

Encuesta Nacional di Salud:  
**STEPS 2023**  
*Dal e paso pa bo salud!*



**STEPS**  
**ARUBA**  
*2023*

Pan American STEPS Risk Factor Surveillance Survey Aruba 2023 Report

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# Abbreviations

BMI	Body Mass Index
CAPI	Computer-Assisted Personal Interviewing
CBS	Central Bureau of Statistics
CI	Confidence Interval
CM	Centimeters
DBP	Diastolic Blood Pressure
DVG	Directie Volksgezondheid
GAC	Geographical Address Classification
HDL	High-Density Lipoprotein
LDL	Low-Density Lipoprotein
MAP	Multi-Sectoral Action Plan
mg/dl	Milligrams per Deciliter
mmHG	Millimeters of Mercury
mmol/L	Millimoles per Liter
NCD	Non-Communicable Disease
PAHO	Pan American Health Organization
SBP	Systolic Blood Pressure
SPSS	Statistical Package for the Social Sciences
WHO	World Health Organization
WHR	Waist-to-Hip Ratio

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# Message from the Minister of Tourism and Public Health, Aruba

As the Minister of Tourism and Public Health, I am honored to present my strategic program for 2021–2025, which prioritizes the critical task of combating non-communicable diseases (NCDs) within the population of Aruba. Recognizing the pressing challenges faced by Aruba, alongside many other Caribbean nations and the global community, we are committed to addressing the global surge in NCDs such as cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes.

In my role as Minister of Public Health, I am firm in my dedication to tackling these lifestyle diseases through strong prevention strategies and strengthening primary care services. We acknowledge that there are no quick fixes or simple solutions to addressing NCDs. The first essential step is to acquire a comprehensive understanding of our population's health status. To this end, the Public Health Department will implement the second STEPS Survey, which aims to provide deeper insights into the complexities and risk factors associated with the onset of NCDs in Aruba.

Utilizing the data obtained from initiatives like the STEPS Survey, my Ministry will develop informed policies, programs, and resource allocations necessary to address various risk factors and foster positive health outcomes. My objective as Minister of Public Health is to transform these commitments into concrete actions that yield tangible health benefits.

I extend my heartfelt gratitude to all stakeholders and individuals who have contributed to the success of the STEPS Survey. I offer my sincere appreciation to the Pan American Health Organization (PAHO) for their indispensable technical support and assistance. I also commend the dedication of my Ministry, the Department of Public Health, and the Central Bureau of Statistics for their diligent efforts in sampling, executing, and analyzing the STEPS Survey data, guided by PAHO's expertise. Special recognition is due to the interviewers and nurses who played a pivotal role in data collection. Lastly, I express my gratitude to all the respondents who participated in this survey, thereby contributing to our collective endeavor to combat NCDs and promote a healthier future for Aruba.

As the Minister of Tourism and Public Health, I am determined to integrate the insights gathered into our forward-thinking programs, advancing towards a vision of a healthier society, and enhancing the quality of life for all our citizens.



Dhr. Danguillaume P. Oduber  
Minister of Tourism and Public Health

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# Summary

## Introduction

This report presents the results of the STEPS Aruba 2023 survey. The general purpose of this survey was to gather up-to-date information on risk factors for Non-Communicable Diseases (NCDs) among the Aruban adult population. The report describes the most common modifiable risk factors underlying the major NCDs, and the results of the physical and biochemical measurements.

## Methodology

STEPS Aruba 2023 followed the standardized PAHO/WHO STEPS survey methodology to gather reliable and representative data. The STEPS survey was translated into 4 languages. A simple random sample of 5,122 address points was drawn from the total number of 47,591 address points in Aruba, to ensure a diverse and representative pool of the Aruban population (18- 69 years). All data was collected using Computer Assisted Personal Interviewing and was uploaded into the online database of PAHO/WHO. STEPS Aruba 2023 consisted of 3 components; a household survey (STEP 1), physical measurements (STEP 2), and biochemical measurements (STEP 3). A total of 2,736 persons participated in STEP 1 and 2 and 2,243 persons completed STEP 3. All data underwent cleaning and validation procedures. Descriptive statistical analyses were performed to derive the results presented in this report.

## Key results

Overall, high levels of risk factors were found in the population studied:

- Almost 80% of the Aruban population has an unhealthy weight, with 33% being overweight, and 46% being obese.
- A third of current drinkers engaged in heavy episodic drinking in the same period ( $\geq 6$  drinks among men and  $\geq 4$  drinks among women per occasion).
- Vaping is an emerging problem among young men (18-29 years), with a prevalence of 14%.
- The Aruban population has a poor diet quality, as 88% of the people did not meet the recommended 5 servings of fruit and/or vegetables per day.
- Raised blood pressure is significantly more common among men than women, with 24% of men and 15% of women having it.
- About 10% of the population has raised blood glucose levels.
- More than 25% of the people has high cholesterol levels, with a higher prevalence among women.
- More than a third of the population with a NCD does not take their prescribed medication.
- 95% of the population is at risk of developing a NCD, and 38% is at high risk.
- Nearly a quarter of the women reported experiencing mild, moderate, or severe symptoms of anxiety and depression compared to 17% of the men.
- Almost 5% of the population ever attempted suicide, with the highest rates among the younger adults (18-44 years).
- More than half of the people that have suicidal thoughts didn't seek for professional help.

## Conclusion

The results from the STEPS Aruba 2023 survey underscore a concerning scenario for NCDs within the adult Aruban population, shedding light on the high prevalence of risk factors. Immediate and decisive action is imperative to alleviate the burden of NCDs and avert preventable deaths caused by these conditions.

# Introduction

In recent decades, Non-Communicable Diseases (NCDs) have emerged as a pressing global health concern. An estimated 17 million people die of NCDs each year, below the age of 70 (WHO, 2023). Cardiovascular diseases, cancers, diabetes and chronic respiratory diseases are the most prevalent causes of death, and are therefore the four leading NCDs worldwide.

In the region of the Americas, NCDs are the leading cause of death and disease burden. Four out of every five deaths in the region were caused by NCDs in 2019, equivalent to 3 million deaths among men and 2.8 million among women resulting in NCDs being major causes of years of life lost due to premature mortality, with 121 million years of life lost. Furthermore, NCDs are also a major cause of disability adjusted life years, which affects quality of life in a negative way. In 2019, NCDs accounted for 226 million disability-adjusted life years (PAHO/WHO, 2021).

The majority of these NCDs are caused by lifestyle variables; so-called modifiable risk factors. The top five most important modifiable risk factors are: insufficient physical activity, unhealthy diet, tobacco use, harmful use of alcohol, and air pollution (WHO, 2023). Similarly, biological risk factors such as overweight/obesity, raised blood pressure, high cholesterol and glucose blood levels also play a significant role in driving the global NCD epidemic (PAHO/WHO, 2023), with overweight/obesity being one of the biggest risk factors. In the Americas, it is estimated that 67% is overweight or obese among adults in 2022; the highest among all WHO regions. Chile, the Bahamas and Saint Kitts and Nevis have the highest prevalence of overweight, while Haiti has the lowest (PAHO 2023).

In the recent years, Aruba is also dealing with a growing burden of NCDs. Results from the previous STEPS survey (2006) already revealed high levels of NCD risk among the population (25-64 years). More specifically, the population consumed an unhealthy diet, was physically inactive and showed excessive alcohol consumption. Furthermore, 77% of the population was overweight, of which 41% was obese (STEPS, 2006). Results from a more recent study indicated that 73% of the Aruban population who perceived their weight as 'normal' was actually overweight or obese (GOA report, 2018). This indicates that for the majority of the Aruban population, the perception of their own weight does not comply with a healthy weight. However, results of this study need to be interpreted with caution as the sample size was very small (n=195). Therefore, these results may not be representative for the whole population.

The increasing burden of NCDs in Aruba and the significant social, economic and health consequences they bring, prompted the development of Aruba's 2020-2030 National Multi-Sectoral Action Plan for Non-Communicable Diseases (NCD MAP 2020-2030). The main goal is to "increase the protective factors for NCDs, while reducing the modifiable risk factors, using an evidence-based approach through multi-sectoral actions to enable sustained behavior change with a particular focus on prevention". It includes four strategic action areas which translate goals into actions:

1. Establish effective leadership and governance for the implementation of the Strategic MAP for the prevention and control of NCDs.
2. Strengthen NCD surveillance, monitoring, evaluation, reporting, and decision-making as part of the national information systems for health.
3. Reduce NCD risk factors, promote protective factors and address the social determinants of health.
4. Strengthen the integration of preventative and curative services for the effective management of NCDs, including self-management.

The second strategic action area highlights the importance of up-to-date and representative data for implementing, monitoring and evaluating the plan. The STEPS Aruba 2023 survey provides vital national data that will serve as the cornerstone for determining key priority actions, activities, and interventions integral to realization of the NCD MAP 2020-2030. Consequently, this can be translated into evidence-based policy and decision-making.

### **Purpose**

The general purpose for conducting the STEPS Survey in Aruba is to produce current and representative data of NCDs and their risk factors among the adult population. This data will be used to evaluate and adjust current and future policies, programs and interventions in Aruba, in line with the NCD MAP 2020-2030.

# Methods

## Study design

The PAHO/WHO STEPwise approach to NCD risk factor surveillance, also called STEPS, is a standardized country-level household survey for systematically collecting, analyzing, and disseminating data on NCDs and their risk factors. It is designed to monitor, evaluate and inform public health priorities within a country in a sequential manner. The survey consists of 3 steps:

STEP 1: Household survey. STEP 2: Basic physical measurements. STEP 3: Biochemical analysis



The STEPS survey captures 11 of the 25 NCD Global Monitoring Framework indicators (PAHO, 2022). Throughout the report, data relevant for the Global Monitoring Framework are identified with this symbol. Aruba's NCD MAP 2020-2030, was developed and aligned with this framework as well.

The STEPS Aruba 2023 survey was adapted in line with PAHO/WHO's recommended and standardized tool for NCD risk factor surveillance. The survey included all but one (urinary sodium and creatinine) of the core items. Furthermore, country-specific questions were added, which can be found under 'expanded items'. The optional item 'mental health/suicide' was also included to gain insight into anxiety, depressive symptoms, suicide and sleep (Table 1).

**Table 1. STEPS Aruba 2023 survey items**

	Core items	Expanded items	Optional items
STEP 1	<b>Basic demographic info</b>	<b>Basic demographic info</b>	<b>Mental health/suicide</b>
	Tobacco use	Tobacco cessation	Anxiety/depression
	Alcohol consumption	Alcohol use disorders	Suicide
	Cessation of alcohol	Sedentary behaviour	Sleep
	Binge drinking		
	Past 7 days drinking		
	Untaxed alcohol		
	Fruit and vegetable consumption		
	Consumption of salt and processed food		
	Physical activity at work		
	Physical activity for transport		
	Physical activity during leisure time		
	History of raised blood pressure		
	History of diabetes		
	History of raised total cholesterol		
	History of cardiovascular disease		
	Lifestyle advice		
	Cervical cancer screening		
STEP 2	Blood pressure	Hip circumference	
	Height and weight	Heart rate	
	Waist circumference		
STEP 3	Fasting blood sugar		
	Total cholesterol		

Preparations for STEPS Aruba 2023 started in 2022, by forming the survey team and developing the implementation plan. In February 2023, preparations were made by finalizing the survey, training the staff and by launching a broad campaign. Data collection was performed between March 4<sup>th</sup> and May 30<sup>th</sup>, 2023. The timing of the data collection was chosen taking local festivities into account, that could influence the lifestyle habits of the people. The data collection phase was extended for two additional months; until July 31<sup>st</sup>, 2023, in order to increase the number of completed interviews. In August 2023, all datasets were reviewed and cleaned for data analysis. Between September and October 2023, data analysis was performed and the data book was created. In November and December 2023, the results were translated into this report (Figure 1).

**Figure 1. Time line of STEPS Aruba 2023**



## Data collection

The STEPS Instrument was used for data collection. This digital questionnaire incorporated automatic skips to appropriate questions and logical checks. The instrument was translated into 4 languages: Papiamentu, Dutch, English and Spanish. Showcards on tobacco, alcohol, dietary salt, fruit, vegetables, and physical activity were included in the instrument to further explain questions. The instrument was reviewed by several core team members, and pre-testing was also done as part of the training. The instrument is presented in Annex A.

All data was collected using Computer Assisted Personal Interviewing. Android tablets were provided by Central Bureau of Statistics (CBS). All data collectors also received a hard copy of a progress sheet that listed all households they needed to visit and keep track of. The progress sheets allowed supervisors to closely monitor the work of each enumerator in their team. All progress was entered into a digital progress sheet by supervisors, who then shared this weekly with the survey coordinator to keep track of the fieldwork's progress.

During the fieldwork, data collectors visited each household on their progress sheet. If no one was home, they left a notification letter with their contact information and re-visited the household numerous times. If someone was home, an explanation was given of the survey, and participation was requested. Written informed consent was always sought prior to starting data collection. At the beginning of the interview, people could choose their preferred language for the interview. A participant feedback form for the physical measurements (STEP 2) was filled in by the interviewer and given to each respondent to inform them about their results.

Subsequently, people were informed of STEP 3 and were given the choice to participate. If written consent was given, biochemical measurements (STEP 3) were done two days after STEP 1 and 2. After taking biochemical measurements, all people received a feedback form. Medical advice was never provided to people, but if questions were asked, they were told to contact their general practitioner.

## Aruban population

People eligible to participate were aged between 18 and 69 years, in line with STEPS surveys conducted in other countries. Furthermore, people were eligible for the study if they were registered in Aruba for >1 year, or intended to continue living in Aruba for 1 year, irrespective of their legal status. Children (<18 years) and older adults (>69 years) were not included in this survey as the specific health-related problems for these specific age groups require separate, age-specific health surveys.

## Sampling

The STEPS Aruba 2023 sample was prepared by CBS Aruba, following the recommended STEPS sampling methodology. The sample was drawn from the Geographical Information System database of CBS (Census, 2020). The database contained 53,465 address points in Aruba, of which 47,591 households were located. Each address point was identified by a Geographical Address Classification code of 5 numbers. In addition, each address point was identified by a street name and by an address number and/or letter.

A sample of 5,122 address points was randomly drawn from the 47,591 households. This approach ensured full geographical coverage of all address points where households are residing in Aruba. The sample was drawn using the Statistical Package for the Social Sciences (SPSS). The randomly selected address points were then divided into areas coinciding in numbers with the 20 enumerators in the field.

All areas contained 256 address points to be visited by one enumerator. Within each selected household, the person to be interviewed was selected at random from all persons eligible for the study, within the household. Selection of the people was conducted automatically by the application used to conduct the survey. The sample size was calculated assuming an expected response rate of 60%. This was based on similar response rates from previous household surveys conducted in Aruba, and taking into account that people were hesitant to let others enter their houses due to the COVID-19 pandemic.

## Staff recruitment and training

The Department of Public Health (DVG) was in charge of recruiting the staff and was assisted by CBS in identifying eligible candidates. The training for data collectors and supervisors was mainly provided by PAHO, in close collaboration with CBS and DVG. The training was a combination of formal classroom training and hands-on experience covering all standards and procedures for data collection.

The training also emphasized data collection for the mental health component, given its novelty within the STEPS survey and the topic's sensitivity. A mental health expert from the DVG was involved during the training and available for support throughout the survey. Close follow-up was applied after each notification to ensure the health and safety of the survey people and data collectors.

*The STEPS data collectors training aimed to:*

- Explain the rationale of the STEPS survey.
- Ensure uniform application of the STEPS survey methodology.
- Prepare data collectors to undertake the fieldwork for the survey.
- Prepare supervisors to guide data collectors and oversee the quality of their work.
- Motivate all staff.
- Ensure good overall data quality.

## Data collectors

STEP 1 and 2 data collectors were trained for three full days. Data collectors were in charge of conducting STEP 1 and 2 at the premises. A total of 25 data collectors were trained; 20 of them started with the fieldwork right after the training, while five of them were on standby. The training focused on the following components:

- Plan fieldwork according to the progress sheet.
- Locate the selected address points.
- Determine the number of households in the selected housing units.
- Explain the purpose of STEPS Aruba 2023 to household members using an information leaflet.
- Record the age and sex of each eligible person living in the household in the tablet.
- Allow the tablet to randomly select one household member who is eligible to participate.
- Obtain written consent from each participant.
- Conduct the interview and record all answers on the tablet.
- Request participation in STEP 2 and record all answers on the tablet.
- Fill in and provide participant feedback form.
- Invite each participant to participate in STEP 3.
- Make STEP 3 appointment and share this with the STEP 3 data collector and supervisor.
- Check all completed forms and hand them over to the supervisor on a weekly basis.
- Complete the progress sheet for each visited household.
- Report any difficulties to the supervisor.

Data collectors for STEP 3 were trained for half a day (four hours). The training focused on locating households, obtaining informed consent, taking blood measurements, recording results and filling in the participant feedback form. A total of 12 persons were trained to conduct STEP 3. Data collection for STEP 3 was done either at the participant's home, the DVG in Oranjestad, or IBISA in San Nicolas, depending on the participant's preference.

## **Supervisors**

The supervisors were included in the training with the data collectors. A training session with only supervisors was held on the last day, where tasks and responsibilities were discussed. Supervisors were tasked with closely guiding the work of the data collectors. Each supervisor was responsible for five STEP 1 and 2 data collectors, and two STEP 3 data collectors. They kept close track of progress sheets and checked in regularly with their team members. They managed human resource and performance issues and reported relevant issues to the STEPS survey coordinator. All supervisors were expected to attend the weekly update meeting with the survey coordinator to discuss the progress of the fieldwork.

## **Data analysis**

### **Data quality assurance**

Data quality assurance was a paramount aspect of the STEPS Aruba 2023 survey, ensuring that the information collected was accurate, reliable, and representative of the Aruban population. The data quality assurance was performed by CBS.

During the preparation and implementation of the survey, several measures were implemented to uphold data quality. This encompassed standardization of the data collection procedures, and keeping track of any discrepancies or inconsistencies during the fieldwork. The CAPI methodology was used to streamline the data collection process.

Regular validation checks were conducted to identify and rectify any abnormalities or outliers in the dataset. All data were downloaded directly from the PAHO database. Some data checks were conducted in Excel, while others were done in SPSS. Data quality checks were performed on a daily basis at the beginning of the fieldwork. Over the course of the data collection phase, this was scaled down to a weekly occurrence. During the weekly supervisor meetings, data quality issues were raised and subsequently checked with data collectors in the field. A list of rectifications was kept to facilitate editing of the data in the next phase.

### **Data handling, editing and weights**

Data were stored in two separate files: the first file contained data from the interview and the physical measurements (STEP 1 and 2). The second file contained the biochemical measurement data (STEP 3). The first step of the data handling process was to link both files using unique identification numbers. Consequently, structural and consistency checks of the QR codes were performed. SPSS was used for all data handling and editing.

In order to have data that are representative for the entire country, the distribution of the Aruban population needed to resemble the distribution of the total population aged 18-69 years in Aruba. Therefore, data was mathematically weighted to ensure the data was proportionate to the country's actual population. All results in this report represent the weighted values.

After comparing data from the CBS with the STEPS Aruba 2023 data, we observed an overrepresentation of older adults in the survey, and an underrepresentation of young adults aged 18 – 30 years. Weights were therefore applied accordingly to correct for these discrepancies. These weights ( $W_a$ ) were calculated by dividing the percentage of males/females in broad age groups from CBS' population estimates by the male/female percentages from the corresponding broad age groups in the STEPS Aruba 2023 sample. The overall weights ( $W$ ) were then calculated as:

$$W = W_h * W_a$$

Households in the STEPS Aruba 2023 sample had an equal probability of being selected, as a simple random sample was used. Therefore, no household sample weights needed to be applied. However, as the STEPS sampling design selected only one individual in each household, weights were applied to ensure the sample's representativeness, as persons in smaller households had a higher chance of being selected than persons in larger households, especially as there was an overrepresentation of smaller households. The design weight was calculated as the reciprocal of the household size:

$$W_h = 1/s$$

Where  $W_h$  is equal to the household weight and  $s$  to the household size.

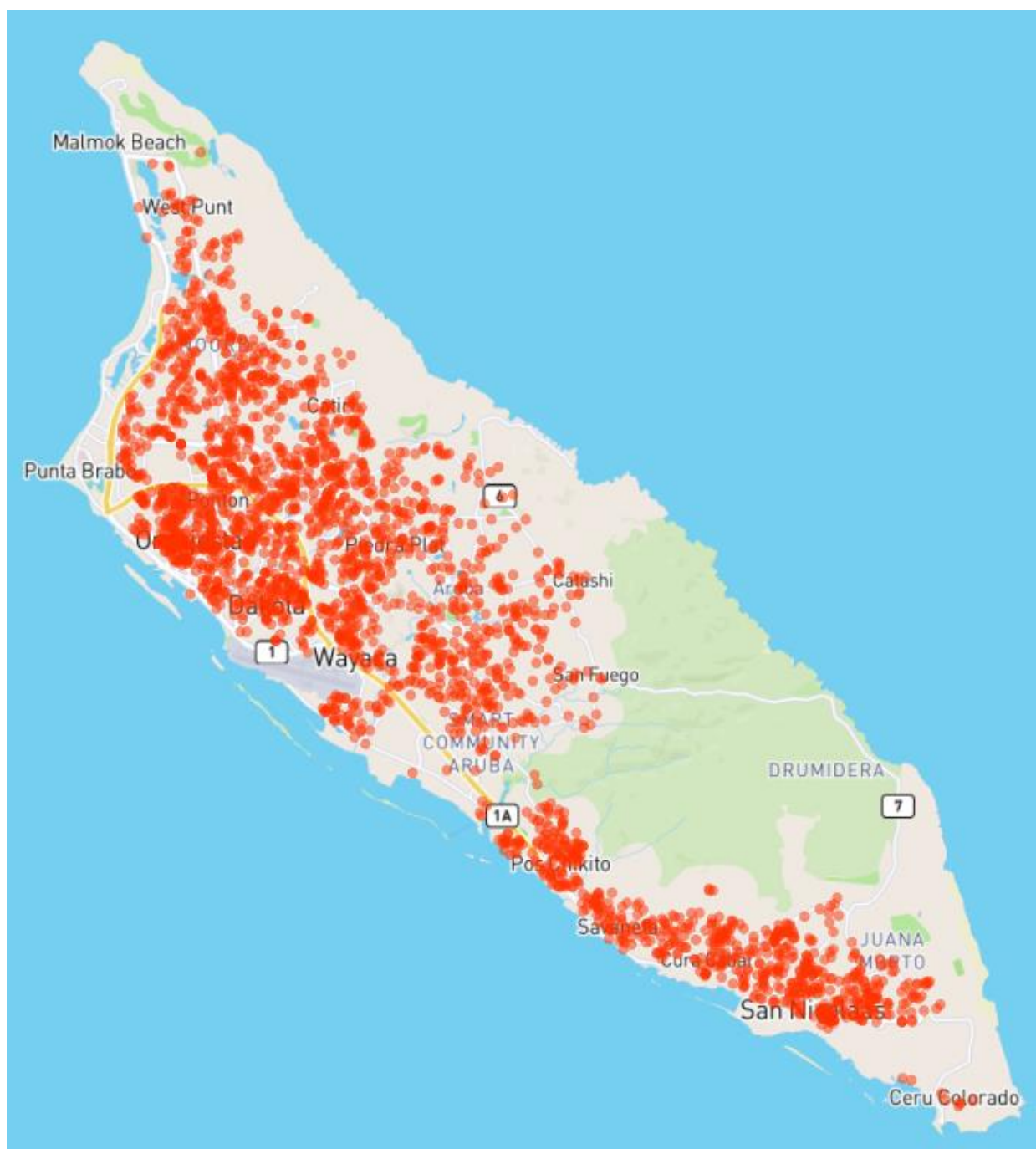
## Statistical analysis

All statistical analyses were performed using Epi Info 3.5.4 and Stata 18. Results are presented as means or percentages, with associated confidence intervals. Statistical significance was defined by using the p-value ( $p < 0.05$ ). All tables are presented for the whole population. When the sample size allowed it, results are stratified by age groups (18-29 years, 30-44 years, 45-59 years, 60-69 years) and sex (male, female).

## Response

Of the 5,122 address points that were selected, a total of 2,744 participated in STEP 1 and 2. Each dot presented in Figure 2 represents a participating household. About 82% of the people that completed STEP 1 and 2, also participated in STEP 3 ( $n = 2,254$ ). After cleaning all data, we had complete data of 2,736 people from STEP 1 and 2, and complete data of 2,243 people from STEP 3. This resulted in an overall response rate of 53% from STEP 1 and 2, and 44% from STEP 3. The desired response rate was 60%, however this target was not met despite extending the data collection for two months.

**Figure 2. Geographical distribution of participating households**

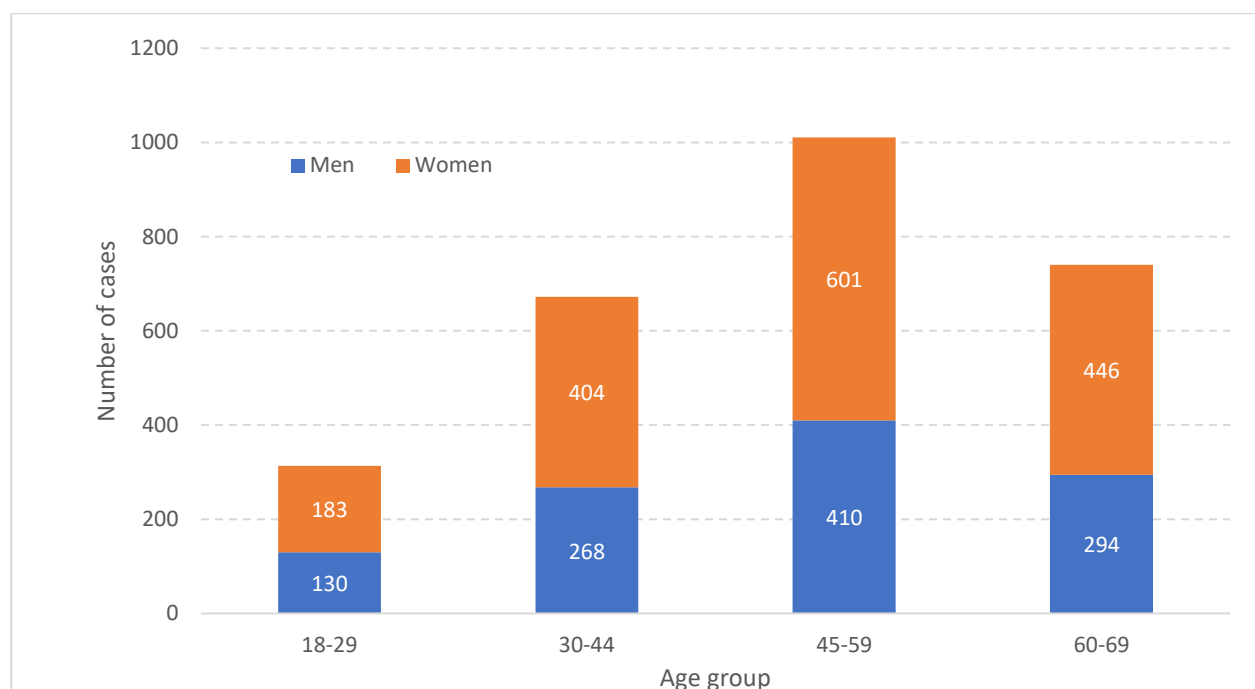


# Results

## Demographics

The total number of participants of STEP 1 and 2 was 2,736 people. Approximately 60% of the participants were women, and 40% were men. The 45-59 years age group showed the highest representation, with 410 men and 601 women completing the survey. The youngest age group (18-29 years) consisted of the least people. Figure 3 shows the number of people per age group and sex.

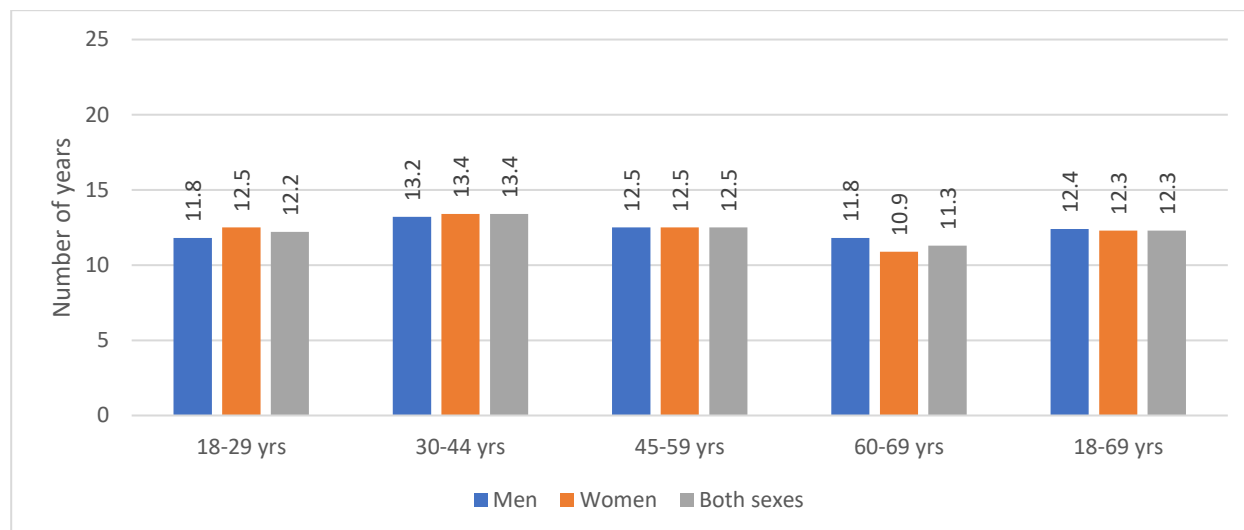
**Figure 3. Number of participants, by age group and sex\***



*\*Numbers are not weighted*

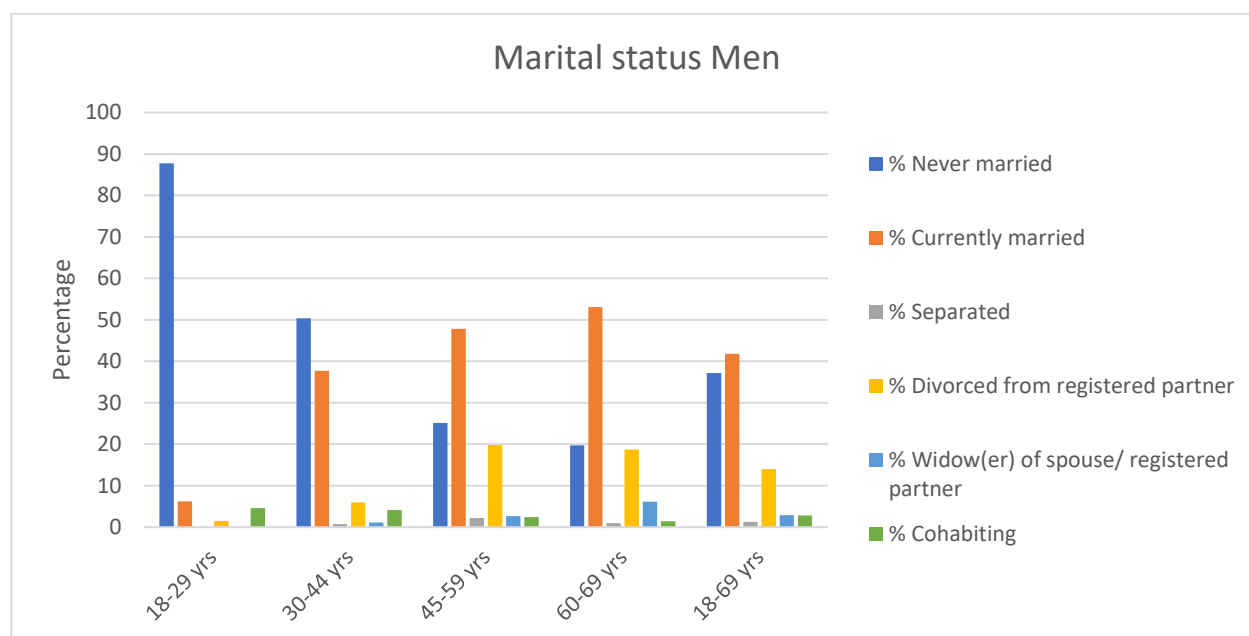
The mean number of years of education was 12.3 years. No difference was observed between sex. The 30-44 years age group had the highest number of years of education (13.4 years). The older adults (60-69 years) had the lowest number of years of education (11.3 years) (Figure 4).

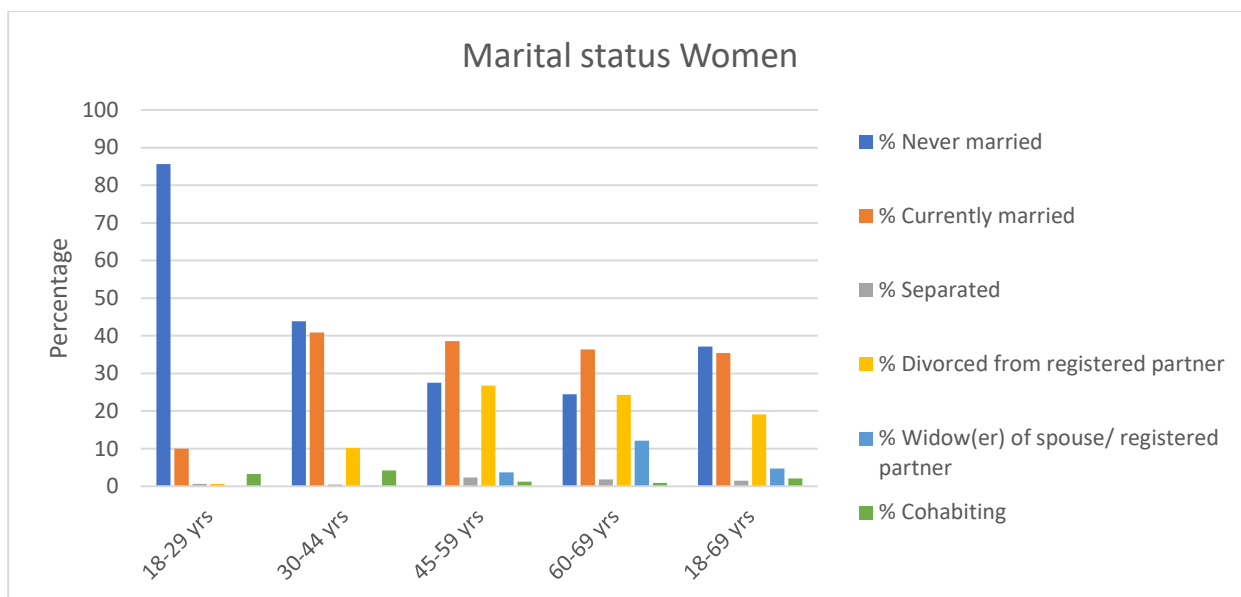
**Figure 4. Mean number of years of education, by age group and sex**



When looking at marital status, 38% of the participants was currently married, and 37% was never married. The remaining 25% was either divorced (17%), separated (1%), widowed (4%) or cohabiting (2%) (Figure 5).

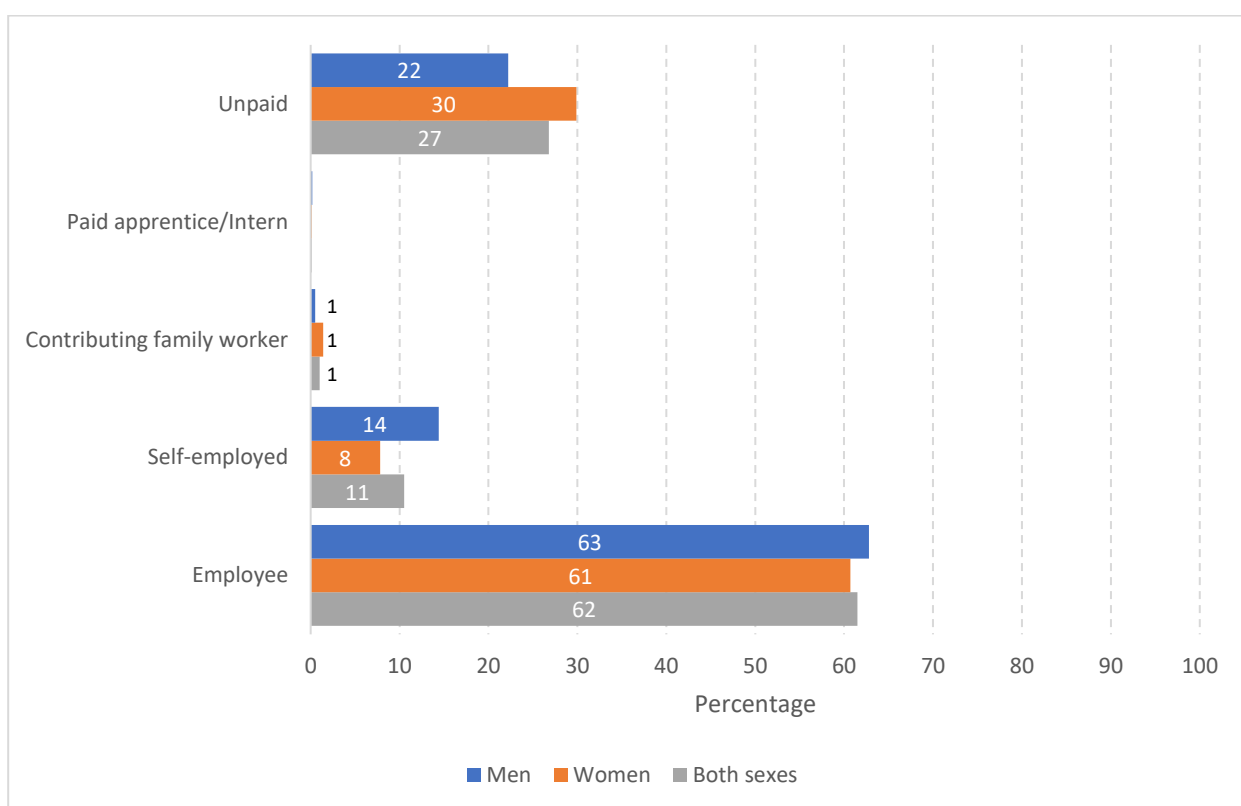
**Figure 5. Percentage of participants by marital status, age group and sex**





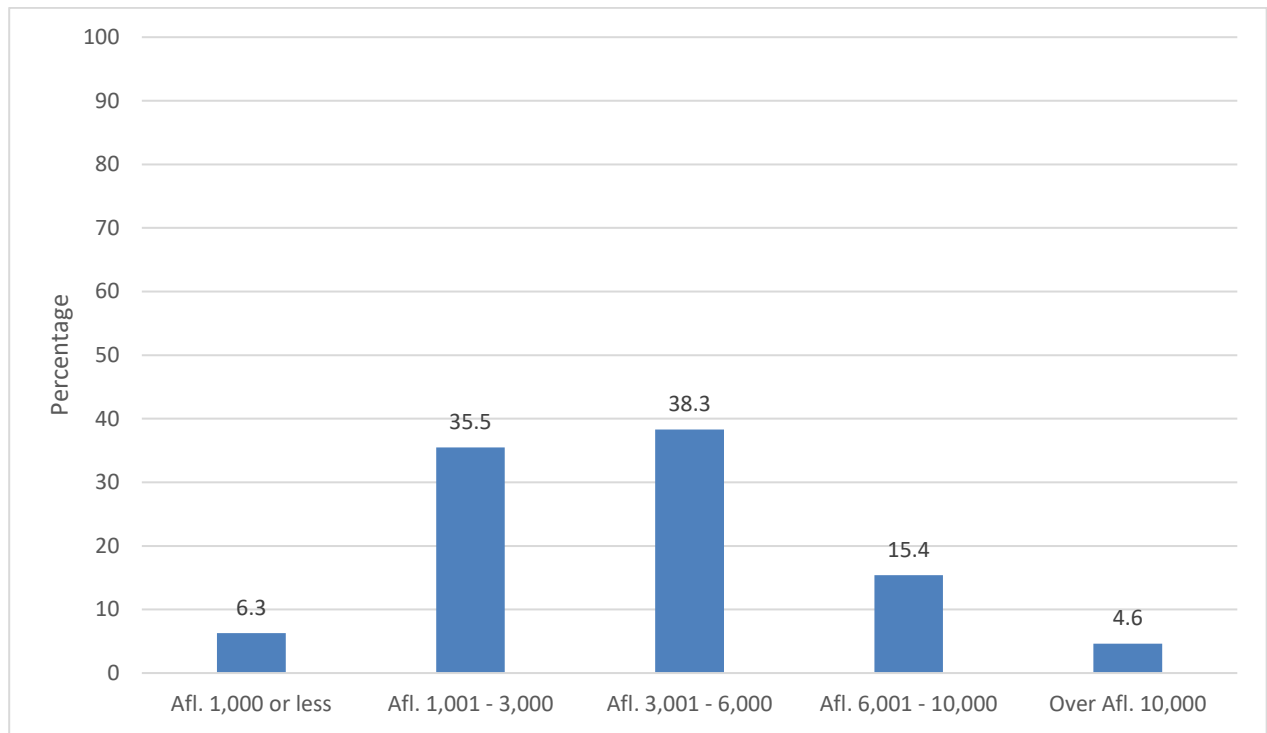
Nearly two-thirds of both men and women were employed. Younger adults (18-34 years) and older adults (60-69 years) covered the largest proportion in the unpaid category. The unpaid category includes students, homemakers, and persons that are retired or unemployed. Approximately 10% of the population was self-employed, and 1% was a contributing family worker (Figure 6).

**Figure 6. Percentage of employment status of participants, by sex**



The majority of the participants have either an estimated household net income between Afl. 1,001-3,000 (36%), or between Afl. 3,001-6,000 (38%). About 20% of the households earned more than Afl. 6,001 per month (Figure 7).

**Figure 7. Percentage of estimated household earnings in Aruban florins**



## Modifiable risk factors

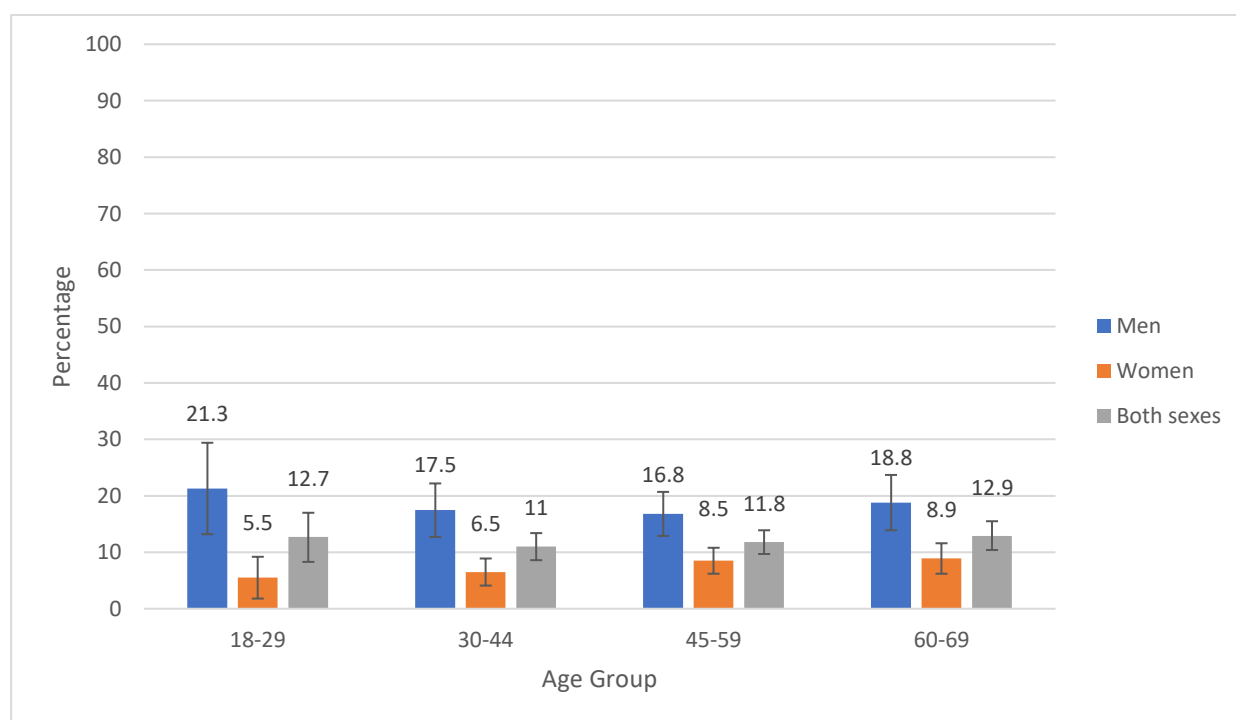
The four most important modifiable behavioral risk factors were included in the survey; tobacco use, harmful use of alcohol, unhealthy diet, and insufficient physical activity. Air pollution was recently added as a contributing risk factor, but was not included in the current survey.

### Tobacco use

Figure 8 shows that 13% of the Aruban population currently smokes tobacco products such as cigarettes, cigars, or pipes. About 7% of the total population smokes tobacco products on a daily basis. Men were more likely to currently smoke tobacco products (19%) than women (9%). The difference is the most pronounced in the age group 18-29 years, in which the prevalence of male current smokers is 21% compared to 6% of female current smokers. Although a relatively higher percentage of younger men and older women reported being current smokers, the difference with other age groups for the same sex was not significant. Age was therefore not significantly related to current smoking status.



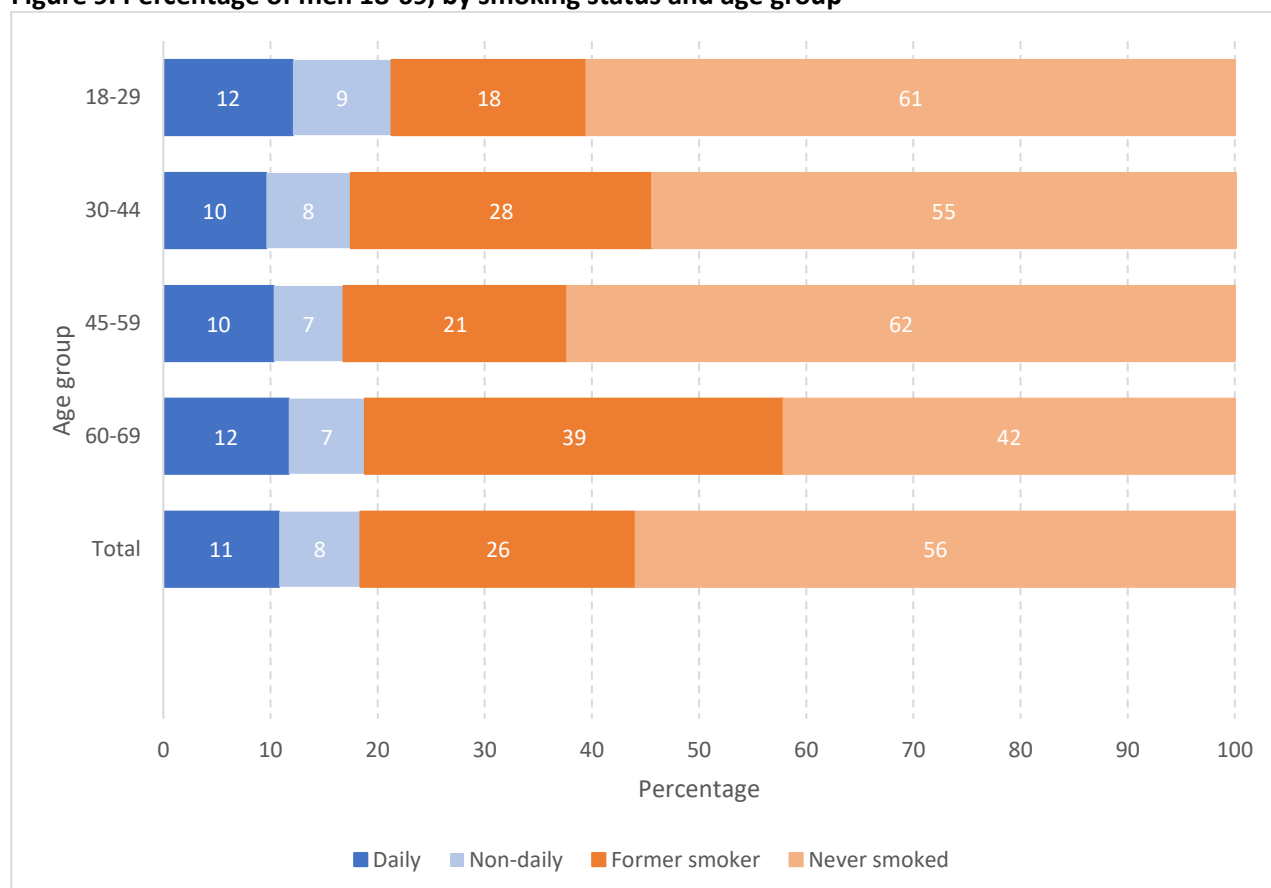
**Figure 8. Percentage of current tobacco users 18-69, by age group and sex**



59% of the current male smokers were daily smokers. Manufactured cigarettes were the most popular tobacco products, with 90% of the men currently using this product. Among non-smokers, 26% are former smokers, and 56% never smoked (Figure 9). 43% of men who are currently smoking have tried to quit in the past year.

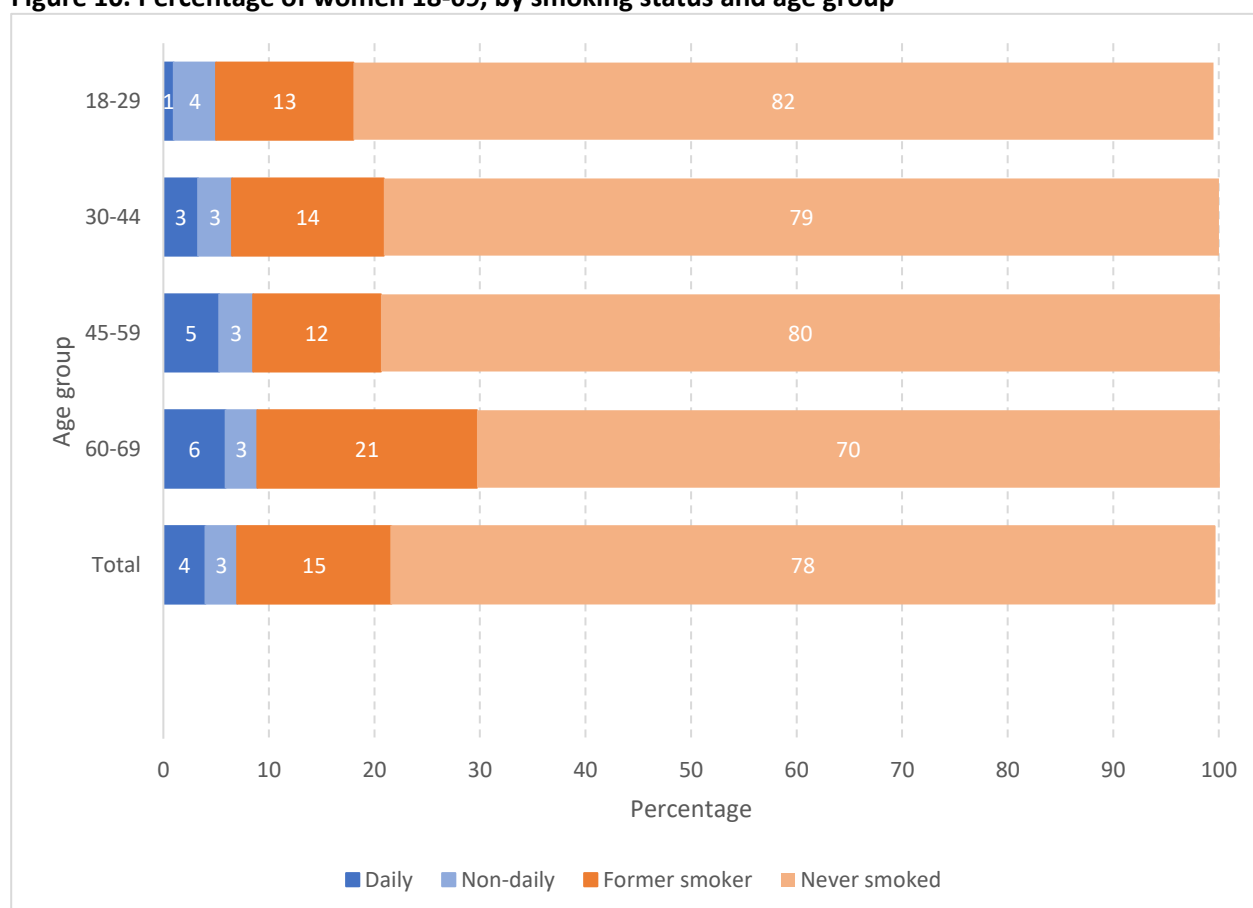
The average age when men started smoking was 18.9 years. Nearly a quarter of current male smokers who visited a doctor or other health worker in the past 12 months were advised to quit smoking.

**Figure 9. Percentage of men 18-69, by smoking status and age group**



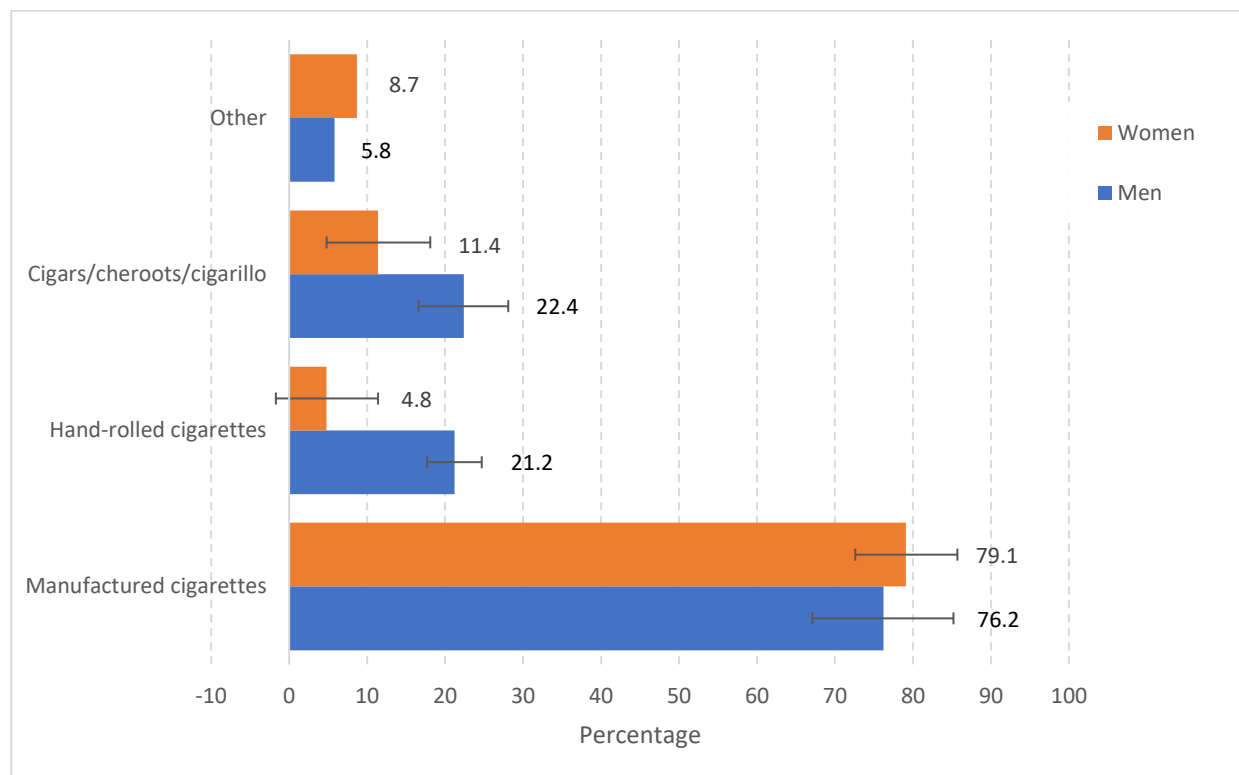
The prevalence of female current smokers is significantly lower compared to men, with 7% of women currently smoking tobacco products. 54% of women are daily smokers. Most women (96%) who currently smoke use manufactured cigarettes. 78% of the women have never smoked, and 15% of the women who previously smoked, quit (Figure 10). Nearly half of female current smokers have tried to quit in the past 12 months. On average, women started smoking at a later age (20.9 years) than men, however these results were not significant. One third of current female smokers were advised by their doctor to quit smoking.

**Figure 10. Percentage of women 18-69, by smoking status and age group**



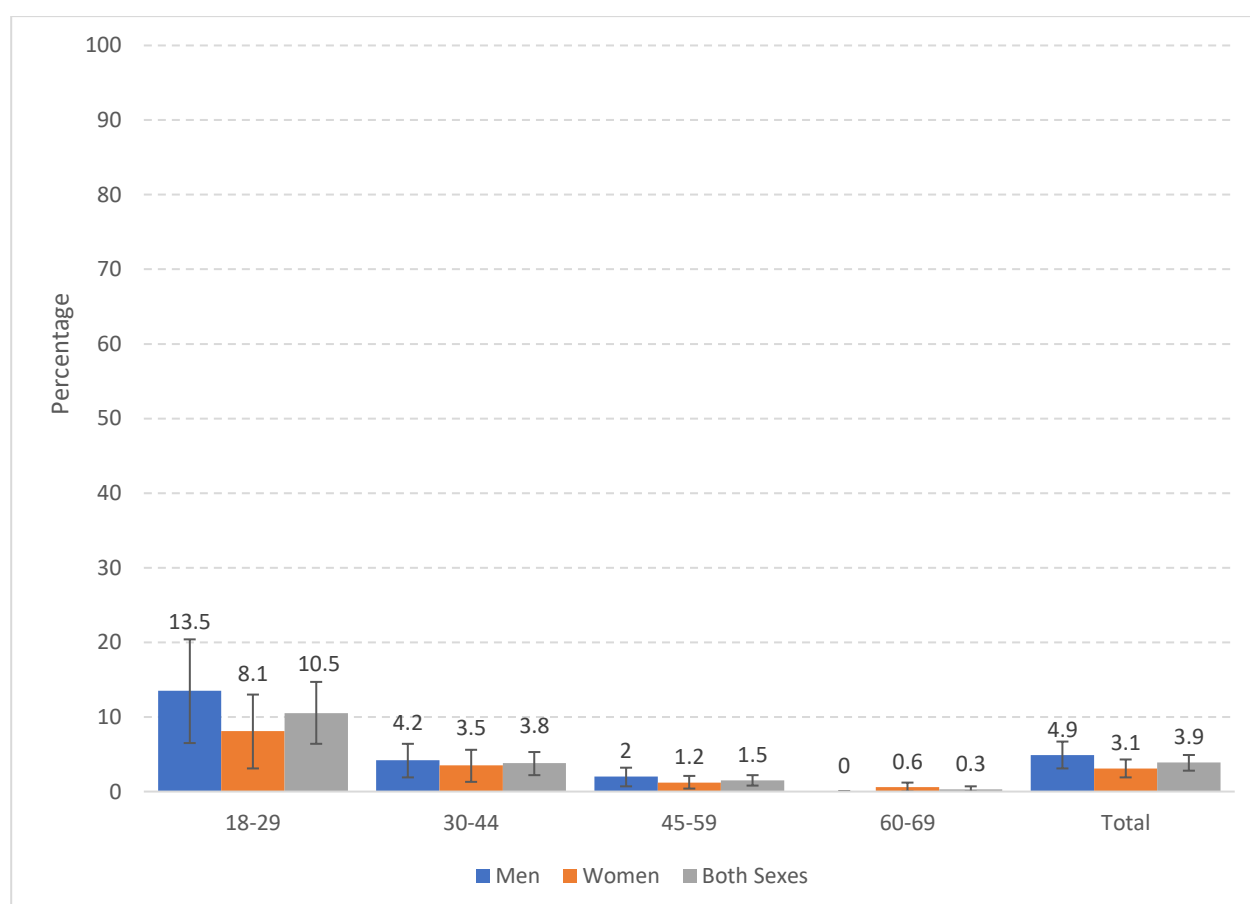
Current smokers were also asked which tobacco products they consumed. Results are shown in Figure 11. Even though the preference for manufactured cigarettes is similar between men and women, significantly more men smoked hand-rolled cigarettes compared to women. Additionally, 22% of the men smoked cigars, cheroots or cigarillos.

**Figure 11. Percentage of current smokers 18-69, by smoke tobacco product and sex**



Vaping is the use of battery-powered electronic cigarette (e-cigarette) devices which heat a liquid to produce vapor or aerosol instead of smoke. Vaping is becoming more popular in recent years, particularly among young people. E-cigarette emissions typically contain nicotine and other toxic substances that are harmful to both users, and non-users who are exposed to the aerosols second-hand (WHO, 2019). To investigate the current situation of vaping in Aruba, a question on e-cigarettes was included in the survey. People were asked whether they currently use e-cigarettes or any other vaping devices. If so, they were also asked about the frequency. Results show that nearly 5% of the men and 3% of the women in Aruba currently vape, with 1% doing so on a daily basis. Vaping was highest among young adults (18-29 years), with 14% of the men and 8% of the women currently use e-cigarettes or other vaping devices. More than 2% of the men and 1% of the women vape on a daily basis. When looking at the whole population, age is significantly related to vaping. As age increases, vaping is significantly reduced (Figure 12).

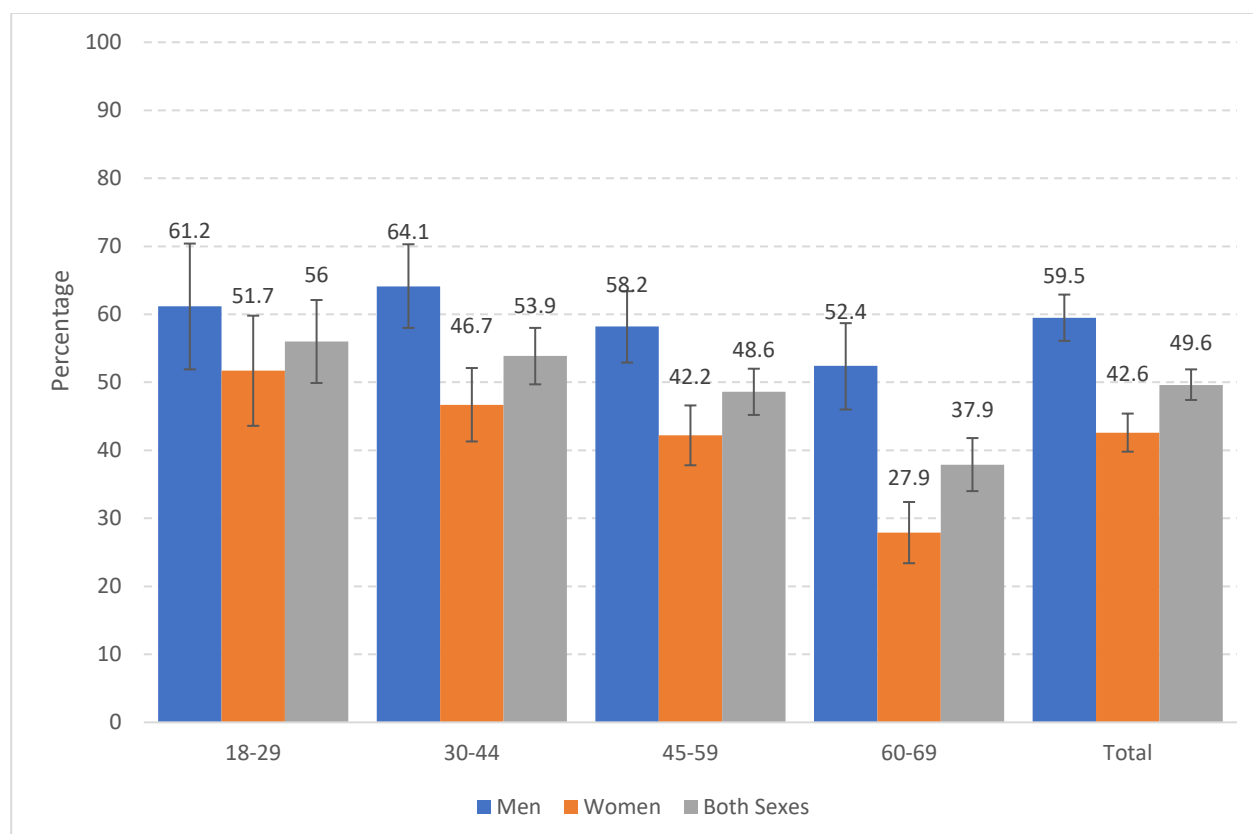
**Figure 12. Percentage of adults 18-69 who currently vape, by age group and sex**



## Alcohol consumption

Among the total Aruban population, 50% had consumed alcohol in the past 30 days. Men were significantly more likely to consume alcohol than women. Almost 60% of the men and 43% of the women drank alcohol in the past 30 days (Figure 13). Women were significantly more likely to abstain from alcohol (26%) than men (15%). 22% of former drinkers (those who did not drink during the past 12 months) stopped drinking due to health reasons.

**Figure 13. Percentage of current drinkers 18-69, by age group and sex**



Male current drinkers had a significantly higher number of drinking occasions in the past 30 days than female current drinkers, with 5.2 occasions compared to 3.4 occasions, respectively.

Sex was also significantly related to the number of standard drinks per occasion. A standard drink contains approximately 10 grams of pure alcohol. Men consumed on average 5.5 standard drinks per occasion in the past 30 days, whereas women consumed 3.3 standard drinks. This difference was statistically significant. The largest number of standard alcoholic drinks that men consumed on 1 occasion was 7.4, compared to 4.2 for women. Younger age groups reported a higher number of average standard drinks consumed, although results for age were not significant (Figure 14).

**Figure 14. Mean number of drinks per drinking occasion among current drinkers 18-69, by age group and sex**

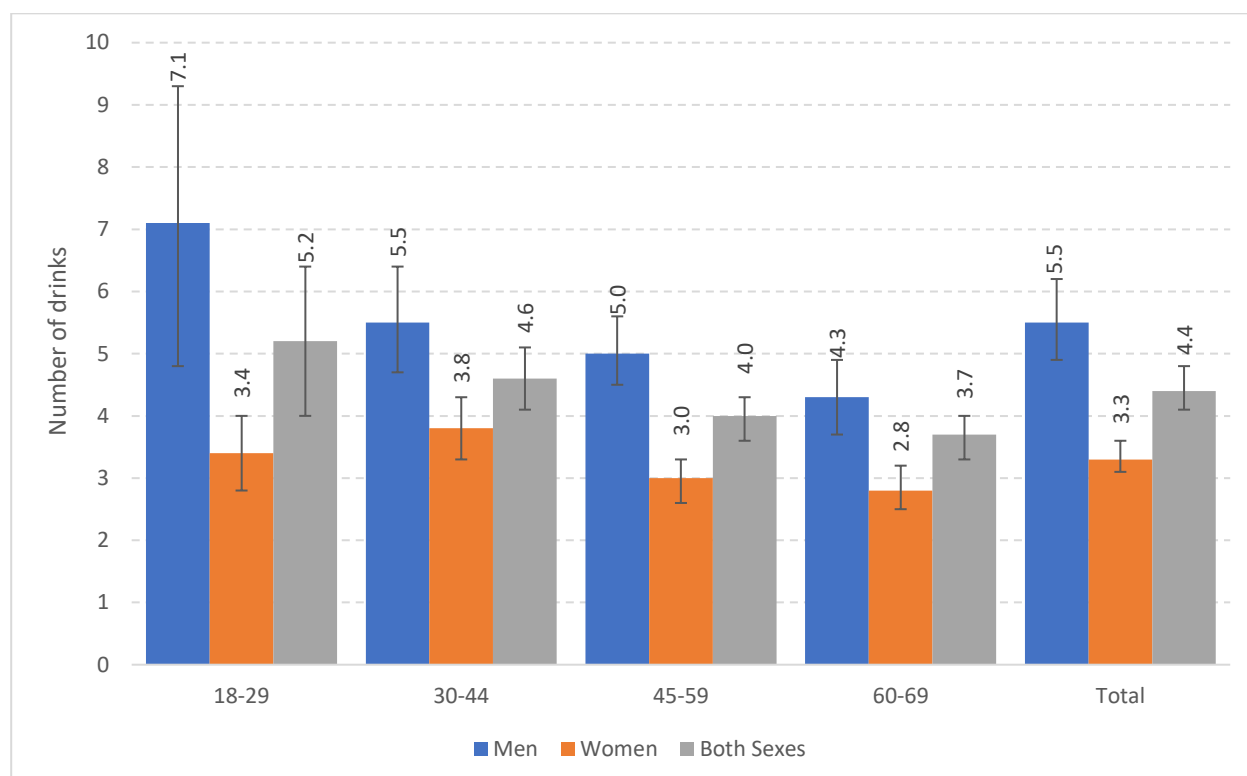
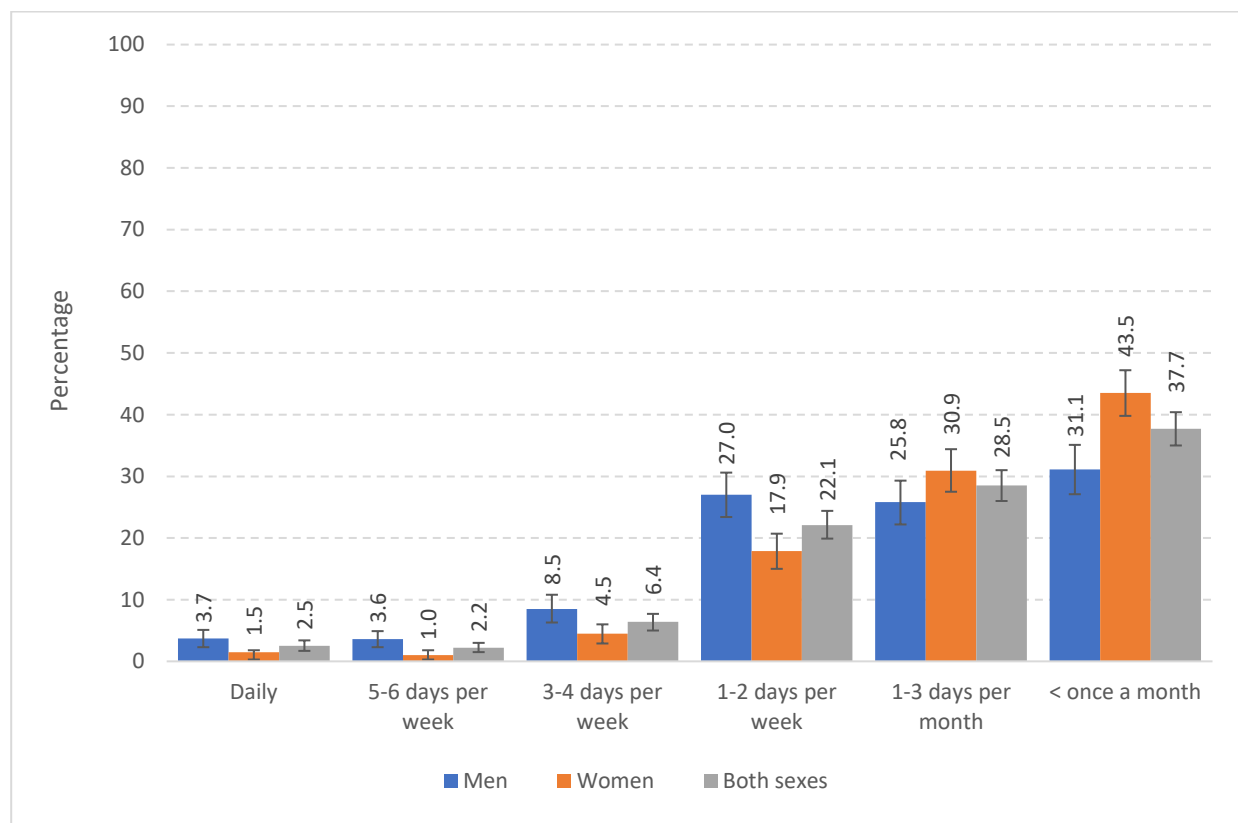


Figure 15 indicates the frequency of alcohol consumption among those who have consumed alcohol in the last 12 months. It shows that daily drinking is significantly more common among men (4%) than among women (2%). When looking at both sexes, 2% of the Aruban population consumed alcohol 5-6 days a week, 6% did so 3-4 days a week, 22% 1-2 days per week, and 29% 1-3 days per month. Nearly 40% of the population drank less than once a month in the past 12 months.

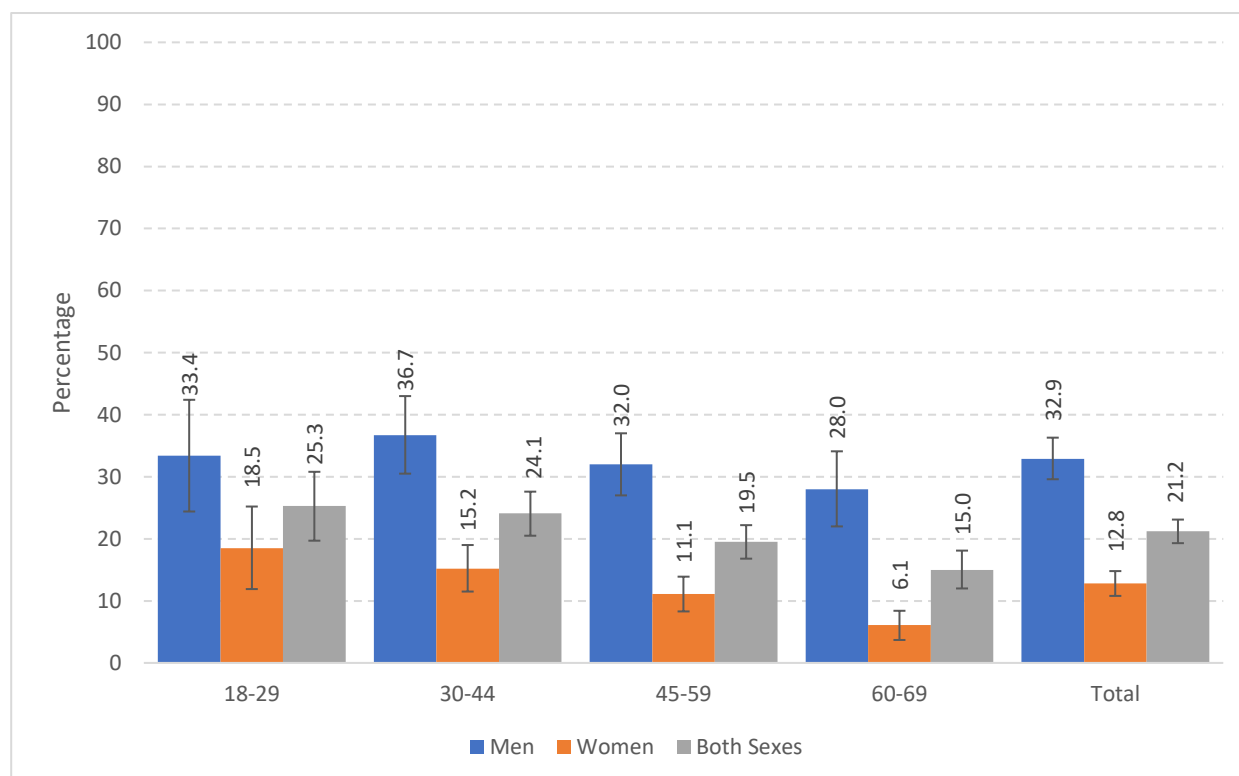
**Figure 15. Percentage of current drinkers 18-69, by frequency of alcohol consumption and sex**



More than 21% of the total population engaged in heavy episodic drinking during the past 30 days, defined as consumption of six or more drinks on a single occasion. 25% of the young adults (18-29 years) engaged in heavy episodic drinking in the past month. Sex was significantly related to heavy episodic drinking in all age groups. For those aged 18-29 years, 33% of the men engaged in heavy episodic drinking compared to 19% of the women. Among the 45-59 year age group, this was 32% compared to 11%, respectively (Figure 16).



**Figure 16. Percentage of adults 18-69 who had six or more drinks in a single occasion in the past 30 days (heavy episodic drinking), by age group and sex**

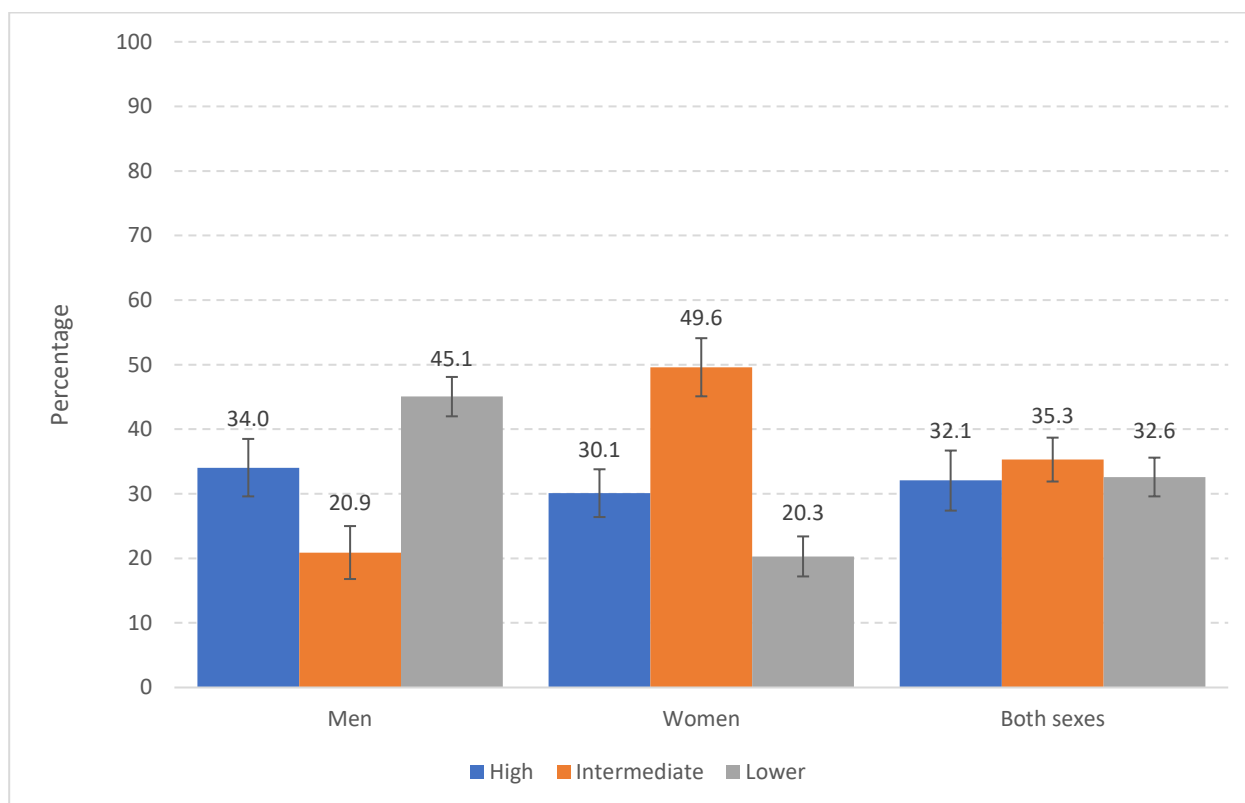


The average volume of drinking levels among the population in the past 30 days was measured and divided into 3 categories. Ten grams of pure alcohol represents a standard drink.

- Lower level: <40g of pure alcohol on average per occasion among men and <20g of pure alcohol on average per occasion among women
- Intermediate level: 40-59.9g of pure alcohol on average per occasion among men and 20-39.9g of pure alcohol on average per occasion among women
- High level: ≥60g of pure alcohol on average per occasion among men and ≥40g of pure alcohol on average per occasion among women.

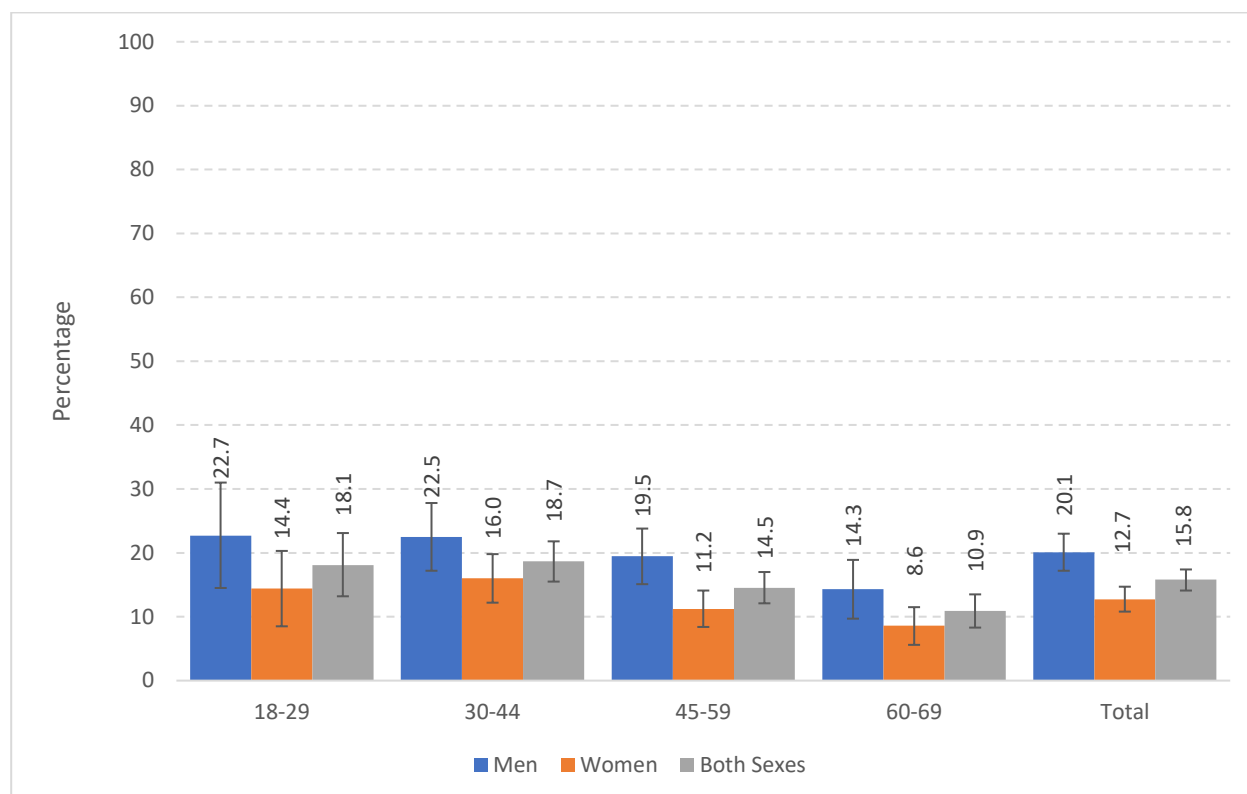
The division of drinking levels for both sexes was equally divided, with about a third of current drinkers engaging in high, intermediate or lower levels of drinking in the past 30 days. High levels of drinking occurred amongst 34% of the men and 30% of the women in the past 30 days. Women are significantly more likely to engage in intermediate drinking levels than men, with 50% of the women doing so, compared to 21% of the men (Figure 17).

**Figure 17. Percentage of current drinkers 18-69, by drinking level and sex**



Adult men are significantly heavier drinkers per occasion than women (Figure 18). 20% of the men engaged in high level drinking ( $\geq 60\text{g}$  of pure alcohol per occasion) compared to 13% of the women ( $\geq 40\text{g}$  of pure alcohol per occasion). Almost 16% of the total population engaged in high level drinking.

**Figure 18. Percentage of adults 18-69 with high level alcohol consumption, by age group and sex**

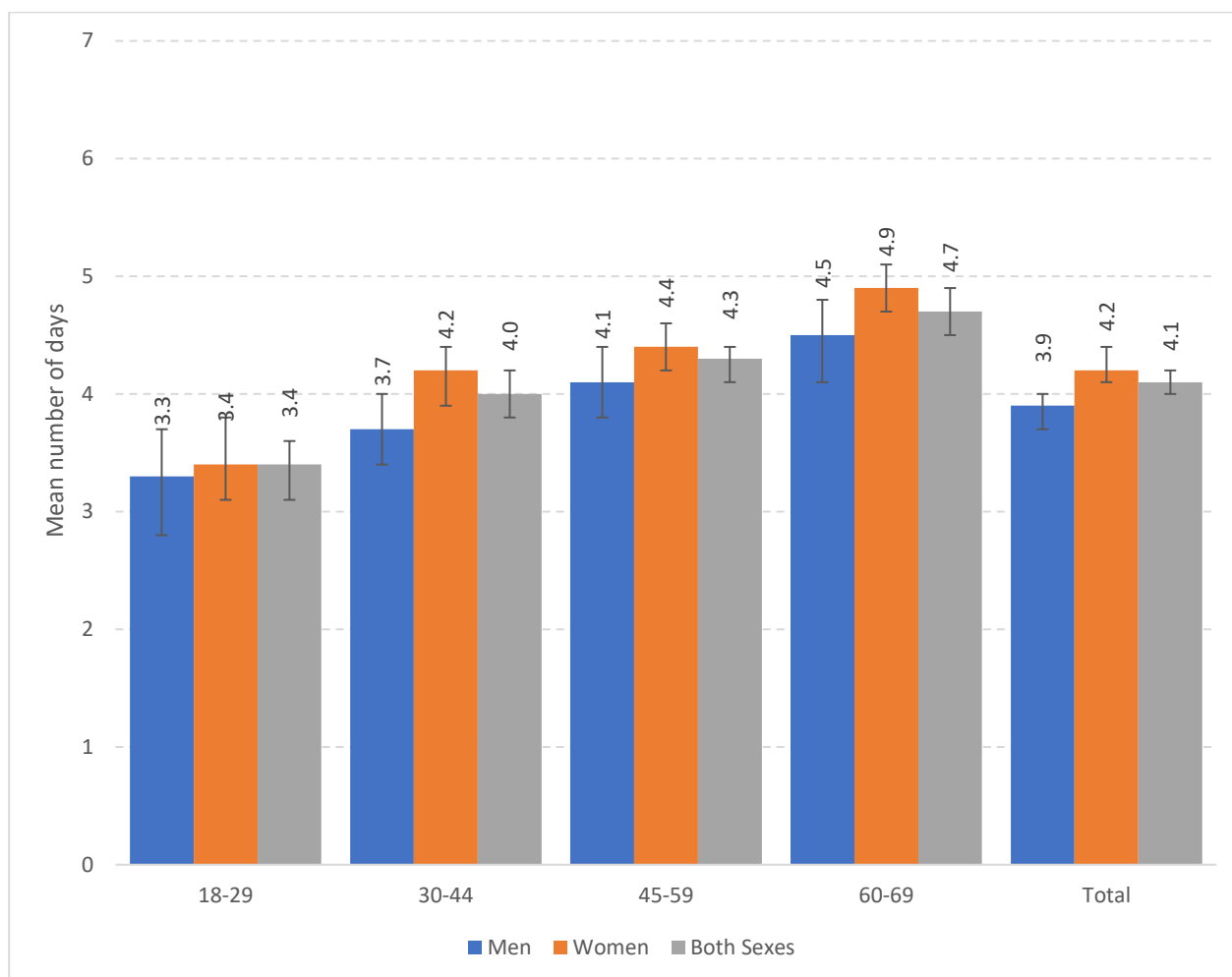


Among the people who consumed alcohol in the past 12 months, 4% of the men and 1% of the women reported not being able to stop drinking once they started. Nearly 94% of the people who consumed alcohol in the past 12 months never failed to do what was normally expected from them because of drinking. Only 1% of male current drinkers and 1% of female current drinkers reported the consumption of unrecorded alcohol in the past 7 days. Examples of unrecorded alcohol are homebrewed alcohol, any alcohol brought over the border, or other untaxed alcohol.

## Dietary behavior

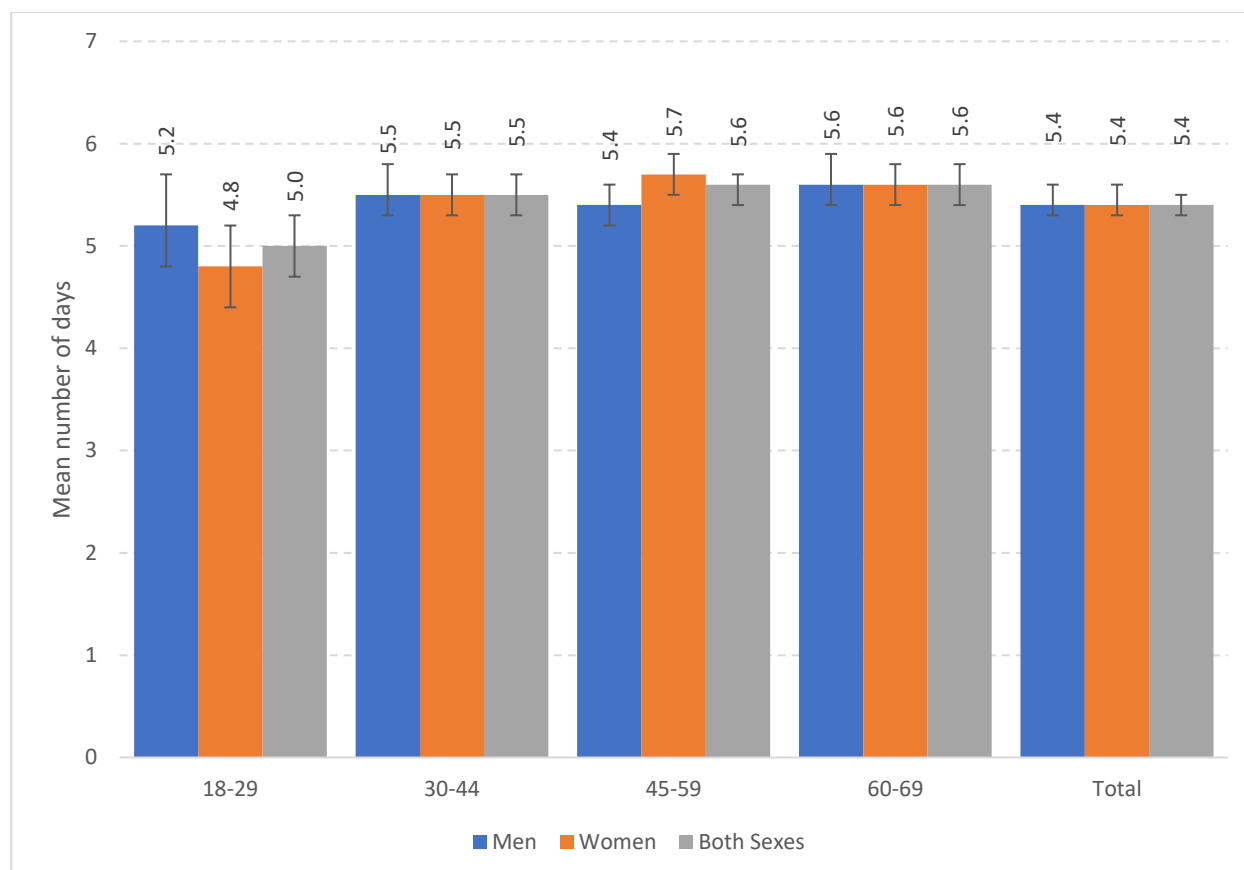
The third modifiable risk factor was dietary behavior. Therefore, fruit, vegetable and salt consumption were asked in the survey. On average, people reported to eat fruit on 4.1 days in a typical week, with no statistical difference observed between sex. Fruit consumption does increase with age as the young adults (18-29 years) consume fruit 3.4 days per week, whereas older adults (60-69 years) consume fruit 4.7 days a week (Figure 19).

**Figure 19. Fruit consumption in days per week, by age group and sex**



Results show that people consume vegetables more often, compared to fruit. Both men and women consumed vegetables on 5.4 days per week. Persons within all age groups reported at least 5 days of vegetable consumption, except for the young women (18-29 years), who consumed vegetables on 4.8 days per week (Figure 20).

**Figure 20. Vegetable consumption in days per week, by age group and sex**

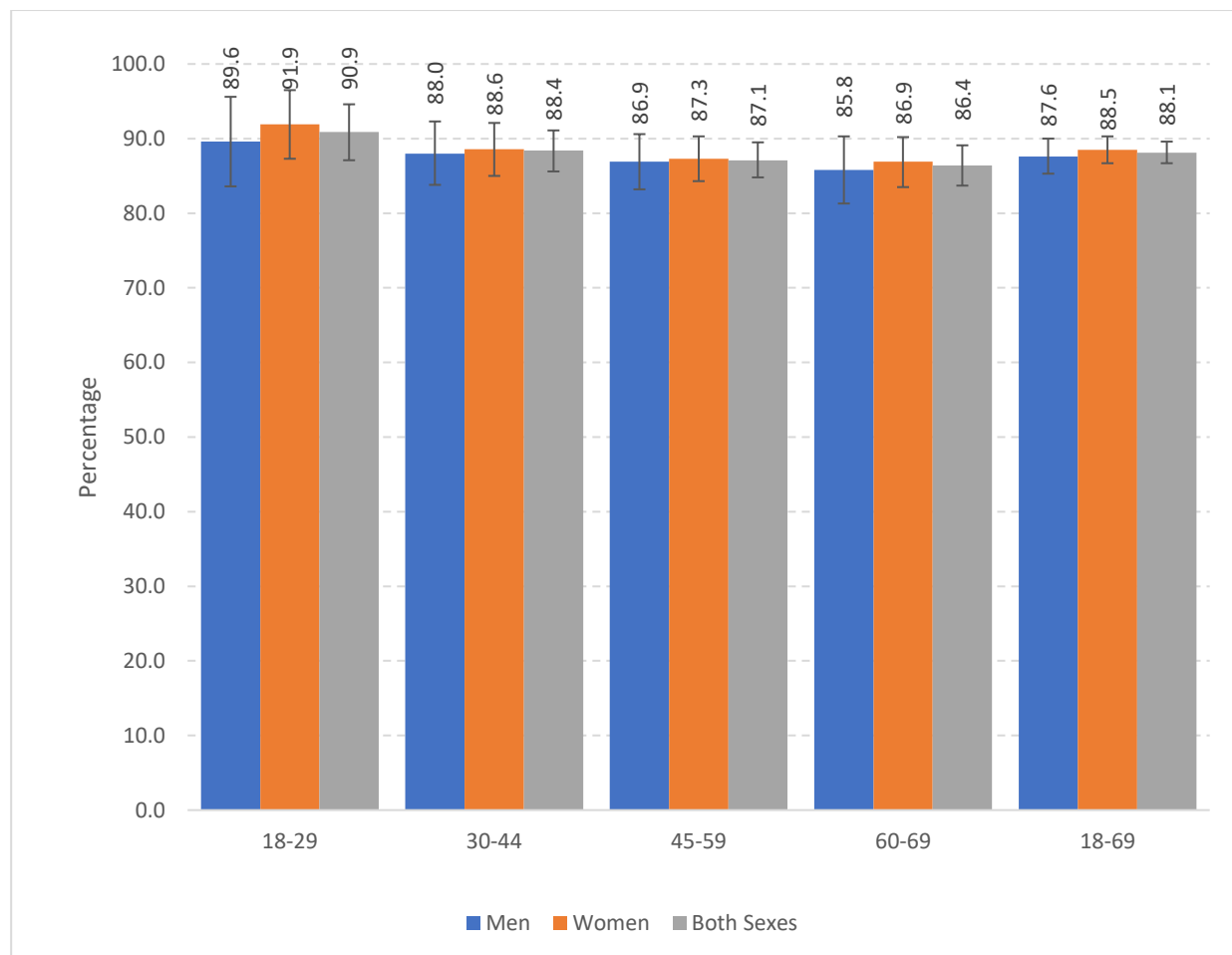


Besides the importance of regular fruit and vegetable consumption, the amount of fruit and vegetables is also very important. The WHO recommends at least 400g (i.e. 5 portions) of fruit and vegetables per day, excluding starchy vegetables such as potatoes, sweet potatoes, cassava and other starchy roots (WHO, 2020). The mean number of fruit servings among the people was 1 serving per day. For vegetables, this was 1.4 servings for the men and 1.5 for the women per day. This equals 2.4 servings of fruit and/or vegetables for men and 2.5 servings for women per day.

In total, 88% of the Aruban population eats less than 5 servings of fruit and/or vegetables per day. Consumption patterns are similar across sex and age groups. Furthermore, 15% of the population does not consume any fruit and/or vegetables typically. The majority of the population consumes 1-2 servings per day, with 57% of the men and 53% of the women doing so. Only 12% of the population consumes 5 or more servings of fruit and/or vegetables per day (Figure 21).

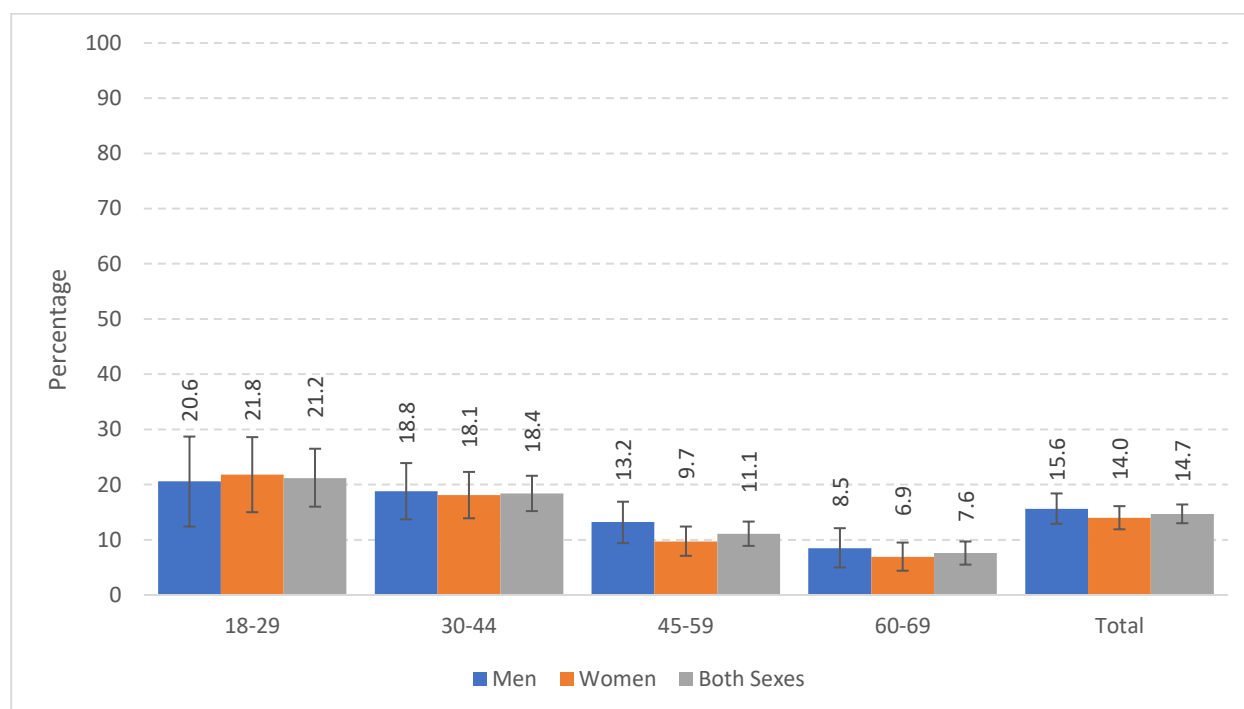


**Figure 21. Percentage of adults 18-69 eating less than 5 servings of fruit and/or vegetables per day, by sex**



People were asked how often they add salt or a salty sauce to their food, before or during eating. As shown in Figure 22, nearly 16% of the men and 14% of the women often or always added some type of salt to their meal. Younger adults (18-29 years) reported a significantly higher salt consumption (21%) compared to the older adults (60-69 years) (7.6%). When looking at adding salt while cooking, 71% of the population often or always added salt when cooking or preparing food at home.

**Figure 22. Percentage of adults 18-69 who always or often add salt to their meal, by age group and sex**



About a quarter of the population often or always consumes processed food that is high in salt, such as packaged salty snacks, pastechi, cheese, bacon or salty food that is prepared at fast-food restaurants. The younger age groups (18-44 years) consumed significantly more salt through processed food, compared to the 45-69 years age group. About 42% of the young adults aged 18-29 years often/always consumed processed food high in salt, compared to 11% of those aged 60-69 years. Women aged 18-29 reported the highest percentage of those who often/ always consumed processed food high in salt, nearing 44% (Table 2).

**Table 2. Percentage of adults 18-69 who consume processed food high in salt, by age group and sex**

	Men	Women	Both Sexes
<b>18-29</b>	39.3	43.6	41.6
<b>30-44</b>	33.1	28.6	30.4
<b>45-59</b>	20.0	19.5	19.7
<b>60-69</b>	14.9	8.7	11.2
<b>18-69</b>	<b>27.2</b>	<b>24.8</b>	<b>25.8</b>

Besides the frequency in salt consumption, people were also asked whether they think they consume too much salt. Only 12% of the people think they consume too much or far too much salt. Nearly 58% of them believe they consume 'just the right amount' of salt (Table 3).

**Table 3. Self-reported salt consumption among adults 18-69, by sex**

	% Far too much	% Too much	% Just the right amount	% Too little	% Far too little
<b>Men</b>	1.3	10.5	59.0	21.9	7.4
<b>Women</b>	1.8	9.5	56.9	23.1	8.6
<b>Both sexes</b>	<b>1.6</b>	<b>9.9</b>	<b>57.8</b>	<b>22.6</b>	<b>8.1</b>

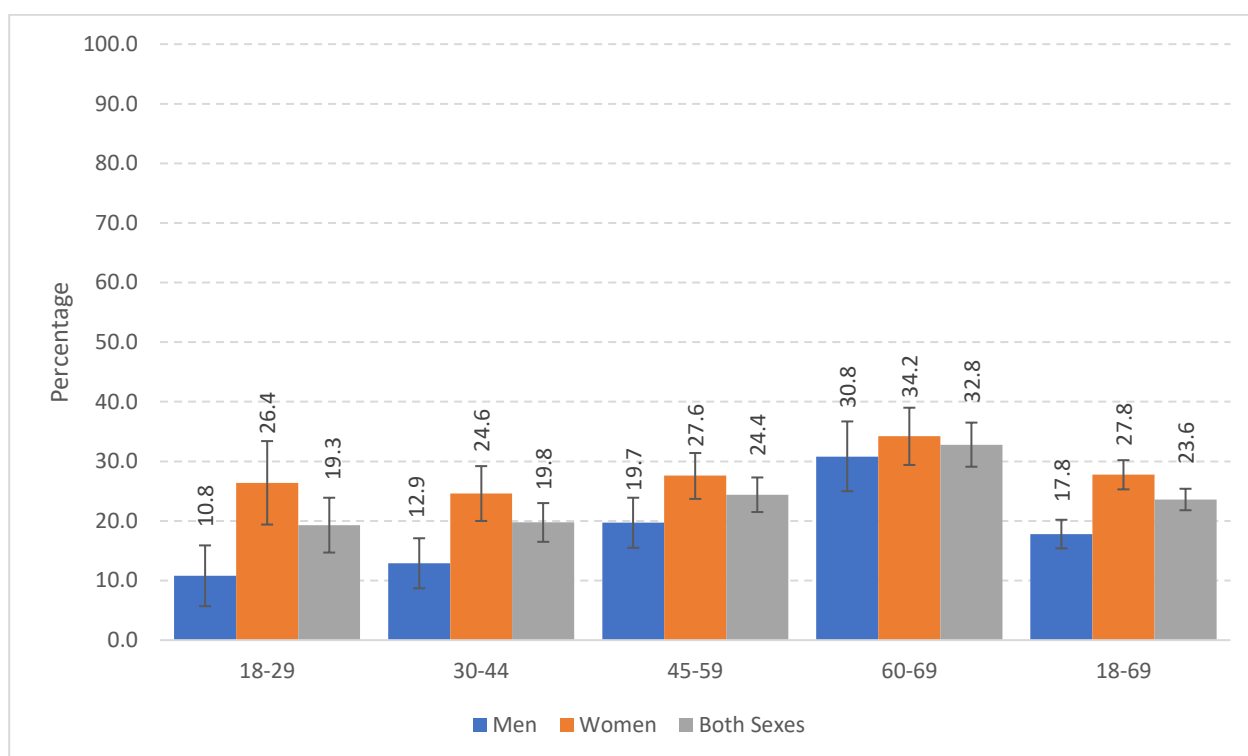
## Physical activity

WHO recommendations on physical activity for health take into account the total time spent in physical activity during a typical week and the intensity of such activity. Adults should be moderate-intense physically active for at least 150 minutes per week.

Figure 23 represents the percentage of people not meeting the WHO recommendations on physical activity for health. About a quarter of the population did not meet WHO recommendations, with significantly more women (28%) not reaching the recommended amount of physical activity compared to men (18%). Sex was significantly related to the level of physical activity in the same age group. The largest sex difference was observed among the young adults (18-29 years), with 11% of the men not meeting the WHO recommendations, compared to 26% of the women.



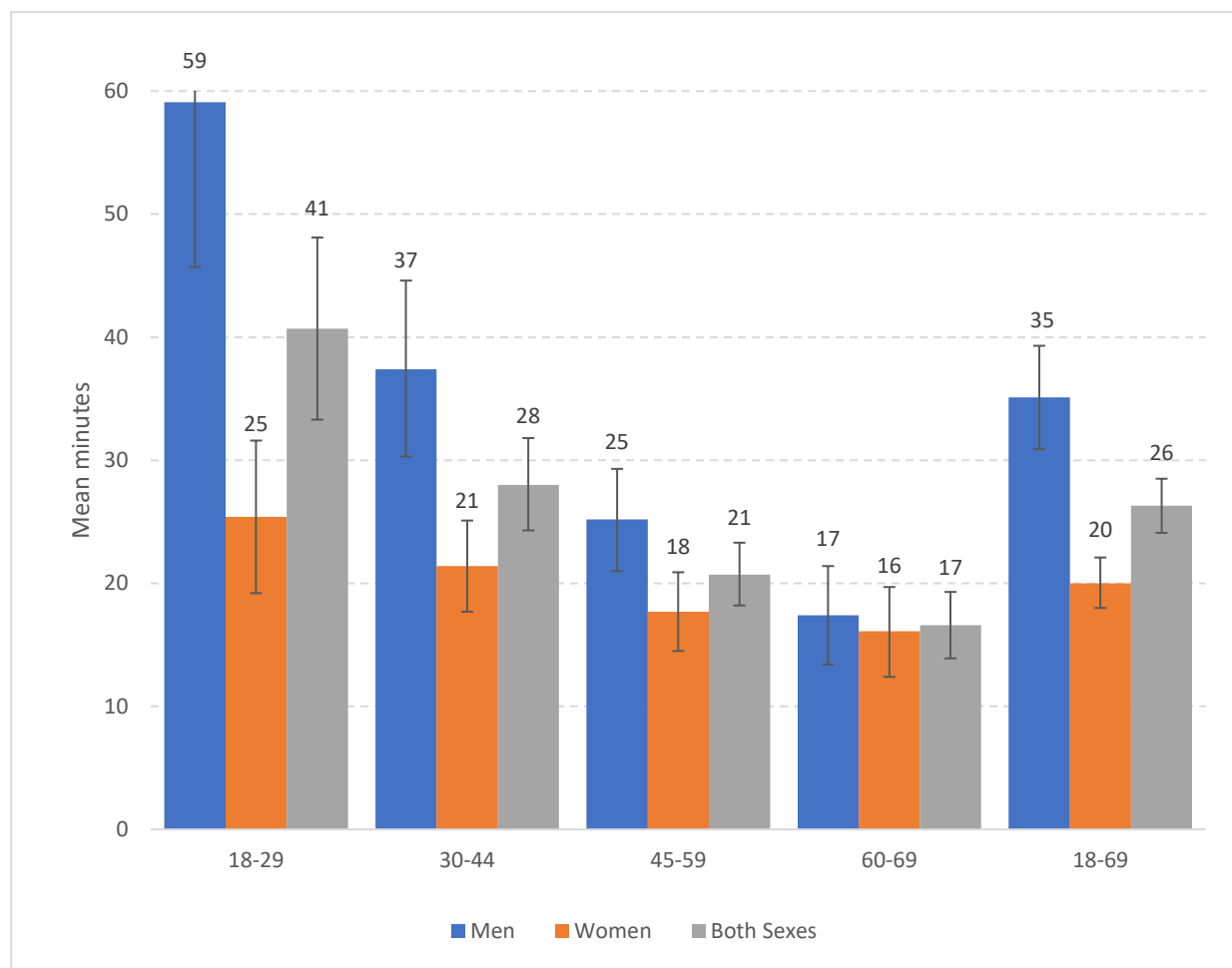
**Figure 23. Percentage of adults 18-69 with insufficient physical activity, by age group and sex**



Among the Aruban population, 227.8 minutes are spent on total physical activity (at work, travel to/ from places, and recreational activities) on average, per day. This was significantly more among men (267.8 minutes) compared to women (199.2 minutes). Younger men (18-29 years) spent significantly more time on physical activity (323 minutes) on average per day than women (190 minutes).

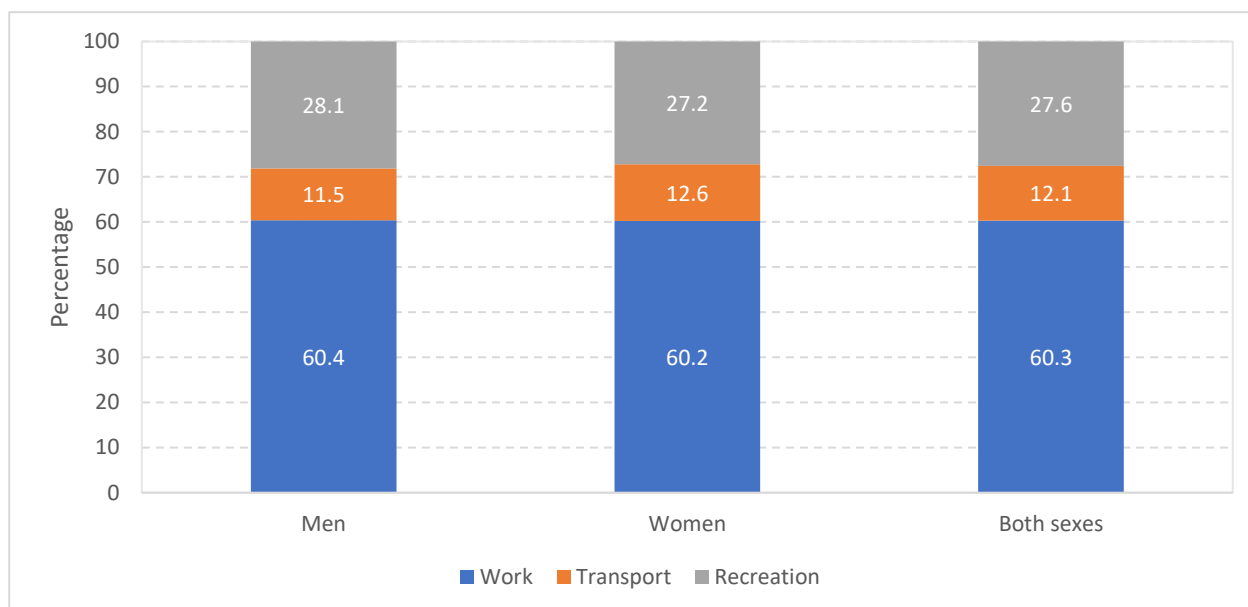
When looking at recreational-related physical activity, the Aruban population spent an average of 26 minutes per day on this. Again, the largest difference was observed among the youngest age group (18-29 years); on average, men spent 59 minutes and women spent 25 minutes on recreational activity per day. A total of 44% of the men and 56% of the women were not doing any recreation-related physical activity (Figure 24).

**Figure 24. Mean minutes of recreation-related physical activity per day, by age group and sex**



When looking at physical activity during work, when travelling to and from places, and during recreation, most physical activity among the people occurred during working hours. 12% of the people reported to be physically active when travelling to/ from places, 28% reported recreational physical activity, and more than 60% was physically active during work (Figure 25).

**Figure 25. Percentage of adults 18-69 by composition of total physical activity, by sex**



## Body mass index

The body mass index (BMI) provides an indication of a person's health status. It is calculated as their weight in kilograms divided by the square of the person's height in meters ( $\text{kg/m}^2$ ) (WHO 2010). The following classification of BMI is made: underweight (BMI:  $<18.5$ ), normal weight (BMI: 18.5-24.9), overweight (BMI: 25.0-29.9) and obese (BMI:  $\geq 30.0$ ). Table 4 provides an overview of the mean BMI by age and sex. Women who were pregnant at the time of participation in the survey were excluded. Among the whole population, 1% is underweight, 20% has a normal weight, 33% is overweight and 46% is obese. Women showed a higher prevalence of obesity (48%) compared to men (43%). For men, the highest prevalence of obesity was observed among the 45-59 year old (51%), while the highest obesity numbers for women were observed in the 60-69 age category (53%).



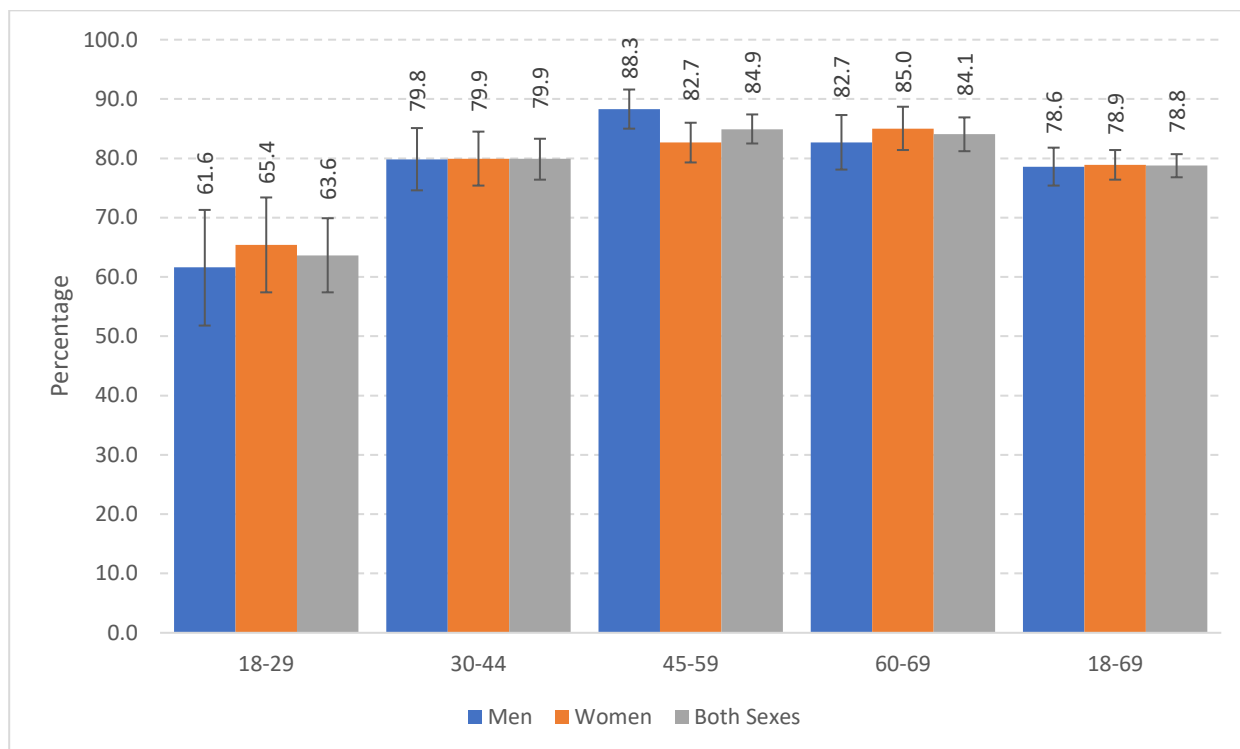
**Table 4. Percentage of adults 18-69, by BMI classification, age group and sex**

	Men				Women				Both sexes			
	<i>Under weight</i>	<i>Normal weight</i>	<i>Over weight</i>	<i>Obese</i>	<i>Under weight</i>	<i>Normal weight</i>	<i>Over weight</i>	<i>Obese</i>	<i>Under weight</i>	<i>Normal weight</i>	<i>Over weight</i>	<i>Obese</i>
<b>18-29</b>	1.1	37.3	31.3	30.2	4.1	30.5	26.3	39.1	2.7	33.6	28.6	35.0
<b>30-44</b>	0.4	19.7	34.0	45.9	0.6	19.4	30.5	49.4	0.6	19.6	32.0	47.9
<b>45-59</b>	0.6	11.1	36.9	51.4	0.4	16.9	33.0	49.6	0.5	14.6	34.6	50.4
<b>60-69</b>	0.9	16.5	42.7	40.0	0.5	14.5	32.5	52.5	0.6	15.3	36.7	47.4
<b>Total</b>	<b>0.7</b>	<b>20.7</b>	<b>35.8</b>	<b>42.8</b>	<b>1.2</b>	<b>19.9</b>	<b>30.9</b>	<b>48.0</b>	<b>1.0</b>	<b>20.2</b>	<b>32.9</b>	<b>45.8</b>

As illustrated by Figure 26, a large proportion of the Aruban population has an unhealthy weight, with 79% having a BMI of 25 or higher. No differences were observed between men and women throughout age groups. Even though overweight prevalence increases with age, the majority of the youngest age group was already overweight. More specifically, 64% of 18–29 year old men and women has a BMI of 25 or higher.



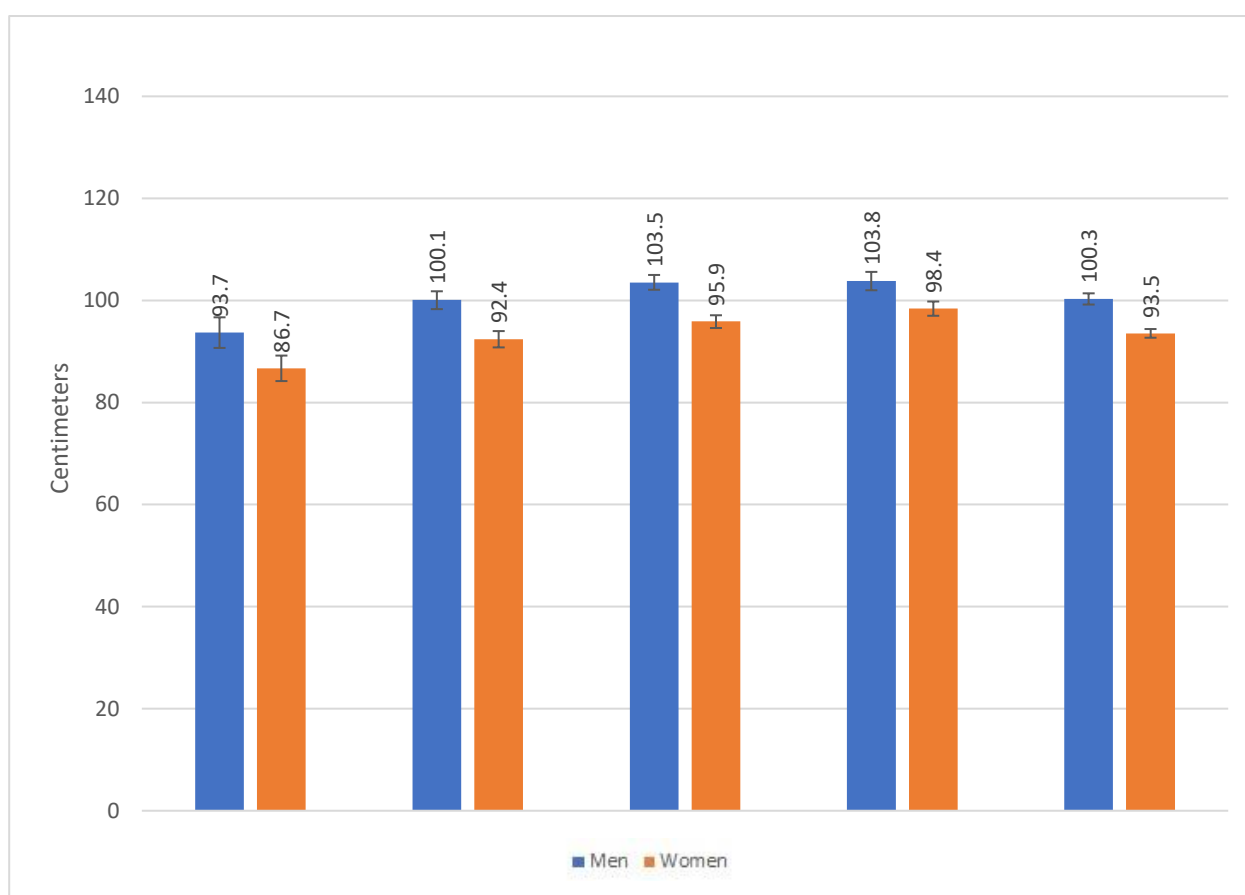
**Figure 26. Percentage of adults 18-69, classified as overweight (BMI  $\geq 25$ ), by age group and sex**



## Waist and hip circumference

The waist-to-hip ratio (WHR) is calculated by dividing the measured waist circumference by the hip circumference. This ratio provides information on where body fat is stored and serves as an indirect indicator of intra-abdominal fat. A high WHR (WHR >0.85 for women and >0.9 for men) is related to an increased risk of developing type 2 diabetes, high cholesterol, high blood pressure and cardiovascular disease (WHO, 2011). A similar mean of 0.9 for WHR was observed for both men and women. The average waist circumference was 100.3 cm for men and 93.5 cm for women (Figure 27), while the mean hip circumference showed an average of 106 cm for men and 108.6 cm for women.

**Figure 27. Mean waist circumference in cm of adults 18-69, by age group and sex**

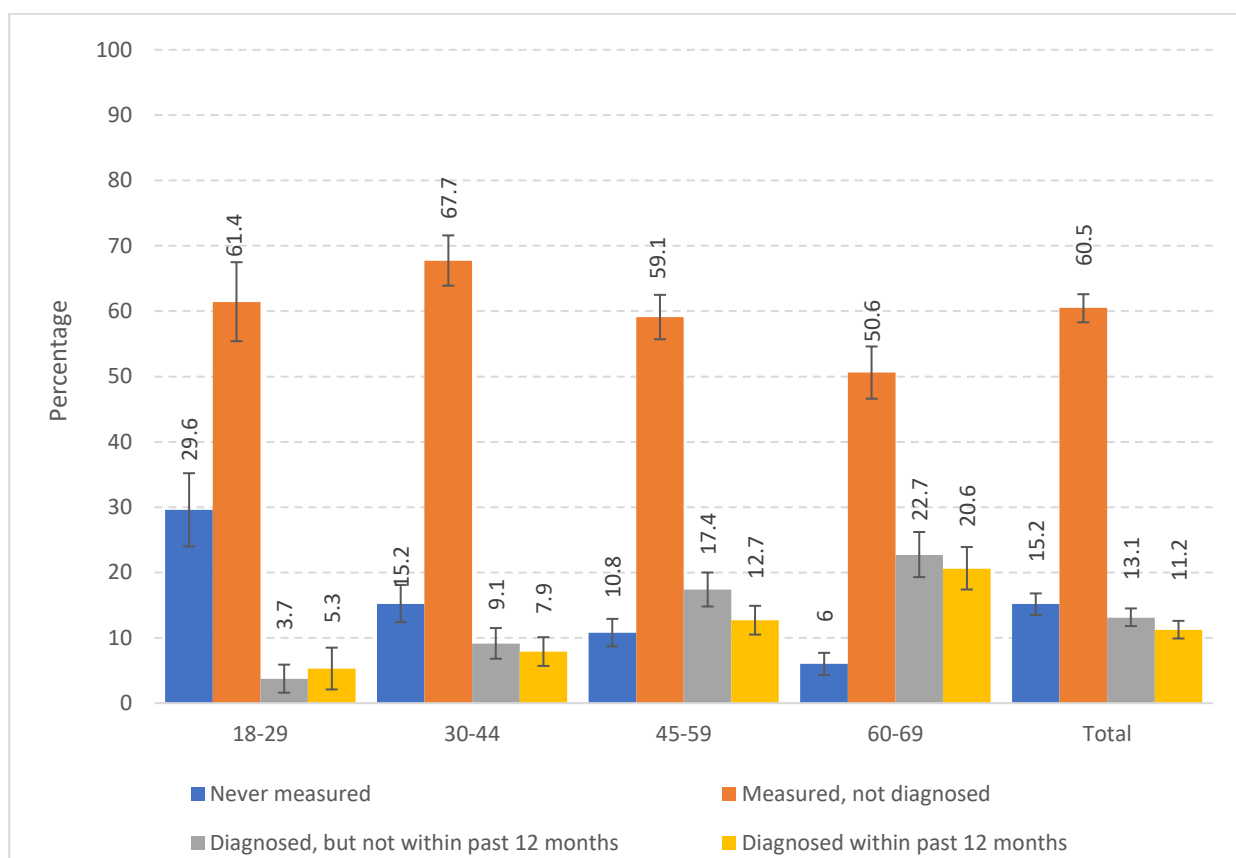


## Blood pressure

### History of raised blood pressure

Figure 28 shows the percentage of persons whose blood pressure has ever been measured and whether or not they were diagnosed. About 60% of the people measured their blood pressure, but were not diagnosed. 24% had been diagnosed either within the past 12 months (11%) or beyond (13%). The highest percentage of persons who had never measured their blood pressure were those aged 18-29 years (30%).

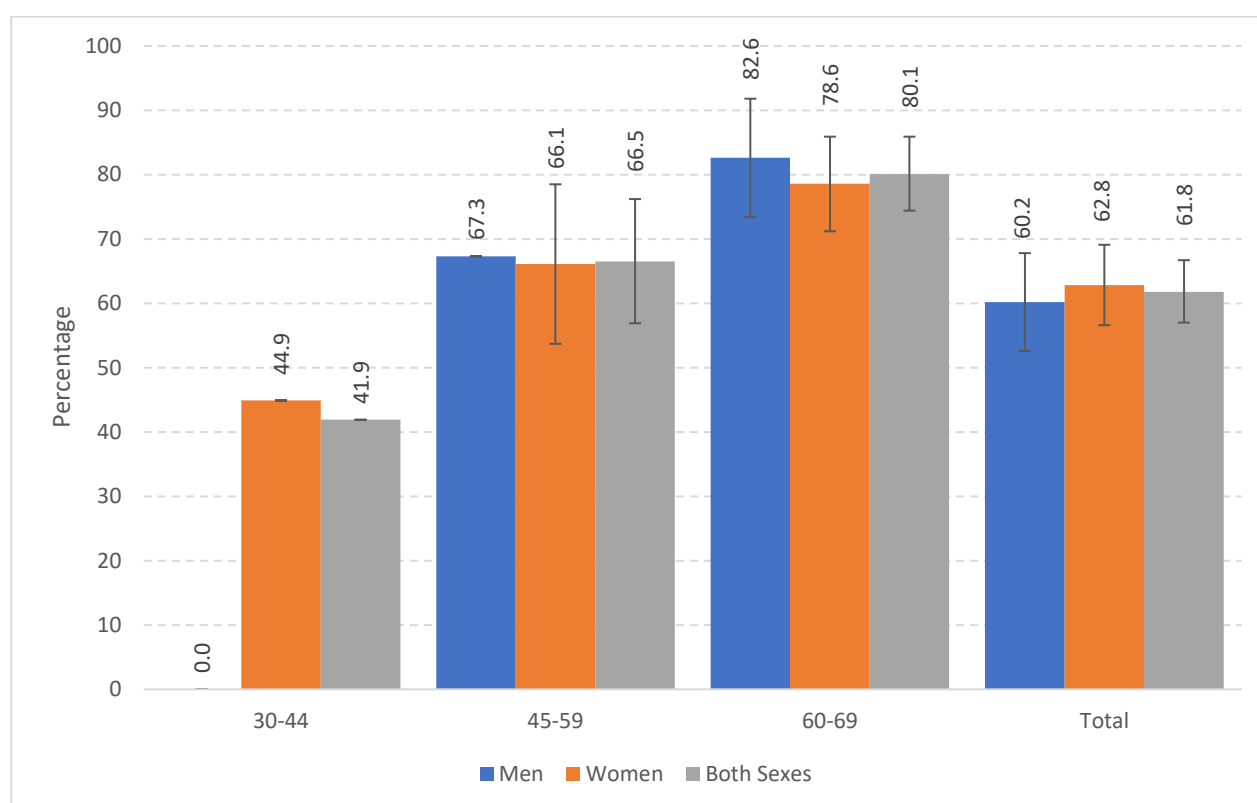
**Figure 28. Percentage of adults 18-69 by blood pressure measurement and diagnosis, by age group**



Of those who have ever been diagnosed with raised blood pressure, 60% of the men and 63% of the women reported that they are currently taking medication prescribed by a doctor or health worker. The young adults (18-29 years) and 30-44 year old men are not included in the graph, as the findings are based on less than 50 cases (Figure 29).

People who had previously been diagnosed with raised blood pressure, were also asked whether they had sought advice or received treatment from a traditional healer. Almost 4% of the Aruban population had seen a traditional healer, and 22% were currently taking herbal medication or a traditional remedy for raised blood pressure.

**Figure 29. Percentage of adults 18-69 currently taking medication for raised blood pressure prescribed by doctor or health worker among those previously diagnosed, by age group and sex**

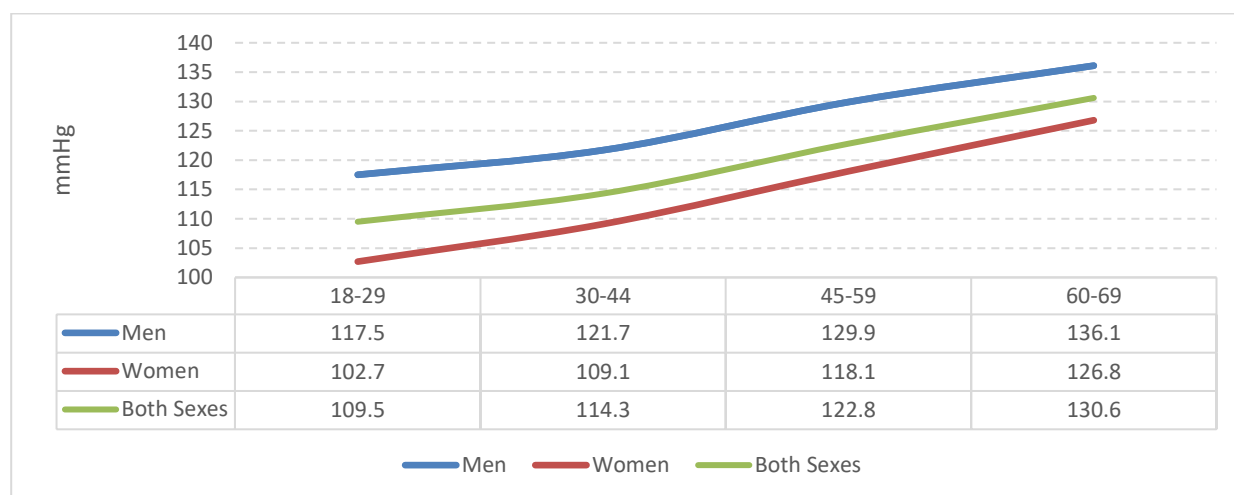


## Physical measurement of blood pressure

Raised blood pressure is defined as a systolic blood pressure of  $\geq 140$  mmHg and/or a diastolic blood pressure of  $\geq 90$  mmHg (WHO, 2023). An increase in age was significantly related to an increase of systolic blood pressure for both men and women. The young adults (18-29 years) had an average systolic blood pressure of 109.5 mmHg, compared to an average of 130.6 mmHg among the older adults (60-69 years) (Figure 30). Systolic blood pressure was significantly higher for men than for women.



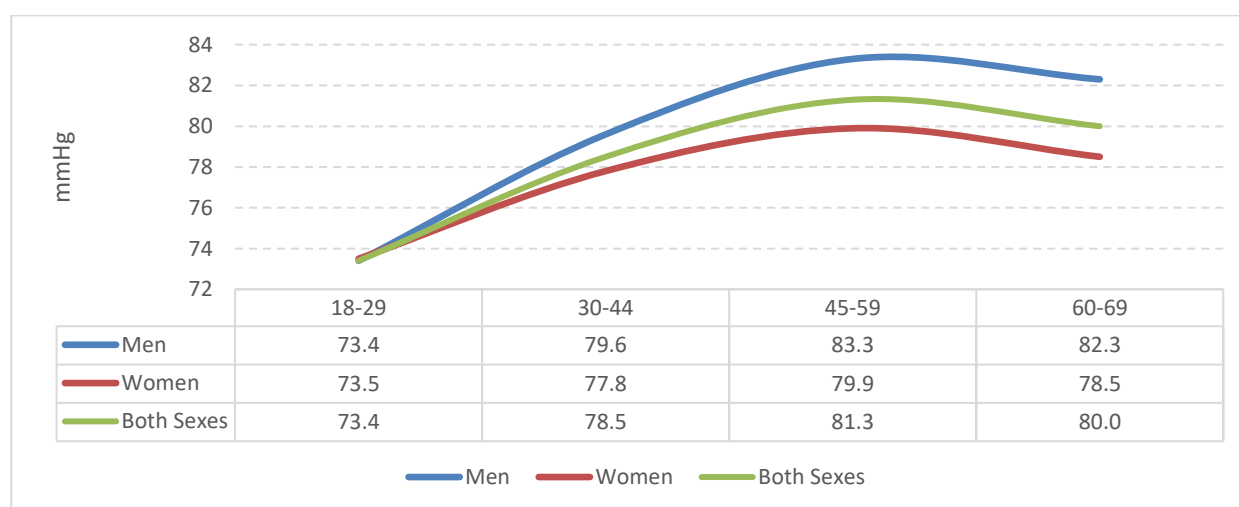
**Figure 30. Mean systolic blood pressure (mmHg) among adults 18-69, by age group and sex**



Diastolic blood pressure also increased with age between 18-59 years, whereas it decreased between 60-69 years. There was no sex difference observed among the young adults (18-29 years). Afterwards, men showed a higher mean diastolic blood pressure compared to women throughout the remaining age groups, however differences were not significant (Figure 31).



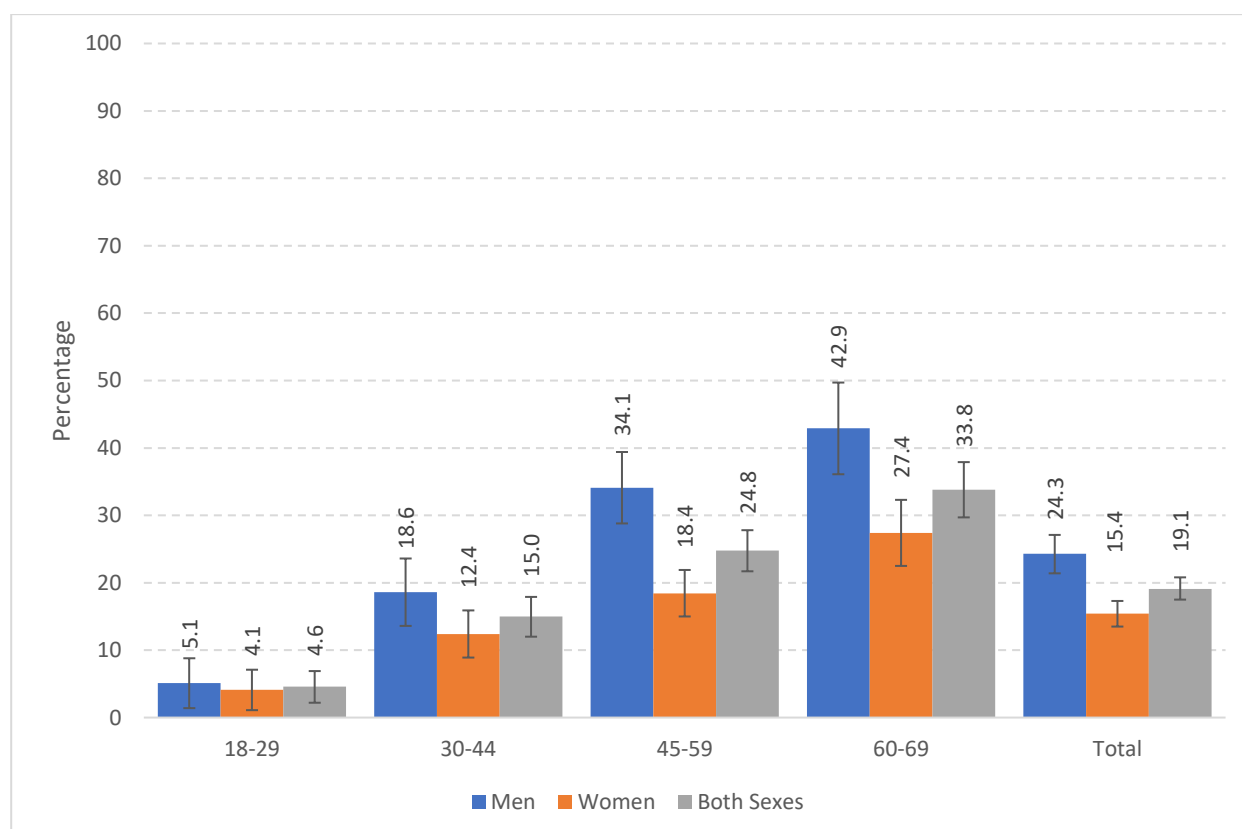
**Figure 31. Mean diastolic blood pressure (mmHg) among adults 18-69, by age group and sex**



In total, 19% of the population had raised blood pressure (SBP  $\geq 140$  and/or DBP  $\geq 90$  mmHg). This was significantly more common among men (24%) compared to women (15%). Furthermore, age was also significantly related to raised blood pressure. Almost 5% of the young adults (18-29 years) showed raised blood pressure, while 34% of the older adults (60-69 years) had raised blood pressure (Figure 32).

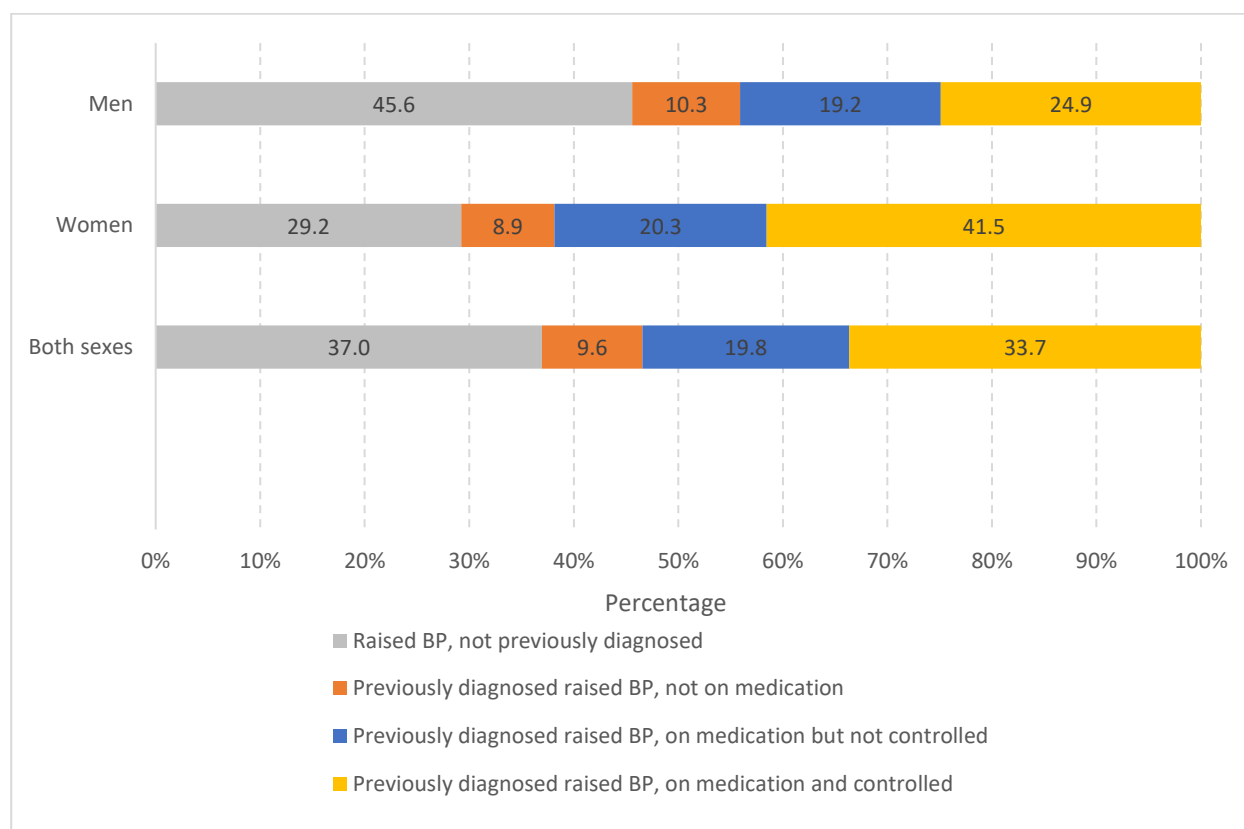


**Figure 32. Percentage of adults 18-69 with raised blood pressure (SBP  $\geq 140$  and/or DBP  $\geq 90$  mmHg), by age group and sex**



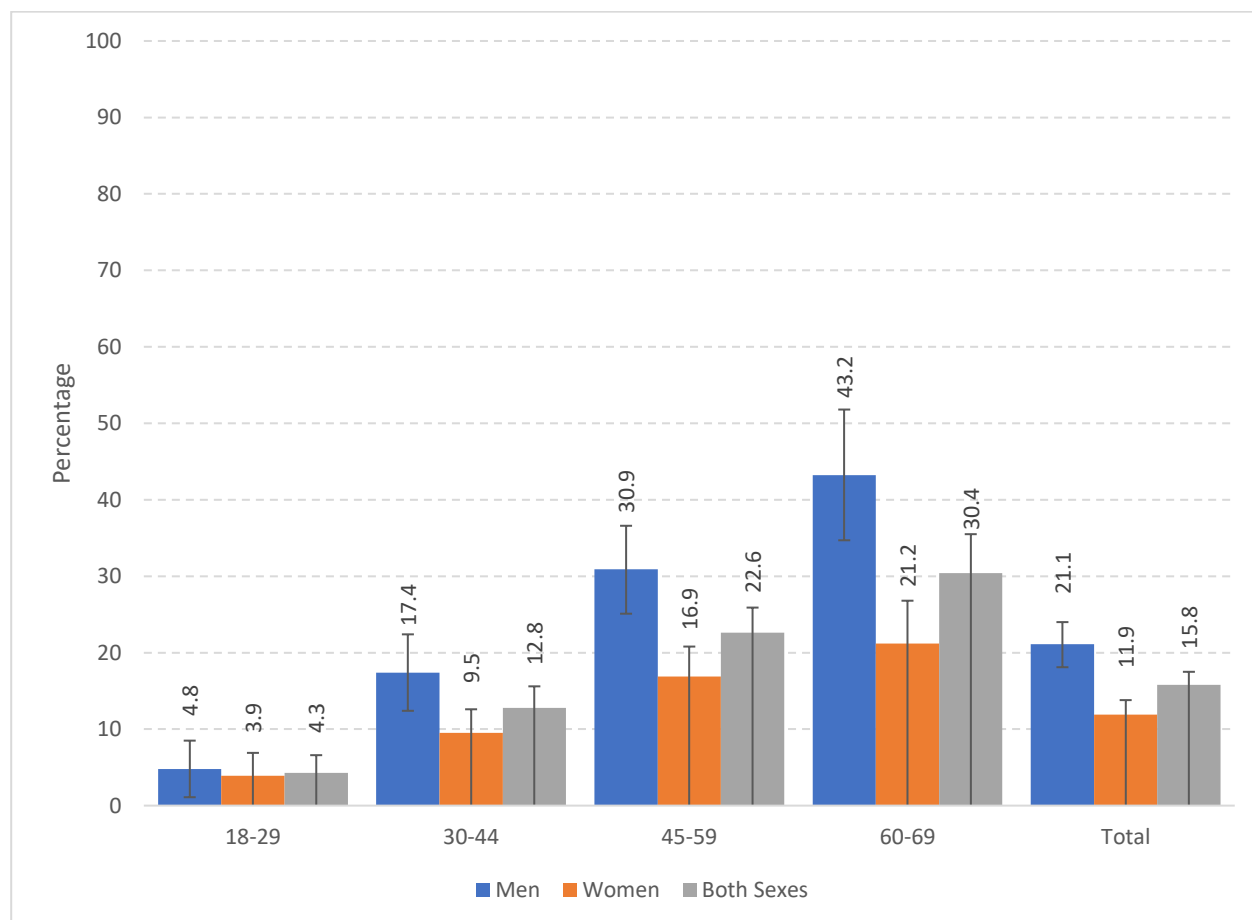
Among those with raised blood pressure (SBP  $\geq 140$  and/or DBP  $\geq 90$  mmHg) or currently on medication for raised blood pressure, 34% had a previous diagnosis of raised blood pressure, is on medication and is controlled. Hypertension control was significantly higher among women (42%) than men (25%). About 20% of adults with hypertension were previously diagnosed, on medication, but still have raised blood pressure. One in every 10 persons had a previously raised blood pressure diagnosis, but was not taking medication. About 37% of the population has raised blood pressure, but has not been previously diagnosed. This was more common among men (46%) than women (29%) (Figure 33).

**Figure 33. Hypertension cascade of care among adults 18-69 with raised blood pressure (SBP  $\geq 140$  and/or DBP  $\geq 90$  mmHg) or currently on medication, by sex**



When excluding those on medication for raised blood pressure, 16% of the Aruban population had raised blood pressure. Raised blood pressure is the highest among the oldest population (60-69 years), though age was not a statistically significant factor. There was a significant difference between sex as men were more likely to have raised blood pressure compared to women (Figure 34).

**Figure 34. Percentage of adults 18-69 with raised blood pressure, excluding those on medication for raised blood pressure, by age group and sex**

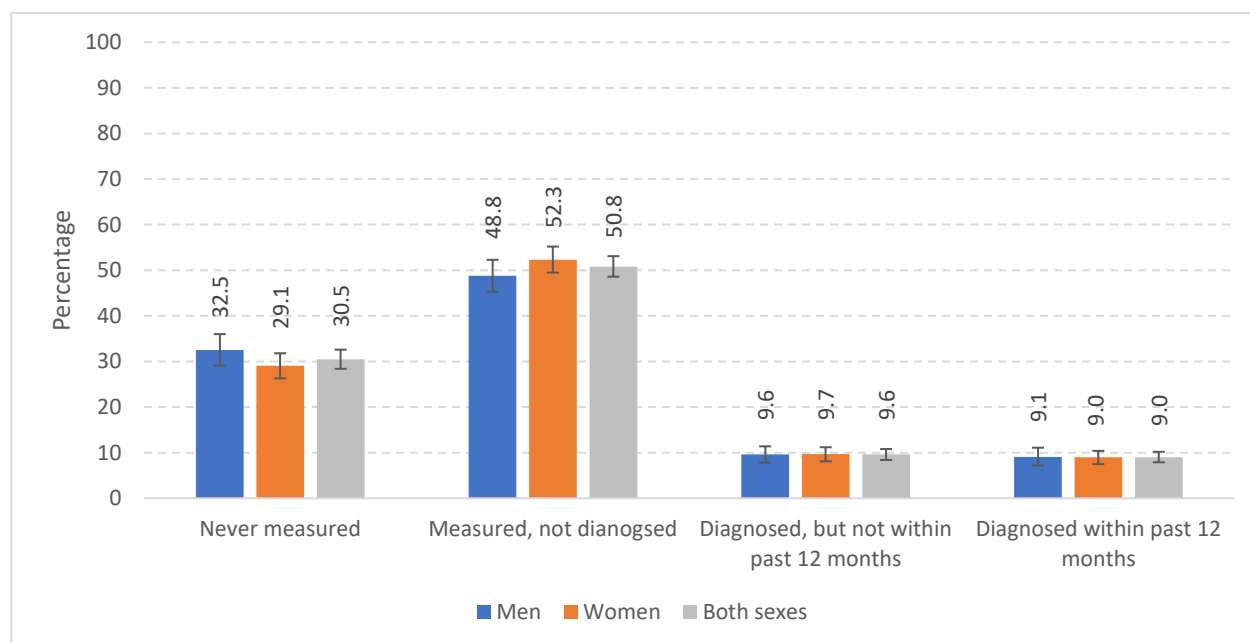


# Cholesterol

## History of raised total cholesterol

Figure 35 indicates that 31% has never measured their cholesterol, and 51% have, but were not diagnosed. Nine percent of the people were diagnosed with raised total cholesterol within the past year, and 10% were diagnosed but not within the past 12 months.

**Figure 35. Total cholesterol measurement and diagnosis of adults 18-69, by sex**



Of those previously diagnosed with raised cholesterol, 32% are currently taking medication for raised total cholesterol. No sex differences were observed. Only 2% of the people sought advice from a traditional healer, and 19% were currently taking herbal or traditional treatment for their raised cholesterol levels.

## Biochemical measurement of total cholesterol

Besides self-reported history of diagnosis of raised cholesterol, biochemical measurements (fasting cholesterol) were collected. Measurements of people were taken in the morning, after at least 12 hours of not eating or drinking (other than water) through a finger prick. People were also asked whether they had taken insulin or other medication prescribed by a doctor or other health worker.

The mean total cholesterol among the Aruban population, including those currently on medication for raised cholesterol, is presented in Figure 36. The mean total cholesterol was 4.6 mmol/L for women, and 4.1 mmol/L for men. The population average is 4.4 mmol/L.



**Figure 36. Mean total cholesterol (mmol/L), by sex**

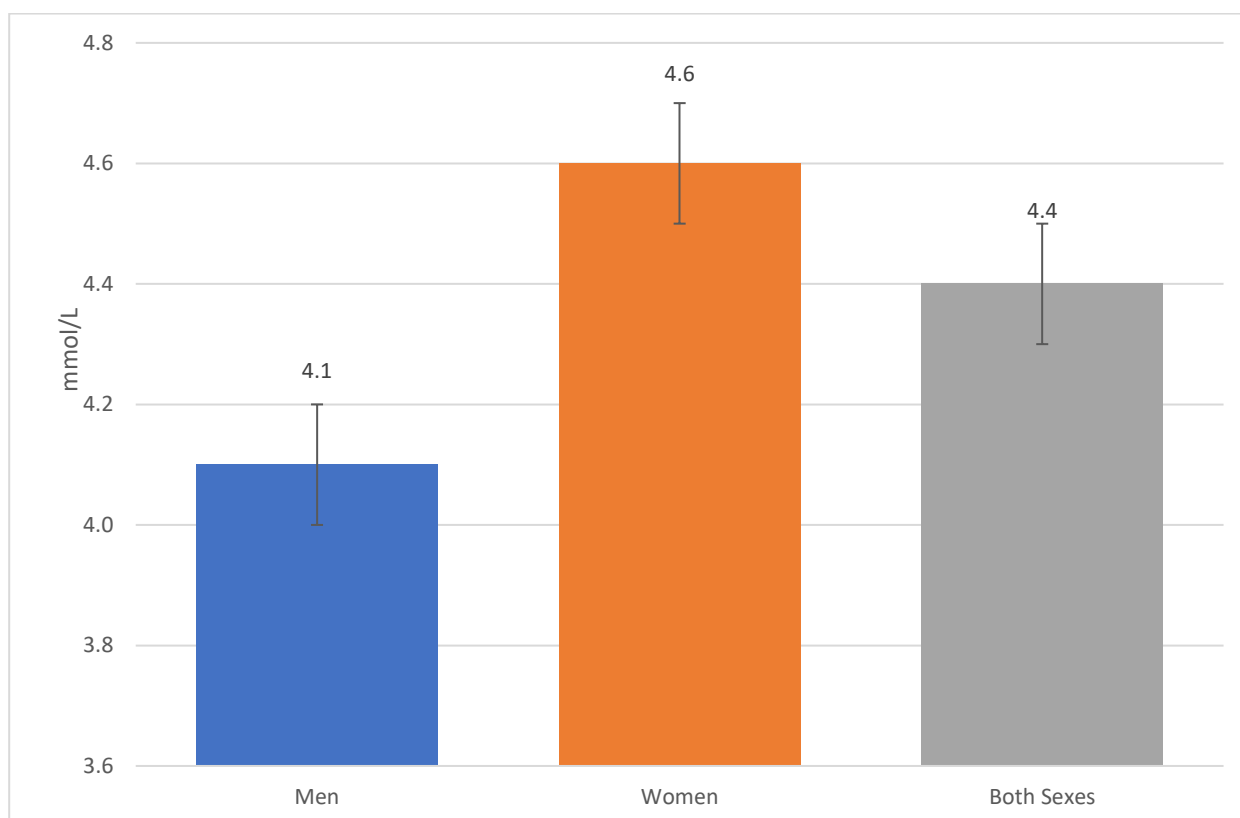
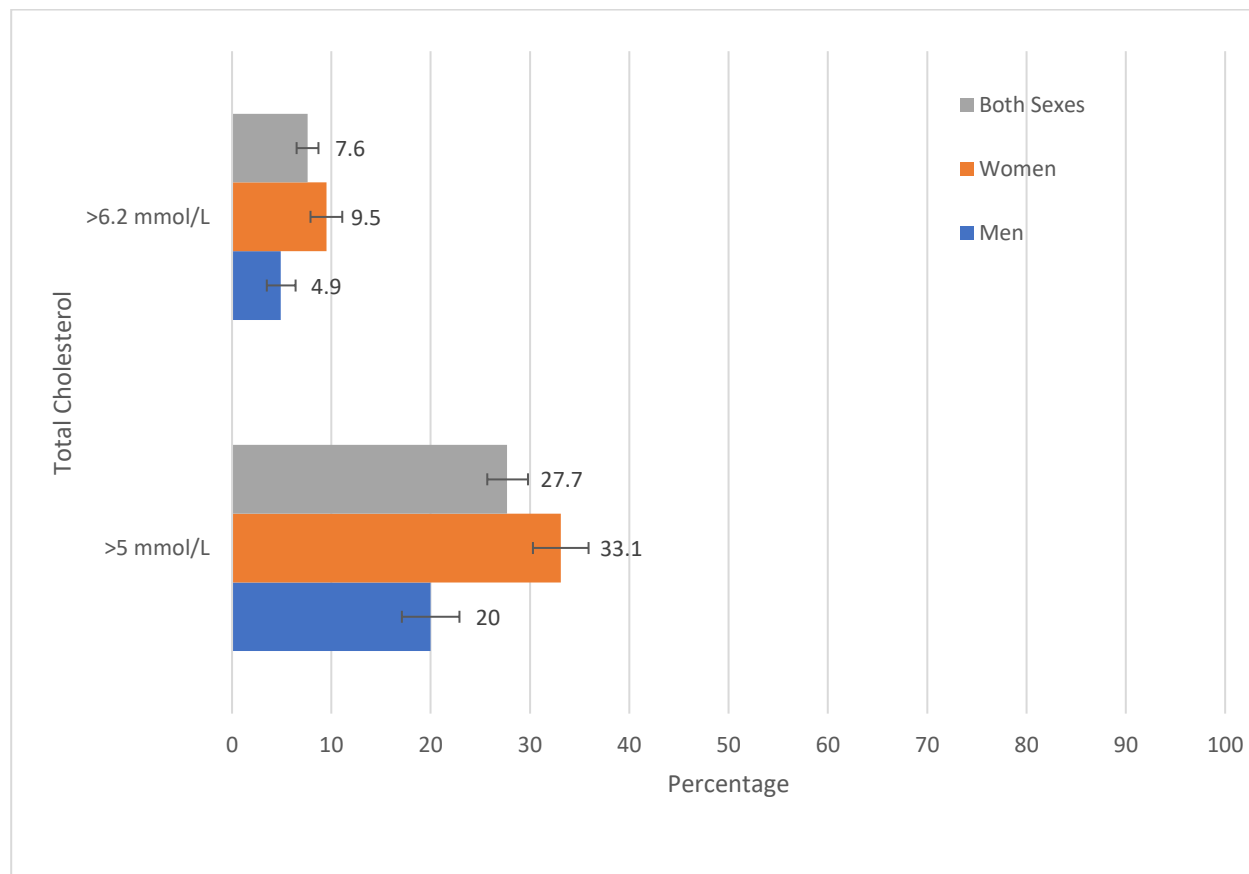


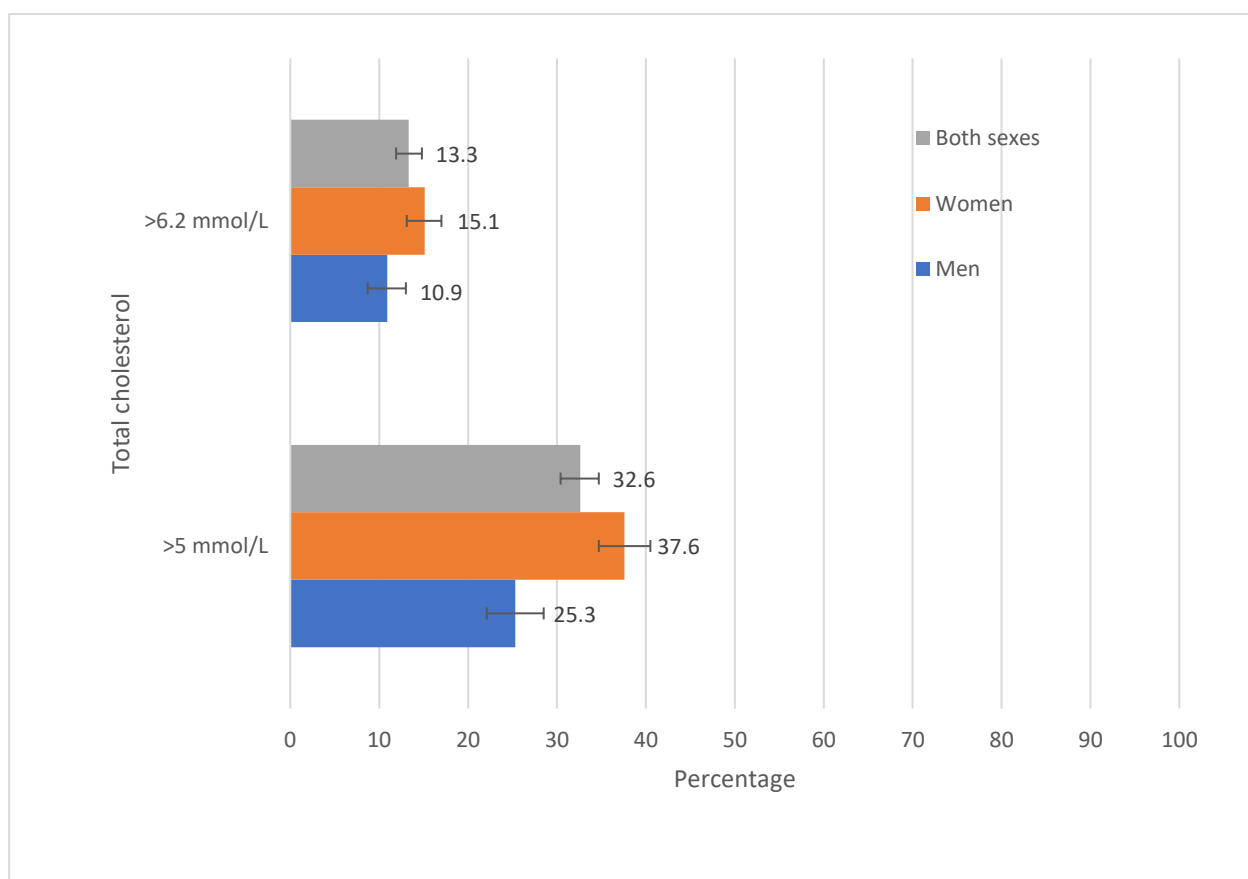
Figure 37 showcases the raised total cholesterol by sex among the Aruban population, defined as total cholesterol levels of  $\geq 5.0$  mmol/L or above. Almost 28% of the people falls into the category with a cholesterol of 5.0 mmol/L or higher, with women having significantly higher levels (33%) compared to men (20%). Nearly 8% of the population had a total cholesterol of 6.2 mmol/L or higher.

**Figure 37. Percentage of adults 18-69 with raised total cholesterol, by sex**



Almost 33% of the population had a raised cholesterol of 5.0 mmol/L or more, or is currently taking medication. More women had higher cholesterol levels (38%) compared to men (25%). When looking at total cholesterol levels of  $\geq 6.2$  mmol/L or who is taking medication, 13% of the people revealed having this, of which 11% of men and 15.1% of women (Figure 38).

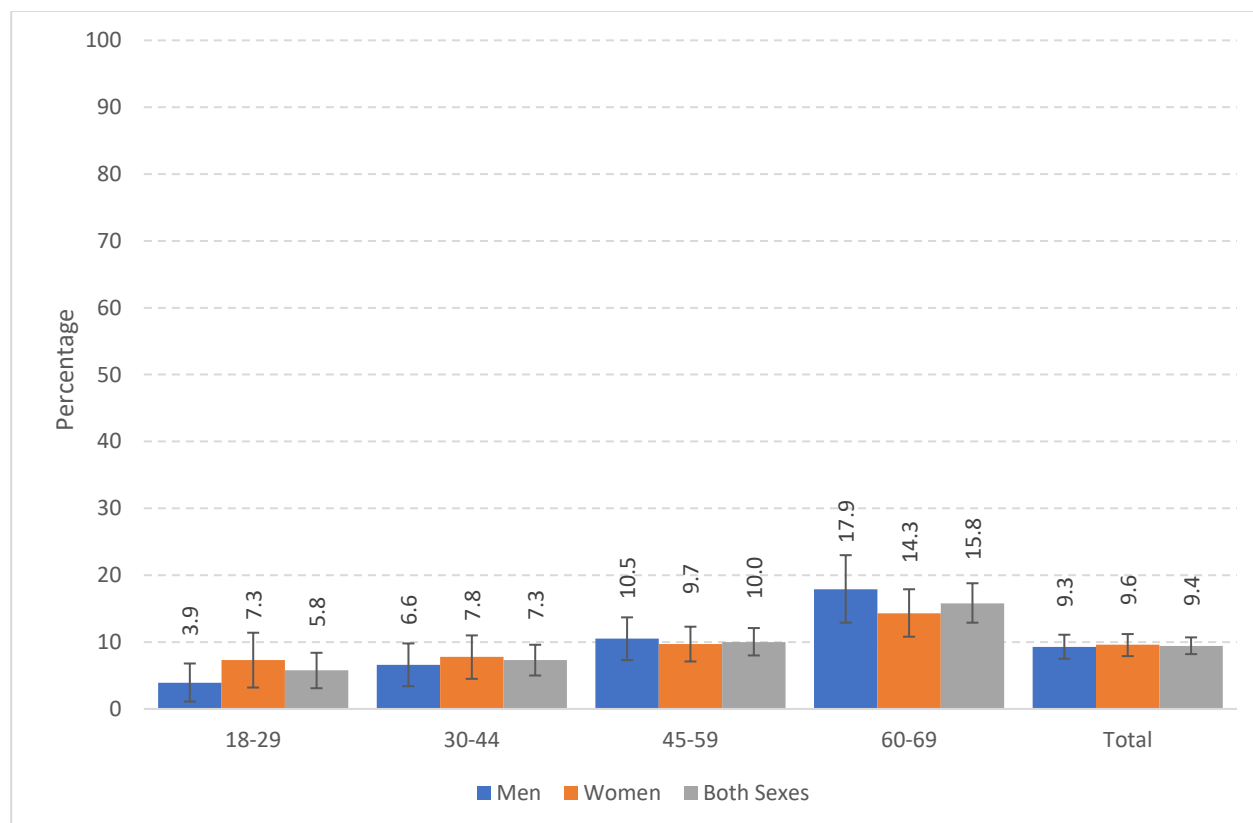
**Figure 38. Percentage of adults 18-69 with raised total cholesterol or on medication for raised cholesterol, by sex**



## History of cardiovascular diseases

In total, 9% of the Aruban population ever had a heart attack or chest pain from heart disease (angina) or a stroke. Higher percentages of both men and women were reported amongst older age groups (45-69 years), but neither age nor sex was found to be statistically significant (Figure 39). Almost 5% of the people are regularly taking aspirin to prevent or treat heart disease. Statins are taken by 4% of the population for the same reason.

**Figure 39. Percentage of adults 18-69 who reported ever having a heart attack or chest pain from heart disease or a stroke, by age group and sex**

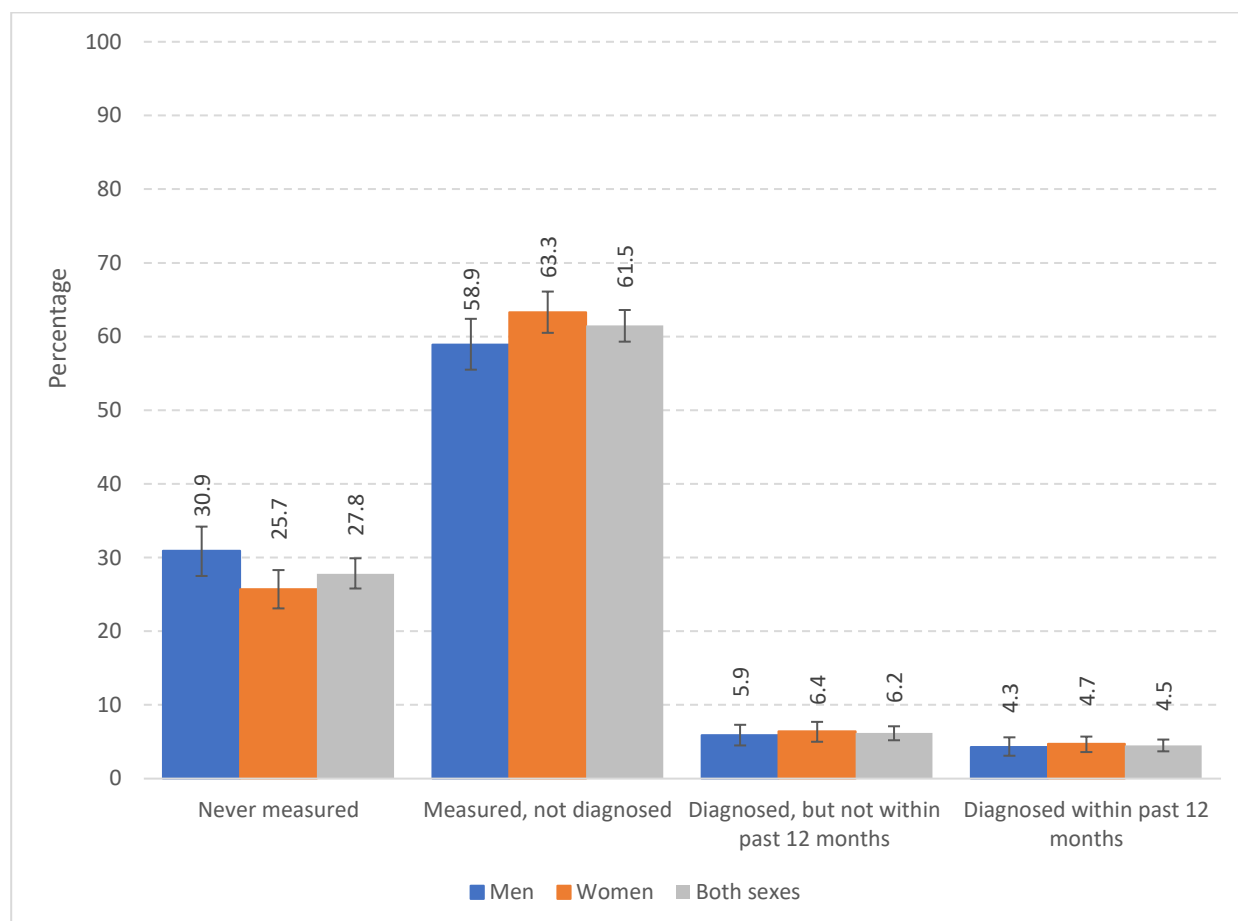


# Diabetes

## History of diabetes

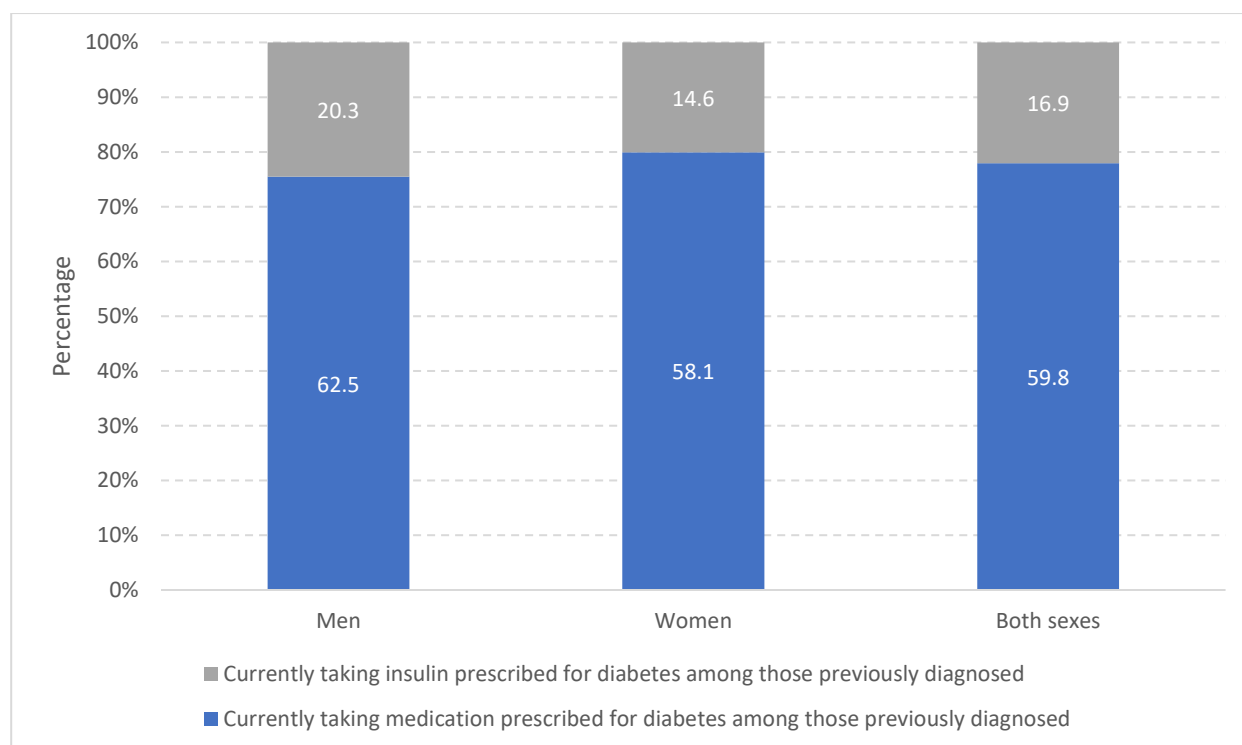
Almost 28% of the Aruban population never had a blood sugar measurement. This percentage is higher for men (31%) than for women (26%). Two-thirds of the population was measured before; however, diabetes was not diagnosed (Figure 40).

**Figure 40. Percentage of adults 18-69 by blood sugar measurement and diagnosis, by sex**



Of those who were previously diagnosed with raised blood sugar or diabetes, 60% indicated that they are currently taking medication for diabetes prescribed by a doctor or other health worker in the past two weeks. About 17% were currently taking prescribed insulin (Figure 41). Among those previously diagnosed, 4% visited a traditional healer, and 24% are currently taking herbal medication or traditional treatments for diabetes.

**Figure 41. Percentage of adults 18-69 previously diagnosed with diabetes and on medication for diabetes, by sex**



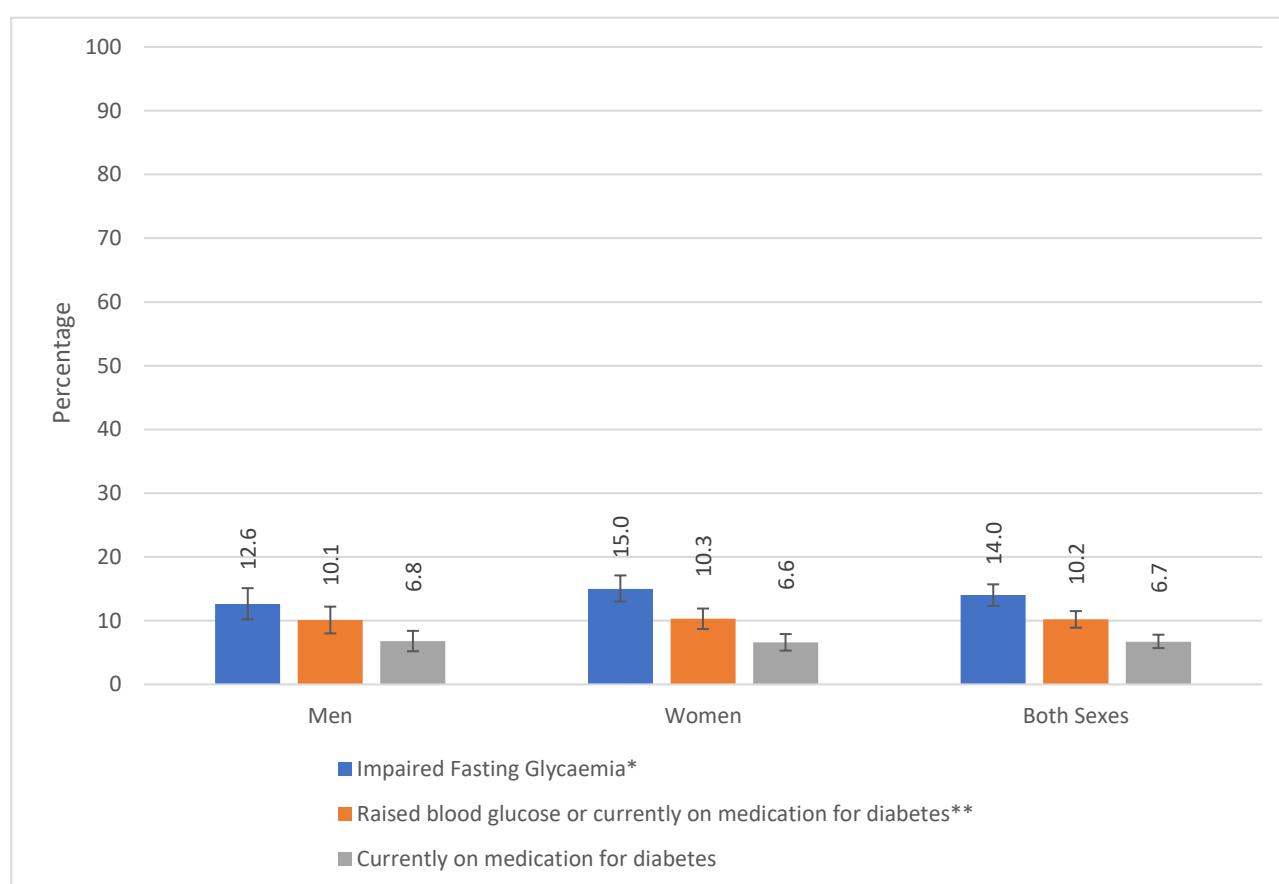
Among those previously diagnosed with diabetes, 61% received at least two HbA1C tests in the past year. Additionally, less than half (47%) of the people who have been diagnosed with diabetes had their eyes checked in the past two years, and only 38% had their feet examined in the past year. There was no difference between sex.

## Biochemical measurement of fasting blood glucose

Blood glucose level was measured by a drop of blood from a finger prick, to get a blood glucose reading using a dry chemistry analyzer. The mean fasting blood glucose was 5.6 mmol/L for both men and women.

The categorization of blood glucose levels and currently using medication for raised blood glucose is presented in Figure 42. Of the Aruban population, 14% had impaired fasting glycaemia (capillary whole blood value between  $\geq 5.6$  mmol/L and  $<6.1$  mmol/L). Hyperglycemia, or raised blood sugar, was defined as a blood value of  $\geq 6.1$  mmol/L. About 10% of all men and women had raised blood glucose, or is currently on medication for diabetes. Nearly 7% of the population was currently on medication for diabetes.

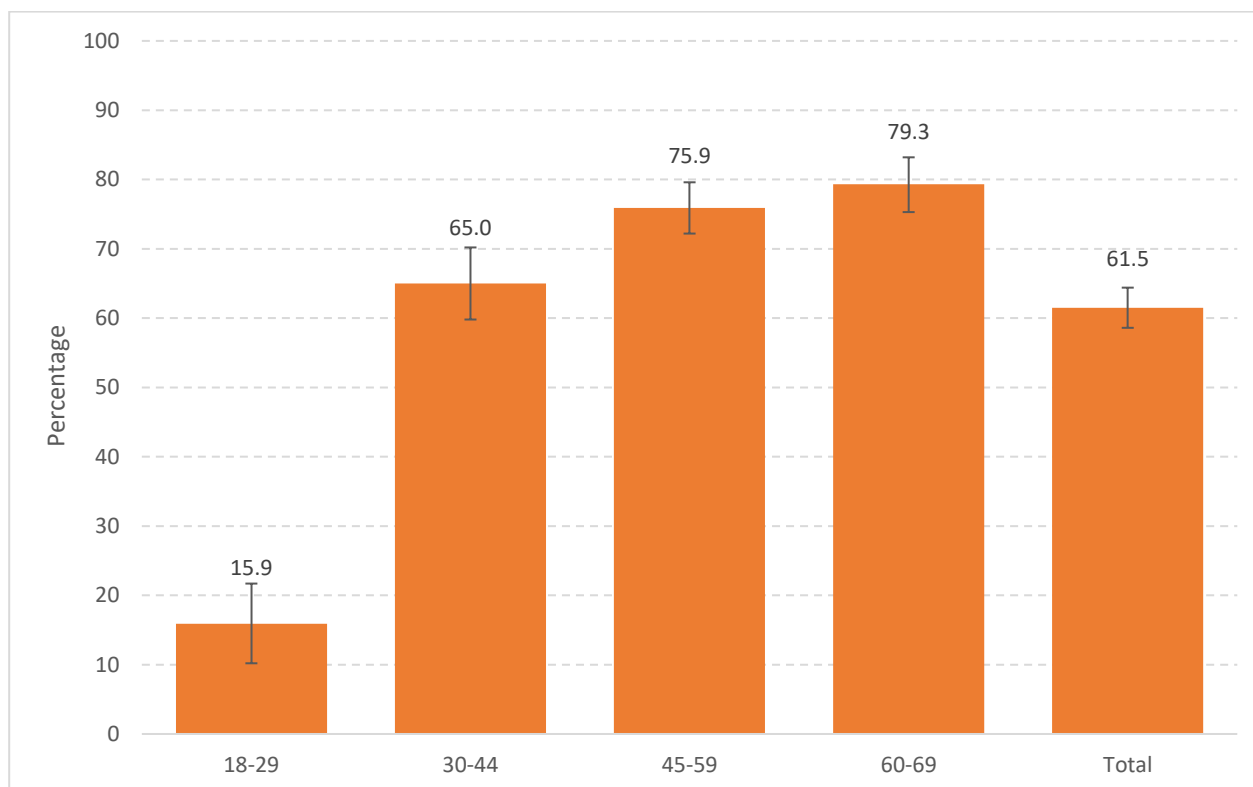
**Figure 42. Percentage of adults 18-69 by blood glucose level categories and currently using medication for raised blood glucose, by sex**



## Cervical cancer screening

Overall, 62% of women ever had a screening test for cervical cancer. Among the 30-44 year-old women, 65% ever had a screening test for cervical cancer. Nearly 80% of women aged 60-69 years were ever tested for cervical cancer (Figure 43). Tests included in the survey question were the Visual Inspection with Acetic Acid/Vinegar Pap smear, and the Human Papillomavirus test.

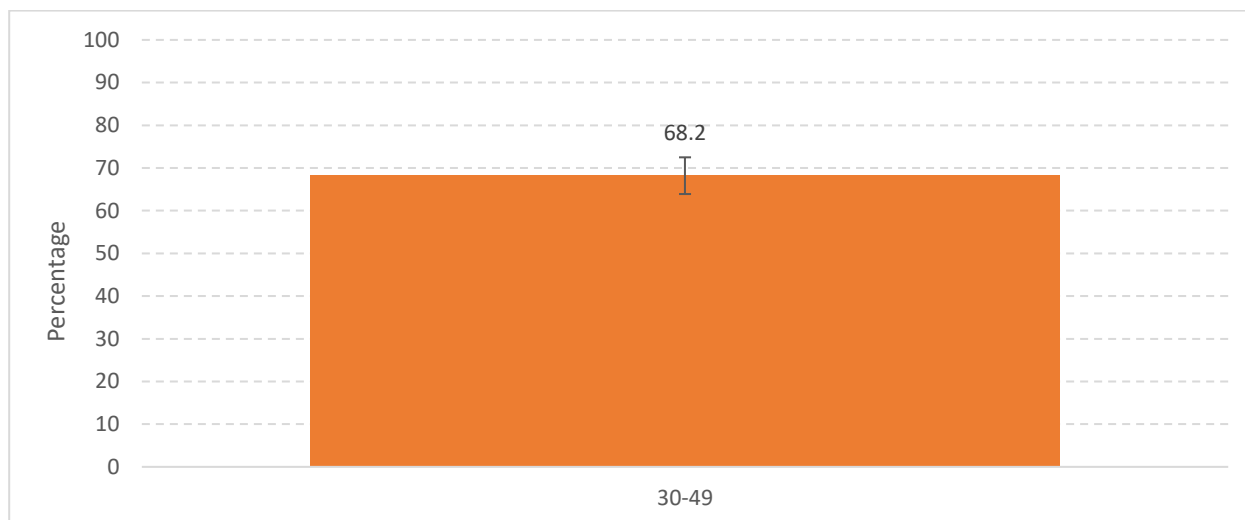
**Figure 43. Percentage of women 18-69 who ever had a screening test for cervical cancer, by age group**



Separate analyses were performed for the population-at-risk (30-49 year old women) for developing cervical cancer. Among this specific age group, 68% has ever had a screening test for cervical cancer (Figure 44).

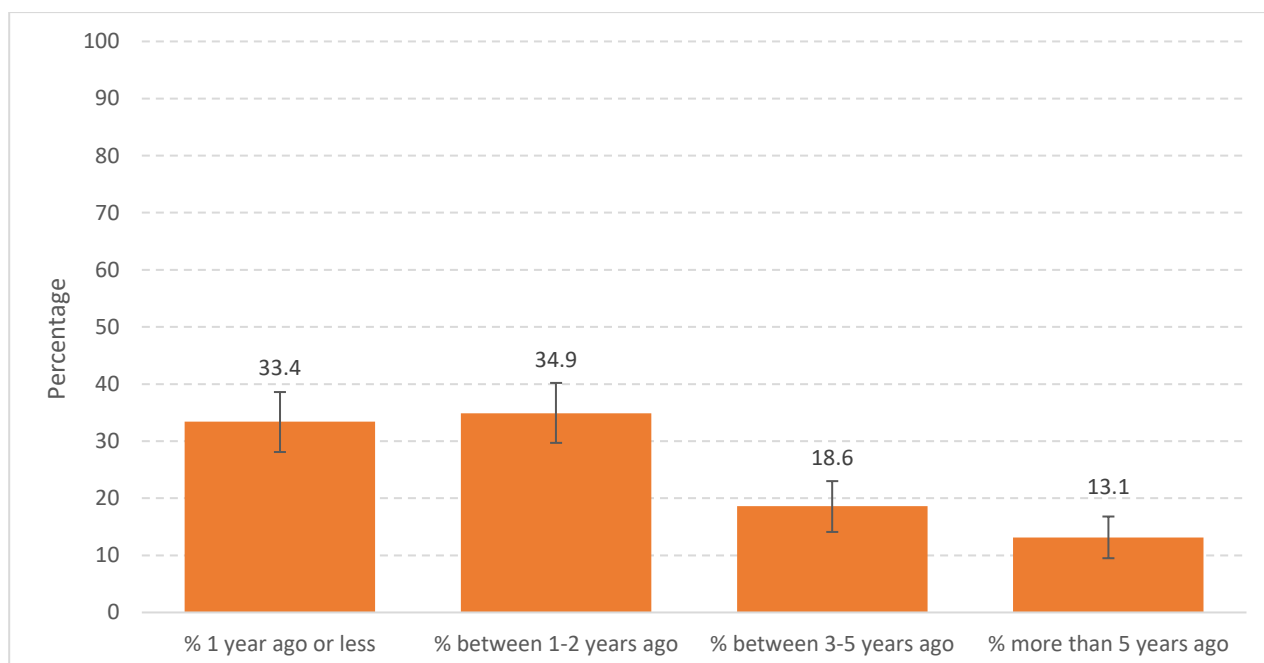


**Figure 44. Percentage of women 30-49 who ever had a screening test for cervical cancer**



Women were also asked when they were last tested for cervical cancer. About one third of women reported they did this in the last year, 35% mentioned this was done 1 to 2 years ago. Moreover, 19% of the women mentioned it was done 3 to 5 years ago, and 13% of the women mentioned it had been more than 5 years ago (Figure 45).

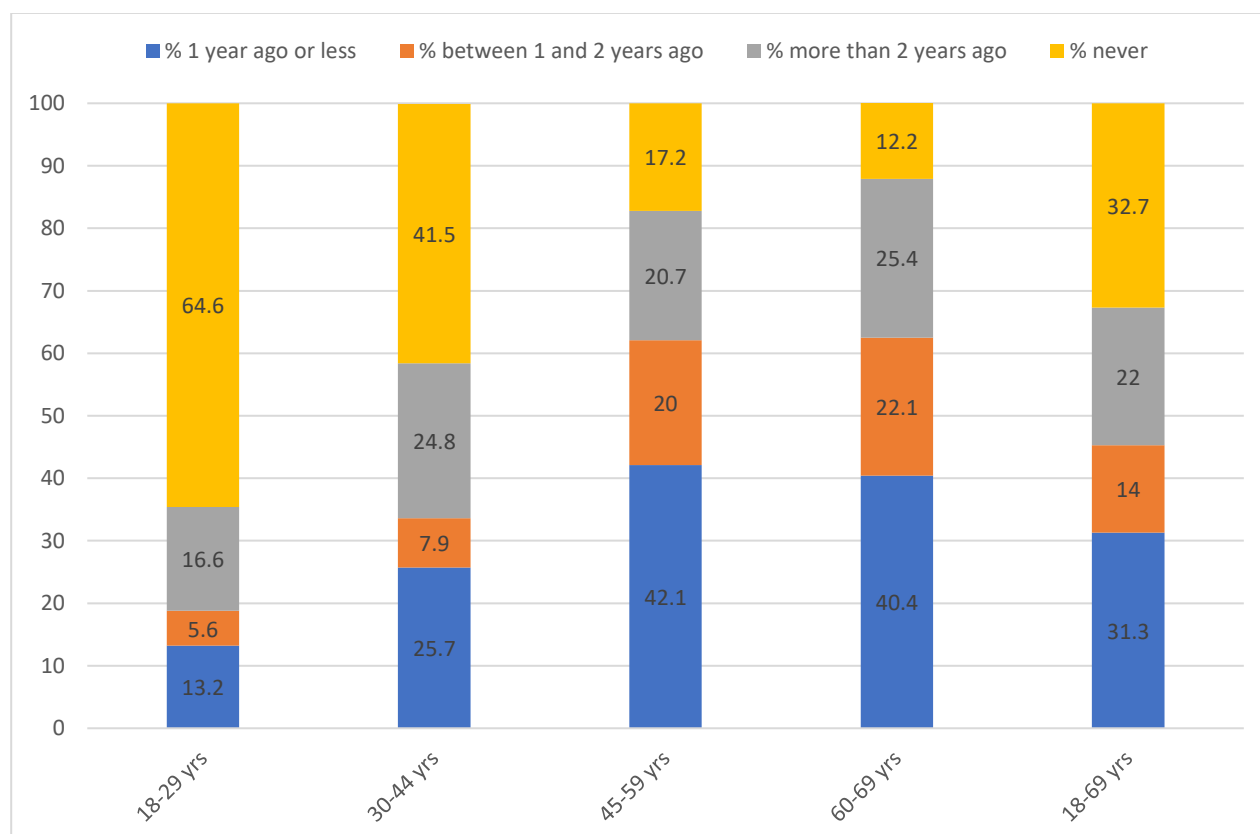
**Figure 45. Percentage of women 30-49 having their last screening test for cervical cancer**



## Breast cancer screening

Among the women, 33% never had a breast examination before. There is a significant difference between age. Only 12% of the 60-69 year old women, and 17% of the 45-59 year old women, never had an examination. More than 40% of the 30-44 year old and almost 65% of the 18-29 year old women never had a breast examination (Figure 46). More than half of the 18-44 year old women never have been informed how to do a breast examination.

**Figure 46. Percentage of women 18-69 having their last breast examination, by age group**



## Prostate cancer screening

When looking at prostate cancer screening, the majority of the 45-59 year old men (60%), and 60-69 year old men (77%) have been screened for prostate cancer. The screening was very low among the younger men, aged 18-44 year old (Table 5).

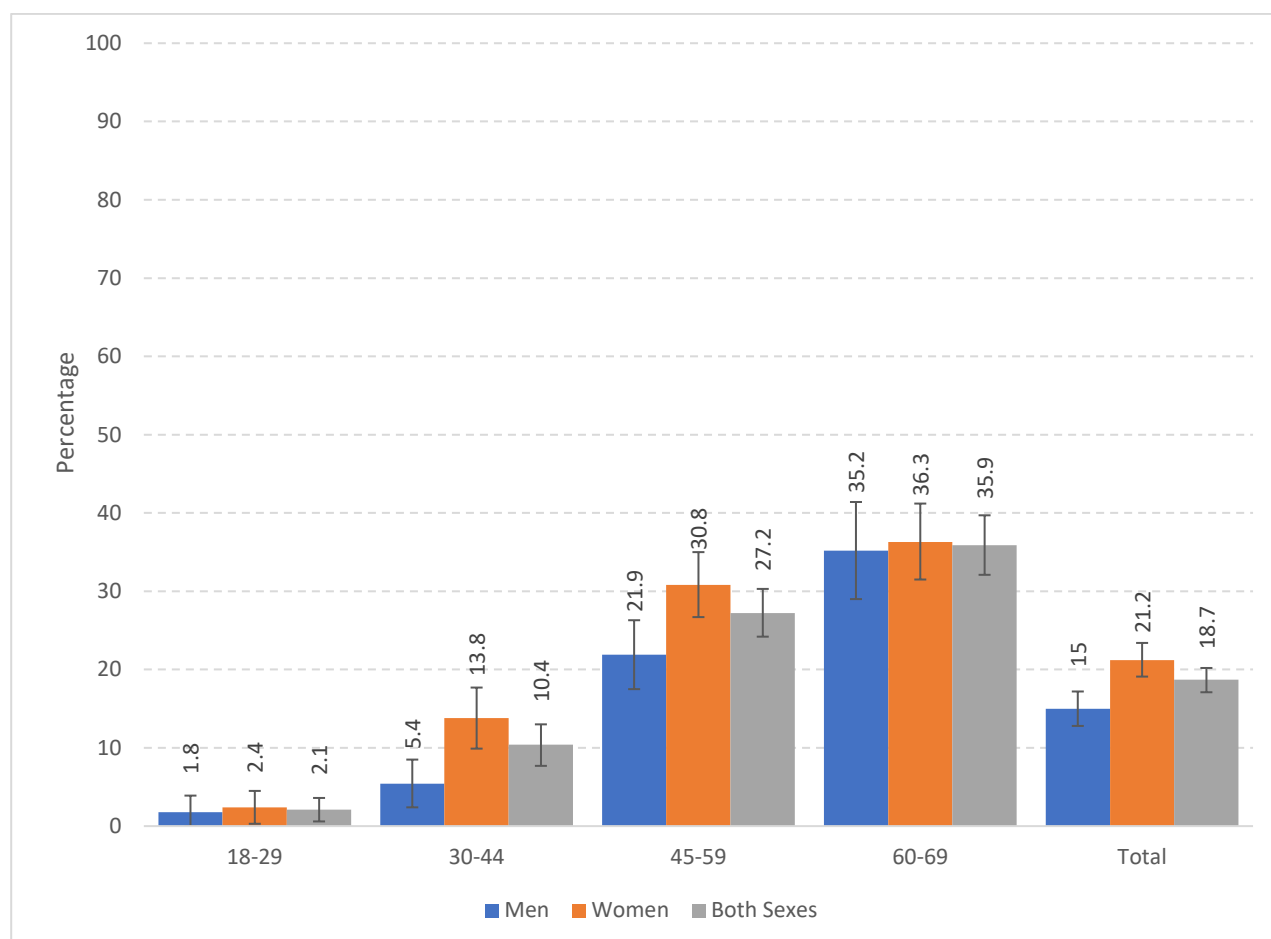
**Table 5. Percentage of men 18-69 having their prostate examination, by age group**

Age Group		Men	
	%	95% CI	
<b>18-29</b>	1.4	0.0-3.2	
<b>30-44</b>	10.1	6.4-13.7	
<b>45-59</b>	60.0	54.8-65.2	
<b>60-69</b>	77.4	72.3-82.5	
<b>18-69</b>	<b>35.4</b>	<b>32.3-38.5</b>	

## Colon cancer screening

Only 19% of the Aruban population has ever done a colon examination. No differences were observed between sex, however significant differences were observed between age groups. About 36% of the 60-69 year olds were ever screened for colon cancer, and 27% of the 45-59 year old people (Figure 47).

**Figure 47. Percentage of adults 18-69 having their colon examination, by age group and sex**



# Mental health

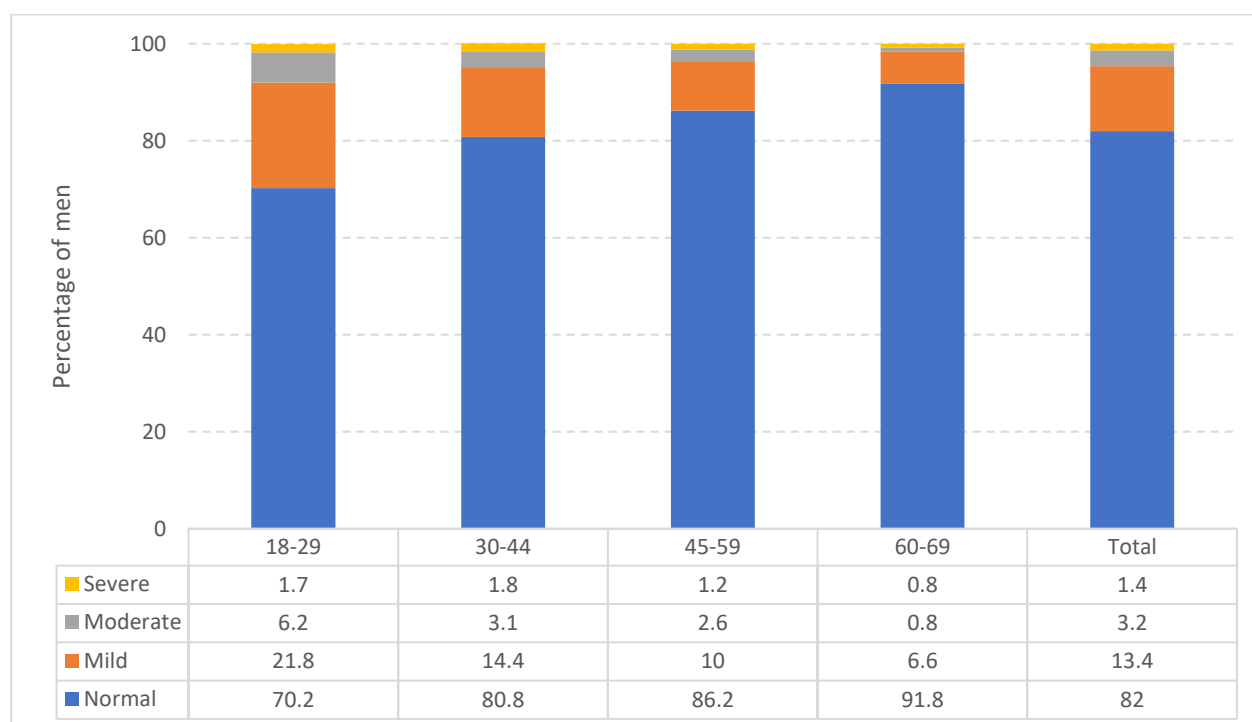
## Anxiety and depressive symptoms

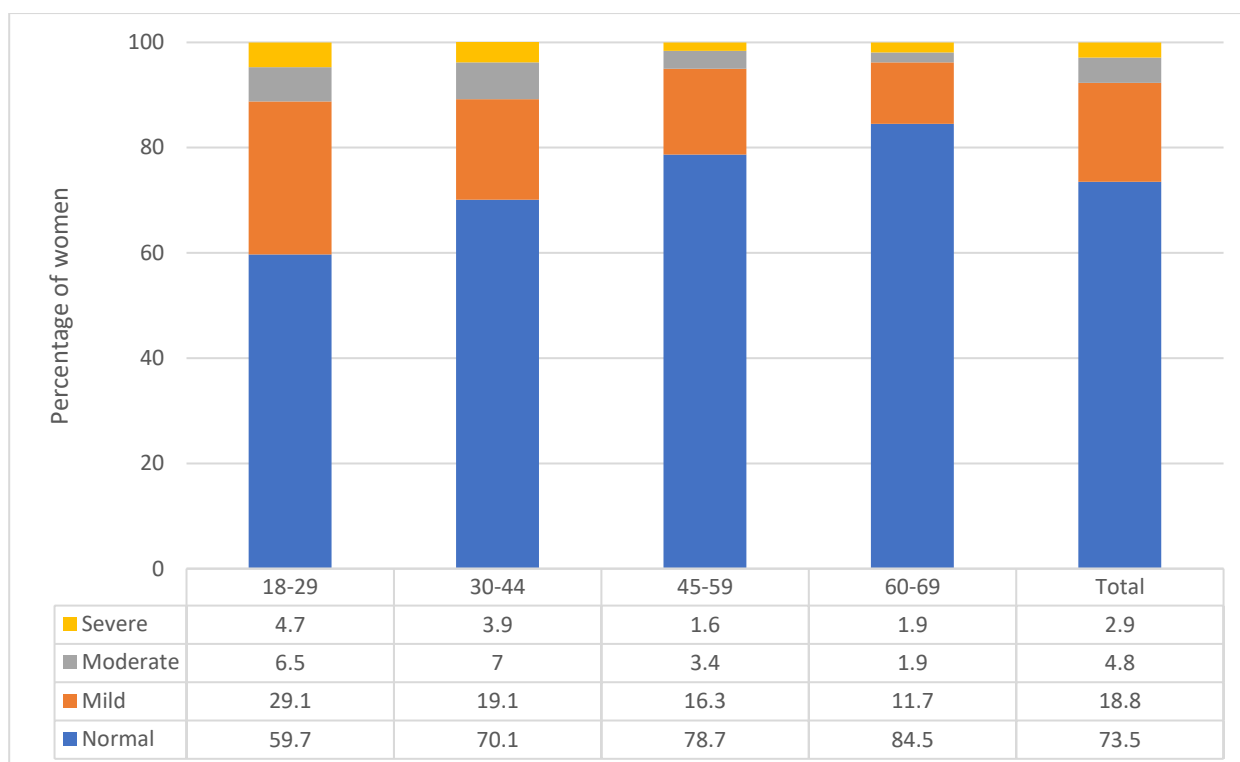
People were asked how often they were bothered by the following feelings in the previous two weeks:

- Feeling nervous, anxious or on edge.
- Not being able to stop or control worrying.
- Feeling down, depressed or hopeless.
- Little interest or pleasure in doing things.

The severity of these symptoms was then classified as normal, mild, moderate and severe. Among the Aruban population, 17% reported mild levels of anxiety and depressive symptoms, 4% reported moderate levels, and 2% reported severe levels. When looking at men and women separately, more than 25% of the women reported mild, moderate or severe symptoms compared to 18% of the men. Even though age was not significantly related to reporting anxiety and depressive symptoms, younger age groups did report more mental health problems than older age groups in both men and women (Figure 48).

**Figure 48. Percentage of adults 18-69 classified by anxiety and depression symptom severity, by age group and sex**





## Suicide

People were asked who seriously considered attempting suicide, or who made plans to commit suicide in the past. Almost 5% of the Aruban population ever attempted suicide, with no significant difference between sex. There is a significant difference between age. The highest rates of suicide attempts were observed among the young adults (18-29 years), with 8% of the young men and 11% of young women. As age increases, the suicide attempts decreased (Table 6). Among those who ever attempted suicide, 15% did this in the past year.

**Table 6. Percentage of adults 18-69 having ever attempted suicide, by age group and sex**

Percentage having ever attempted suicide						
Age Group (years)	Men		Women		Both sexes	
	Attempted suicide %	95% CI	Attempted suicide %	95% CI	Attempted suicide %	95% CI
<b>18-29</b>	7.6	2.9-12.3	11.2	5.7-16.7	9.6	5.9-13.3
<b>30-44</b>	4.6	1.8-7.4	6.2	3.6-8.7	5.5	3.6-7.4
<b>45-59</b>	2.4	0.6-4.2	2.8	1.5-4.1	2.6	1.6-3.7
<b>60-69</b>	2.0	0.5-3.6	1.5	0.5-2.5	1.7	0.8-2.6
<b>18-69</b>	<b>4.2</b>	<b>2.7-5.7</b>	<b>5.2</b>	<b>3.8-6.6</b>	<b>4.8</b>	<b>3.7-5.8</b>

Among the Aruban population, 3% have considered attempting suicide in the past year, of which 4% of the women and 2% of the men. The highest number of suicidal thoughts were seen among the young adults (18-29 years). Four percent of the young men and 7% of the young women had suicidal thoughts in the past year (Figure 49). Only 44% of the people with suicidal thoughts sought for professional help.

**Figure 49. Percentage of adults 18-69 that considered attempting suicide in the past year, by age group and sex**

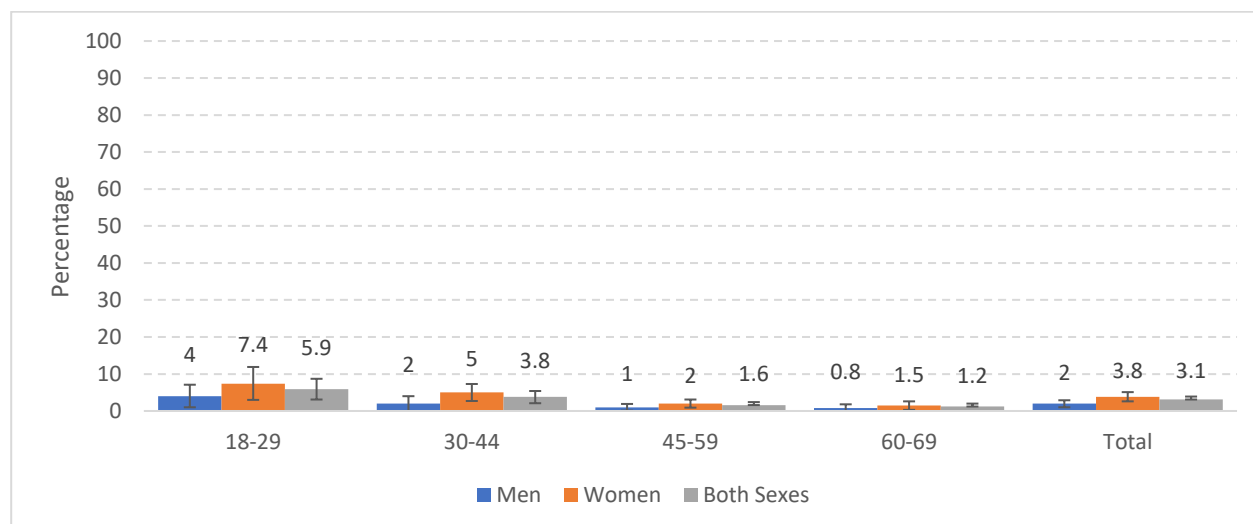
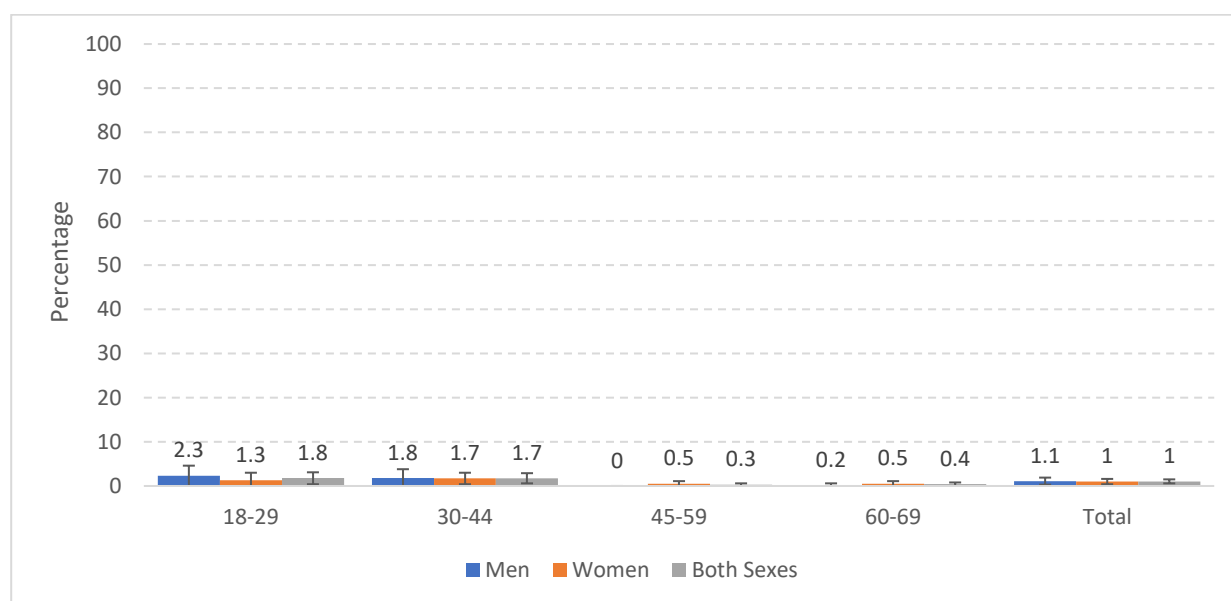


Figure 50 reveals that 1% of the Aruban population made an actual suicide plan in the past year. No differences were observed between sex. Again, this number was the highest among the young adults (18-29 years) with 2% of the young men and 1% of the young women doing so.

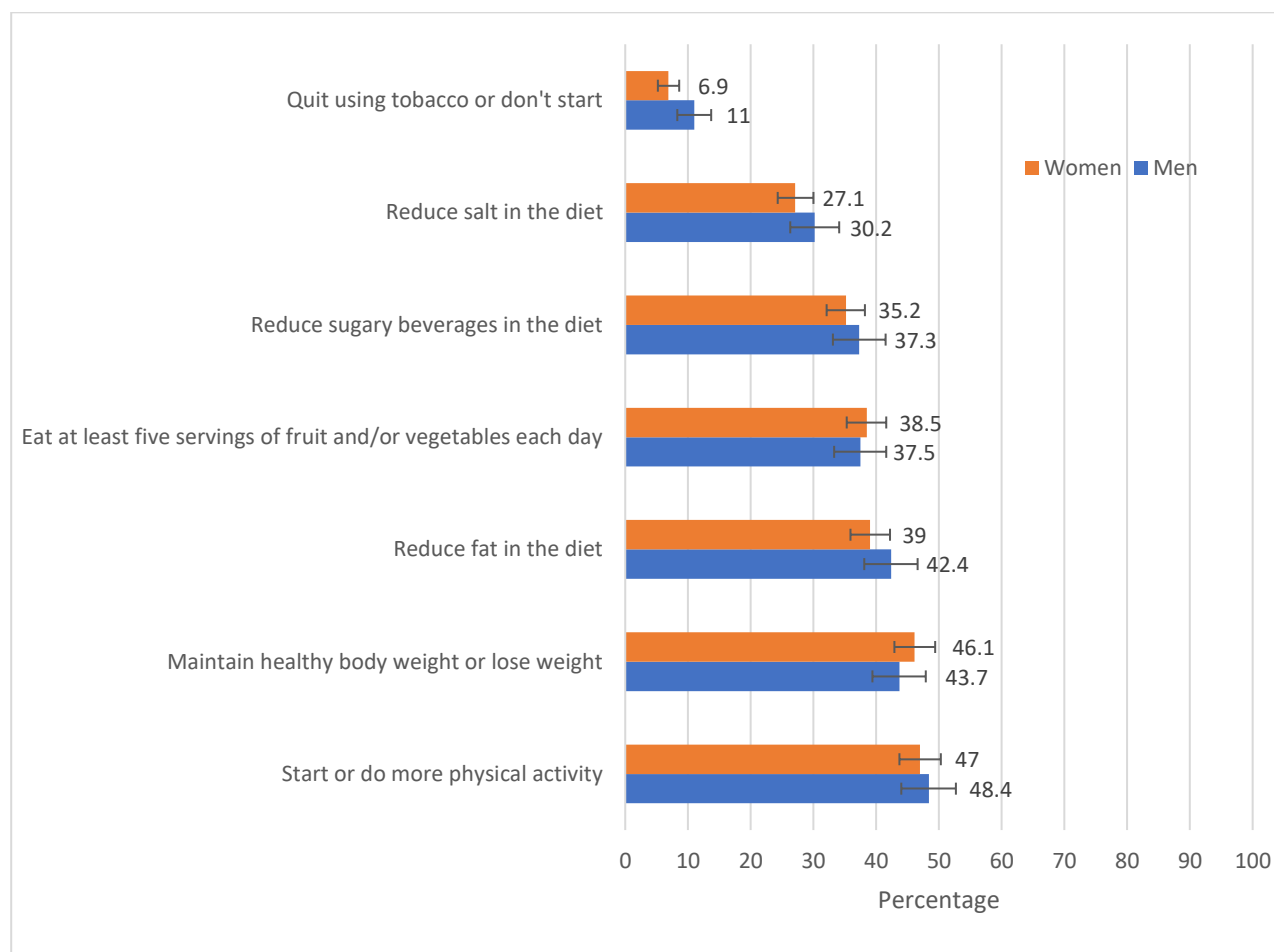
**Figure 50. Percentage of adults 18-69 having made a suicide plan in the past year, by age group and sex**



## Lifestyle advice

Persons who indicated they had visited a doctor or other health worker in the past 12 months, were asked if they had received any lifestyle advice during any of those visits. Advice on maintaining a healthy weight, engaging in physical activity, and reducing fat in their diet was the most common advice received. Nearly half of both women and men were told by their doctor or other health worker that they should start or do more physical activity, for example (Figure 51).

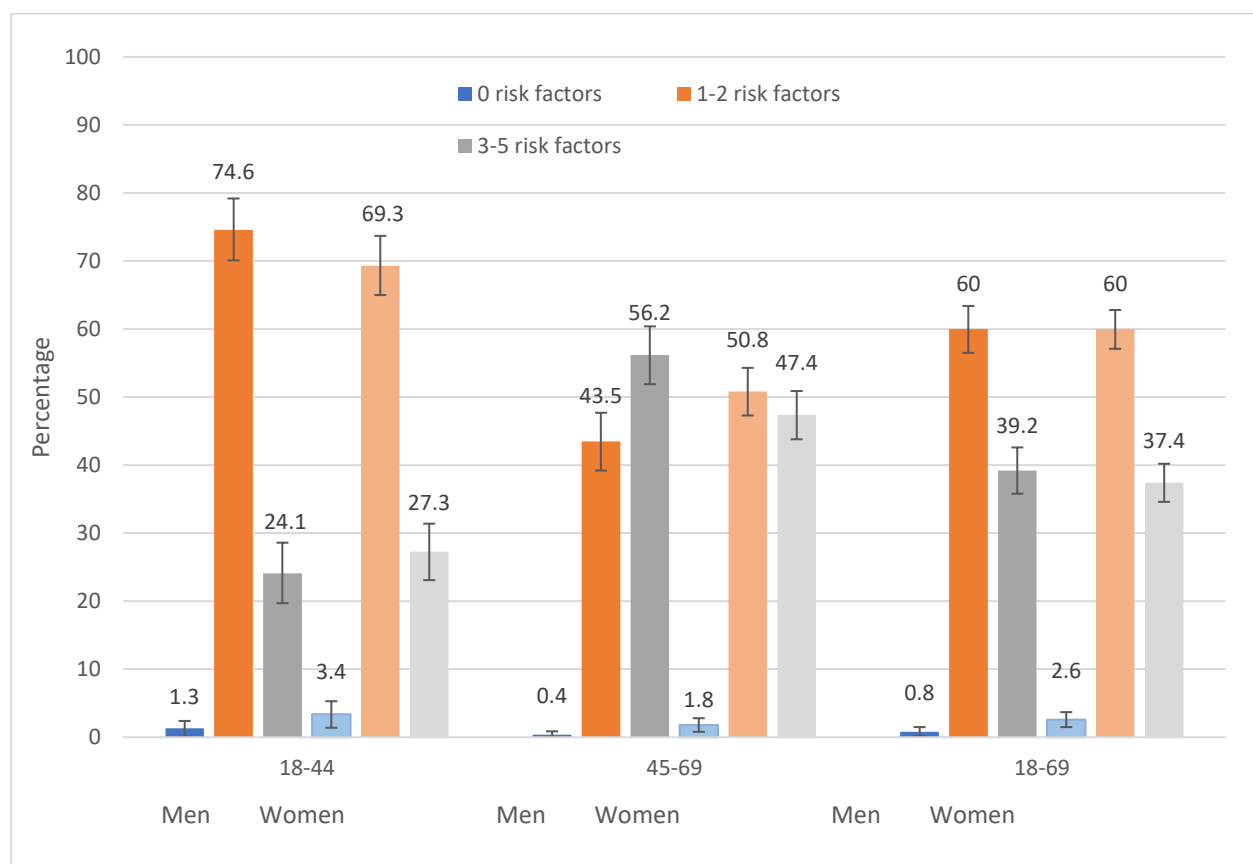
**Figure 51. Percentage of adults 18-69 who received lifestyle advice from a doctor or health worker, by sex**



## Combined risk factors summary

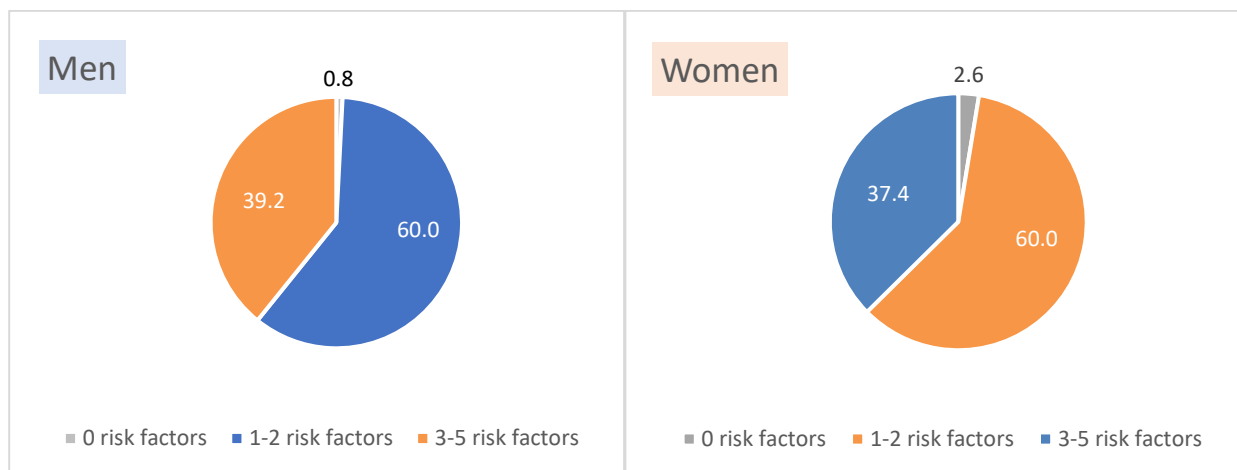
The combined risk factor approach includes daily smoking, eating less than 5 servings of fruit and/or vegetables per day, not meeting WHO recommendations on physical activity (<150 minutes of moderate activity per week, or equivalent), raised blood pressure (SBP  $\geq 140$  and/or DBP  $\geq 90$  mmHg or currently on medication for raised blood pressure) and being overweight (BMI  $\geq 25$  kg/m<sup>2</sup>). Almost all men had at least 1 risk factor (99%), compared to 9% of women. Roughly 40% of men and women were at high risk of developing a NCD, as they had 3-5 risk factors. Older adults (45-69 years) had a higher proportion of 3-5 risk factors among both men (56%) and women (47%), compared to the 18-44 year old men (24%) and women (27%). However, age differences were not statistically significant (Figure 52).

**Figure 52. Summary of combined risk factors of adults 18-69, by age group and sex**



When looking at the summary of combined risk factors by sex, 60% of both men and women currently have 1-2 risk factors. Only 1% of men and 3% of women are at low risk of developing NCDs, as they had none of the top 5 risk factors (Figure 53).

**Figure 53. Summary of combined risk factors of adults 18-69, by sex**



# Discussion

The prevalence of NCDs is a significant problem worldwide. Besides genetic predisposition, socioeconomic disparities and environmental influences, the most important risk factors for developing NCDs are lifestyle related, and therefore modifiable. Poor diet, physical inactivity, smoking and alcohol consumption are the top 4 modifiable risk factors, which in turn increase the risk of developing overweight/obesity, raised blood pressure, high blood glucose, high cholesterol and consequently NCDs.

The STEPS Aruba 2023 survey was developed to get more insight into the current physical and mental health status of the Aruban adult population. The survey reveals that the Aruban people face numerous (combined) health risks. The majority of the Aruban population is at high risk of developing a NCD, as 98% of the men and women have at least 1 risk factor, of which 38% has 3-5 risk factors (overweight, high blood pressure, daily smoking, poor diet, physical inactivity). The most important risk factor on Aruba is overweight and obesity. Furthermore, the study shows a high prevalence of heavy episodic drinking, especially amongst men. Additionally, there is an emerging rise in vaping among the young adults. Another concerning aspect is taking herbal medication or going to a traditional healer instead of taking the medication prescribed by a doctor or health worker.

Besides the physical health challenges, we also observed mental health challenges among the Aruban adults. About 20% of the population suffered from anxiety or depressive symptoms, and 17% of the younger women (18-44 years), ever attempted to commit suicide. Of the people that had suicidal thoughts, only 44% sought for professional help, which means that the majority of people with these thoughts don't seek for help.

# Modifiable risk factors

## Tobacco use

Overall, 12% of the Aruban population currently uses tobacco products. This is lower than the global (22%) and regional (16%) prevalence of current tobacco use among adults (PAHO/WHO, 2022). Sex and age are significantly related to tobacco use in Aruba. Men use more tobacco products than women. The highest percentage of tobacco use was amongst 18-29 year old men. Similar sex and age differences were observed at the regional and global levels.

Even though tobacco use is relatively low in Aruba, vaping has gained global popularity in recent years, particularly amongst the youth. In line with tobacco use, vaping is most popular among the young adults (18-29 years), and more men vape compared to women. This is a phenomenon that is also seen in other countries, whereby 9 out of 10 smokers started vaping before the age of 18 (WHO, 2023).

Reduction of tobacco use, consistent with WHO's Framework Convention on Tobacco Control regulation, is a key component of the NCD MAP of Aruba, which aims to reduce NCD risk factors and promote protective factors through the social and environmental determinants of health. In 2022, the National Ordinance Restriction Tobacco Products was introduced (AB 2016 no. 44). It includes a prohibition of smoking in public places and public transportation, and banning the sale or providing tobacco products to anyone under the age of 21, amongst others. Based on the STEPS findings, it is unclear whether the adopted measures have impacted the use of tobacco products. However, improvements can still be made in Aruba for tobacco use, for example, by placing large graphic health warnings on the packages, as this is one of WHO's Best Buys on tobacco. Unfortunately, we still see advertisements and promotion of vaping products on large billboards and supermarket entrances on the island. This can be banned by adapting the law, and to increase regular checks on compliance of these laws.

## Alcohol

Current alcohol use on Aruba (50%) is similar to other countries in the Caribbean. Similar to tobacco use, men drink more frequently, and consume more drinks per occasion compared to women. STEPS shows concerning numbers of heavy episodic drinking (6 or more drinks on a single occasion) in Aruba, with 21% of the population doing so in the last month. Heavy episodic drinking varied widely between countries in the Americas, ranging from 31% in Trinidad and Tobago to 9% in Guatemala (PAHO/WHO, 2019). No major differences were observed of alcohol use amongst age groups. However, the highest alcohol intake was found in the young adults. Also, it needs to be taken into account that the reported intake may be under-reported, due to socially desirable answers. Finally, it needs to be taken into account which period the survey was done, as the people tend to drink more during specific holidays like the carnival season. Therefore, the survey was performed between March and July, after carnival season.

The NCD MAP of Aruba includes a priority action on the reduction of harmful use of alcohol through targeted and collaborative interventions and programs. Laws are already in place on sale, distribution and taxation of alcohol. In 2019, the Aruban Government introduced an increase in taxation for importing and consuming distilled drinks and wine (Government of Aruba, 2019). This is in line with WHO's Best Buy on increasing taxes on alcoholic beverages, though the impact on alcohol reduction in Aruba is unclear. Enacting and enforcing bans or comprehensive restrictions on exposure to alcohol advertising (across multiple media types) is another WHO Best Buy to reduce alcohol consumption. However, advertisements of alcohol remain widely seen and heard in Aruba.

Further considerations should be made on how to reduce heavy episodic drinking amongst the total population, but also particularly targeting the youth and young adults. For example, the development and implementation of more extensive awareness campaigns targeted at schools and universities. In line with smoking, more frequent check-ups can be done at work places, schools and in traffic. For this, close collaboration is necessary with the Ministry of Justice, as part of health in all policies.

## Dietary behaviors

The Aruban population is not eating enough fruit and vegetables. Even though people consumed fruit and/ or vegetables about 5 times per week, the number of servings is well below WHO recommendations. About 88% of the people is not reaching the recommended 5 portions of fruit and vegetables per day, excluding starchy vegetables such as potatoes, sweet potatoes and cassava (WHO, 2020). These results are consistent with other countries in the Americas.

Moreover, Aruban adults are eating too much salt by adding salt while cooking, and especially by eating fast foods. Almost 71% of the people often or always add salt when preparing food at home, and 25% of the population often or always consumes processed food that is high in salt. This was done significantly more by younger age groups (18-44 years) compared to older age groups (45-69 years). Interestingly, most people self-reported the quantity of salt that they consumed to be 'just the right amount.'

The findings of the STEPS survey showcase that the Aruban population consumes a poor diet. A possible explanation for this could be that people have the perception that healthy foods (particularly fruit and vegetables) are much more expensive compared to unhealthy foods. Moreover, it may be that people don't have sufficient knowledge on what is healthy and what is not, and which products are high in salt. For example; salads are often prepared with starchy vegetables such as potatoes or macaroni with a lot of creamy sauce (high in salt and sugar). Future surveys should measure actual salt intake, instead of only relying on self-reported intake, which was the case for this STEPS survey. This will give valuable insight into the actual salt intake versus the perception of people, as we know that the average estimated salt consumption is 8.5 grams per day, while the WHO recommends a maximum of 5 grams per day (PAHO/WHO, 2023).

No questions were included in STEPS about sugar sweetened beverage intake, nor the frequency of eating out. This should remain an important area of concern for improving dietary habits of the population. The fact that Aruba has a wide range of food trucks and fast-food places, including in close proximity to schools, should also be taken into consideration. Moreover, supermarkets can contain about 80% of unhealthy foods and many times it can be difficult for the general public to understand food labels and health claims. For example, sugar has more than 50 synonyms that are used on food labels. A national nutrition survey would provide more detailed information for developing targeted policies on food labelling, interventions and programs for a healthier food and beverage market. A specific example of food labelling is the Front-Of-Package Labelling, which is one of the best buys of the WHO (PAHO 2023). This allows the customers to correctly, quickly and easily identify products that contain excessive amounts of sugar, total fat, saturated fat, trans fat and sodium.

## Physical activity

The Aruban population is quite active during the day, as almost 75% of the people met the WHO recommendations (at least 150 minutes of moderate-intensity physical activity per week, or equivalent). The country with the highest prevalence of insufficient physical activity in the region was Brazil (47% not meeting the WHO guidelines). These numbers are in line with other countries meeting the WHO guidelines like Chile (73%), Ecuador (73%) and Grenada (71%) (PAHO/WHO, 2016).

Men were physically more active compared to women for all three physical activity indicators; work-related, transport-related, and recreational-related. Most physical activity was done at work, whereas the people were the least active in transport-related physical activity, because the majority of people use a car or public transport on Aruba. Not many people walk or bike due to the warm climate, and due to a lack of safe biking/walking paths in some areas.

The biggest sex differences were found for recreation-related physical activity, especially among the younger age groups. Young adult men showed a mean of almost 60 minutes of recreation-related exercise; as for young women, this was only 25 minutes on average. This is because the majority of women don't do any recreation-related physical activity, which is concerning. To further stimulate physical activity, the WHO Best Buys to promote physical activity need to be closely considered. For example, development of mass media campaigns and motivational programs with special focus on women and the elderly. Another best buy is to provide physical activity counselling and referral as part of routine primary health care. There are sufficient opportunities to go to a gym on Aruba. It may be that the gyms are too expensive, people have a lack of transportation to the gym, or they find it intimidating to go to a gym. This is why the Healthy Lifestyle Center will start offering free community-based exercise programs. This may stimulate the recreational physical activity among the Aruban community. Finally, even though Aruba invested a lot in biking/walking paths in the last decade, this can be expanded to stimulate physical activity even more as part of environmental programs.

# Physical measurements and disease history

## Overweight and obesity

Overweight and obesity is a major health problem on Aruba, as 79% of the population is too heavy, with 33% of the people being overweight and 46% being obese. This problem was consistent among age groups, and also among sex. This results in Aruba having the highest number of overweight people in the Americas together with Chile (both 79%), followed by the Bahamas (76%) and Saint Kitts and Nevis (76%) (WHO, 2022).

Based on the STEPS results, it could be indicated that poor diet, heavy episodic drinking and low recreational physical activity are the most important risk factors for the high prevalence of overweight and obesity. Additionally, the unhealthy environment with an extremely high number of fast-food restaurants and snack trucks on the island, may play an important role as well. Finally, cultural aspects may also play an important role that go on for generations. A former survey in Aruba showed that the perception of what a healthy weight is does not comply with people's own perception of their weight (GOA, 2018). In other words, if people don't see their overweight status as a problem, their motivation to do something about it is likely to be low. This can be tackled by starting with awareness campaigns to teach people what/when somebody is overweight and why this is so unhealthy. This is the first step to react on the possible stigma of overweight and obesity.

The Minister of Public Health and Tourism already anticipated these high overweight numbers. A primary prevention clinic was opened in February 2023, before the STEPS survey took place. The Healthy Lifestyle Center Aruba is open for the community for free nutrition and lifestyle advice, given by licensed dietitians. There are plans to open more locations and to expand the professional team with mental and exercise coaches. Herewith, Aruba took a very important step toward closing the gap between not knowing where to seek professional help, and possible financial obstacles for the community. Finally, the consensus around healthy lifestyles indicates a need to start from a young age. This is already been done through several programs and initiatives at schools, but these programs can be strengthened and expanded. Also, education on health may be further incorporate into the curriculums of all primary and secondary schools. For this to be implemented, a health in all policies approach is needed.

## Cancer screening

Early detection of cancer increases the life expectancy of cancer survivors, and makes a less invasive and intensive treatment possible. Therefore, cancer screening is extremely important. At the moment, there is only a national screening program for breast cancer on the island. We observed a high response rate as 85% of the targeted women (45-69 years) were ever screened for breast cancer in the STEPS survey. This is higher compared to the screening of other type of cancers. Among the 30-59 year old women, 70% was ever tested for cervical cancer. For prostate cancer, 69% of the 45-69 year old men were ever screened, and for colon cancer this was only 32% among the 45-69 year old men and women.

Whilst cancer screening is covered by national insurance, it is clear that not everybody is screened or encouraged to do so. Early detection of NCDs, including cancer, is an important strategic area in the NCD MAP to ensure that care is integrated, people-centered and community-oriented. By looking at the high rate of breast cancer screening, and taking into account Aruba has a National screening program for this, it is highly recommended to expand the breast cancer screening organization by developing national screening programs for the other types of cancer as well; cervical cancer, prostate cancer and colon cancer.

In addition to the lower the prevalence of cervical cancer, vaccination against the human papillomavirus among girls – another WHO Best Buy – should be continued, and expanded, by the Department of Youth Health Care. It is also advised to start a vaccination program against the human papillomavirus for young boys.

## Mental health

The survey included questions about anxiety, depressive symptoms and suicide. Overall, there are quite some mental health challenges amongst the Aruban population, especially among the younger age groups (18-44 years). Even though there were no significant sex differences, women reported more mental health problems compared to men. There is also a concerning prevalence of suicide attempts/ suicidal thoughts among the younger age groups, especially among 18-44 year old women. Also, for men, the highest suicide attempts were observed among the younger age groups. Another concerning aspect is that more than 60% of the people with suicidal thoughts are not seeking professional help. It is not known why they don't seek professional help. Possible explanations for this are that there is still a stigma surrounding mental health problems on Aruba. Furthermore, it may be that people don't know where to go, or that they are on a waiting list for the institution for mental health. Further analyses need to be performed to get insight into the underlying causes of the mental health problems on Aruba. For example, the relationship between demographic variables marital status, employment status, income, and mental health. Moreover, valuable insights can be obtained by investigating the association between lifestyle factors, alcohol use, sleep, obesity and mental health.

In 2022, the Ministry of Justice and Social Affairs, with support of the Ministry of Public Health and Tourism, developed the Roadmap for Mental Health and Substance Use Disorders in Aruba 2021-2030. One of the key building blocks of this roadmap is lowering the numbers of depression and anxiety, and also decreasing the number of suicide attempts. Important projects of this roadmap are, amongst others, improving forensic care, setting up a national crisis service, and intensify the youth mental health care. Additionally, Aruba is currently engaged in efforts to enhance its mental health services through the implementation of the POH-GGZ program, aimed at reducing waiting lists at mental health institutions. However, challenges persist in integrating basic primary mental health care into the National Insurance package. This endeavor requires meticulous attention and collaborative strategies to overcome obstacles, and ensure comprehensive mental health coverage for all individuals. The persistent challenge is the recruitment of psychologists and psychiatrists, a dilemma not confined to Aruba, but prevalent globally. Aruba, in response, is meticulously exploring various avenues to address this issue. Among the strategies being considered is the broadening of recruitment horizons to include professionals from Latin America and other regions beyond the Netherlands. Simultaneously, discussions are underway regarding the establishment of local training programs facilitated by relevant foundations.

Moreover, concrete steps are being taken to enhance mental health services on the island. This includes the establishment of a FACT-Team, and the implementation of a crisis intervention service, both slated for completion by September. Additionally, a secondary cadre of street-corner caregivers ("bemoeizorg") is being mobilized to alleviate waiting lists at mental health institutions.

Furthermore, community organizations such as the Foundation Anti-Drugs Aruba (F.A.D.A.) are intensifying their involvement in mental health prevention initiatives. F.A.D.A. has expanded its focus beyond substance abuse to encompass broader mental health issues like family dynamics, anxiety, depression, and eating disorders. Biannual mental health conferences are being organized to foster awareness and combat stigmas associated with mental health conditions on the island, with the most recent event held in May, and the next scheduled for October.

Notably, F.A.D.A. is spearheading the development of a suicide prevention hotline in collaboration with Dutch counterparts. This initiative, supported by a diverse stakeholder group including the Netherlands' suicide prevention hotline 113 and the Dutch Ministry of Health, Welfare, and Sport, aims to proactively identify and address suicidal ideation. Efforts are also underway to integrate the hotline's data into a digital tracking system, in coordination with various telephone service organizations.

## Blood pressure

Raised blood pressure is a persistent problem on Aruba as well, especially amongst men. Almost 30% of the population has hypertension (SBP  $\geq 140$  and/or DBP  $\geq 90$  mmHg or currently on medication for raised blood pressure). This is lower compared to the average of the Americas which is 35%. Even though this number is age-standardized, the age group was a bit older (30-79 years) compared to our study population (18-69 years). Moreover, 34% of the Aruban population has a controlled blood pressure after having a diagnosis and taking medication. This is lower compared to most other countries in the Americas, because regionwide, 60% of people treated for hypertension achieved hypertension control (PAHO, 2019).

It was observed that for the physical measurements, 20% of the people had hypertension, and nearly half of those were new cases. This means that chances are high that a great proportion of the population has raised blood pressure, without them knowing. Raised blood pressure numbers increase when people get older. However, among the young adults (18-29 years), 9% already has raised blood pressure. The high number of people with raised blood pressure may be explained by the poor diet quality, especially the high salt intake, by adding salt while cooking, and frequently consuming fast foods high in salt. Mainly this last aspect may be related to the high prevalence of raised blood pressure amongst the young adults, as they eat more fast foods compared to the other age groups. The higher occurrence of raised blood pressure amongst men may be, amongst others, explained by the fact that men drink more alcohol and smoke more tobacco compared to women. And it is known that high alcohol intake and tobacco use are related to raised blood pressure. Further analyses need to confirm this theory. Another concerning factor is the low medication adherence. Almost 40% of the people that were known to have raised blood pressure are not taking their medication prescribed by the doctor. They go either to alternative healers, take herbal medicine, or are not taking any medication at all. Both late diagnosis and not adhering to medication increase the risk of developing cardiovascular diseases, amongst others.

Efforts should prominently target men, given the survey findings. Furthermore, the focus should be on early detection at primary care level, but also through health checks at work or at universities, as quite some young people already have raised blood pressure. Special attention should be on follow-up check-ups to track the progress of people. Pharmacies may play a more prominent role in explaining the importance of medication adherence, and also to track the follow-ups, as people are coming back on a regular basis to pick up their medication. Moreover, intensive campaigns should be developed and launched to increase the awareness of early detection, and also the importance of medication adherence. Lastly, as mentioned before, it may be that people don't have the right knowledge on which foods are high in salt. Therefore, programs and campaigns should be launched to increase the knowledge and awareness on healthy/ unhealthy foods of the Aruban population.

# Biochemical measurements

## Fasting blood glucose

In total, 10% of the Aruban population has raised blood glucose, or is currently on medication for diabetes. In addition, another 14% of the population is pre-diabetic based on the blood measurements. These people are at high risk for developing type-2 diabetes, although this can be prevented or delayed by pursuing a healthy diet, regular physical activity, maintaining a normal body weight and avoiding tobacco use (WHO, 2023). The average prevalence of diabetes worldwide is about 8%. This means that Aruba scores a bit higher compared to the global average. However, there are countries that show a higher diabetes prevalence, such as Saint Kitts and Nevis, which reveal a prevalence of 15% among adults (PAHO/WHO, 2014). A concerning result was the fact that about one third of the population with a diabetes diagnosis was taking herbal medication or was going to a traditional healer. The low medication adherence may (partly) explain the high rates of diabetes complications, such as diabetic foot, and dialysis.

It is crucial that interventions and programs target the population-at-risk to avoid the development of diabetes. Furthermore, current diabetes patients may need to receive more intensive care in line with the recent healthcare agreement (Zorgakkoord), with special focus on weight loss, diet quality and exercise. Additionally, people need to be aware of their behavior towards their health and medication adherence. Therefore, it is advised to expand the current PRISMA program, which is focused on the self-management and education for diabetes patients, that they are currently working on. PRISMA started a pre-diabetes program and they are developing a program for cardiovascular disease as well. The quality of care may also be improved by closer collaboration between different stakeholders on the island. The first step to achieve this is to develop an up-to-date protocol, including treatment plans and referral systems. Finally, extensive awareness campaigns about the importance of medication adherence are also highly advised.

## Fasting total cholesterol

More than a quarter of the population had high cholesterol levels, specifically the women. This is lower than other countries that have conducted a STEPS survey in the region. Despite the lower prevalence of high cholesterol compared to other countries, it is still quite high, and results in being at higher risk of developing cardiovascular diseases. Again, medication adherence is a major issue here. About a third of the Aruban population is not taking the medication prescribed by the health professional.

In line with the advised campaigns for diabetes and blood pressure, extensive awareness campaigns on the importance of medication adherence are highly advised for cholesterol as well. Furthermore, new insights about nutrition and cholesterol need to be translated into campaigns to increase the knowledge about which foods decrease/ increase cholesterol levels. Moreover, updating the new nutrition guidelines will support this as well.

## Combined risk factors

When looking at the combined risk factors: overweight, high blood pressure, daily smoking, poor diet and physical inactivity, 98% of the population have at least 1 risk factor, of which about 38% has 3-5 risk factors. There was no difference between men and women. From this we can conclude that only 2% of the Aruban population is at low risk of developing a NCD. Consequently, people are at high risk of developing some type of NCD in the future.

## General recommendations

Besides reflections and suggestions on the specific topics made above, the following general recommendations can be made based on the findings of the STEPS Aruba 2023 survey:

### **Enforce full implementation of the NCD Multi-sectoral Action Plan**

This report serves as a reminder of the considerable threat posed by NCDs and their associated risk factors in Aruba. Addressing the NCD burden requires comprehensive multi-sectoral strategies that encompass public health education, lifestyle interventions, regulatory measures, adjustment of legislation, and community support systems to promote healthier behaviors and healthy environments, and reduce the prevalence of these risk factors. Further gains are also to be made in providing preventive lifestyle advice in healthcare settings. Solutions to the alarming trends identified in the Aruba STEPS 2023 survey are already outlined in the NCD MAP and have been collectively agreed upon through multi-sectoral consultations. The full-scale implementation of the plan, with adequate costing and financing, as well as political commitment and coordinated action, is now needed. The NCD MAP is a key document that outlines high-level strategic areas and priority actions. Finally, regular tracking of NCD indicators (e.g. by conducting the STEPS survey every five years) is crucial to ensure that commitments in the NCD MAP are translated into concrete and sustainable action. By doing this, results can be tracked after five years, and proper evaluations can be performed to improve the health of the Aruban community.

### **The importance of a sustainable NCD surveillance system**

Addressing the burden of NCDs requires a comprehensive understanding of their risk factors, prevalence, and progression over time. To achieve this, a sustainable NCD surveillance system is needed. By implementing a sustainable NCD surveillance system, data on NCDs and risk factors is collected in a periodic, systematic and standardized manner. This includes the implementation and execution of health surveys, such as STEPS every five years. The previous STEPS survey was performed in 2006, and included different age groups compared with the current STEPS survey. Hereby, results are not directly comparable, and are therefore not presented in this report. Further analyses should be conducted to make this important comparison and create more in-depth findings.

In addition, further research to better understand certain patterns is needed. The survey has shown that the consumption of daily fruit and/ or vegetable servings was low, though reasons for this were not investigated. Moreover, STEPS did not collect data on the youth and adolescents. The implementation of school health surveys, such as the Global School-based Student Health Survey and the Global Youth Tobacco Survey, might provide valuable complementary information on risk factors and protective behaviors among adolescents.

Other important aspects of a sustainable NCD surveillance system are collecting and reporting mortality data, health system information, and an active cancer registry. Indeed Aruba is collaborating with the RIVM to set up a cancer registry. This is in progress on a four-country level, and the goal is to start with the cancer registry in 2025. Finally, even though Aruba has mortality surveillance in place, it can still be strengthened.

### Limitations of the study

Recognizing the limitations of the Aruba STEPS 2023 survey is essential for readers to interpret the results accurately, and make informed decisions based on the presented data. Limitations of the survey methodology and implementation were mitigated to the extent possible, but several are worth mentioning explicitly:

- *Low response rate.* Despite significant efforts to engage the target population, the overall response rate was below 60%. Several factors may have contributed to the low response, including an ineffective communication campaign, competing priorities, survey fatigue, or hesitation to participate after the COVID-19 pandemic, among others. However, the survey uses a probabilistic sample, and data are presented weighted, which means the results from this survey are representative of the whole 18-69 Aruban adult population.
- *Additional analyses:* this report is based on standard descriptive analyses of the data. More in-depth analyses need to be performed to better understand the relationship between demographics, risk factors and the development of NCDs (physical as well as mental). However, these analyses fall out of the scope of this report. Also, to make better comparisons with the 2006 STEPS survey, separate analyses need to be done on the age group 25-64 years.

## Conclusion

The results from the 2023 STEPS Aruba survey underscore a concerning scenario for NCDs within the adult Aruban population, as nearly the entire population has at least one risk factor of developing an NCD. The most important risk factors were excessive alcohol intake and poor diet quality. The consequences of these risk factors are evident in the high prevalence of overweight and obesity, high blood pressure, and metabolic risk factors such as raised blood glucose and total cholesterol. Finally, there are also many mental health problems, of which the majority does not seek professional help for. All these NCDs are already prevalent from a young age.

Immediate and decisive action is imperative to alleviate the burden of NCDs, and avert preventable deaths stemming from these conditions. Concrete policy action and follow-up through sufficient investment in cost-effective interventions, as proposed in the above-mentioned recommendations, is necessary. This also includes adapting legislation to enable more opportunities to create healthier environments so that people are stimulated to make healthier choices. The NCD MAP serves as an excellent guide for such efforts. More detailed action plans need to be continuously developed, implemented and evaluated for this. Failure to do so puts the country at risk of exacerbating the NCD burden, and putting the sustainability of the universal healthcare that Aruba offers in danger. In turn, this can negatively affect the workforce, the productivity, and the social security of the island.

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