 mmol/L (110 mg/dl)	**6.9%** (5.0 – 8.7)	**4.7%** (2.7 – 6.8)	**8.7%** (5.5 – 11.8)
Mean total blood cholesterol, including those currently on medication for raised cholesterol [mmol/L]	**4.1** (3.9 – 4.3)	**3.9** (3.7 – 4.0)	**4.4** (4.1 – 4.6)
Percentage with raised total cholesterol (≥ 5.0 mmol/L or ≥ 190	**20.7%**	**13.3%**	**26.7%**

mg/dl or currently on medication for raised cholesterol)	(14.5 – 26.9)	(8.4 – 18.3)	(18.8 – 34.5)
Summary of combined risk factors • current daily smokers • less than 5 servings of fruits & vegetables per day • insufficient physical 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	**1.8%** (0.8 – 2.9)	**2.7%** (1.0 – 4.5)	**0.9%** (0.0 – 1.9)
Percentage with three or more of the above risk factors, aged 18 to 44 years	**20.7%** (14.8 – 26.6)	**14.3%** (10.0 – 18.5)	**27.3%** (19.6 - 35.0)
Percentage with three or more of the above risk factors, aged 45 to 69 years	**46.5%** (39.0 – 54.0)	**38.5%** (29.3 – 47.3)	**54.3%** (47.1 - 61.5)
Percentage with three or more of the above risk factors, aged 18 to 69 years	**26.9** (21.3 – 32.6)	**20.0%** (15.0 - 24.8)	**34.0%** (27.4 – 40.7)

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

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