



MINISTRY OF HEALTH
SEYCHELLES

National Survey of Noncommunicable Diseases in Seychelles 2013-2014 (Seychelles Heart Study IV): methods and main findings

This report focuses on selected main findings from the 2013 National NCD Survey and these findings are compared, whenever possible, with results from previous national NCD surveys in 1989, 1994 and 2004.

A technical report entitled “National Survey of Noncommunicable Diseases in Seychelles 2013-2014 (Seychelles Heart Study IV): Methods and Overall Findings” was produced in October 2014 and presented methods and crude results for all variables assessed in the survey. These findings were discussed in two half-day meetings in the presence of Minister of Health, officials and key persons of MOH on 31 October & 4 November 2014.

Detailed analysis on specific issues and related recommendations will be addressed in separate reports.

Public Health Authority
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National Survey of Noncommunicable Diseases in Seychelles 2013-2014 (Seychelles Heart Study IV): main findings

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Minister of health, high officials and survey team at the opening ceremony of the Seychelles NCD Survey (Seychelles Heart Study IV) on 23 September 2013



Table of contents

Summary and recommendations	4
Context of NCDs globally and in Seychelles	6
Objectives of the 2013 survey	7
Methods and participants in the 2013 survey.....	7
Population and mortality, Seychelles, 1989-2013.....	9
Participation to Seychelles NCD surveys	10
Body mass index (BMI)	11
Tobacco use	15
Alcohol use	19
Dietary habits	24
Physical activity (PA).....	28
High blood pressure (HBP)	31
Blood cholesterol.....	37
Diabetes.....	41
Trends in risk factors between 1989 and 2013	45
Socio demographic variables.....	46
Perceived health status	50
Utilization of health care services	53
Screening of selected cancers	55
Communication, mass media, and exposure to health programs	57
Appendix 1. Selected findings by sex and survey year	62
Appendix 2. Questionnaire in English.....	67
Appendix 3. Data entry form for measurements	81
Appendix 4. Selection of participants and methods	82

Summary and recommendations

This report provides information on selected summary results of the National Survey of Noncommunicable Diseases in Seychelles in 2013-2014 (Seychelles Heart Study IV). The survey is also referred shortly as the “2013 Survey” in this report. Overall crude results were reported in a comprehensive report in November 2014. Further detailed analyses and recommendations on particular topics will be performed separately.

The survey 2013 Survey addressed the following objectives:

Primary objectives

- a) Distribution of the main modifiable risk factors of noncommunicable diseases (NCD), particularly blood pressure, adiposity markers, diabetes and blood lipids
- b) Distribution of health behaviors related to NCDs, particularly tobacco use, alcohol drinking, and physical activity
- c) Rates of awareness, treatment and control of hypertension, diabetes and dyslipidemia
- d) Comparison of findings in survey in 2013-2014 with results in previous surveys in 1989, 1994, 2004
- e) Dietary patterns
- f) Knowledge, attitudes and practices related to NCDs and NCD risk factors

Secondary objectives

- g) Assessment of indicators of quality of health (e.g. SF-12)
- h) Assessment of psychological stress and relation with NCD
- i) Assessment of indicators of frailty (e.g. handgrip strength test, chair stand test, questions on functional limitations)
- j) Assessment of knowledge and level of agreement with current policies on tobacco control
- k) Use of public and private health care services, particularly for NCDs
- l) Exposure to advice on health behaviors given by health professionals at health care level
- m) Burden of chronic diseases not related to the main NCDs (e.g. musculoskeletal, mental health, etc)
- n) Screening of selected cancers
- o) Assessment of the kidney function in the population
- p) Frequency of heart arrhythmias (one-lead ECG) and heart murmurs (auscultation)
- q) Assessment of bone mineral density (ultrasound of calcaneus)
- r) Exposure of the population to the mass media, particularly in relation to health programs, and use by the population of new communication technologies
- s) Assessment of social variables and their association with the variables measured in the survey
- t) More generally, the survey provides broad information (medical, social, environment, etc) that can be useful for tailoring NCD prevention and control programs.

Overall methods of the survey

The survey was performed in a sex and age stratified random sample of all adults aged 25-64 years of Seychelles between October and December 2013 on Mahé and during 2 weeks in February 2014 in the islands of Praslin and La Digue. These three islands account for >98% of the total population of Seychelles. The eligible sample was extracted from the population registry. The survey was attended by 1240 adults, with a participation rate of 73%. Participants were invited to attend the survey on selected days in study centers located in Mahé, Praslin, and La Digue. All the eligible participants who did not attend were actively traced using (telephone, local administration, announcements on radio, etc) and invited to attend the survey. Since participants were randomly selected from the general adult population, findings of the survey can be inferred to the general adult population of Seychelles.

The survey included a questionnaire and clinical and biological tests including anthropometrics, bioimpedance, blood pressure, blood tests, urine tests, one lead ECG, bone ultrasound, and selected functional tests to assess frailty.

Main findings and global recommendations

Pending further analysis, and based on preliminary analysis reported in this report and the overall report produced in November, the following general findings can be formulated:

- a) The prevalence of tobacco use decreased between 1989-and 2013, reflecting strong tobacco control programs and policy in the interval. Data also show that the general public largely supports the tobacco control legislation implemented a few years ago in Seychelles.
 - *Tobacco control needs to be strengthened including strict enforcement of current legislation and need to address new issues, e.g. electronic cigarettes, shisha, measures targeting smoking among youth, etc.*
- b) Blood pressure (BP) tended to decrease over time, consistent with improved awareness, treatment and control

rates between 1989 and 2013. Favorable trends likely reflect socio-economic development, increasingly diverse nutrition, and improved medical care. However, the level of control of BP among persons with HBP and knowledge on hypertension is far from optimal.

- *There is a need to improve health care for patient with HBP, including updated guidelines for detection and treatment of hypertension, training of health professionals, extended use of home BP monitoring, etc. There is also a need to improve population-based interventions, including awareness campaigns (“know your numbers”, “reduce your salt”, etc) and structural measures in all sectors to improve choices for healthy products and regular physical activity (e.g. reduction of salt in locally made or imported manufactured foods).*
- c) The prevalence of overweight/obesity and diabetes has markedly increased between 1989 and 2013, consistent with worldwide upward trends and increasingly globalized food markets. The survey provides information on dietary patterns in the population, which is useful to guide individual-based and population-based interventions.
- *Need to develop structural interventions in all sectors to improve the availability of, and access to, healthy foods for all people and in different possible settings (schools, workplaces, etc), adequate food labeling, ban on advertising of unhealthy foods in mass media, subsidies/taxes on healthy/unhealthy foods, reformulation of manufactured foods in terms of salt, sugar and fats, etc. Interventions in all sectors are also needed to promote physical activity in different settings. Health education programs are helpful to raise awareness on healthy lifestyles and should target all population sub-groups. The school setting is particularly important to empower healthy choices at a young age. Specific measures include free water supply through water fountains in all schools, healthy food menus in canteens, 2 or 3 hours per week of physical activity as part of regular school program, etc.*
- d) Knowledge on NCDs is fairly good in the population, reflecting the impact of continued health education programs in the mass media in Seychelles and through other avenues over the past 2-3 decades. Yet several areas of knowledge about NCDs should be improved, including knowledge on his/her own body weight, blood pressure, etc. (“know your numbers”) The survey also provides information on how people are exposed to mass media in Seychelles and how people use electronic communication devices: this information is useful to adjust effective and innovative NCD awareness campaigns.
- *Need to brainstorm ways to enhance health education programs, including through targeted use of mass media and new communication technologies.*
- e) Many people report less than optimal exposure to advice on healthy lifestyle and nutrition by health professionals at the level of health care.
- *Need to brainstorm efficient and innovative mechanisms to provide adequate health education at the level of health care services (in order to target patients) and through other channels (in order to target the general public).*
- f) The survey provides information on frequency of screening for several priority cancers.
- *Need to brainstorm the design, implementation and monitoring of screening programs for priority cancers in Seychelles.*
- g) Several characteristics related to NCDs (health behaviors, risk factors, knowledge, exposure to information, use of health care services, etc) were less favorable among lower socio-economic groups.
- *Need to brainstorm these results and consider social factors when designing interventions to address the prevention and control of NCDs.*

The following data collected in the 2013 Survey will be examined in separate reports: quality of life; stress and NCDs; frailty & aging; kidney function; heart arrhythmias & murmurs; bone mass density; diagnosis of diabetes, etc.

Of note, the WHO 2014 NCD Status Report (available on www.who.int) provides lists of cost-effective population-wide and high-risk interventions to reduce the burden of NCDs in populations.

Next national NCD surveys & WHO Global Status Reports

The WHO 2014 Global Status Report on NCDs provides population levels of selected indicators related to the 9 targets in 2010 and 2014 for all countries. All countries are expected to report population levels of 25 NCD indicators which will be published in planned versions of the Global Status Report on NCDs in 2020 and 2025. This implies that each country should perform national surveys of NCD risk factors. A next survey in Seychelles should be organized in 2018-2019 and, in all cases, in 2023-2024 in order to assess progress toward Seychelles meeting the 9 priority targets.

Context of NCDs globally and in Seychelles

Global burden of NCDs

Cardiovascular diseases (CVD) and other main noncommunicable diseases (NCD) such as cancer, diabetes, and obstructive pulmonary disease account for more than 70% of all premature deaths in most middle income countries, including in Seychelles. The burden of NCD is largely attributable to 4 “physiological” main risk factors (body mass index, blood pressure, blood lipids and diabetes) which are themselves largely determined by 4 major modifiable risk behaviors (smoking, insufficient physical activity, unhealthy diet, and excess alcohol intake).

Main risk factors of NCDs

The focus on 4 main modifiable behaviors to reduce the NCD burden is encapsulated in the “4*4 strategy”, advocated in the Political Declaration on NCD Prevention and Control adopted at the High Level Meeting on NCDs at the United Nations in 2011 [1] and in the WHO 2013-2020 Global Action Plan for the Prevention and Control of NCDs adopted by all member states in at the World Health Assembly in May 2013 [2]. From a clinical perspective (i.e. the health care response) the emphasis is on the main physiological risk factors (high levels of blood pressure, blood lipids and blood glucose), which are amenable to screening and control through cost-effective treatment.

WHO targets to reduce the burden of NCDs

The “Global Action Plan for the Prevention and Control of NCDs, 2013-2020 (3) adopted by all WHO member states in May 2013 [3] defines 9 voluntary national targets to be achieved by 2025 and 25 indicators to monitor progress towards meeting these targets.

The 9 targets to be achieved by 2025, compared to baseline in 2010, are:

- 1) 25% reduction of NCD
- 2) 10% reduction in alcohol use
- 3) 10% reduction in prevalence of insufficient physical activity
- 4) 30% reduction in mean population salt intake
- 5) 30% reduction in the prevalence of tobacco use
- 6) 25% reduction in the prevalence of raised blood pressure
- 7) 0% increase in obesity and diabetes
- 8) At least 50% of eligible people receiving drug therapy and counseling to prevent heart attack and stroke
- 9) At least 80% availability of the affordable technologies and essential medicines, including generics, required to treat major NCDs on both public and private facilities

All WHO Member States have committed to report national levels of NCD risk factors on a regular basis. A first report (WHO Global Status Report on NCDs 2010) was published in 2011 and an updated report (WHO Global Status Report on NCDs 2014) was published in 2015 [16]. This report will be updated in 2021 and in 2025. This implies that a next NCD survey in Seychelles should take place before 2019, and no later than 2024.

Overall trends of NCDs in Seychelles

Vital statistics in Seychelles show that CVD and cancer account for the largest share of premature mortality and morbidity in Seychelles [5]. The good news is that the age-standardized rates of CVD are decreasing in Seychelles [6], consistent with trends in high income countries. This favorable downward trend in is likely related to the many programs and policies implemented over the past 2-3 decades in the Seychelles to address NCDs, particularly strong tobacco control measures (e.g. comprehensive tobacco control legislation in 2009), improved nutrition (i.e. increasingly diverse food) and free health care allowing all high risk persons to receive treatment.

However, Seychelles experiences a rapid demographic transition so that the total number of NCD will rise over time patients (since NCDs tend to occur more often at middle or older age) even if interventions to prevent and control NCDs are successful.

NCD risk factors in previous surveys in Seychelles

The key information needed to guide interventions for NCD prevention and control is the current levels of risk factors in the population. Population-based surveys require that participants are randomly selected from the general population. Previous population-based surveys of NCD risk factors were conducted in 1989, 1994 and 2004. Results of these surveys have been widely reported in overall reports [7-9] and through more than 50 publications that have focused on special NCD issues [10-15]. The existence of data from 4 national surveys between 1989 and 2013 is unique and no country in the African region has performed more than two national NCD surveys, except Mauritius.

Results from the past surveys (1989, 1994, 2004) have shown divergent trends of NCD risk factors over time: downward trend for smoking (good news), unchanged or decreasing trends for high BP and high blood cholesterol (good news) but largely upward trends for diabetes and obesity (bad news) [13,14,15]. Findings of these previous surveys have been instrumental to guide prevention and control programs in Seychelles since the early 1990s.

The NCD survey in 2013-2014 was therefore timely to update the situation of NCD risk factors which was last surveyed in 2004. Information in 2013-2014 will be important to guide and adjust clinical and public health responses to address NCDs, including useful information to guide the Seychelles NCD strategy.

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Objectives of the 2013 survey

The 2013 survey addressed the following objectives:

Primary objectives

- a) Distribution of health behaviors related to NCDs, particularly tobacco use, alcohol drinking, and physical activity
- b) Distribution of the main modifiable risk factors of NCDs, particularly blood pressure, adiposity markers, diabetes and blood lipids
- c) Rates of awareness, treatment and control of hypertension, diabetes and dyslipidemia
- d) Comparison of findings in the survey 2013 with results in previous similar NCD surveys in 1989, 1994, 2004
- e) Dietary patterns
- f) Knowledge, attitudes and practices related to NCDs and NCD risk factors

Secondary objectives

- g) Assessment of indicators of quality of health (e.g. SF-12)
- h) Assessment of psychological stress and relation with NCD
- i) Assessment of several indicators of frailty (e.g. handgrip strength test, chair stand test, functional limitations)
- j) Assessment of knowledge and level of agreement with current policies on tobacco control
- k) Use of public and private health care services, particularly for NCDs
- l) Exposure to advice on health behaviors given by health professionals at health care level
- m) Burden of chronic diseases not related to the main NCDs (e.g. musculoskeletal, mental health, etc)
- n) Screening of selected cancers
- o) Assessment of the kidney function
- p) Frequency of heart arrhythmias (one-lead ECG) and heart murmurs (auscultation)
- q) Assessment of bone mineral density (ultrasound of calcaneus)
- r) Exposure of the population to mass media, particularly in relation to health programs, and use by the population of new communication technologies
- s) Assessment of a number of social variables and their association with the variables measured in the survey
- t) More generally, the survey provides broad information (medical, social, environment, etc) that can be useful for tailoring NCD prevention and control programs.

Methods and participants in the 2013 survey

Selection of participants

The survey was performed in a sex and age stratified random sample of all adults aged 25-64 years of Seychelles between October and December 2013 on Mahé and during 2 weeks in February 2014 in the islands of Praslin and La

Digue. These three islands account for >98% of the total population of Seychelles. The eligible sample was extracted from the population registry, which is available electronically in Seychelles

The survey was attended by 1240 adults, with a participation rate of 73%. Participants were invited to attend the survey on selected days in study centers located in Mahé, Praslin and La Digue. Eligible persons who did not participate were actively traced (telephone, local administration, announcements on radio, etc) and invited to attend the survey at other dates. Since participants were randomly selected from the general adult population, findings of the survey can be inferred to the general adult population aged 25-64 of the Seychelles.

Instruments used in the survey to collect data

The survey included a questionnaire and several measurements including anthropometrics, bioimpedance, blood pressure, blood tests, urine tests, one lead ECG, bone ultrasound, and selected functional tests.

Detailed information on methods have been described in the report entitled “National Survey of Noncommunicable Diseases in Seychelles 2013-2014 (Seychelles Heart Study IV): Methods and Overall Findings, Public Health Authority, Ministry of Health, Seychelles, 2nd version, 10 November 2014”).

Further analyses will be performed and detailed description will be published in separate reports.

Approval of the survey

- The protocol of the survey was approved by the Health Research and Ethics Committee, Ministry of Health, Seychelles.
- The objectives of the survey were also guided by recommendations of the WHO Global Monitoring Framework and priority targets and indicators.
- A large part of the survey followed standard methods for NCDs recommended by WHO (i.e. STEPS).

Consent form

- Upon arrival to the study center, the aim and procedures of the survey were explained to each participant separately and each participant was invited to sign an informed consent form.
- Participants were asked to separately sign: 1) a consent form to participate in the survey along modalities stated in the invitation letter (no participant declined); 2) a consent form for blood to be used for genetic tests, and 3) a consent form to be possibly contacted for possible follow up of the survey.
- All participants were informed that they retained the right to decline any question or any test.
- The original paper consent forms will be kept for 5 years in a locked room and a scanned copy of all consent forms will be kept for at least 10 years.

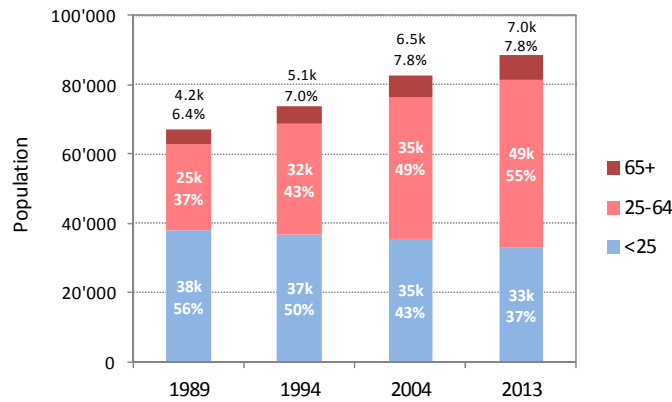
Communication of results to the participants

- Before being discharged from study centers, participants received information on their own results, with relevant advice, from the medical doctor of the survey.
- Participants with a newly discovered abnormal medical condition were given a referral form signed by the doctor of the survey (a copy of which is kept at UPCCD) and were advised to go to a health center or to a specialist clinic to confirm or manage the condition.
- Participants who presented a serious medical condition were referred to the casualty of Seychelles Hospital for further diagnosis and care.
- A letter with selected results was sent to all participants a few weeks after their visit to the survey center.

Population and mortality, Seychelles, 1989-2013

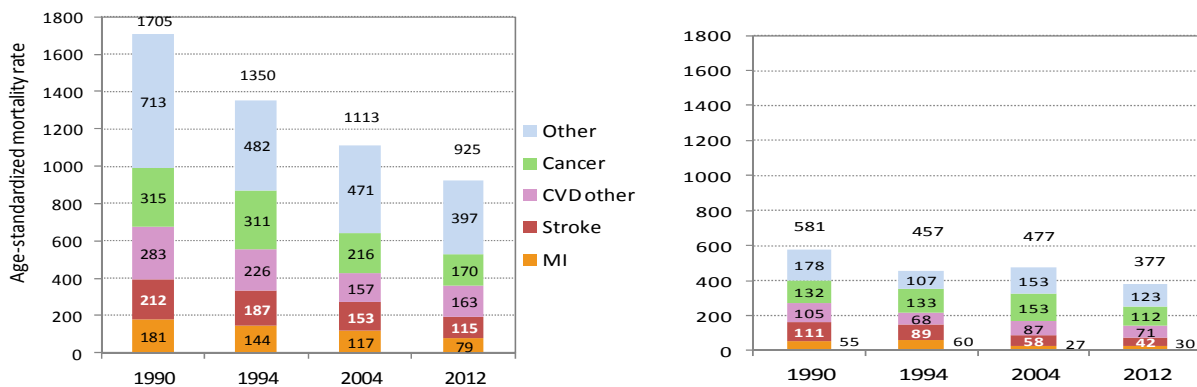
These data are compiled from Seychelles vital statistics of the Ministry of Health and from the Seychelles National Bureau of Statistics. Data on health outcomes in relation to CVD shown in this page are useful to put results of the survey in 2013 and other pat surveys in context.

Figure 1. Population of Seychelles between 1989 and 2013



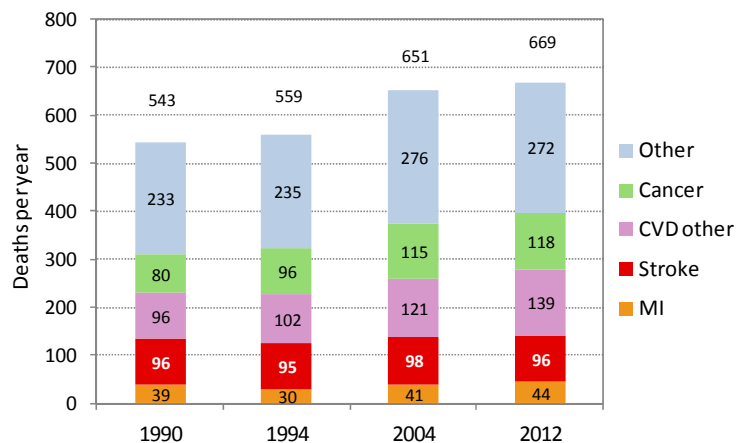
The population aged 25-64 has nearly doubled between 1989 and 2013. The population is markedly aging with decreasing numbers of person aged <25 years and increased numbers of middle-aged and older persons in the 25-year interval.

Figure 2. Age-standardized broad-cause mortality rates in Seychelles, 1989-2012, in men (top) and women (bottom)



Age-standardized mortality rates have markedly decreased in the 25 year interval for all broad cause categories, including cardiovascular disease (CVD) and cancer. This means that at a given age the chance to get CVD or cancer has decreased over time. This decrease in age-specific causes of mortality is due to improved living conditions, public health programs and improved health care occurring in the interval. Decreased age-specific mortality is consistent with substantially increased life expectancy in Seychelles over the past 25 years.

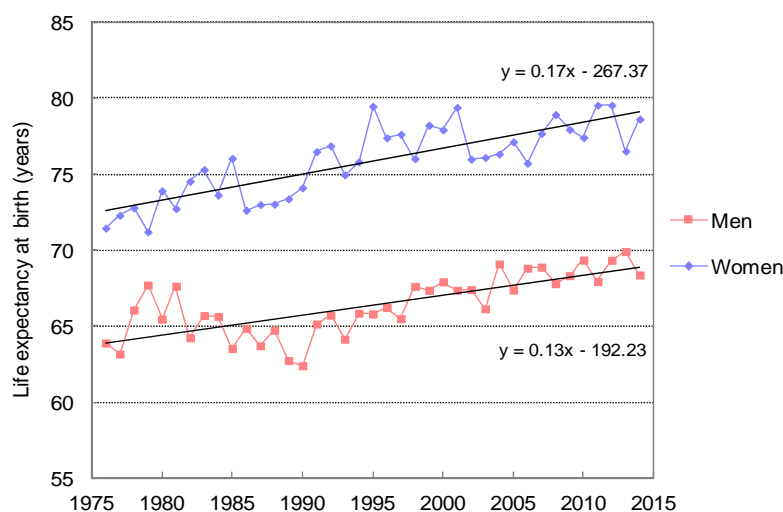
Figure 3. Total numbers of cardiovascular disease, cancer and other broad causes of deaths between 1990 and 2012



It is remarkable that the total number of CVD deaths has not increased substantially between 1989 and 2013. This is due to the marked reduction in age-standardized CVD mortality rates over time. The total number of cancer deaths

has only slightly increased, despite largely increasing and aging population. These favorable trends reflect improved health in the population over time, including the reduction of risk factors of NCDs in the population, e.g. tobacco use, and improved health care.

Figure 4. Life expectancy in Seychelles between 1976 and 2014



Consistent with regularly decreasing age-specific mortality between 1989 and 2013, life expectancy has increased steadily during the past decades and reaches fairly high values in recent years. Increased life expectancy is also noted at age 45 or 65 (data not shown). Variation in life expectancy across different years is expected in view of small numbers of deaths and small population in Seychelles, and mostly reflects random noise in the data.

Participation to Seychelles NCD surveys

Table 1. Participation to the 2013 survey by age and sex

	25-34	35-44	45-54	55-64	Total
Men					
Eligible	196	202	217	215	830
Participants	111	109	150	161	531
<i>Participation (%)</i>	56.6	54	69.1	74.9	64
Women					
Eligible	204	216	222	230	872
Participants	162	168	183	196	709
<i>Participation (%)</i>	79.4	77.8	82.4	85.2	81.3
Total					
Eligible	400	418	439	445	1702
Participants	273	277	333	357	1240
<i>Participation (%)</i>	68.3	66.3	75.9	80.2	72.9

Participation in the 2013 survey was lower among men (64.0%) than among women (81.3%) and lower among young than older male participants (55.6% among men aged 25-34 vs. 54% among men aged 35-44). These findings are frequently noted in population surveys in many countries.

With regards to non participation, we were able to compare education status among eligible participants who did not participate and eligible participants who participated in the 2013 Survey, based on information on education that was available in the entire sample of eligible participants, as provided by the National Bureau of Statistics. Education level was not different in participants and non-participants, which gives reasonable assurance that participants and non-participants did not differ substantially according to socio-economic status (SES).

Table 2. Participants in national NCD surveys in 1989, 1994, 2004 and 2013

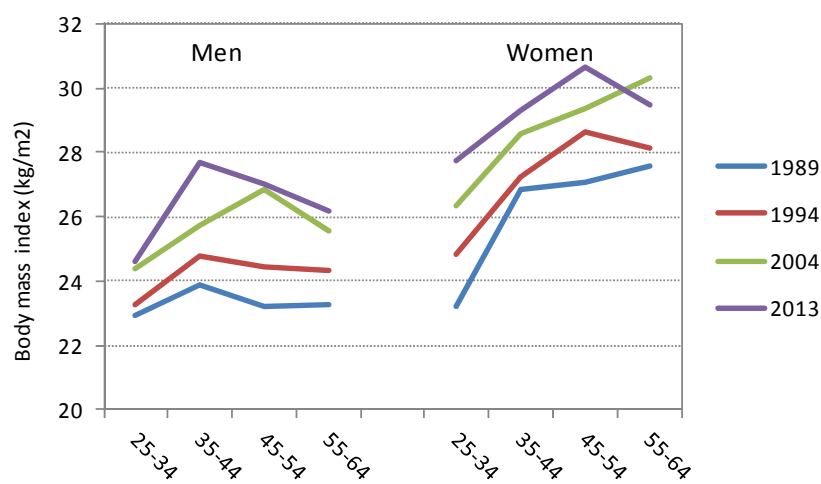
Age range	1989		1994		2004		2013-2014		Total
	Men	Women	Men	Women	Men	Women	Men	Women	
25-34	105	123	119	142	126	149	111	161	1036
35-44	127	143	124	143	134	176	109	170	1126
45-54	145	145	132	142	158	181	150	183	1236
55-64	136	157	129	136	150	181	161	195	1245
Total	513	568	504	563	568	687	531	709	4643

The four surveys included similar total numbers of participants, i.e. 1081 in 1989, 1067 in 1994, 1255 in 2004 and 1240 in 2013. Participation rates in the surveys in 1989, 1994 and 2004 exceeded 80% and participation in 2013 was 73%. These participation rates are excellent for such examination surveys, and allow generalizing findings to the entire population of Seychelles. Participation to examination surveys, for which participants have to come to designated study centers, is often lower than 50% in high income countries.

To maximize the statistical power of estimates of the variables assessed in the survey in all age categories considering that there are less older than young people in the population, the sampling strategy was designed to include similar numbers of participants in each of four 10-year age categories (i.e. random sex and age stratified sample from the total population aged 25-64 years). The sample sizes in each of the four surveys are sufficiently large to provide sufficient statistical power to assess the main objectives of the surveys, i.e. the prevalence of risk factors and their trends over time.

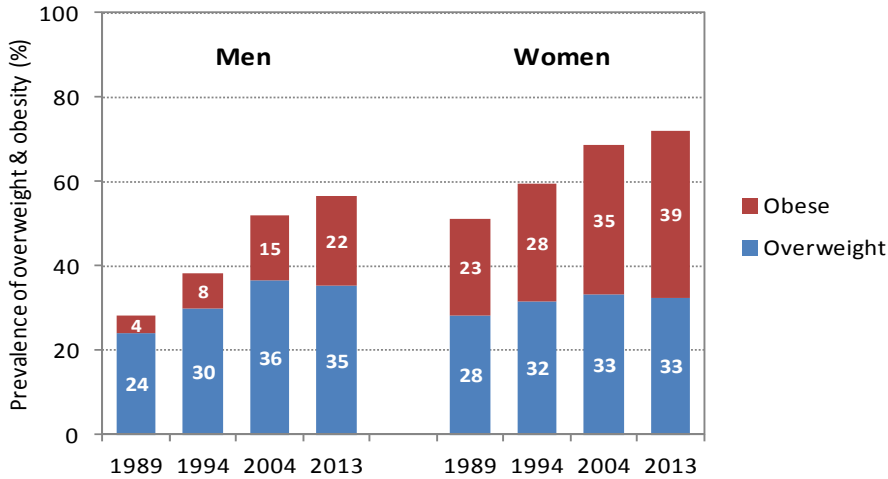
Of note, similar methods were used in all four surveys in relation to the sampling strategy (sex and age stratified random samples of the total population aged 25-64), questionnaires used (a majority of questions were identical in each survey) and methods used to assess risk factors (blood pressure, BMI, etc). This allows both inferring results to the general population of Seychelles and directly comparing results across different survey.

Body mass index (BMI)

Figure 1. Mean BMI by sex, age and survey year, age 25-64

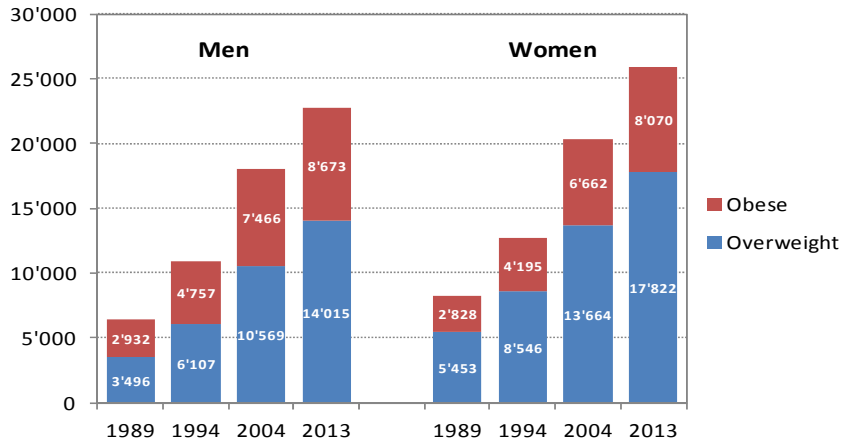
Mean BMI was higher in women than men and in younger than older persons, particularly in women. Mean BMI increased markedly between 1989 and 2013 in all sex and age categories. The increase of mean BMI between 1989 and 2013 is particularly striking among women aged 25-34.

Figure 2. Age-standardized prevalence of overweight and obesity by sex and survey year, age 25-64



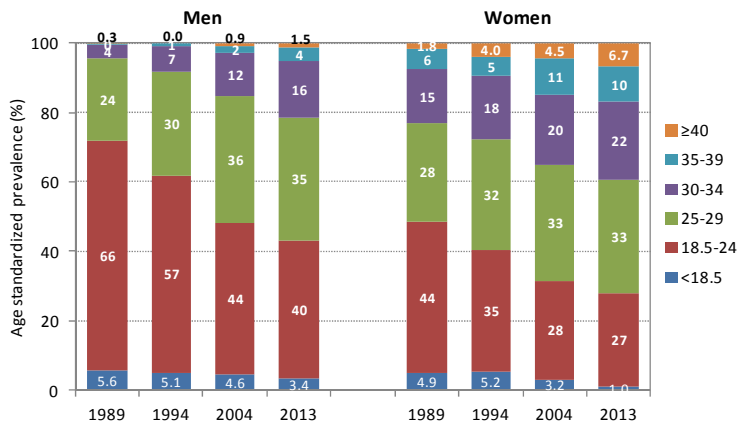
Between 1989 and 2013, the prevalence of combined overweight (i.e. moderate excess of weight, BMI: 25-29 kg/m²) and obesity (marked excess of weight, BMI ≥30 kg/m²) has doubled in men (from 28% to 57%) and also has markedly increased in women (from 51% to 72%).

Figure 3. Total numbers of overweight and obese persons in Seychelles by sex and survey year, age 25-64



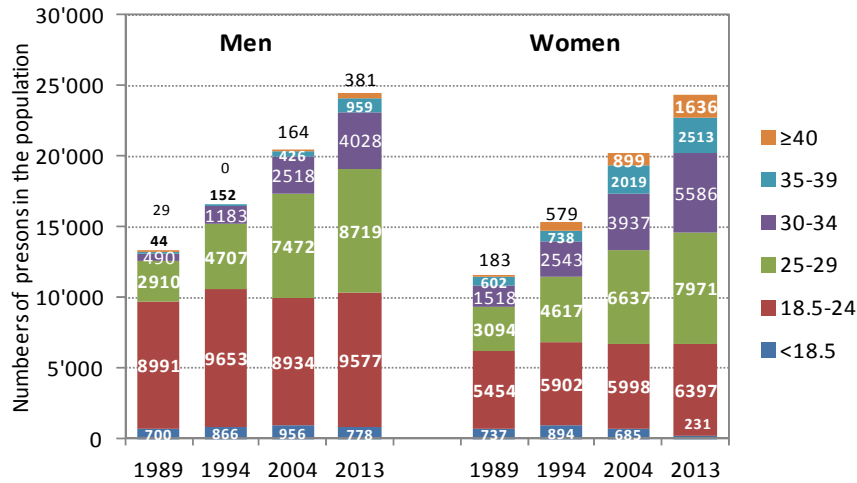
Because of the increasing and aging population between 1989 and 2013, the increasing prevalence of overweight and obesity over time results in largely increasing numbers of overweight and obese persons in the population (48'830 persons aged 25-64 in 2013).

Figure 4. Age-standardized prevalence of categories of BMI by sex and survey year, age 25-64



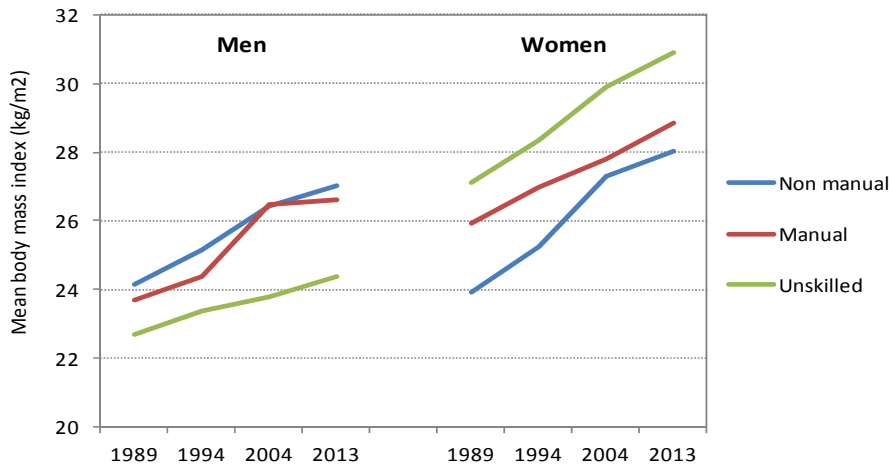
Note: BMI<18.5: underweight; 18.5-24.9: normal range; 25-29: overweight; 30-34: obese class I; 35-39: obese class II (severe); ≥40: obese class III (morbid obesity). The age-standardized prevalence of very obese persons, which is strongly associated with several ill conditions, is rapidly increasing over time.

Figure 5. Numbers of persons in the population of Seychelles with different levels of BMI, age 25-64



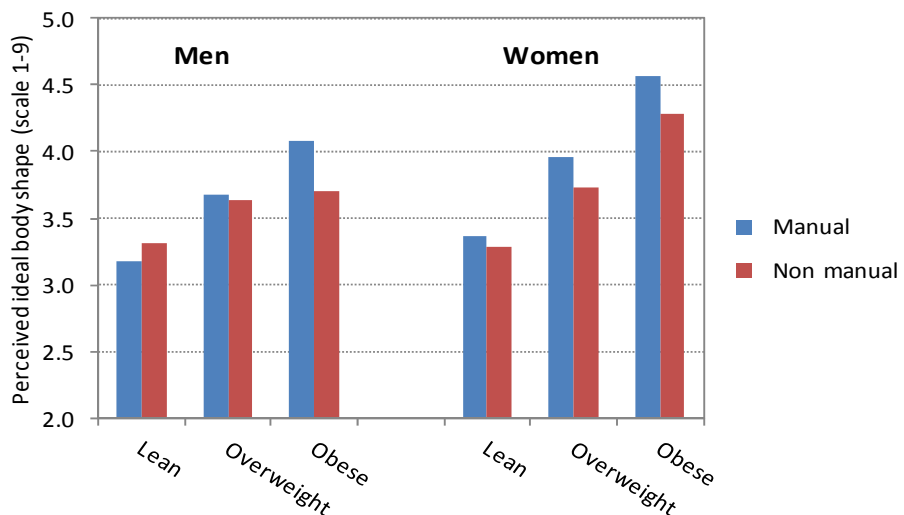
The number of persons with severe obesity (BMI 34-39) or morbid obesity (BMI ≥ 40) has dramatically increased over time, and exceeds several thousands of adults (from a total population of 48'830 aged 25-64 in 2013). This predicts high numbers of persons with obesity related complications in the future.

Figure 6. Mean age-standardized BMI by sex, SES and survey year, age 25-64



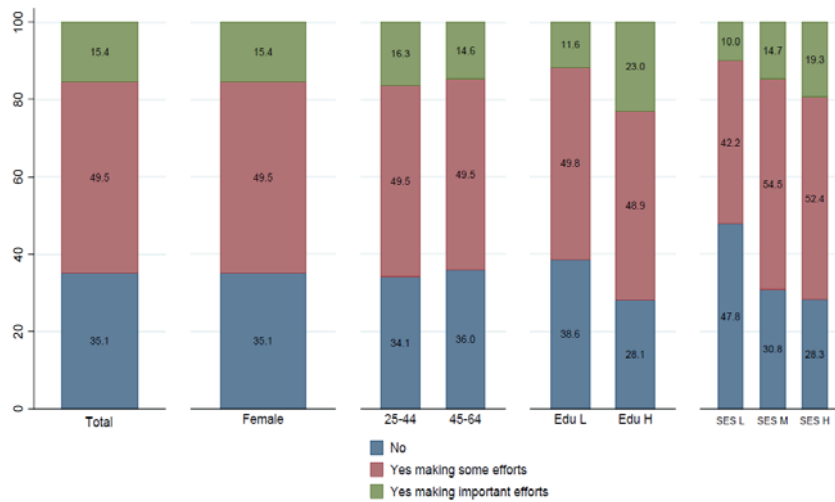
There is a strong sex-specific social patterning of body weight in all surveys. Mean BMI is higher among women of lower than higher SES while mean BMI is markedly higher in men of higher than lower SES.

Figure 7. Perceived ideal body shape by sex, BMI and SES, age 25-64



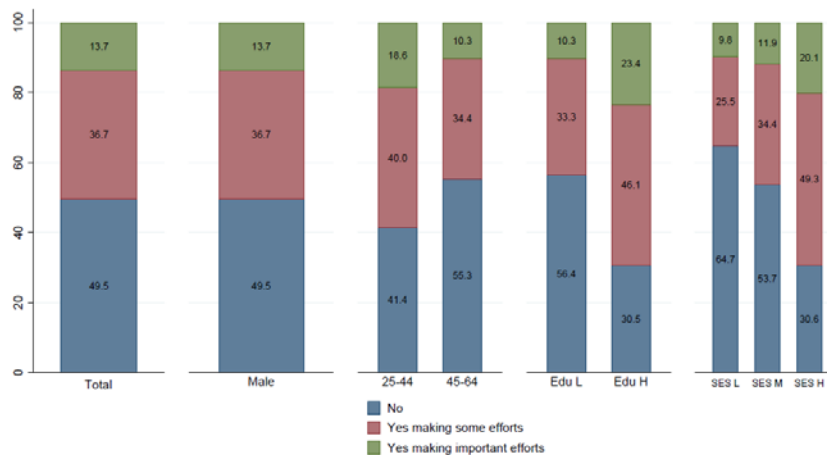
Ideal body shape was assessed by asking participants to choose a body shape silhouette that best represented their ideal body weight, using a drawing showing 9 silhouettes of increasing body shape sizes. Body shape ideal was higher in obese than lean persons and in women of lower than higher SES. Body shape ideals differed less between men of higher vs. lower SES. Having a high body shape ideal likely is a barrier to adequate weight control.

Figure 8. Proportions of women taking concrete measures to control their body weight, by age, sex and SES, age 25-64



Substantial proportions of women report to take measures to control their body weight, with some differences according to SES.

Figure 9. Proportions of men taking concrete measures to control their body weight, by age, sex and SES, age 25-64



Substantial proportions of men report to take measures to control their body weight in the population, with a marked difference according to higher vs. lower SES.

Comments

BMI (i.e. relative body weight) largely increased over surveys in Seychelles in all sex, age and SES categories. High BMI is associated with many detrimental health conditions, including diabetes, high blood pressure, dyslipidemia, osteoarticular problems, etc.

The 2013 survey identified marked differences in BMI according to sex and SES categories, as well as large differences in the perception of ideal body weight and attitudes by sex and SES. These variables will be analyzed in further detail as they bear important significance in terms of cultural and social determinants of obesity and have implications for targeted weight control programs.

The WHO member states, including Seychelles, have agreed in 2014 on the target of a 0% increase of the prevalence of obesity and diabetes between 2010 and 2025.

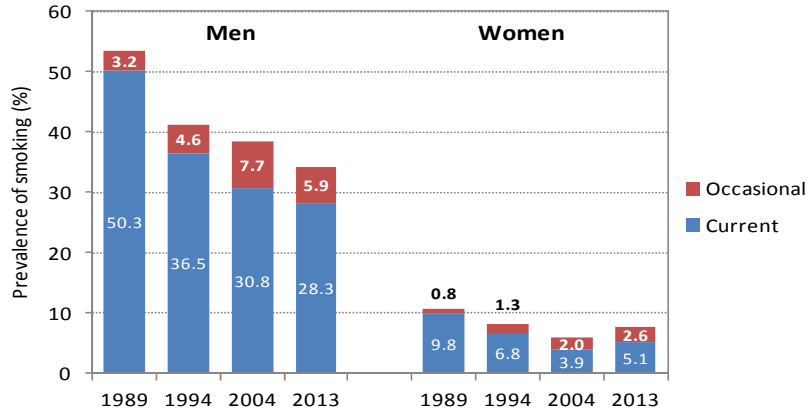
Interventions to reduce body weight at the individual level often have little efficacy, except bariatric surgery. Therefore, weight control interventions should focus on the societal causes of the obesogenic environment and include interventions in all sectors (e.g. education, agriculture, finance, transports, nutrition, food industry, etc) to enable people to choose healthier diets, including adequate food labeling, tax/subsidies on healthy/unhealthy foods; ban on advertising of unhealthy foods, healthy food in canteens in schools/workplaces. Multisectoral interventions

should also address the structural environment to help people engage in more physical activity in their daily lives (e.g. bus/cycling lanes, safe sidewalks, promotion of public transports, disincentives to use private cars, etc).

The WHO 2014 NCD Status Report lists several cost-effective interventions in many sectors that can help reduce obesity and promote physical activity in the general population.

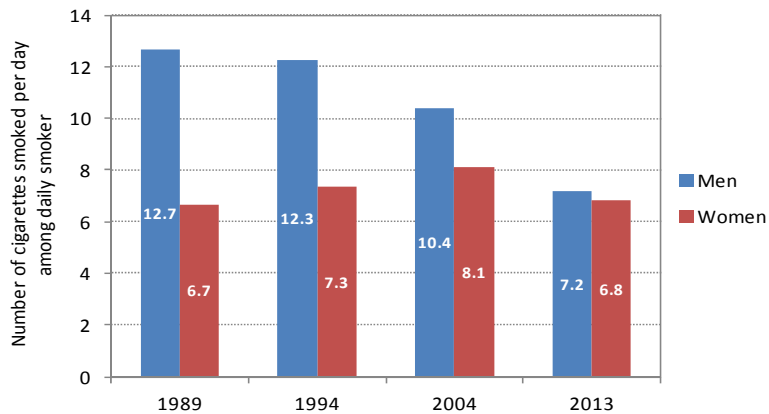
Tobacco use

Figure 1. Age-standardized prevalence of occasional and daily cigarette smoking by sex, age and survey year, age 25-64



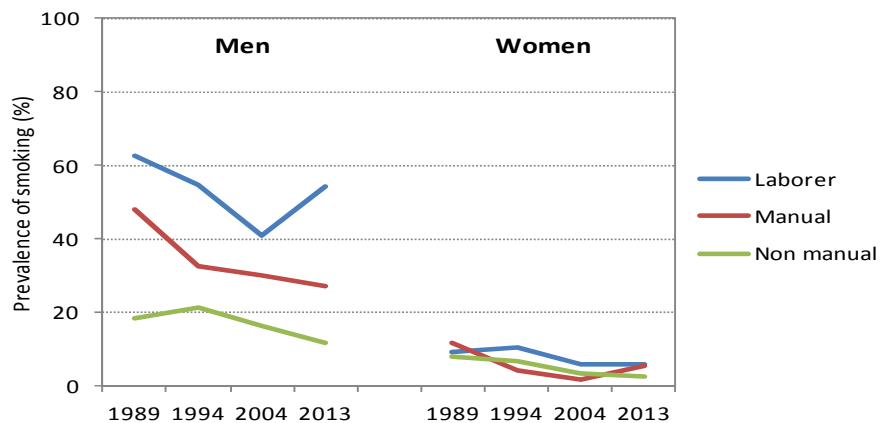
The prevalence of daily smokers is much higher in men than in women. The prevalence decreased markedly among men over time but tended to increase among women between 2004 and 2014.

Figure 4. Age-standardized number of cigarettes smoked per day among daily smokers, by sex and survey year, age 25-64



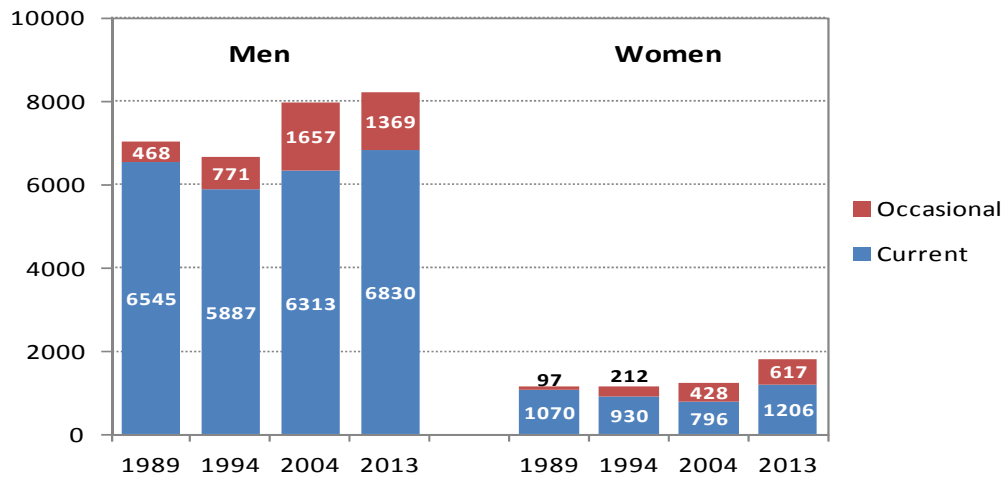
The number of cigarettes smoked by daily smokers, which was much higher in men than women in the past, has decreased in male smokers, but not in female smokers.

Figure 3. Age-standardized prevalence of cigarette smoking by sex, SES, and survey year, age 25-64



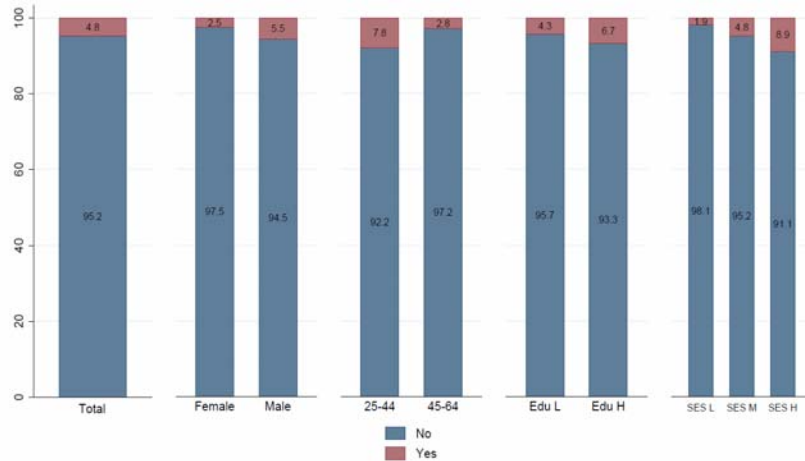
The prevalence of smoking was higher in all surveys among persons of lower vs. higher SES, particularly in men.

Figure 4. Numbers of regular and occasional smokers in Seychelles by sex and survey year, age 25-64



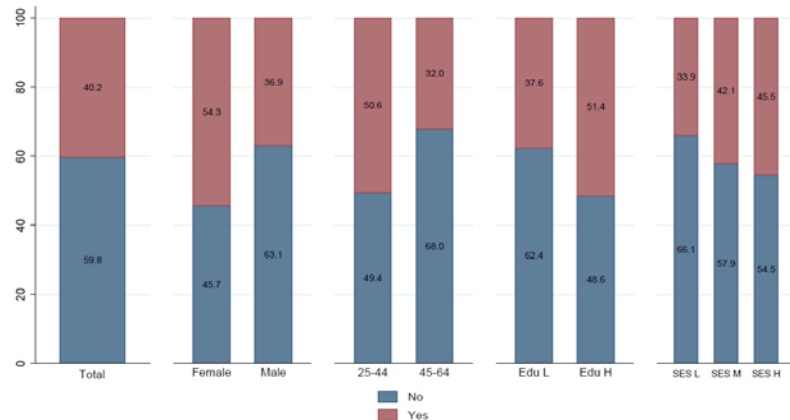
Even if the prevalence of smoking has markedly decreased in men and not markedly increased in women, the total numbers of smokers has increased over time because of the largely increasing population between 1989 and 2013.

Figure 5. Proportion of persons smoking pipe, cigars, cigarillos, hand rolled cigarettes or shisha (n=17 in total) among ever smokers (n=345)



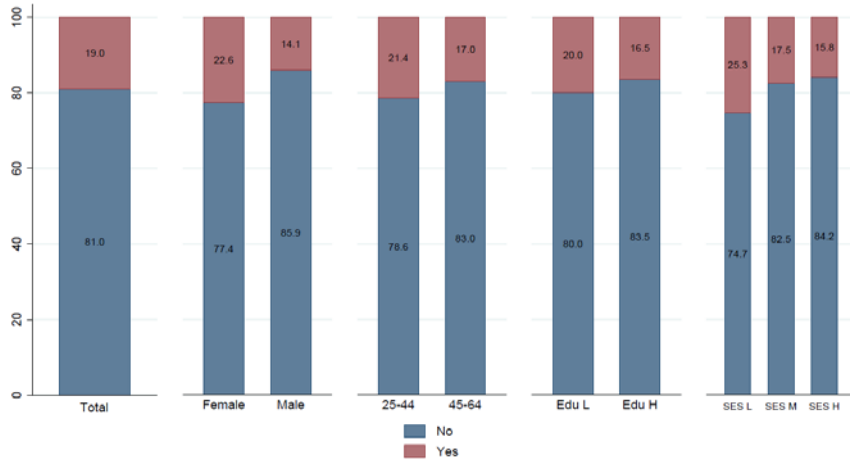
The use of tobacco products other than cigarettes is very uncommon. In addition, most users of other products also smoke cigarettes (data not shown here).

Figure 6. Proportion of daily smokers who tried to quit smoking in the past 12 months, by sex, age and SES, age 25-54



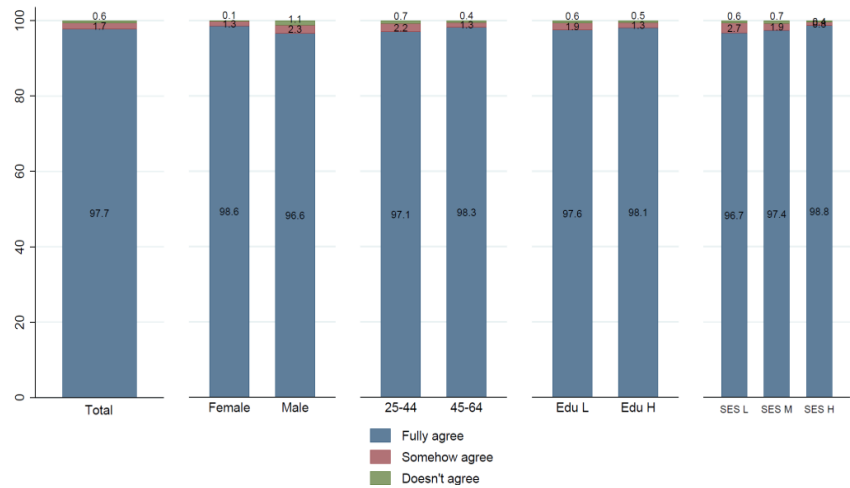
A large proportion of smokers wish to quit. This proportion is higher among smokers of higher than lower SES, consistent with higher prevalence of smokers among persons of lower than higher SES. Of note, attempts to quit are often not successful because of the addictive nature of nicotine, which emphasizes the need to focus on measures on demand to prevent smoking uptake at the first place.

Figure 7. Did anyone smoke in your home when you were present in the past 7 days? By sex, age and SES, age 25-64



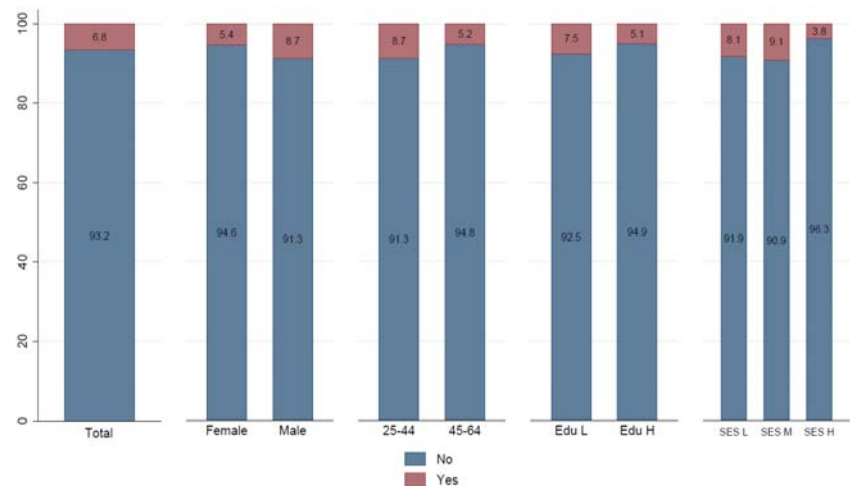
Nearly 20% of all adults report to have been exposed to smoke at home, slightly less often among persons of higher than lower SES.

Figure 8. Do you agree with the ban on smoking in enclosed public places, including work places and restaurants? by sex, age and SES, age 25-64



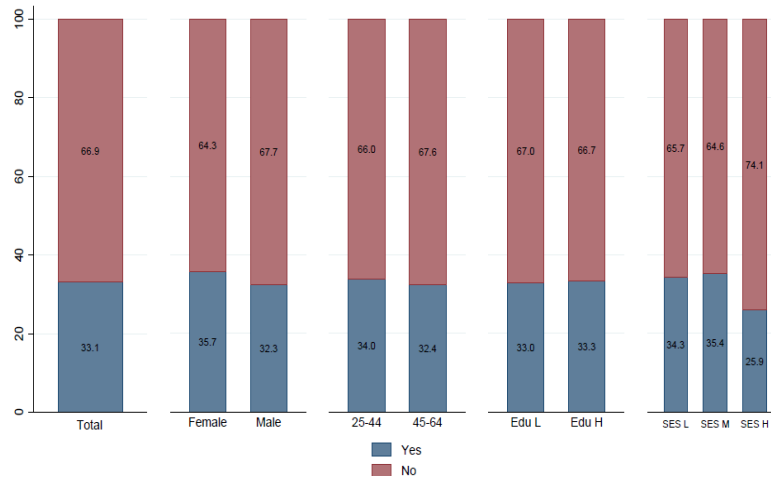
The ban on smoking in enclosed places is largely supported, including by the majority of smokers.

Figure 9. Did anyone smoke in enclosed areas in your workplace when you were present in the past 7 days, by sex, age and SES



Around 10% of participants report exposure to indoor smoke in the workplace, which suggests the need to improve enforcement of the legislation that bans smoking in enclosed public places and work places.

Figure 10. Received advice about smoking cessation from a health officer in the past 12 months by sex, age and SES, age 25-64, among 127 smokers who visited a doctor in the past 12 months



Only a third of smokers receive advice to quit smoking during medical visits. Advice to quit smoking should be repeated at all visits as studies show that advice by doctors to quit smoking is cost effective.

Comments

The age-adjusted prevalence of smoking decreased over time as well as the number of cigarettes smoked per day in male smokers. This decrease is one factor that underlies the marked decrease in the age-adjusted mortality rates of cardiovascular diseases and lung cancer between 1989 and 2013. Decreasing prevalence of smoking (men) likely reflects the high profile tobacco control program in Seychelles since the late 1980s, which includes continued awareness programs, fairly high tax on tobacco products (>65% of total cost of cigarette packet in 2014), and impact of comprehensive legislation on tobacco control in 2009 (i.e. total ban on smoking in enclosed public places and selected open public spaces, total ban on tobacco advertising, promotion and sponsorship, etc).

However, the total numbers of smokers in the population is still both high and increasing over time, which emphasizes the need to further strengthen tobacco control program as a main public health priority.

This emphasizes that interventions to reduce tobacco use should be strengthened. This includes ensuring full enforcement of the ban on smoking in enclosed public places with regular monitoring by inspectors and spot fining smokers and managers when smokers smoke in non authorized areas; implementation of rotating health warnings on tobacco packets; further tax increases at regular intervals at a greater pace than inflation, so that the ratio of tax/total cost is and remains larger than 75%); and continued health education programs.

It is also necessary that a cessation smoking program is provided by health services to help smokers who wish to quit, including free provision of nicotine replacement medications.

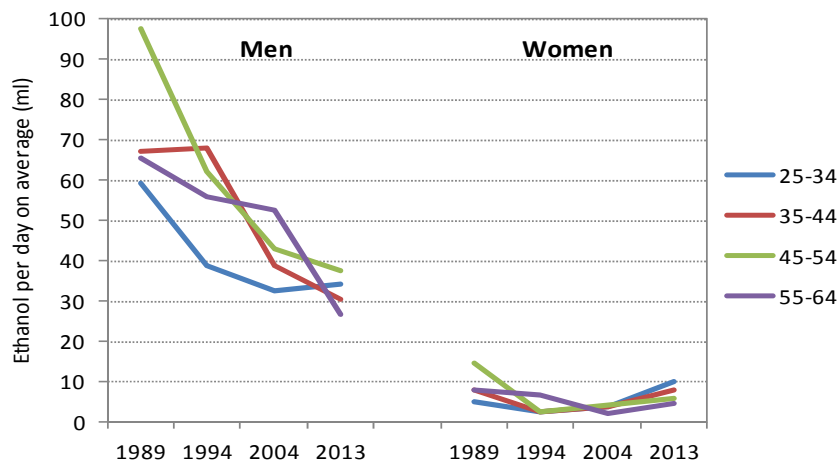
The WHO member states, inclusive Seychelles, have agreed on a 30% relative reduction in the prevalence of smoking between 2010 and 2025. The WHO 2014 NCD Status Report provides a list of cost-effective interventions for tobacco control.

All tobacco control interventions and policies implemented in Seychelles are reported in the Reporting Instrument submitted every 2 years to the Conference of Parties to the Framework Convention of Tobacco Control. It is necessary to address all known measures for tobacco control so that the prevalence of smoking keeps decreasing in Seychelles and the target of a 30% decrease between 2010 and 2025 is achieved.

As the first country that has ratified the Framework Convention for Tobacco Control in the African region, and consistent with strong tobacco control programs since more than 20 years, Seychelles should continue to aim at implementing best practices in tobacco control in the region.

Alcohol use

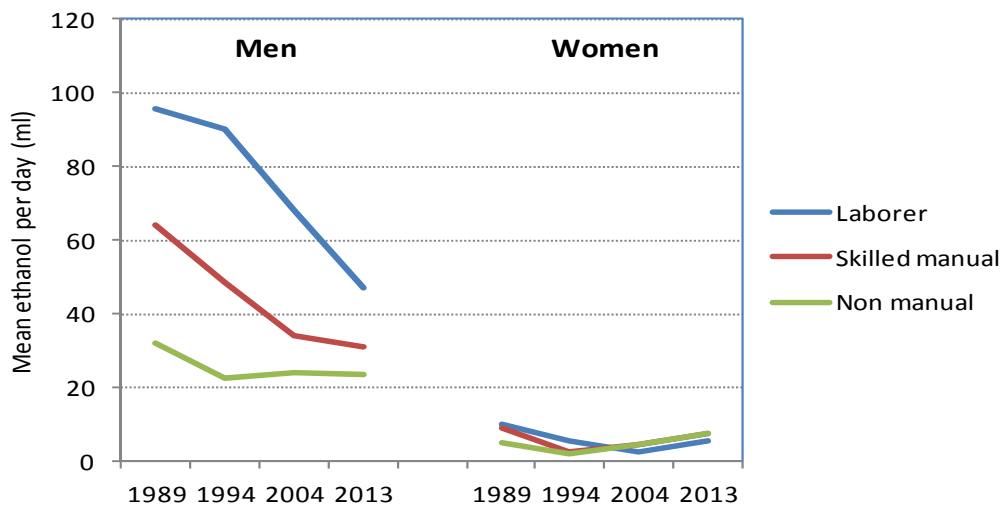
Figure 1. Mean age-standardized daily intake of ethanol by sex, age and survey year, age 25-64



Volume of drinking (ml ethanol per day and per capita on average = ml alcohol intake per day and per capita) is much lower among women than among men and has decreased markedly over time in men. Consumption was not assessed in 1994 for persons drinking alcohol less often than weekly but this has little impact on mean drinking volume (which is contributed mainly by persons who drink high volumes).

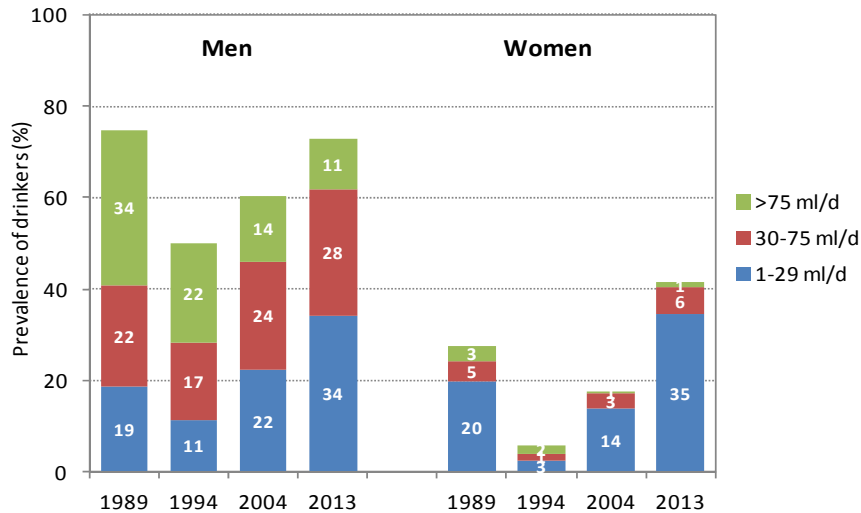
The decrease in mean alcohol intake per capita over time in men is driven by the marked decrease in the consumption of homebrews over time, which accounted for as much as 50% of the total ethanol intake in 1989 (mainly among men) but has become only marginal in 2013. The decrease in mean alcohol intake is also driven by the decrease over time of the numbers of heavy drinkers (>75 ml ethanol/day), which also used to be strongly associated with homebrew drinking.

Figure 2. Mean age-standardized ethanol intake by sex, SES and survey year, age 25-64



Ethanol intake differed largely by SES in men, with much higher intake of alcohol in lower than higher SES. However, the difference in mean alcohol intake according to SES decreased markedly over time, driven by the marked decrease of homebrew drinking in Seychelles. It was indeed mostly persons of lower SES who used to drink inexpensive homebrews in past surveys, and drank it in large amounts. Homebrew drinking has virtually disappeared in recent years and consumption of alcohol now almost entirely relies on commercial beverages, which are highly taxed. High price of alcohol beverages is a most effective measure against heavy drinking. One could even expect a reversal of the SES gradient in heavy drinking, as already apparently already seen in women, at a small scale, with higher alcohol intake in women of higher vs. lower SES.

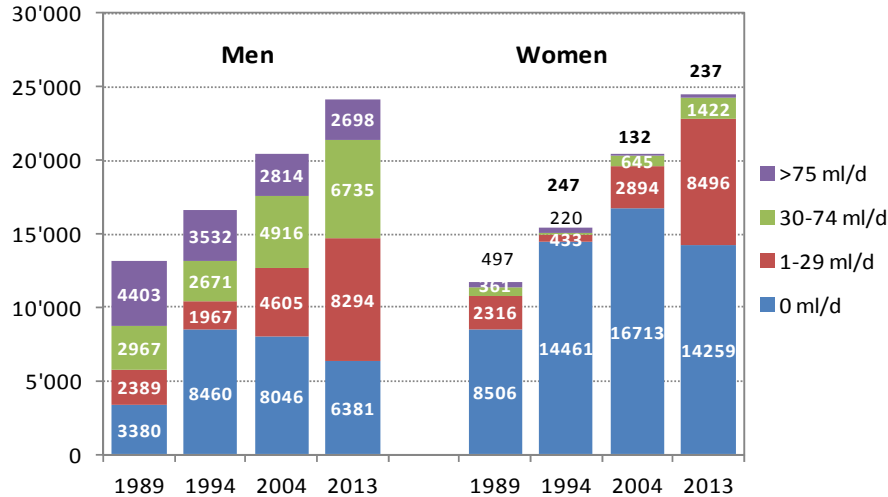
Figure 3. Age-standardized prevalence of categories of drinking by sex and survey year, age 25-64 (1-29 ml ethanol/day = 1-2 drinks per day on average; 30-75 ml/day = 3- 5 drinks; ≥75 ml/day >5 drinks)



The prevalence of heavy drinking (≥ 5 drinks per day on average), which was very high in men in 1989 and 1994, has decreased over time, but is still substantial in 2013 (nearly 11% of men in 2013). However, the prevalence of both moderate drinking (1-2 drinks per day) and marked drinking (3-5 drinks per day) has increased over time in both men and women.

Of note, alcohol intake was not assessed in 1994 for persons drinking less than once weekly and the prevalence of category 1-25 ml/day is therefore underestimated in 1994. This has impact on estimation of the prevalence of light drinking but has only little impact on estimates of total alcohol consumption.

Figure 4. Total numbers of light, moderate, marked and heavy drinkers in the population of Seychelles, by sex and survey year, age 25-64



Note: 1-29 ml ethanol/day = 1-2 drinks/day; 30-75 ml/d = 3-5 drinks/d; >75 ml/d: >5 drinks/d. Alcohol consumption was not assessed in 1994 for persons drinking alcohol less often than once weekly, hence the frequency of moderate drinking (1-25 ml/day) is under-estimated and the category of 0 ml/day is overestimated in 1994.

Although the prevalence of heavy drinkers (>5 drinks per day on average) has decreased over time, the total number of heavy drinkers remains high among men with nearly 3000 male heavy drinkers in 2013. The cumulating effect of the increasing prevalences of light and moderate drinkers, and the increasing population between 1989 and 2013, result in largely increasing numbers of light and moderate drinkers over time, both male and female.

Figure 5. Number of drinks consumed on a typical week day by sex, age and SES, age 25-64

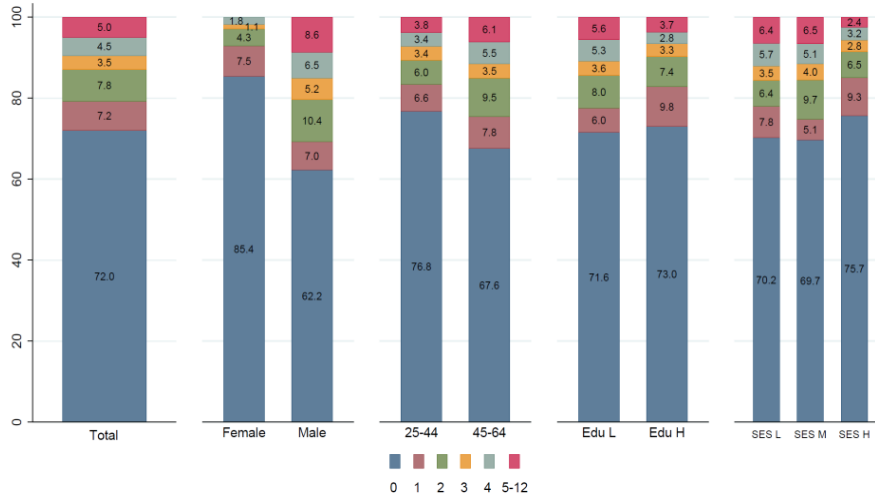


Figure 6. Number of drinks consumed on a typical Friday, by sex, age and SES, age 25-64

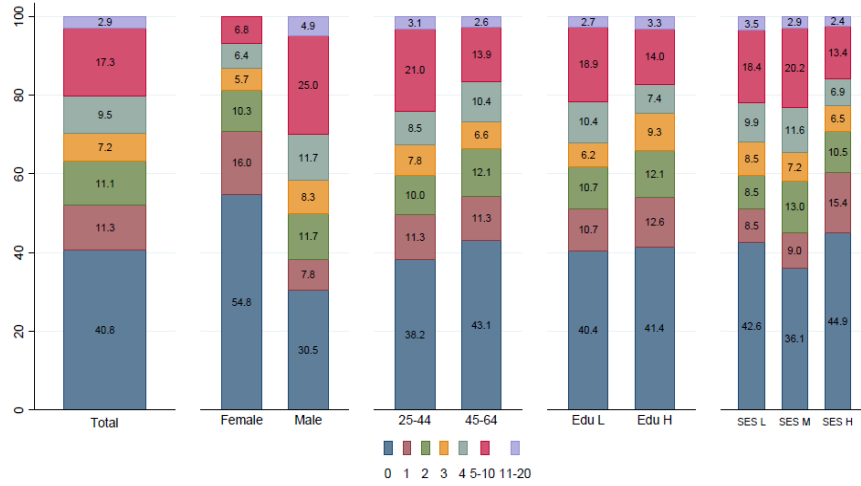


Figure 7. Number of drinks consumed on a typical Saturday by sex, age and SES, age 25-64

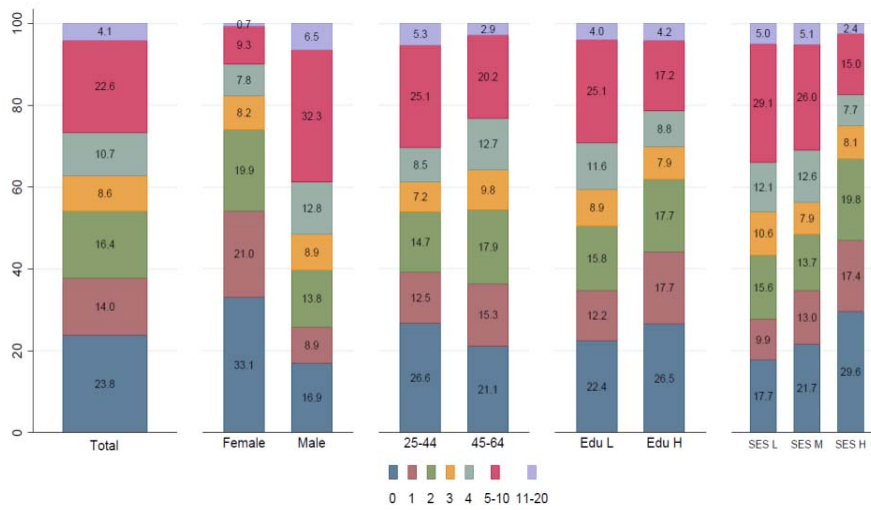
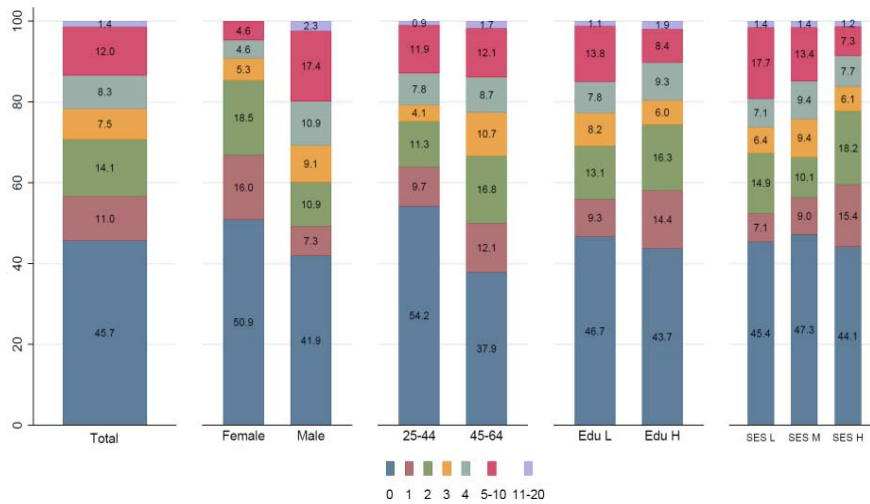
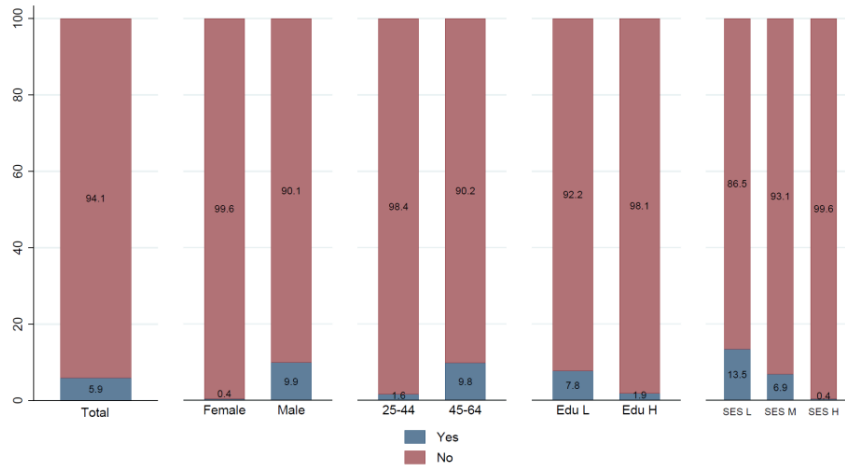


Figure 8. Number of drinks consumed on a typical Sunday, by sex, age and SES, age 25-64



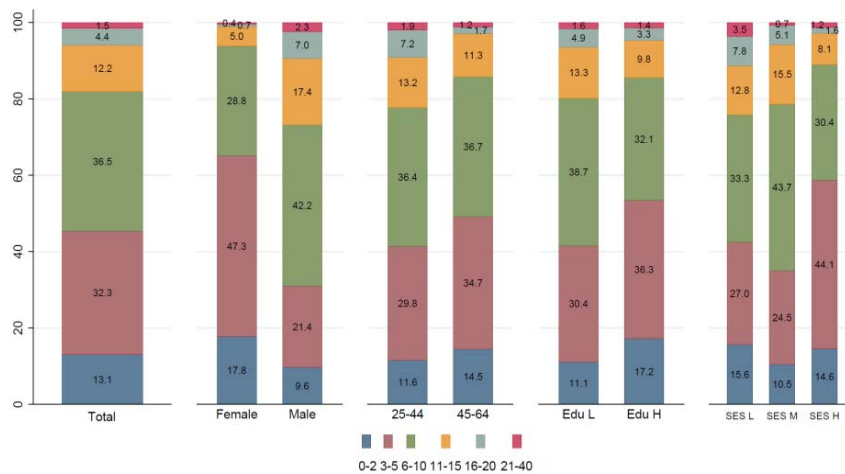
Few adults drink on workdays but high proportions drink on Fridays and Sundays and the highest proportions are noted on Saturdays. This suggests binge drinking patterns in many drinkers.

Figure 9. Proportion of persons drinking homebrews (kalou, baka, or lapire) by sex, age and SES, age 25-64, among 665 current drinkers

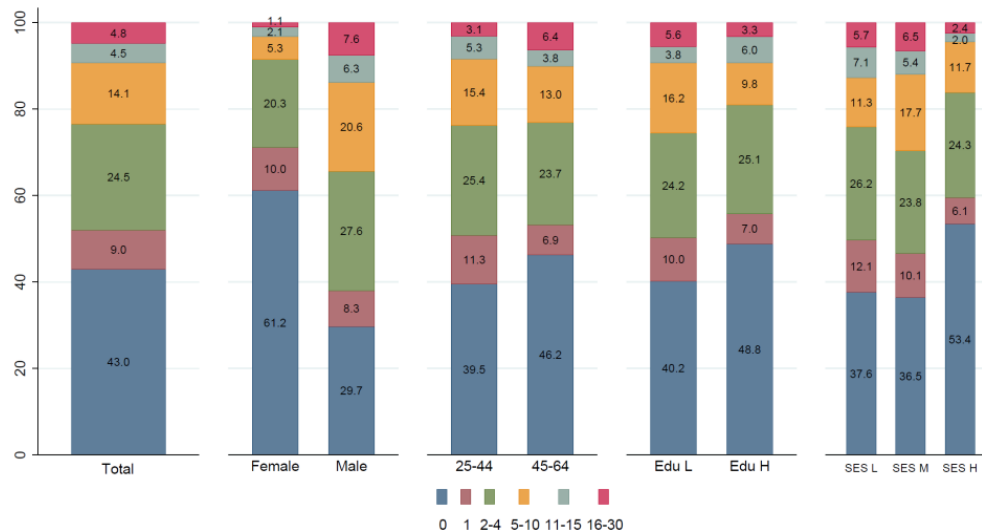


Homebrew drinking is very low in 2013, and is higher in males than females, older than young persons, and persons of lower than higher SES.

Figure 10. Number of drinks of any type consumed in a single day on special occasions, by sex, age and SES, age 25-64



Around 20% of all adults aged 25-64 report drinking >10 drinks on special occasions. This proportion is higher in male vs. female, younger vs. older persons, and persons of lower vs. higher SES. Binge drinking (irregular drinking with high amounts on a few drinking sessions) has numerous health and social detrimental outcomes and it is an important public health problem.

Figure 10. Number of days per month drinking more than 4 (women) or 5 (men) drinks, by age, sex and SES, age 25-64

Around 20% of all adults drink high amounts of alcohol on more than 5 days per month and around 10% of all adults drink high alcohol amounts of alcohol on more than 10 days per month. Binge drinking is more frequent in male than female persons and in persons of lower than higher SES. There was little difference between younger and older persons. Overall, these figures show a high frequency of binge drinking, with many men and women drinking in excess on many days per month.

Comments

Ethanol consumption per capita decreased over the past 25 years, largely driven by both a marked decrease of heavy drinking among men and a largely decreasing consumption of homebrews between 1989 and 2013.

However, while the prevalence of heavy drinking (>5 drinks per day on average) has decreased over time, the proportions of all adults drinking light or moderate alcohol amounts has increased among both men and women.

Because the population has largely increased over time, the total numbers of heavy drinkers in the population (mainly men) remains high, and the numbers of moderate drinkers (1-2 or 3-5 drinks per day on average) have largely increased. This implies large and further increasing numbers of health, social and other alcohol-related problems in the population, e.g. larger numbers of drunk drivers on the roads.

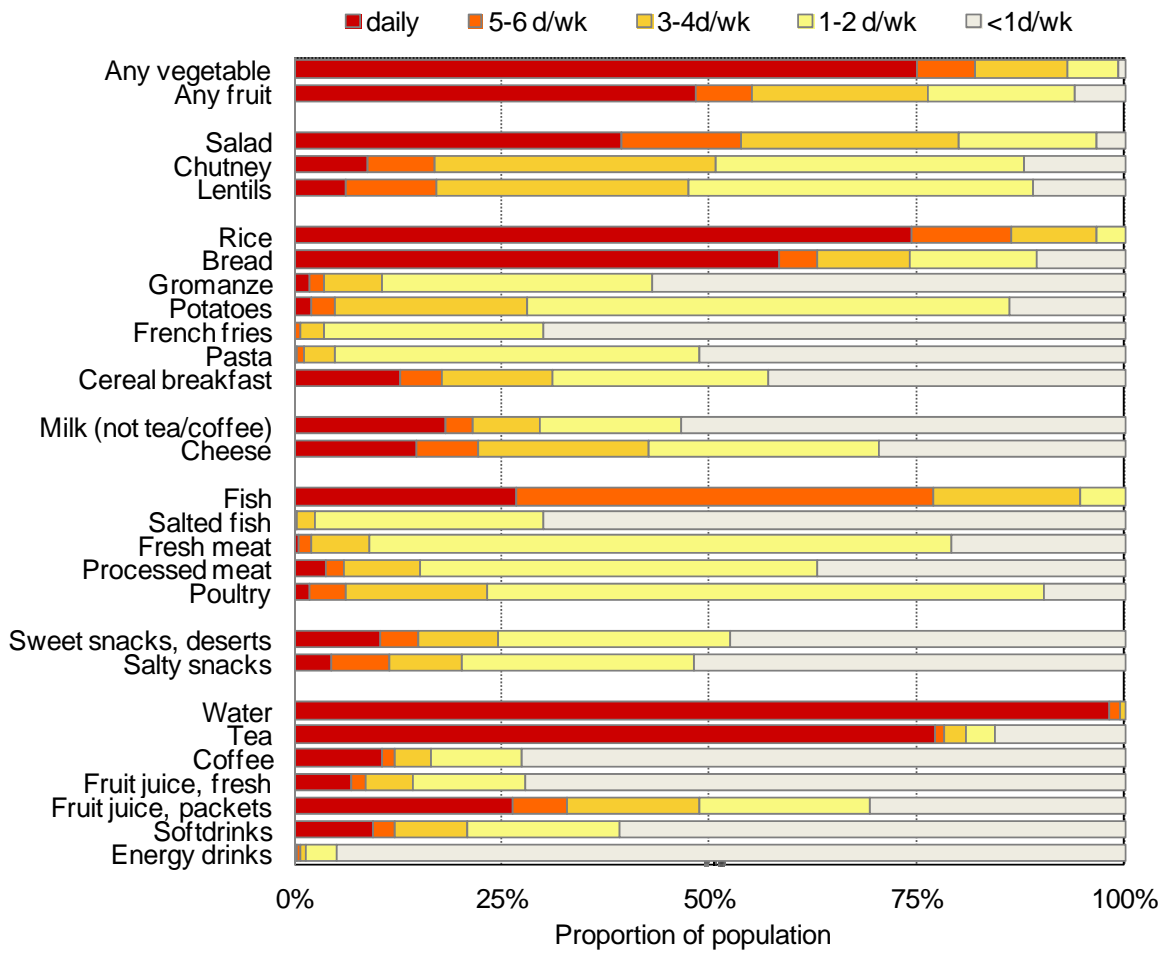
A further important problem is that alcohol is often consumed along a binge drinking pattern (i.e. high intake on few occasions). Binge drinking (as compared to regular low intake of alcohol) is associated with many health and social problems (heart attack, drunk driving, violence, etc).

Findings in the different surveys between 1989 and 2013 confirm that alcohol misuse remains a main public health issue in Seychelles and requires a strengthened public health response, e.g. frequent random alcohol checks of drivers in sensitive points (discotheques, social gatherings at night, etc), high taxes on alcohol beverages on a basis of alcohol content of the beverages, severe penalties for drunk driving, ban on advertisements of alcohol beverages in the mass media, awareness campaigns, etc).

The WHO member states, inclusive Seychelles, have agreed on a 10% relative reduction of the prevalence of harmful use of alcohol between 2010 and 2025. The WHO 2014 NCD Status Report provides a list of cost-effective interventions in multiple sectors to reduce alcohol misuse in the population.

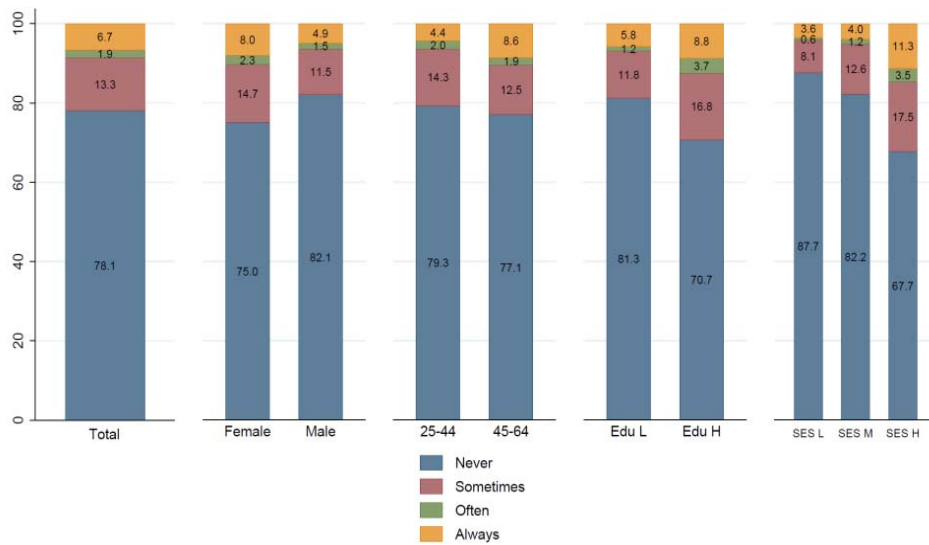
Dietary habits

Figure 1. Patterns of dietary habits, based on food frequency questionnaire, age 25-64



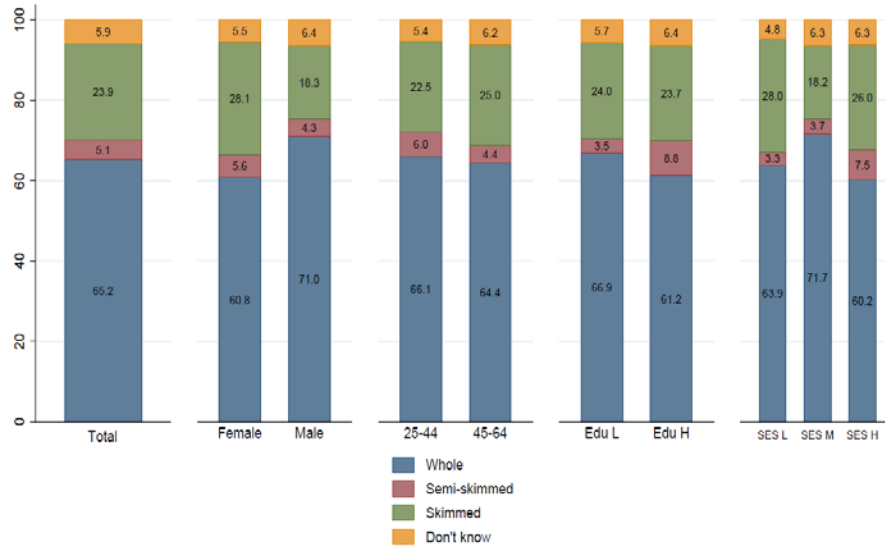
Description of some findings in this figure appears in the comment section.

Figure 2. How often do you eat brown bread at home, by sex, age and SES, age 25-64



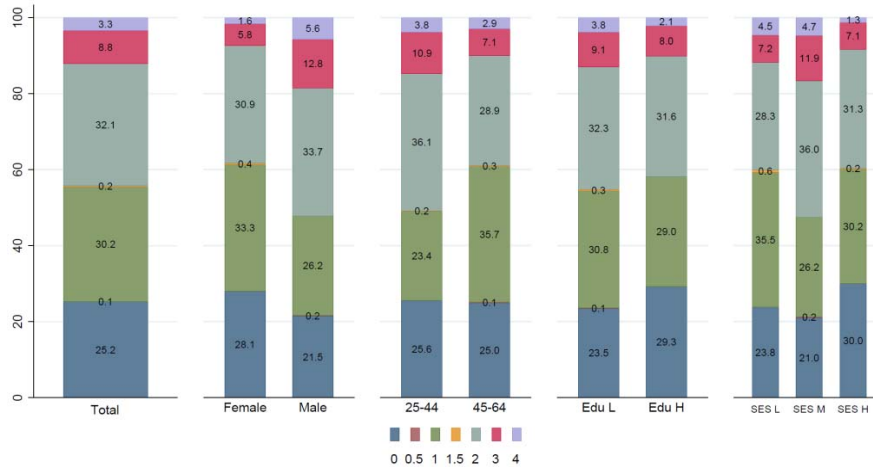
A significant proportion of people eat (more healthy) brown bread, and more often among higher vs. lower SES persons. This proportion should be increased through awareness campaigns.

Figure 3. Which type of milk do you buy most often, by sex, age and SES, age 25-64



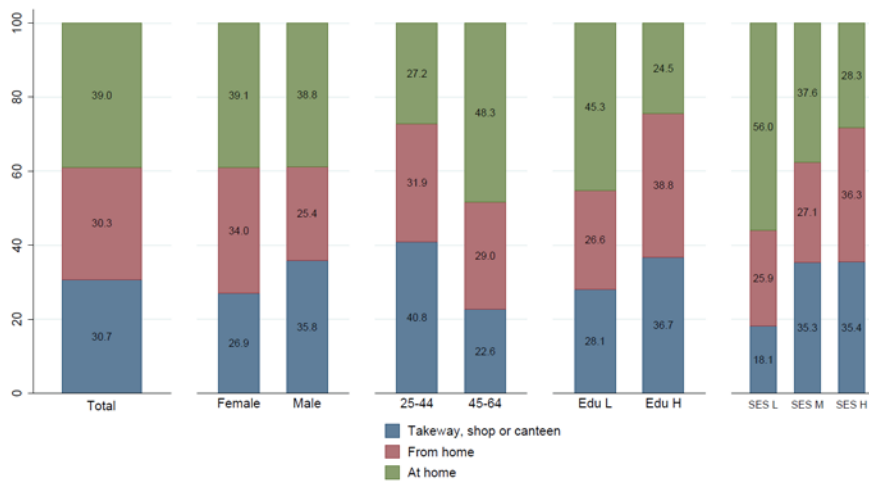
A substantial proportion of people drink semi-skimmed or skimmed milk, and this proportion does not differ much according to SES. Awareness campaigns should encourage people drinking semi-skimmed milk.

Figure 4. Number of spoons of sugar added in tea or coffee, by sex, age and SES; age 25-64



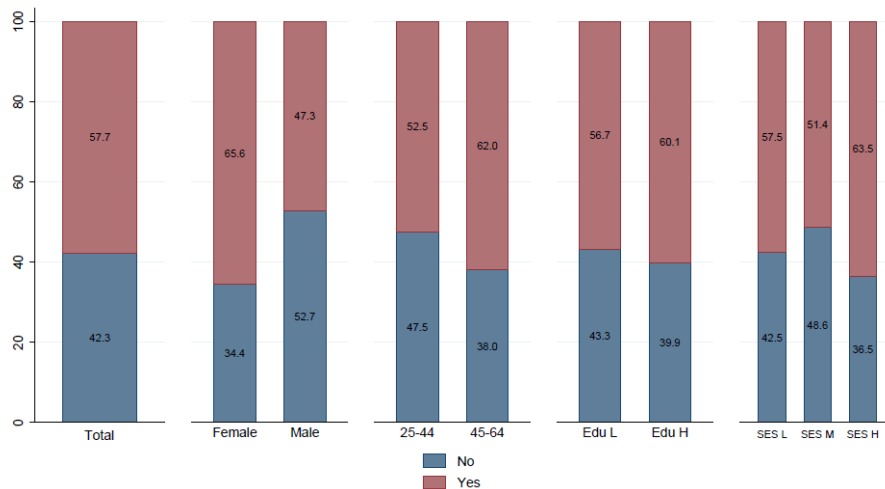
Many people add large amounts of sugar in tea/coffee. This is an important source of calorie intake in the population, hence a cause of obesity. Awareness campaigns should encourage people reducing added sugar.

Figure 5. Where do you get your lunch most often? by sex, age and SES, age 25-64



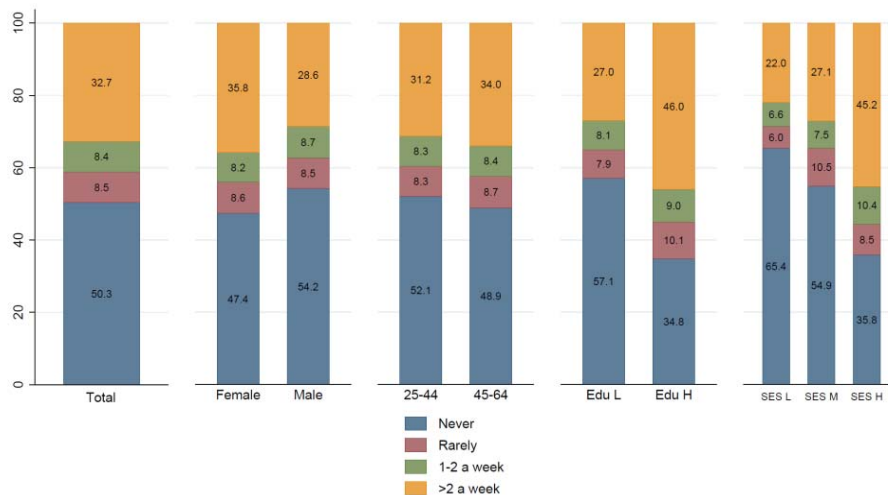
Substantial proportions of persons eat their lunch from take away premises, which emphasizes the need for designing and implementing programs and policy to improve nutrition value of take away meals.

Figure 6. Removes visible fat on meat for cooking or eating (chicken skin, fat in meat), by sex, age and SES; age 25-64



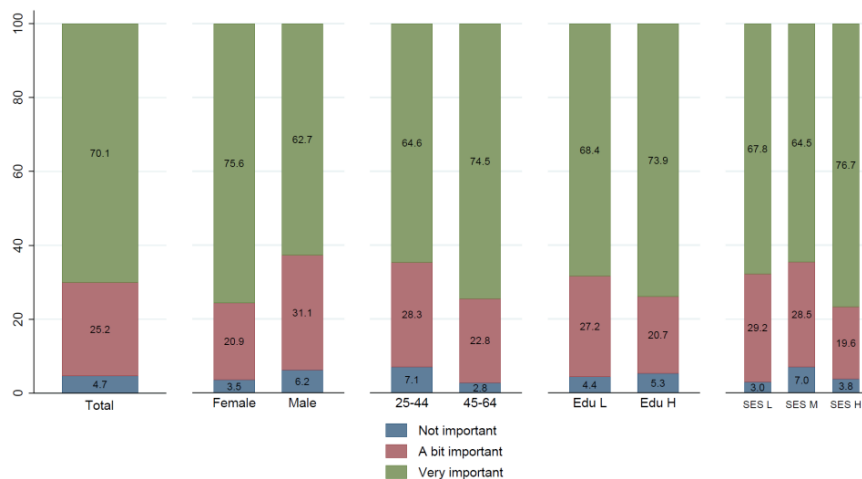
The proportions of persons not removing fat is high, and tends to be lower in female vs. male, older vs. young, and higher vs. lower SES persons. Awareness campaigns should encourage people removing fat (which includes mostly unhealthy saturated fats) from meat when cooking or when eating.

Figure 7. Do you use olive oil when cooking or to add in salad, by sex, age and SES, age 25-64



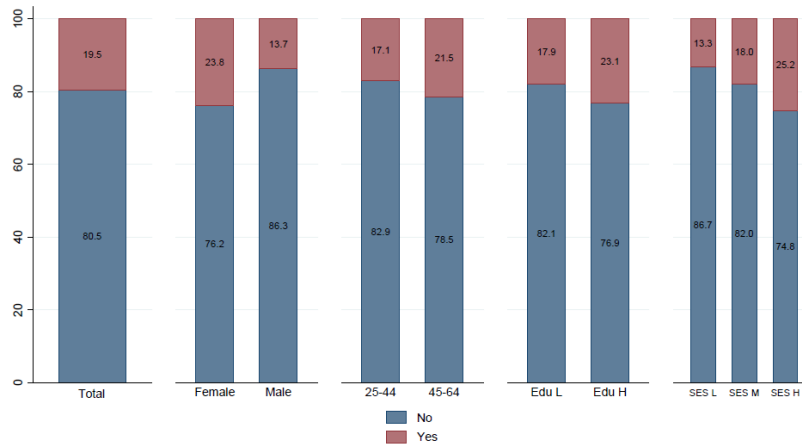
The consumption of olive oil (a healthy oil rich in mono-unsaturated fatty acids) is unexpectedly high in the population, and likely a new trend, likely reflecting health consciousness, impact of health education programs, and recent decrease in the price of olive oils. Consumption of olive oil is markedly higher in higher vs. lower SES persons, possibly reflecting both a cost issue and higher health awareness.

Figure 8. How Important to you is lowering the salt content in your diet, by sex, age and SES; age 25-64



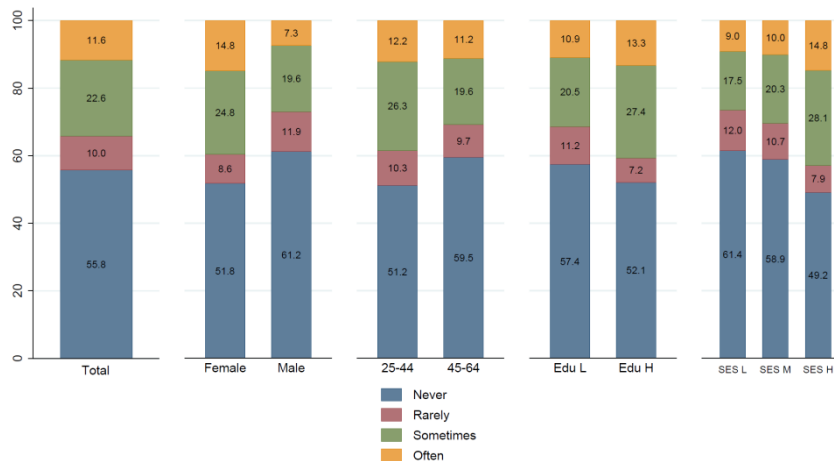
The proportion of people reporting paying attention to salt reduction (a main measure for reducing blood pressure) is high in the population, likely reflecting awareness campaigns on this issue. This proportion of persons trying to reduce salt intake is higher among female vs. male, older vs. young, and higher vs. lower SES persons.

Figure 9. Took vitamins during the last 4 weeks, by sex, age and SES, age 25-64



The proportion of adults taking vitamins is high, possibly reflecting perceived health concerns. Yet, there is no medical reason for healthy people having a proper diet to take vitamin supplements. Taking vitamin supplements has been associated with adverse health effects in many studies.

Figure 10. Do you read labels on food packages to help you decide, e.g. to look for salt, sugar or fat content, by sex, age, and SES, age 25-64



Few people read food labels, and many of those who read labels said they read mostly expiry dates. There is a need for health education programs to raise this issue, as well as policy measures to regulate the content and format of food labels so most people can understand them and help them choose healthy products.

Comments

Fish, unpolished rice and sugared tea continue to be the predominant staple diet in Seychelles. Of note, these items do not include a number of nutrients so the trends towards a more diverse diet are welcome to provide healthy micronutrients and vitamins.

A few other items are consumed frequently in 2013, e.g. bread, vegetables, fruit, lentils, breakfast cereals, milk, and cheese.

Intakes of meat, processed meat, potatoes, potato chips, and pasta are still low (although likely largely higher compared to past years). Consumption of poultry is quite frequent. Intake of salted and sweet snacks is substantial.

The data do not provide information on portion sizes. Therefore high frequency of eating different food items (e.g. "vegetables") does not necessarily mean that a product is consumed in large and/or adequate amounts. For example, large proportions of people report eating salad on most days of the week, yet the amount of salad actually found in plates in Seychelles (in grams) is often very low.

Overall, a varied diet, as found in the 2013 survey, has advantages in providing a broad range of nutrients and vitamins (e.g. bread, cheese, milk, breakfast cereals, etc) which are not substantially present in rice and fish. However, the current diet also includes substantial intake of nutrient-poor and energy-rich food items (e.g. large amounts of sugar

added in tea/coffee, soft drinks, juices in packets, salted and sweet snacks, processed meat, etc). These nutrients contribute large amounts of sugar, salt, saturated fats or trans fats, which are important causes of cardiovascular disease. Sugared drinks and, to a large extent, juices in packets, have little nutritional value and contribute large energy intake and therefore fuel the raising prevalence of obesity.

There is a need to sustain health education campaigns on healthy nutrition, e.g. emphasizing the need to have five portions of vegetables and (fresh) fruit a day, the need to prefer water (including tap water), semi-skimmed milk and fresh fruit juices to soft drinks or packets of fruit juices.

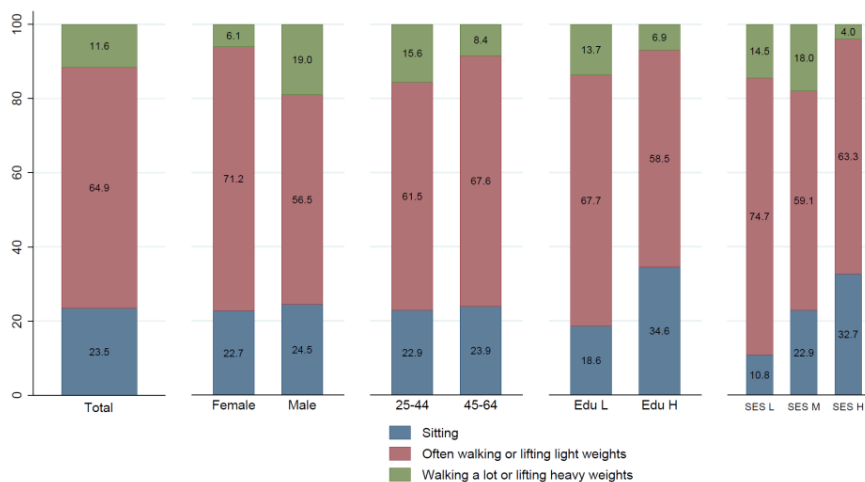
Most importantly, promoting a healthy diet requires interventions in multiple sectors aimed at enabling healthy choices by all people. This includes, *inter alia*, differential subsidies/taxes on healthy/unhealthy food items; structural measures to facilitate the production and distribution of local fruit and vegetables; adequate labeling of food products; reformulation of locally made and imported manufactured foods to decrease salt, sugar, saturated fats and trans fats; ban on advertising of unhealthy foods in the mass media; provision of healthy meals in school/workplace canteens; water fountains in all school and workplaces; etc.

The WHO member states, inclusive Seychelles, have agreed in 2014 on the target of a 10% decrease of salt intake between 2010 and 2025. Other documents emphasize the need for healthy nutrition in terms of increased fruit and vegetables and reduced consumption of added sugar, salt, saturated fats and trans fats.

The WHO 2014 NCD Status Report provides a list of multisectoral cost-effective interventions to reduce salt and improve nutrition in the population, including reduced intake of sugar, salt, trans fats and saturated fats.

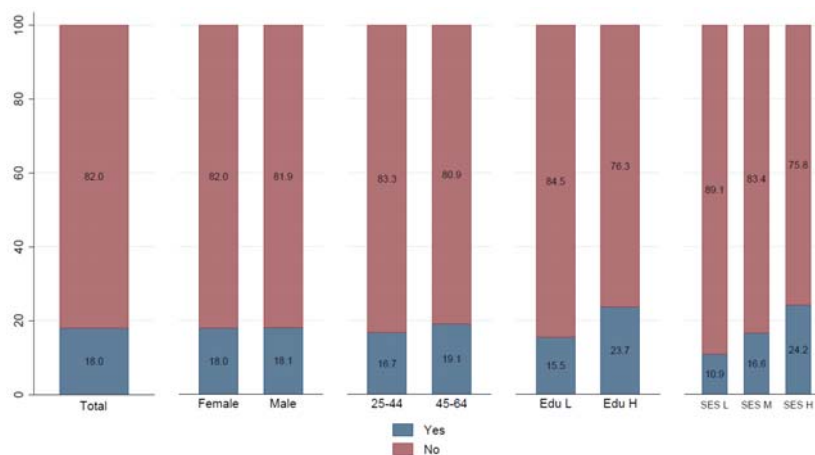
Physical activity (PA)

Figure 1. Patterns of PA at workplace and/or at home, by sex, age and SES, age 25-64



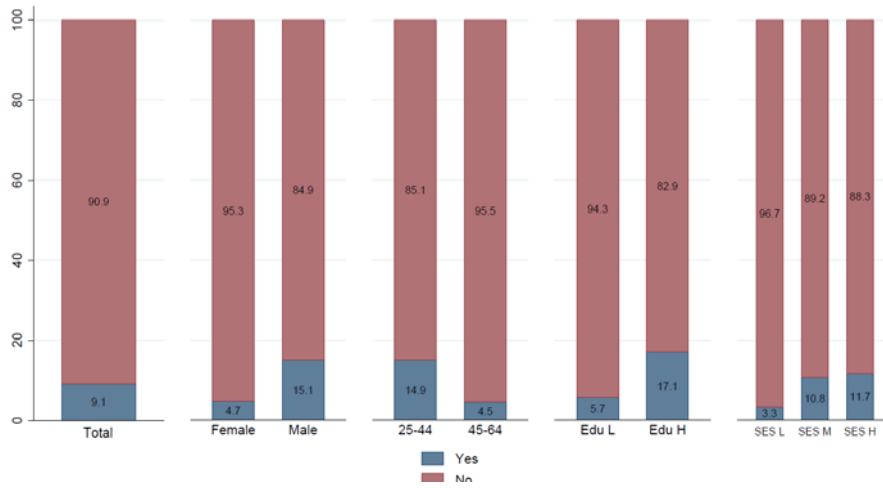
The proportion of persons reporting some PA at home or at work in 2013 is (still) fairly high. But around 20% of people report to be sedentary.

Figure 2. PA of moderate intensity during leisure time for >10 min continuously, by sex, age and SES, age 25-64



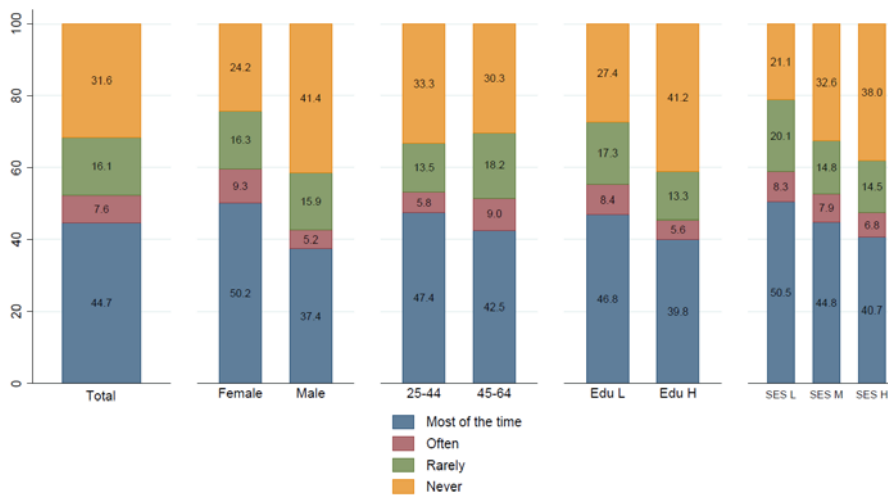
Less than 20% of people report PA during their leisure time. The proportion is higher in persons of higher vs. lower SES and slightly higher in older than younger persons.

Figure 3. PA of vigorous intensity during leisure time for >10 min continuously, by sex, age and SES; age 25-64



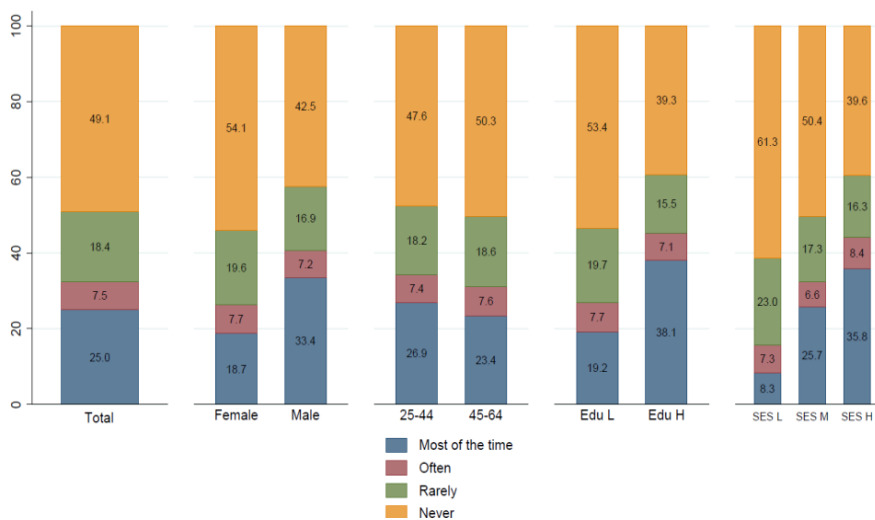
Around 10% of persons report PA of vigorous intensity during their leisure time. This proportion is higher in male vs. female, young vs. older and higher vs. lower SES persons.

Figure 4. How often do you take the bus to go to work, shop, church, etc, by sex, age and SES, age 25-64

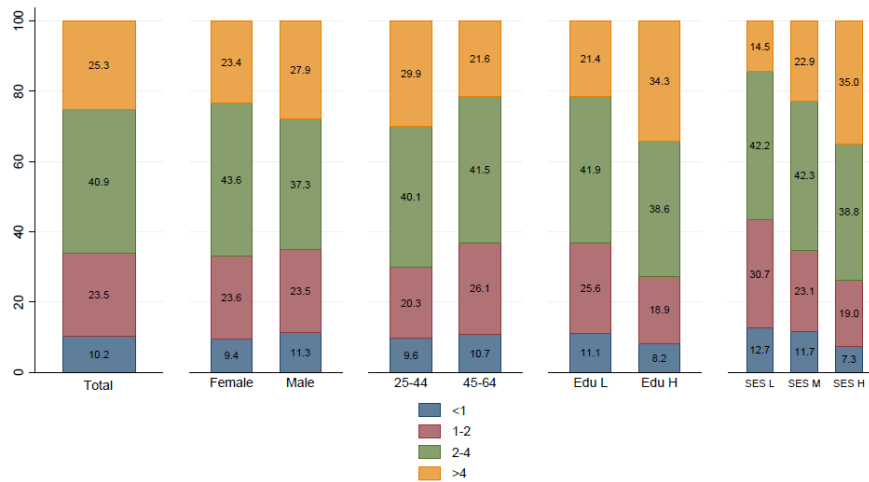
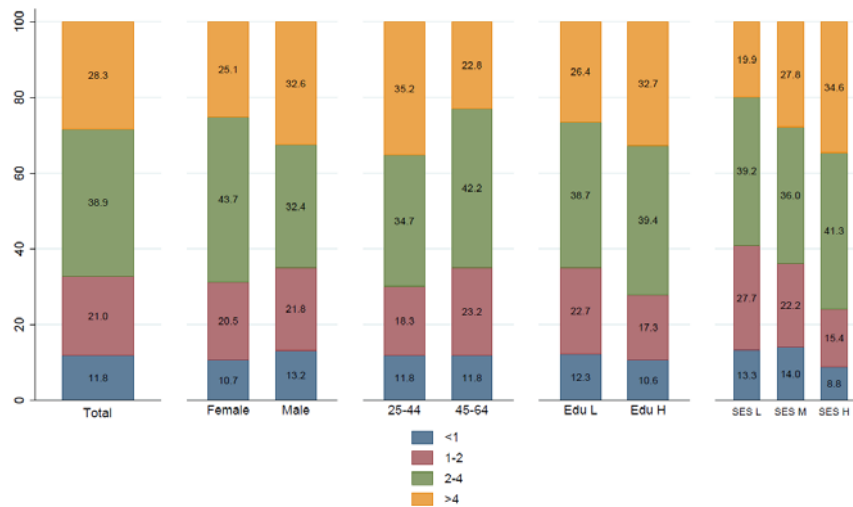


Around 50% of people take buses, with a trend to lower frequency among males than females and among high than lower SES. Taking buses generally enables to walk more than commuting by car.

Figure 5. How often do you take a private vehicle to go to work, by sex, age and SES, age 25-64



Around 50% of people commute to work using a private car, with larger proportions among higher vs. lower SES persons.

Figure 6. Hours watching TV, computer or Internet per week day, by sex, age and SES, age 25-64**Figure 7.** Hours watching TV, computer or Internet per weekend day, by sex, age and SES, age 25-64

Time in front of a screen, implying sedentary time, is larger among young vs. older persons and higher vs. lower SES persons.

Comment

Fairly high proportions of people report PA at work but few persons report PA during their leisure time. Many studies show that PA at leisure time has larger benefit on health than PA derived at work, hence the need to emphasize on PA during leisure time. Of note, levels of PA reported through questionnaire are known to be quite inaccurate compared to PA measured objectively measured (accelerometers, etc), hence the value of questionnaire-based information on PA is limited.

None withstanding these issues, improving PA during leisure time should be emphasized through adequate programs and policy. Emphasis should be given to population-wide interventions in many sectors to enable more opportunities for PA in daily life, including bus lanes to promote more attractive transports in buses (which increases walking time of users), cycling lanes around main urban centers (which have numerous advantages for commuting when distances are less than a few km). These measures promoting PA also have favorable effects to decrease traffic, decrease pollution, increase alternate businesses and improve social cohesion.

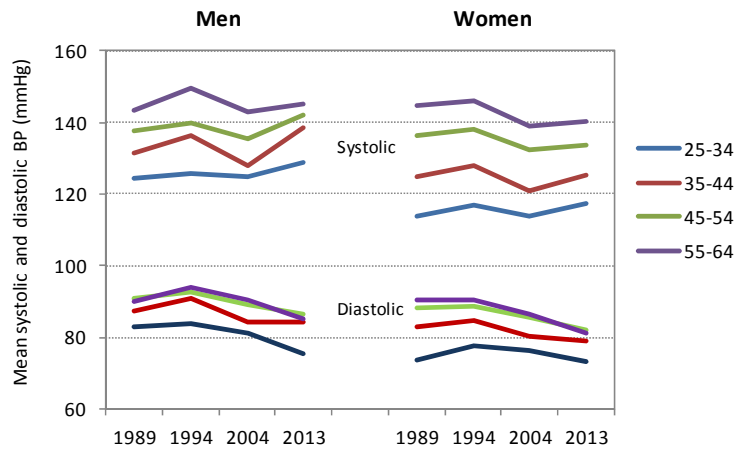
All students in all classes in all schools should have at least 2 (or better 3) compulsory classes of PA per week, emphasizing on PA that is suitable for all students (including girls, overweight children, etc) vs. sportive performance (the latter can be better provided through activities outside of regular school classes).

The WHO member states, inclusive Seychelles, have agreed in 2014 on the target of a 10% relative decrease in the prevalence of insufficient PA.

The WHO 2014 NCD Status Report provides a list of multisectoral cost-effective interventions to increase PA in the population.

High blood pressure (HBP)

Figure 1. Mean systolic and diastolic BP by sex, age and survey



Mean systolic BP did not decrease over time in men but decreased slightly in women, while diastolic BP decreased in both men and women. Lower systolic BP in 2004 may relate to the fact that BP was measured with Tricuff in the 2004 survey but with standard/large cuffs in other years.

Figure 2. Age-standardized prevalence of normal and high BP by sex, survey year and treatment status, age 25-64

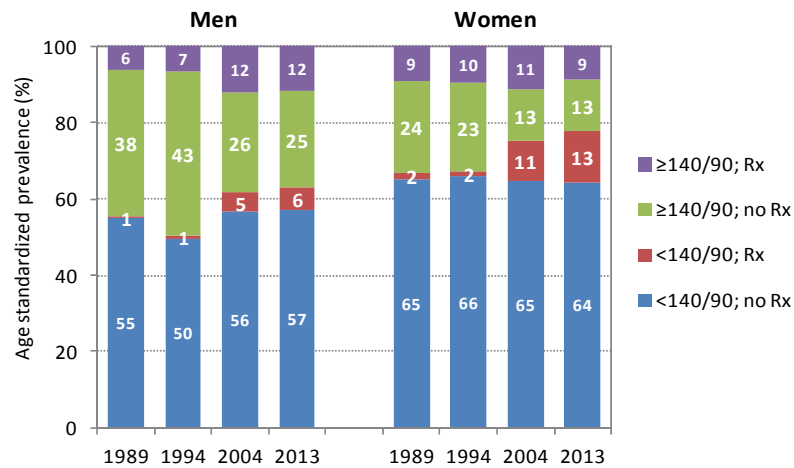
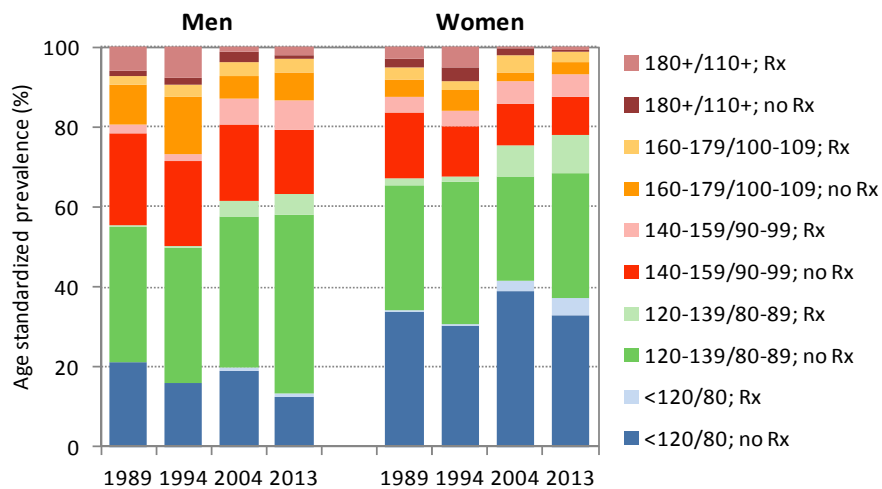


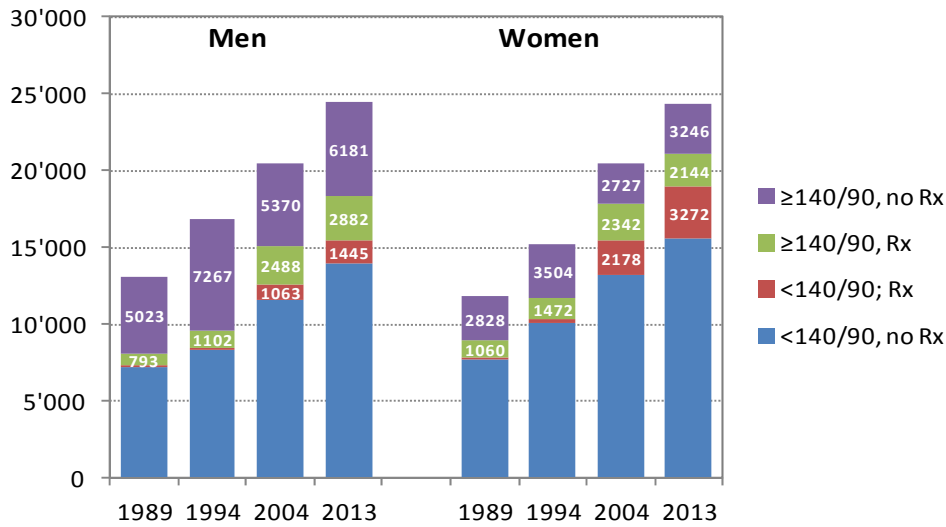
Figure 3. Age-standardized prevalence of categories of BP by sex, survey year and treatment status, age 25-64



The age-adjusted prevalence of high BP (treated or not) is decreasing over time with increasing proportions of persons receiving treatment for HBP, consistent with improved BP control and treatment over time. The increasing proportions of persons with normal BP without treatment over time (blue and green) also suggest favorable effects of other preventive factors at the population level, despite the marked increase of obesity in the population.

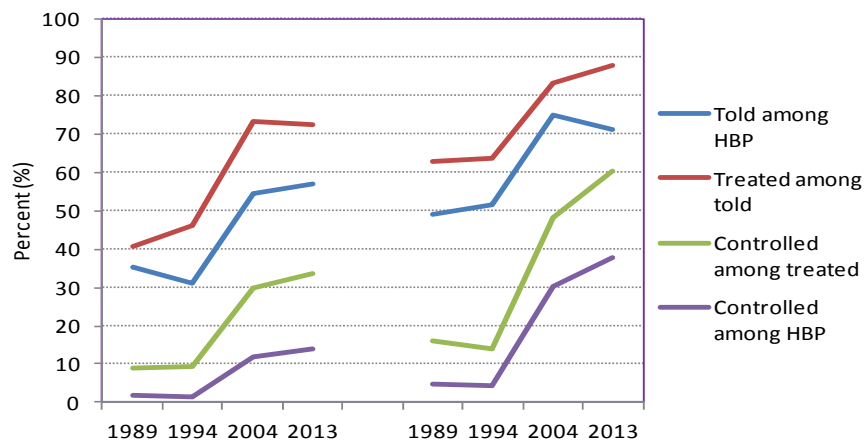
The proportions of persons treated for HBP increased over time, consistent with improved health care services over time. However, large proportions of persons with high BP are still not treated, within all BP categories, including in persons with very high BP, which emphasizes the need to further improve health care for HBP.

Figure 4. Numbers of persons with different BP categories in Seychelles, by sex and survey year, age 25-64



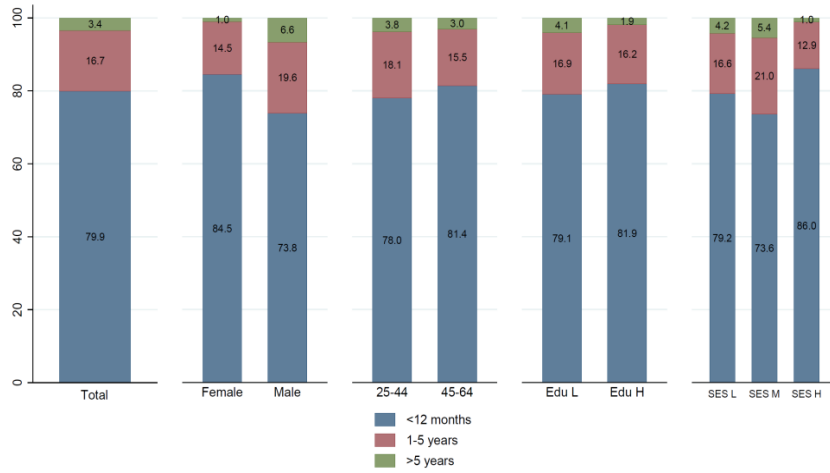
Although the prevalence of HBP (BP >140/90) did not increase over time, the number of persons treated or not treated for HBP has increased markedly over time because of the increasing and aging population, with approximately 18'000 persons with HBP in 2013, at age 25-64. Assuming that all persons with HBP were treated with low cost generic medications, at the average (low) cost 0.2 US\$ per patient and per day, the sole cost of medications for these persons would amount to 1.3 million US\$ per year.

Figure 5. Age-standardized proportions of persons aware of having HBP (among all persons aged 25-64), treated (among those aware), and adequately controlled (among those treated; among all persons with HBP), by sex and survey year, age 25-64



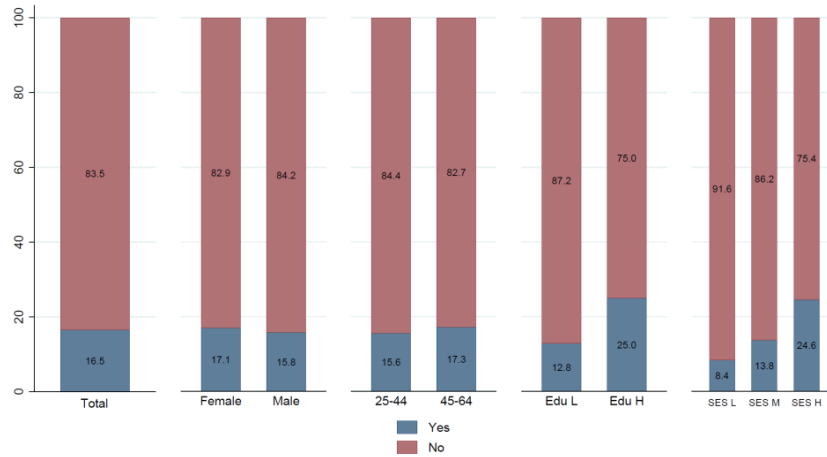
The proportions of persons aware of having HBP among all persons who have HBP (i.e. $\geq 140/90$ or treatment), the proportions of persons treated for HBP among all persons who are aware of having HBP, and the proportions of persons who have their BP controlled (BP <140/90) among all patients treated for HBP, are higher among women than among men and these proportions have increased over time in both men and women. However, these proportions (percent awareness, treated, and controlled) are not yet optimal and, ultimately, the proportions of persons with HBP who have their BP controlled in the population (violet line) remains low, particularly in men.

Figure 6. When was last BP check done, by sex, age and SES, age 25-64



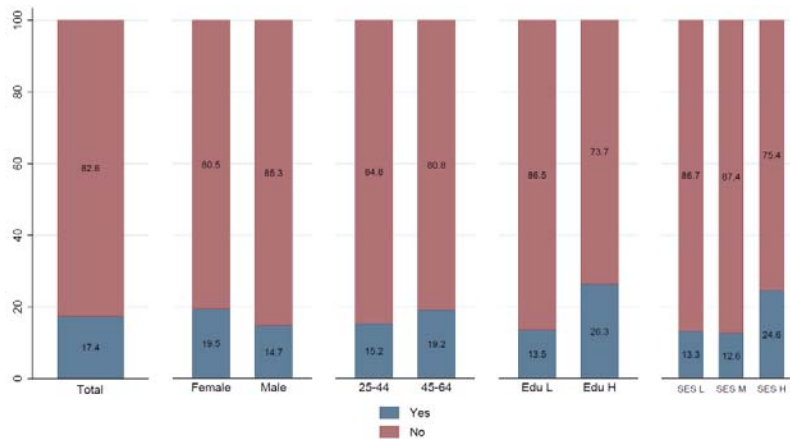
A large majority of adults have had their BP checked during the past 12 months and almost all adults had their BP checked within the 5 past years. Screening of hypertension is therefore adequate in Seychelles and insufficient control of BP in the population (as shown in previous figures) is not related to insufficient screening.

Figure 7. Do you have, or a member of your family, a device to measure your BP at home? by sex, age and SES, age 25-64



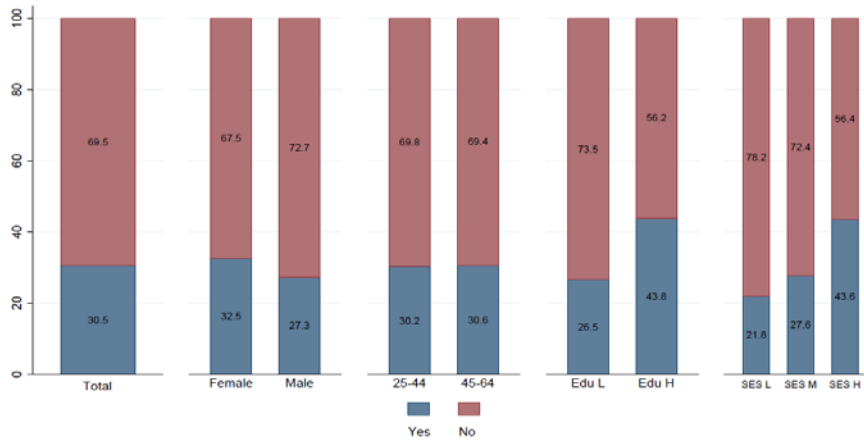
A device to measure BP is found in nearly 1 out of 5 households in Seychelles, with a higher proportion among persons of higher vs. lower SES. Having a BP measuring device (cost ~1000 SR) can be a useful strategy for patients to improve adherence to their treatment and should be encouraged for persons with HBP.

Figure 8. Can you report a value for your own BP? By, by sex, age and SES, age 25-64



The proportion of persons knowing a number for their own BP values is very low, despite several “know your numbers” campaigns in the past. Adequate knowledge of one’s own BP and of values of normal BP can improve empowerment of patients in controlling their BP. Further campaigns to improve knowledge about the need to know BP values are needed.

Figure 9. Can you report a value for your own BP? by sex, age, and SES, age-25-64, among 318 persons treated for HBP



The knowledge on his/her own BP is better among persons with HBP (Figure 9) than persons without HBP (Figure 8), but knowledge remains far from optimal. This suggests that health professionals should better communicate these numbers, and their significance, to their patients.

Figure 10. Can you report a value for normal BP? by sex age and SES, age 25-64

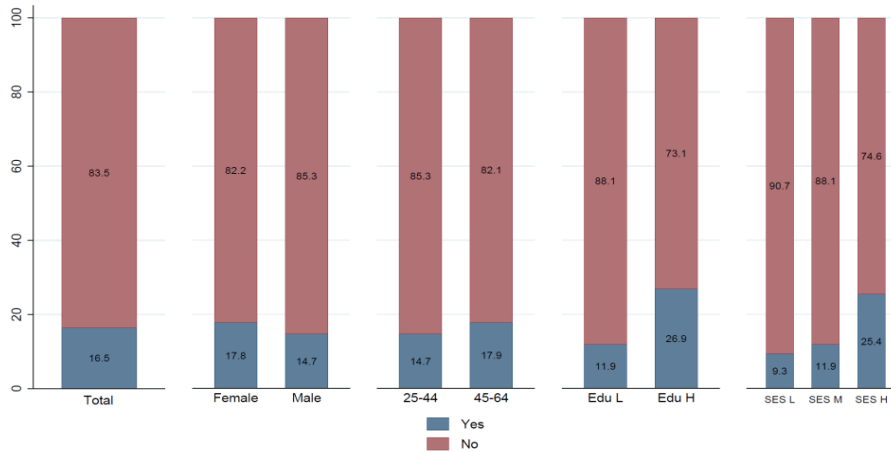
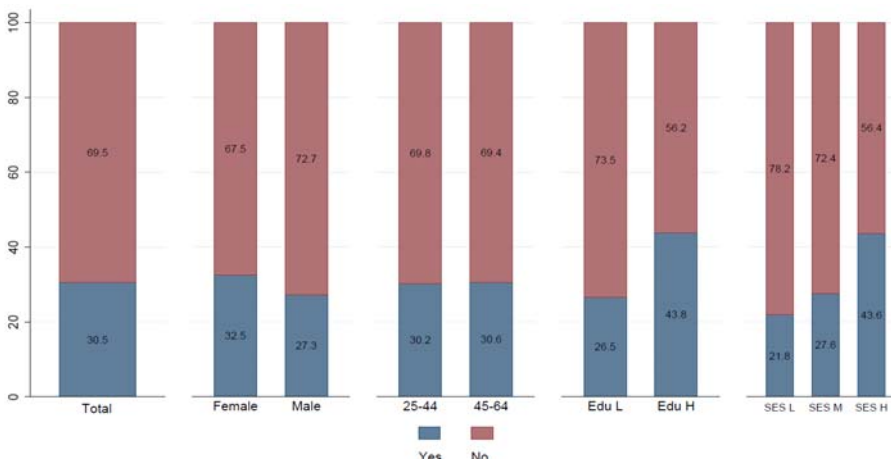
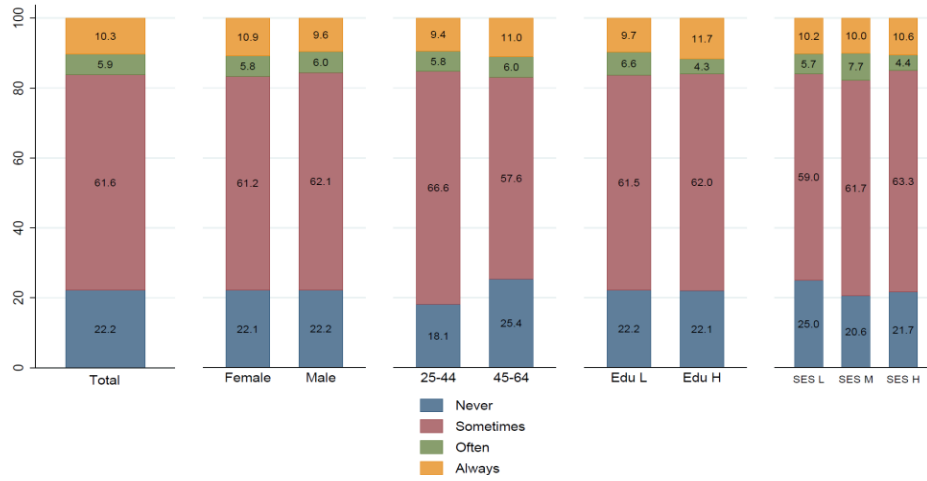


Figure 11. Can you report at least one value for normal BP? by sex, age and SES, age 25-64, among 318 participants treated for HBP



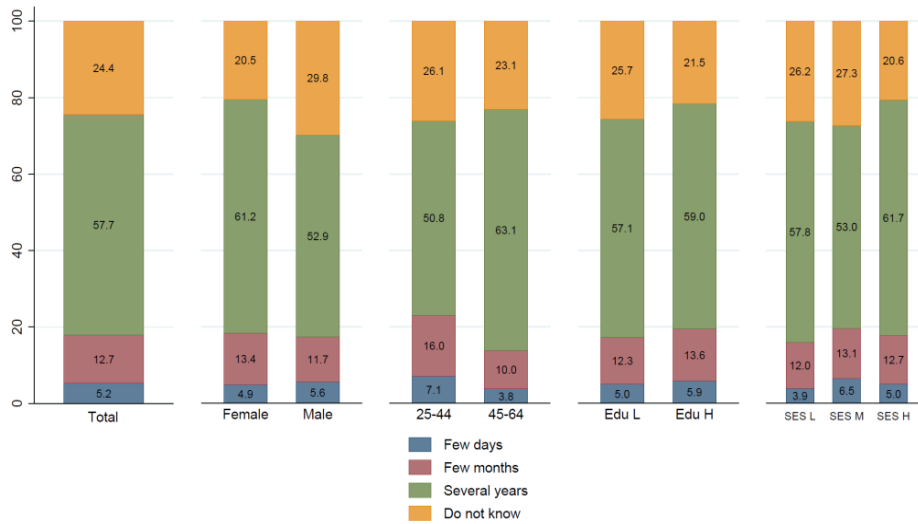
Knowledge on values for normal BP is low and is only slightly better among patients with HBP. Better knowledge on own/normal BP should be encouraged, in particular as a task of doctors at health care level, and this knowledge can help patients take adequate BP control measures, including improving adherence to treatment.

Figure 12. Do you believe that someone can feel HBP? by sex, age and SES; age 25-64



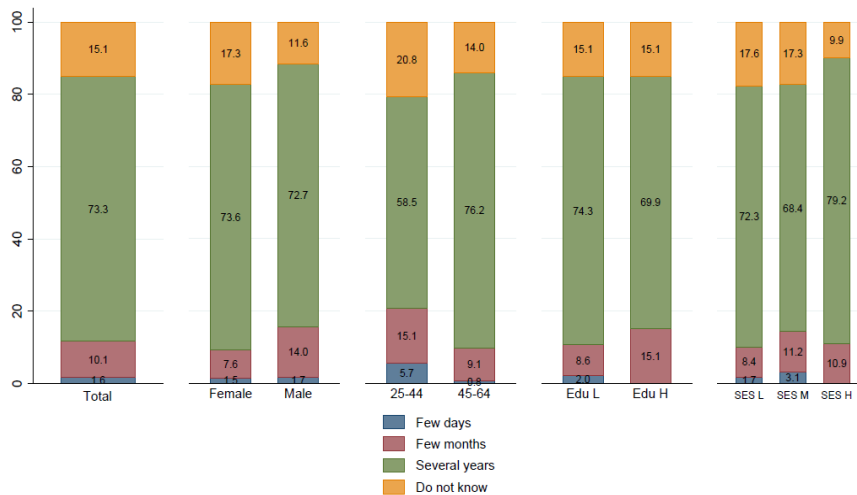
The wrong belief that HBP causes symptoms (HBP does not cause symptoms in most cases) is still frequent in the population and health education programs should clarify this question.

Figure 13. In general, for how long should people with high BP take pills to reduce their BP? by sex, age and SES, age 25-64



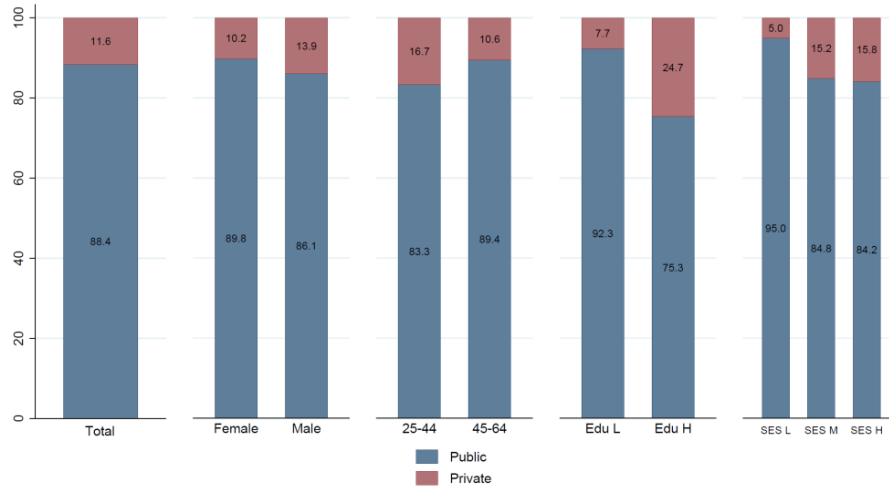
A majority of people rightly report that treatment for HBP should be taken for years.

Figure 14. How long should pills be taken to reduce BP? by sex, age and SES, age 25-64, among 315 participants treated for HBP



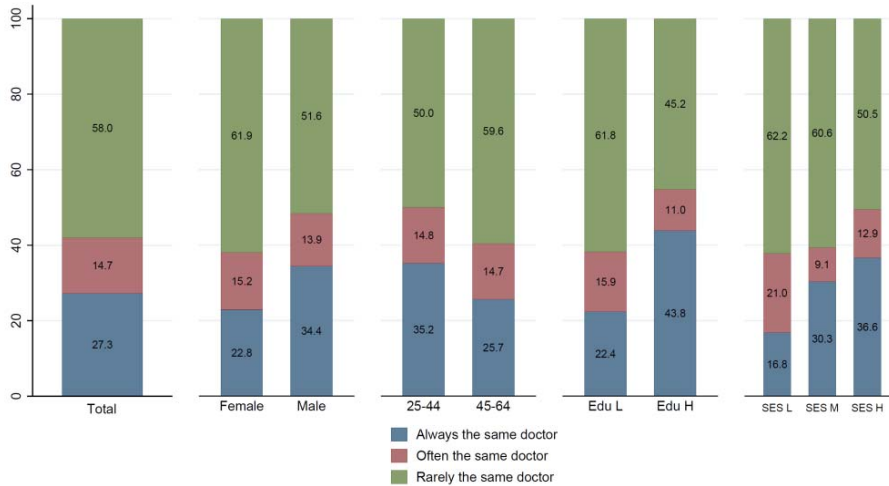
This knowledge is fairly good, but as many as a quarter of patients do not know that treatment should be taken for several years. This shows that doctors need to better communicate the chronic nature of HBP to their patients.

Figure 15. Did a public or private doctor prescribe your medication(s) for high BP? by sex, age and SES, age 25.64, among 319 patients treated for HBP



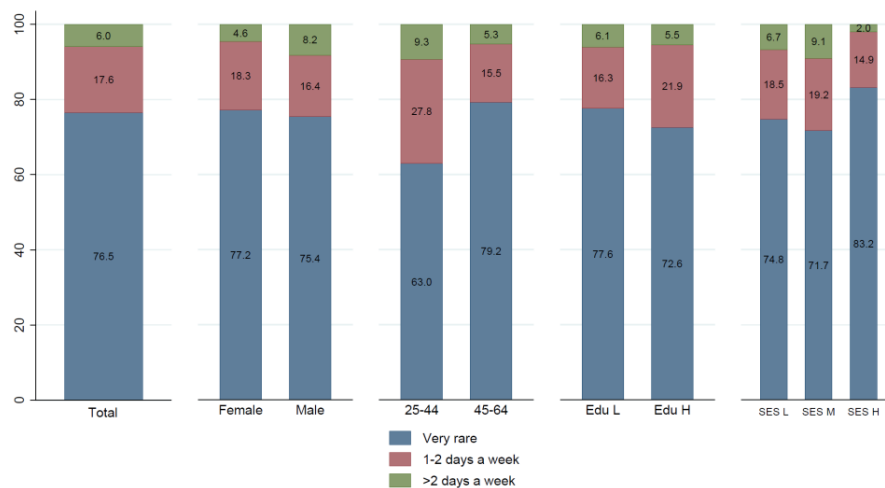
Nearly 90% of all hypertensive persons in Seychelles had their medication(s) prescribed by public health services. This proportion is slightly lower among younger vs. older and higher vs. lower SES patients.

Figure 16. Did you see the same doctor when you had your last BP control? by sex, age and SES; age 25-64, among 319 persons treated for HBP



A large number of hypertensive patients do not see the same doctor for follow up of their HBP. This issue should be addressed, with appropriate adjustment of health care services organization, as being followed by a same doctor over time can improve patients' adherence to treatment.

Figure 17. How frequently do you miss your medication in a typical week? by sex, age and SES, age 25-64, among 319 persons treated for HBP



Approximately 75% of hypertensive patients report taking their medication(s) regularly, with better reported adherence among older vs. younger and higher vs. lower SES patients. However this might be partly “wishful thinking” driven by “social desirability” as other studies in Seychelles using objective measurement of adherence showed that long term adherence to treatment of hypertension was much lower.

Comments

Systolic BP did not increase over time, and diastolic BP decreased, despite a marked increase of the prevalence of obesity (a main risk factor of HBP). In parallel, the proportions of hypertensive individuals who are aware of having HBP (among all persons with HBP), who are treated for HBP (among those who are aware of having HBP) and who have BP lowered to target BP values (among those patients treated for HBP) have markedly increased over time, consistent with marked improvement in health care for HBP over time. However, the proportion of hypertensive persons who have BP adequately controlled is still low and there is a need to further strengthen health care to antihypertensive patients. This includes revision of guidelines, training of health care professionals, innovative measures to improve adherence of patients to treatment (e.g. appointments for follow up visits, seeing same doctors over time, etc).

There is also a need for multisectoral interventions to decrease BP in the entire population, particularly through decreased salt intake in the diet (e.g. reformulation of manufactured foods to reduce the content in salt; fiscal and other policy measures to promote the consumption of vegetables in the population, etc) and to promote physical activity in the entire population.

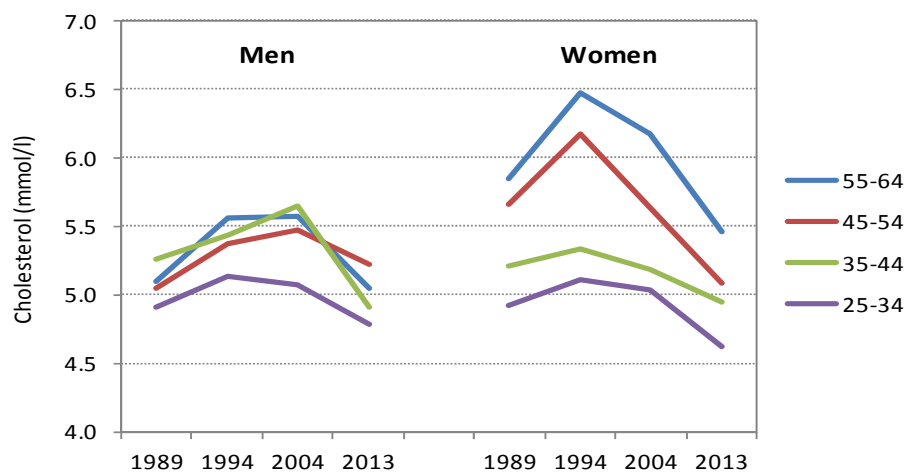
The WHO member states, inclusive Seychelles, have agreed in 2014 on the target of a relative 25% decrease of blood pressure between 2010 and 2025. Other agreed targets are also highly pertinent for improved BP control, including i) 30% relative reduction of salt, ii) at least 50% of eligible persons receiving treatment for NCD conditions such as hypertension (this goal is nearly achieved by 2013) and iii) 80% availability of technologies and essential medicines required to treat NCD (this goal is achieved since many years in Seychelles).

Awareness campaigns need to further to sensitize the population about BP e.g. “know your numbers” campaigns, nutrition messages, etc).

The WHO 2014 NCD Status Report provides a list of cost-effective interventions to reduce high BP an in the population.

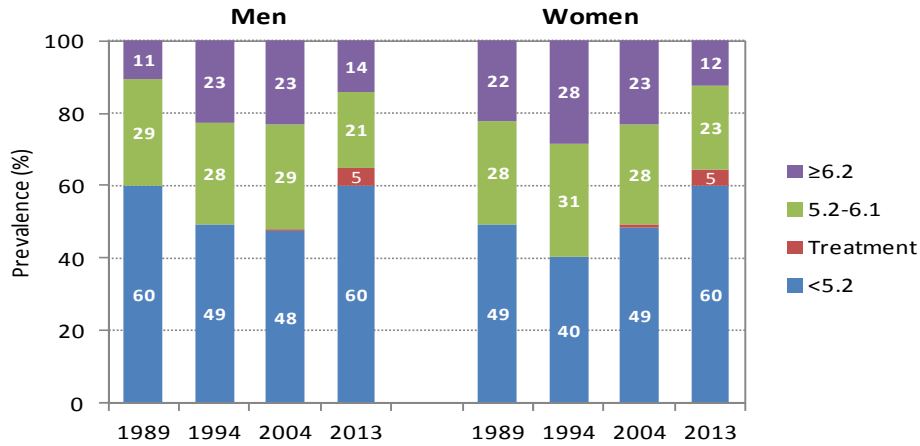
Blood cholesterol

Figure 1. Age-standardized mean blood total cholesterol, by sex, age and survey year



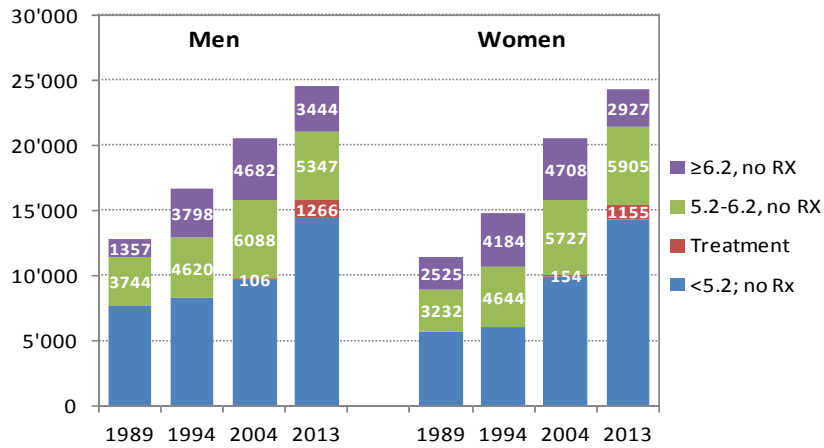
Mean blood cholesterol levels are fairly high in Seychelles, and are higher in older than younger and in women than in men. Cholesterol increases with age, particularly in women, which is related to both hormonal changes in older women and to overweight. There is also an inverse J shape relation between mean cholesterol and calendar years with lower levels in recent years, which is a favorable trend, likely related to a diet containing less saturated fats recently.

Figure 2. Age-standardized prevalence of categories of blood cholesterol by sex and survey year, age 25-64



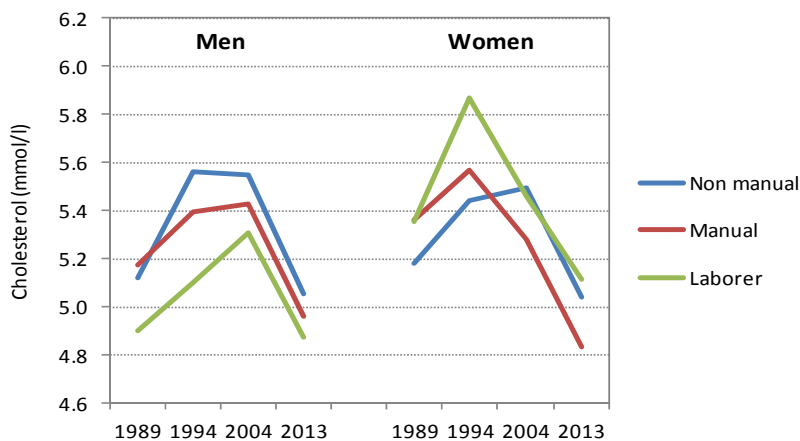
Levels <math>< 5.2</math> mmol/l are “desirable”; 5.2-6.2 are “borderline high”; and

Figure 3. Number of persons with different cholesterol levels in Seychelles, by sex and survey year, age 25-64



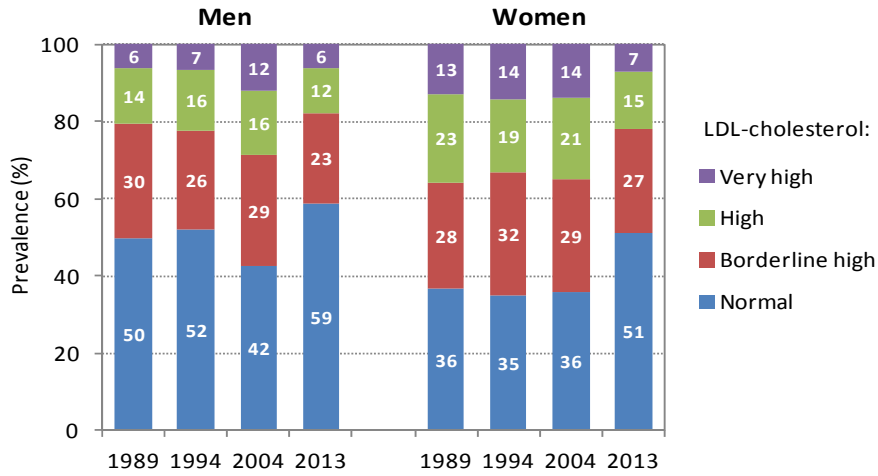
Despite a decreasing prevalence of cholesterol in recent years, the number of persons with high cholesterol levels in Seychelles (age 25-64) has largely increased because of the increasing and aging population. While around 2500 persons aged 25-64 received cholesterol lowering treatment in 2013, treatment should also be considered for a substantial proportion of the around 6000 adults with high levels (

Figure 4. Age-standardized mean blood cholesterol by sex, SES and survey year, age 25-64



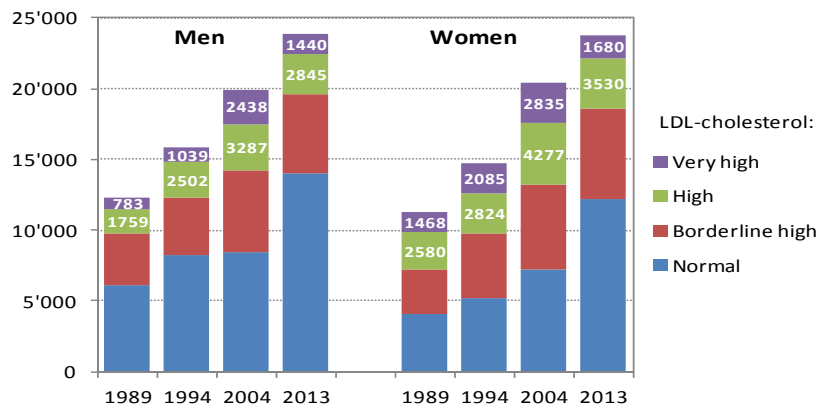
Cholesterol was more elevated in higher vs. lower SES men but lower in higher vs. lower SES women. This social patterning of blood cholesterol parallels similar inverse social patterns of BMI in men vs. women (BMI is a risk factor of blood cholesterol).

Figure 5. Age standardized prevalence of f LDL-cholesterol (“bad-cholesterol2) by sex and survey year, age 25-64



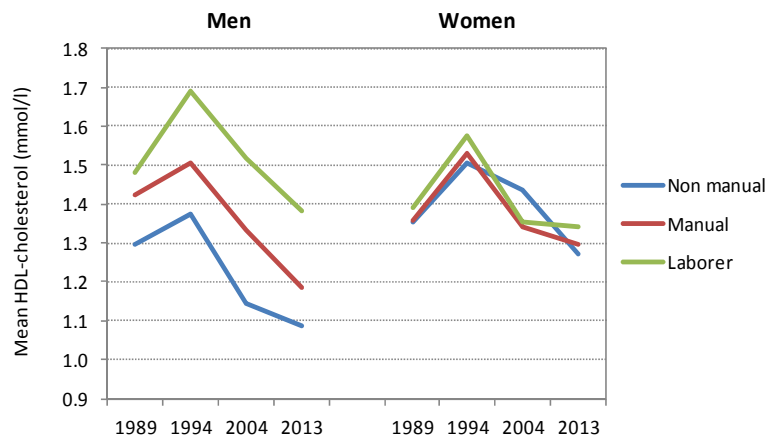
The prevalence of high or very high levels of LDL-cholesterol (who may need treatment) is substantial but has been (fortunately) decreasing in recent years, possibly because of a diet containing less saturated fats (e.g. less palm oil, more skimmed milk, etc).

Figure 6. Numbers of persons with different levels of LDL-cholesterol in Seychelles by sex and survey year, age 25-64



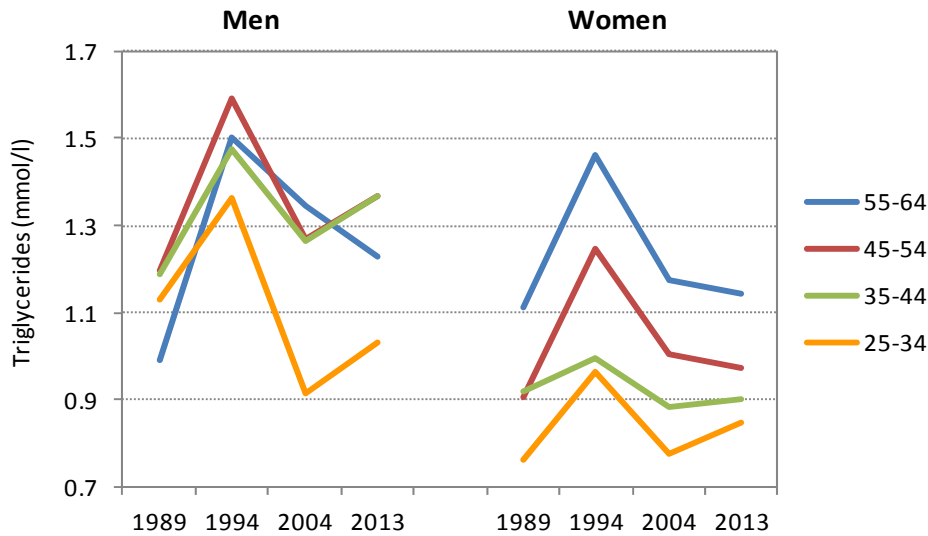
The numbers of persons in the population who may need a cholesterol lowering medication (usually the treatment must be taken for life) is of an order of several thousands, including all persons with very high LDL-cholesterol and a substantial proportion with high LDL cholesterol (those at high CVD risk). This can incur large overall costs.

Figure 7. Age- standardized mean HDL-cholesterol (“good cholesterol”) by sex, SES and survey year, age 25-64



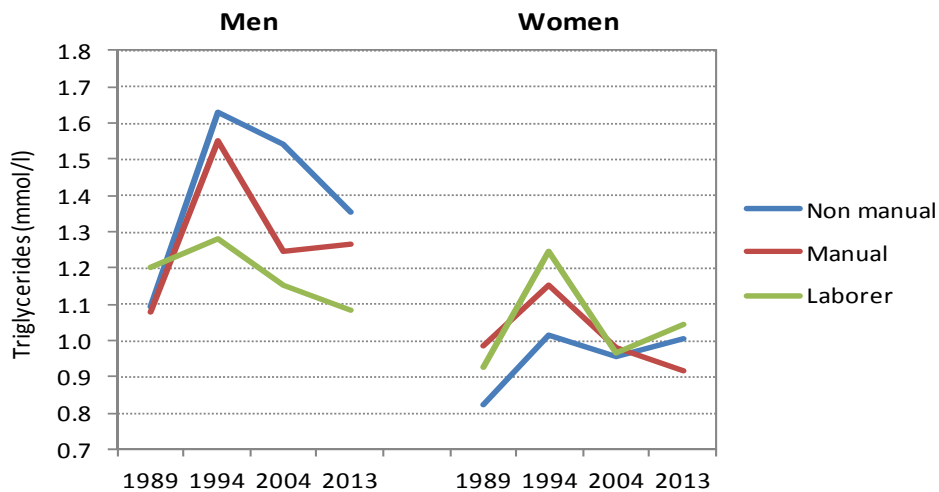
HDL cholesterol (“good cholesterol”) is markedly higher (i.e. better for health) in men with low than higher SES, partly because of a combined effect of higher alcohol consumption (strong positive associations with HDL cholesterol) and lower BMI (strong negative association) in men than women.

Figure 7. Mean levels of blood triglycerides by sex, survey year and age



Levels of triglycerides are higher at older vs. younger age, partly because of higher BMI in older than younger persons.

Figure 8. Age-standardized mean blood triglycerides by sex, SES and survey year, age 25-64



The inverse social patterning of triglyceride in men and in women is likely related, at least partly, to the corresponding inverse social patterning of obesity in men and women (obesity being a main risk factor of high triglycerides).

Comments

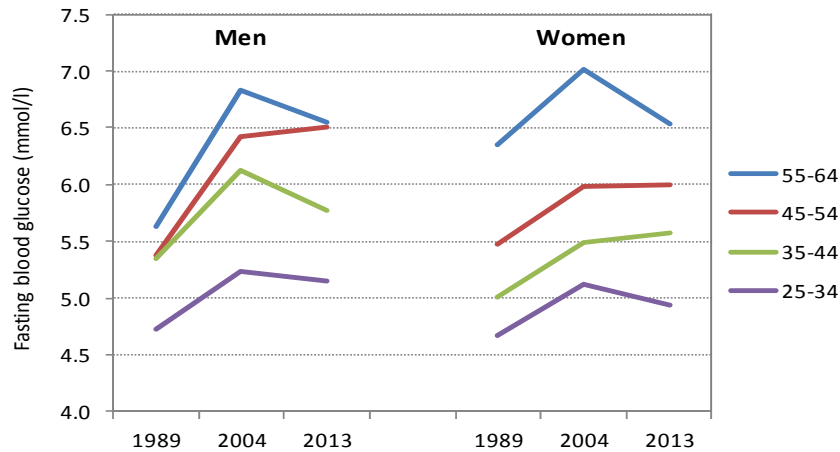
Dyslipidemia (mainly high LDL-cholesterol) is a major risk factor for heart attack and, to a lesser extent, for stroke.

Individual based measures to improve cholesterol levels can be very effective, and include screening of persons at high risk of CVD, adequate counseling on healthy lifestyles, and treatment of persons with high CVD risk. This underlies the need to update guidelines for detection and treatment, training of health professionals, and various measures to ensure good adherence of patients to treatment.

Measures addressing the roots of high cholesterol levels in the entire population involve multisectoral interventions to address healthy nutrition, obesity, and regular physical activity. These interventions are discussed in the sections on obesity, diabetes and physical activity in this report.

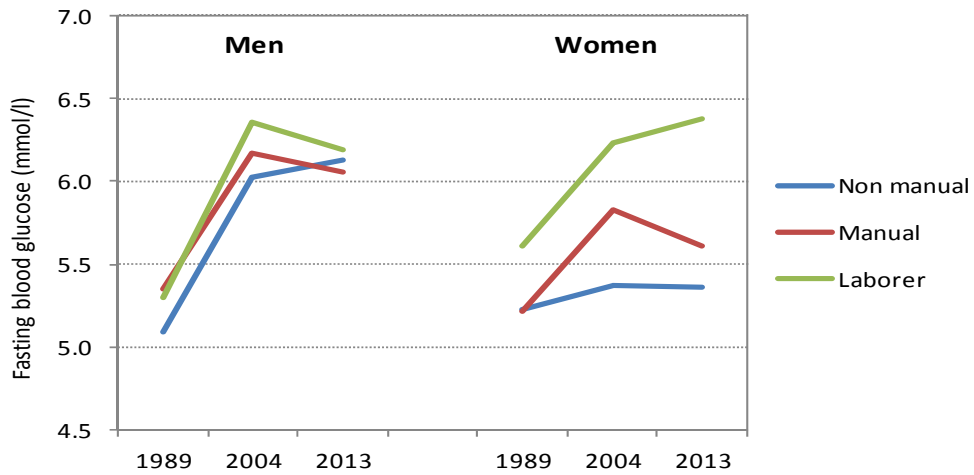
Diabetes

Figure 1. Mean fasting blood glucose by sex, age and survey



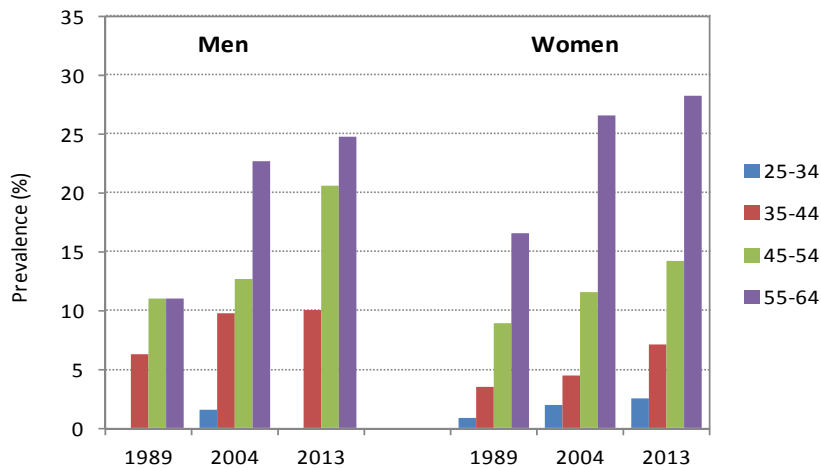
Mean fasting blood glucose (mmol/l) increases according to age and over survey years. Fasting blood glucose was not measured in 1994.

Figure 2. Age-standardized mean fasting blood glucose, by sex and SES and survey year, age 25-64



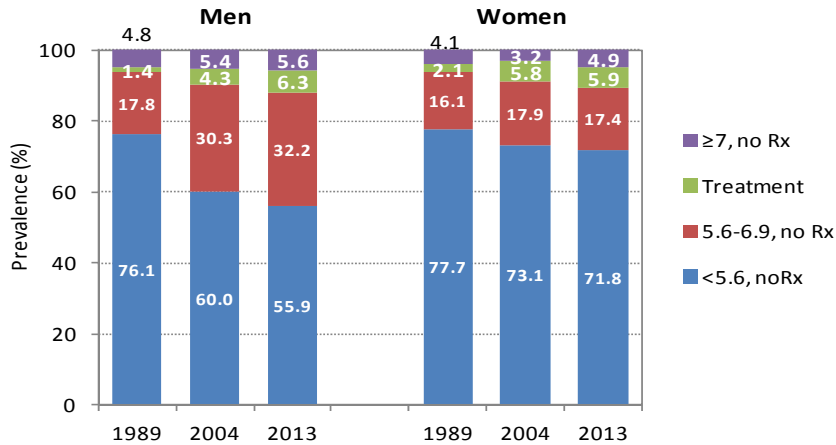
Mean fasting blood glucose was higher in women of lower than higher SES, partly attributable to higher BMI in lower than higher SES women.

Figure 3. Prevalence of diabetes (FBG ≥ 7.0 mmol/l or treatment) by sex, survey year and age



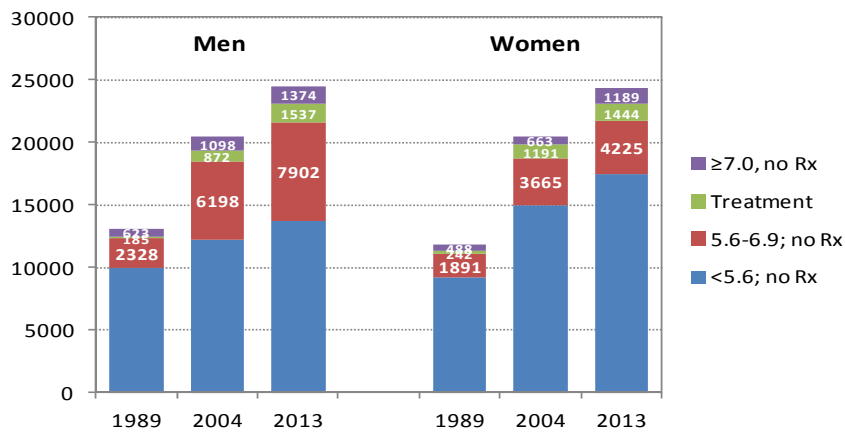
The prevalence of diabetes increases sharply with age and over calendar years.

Figure 4. Age-standardized prevalence of impaired fasting blood glucose (5.6-6.9 mmol/l) and diabetes (FBG ≥7 mmol/l or treatment) by sex and survey year, age 25-64



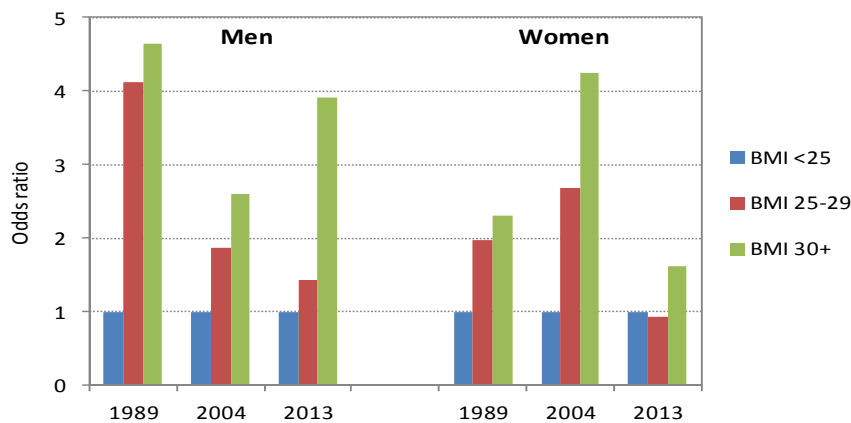
The prevalence of diabetes increased from 6.2% to 11.9% in men and from 6.2% to 10.8% in women between 1989 and 2013. The prevalence of impaired fasting blood glucose (“pre-diabetes”) was 32% in men and 17.4% in women in 2013. Of note, a few false positives diabetes cases can have occurred if some participants were not fasting and the prevalence of diabetes may subsequently be slightly overestimated. Also, definite diagnosis of DM should be based on values confirmed on different days, which cannot be done in epidemiological surveys.

Figure 5. Number of persons with diabetes in Seychelles, by sex and survey year, age 25-64



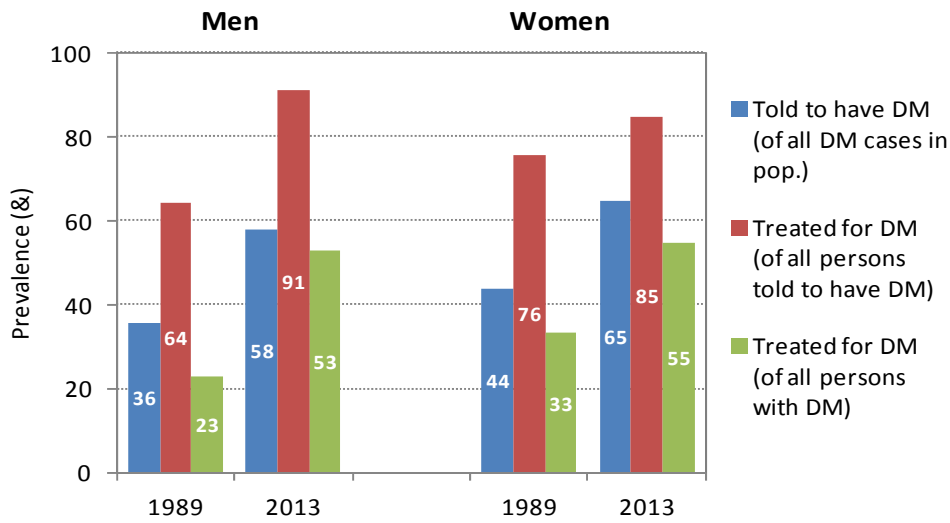
The numbers of persons with diabetes and with pre-diabetes have increased markedly over time, consistent with the increasing prevalence of obesity. There are approximately 6000 diabetes persons in the population aged 25-64, with around 40% of them not yet identified and/or treated.

Figure 6. Age-adjusted relative risk (odds ratio) of having diabetes in relation to BMI, by sex and survey year



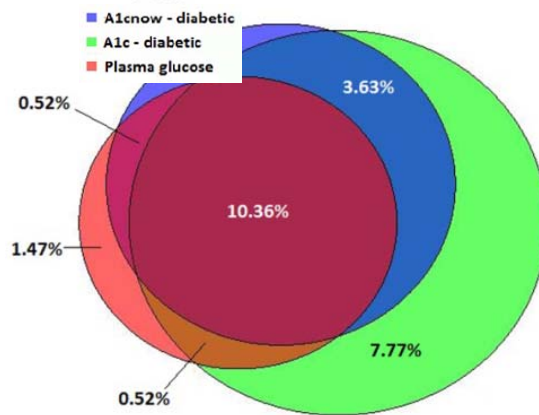
The relative risk of having diabetes is several times higher in case of overweight or obesity. Estimation is difficult to do in women in recent years as only few women have a BMI in the normal range.

Figure 7. Proportions of diabetic persons who are aware of having diabetes, and proportions of persons aware of having diabetes who are treated, by sex and survey year, age 25-64



The proportion of persons aware of having diabetes (DM) in the population was around 60% in 2013, and 80-90% of persons aware of having diabetes were treated for DM. These indicators of control have progressed markedly between 1989 and 2013, but around half of all persons with diabetes in the population are still not treated in 2013.

Figure 8. Agreement on diagnosis of diabetes based on plasma glucose (≥ 7 mmol/l) or based on A1c (≥ 6.5) measured with laboratory method or A1c measured with a point of care device (A1cNow).



Agreement between different methods is not very good. More cases of DM are identified with A1c (measured with laboratory) than with plasma glucose. This disagreement between different methods needs to be further analyzed as it has important implications for diagnosis of diabetes.

Figure 9. When was your last blood sugar test done? by sex, age and SES, age 25-64, among all participants

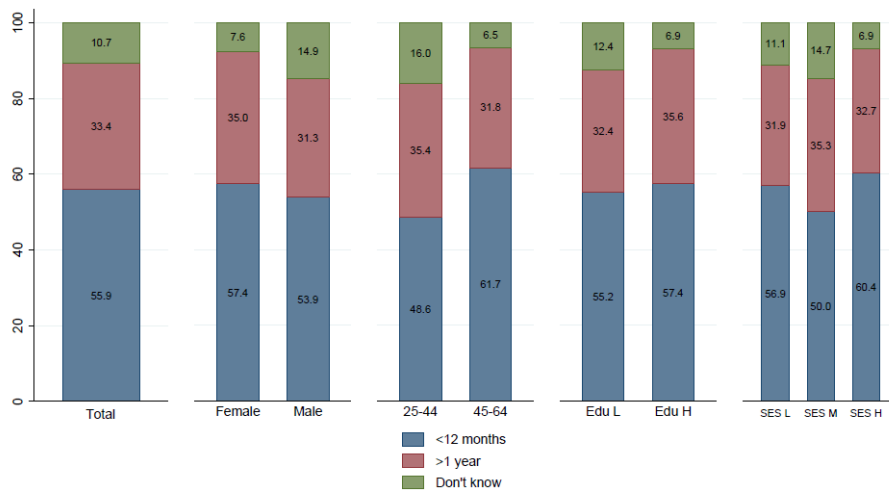
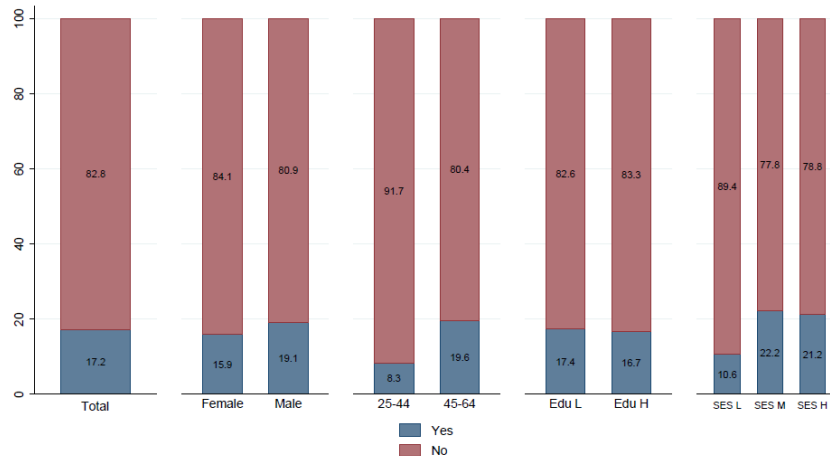
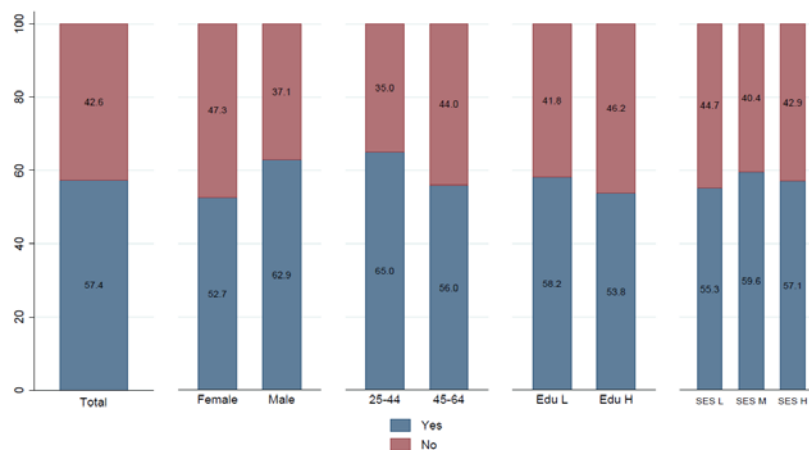


Figure 10. Do you have a glucometer to measure capillary blood sugar yourself at home) by sex, age and SES, age 25-64, among 116 treated diabetic persons



Nearly 20% of diabetic patients have a glucometer at home, and slightly more among persons of higher SES.

Figure 11. Received advice about physical activity from a health officer during the past 12 months, by sex, age and SES; age 25-64, among 136 diabetic persons who visited a doctor in the past 12 months



Comments

The prevalence of diabetes has markedly increased between 1989 and 2013, reaching 11.9% in men and 10.8% in women in 2013. These proportions may be slightly overestimated because diabetes is based on one single blood glucose measurement and high values of fasting blood glucose were not confirmed with a repeat test on a separate day. The increase in the prevalence of diabetes is closely linked with the increasing prevalence of obesity.

Measures to reduce the burden of diabetes include strengthened health care to manage existing diabetes cases, including improved detection and treatment (e.g. updated guidelines, training of health professionals, measures to improve adherence to treatment, etc). Improved management of diabetes patients must be comprehensive with management of all other risk factors, particularly healthy lifestyle, including physical activity, healthy diet, refraining of tobacco use, and management of high blood pressure, dyslipidaemia, other risk factors, and target organ damages.

Because diabetes cannot be cured, preventive measures must be emphasized, which includes multisectoral population wide interventions to promote a healthy diet and physical activity (listed in the sections on BMI and physical activity).

The WHO member states, inclusive Seychelles, have agreed in 2014 on the target of a 0% relative increase in the prevalence of diabetes between 2010 and 2025. Several other agreed targets are also highly pertinent for improved diabetes prevention and control including: i) a 0% relative increase in the prevalence of obesity; ii) a 10% decrease in the prevalence of insufficient physical activity; iii) 50% of eligible persons receive treatment for NCD conditions (this goal is nearly achieved by 2013); and iv) 80% availability of technologies and essential medicines required to treat NCD (this goal is achieved in Seychelles).

A main challenge is to design and implement population-wide interventions in all sectors which can address the main underlying causes of the diabetes epidemic, i.e. obesity and lack of physical activity.

Trends in risk factors between 1989 and 2013

Figure 1. Age-standardized prevalence of risk factors in successive surveys and linear relative change during the 24 year interval, age 25-64

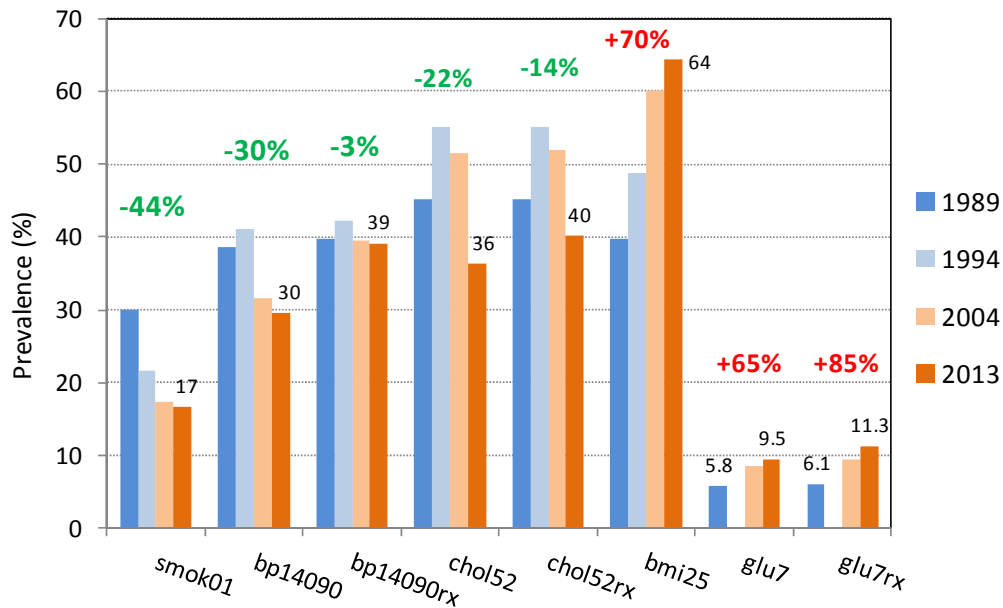
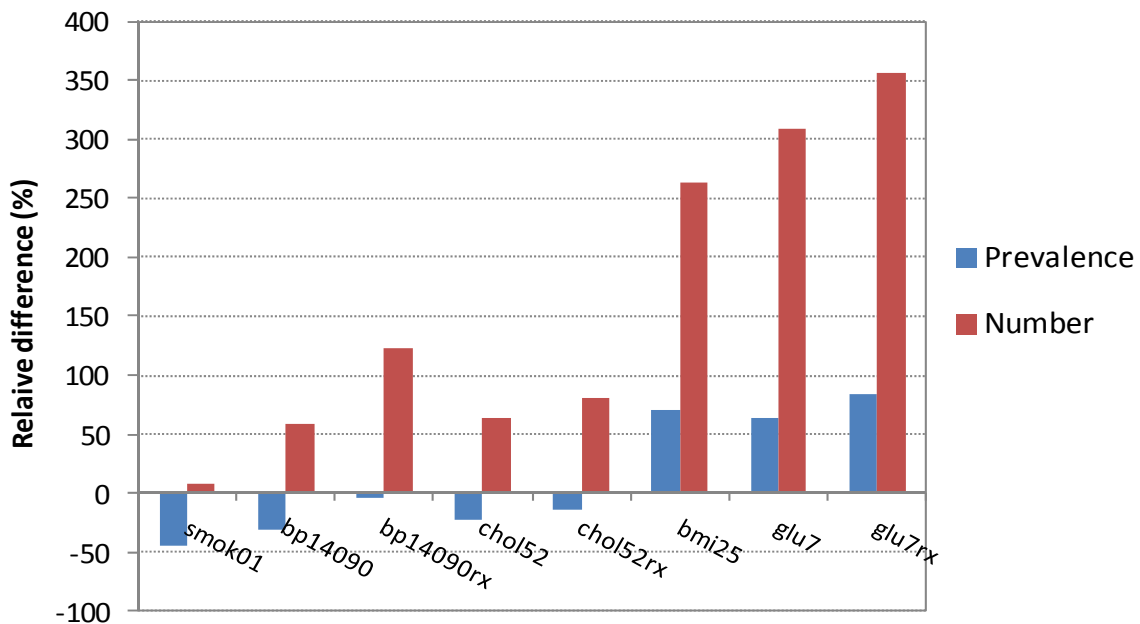


Figure 2. Relative difference in age-standardized prevalence of cardiovascular risk factors and total numbers of persons with these risk factors, between 1989 and 2013

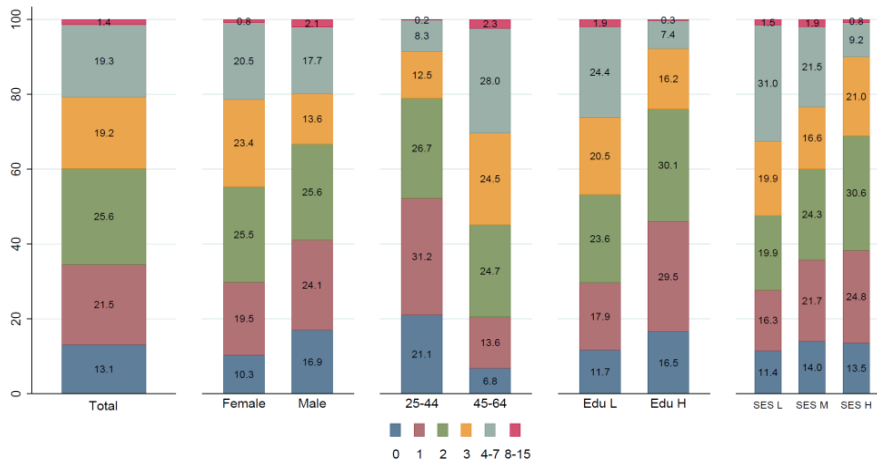


Comment. The age-standardized prevalence of main risk factors between 1989 and 2013 decreased, or did not increase (which is good news) for some risk factors (smoking, blood pressure, cholesterol), but the total numbers of persons with these risk factors still increased substantially because of the ageing and increasing population. For obesity and diabetes, the age-standardized prevalence increased (bad news) and the number of total cases in the population markedly increased, predicting a future large burden of diabetes. The figure 2 shows the striking contrasts between relative changes in the age-standardized prevalence of risk factors and the absolute changes in the total numbers of persons with these risk factors. These issues have also been commented in the section in this report on obesity..

Socio demographic variables

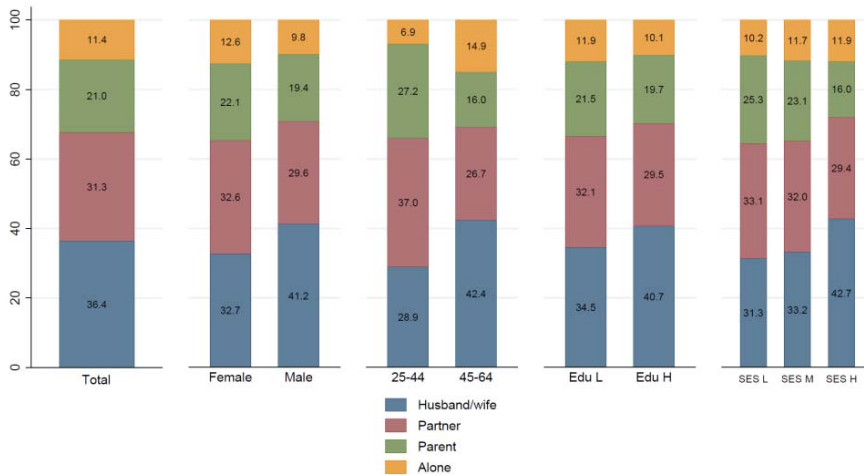
As are reminder, proportions in the following sections are not standardized for age. Because older persons have been oversampled in the survey, crude estimates may not indicate the actual prevalence in the total population, although differences are minimal in most instances.

Figure 1. Number of children of participants, by sex, age and SES; age 25-64



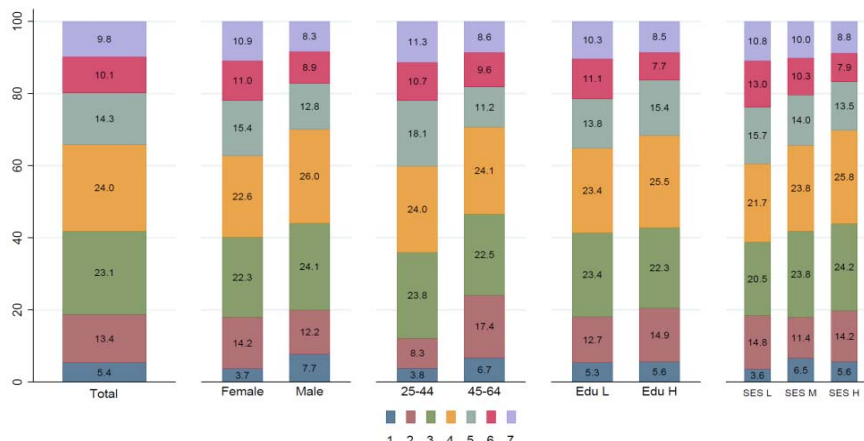
Less than 30% of participants have more than 3 children. Participants of higher vs. lower SES, and younger vs. older ones, have fewer children.

Figure 2. Living with spouse, partner, parent or alone, by sex, age and SES, age 25-64



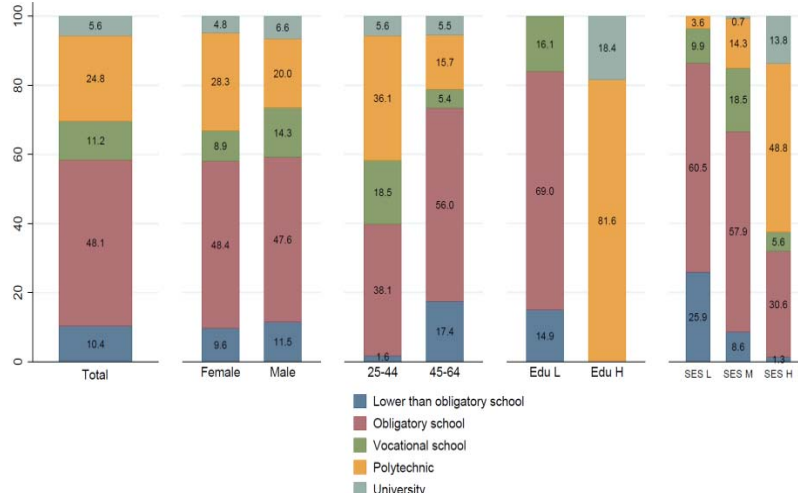
One third of participants are married, another third live with a partner, 21% with a parent and 11% alone, at age 25-64. These proportions are not largely different according to SES.

Figure 3. Number of persons living in same household, by sex, age and SES, age 25-64



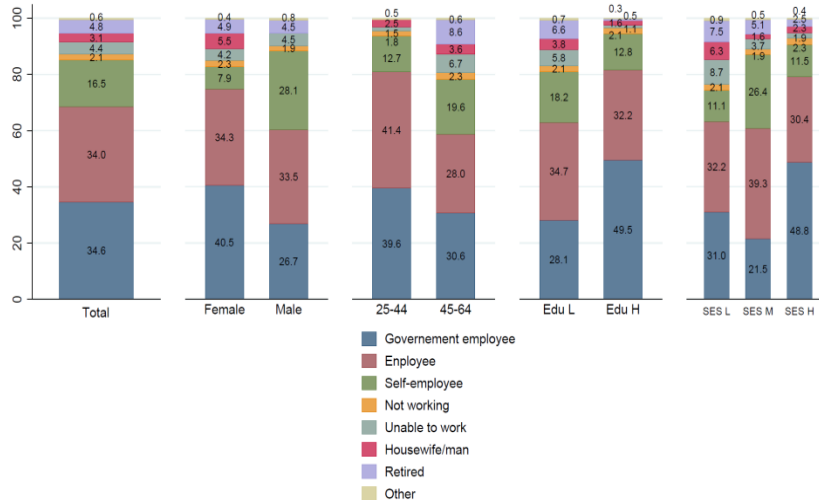
Only one third of participants live in households including more than 4 persons. Around 10% of participants report that their household includes 7 or more people, and only 5% of persons live alone.

Figure 4. Education categories, by sex, age and SES, age 25-64



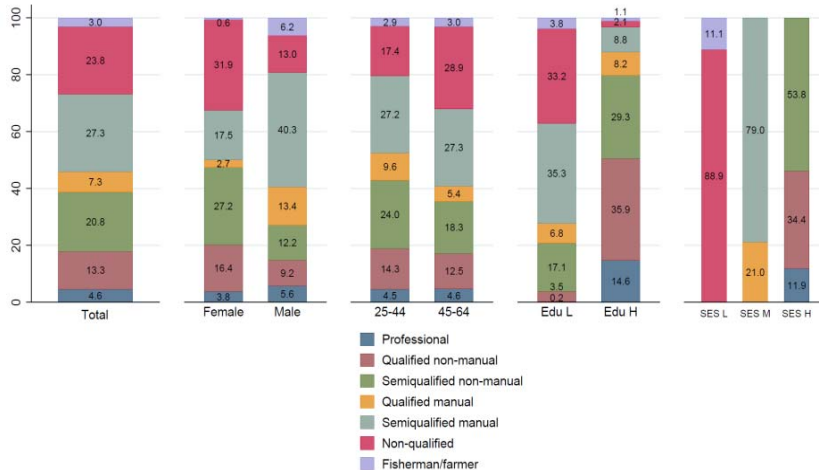
Higher education is not substantially different between males and females, and was higher in younger vs. older participants consistent with increasing years of education at school over time.

Figure 5. Work status (last job if not currently working), by sex, age and SES, age 25-64



One third of all participants are working in the government sector. This proportion is higher in female vs. male, younger vs. older, and higher vs. lower SES persons. Being self-employed is more frequent among male vs. female and older vs. younger persons, as well as among middle SES persons (e.g. craftsmen/women).

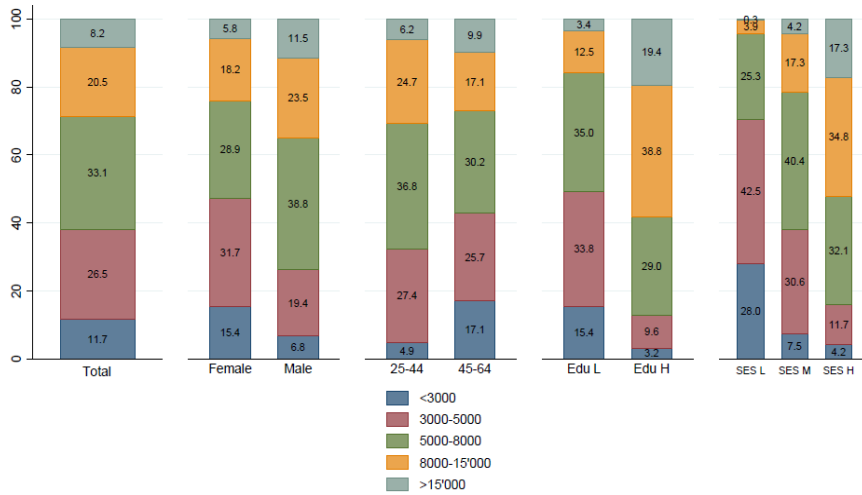
Figure 6. Current occupation (last occupation if not currently working), by sex, age and SES, age 25-64



The participant describes his/her current/last job and the survey officer classifies it along the categories appearing in this figure.

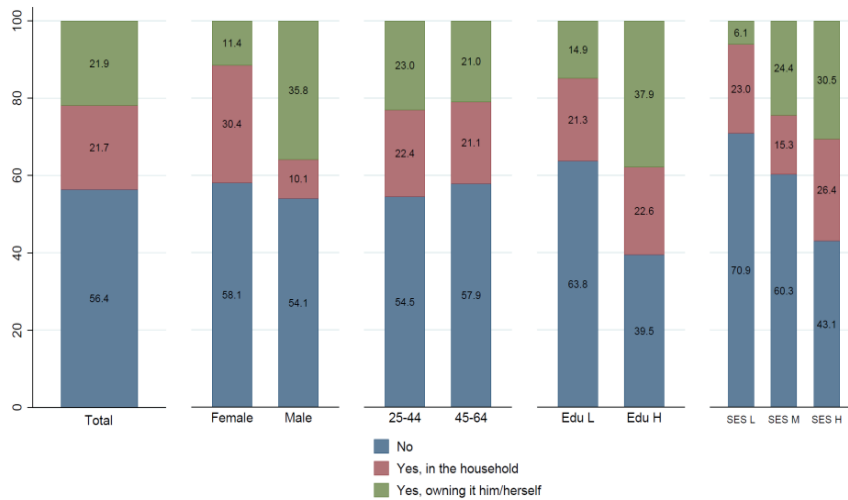
The proportion of laborers is fairly high, and higher among female vs. male and older vs. younger participants.

Figure 7. Total monthly earnings, including allowance and other benefits, by sex, age and SES, age 25-64



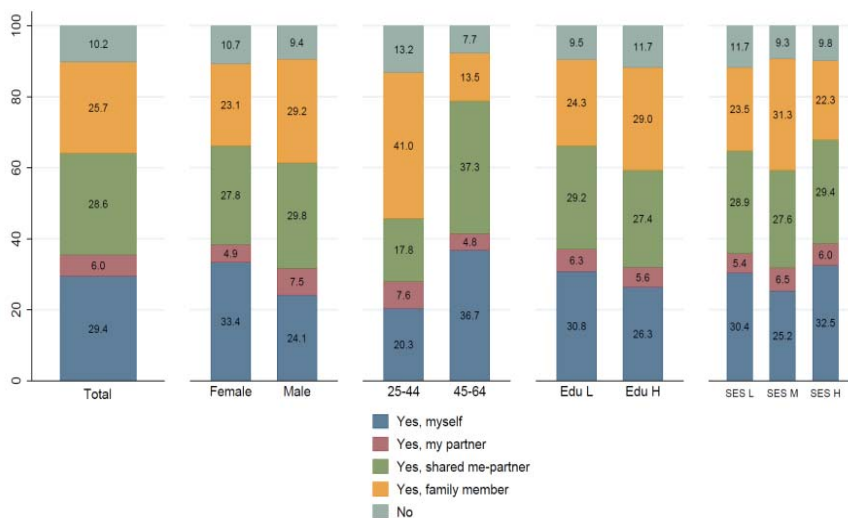
In 2013, around one third of people aged 25-64 earned less than SR 5000, one third 5000-8000 and one third >8000. Salary is strongly associated with education and occupation. On average, earnings were also higher in male vs. female and in younger vs. older participants.

Figure 8. Does anyone own a car or truck in your household, by sex, age and SES, age 25-64



Overall, 22% of participants, and 43% of households, owned a car in 2013 and this proportion increased with SES.

Figure 9. Do you own the place where you are currently living? by sex, age and SES, age 25-64



Around 90% of participants live in a house/apartment that is owned by themselves, their partner or their family.

Figure 10. Traveling abroad for professional purpose during the past 5 years, by sex, age and SES; age 25-64

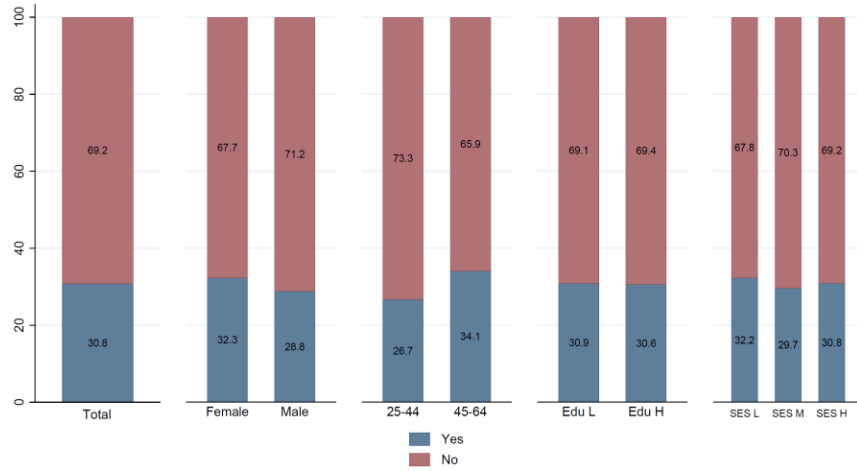
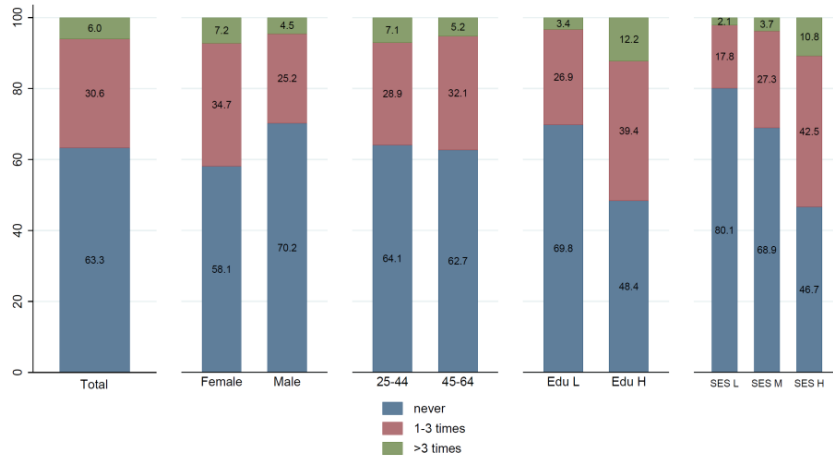


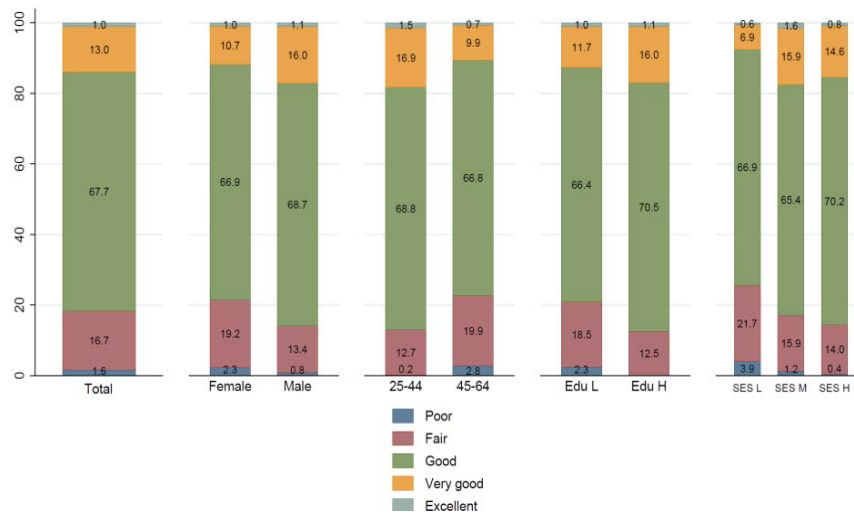
Figure 11. Traveling abroad for private purpose during the past 5 years, by sex, age and SES, age 25-64



Large proportions of adults of Seychelles travelled abroad. This has implications for health, including exposure to mass media, purchasing medical materials or medications.

Perceived health status

Figure 1. How would you rate your health, currently? by sex, age and SES, age 25-64



Less than 20% of participants report that their health is poor or not too good (“pa tro bon”) and this proportion is higher in female vs. male, older vs. younger, and lower vs. higher SES participants.

Figure 2. Does your health limit you in physical activities of moderate intensity that you might do in a typical day, such as carrying a grocery bag, sweeping at home, or moving a light piece of furniture? by sex, age and SES, age 25-64

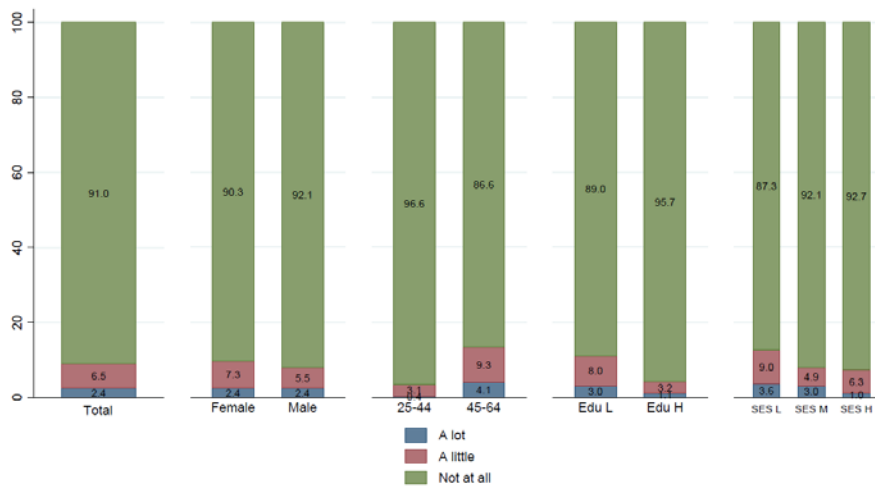


Figure 3. During the past 4 weeks, did you have any physical pain that interfered with your activities at work or at home? by sex, age and SES, age 25-64

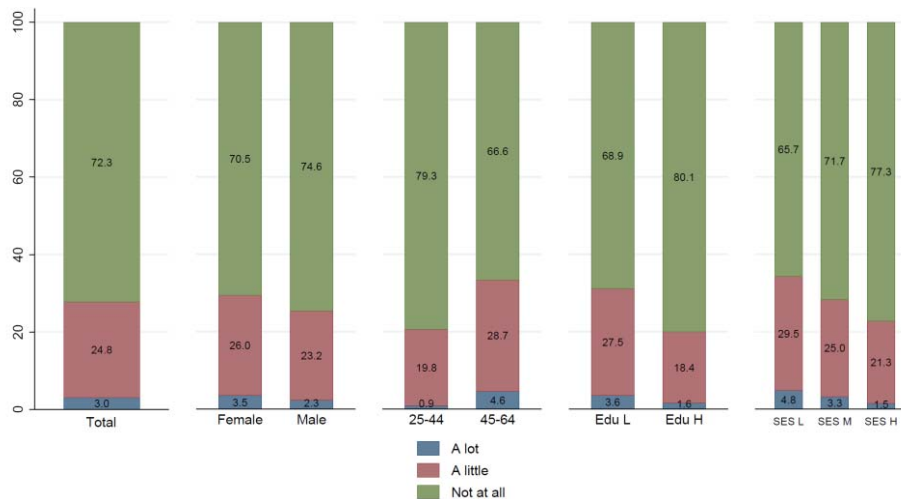


Figure 4. During the 4 past weeks, did you have a feeling of fatigue or lack of energy (fay, fatig, mak lenerzi) ? by sex, age and SES, age 25-64

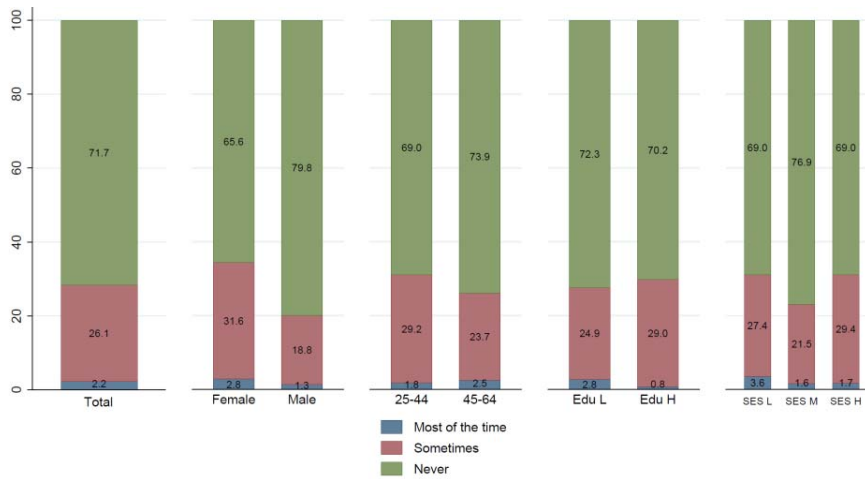


Figure 5. If so (among 344 persons in figure above), would you say the fatigue was mostly physical or psychological ? by sex, age and SES, age 25-64

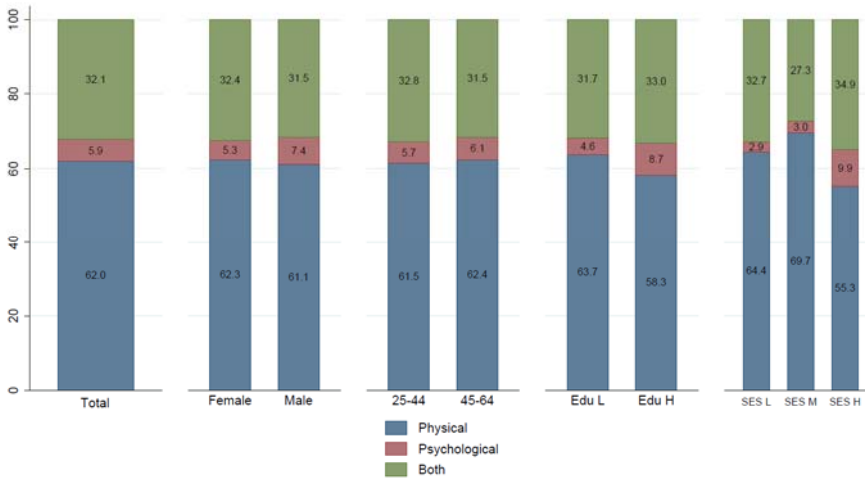
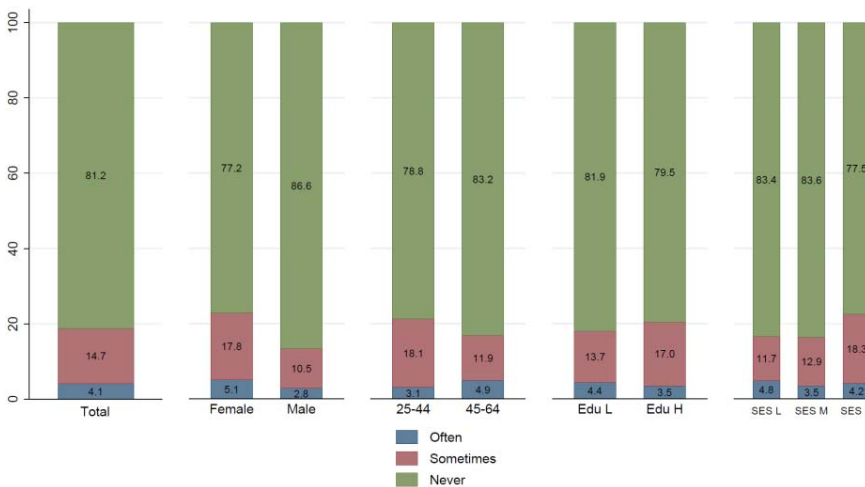
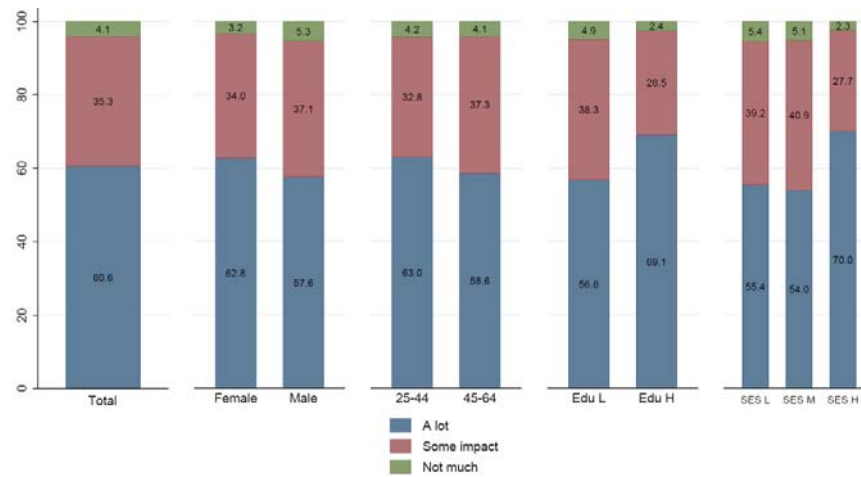


Figure 6. During the past 4 weeks, how often did you feel emotionally down or depressed? by age, sex and SES, age 25-64



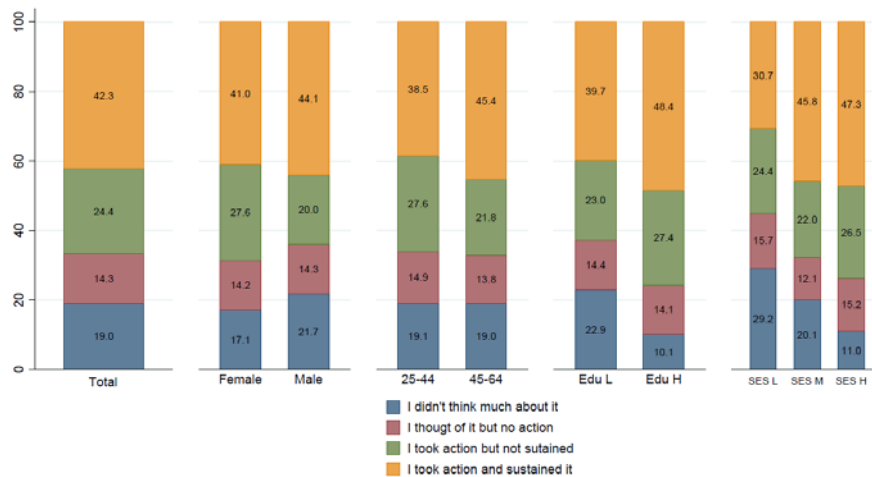
Comment. Data on perceived health emphasize the substantial burden of functional and qualitative dimensions of health. Further analysis will be done on these important topics, including data not shown here.

Figure 7. Do you think your lifestyle and diet can have an impact on your health? by sex, age and SES; age 25-64



Two thirds of participants recognize a substantial role of behaviors on one's health.

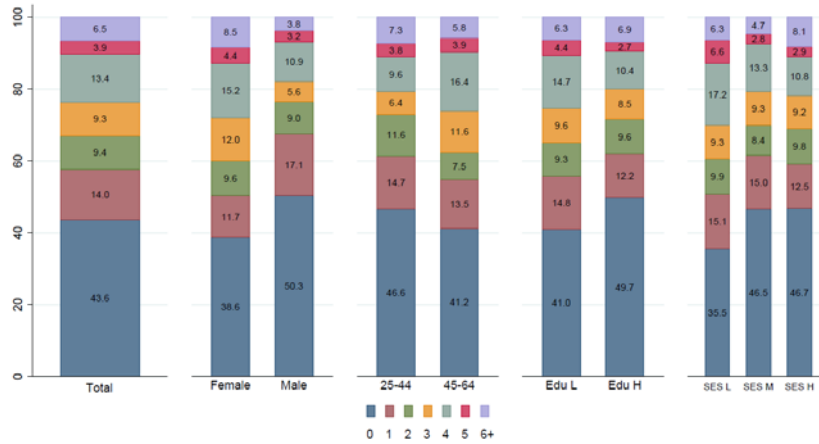
Figure 8. What best describes your attitude and actions regarding taking regular physical activity and having a balanced diet during the past 6 months? by sex, age and SES, age 25-64



Comment. A large proportion of persons aged 25-64 report making efforts to adopt healthier behaviors. This emphasizes that most people are aware of issues related to health and indirectly indicates the need for multisectoral interventions to enable healthy behavior changes by all.

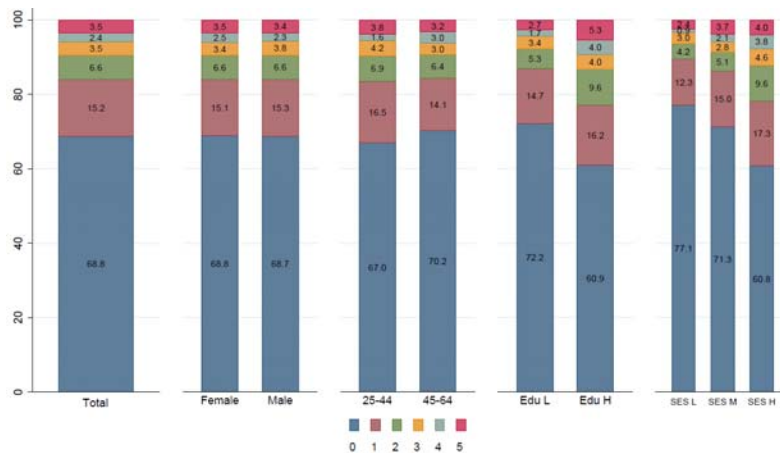
Utilization of health care services

Figure 1. How many times did you go to a government health facility for ambulatory care in the past 12 months? by sex, age, and SES, age 25-64



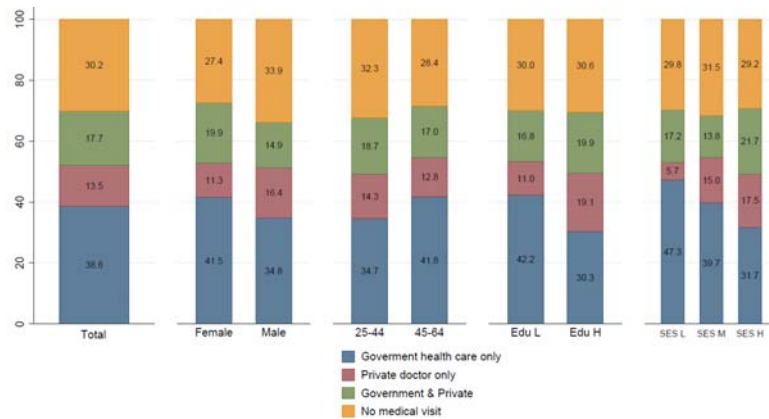
Nearly two thirds of people aged 25-64 used public ambulatory care facilities during the past 12 months, with slightly higher use of public health services by female vs. male and lower vs. higher SES persons. This implies that public primary care is a good setting for providing preventive measures (e.g. screening, counseling, etc).

Figure 2. How many times did you go to a private doctor for ambulatory care in the past 12 months? by age, sex and SES, age 25-64



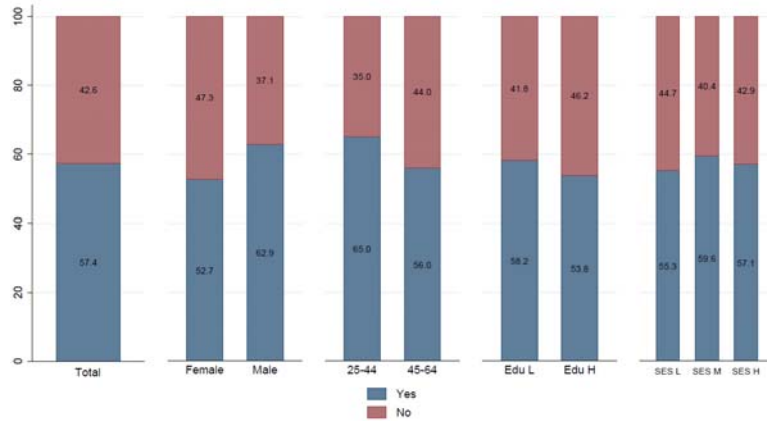
One third of people aged 25-64 attended a private clinic during the past 12 months. This proportion was higher among higher vs. lower SES participants, with no substantial difference by sex and age.

Figure 3. Ambulatory medical care sought at government or private facilities in the past 12 months, by sex, age and SES; age 25-64



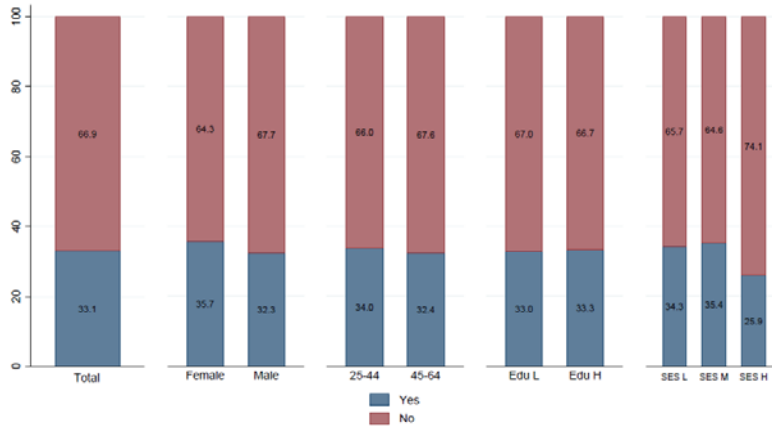
Nearly 20% of participants used both public and private health care overall. Around 40-50% of persons of lower SES did not seek medical care vs. around 30% of persons of higher SES. This indirectly supports the need for national guidelines (on NCDs and other diseases) to ensure consistent and quality clinical management in all public and private facilities.

Figure 4. Health officer advised about physical activity during the past 12 months, by sex, age and SES; age 25-64, among 136 diabetic persons who visited a doctor during past 12 months



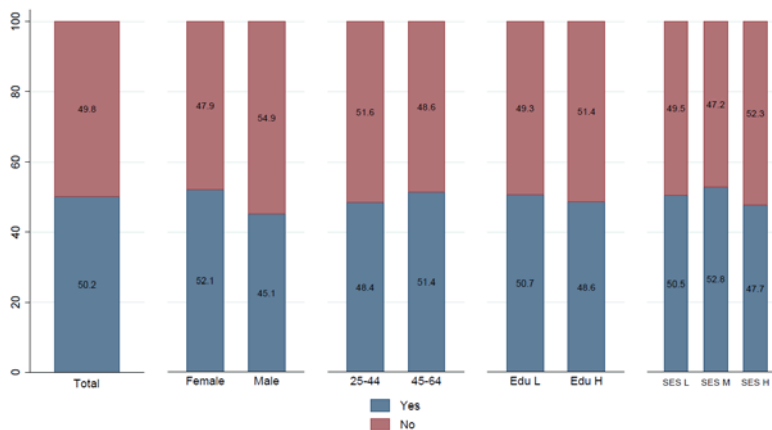
Around 40% of diabetic patients did not receive (or did not remember) advice on physical activity recently. Education on healthy lifestyles has to be strengthened at primary health care level, with adequate training of health professionals.

Figure 5. Health officer advised about quitting smoking during the past 12 months, by sex, age and SES, age 25-64, among 127 smokers who visited a doctor during past 12 months



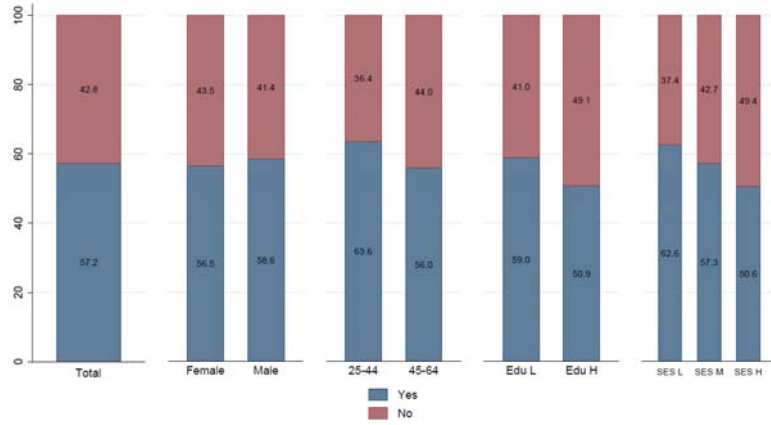
Only one third of smokers were reminded about the need to quit smoking at a recent medical visit. Education about healthy lifestyles has to be strengthened at primary health care level, with adequate training of health professionals.

Figure 6. Health officer advised about weight control during past 12 months, by sex, age and SES,; age 25-64, among 299 obese persons who visited a doctor during past 12 months



Same comments as in 2 previous figures. Health professionals should regularly give support and advice about weight control to their patients.

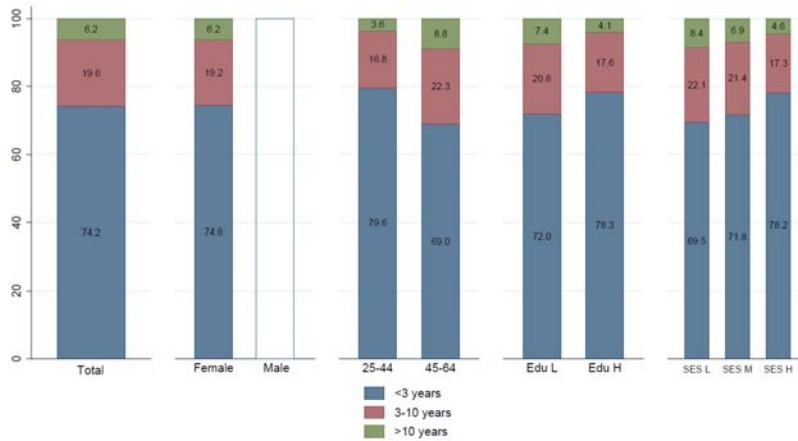
Figure 7. Health officer advised about salt consumption during the past 12 months, by sex, age and SES; age d25-64, among 269 persons treated for HBP who visited a doctor during the past 12 months



Same observations as in previous three figures. Health professionals should regularly advise about lifestyle and diet to hypertensive patients and other patients at risk.

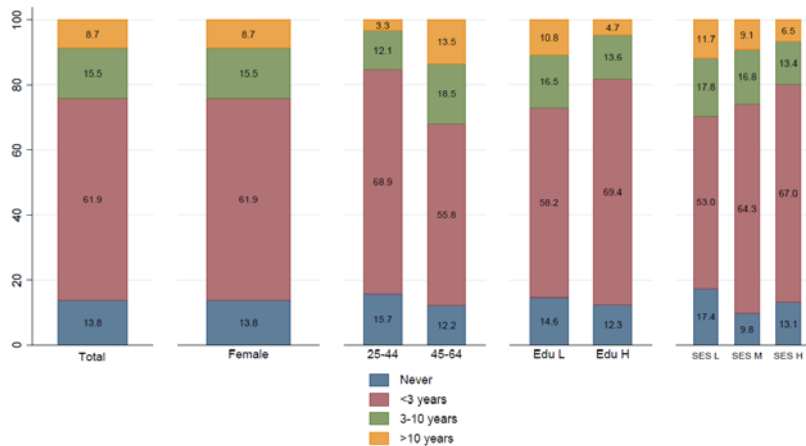
Screening of selected cancers

Figure 1. Last Pap smear among women, by age and SES, age 25-64



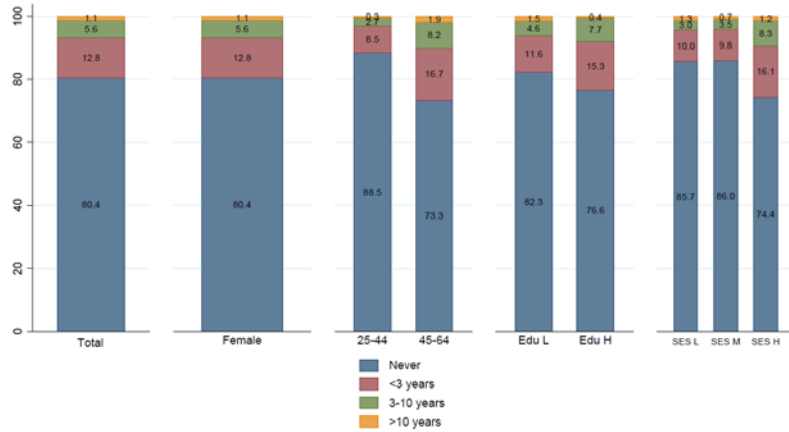
A large majority of women underwent screening for cervical cancer within the past 3 years. Screening was slightly more frequent in younger vs. older and in higher vs. lower SES women.

Figure 2. Breast examination by health professional to screen for breast cancer among women, by age and SES



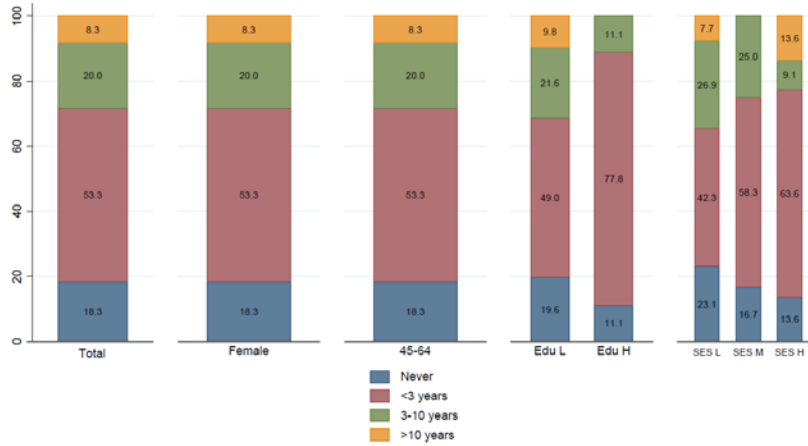
Most women had a breast examination, and a majority had it within the last 3 years. Screening was less frequent in younger (25-44) vs. older women (45-64). However screening should also be done in older vs. younger women since breast cancer risk increases with age. Screening was also done more frequently in women of higher vs. lower SES.

Figure 3. Last mammography or breast ultrasound among women, by age and SES, age 26-64



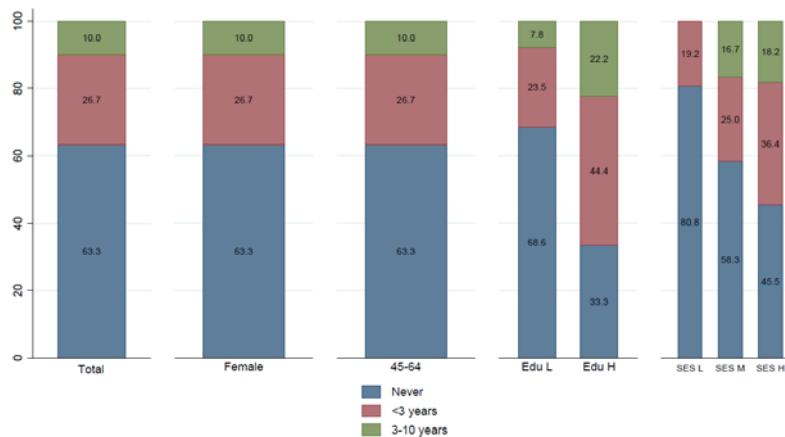
Around 27% of women aged 45-64 had a mammography done within the last 3 years. Of note, there is much debate among experts about benefits and harms of breast cancer screening at different ages because of large numbers of false positive cases resulting from screening and limited overall benefit of non targeted screening.

Figure 4. Breast examination by SES, among 60 women aged 50-64 who had a family history of breast cancer



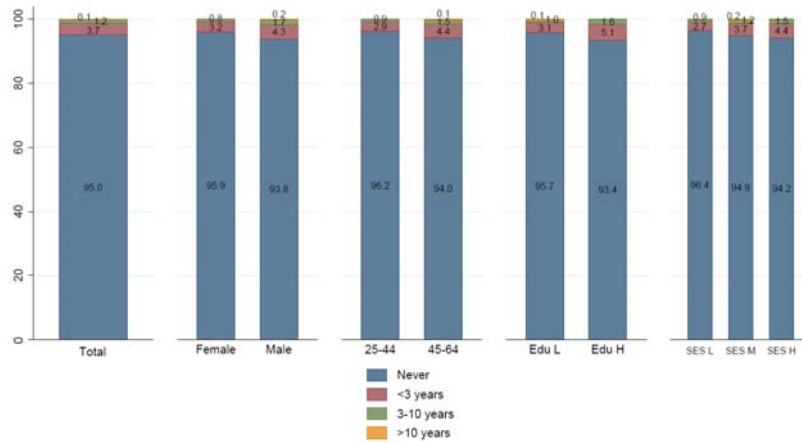
While the frequency of breast cancer screening in women without a family history of breast cancer is debatable, women with history of breast cancer should be screened regularly. More than one half of women with history of breast cancer were screened. This proportion was higher in women of higher vs. lower SES.

Figure 5. Had a mammography by SES, among 60 women aged 50-64 with a family history of breast cancer



Less than one third of women at high risk (e.g. family history of breast cancer) did a mammography. The test was done more frequently in women of higher vs. lower SES. Screening breast cancer should be strengthened for women with a family history of breast cancer.

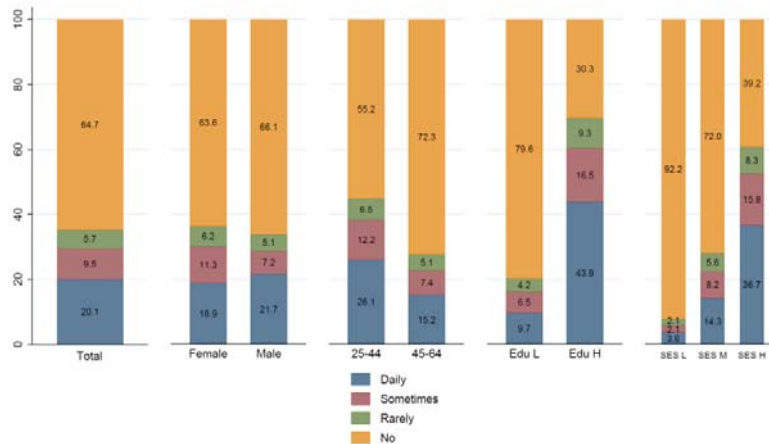
Figure 6. Test for blood in stools to screen for colon cancer, by sex, age and SES, age 25-64



Very few persons underwent screening for occult blood in stools. It would be useful to assess the cost benefit ratio of this test in Seychelles and which groups of people would benefit of this simple screening test.

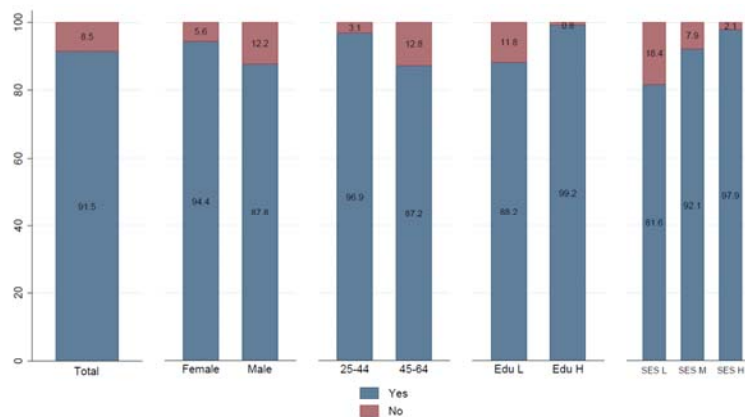
Communication, mass media, and exposure to health programs

Figure 1. Uses Internet on a computer/tablet outside of work, by sex, age and SES, age 25-64



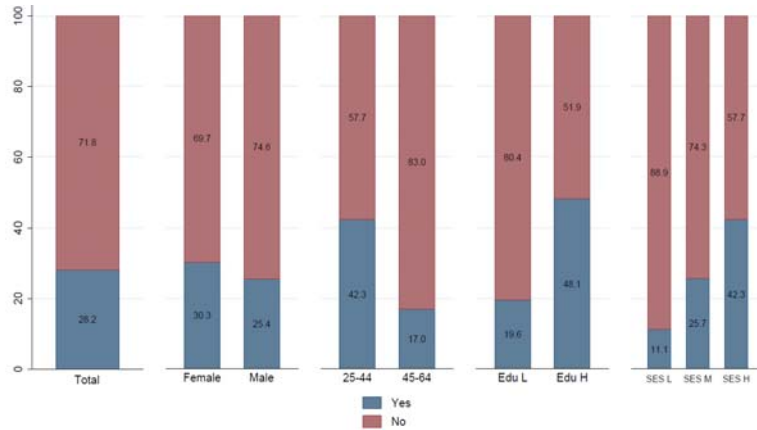
Two thirds of participants do not use Internet outside of work. This proportion is lower among younger vs. older and higher vs. lower SES participants.

Figure 2. Has a mobile phone, by sex, age and SES, age 25-64



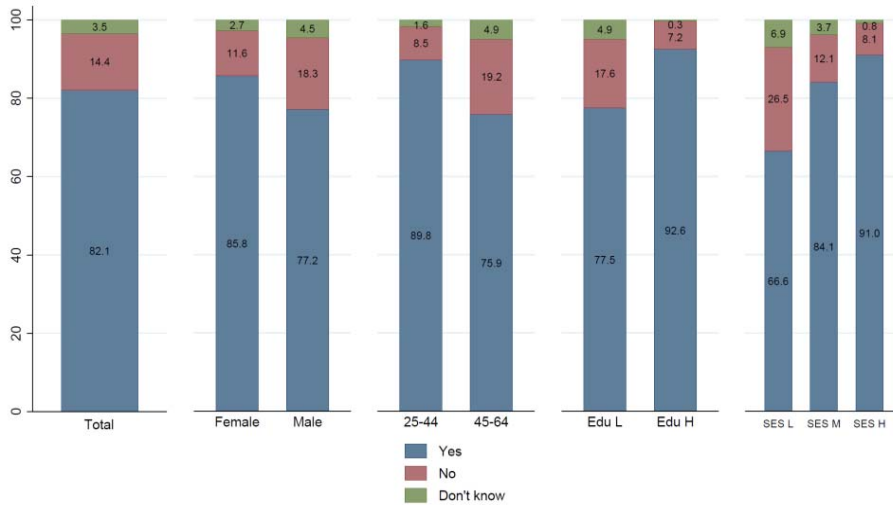
Less than 10% of participants do not have a mobile phone, but this proportion increases among persons of lower vs higher SES.

Figure 3. Has a mobile phone that can access Internet, by sex, age and SES, age 25-64



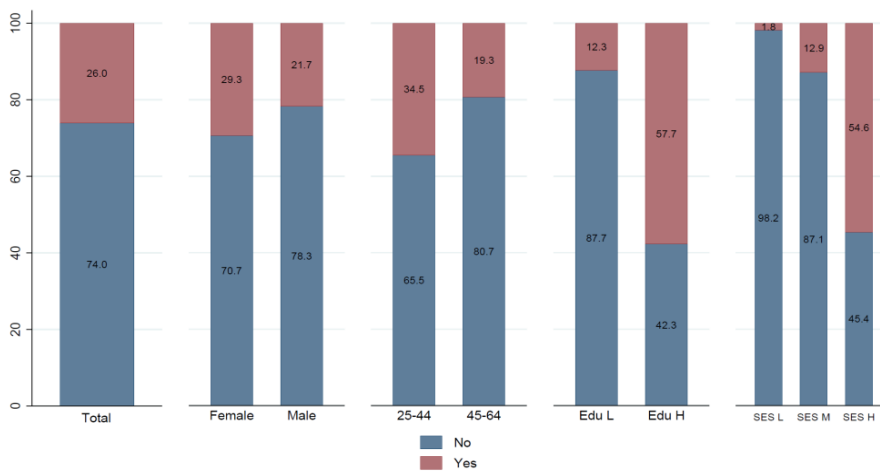
Less than one third of participants can access internet with their phone. This proportion is associated with SES status. This situation does not support current dissemination of interactive health education messages based on Internet.

Figure 4. Would like to receive health messages on their mobile phone, by sex, age and SES; age 25-64



A large majority of participants would like to receive SMS, but around 10% do not wish to receive health messages, and up to 30% among persons of lower vs higher SES.

Figure 4. Has an email address, by sex, age and SES, age 25-64



Only one third of participants have an email address, and up to 90% don't have email address among participants of lower vs. higher SES. This situation limits, for now, using emails as a channel for health education.

Figure 5. How often reads local daily newspapers, by age, sex and SES, age 25-64

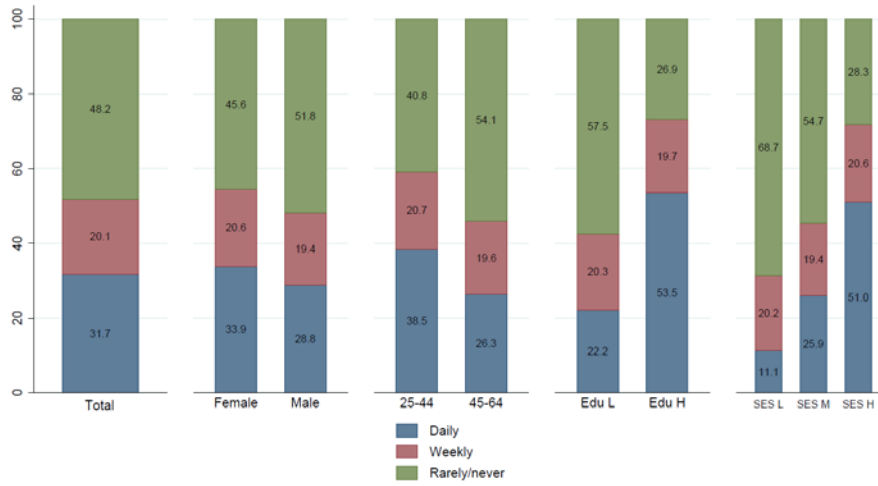
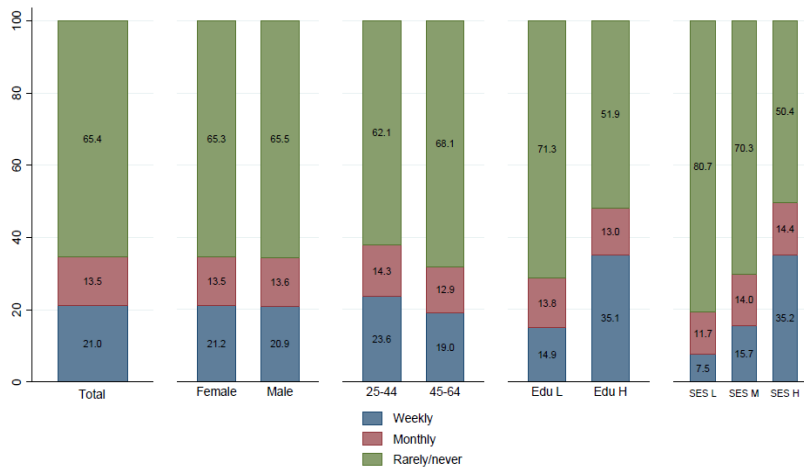
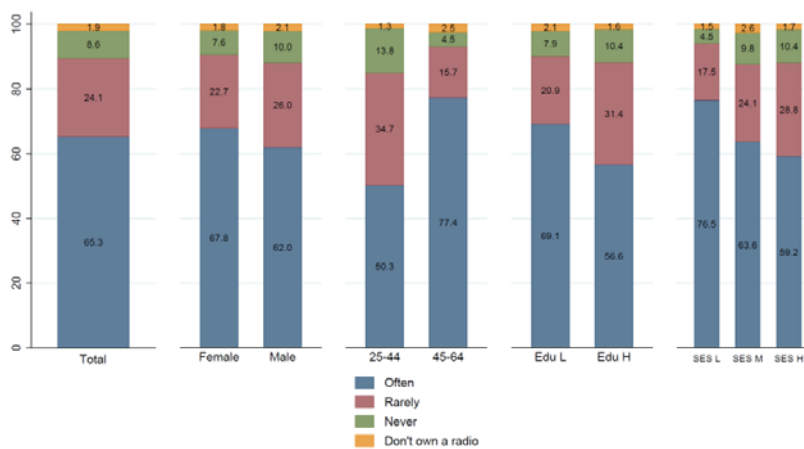


Figure 6. How often reads local weekly newspapers, by sex, age and SES, age 25-64



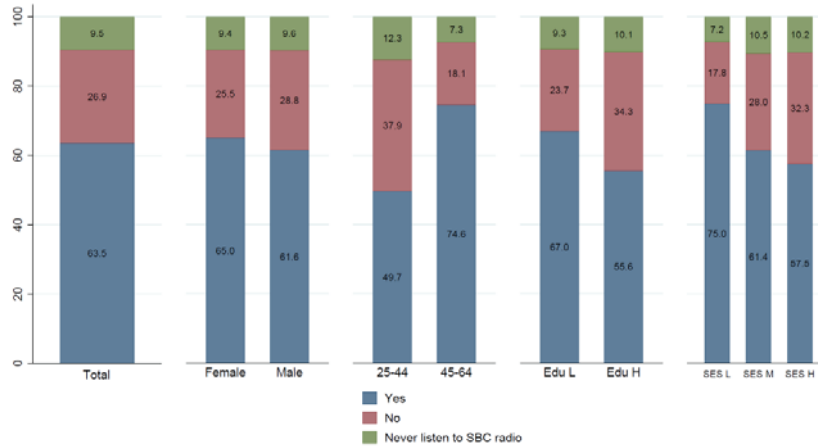
The proportions of participants aged 25-64 reading daily newspapers (around half of all people overall) or weekly newspapers (around one third of all people) newspaper is low, and it is much lower among lower vs. higher SES persons. This implies that newspapers are not an optimal channel for dissemination of health education, particularly when targeting lower SES persons.

Figure 7. How often do you listen to SBC radio (not including Paradise FM), by sex, age and SES, age 25-64



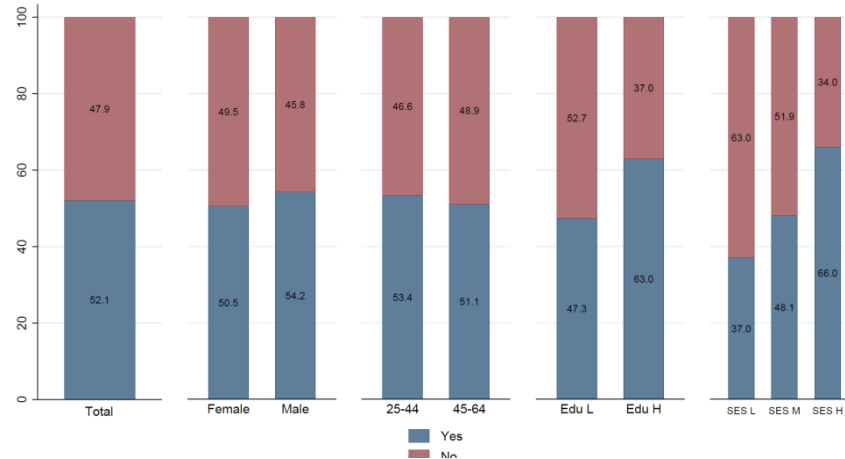
Two thirds of participants often listen to SBC radio, with slightly higher proportions in lower vs. higher SES persons. This makes this channel ideal a good medium for dissemination of health education.

Figure 8. Did you listen to a health program on cardiovascular disease, smoking, diabetes, nutrition, etc, on SBC radio in the past 12 months, by age, sex and SES



Two thirds of participants heard a health program on NCD during the past 12 months, with slightly higher proportions of lower vs. higher SES persons. This confirms that this is an excellent channel for dissemination of health education.

Figure 9. Has cable TV or satellite dish TV at home, by sex, age and SES; age 25-64



One half of participants have cable TV or satellite dish TV. This proportion is higher in higher vs. lower SES persons.

Figure 10. When watching TV, how often do you watch SBC TV, by sex, age and SES, age 25-64

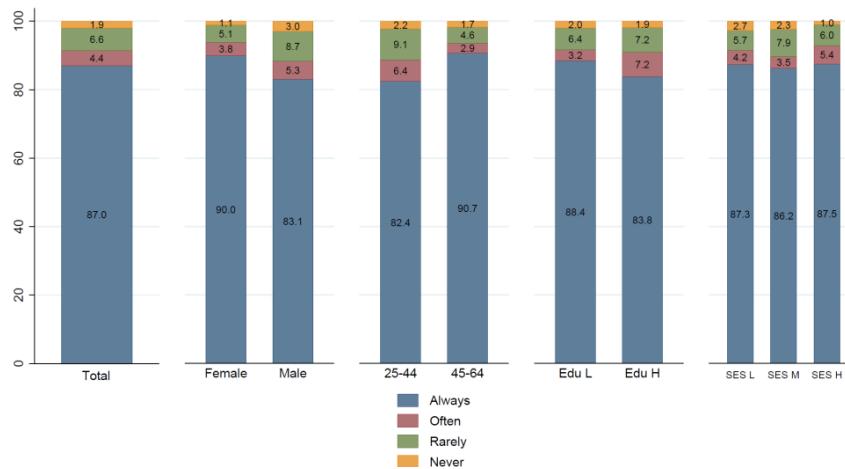
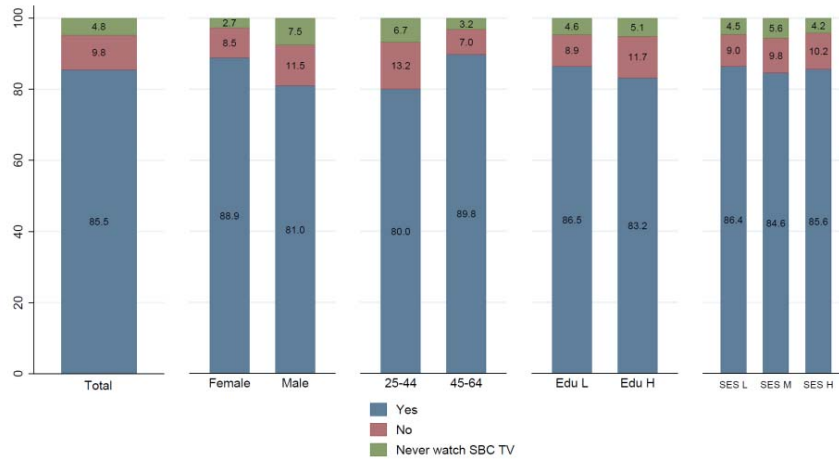
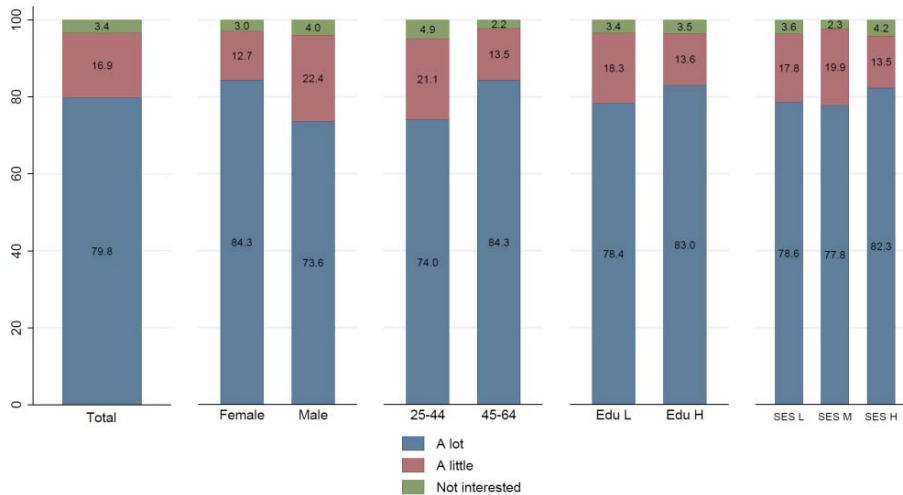


Figure 11. Did you watch a health program related to cardiovascular diseases, diabetes, smoking, blood pressure, diet, etc on SBC TV in the past 12 months, by sex, age and SES, age 25-64



More than 90% of participants (all are Seychellois nationals) always or often watch SBC. The proportion is similar in all SES categories. Although this was not formally assessed, participants reported that they like to watch, at the minimum, the news bulletins and similar information programs. This confirms that dissemination of health information through this channel is useful and can reach a large majority of Seychellois adults.

Figure 12. Do you like listening radio or watch TV programs or magazines on health, by sex, age and SES; age 25-64



There is broad interest in health programs on radio/TV. Yet 15% are not too interested. This raises the issue to produce increasingly more innovative programs on health.

Appendix 1. Selected findings by sex and survey year

agecat	Men						Women						Rel. Dif.	
	1989	1994	2004	2013	Abs. Dif in 24 yr	Rel. Dif 2013/19 89	1989	1994	2004	2013	Abs. Diff. in 24 yr	2013/198 9		
BMI														
25-34	22.9	23.3	24.4	24.6	1.8	8.0	23.2	24.8	26.4	27.8	4.3	18.7		
35-44	23.9	24.8	25.7	27.7	3.6	15.1	26.9	27.3	28.6	29.3	2.5	9.5		
45-54	23.2	24.4	26.8	27.0	4.0	17.1	27.1	28.6	29.4	30.6	3.2	12.0		
55-64	23.3	24.3	25.6	26.2	2.8	12.2	27.6	28.1	30.3	29.5	2.2	8.1		
<i>25-64 Ahmad</i>	<i>23.3</i>	<i>24.1</i>	<i>25.5</i>	<i>26.3</i>	<i>3.0</i>	<i>12.8</i>	<i>25.9</i>	<i>26.9</i>	<i>28.3</i>	<i>29.1</i>	<i>3.2</i>	<i>12.5</i>		
BMI ≥25														
25-34	21.0	26.9	41.3	42.3	22.7	108.4	30.1	41.5	55.0	56.5	26.3	87.4		
35-44	37.8	42.1	55.2	67.0	29.7	78.5	57.3	61.5	67.6	72.9	15.3	26.8		
45-54	29.7	45.5	63.3	64.0	34.1	115.1	58.6	73.9	76.8	86.3	23.9	40.8		
55-64	24.3	42.5	50.7	57.1	29.7	122.5	70.1	69.9	84.0	80.0	13.1	18.6		
<i>Prev 25-64 Ahmad</i>	<i>28.2</i>	<i>38.1</i>	<i>51.8</i>	<i>56.7</i>	<i>28.5</i>	<i>100.9</i>	<i>51.1</i>	<i>59.4</i>	<i>68.5</i>	<i>72.0</i>	<i>20.4</i>	<i>40.0</i>		
<i>Prev 25-64 actual pop</i>	<i>26.5</i>	<i>36.5</i>	<i>51.7</i>	<i>57.6</i>	<i>31.3</i>	<i>118.1</i>	<i>46.6</i>	<i>55.6</i>	<i>66.9</i>	<i>72.7</i>	<i>25.8</i>	<i>55.3</i>		
<i>N in actual pop 25-64</i>	<i>3'496</i>	<i>6'107</i>	<i>10'569</i>	<i>14'015</i>	<i>10'482</i>	<i>299.8</i>	<i>5'453</i>	<i>8'546</i>	<i>13'664</i>	<i>17'822</i>	<i>12'287</i>	<i>225.3</i>		
BMI ≥30														
25-34	3.8	5.9	9.5	14.4	10.4	273.2	8.9	16.2	22.8	31.1	21.0	235.0		
35-44	4.7	9.9	15.7	32.1	25.9	547.6	29.4	28.0	37.5	39.4	12.0	41.0		
45-54	2.8	7.6	22.8	21.3	20.5	744.5	26.9	38.0	39.8	50.3	20.3	75.3		
55-64	6.6	11.0	16.0	18.0	11.2	168.8	33.1	36.0	48.1	40.5	9.7	29.3		
<i>Prev 25-64 Ahmad</i>	<i>4.3</i>	<i>8.3</i>	<i>15.4</i>	<i>21.6</i>	<i>17.2</i>	<i>399.8</i>	<i>22.9</i>	<i>27.9</i>	<i>35.1</i>	<i>39.4</i>	<i>16.4</i>	<i>71.6</i>		
<i>Prev 25-64 actual pop</i>	<i>4.3</i>	<i>8.1</i>	<i>15.2</i>	<i>22.0</i>	<i>17.6</i>	<i>411.8</i>	<i>19.9</i>	<i>26.0</i>	<i>34.2</i>	<i>40.1</i>	<i>19.9</i>	<i>100.1</i>		
<i>N in actual pop 25-64</i>	<i>564</i>	<i>1'351</i>	<i>3'103</i>	<i>5'342</i>	<i>4'740</i>	<i>839.7</i>	<i>2'625</i>	<i>4'351</i>	<i>7'001</i>	<i>9'753</i>	<i>7'004</i>	<i>266.8</i>		
Smoking daily														
25-34	47.6	27.7	30.2	31.5	-11.2	-23.5	6.5	3.5	4.0	7.5	1.4	21.9		
35-44	40.2	32.3	32.1	25.7	-12.1	-30.2	9.8	6.3	4.0	3.5	-5.9	-60.0		
45-54	62.1	40.2	31.0	26.7	-31.8	-51.2	12.4	9.9	3.9	3.3	-9.7	-77.8		
55-64	55.9	55.0	29.3	28.6	-32.0	-57.3	12.7	9.6	3.3	5.6	-7.8	-61.1		
<i>Prev 25-64 Ahmad</i>	<i>50.3</i>	<i>36.5</i>	<i>30.8</i>	<i>28.3</i>	<i>-19.7</i>	<i>-39.3</i>	<i>9.8</i>	<i>6.8</i>	<i>3.9</i>	<i>5.1</i>	<i>-4.7</i>	<i>-48.1</i>		
<i>Prev 25-64 actual pop</i>	<i>49.5</i>	<i>35.2</i>	<i>30.9</i>	<i>28.1</i>	<i>-18.8</i>	<i>-37.9</i>	<i>9.1</i>	<i>6.1</i>	<i>3.9</i>	<i>4.9</i>	<i>-4.0</i>	<i>-44.0</i>		
<i>N in actual pop 25-64</i>	<i>6'545</i>	<i>5'887</i>	<i>6'313</i>	<i>6'830</i>	<i>472</i>	<i>7.2</i>	<i>1'070</i>	<i>930</i>	<i>796</i>	<i>1'206</i>	<i>106</i>	<i>9.9</i>		
Smoking daily/weekly														
25-34	52.4	31.9	42.9	41.4	-4.0	-7.7	7.3	4.9	6.7	13.0	6.1	82.8		
35-44	42.5	37.9	39.6	30.3	-10.1	-23.7	10.5	8.4	6.3	5.3	-5.0	-48.1		
45-54	64.1	44.7	35.4	30.0	-31.0	-48.4	13.1	10.6	5.5	4.4	-9.0	-68.9		
55-64	58.8	58.9	32.7	32.3	-31.6	-53.7	14.0	10.3	3.9	6.2	-8.5	-60.3		
<i>Prev 25-64 Ahmad</i>	<i>53.4</i>	<i>41.1</i>	<i>38.5</i>	<i>34.1</i>	<i>-16.6</i>	<i>-31.1</i>	<i>10.7</i>	<i>8.1</i>	<i>5.8</i>	<i>7.7</i>	<i>-3.0</i>	<i>-28.0</i>		
<i>Prev 25-64 actual pop</i>	<i>53.1</i>	<i>39.8</i>	<i>39.0</i>	<i>33.7</i>	<i>-16.1</i>	<i>-30.2</i>	<i>9.9</i>	<i>7.6</i>	<i>6.0</i>	<i>7.4</i>	<i>-2.5</i>	<i>-24.8</i>		
<i>N in actual pop 25-64</i>	<i>7'013</i>	<i>6'658</i>	<i>7'970</i>	<i>8'198</i>	<i>1'500</i>	<i>21.4</i>	<i>1'312</i>	<i>1'274</i>	<i>1'220</i>	<i>1'797</i>	<i>433</i>	<i>33.0</i>		
Occasional smoking														
25-34	4.8	4.2	12.7	9.9	7.2	150.4	0.8	1.4	3	6	4.6	569.8		
35-44	2.4	5.6	7.5	4.6	2.1	88.0	0.7	2.1	2	2	0.8	117.9		
45-54	2.1	4.5	4.4	3.3	0.8	37.4	0.7	0.7	2	1	0.6	91.8		
55-64	2.9	3.9	3.3	3.7	0.4	14.7	1.3	0.7	1	1	-0.7	-52.6		
<i>Prev 25-64 Ahmad</i>	<i>3.2</i>	<i>4.6</i>	<i>7.7</i>	<i>5.9</i>	<i>3.1</i>	<i>98.9</i>	<i>0.8</i>	<i>1.3</i>	<i>2.0</i>	<i>2.6</i>	<i>1.7</i>	<i>210.0</i>		
<i>Prev 25-64 actual pop</i>	<i>3.5</i>	<i>4.6</i>	<i>8.1</i>	<i>5.6</i>	<i>2.7</i>	<i>77.0</i>	<i>0.8</i>	<i>1.4</i>	<i>2.1</i>	<i>2.5</i>	<i>1.7</i>	<i>201.1</i>		
<i>N in actual pop 25-64</i>	<i>468</i>	<i>771</i>	<i>1'657</i>	<i>1'369</i>	<i>1'028</i>	<i>219.5</i>	<i>97</i>	<i>212</i>	<i>428</i>	<i>617</i>	<i>519</i>	<i>535.0</i>		

agecat	Men						Women						Rel. Dif.	
	1989	1994	2004	2013	Abs. Dif in 24 yr	Rel. Dif 2013/19 89	1989	1994	2004	2013	Abs. Diff. in 24 yr	2013/198 9		
Cig/day (smoker)														
25-34	12.9	13.3	9.2	7.1	-6.5	-50.8	4.1	6.4	8.8	4.6	0.8	19.0		
35-44	13.1	12.6	9.4	6.0	-7.4	-56.1	8.9	8.3	7.6	11.5	2.2	24.8		
45-54	12.9	10.5	13.1	9.3	-2.2	-17.2	7.8	9.6	6.9	4.7	-3.9	-49.7		
55-64	11.2	12.3	10.8	6.6	-4.8	-42.6	6.2	4.4	9.3	6.3	1.7	27.6		
<i>25-64 Ahmad</i>	<i>12.7</i>	<i>12.3</i>	<i>10.4</i>	<i>7.2</i>	<i>-5.5</i>	<i>-43.3</i>	<i>6.7</i>	<i>7.3</i>	<i>8.1</i>	<i>6.8</i>	<i>0.3</i>	<i>4.0</i>		
Ethanol (ml)														
25-34	59.2	38.6	32.7	34.1	-21.7	-36.7	4.9	2.3	3.9	10.0	5.5	112.2		
35-44	67.0	67.8	38.6	30.5	-41.5	-62.0	8.1	2.6	3.8	7.9	0.9	11.2		
45-54	97.6	62.2	43.0	37.5	-55.2	-56.6	14.5	2.6	4.3	5.7	-5.9	-40.8		
55-64	65.5	56.0	52.4	26.9	-34.9	-53.3	8.0	6.5	2.1	4.4	-4.3	-53.6		
<i>25-64 Ahmad</i>	<i>71.3</i>	<i>55.2</i>	<i>40.0</i>	<i>32.7</i>	<i>-37.2</i>	<i>-52.2</i>	<i>8.5</i>	<i>3.2</i>	<i>3.7</i>	<i>7.5</i>	<i>-0.1</i>	<i>-1.0</i>		
Ethanol ≥30 ml/day														
25-34	55.2	25.2	37.3	41.4	-5.0	-9.0	4.9	2.8	4.7	9.9	5.4	111.4		
35-44	54.3	50.0	35.8	34.9	-21.1	-38.9	9.1	2.1	2.8	7.6	-0.1	-1.4		
45-54	59.3	39.4	40.5	45.3	-9.6	-16.3	11.7	2.8	4.4	4.4	-5.0	-42.7		
55-64	55.9	42.6	39.3	30.4	-22.3	-39.9	7.0	5.9	2.8	3.1	-4.3	-61.4		
<i>Prev 25-64 Ahmad</i>	<i>56.0</i>	<i>38.4</i>	<i>38.0</i>	<i>38.6</i>	<i>-13.5</i>	<i>-24.1</i>	<i>8.0</i>	<i>3.1</i>	<i>3.8</i>	<i>6.8</i>	<i>-0.2</i>	<i>-2.3</i>		
<i>Prev 25-64 actual pop</i>	<i>55.8</i>	<i>37.1</i>	<i>37.8</i>	<i>38.8</i>	<i>-12.7</i>	<i>-22.8</i>	<i>7.3</i>	<i>3.0</i>	<i>3.8</i>	<i>6.8</i>	<i>0.3</i>	<i>4.2</i>		
<i>N in actual pop 25-64</i>	<i>7'370</i>	<i>6'203</i>	<i>7'730</i>	<i>9'433</i>	<i>2'474</i>	<i>33.6</i>	<i>858</i>	<i>468</i>	<i>776</i>	<i>1'659</i>	<i>872</i>	<i>101.7</i>		
Ethanol ≥75 ml/day														
25-34	32.4	15.1	11.1	12.6	-16.7	-51.7	1.6	1.4	0.7	1.9	0.0	2.5		
35-44	30.7	29.0	11.9	7.3	-25.9	-84.3	3.5	1.4	0.6	1.2	-2.1	-58.8		
45-54	40.0	22.7	17.1	14.7	-22.3	-55.7	6.2	1.4	1.1	0.0	-5.1	-81.8		
55-64	33.1	20.9	20.0	9.3	-20.2	-61.2	3.2	2.9	0.0	0.5	-3.2	-101.4		
<i>Prev 25-64 Ahmad</i>	<i>33.8</i>	<i>21.8</i>	<i>14.2</i>	<i>11.0</i>	<i>-21.2</i>	<i>-62.7</i>	<i>3.5</i>	<i>1.7</i>	<i>0.6</i>	<i>1.0</i>	<i>-2.3</i>	<i>-65.7</i>		
<i>Prev 25-64 actual pop</i>	<i>33.3</i>	<i>21.1</i>	<i>13.8</i>	<i>11.1</i>	<i>-20.6</i>	<i>-61.9</i>	<i>3.1</i>	<i>1.6</i>	<i>0.6</i>	<i>1.0</i>	<i>-2.0</i>	<i>-64.7</i>		
<i>N in actual pop 25-64</i>	<i>4'403</i>	<i>3'532</i>	<i>2'814</i>	<i>2'698</i>	<i>-1'634</i>	<i>-37.1</i>	<i>361</i>	<i>247</i>	<i>132</i>	<i>237</i>	<i>-129</i>	<i>-35.9</i>		
Systolic BP														
25-34	124.3	125.5	124.6	128.6	3.6	2.9	113.6	116.7	113.9	117.2	2.1	1.8		
35-44	131.6	136.2	127.8	138.5	3.2	2.5	124.9	127.7	120.9	125.2	-2.1	-1.7		
45-54	137.8	139.8	135.6	141.9	2.3	1.6	136.0	137.9	132.3	133.8	-3.9	-2.9		
55-64	143.2	149.6	142.7	145.3	-0.9	-0.7	144.8	145.8	139.1	140.3	-6.2	-4.2		
<i>25-64 Ahmad</i>	<i>132.7</i>	<i>135.9</i>	<i>131.1</i>	<i>137.3</i>	<i>2.4</i>	<i>1.8</i>	<i>127.2</i>	<i>129.6</i>	<i>124.4</i>	<i>127.2</i>	<i>-1.9</i>	<i>-1.5</i>		
Diastolic BP														
25-34	82.8	83.9	81.3	75.6	-7.4	-9.0	73.7	77.4	76.4	73.4	-1.1	-1.5		
35-44	87.3	91.0	84.1	84.1	-5.4	-6.2	83.1	84.6	80.2	79.0	-5.2	-6.2		
45-54	90.6	92.7	89.2	86.3	-5.2	-5.7	88.0	88.8	85.5	82.0	-6.5	-7.4		
55-64	89.9	94.0	90.6	84.9	-6.1	-6.8	90.3	90.2	86.4	81.3	-9.3	-10.3		
<i>25-64 Ahmad</i>	<i>87.1</i>	<i>89.6</i>	<i>85.5</i>	<i>82.0</i>	<i>-6.1</i>	<i>-7.0</i>	<i>82.4</i>	<i>84.2</i>	<i>81.3</i>	<i>78.3</i>	<i>-4.9</i>	<i>-5.9</i>		
BP ≥140/90														
25-34	25.7	26.1	20.6	17.1	-9.4	-36.6	8.1	9.2	6.0	4.3	-4.5	-55.0		
35-44	44.9	51.6	33.6	39.4	-11.0	-24.4	33.6	31.5	19.9	17.6	-17.5	-52.1		
45-54	54.5	61.4	49.4	48.0	-10.2	-18.8	43.4	43.7	39.2	33.9	-10.0	-23.0		
55-64	65.4	74.4	64.7	54.7	-13.8	-21.1	63.1	63.2	48.6	47.2	-18.6	-29.5		
<i>Prev 25-64 Ahmad</i>	<i>44.5</i>	<i>49.6</i>	<i>38.4</i>	<i>36.9</i>	<i>-10.8</i>	<i>-24.3</i>	<i>32.7</i>	<i>32.5</i>	<i>24.8</i>	<i>22.1</i>	<i>-11.8</i>	<i>-36.0</i>		
<i>Prev 25-64 actual pop</i>	<i>40.4</i>	<i>46.3</i>	<i>36.3</i>	<i>37.8</i>	<i>-6.0</i>	<i>-14.8</i>	<i>27.5</i>	<i>27.6</i>	<i>22.2</i>	<i>22.4</i>	<i>-6.2</i>	<i>-22.4</i>		
<i>N in actual pop 25-64</i>	<i>5'343</i>	<i>7'740</i>	<i>7'434</i>	<i>9'207</i>	<i>3'103</i>	<i>58.1</i>	<i>3'221</i>	<i>4'242</i>	<i>4'533</i>	<i>5'496</i>	<i>2'014</i>	<i>62.5</i>		

agecat	Men						Women						Rel. Dif.	
	1989	1994	2004	2013	Abs. Dif in 24 yr	Rel. Dif 2013/19 89	1989	1994	2004	2013	Abs. Dif. in 24 yr	2013/198 9		
BP ≥140/90 or Rx														
25-34	25.7	26.1	23.0	18.9	-7.1	-27.6	8.1	9.9	10.1	8.7	0.3	4.1		
35-44	45.7	52.4	38.8	44.0	-6.3	-13.7	34.3	31.5	30.1	28.8	-5.0	-14.5		
45-54	55.2	62.1	56.3	55.3	-2.5	-4.4	47.6	47.2	51.9	54.1	7.3	15.4		
55-64	67.6	76.0	72.7	68.3	-1.5	-2.2	66.2	66.2	69.6	72.3	6.5	9.8		
<i>Prev 25-64 Ahmad</i>	45.2	50.2	43.5	42.7	-4.8	-10.7	34.4	34.1	35.4	35.6	1.5	4.4		
<i>Prev 25-64 actual pop</i>	41.1	46.9	41.3	43.8	0.2	0.4	28.8	28.9	32.0	36.1	7.5	25.8		
<i>N in actual pop 25-64</i>	5'424	7'838	8'449	10'666	4'615	85.1	3'378	4'439	6'531	8'839	5'420	160.4		
BP ≥160/100														
25-34	12.4	13.4	5.6	1.8	-12.0	-97.0	1.6	4.2	1.3	0.6	-2.1	-128.6		
35-44	18.1	27.4	7.5	15.6	-9.2	-50.8	7.0	13.3	5.1	2.9	-6.9	-98.3		
45-54	24.1	30.3	22.2	18.7	-8.1	-33.7	21.4	24.6	16.0	9.8	-13.4	-62.7		
55-64	27.9	47.3	24.7	23.0	-13.6	-48.6	28.7	29.4	18.8	20.0	-11.0	-38.3		
<i>Prev 25-64 Ahmad</i>	19.3	27.0	13.2	13.1	-10.6	-54.8	12.3	15.7	8.7	6.7	-7.5	-61.5		
<i>Prev 25-64 actual pop</i>	17.8	25.3	12.1	13.7	-8.5	-47.7	10.1	13.2	7.5	6.6	-5.2	-51.4		
<i>N in actual pop 25-64</i>	2'357	4'225	2'477	3'332	136	5.8	1'180	2'026	1'541	1'621	147	12.4		
Told to have HBP (whole pop)														
25-34	9.5	5.0	8.7	11.7	3.7	38.7	6.5	9.9	8.1	9.3	1.6	24.2		
35-44	17.3	19.4	18.7	26.6	8.0	46.2	19.6	18.2	23.3	21.2	3.1	15.8		
45-54	23.4	22.0	37.3	36.0	16.0	68.3	31.0	28.9	40.9	40.4	12.2	39.5		
55-64	29.4	29.5	47.3	47.8	21.8	74.0	40.8	41.9	59.1	60.0	22.2	54.4		
<i>Prev 25-64 Ahmad</i>	18.3	17.1	24.6	27.6	10.8	59.1	21.6	22.0	28.6	28.4	8.0	36.8		
<i>Prev 25-64 actual pop</i>	16.4	15.5	22.8	28.3	13.0	79.4	18.5	19.4	25.6	28.6	10.8	58.7		
<i>N in actual pop 25-64</i>	2'168	2'594	4'663	6'885	4'825	222.6	2'161	2'973	5'229	6'996	4'930	228.1		
Treated for HBP (in whole pop)														
25-34	1.0	0.0	4.8	2.7	3.1	322.0	1.6	2.1	5.4	5.6	4.5	274.4		
35-44	9.4	4.8	13.4	15.6	8.7	91.7	7.7	5.6	16.5	14.1	9.2	119.7		
45-54	7.6	12.1	25.3	23.3	17.4	229.8	17.9	19.7	31.5	31.7	15.6	87.1		
55-64	12.5	17.8	36.7	41.0	30.5	244.3	22.3	25.7	50.3	54.4	35.7	160.0		
<i>Prev 25-64 Ahmad</i>	6.8	7.2	17.3	17.6	12.6	184.9	10.6	11.2	22.1	22.3	13.7	129.0		
<i>Prev 25-64 actual pop</i>	5.6	6.0	15.9	18.1	14.1	252.4	8.7	9.0	19.5	22.2	15.2	174.5		
<i>N in actual pop 25-64</i>	739	1'009	3'244	4'406	3'935	532.4	1'022	1'382	3'978	5'449	4'716	461.4		
Treated & BP <140/90 (in whole pop)														
25-34	0	0	2	2	2.4		0	1	4	4	4.4			
35-44	1	1	5	5	4.8	477.2	1	0	10	11	12.1	1207.0		
45-54	1	1	7	7	7.2	715.8	4	4	13	20	17.1	428.1		
55-64	2	2	8	14	12.6	631.6	3	3	21	25	25.1	837.4		
<i>Prev 25-64 Ahmad</i>	0.9	0.9	5.0	6.0	5.9	693.3	1.7	1.8	10.6	13.2	13.0	759.1		
<i>Prev 25-64 actual pop</i>	0.7	0.7	4.8	6.1	6.1	899.2	1.4	1.5	9.8	13.4	13.3	979.1		
<i>N in actual pop 25-64</i>	90	125	976	1'494	1'515	1689.6	159	230	1'993	3'286	3'338	2099.0		
Cholesterol														
25-34	4.91	5.13	5.08	4.78	-0.2	-3.3	4.92	5.11	5.03	4.61	-0.3	-6.7		
35-44	5.26	5.43	5.65	4.90	-0.3	-5.4	5.21	5.33	5.18	4.94	-0.3	-5.7		
45-54	5.05	5.37	5.48	5.23	0.1	2.9	5.66	6.18	5.64	5.09	-0.7	-13.2		
55-64	5.09	5.56	5.57	5.04	-0.1	-2.2	5.85	6.47	6.18	5.46	-0.5	-9.0		
<i>25-64 Ahmad</i>	5.1	5.3	5.4	5.0	-0.1	-2.3	5.3	5.6	5.4	5.0	-0.4	-8.4		
HDL cholesterol														
25-34	1.41	1.57	1.38	1.23	-0.2	-16.8	1.32	1.52	1.34	1.28	-0.1	-9.2		
35-44	1.40	1.52	1.29	1.11	-0.3	-24.8	1.41	1.52	1.37	1.27	-0.2	-13.2		
45-54	1.49	1.50	1.33	1.23	-0.3	-19.5	1.41	1.58	1.39	1.37	-0.1	-7.9		
55-64	1.44	1.54	1.45	1.23	-0.2	-16.0	1.36	1.56	1.37	1.32	-0.1	-8.8		
<i>25-64 Ahmad</i>	1.4	1.5	1.4	1.2	-0.3	-19.5	1.4	1.5	1.4	1.3	-0.1	-10.0		

agecat	Men						Women						Rel. Dif.	
	1989	1994	2004	2013	Abs. Dif in 24 yr	Rel. Dif 2013/19 89	1989	1994	2004	2013	Abs. Dif. in 24 yr	2013/198 9		
Triglycerides														
25-34	1.13	1.36	0.92	1.03	-0.2	-21.8	0.76	0.96	0.78	0.85	0.0	-0.1		
35-44	1.19	1.47	1.27	1.37	0.1	5.7	0.92	0.99	0.89	0.90	-0.1	-6.4		
45-54	1.20	1.59	1.27	1.37	0.0	0.9	0.91	1.25	1.00	0.98	-0.1	-5.9		
55-64	0.99	1.50	1.34	1.23	0.1	10.3	1.11	1.46	1.17	1.14	-0.1	-9.2		
<i>25-64 Ahmad</i>	<i>1.1</i>	<i>1.5</i>	<i>1.2</i>	<i>1.2</i>	<i>0.0</i>	<i>-3.5</i>	<i>0.9</i>	<i>1.1</i>	<i>0.9</i>	<i>0.9</i>	<i>0.0</i>	<i>-5.2</i>		
Chol ≥5.2														
25-34	35.9	40.7	42.3	26.6	-8.7	-24.3	36.7	40.0	36.2	24.5	-12.6	-34.4		
35-44	43.9	54.2	56.0	33.6	-10.3	-23.4	41.9	52.2	48.3	35.3	-8.5	-20.4		
45-54	41.3	54.5	57.6	49.7	6.7	16.1	64.8	80.9	61.7	42.2	-28.2	-43.6		
55-64	39.2	57.8	55.6	38.6	-3.8	-9.7	70.2	80.9	70.4	53.7	-19.5	-27.8		
<i>Prev 25-64 Ahmad</i>	<i>39.9</i>	<i>50.6</i>	<i>51.9</i>	<i>35.9</i>	<i>-4.8</i>	<i>-12.0</i>	<i>50.3</i>	<i>59.8</i>	<i>51.3</i>	<i>36.6</i>	<i>-16.2</i>	<i>-32.3</i>		
<i>Prev 25-64 actual pop</i>	<i>39.0</i>	<i>49.3</i>	<i>51.6</i>	<i>36.7</i>	<i>-2.9</i>	<i>-7.5</i>	<i>47.5</i>	<i>55.2</i>	<i>49.3</i>	<i>36.7</i>	<i>-12.6</i>	<i>-26.5</i>		
<i>N in actual pop 25-64</i>	<i>5'152</i>	<i>8'246</i>	<i>10'551</i>	<i>8'924</i>	<i>3'655</i>	<i>70.9</i>	<i>5'565</i>	<i>8'474</i>	<i>10'063</i>	<i>8'997</i>	<i>3'169</i>	<i>57.0</i>		
Cholesterol ≥6.5														
25-34	5.8	12.7	8.9	3.7	-4.0	-68.5	10.0	10.0	11.4	3.1	-5.9	-58.6		
35-44	13.8	19.2	21.6	10.3	-3.3	-23.8	14.0	13.8	9.7	9.6	-5.1	-36.7		
45-54	9.8	18.2	20.9	15.4	4.7	48.3	21.8	41.2	21.1	8.9	-20.2	-92.3		
55-64	9.2	28.1	18.1	12.0	-2.9	-31.7	27.8	45.0	41.3	20.2	-10.4	-37.4		
<i>Prev 25-64 Ahmad</i>	<i>9.6</i>	<i>18.4</i>	<i>16.8</i>	<i>9.6</i>	<i>-1.6</i>	<i>-16.8</i>	<i>16.9</i>	<i>24.2</i>	<i>18.2</i>	<i>9.2</i>	<i>-9.7</i>	<i>-57.6</i>		
<i>Prev 25-64 actual pop</i>	<i>8.7</i>	<i>17.8</i>	<i>16.7</i>	<i>10.0</i>	<i>-0.3</i>	<i>-3.9</i>	<i>15.4</i>	<i>20.7</i>	<i>16.2</i>	<i>9.1</i>	<i>-7.8</i>	<i>-50.4</i>		
<i>N in actual pop 25-64</i>	<i>1'149</i>	<i>2'972</i>	<i>3'413</i>	<i>2'445</i>	<i>1'050</i>	<i>91.4</i>	<i>1'808</i>	<i>3'177</i>	<i>3'316</i>	<i>2'227</i>	<i>229</i>	<i>12.7</i>		
Rx for chol.														
25-34			0.0	0.9					0.0	1.9				
35-44			0.0	7.3					0.0	2.9				
45-54			1.3	6.7					1.7	8.7				
55-64			1.3	7.5					2.2	16.4				
<i>Prev 25-64 Ahmad</i>			<i>0.5</i>	<i>5.1</i>					<i>0.8</i>	<i>6.2</i>				
<i>Prev 25-64 actual pop</i>			<i>0.6</i>	<i>5.4</i>					<i>0.8</i>	<i>6.2</i>				
<i>N in actual pop 25-64</i>			<i>134</i>	<i>1'303</i>					<i>188</i>	<i>1'508</i>				
Chol ≥5.2 or Rx														
25-34	35.9	40.7	42.3	26.6	-8.7	-24.3	36.7	40.0	36.2	24.5	-12.6	-34.4		
35-44	43.9	54.2	56.0	40.2	-4.3	-9.8	41.9	52.2	48.3	35.9	-8.0	-19.1		
45-54	41.3	54.5	58.9	55.0	11.9	28.9	64.8	80.9	62.2	48.6	-22.2	-34.3		
55-64	39.2	57.8	56.3	45.0	2.2	5.7	70.2	80.9	71.5	65.3	-8.6	-12.3		
<i>Prev 25-64 Ahmad</i>	<i>39.9</i>	<i>50.6</i>	<i>52.3</i>	<i>40.1</i>	<i>-0.9</i>	<i>-2.2</i>	<i>50.3</i>	<i>59.8</i>	<i>51.6</i>	<i>40.2</i>	<i>-12.9</i>	<i>-25.6</i>		
<i>Prev 25-64 actual pop</i>	<i>39.0</i>	<i>49.3</i>	<i>51.9</i>	<i>41.0</i>	<i>1.2</i>	<i>3.0</i>	<i>47.5</i>	<i>55.2</i>	<i>49.5</i>	<i>40.3</i>	<i>-9.2</i>	<i>-19.5</i>		
<i>N in actual pop 25-64</i>	<i>5'152</i>	<i>8'246</i>	<i>10'625</i>	<i>9'983</i>	<i>4'642</i>	<i>90.1</i>	<i>5'565</i>	<i>8'474</i>	<i>10'112</i>	<i>9'874</i>	<i>3'983</i>	<i>71.6</i>		
Glucose														
25-34	4.73		5.23	5.15	0.46	9.8	4.67		5.12	4.94	0.32	6.9		
35-44	5.35		6.12	5.77	0.50	9.4	5.01		5.49	5.57	0.58	11.6		
45-54	5.38		6.43	6.50	1.18	21.8	5.48		5.99	6.00	0.55	10.0		
55-64	5.63		6.83	6.56	1.03	18.4	6.36		7.02	6.53	0.27	4.2		
<i>25-64 Ahmad</i>	<i>5.21</i>		<i>6.03</i>	<i>5.87</i>	<i>0.73</i>	<i>14.1</i>	<i>5.24</i>		<i>5.75</i>	<i>5.63</i>	<i>0.44</i>	<i>8.3</i>		
Glucose ≥5.6														
25-34	14.3		16.8	19.8	5.4		8.1		6.7	5.6	-2.5	-30.9		
35-44	23.6		44.8	44.0	21.8		19.6		18.2	25.3	4.9	25.0		
45-54	29.0		54.4	60.7	32.6		26.2		38.1	41.5	15.7	59.9		
55-64	35.3		54.4	62.1	27.2		44.6		63.0	54.4	11.8	26.4		
<i>Prev 25-64 Ahmad</i>	<i>23.8</i>	<i>0.0</i>	<i>39.7</i>	<i>43.2</i>	<i>32.1</i>		<i>21.7</i>	<i>0.0</i>	<i>26.7</i>	<i>27.7</i>	<i>16.0</i>	<i>73.7</i>		
<i>Prev 25-64 actual pop</i>	<i>21.8</i>	<i>0.0</i>	<i>38.4</i>	<i>44.5</i>	<i>34.5</i>		<i>18.8</i>	<i>0.0</i>	<i>23.3</i>	<i>28.1</i>	<i>17.7</i>	<i>93.8</i>		
<i>N in actual pop 25-64</i>	<i>2'882</i>	<i>0</i>	<i>7'864</i>	<i>10'825</i>	<i>9'858</i>		<i>2'207</i>	<i>0</i>	<i>4'761</i>	<i>6'895</i>	<i>5'923</i>	<i>268.4</i>		

agecat	Men					Women					Rel. Dif.	
	1989	1994	2004	2013	Abs. Dif in 24 yr	Rel. Dif 2013/19 89	1989	1994	2004	2013	Abs. Diff. in 24 yr	2013/198 9
Glucose ≥7.0												
25-34	0.0		0.8	0.0	0.1	-	0.8		1.3	1.9	1.0	126.6
35-44	6.3		9.7	7.3	1.5	23.6	3.5		4.5	6.5	2.8	81.3
45-54	10.3		11.4	18.7	7.6	73.9	8.3		9.4	13.1	4.5	54.7
55-64	10.3		20.8	21.1	11.4	111.1	15.3		23.8	21.5	7.0	45.8
<i>Prev 25-64 Ahmad</i>	5.9		9.1	9.9	4.2	70.6	5.7		7.9	9.1	3.4	58.5
<i>Prev 25-64 actual pop</i>	4.6		8.3	10.5	5.9	130.5	4.7		6.6	9.1	4.3	90.0
<i>N in actual pop 25-64</i>	602		1'707	2'551	1'931	320.8	553		1'351	2'233	1'639	296.2
Gluc ≥7.0 or Rx (in whole pop)												
25-34	0.0		1.6	0.0	0.3	-	0.8		2.0	2.5	1.7	-
35-44	6.3		9.7	10.1	4.0	62.9	3.5		4.5	7.1	3.4	96.4
45-54	11.0		12.7	20.7	8.9	80.8	9.0		11.6	14.2	5.1	57.3
55-64	11.0		22.7	24.8	14.3	129.7	16.6		26.5	28.2	12.1	73.0
<i>Prev 25-64 Ahmad</i>	6.2		10.0	11.8	5.7	91.9	6.1		9.1	10.8	4.7	77.2
<i>Prev 25-64 actual pop</i>	4.8		9.1	12.4	7.6	158.5	5.0		7.6	10.7	5.6	110.7
<i>N in actual pop 25-64</i>	631		1'865	3'021	2'348	372.1	588		1'554	2'633	1'994	338.8
Aware (in whole pop)												
25-34	0.0	2.0	0.0	1.0	0.1		1.0	2.0	2.0	2.0	0.8	77.2
35-44	2.0	1.0	4.0	6.0	4.6	231.6	3.0	2.0	3.0	7.0	4.1	135.7
45-54	6.0	5.0	6.0	10.0	4.1	67.8	4.0	6.0	7.0	7.0	2.7	68.4
55-64	7.0	12.0	15.0	19.0	11.1	158.4	8.0	15.0	18.0	21.0	11.7	146.5
<i>Prev 25-64 Ahmad</i>	3.1	4.1	5.1	7.5	4.1	132.3	3.4	5.1	6.2	7.8	4.0	116.5
<i>Prev 25-64 actual pop</i>	2.4	3.5	4.4	7.8	4.9	201.6	2.9	4.4	5.2	7.6	4.3	146.6
<i>N in actual pop 25-64</i>	323	725	897	1'886	1'418	439.3	343	674	1'059	1'865	1'450	422.9
Rx for diabetes												
25-34	0.0	1.7	0.0	0.0	-0.7	-	0.0	0.7	2.0	1.2	1.4	-
35-44	0.0	0.8	3.0	4.6	4.7	-	0.7	2.1	2.3	3.5	2.4	348.2
45-54	3.4	3.8	5.1	8.7	5.1	147.1	2.8	3.5	7.2	5.5	3.4	122.9
55-64	3.7	11.6	13.3	17.4	11.9	323.0	7.0	13.2	17.1	19.5	11.6	165.6
<i>Prev 25-64 Ahmad</i>	1.4	3.6	4.3	6.2	4.3	301.1	2.0	3.9	5.8	6.0	3.9	192.1
<i>Prev 25-64 actual pop</i>	1.1	3.3	3.7	6.4	4.6	421.5	1.6	3.2	4.9	5.7	4.0	249.1
<i>N in actual pop 25-64</i>	146	442	748	1'568	1'342	921.3	188	377	998	1'405	1'258	667.9

Appendix 2. Questionnaire in English

#	topic	Questions	Answers categories
1	admin	Subject survey ID	n
2	admin	Discrepancy in ID by questionnaire, lab or data entry	text
3	admin	Date survey (dd-mmm)	date
4	admin	Sex	1: M 2: F
5	admin	Age	years
6	admin	Island	M: mahe, P: praslin D: La Digue
7	admin	District abbreviation	district abbreviation
8	admin	District	district
9		Telephone	1: yes; 0: no
10	admin	Email	1: yes; 0: no
11	admin	From census, see xls sample	
12	admin	From census, see xls sample	
13	admin	From census, see xls sample	
14	admin	From census, see xls sample	
15	admin	From census, see xls sample	
16	admin	From census, see xls sample	
17	admin	From census, see xls sample	
18	admin	Time entry in survey, same as BP entry (secretary)	hh:mn
19	admin	Time start questionnaire, same as BP1,2,3 (nurse)	hh:mn
20	admin	In which language do you want to answer questions ?	1: creole; 2: english; 3: french
21	admin	Which survey(s) ?	1: no 2: i dont know/don't remember 3: yes, but i dont remember which ones; 4: 1989; 5: 1994; 6: 2004;
22	ses	What is the highest level of education you have completed ?	1: i did not complete obligatory school; 2: i completed obligat school (prim/sec); 3: i did a vocational school; 4: i did polytechnic, A levels, or similar; 5: i did university or equivalent
23	ses	Do you currently live alone or with a partner? (irrespective of marital status)	1: i live with my husband/wife (married) 2: i live with a partner ("menaz"); 3: i live with a parent 3: i currently live alone
24	ses	How many children do you have?	nb kids
25	ses	How many people, including children and yourself, are currently living in your household (at least 4 days per week)?	n
26	ses	How many rooms are there in your house/flat where you currently live, including living room, but not including kitchen, bathroom, toilets or verandah?	n
27	ses	What is your current occupation (job) (it you are not working now, what was your last job)?	text :
28	ses	Category assessed by interviewer among following (current or past occupation):	1: professional; 2: qualified non-manual (teacher); 3: semiqualfied non-manual (clerk); 4: qualified manual (trained mechanic); 5: semiqualfied manual (some training); 6: nonqualified (laborer); 7: fisherman/farmer; 8: other (student)
29	ses	Which of the following best describes your main work situation over the past 12 months (also before "pensioner")?	1: government or parastatal employee; 2: non government employee; 3: self-employed; 4: not currently working but able to work; 5: unable to work; 6: housewife/man (homemaker); 7: retired/pensioned; 8: other

30	ses	What is your personal <u>earnings</u> per month, on average (incl. all allowances, benefits, etc)? Is it:	1: <3000; 2: 3000-5000; 3: 5000-8000; 4: 8000-15'000; 5: >15'000; 9: refuses to answer
31	ses	What is the approximate monthly earnings of your partner? Is it:	1: <3000; 2: 3000-5000; 3: 5000-8000; 4: 8000-15'000; 5: >15'000; 6: i dont live with a partner 7: my partner doesn't work 9: refuses to answer
32	ses	Do you, or your partner, own the place (flat, apartment, house) where you live? If rent monthly amount	1: yes, myself 2: yes, my partner 3: yes, shared myself and my partner 4: yes, family member 5: no (rent)
33	ses	[if rental] Monthly rental (Sey rupees; 1\$=12 SR)	n
34	ses	How often have you travelled abroad in relation to your <u>work</u> during the past 5 years?	1: never; 2: 1-3 times; 3: more than 3 times
35	ses	Not accounting for work purposes, how often have you travelled abroad to <u>visit family of for holidays</u> during the past 5 years?	1: never; 2: 1-3 times; 3: more than 3 times
36	tobacco	Smoking category	1: current; 2: occasional; 3: ex; 4: never
37	tobacco	Have you <u>ever</u> smoked cigarettes, cigars, cigarillos, pipe or shisha?	1: yes 2: no (→ tob17)
38	tobacco	Do you <u>currently</u> smoke cigarettes daily?	1: yes 2: no (→ tob5)
39	tobacco	[current smoker] How many cigarettes do you smoke each day on average?	n
40	tobacco	[current smoker] Did you try to stop smoking during the past 12 months?	1: yes (→ tob9) 2: no (→ tob9)
41	tobacco	[If <u>not</u> a daily smoker] Do you smoke cigarettes <u>occasionally</u> ?	1: yes 2: no (→ tob7)
42	tobacco	[<u>occasional</u> smoker] How many cigarettes do you smoke in one week on average?	n (→ tob9)
43	tobacco	[If <u>not</u> a current or occasional smoker] Did you <u>ever</u> smoke cigarettes daily?	1: yes 2: no (→ tob9)
44	tobacco	[ex smoker]: How many years ago did you stop smoking?	n (years; if 2 months: 0.2)
45	tobacco	How old were you when you first <u>started</u> to smoke cigarettes [>2 packs in total]?	n (age)
46	tobacco	Did you ever use nicotine gums or pills (e.g. bupropion) to help quit smoking?	1: yes 2: no
47	tobacco	Do you currently smoke pipe, cigars, cigarillos, hand-rolled cigarettes, or shisha?	1: yes 2: no (→ tob16)
48	tobacco	[if yes] Do you currently smoke pipe?	1: daily; 2: occasionally; 3: no
49	tobacco	[if yes] Do you currently smoke cigars or cigarillos?	1: daily; 2: occasionally; 3: no
50	tobacco	[if yes] Do you currently smoke hand rolled cigarettes?	1: daily; 2: occasionally; 3: no
51	tobacco	[if yes] Do you currently smoke shisha?	1: daily; 2: occasionally; 3: no
52	tobacco	Did you ever used <u>electronic cigarettes</u> for more than 1 week?	1: yes, now; 2: yes, in the past; 3: no, never
53	tobacco	Did you ever <u>chew or sniff tobacco</u> regularly or occasionally?	1: yes, currently; 2: yes, in the past; 3: no, never

54	tobacco	During the past 7 days, did <u>anyone</u> smoke in your <u>home</u> when you were present?	1: yes 2: no
55	tobacco	[During the past 7 days, did <u>anyone</u> smoke in <u>enclosed areas in your workplace</u> when you were present?	1: yes 2: no
56	tobacco	Have you ever heard of current legislation for tobacc control in Seychelles	1:yes; 2: no
57	tobacco	Do you approve the <u>ban on smoking in all enclosed places</u> , including working places and restaurants, as per law in Seychelles ?	1: i fully agree; 2: i somehow agree; 3: i don't agree (smoking should be allowed in enclosed places)
58	diet	In a typical week, on how many days do you eat <u>fruit</u> (fresh or can; local or imported), such as mango, banana, starfruit, ripe papay, orange, apple, pear, grape, etc [card]	n (0-7)
59	diet	How many servings ("portion") of fruit do you eat on one of those days?	nb servings
60	diet	In a typical week, on how many days do you eat <u>vegetables</u> on average, such as legumes, tomato, carrot, bred, brinzel, ziromon, green papay, green beens, salad (do not include lentils or gro maze) [card]	n (0-7)
61	diet	On one of those days, how many servings of vegetables do you eat ?	nb servings
62	diet	In a typical week, on how many days do you eat <u>rice</u> on average?	n (0-7)
63	diet	On those days, do you eat rice generally on one or on two meals (lunch and/or dinner)	1: 1 meal; 2: 2 meals
64	diet	In a typical week, on how many days do you eat <u>pasta</u> (spaghetti or macaroni) ?	n (0-7)
65	diet	In a typical week, on how many days do you eat <u>bread</u> , whether fresh, toasted or sandwiches ?	n (0-7)
66	diet	When you eat bread at home, how often do you use brown bread?	1: never; 2: sometimes; 3: often; 4: always
67	diet	In a typical week, on how many days do you eat <u>potatoes</u> including in curry, stew or other dishes, but not accounting for chips/french fries?	n (0-7)
68	diet	In a typical week, on how many days do you eat <u>french fries</u> ("frit")?	n (0-7)
69	diet	In a typical week, on how many days do you eat <u>breakfast cereals</u> , such as cornflakes, oatmeal, weetabics, others?	n (0-7)
70	diet	In a typical week, on how many days do you eat <u>salad</u> , think of tomato, letuce, watercress, tomato, carrots, cabbage, cucumber, 'patol', 'margoz', and others?	n (0-7)
71	diet	When you eat salad, do you add vinaigrette (with oil) or oil (do not include "piman")?	1: yes 2: no
72	diet	In a typical week, on how many days do you eat " <u>gro manze</u> " (breadfruit, cassava, sweet potato, cooked banana, etc) ?	n (0-7)
73	diet	In a typical week, on how many days do you eat <u>lentils</u> ?	n (0-7)
74	diet	In a typical week, on how many days do you eat " <u>satini</u> " (papay, fisiter, ziromon, brinzel...)?	n (0-7)
75	diet	In a typical week, on how many days do you eat <u>cheese</u> (natural, sliced, paste) or yoghurt?	n (0-7)
76	diet	In a typical week, on how many days do you drink <u>milk</u> or <u>flavored milk</u> , or use drink (breakfast cereals, etc) on average, not accounting for milk added in tea/coffee ?	n (0-7)
77	diet	When buying milk in packet ("dile pake") or powdered milk ("dile an bwat"), which one do you buy most often?	1: whole milk; 2: semi-skimmed milk; 3: skimmed milk 4: i dont pay attention
78	diet	In a typical week, on how many days do you eat <u>fish</u> on average, fresh, frozen or in can?	n (0-7)
79	diet	On those days, do you have generally fish on one or on two meals (lunch, dinner)?	1: 1 time per day; 2: 2 times per day
80	diet	When you cook fish at home, how often do you fry your fish?	1: most of the times; 2: often; 3: rarely or never
81	diet	In a typical week, on how many days do you eat <u>poultry</u> ?	n (0-7)
82	diet	In a typical week, on how many days do you eat <u>fresh or frozen red meat</u> ? (pork, beef, lamb, but do <u>not</u> account for chicken or processed meat, bacon, sausage, ham, luncheon meal, cornedbeef)	n (0-7)
83	diet	In a typical week, on how many days do you eat <u>processed meat</u> such as sausages, bacon, corned beef, ham, luncheon meat?	n (0-7)

84	diet	Do you remove <u>visible fat</u> on meat for cooking or eating (skin on chicken, fat from meat)?	1: yes 2: no
85	diet	In a typical week, on how many days do you eat <u>salted snacks</u> such as gato piman, samosa, banana/cassava chips/ breadfruit chips, peanuts, pizza, 'pate' (baked meat), corn snacks (Doritos) ?	n (0-7)
86	diet	In a typical week, how often do you eat salted fish (pwason sale) including smoked fish?	n (0-7)
87	diet	In a typical week, on how many days do you eat <u>sweet snacks</u> or dessert, such as mutay, gato banann, chocolate, biscuits, ice-cake, ice-cream, sweets, cakes, etc?	n (0-7)
88	diet	Did you take <u>vitamins pills</u> or <u>dietary supplements</u> in the past 4 weeks?	1: yes 2: no
89	diet	[if yes] Which vitamin(s) or dietary supplements?	text :
90	diet	Which type of oil or fat do you use most often for <u>cooking</u> at home?	1: turkey oil; 2: other veg oil (sunflower, soy, peanut); 3: olive oil; 4: margarin; 5: butter; 6: other; which?
91	diet	Which type of fat do you use most often to <u>spread on bread</u> ?	1: butter; 2: margarin; 3: other 4: i dont spread on bread
92	diet	Do you use <u>olive oil</u> when cooking or to add in salad?	1: never; 2: rarely; 3: once or twice a week; 4: more than twice a week
93	diet	In a typical <u>month</u> (4 weeks), how often do you use coconut at home (dile koko or other forms of coconut) when preparing meals?	1: less than once per month 2: a few times but less than weekly 3: 1-2 times in a week 4: on 3 or more days per week
94	diet	In a typical week, on how many days do you have <u>tea</u> on average (black tea, green tea, citronel, camomille, etc)?	n (0-7)
95	diet	On such days, how many cups of tea do you have per day on average?	nb cups/d
96	diet	In a typical week, on how many days do you have <u>coffee</u> ?	n (0-7)
97	diet	On such days, how many cups of coffee do you have per day on average?	nb cups/d
98	diet	When you have tea or coffee, how many <u>spoons of sugar</u> do you add in each cup? (teaspoons)	n (0 if not)
99	diet	When you have tea/coffee, do you <u>add milk</u> ?	1: yes, full milk; 2: yes, skimmed or semi-skimmed milk; 3: no, i dont add milk
100	diet	In a typical week, on how many days do you have <u>lemonades/soft drinks</u> (Coke, Spirte, Fanta, etc) on average? (do not count soda water, fruit juices, or plain water)	n (0-7)
101	diet	On such days, how many small bottles or glasses do you have per day on average?	nb 5dl bottles or large glass per day
102	diet	In a typical week, on how many days do you have <u>fruit juice in packet</u> ("juice dan pake") on average?	n (0-7)
103	diet	On such days, how many small packets/glasses of juice do you have per day on average?	nb cups/3 dl bottles/packets per day
104	diet	In a typical week, on how many days do you have <u>fresh juice</u> (not in a packet) on average?	n (0-7)
105	diet	In a typical week, on how many days do you <u>drink water</u> on average (soda, bottles, tap water)?	n (0-7)
106	diet	On such days, how many glasses of water do you drink per day on average?	nb glasses 3 dl/day (bot. 5 dl=2 glasses)
107	diet	In a typical week, on how many days do you have <u>"energy" drinks</u> such as RedBull, KiddyBell, PussyDrink, DarkDug, Monster, Glucozade, etc?	n (0-7)
108	diet	How often do you add <u>salt</u> (or Aromat) to your food at the table?	1: never; 2: sometimes; 3: often; 4: always
109	diet	How important to you is lowering the salt content in your diet?	1: not important; 2: a bit important; 3: very important

11 0	diet	How often do you have <u>take-away</u> meals?	1: most workdays of the week; 2: several days per week; 3: a few times per month; 4: rarely
11 1	diet	What best describes where you get your <u>lunch</u> most often?	1: from a takeway, shop, or canteen; 2: i bring lunch from home; 3: i have lunch at home most of the time
11 2	diet	Do you read labels on food packages to help you decide what you buy, for example to look for salt, sugar or fat content (don't count for "expiry date")?	1: never; 2: rarely; 3: sometimes; 4: often
11 3	oh	Have you <u>ever</u> drunk <u>alcohol</u> beverages such as beer, wine, spirit or other alcohol drinks?	1: yes 2: no (→ pa1)
11 4	oh	Do you <u>currently</u> drink alcohol beverages such as beer, wine, spirit or other alcoholic drinks <u>at least once per month</u> ?	1: yes 2: no (→ pa1)
11 5	oh	On average, on how many <u>days</u> in a month do you drink at least one alcohol drink?	n (0-31)
11 6	oh	On average, how many alcohol drinks (beer, wine, spirit, etc) do you have per day between <u>Monday and Thursday</u> , think of any type of alcohol drinks?	nb drinks/day
11 7	oh	On average, how many alcohol drinks (beer, spirit, wine, etc) do you have on a typical <u>Friday</u> ?	nb drinks/day
11 8	oh	On average, how many alcohol drinks do you have on a typical <u>Saturday</u> ?	nb drinks/day
11 9	oh	On average, how many drinks do you have on a typical <u>Sunday</u> ?	nb drinks/day
12 0	oh	On special occasions such as celebrations, pay days, end of the month, weddings, etc, how many alcohol drinks can you have in total in one day? (can review this question after Q on weekly consumption)	nb drinks/day
12 1	oh	<i>Now, think of your alcohol consumption in a whole week, including weekdays + weekends.</i> How many bottles/cans of <u>beer</u> (not Guinness) do you drink in <u>1 week</u> , on average?	nb bottles beer/wk
12 2	oh	How many bottles of <u>Guinness</u> (not another beer) do you drink in <u>1 week</u> , on average?	nb bottles guinness/wk
12 3	oh	How many glasses of <u>wine</u> (2 dl) do you drink in <u>1 week</u> , on average?	nb glasses wine/wk (1 bottle=4 glasses)
12 4	oh	Not accounting for alcopops or liquor, how many pegs of <u>spirit</u> (whisky, takamaka, rum, vodka) do you drink in <u>1 week</u> , on average?	nb pegs /wk (peg = 0.25 dl; 30/bottle)
12 5	oh	How many small glasses of liquor such as Irish coffee, Amarula, Martini, Porto, etc, do you drink in <u>1 week</u> on average (alcohol content-15-20%)	nb small glasses/wk
12 6	oh	How many bottle/cans (3dl) of <u>alcopops</u> /flavored/mixed alcohol drinks (Smirnoff Ice, Baccardi Breezer, etc) do you drink in <u>1 week</u> , on average?	nb bottles alcopops/wk
12 7	oh	In the past 12 months, what was the <u>largest amount of drinks</u> you had on <u>one single day</u> , accounting for all types of drinks altogether?	nb drinks (3dl beer=2dl wine/liquor=0.25dl pirit=3 dl homebrew)
12 8	oh	In a typical month (30 days), on <u>how many days</u> do you drink <u>more than 5 (men)/4 (women)</u> standard drinks per day, on average? (card: 1beer=1glass wine/liquor=1peg whisky)	n (0-30)
12 9	oh	Do you drink baka, kalou or lapire at times?	1: yes 2: no (→ pa1)
13 0	oh	How many bottles (0.5l) of baka do you drink in 1 week, on average? (Assess if bottles 0.5 or 1.5 l)	nb bottles (0.5l) /wk
13 1	oh	How many bottles of kalou do you drink in 1 week, on average?	nb bottles (0.5l) /wk
13 2	oh	How many bottles of lapire do you drink in 1 week, on average?	nb bottles (0.5l) /wk
13 3	oh	alcohol intake ml calculated based on weekly basis (but problem if drinkgs <4 days/wk)	(DV650*0.06*350+DW650*0.08*500+DX650*0.12*200+DY650*0.5*20+DZ650*0.2*100+EA650*0.05*250+EE650*0.09*500+EF650*0.08*500+EG650*0.1*500)/7;1)
13 4	oh	Alcohol intake based on weekly basis adjusted for number of weeks drinking per month	oh adjusted: ohtoth*1 for ohdays 21+; ohot*0.75 for ohdays 14-21; ohtot*0.5 for ohdays 7-14; ohtot*0.25 for ohdays 1.7

13 5	PA	What of the following best suits your physical activity pattern in relation to doing work in your workplace or at home?	1: Sitting always or most often 2: Often walking, standing up or carrying light weights 3: Walking or standing up a lot, or regularly carrying heavy weights
<i>PA at WORK. Now i am going to ask you about the <u>time</u> you spend doing <u>different types</u> of physical activity in a <u>typical week</u>. We will talk about PA in <u>three situations</u>: activity related to <u>doing work</u>, walking to places, and leisure activity.</i>			
13 6	PA	<i>Think first about PA you spend <u>doing work</u> (at the <u>workplace</u>, at home, or any other place). Think of <u>work</u> as the things you have to do for <u>paid or unpaid work</u>, household chores, fishing, gardening, farming, etc. In answering the following questions, "<u>vigorous-intensity activities</u>" are activities that require <u>hard physical effort</u> and cause <u>large increases in breathing or heart rate</u>, while "<u>moderate-intensity activities</u>" are activities that require <u>moderate physical effort</u> and cause <u>small increases in breathing or heart rate</u>.</i>	
13 7	PA	Does your <u>work</u> (at work, at home, etc) involve <u>vigorous-intensity activity</u> that causes large increases in breathing or heart rate, like carrying or lifting heavy loads, digging or construction, for at least 10 min continuously?	1: yes 2: no (→ pa5)
13 8	PA	In a typical week, on <u>how many days</u> do you do <u>vigorous-intensity activity</u> as part of doing your usual <u>work</u> ? (probe what work is about for people, housewife, gardener, farmer, electrician, etc)	n (0-7)
13 9	PA	<u>How much time</u> do you spend doing vigorous-intensity activity as part of doing your <u>work</u> on a typical day?	nb min/day
14 0	PA	Does your work (at your working place, at home, etc) involve <u>moderate-intensity activity</u> , that causes small increases in breathing or heart rate, such as brisk walking, lifting light weights, gardening, etc), for at least 10 min continuously?	1: yes 2: no (→ pa8)
14 1	PA	In a typical week, on <u>how many days</u> do you do moderate-intensity activities as part of your <u>work</u> ?	n (0-7)
14 2	PA	How much time do you spend doing moderate-intensity activities at work on a typical day?	nb min/d
<i>TRAVEL to and from PLACES. The next questions exclude the physical activities that you have already mentioned. Now i would like to ask you about the usual way you travel to and from places. For example to work, for shopping, to friends, to market, to church, etc.</i>			
14 3	PA	Do you <u>walk</u> (or use a bicycle) for at least 10 min continuously to get to and from such places?	1: yes 2: no (→ pa11)
14 4	PA	In a typical week, on how many days do you <u>walk continuously for at least 10 min</u> to get to and from places?	n (0-7)
14 5	PA	How much time do you spend walking to/from places on a typical day?	nb min/d
<i>RECREATIONAL ACTIVITIES. The next questions exclude physical activities you do for work or to go to places that you have already mentioned. Now i would like to ask you about sports, fitness and recreational activities (leisure).</i>			
14 6	PA	Do you do any <u>vigorous-intensity sports, fitness or recreational</u> ("leisure") activities that cause large increase in breathing or heart rate like running, football, weight lifting, cycling, swimming, cycling, etc, for at least 10 min continuously?	1: yes 2: no (→ pa14)
14 7	PA	In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational activities?	n (0-7)
14 8	PA	How much time do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?	nb min/d
15 9	PA	Do you do any moderate-intensity sports, fitness or recreational activities that cause a small increase in breathing or heart rate such as brisk walking, light swimming, easy cycling, etc, for at least 10 min continuously?	1: yes 2: no (→ pa17)
15 0	PA	In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational (leisure) activities?	n (0-7)
15 1	PA	How much time do you spend doing moderate-intensity sports, fitness or recreational activities on a typical day?	nb min/d
15 2	PA	In a typical <u>weekday</u> , how many hours do you spend watching TV, working on a computer, or using Internet, <u>per day</u> ?	n (hours/day, if 30 min = 0.5 hour)
15 3	PA	In a typical <u>weekend</u> , how many hours do you spend watching TV, working on a computer, or using Internet, <u>per day</u> ?	n (hours/day, if 30 min = 0.5 hour)
15 4	PA	How long does it take to walk between your house and the next bus stop (in minutes, one way)? No value for La Digue (no bus)	n (min)

15 7	PA	How often do you take a bus to go to work, shop, church, etc? No value for La Digue (no bus)	1: most of the time; 2: often; 3: rarely; 4: never
15 8	PA	How often do you go to work with a private vehicle? No value for La Digue (no car)	1: most of the time; 2: often; 3: rarely; 4: never.
15 9	PA	Does anyone in your household have a car or a pickup? No value for La Digue (no car)	1: no; 2: yes, in the family; 3: yes, it is my own.
16 0	BP	Have you ever heard of blood pressure or hypertension ("tansyon o")?	1: yes 2: no
16 1	BP	Can you tell me at least one or two values of your <u>own</u> BP, even approximate? Sys BP?	n
16 2	BP	Tells own dia BP	n
16 3	BP	Tells 1/2 values for own BP	1: yes; 2: no
16 4	BP	Can you tell me one or two figures, even approximate, for the upper limit for <u>normal</u> BP? Systolic BP	n
16 5	BP	Tells normal dia	n
16 6	BP	Tells 1 or 2 value for normal BP	1: yes; 2: no
16 7	BP	Tells right normal BP	1: yes; 2: no
16 8	BP	In general, do you think that someone can feel when BP is high?	1: never; 2: sometimes; 3: often; 4: always; 5: DNK
16 9	BP	In general, for how long people with high BP should take pills to reduce their BP?	1: a few days; 2: a few months; 3: several years; 4: DNK
17 0	BP	When was the last time you had your BP checked by a health officer?	1: <12 months; 2: 1-5 yr; 3: > 5yr
17 1	BP	Do you, or a member of your family, have a device to measure BP at home?	1: yes 2: no
17 2	BP	Were you told by a doctor or another health professional that you have high BP ("tansyon o")?	1: yes 2: no (→ diab1)
17 3	BP	[yes] How many years ago were you first told that you had high blood pressure?	n (years; if 6 months=0.5)
17 4	BP	[yes] Do you take a medication for HBP (over past 2 weeks)? ("prescription", adherence is tested with bp13)	1: yes 2: no (→ bp14)
17 5	clinic	Treatment for HBP taken this morning, asked on Lab Form by Q officer	1: yes; 0 no
17 6	BP	[if Rx] Who prescribed your current medication for high blood pressure most often?	1: clinic/hospital government dr; 2: private dr; 3: abroad
17 7	BP	[if Rx] When you went to the dr to chek you BP, did you see the <u>same dr</u> ?	1: always the same dr; 2: often the same dr; 3: rarely the same dr;
17 8	BP	[if Rx] It is difficult to not forget to take pills every day. On average, how frequently do you miss (voluntarily or involuntarily) your medication for high BP in a <u>typical week</u> ?	1: i forget very rarely; 2: i forget on 1-2 days in a week; 3: i forget on 3 or more days in a week
17 9	BP	Have you consulted a traditional practitioner ("okenn dimoun ki donn lafresisan") for your BP ?	1: yes 2: no
18 0		Are you taking any traditional medicine "lafresisan" for your diabetes?	1: yes 2: no
18 1	BP	Are you taking any traditional medicine "lafresisan" for your blood pressure? Which 'lafresisan' are you taking?	text :
18 2	diab	Have you ever <u>heard</u> of diabetes of high blood sugar?	1: yes 2: no

18 3	diab	When did you last have your blood sugar <u>checked</u> ?	1: <12 months ago; 2: 1 or more years ago 3: never, DNK
18 4	diab	Have you ever been <u>told</u> by a doctor or a health worker that you had high blood sugar or diabetes?	1: yes 2: no (→ chol1)
18 5	diab	How many years ago were you first told that you had diabetes?	n (years; if 6 months=0.5; 1 month:0.1)
18 6	diab	Do you currently take tablets for diabetes?	1: yes 2: no
18 7	diab	Do you currently take insulin for diabetes?	1: yes 2: no
18 8	diab	Did you take insulin today? assessed in LabForm	y /n
18 9	diab	Did you take pills for DM taken this morning? assessed by lab, in LabForm	y /n
19 0	diab	[if Rx] It is difficult to not forget to take pills every day. On average, how frequently do you miss your medication for diabetes in a <u>typical week</u> ?	1: i forget very rarely; 2: i forget on 1-2 days in a week; 3: i forget on 3 or more days in a week
19 1	diab	Have you consulted a traditional practitioner ("okenn dimoun ki donn lafresisan") for your diabetes?	1: yes 2: no
19 2	diab	Are you taking any traditional medicine "lafresisan" for your diabetes?	1: yes 2: no
19 3	diab	[if lafresisan] Which 'lafresisan' are you taking?	text :
19 4	diab	Do you have a device to measure your blood glucose yourself on the fingers at home?	1: yes 2: no
19 5	chol	Have you ever heard of blood cholesterol or "lagres dan disan"?	1: yes 2: no (→ wei1)
19 6	chol	Have you ever had your blood cholesterol checked?	1: yes 2: no or DNK
19 7	chol	Have you ever been told by a doctor or a health worker that you had high cholesterol?	1: yes 2: no
19 8	chol	Do you currently take any medication to reduce your blood cholesterol (statin)?	1: yes 2: no
19 9	weight	<i>Let's talk now about your body weight.</i> How would you describe your weight ?	1: largely too high; 2: a little too high; 3: about right (byen, bon); 4: a little too low; 5: much too low
20 0	weight	Do you take concrete measures to control your weight, currently?	1: no, i don't think much about it; 2: yes, i make <u>some</u> efforts to control my weight; 3: yes, i make <u>important</u> efforts to control my weight
20 1	weight	In this drawing, which figure best reflects how you think you look with regards to your weight?	n (1-9)
20 2	weight	Which figure best represents how you would like to look with regards to weight, ideally?	n (1-9)
20 3	weight	Which figure best reflects the ideal weight of a person of the <u>other sex</u> ?	n (1-9)
20 4	stress	<i>Stress can impact on your physical health, including BP. Stress can be related to both <u>positive</u> or <u>negative</u> events.</i> Have you experienced <u>positive events</u> during the <u>past 12 months</u> , such as finding a new job, wedding, birth of a child, or any other event that can generate a substantial positive stress for you?	1: yes 2: no
20 5	stress	Have you experienced <u>negative events</u> during the <u>past 12 months</u> , such as job loss, divorce, death in the family, or any other event that can generate a substantial negative stress for you?	1: yes 2: no
20 6	stress	<i>I will now ask you 4 questions on your stress in relation to your work, your family, your financial situation and the environment where you live.</i> First, on a scale of 10 (0 not stressed at all, 10 extremely stressed), how would you define your "stress level", during the past 12 months, in relation to your <u>work</u> (i.e. work for pay)? No data if no work	n (0-10) (if >=5 provide one reason)
20 7	stress	If stress>=5: Can you tell me about reason of this stress at work	

20 8	stress	[if paid work] With regard to your paid work, how do you feel about the way you can organize it on a day-to-day basis:	1: i have <u>little</u> control on how i can organize my daily work 2: i have <u>some</u> control on how i can organize my daily work 3: i have <u>quite a lot</u> of control on how i can organize my daily work
20 9	stress	[if paid work] Does your paid work involve supervising other persons?	1: yes 2: no
21 0	stress	On a scale of 10 (0 not stressed at all, 10 extremely stressed), how would you define your "stress level", during the past 12 months, in relation to your <u>family, friends or neighbours</u> (social level - not noise, etc)?	n (0-10) (if >=5 provide one reason)
21 1	stress	If stress>=5: Can you tell me about reason of this social stress	text
21 2	stress	On a scale of 10 (0 not stressed, 10 extremely stressed), how would you define your "stress level", during the past 12 months, in relation to the <u>place where you live</u> , including noise, pollution, or other <u>external circumstances</u> (i.e. not social aspects)?	n (0-10) (if >=5 provide one reason)
21 3	stress	If stress>=5: Can you tell me about reason of this stress due to environment	text
21 4	stress	On a scale of 10 (0 not stressed at all, 10 extremely stressed), how would you define your "stress level", during the past 12 months, in relation to your <u>financial situation</u> ?	n (0-10) (if >=5 provide one reason)
21 5	stress	If stress>=5: Can you tell me about reason of this stress due to your finances	text
21 6	stress	During the past 12 months, did you have problems paying your <u>routine bills</u> , such as for food, water, electricity or telephone (not accounting for big loans for house, car, etc)?	1: never; 2: sometimes; 3: often; 4: always
21 7	health	<i>Let's turn to your health in general.</i> Would you say your health is?	1: poor; 2: fair ("not too good" "pa tro bon"); 3: good; 4: very good; 5: excellent
21 8	health	Does your health limit you in <u>physical activities of moderate intensity</u> that you might do in a typical day, such as carrying a grocery bag, sweeping at home, or moving a light piece of furniture? If so, how much?	1: yes, i am limited a lot; 2: yes, i am limited a little; 3: no, i am not limited at all
21 9	health	Does your health limit you in carrying out <u>physical activities of vigorous intensity</u> that you might do during a typical day, such as carrying heavy loads, climbing several flights of stairs or climbing a steep path? If so how much?	1: yes, i am limited a lot; 2: yes, i am limited a little; 3: no, i am not limited at all
22 0	health	Does your health limit you in <u>walking small distances</u> , such as walking to the next bus stop or to the next shop? If so, how much?	1: yes, i am limited a lot; 2: yes, i am limited a little; 3: no, i am not limited at all
22 1	health	Does your health limit you in <u>climbing stairs</u> , like when you came this morning to our office?	1: yes, i am limited a lot; 2: yes, i am limited a little; 3: no, i am not limited at all
22 2	health	During the past 4 weeks, did you have any <u>physical pain</u> that interfered with your activities at work or at home?	1: yes, i am limited a lot because of pain; 2: yes, i am limited a little because of pain; 3: no, not i am not limited because of pain
22 3	health	Now, think of energy you have to do usual things. During the past 4 weeks, did you have a feeling of general weakness, tiredness, or <u>lack of energy (fay, fatigue, mank lenerzi)</u> ? If so, how often?	1: yes, i lacked energy most of the time; 2: yes, i lacked energy some of the time; 3: no, i didn't lack energy
22 4	health	[yes] If you lacked energy some or most of the time: Would you say the fatigue was mostly?	1: rather physical (dan lekor); 2: rather psychological (dan latet); 3: both physical and psychological
22 5	health	Now, think of being sometimes down or depressed. During the past 4 weeks, how often did you feel emotionally "down" or " <u>depressed</u> "?	1: i felt down or depressed often; 2: i felt depressed some of the time; 3: no, i did not feel depressed at all
22 6	health	Now think of your interactions with other people. During the past 4 weeks, did you reduce your social activities, like visiting friends or relatives, because of any <u>physical health or emotional problem</u> ? Would you say:	1: yes, a lot; 2: yes, a little; 3: no
22 7	health	How was your appetite recently?	1: my appetite was as usual; 2: diminished; 3: increased
22 8	health	Have you lost or gained weight <u>involuntary</u> during the last 12 months?	1: yes, i lost weight 2: yes, i gained weight; 3: no, my weight did not change much
22 9	health	[if yes]: how much weight have di you gain or lose during the past 12 months (kg)?	n

23 0	health	Not accounting for hypertension or diabetes, do you suffer from <u>any medical condition</u> for which you take a medical treatment during the past 4 weeks? Likely Q not useful	1: yes 2: no
23 1	health	Do you have any chronic medical condition(s)/disease(s) which recurrently bother(s) you ? Write any chronic conditions (even without treatment, like)	text :
23 2		List all of your medications (from Q, lab form, and Dr)	text
23 3	health	Do you currently take any medic? (question asked when taking blood)	1: yes 2: no
23 4	health	Did you bring your medications along (question asked when taking blood)	1: yes 2: no
23 5	health syst	Were you <u>admitted to a hospital</u> in Seychelles or abroad during the past 12 months for any reason (at least one night in hospital)? Info for this Q was extended during contact with Dr to include all chronic conditions written in Dataform	1: yes, in Seychelles 2: yes, abroad 3: yes, both in Seychelles and abroad 4: no
23 6	health syst	During the <u>past 12 months</u> , approximately how many times did you go to a <u>health center</u> or hospital for <u>ambulatory care</u> (MOH) for any medical problem or accident?	n
23 7	health syst	During the <u>past 12 months</u> , approximately how many times did you go to a <u>private doctor</u> for any medical, surgical condition, or accident?	n
23 8	health syst	Did you ever go <u>abroad</u> for medical care, which was <u>advised and paid for</u> by the MOH? How many times in your entire life altogether?	n (0: never)
23 9	health syst	Did you ever go abroad for medical care, on your <u>own initiative</u> and <u>paid for by yourself</u> ? How many times altogether in your entire life?	n (0: never) (all men: → hp15)
24 0	gyne	[Women] Did you take oral or injectable contraceptives during the past month?	1: oral; 2: injectable; 3: no
24 1	gyne	[Women] Are you pregnant now, as far as you know?	1: yes 2: no
24 2	screening	[Women] How many times did you have a screening test for cervical abnormalities such as a pap smear in the past 10 years ?	n (0 = never)
24 3	screening	[If >1 pap smear test] When did you have your last pap smear test done?	1: less than 3 years ago; 2: between 3-10 years ago; 3: more than 10 years ago
24 4	screening	[Women] Has a health professional ever examined your breast to screen for a disease? When?	1: never; 2: less than 3 years ago; 3: between 3-10 years ago; 4: more than 10 years ago
24 5	screening	[Women] Did you ever do a mammography (xray) or ultrasound of your breast? When?	1: never; 2: less than 3 years ago; 3: between 3-10 years ago; 4: more than 10 years ago
24 6	screening	[Women] Has anyone in your direct family (grand-mothers, mother, sisters, daughters) ever had a breast cancer starting before the age of 60?	1: yes 2: no
24 7	screening	[All] Did you ever do a test to look for blood in your stools to screen for colon/intestine disease When?	1: never; 2: less than 3 years ago; 3: between 3-10 years ago; 4: more than 10 years ago
24 8	HP	During the past 12 months, did a health officer advise you about smoking, perhaps in relation to a medical condition that you may have?	1: yes 2: no
24 9	HP	During the past 12 months, did a health officer advise you about your diet, perhaps in relation to a medical condition that you may have?	1: yes 2: no
25 0	HP	During the past 12 months, did a health officer advise you in relation to weight control, perhaps in relation to a medical condition that you may have (BP, diabetes, etc)?	1: yes 2: no
25 1	HP	During the past 12 months, did a health officer advise you about the need to have regular physical activity, perhaps in relation to a medical condition that you may have?	1: yes 2: no
25 2	HP	During the past 12 months, did a health officer advise you about the need to limit salt consumption, perhaps in relation to a medical condition that you may have?	1: yes 2: no
25 3	HP	Before you came to this study, had you ever heard of the Unit for Prevention and Control of Cardiovascular Disease (UPCCD)?	1: yes 2: no
25 4	media	Do you listen to the radio?	1: every day; 2: a few days per week; 3: i rarely or never listen to the radio at home; 4: i dont have a radio at home

25 5	media	When you listen to the radio, how often do you listen to SBC radio (excluding Paradise FM or other radio channels)?	1: i often listen to SBC radio; 2: rarely; 3: never; 4: i don't have a radio at home
25 6	media	In the past 12 months, can you remember to have listened to a program on health, particularly cardiovascular disease, smoking, blood pressure, diabetes or diet on <u>SBC radio</u> ?	1: yes; 2: no; 3: i never or rarely listen to SBC radio
25 7	media	How often do you watch TV at home?	1: every day; 2: a few days per week; 3: rarely or never; 4: i dont have a TV at home
25 8	media	Do you have cable TV, or a satellite dish, at home?	1: yes 2: no
25 9	media	When you watch TV at home, how often do you watch SBC?	1: i watch SBC always/most of the time; 2: often; 3: rarely; 4: never
26 0	media	In the past 12 months, can you remember to have watched a program on cardiovascular disease, smoking, blood pressure, diabetes or diet on <u>SBC TV</u> ?	1: yes; 2: no; 3: i never or rarely watch SBC TV
26 1	media	Do you like to watch TV programs or listen to radio programs/magazines related to health?	1: yes, i am interested a lot; 2: yes, i am interested a little; 3: no, i am not too interested
26 2	media	How often do you read <u>local daily</u> newspapers?	1: every <u>day</u> or almost every day 2: a few times per week 3: rarely or never
26 3	media	How often do you read <u>local weekly</u> newspapers?	1: every <u>week</u> or almost every week 2: a few times per month 3: rarely or never
26 4	KAP CVD	<i>Let's speak now of some medical conditions.</i> Have you ever heard of heart attack (" <u>latak leker</u> ")?	1: yes 2: no
26 5	KAP CVD	Do you know someone in your <u>family</u> or among your <u>friends</u> who has had a <u>heart attack</u> ?	1: no; 2: yes, someone in my family; 3: yes, a friend; 4: yes, in my family and among friends
26 6	KAP CVD	Have you ever heard on stroke (" <u>latak laserve</u> ")?	1: yes 2: no
26 7	KAP CVD	Do you know someone in your family or among your friends who has had a stroke?	1: no; 2: yes, someone in my family; 3: yes, a friend; 4: yes, in my family and among friends
26 8	KAP CVD	Do you think that your lifestyle and you diet can have an impact on your health later?	1: yes, i think my lifestyle has a lot of impact on my health; 2: yes, it has some impact; 3: no, it has not much impact
26 9	KAP CVD	What best describes your attitude and actions regarding taking regular PA or having a balanced diet during the past 6 months?	1: i didn't think much of it; 2: i think if it but i didn't take action; 3: i took action but i did not sustain it; 4: i took action and i still continue
27 0	communication	<i>Finally, we would like to ask you a few questions on how we could possibly communicate health messages.</i> Do you have a mobile phone?	1: yes 2: no
27 1	communication	Can your mobile phone access Internet (e.g. iphone, android, blackberry, windows, etc)?	1: yes 2: no
27 2	communication	Do you use Internet with your phone?	1: yes, every day 2: yes, on some days 3: yes, rarely 4 (3): no
27 3	communication	Do you have a tablet or computer (your own or that you can use whenever you want outside of work)?	1: computer 2: tablet 3: computer and tablet 4: no
27 4	communication	Do you use Internet with a computer or tablet (outside of work)?	1: yes, every day 2: yes, on some days 3: yes, rarely 4 (3): no
27 5	communication	Do you have an email address?	1: yes 2: no

27 6	communicati on	Would you like to receive sms (text) on your phone related to health?	1: yes 2: no 3: i don't know
27 7	communicati on	Would you like to receive emails related to health?	1: yes 2: no 3: i don't know
27 8	other studies	Would you agree to participate in further studies of follow up related to cardiovascular diseases, chronic conditions or other tests related to aging?	1: yes 2: no
27 9	clinic	Arm circumference (cm)	n
28 0	clinic	Height measured (cm)	n
28 1	clinic	Weight asked (before measuring weight)	n
28 2	clinic	Weight measured (kg)	n
28 3	clinic	BMI based on wei and hei (to be used in most analyses)	n
28 4	clinic	Waist (cm)	n
28 5	clinic	Hip (cm)	n
28 6	clinic	Cuff used	l; m
28 7	clinic	sys at entry (by secretary, see time entry)	n
28 8	clinic	dia at entry (secretary)	n
28 9	clinic	pulse at entry (secretary)	n
29 0	clinic	officer administering questionnaire	rm, jl, gem (ganyor mangroo); gm (gina michel), bf, vb, pb
29 1	clinic	sys 1 by nurse , during questionnaire	n
29 2	clinic	dia 1 by nurse , during questionnaire	n
29 3	clinic	pulse 1 by nurse , during questionnaire	n
29 4	clinic	sys 2 by nurse , during questionnaire	n
29 5	clinic	dia 2 by nurse , during questionnaire	n
29 6	clinic	pulse 2 by nurse , during questionnaire	n
29 7	clinic	sys 3 by nurse , during questionnaire	n
29 8	clinic	dia 3 by nurse , during questionnaire	n
29 9	clinic	pulse 3 by nurse , during questionnaire	n
30 0	clinic	mean sys2 + sys3	n
30 1	clinic	mean dia2 + dia3	n
30 2	clinic	mean pulse2 + pulse3	n
30 3	clinic	SBP taken just after standing up 3 times from chair, 1 minute after BP3	n
30 4	clinic	DBP taken just after standing up 3 times from chair, 1 minute after BP4	n
30 5	clinic	pulse taken just after standing up 3 times from chair, 1 minute after BP5	n
30 6	clinic	first SBP taken by doctor before leaving study center, after all other measurements, often 2-4 hours after entry in study, e.g. between 8am - 1 pm	n
30 7	clinic	first DBP taken by doctor before leaving study center	n
30 8	clinic	first pulse taken by doctor before leaving study center	n
30 9	clinic	second SBP taken by Dr	n

9			
31 0	clinic	second DBP taken by Dr	n
31 1	clinic	second pulse taken by Dr	n
31 2	clinic	number times standing up from chair, by nurse, at end of questionnaire, just after BP3 (and before BP4)	n
31 3	clinic	reason for failing the test	text
31 4	clinic	grip test 1, conducted at end of questionnaire, by nurse	n
31 5	clinic	grip test 2, conducted at end of questionnaire, by nurse	n
31 6	clinic	grip test 3, conducted at end of questionnaire, by nurse, at 15-30 second intervals	n
31 7	clinic	failed test, or done on left hand	text
31 8	clinic	reason to fail test	text
31 9	clinic	officer who administered BIA Omron and ultrasound foot Sahara	text
32 0	clinic	weight using Omron BIA BF 508	n
32 1	clinic	bmi using Omron BIA	n
32 2	clinic	fat percent using Omron BIA	n
32 3	clinic	muscle percent using Omron BIA	n
32 4	clinic	resting metabolic rate using Omron BIA	n
32 5	clinic	visceral fat using Omron BIA	n
32 6	clinic	BIA METS reactance	n
32 7	clinic	BIA METS resistance	n
32 8	clinic	BMD using Sahara ultrasound	n
32 9	clinic	T score using Sahara ultrasound	n
33 0	clinic	ethnicity assessed by Dr (same, PB)	b; m, w, c(hin), i(nd)
33 1	clinic	heart murmur by stethoscope assessed by Dr (same PB)	text
33 2	clinic	heart rythm by ECG Omron assessed by Dr (same, PB)	text
33 3	clinic	extrabeats by ECG monitor Omron HCG 801 E (assessed by PB)	text
33 4	clinic	Referal to HC or specialist for some medical problem that require further medical assessment	1:yes; 2: no
33 5	clinic	Where particiapant was referred	text
33 6	clinic	Condition needing refereal	text
33 7	lab	Officer doing blood test	text
33 8	lab	fasting	1:yes; 2: no
33 9	lab	time blood taken	hh:mm
34 0	lab	chol -lab Victoria	n
34 1	lab	hdl - lab Victoria	n
34 2	lab	trig - lab Victoria	n
34 3	lab	ldl reagents (often not possible) - lab Victoria	n

34 4	lab	calcium - lab Victoria	n
34 5	lab	crp - lab Victoria	n
34 6	lab	creatinine - lab Victoria	n
34 7	lab	uric acid - lab Victoria	n
34 8	lab	a1c measured by laboratory of Victoria	n
34 9	lab	a1c measured with A1cNow Bayer	n
35 0	lab	glucose plasma measured on plasma by lab Victoria	n
35 1	lab	glucose measured on capillary blood with Contour Bayer	n
35 2	lab	glucose measured with Contour Plus (Praslin, n~100)	n
35 3	lab	glucose measured by laboratory, but with values with Contour for 12 missing plasma values	n
35 4	lab	a1c measured with lab Victoria but with ~20 values with A1cNow when a1c lab was missing	n
35 5	lab	a1c measured with A1cNow but with ~20 values with a1c clin when A1cNow was missing	n
35 6	lab	diabetes based on glucose ≥ 7.0 on gluc plama (or contour if plasma missing) or glucrxnow==1	1 if diabetes with this criterion
35 7	lab	diabetes based on a1c clin ≥ 6.5 or a1cnow if a1c clin missing (~20) or glucrxnow==1	1 if diabetes with this criterion
35 8	lab	diabetes based on a1c now ≥ 6.5 or a1c lab if a1cnow missing (~20-30) or glucrxnow==1	1 if diabetes with this criterion
35 9	lab	number urine miction at survey since participant woke up	n
36 0	lab	menstruation	1:yes; 0: no
36 1	lab	glucosuria (Siemens Multistix 10 SG)	neg, tr, +, +++
36 2	lab	ketones (Siemens Multistix 10 SG)	neg, tr, +, +++
36 3	lab	proteinuria (Siemens Multistix 10 SG)	neg, tr, +, +++
36 4	lab	blood (Siemens Multistix 10 SG)	neg, tr, +, +++
36 5	lab	leucocytes (Siemens Multistix 10 SG)	neg, tr, +, +++
36 6	lab	density (Siemens Multistix 10 SG)	1000-1030
36 7	lab	pH(Siemens Multistix 10 SG)	5.0-8.5
36 8	lab	bilirubin (Siemens Multistix 10 SG)	neg, +, +++
36 9	lab	urobilinogen	0.2- >8
37 0	lab	nitrites	neg, pos

Appendix 3. Data entry form for measurements

First name		Last name		Study ID	
Age		Sex (M/F)		Occupation	
Address (if change)		District (if change)		Work place	
Tel 1		Tel 2		Email private	
Date (dd-mmm)		Time (hh/mm)		Weight asked	
Arm circumf (cm)		Sys/Dia entry	/	Pulse entry	
Cuff used (M/L>32)		Height		Weight measured	
Lab officer initials		Time (hh/mm)		Blood taken (Y/N/F)	
Eat/drink 12 h, not water (Y/N)		Diab Rx 2 wks (Y/N)		Glucose Contour	
Insulin this morning (y/n)		Pills DM this morning (Y/N)		A1cNow	
Nb this urine (1,2,3, F)		Menst (Y/N)		GLU 30s(Neg, TR, +, +++)	
BIL (Neg, +, +++) →		KET (Neg, Tr, +, +++)		SG (1000-1030)	
BLO (Neg, Tr, +, +++)		pH (5.0-8.5) →		PRO 60s (N, Tr, +, +++)	
URO (0.2- >8) →		NIT (Neg, Pos) →		LEU (Neg, Tr, +, ++)	
Quest. officer initials		Time start (hh/mm)		Takes any medic (Y/N)	
BP medic this morning (y/n)		Brought med (Y/N)		List all medications	
Sys/Dia1	/	Pulse 1			
Sys/Dia2	/	Pulse 2			
Sys/Dia3	/	Pulse 3			
# stand up (0-5)		Time 5x chair (sec)		Reason failure (if <5)	
Sys/Dia4	/	Pulse 4			
Grip test 1		Grip test 2		Grip test 3	
Left side (Y/N)		Reason left or failure			
Waist 1 (cm)		Waist 2 (cm)		BIA METS react	
Hip 1 (cm)		Hip 2 (cm)		BIA METS resist	
Officer initials		Sahara BMD (RFt)		Sahara Tscore	
Weight (kg)		BMI		Fat percent	
Muscle percent		RMR		Visceral fat level	
Sys/Dia5	/	Pulse 5		Pred 182W314C5M	
Rythm (Sin, ES, AF)		Murmur (1-5/5)		Ebeats/type	
Form completed (Y/N)		Res. explained (Y/N)		Remarks exit	
Referral (Y/N)		Where		What condition	
Voucher; signature		Attend certif. (Y/N)		Transp. signed	
Officer data entry		Data entry done (Y/N)		Remark	
Data missing (Y/N)		Which		Corrected (Y/N)	

Appendix 4. Selection of participants and methods

Selection of the participants

- Assumptions considered for the selection of the eligible participants
- A maximum of 20 participants could be seen every day considering that the survey team included 5 persons and since examination of each participant takes 2 hours (without waiting time).
- The number of eligible participants invited each day was progressively adjusted over the first 3 weeks so that up to 20 participants could be seen every day. Since letters were sent 3 weeks in advance, the response time to adjust for the optimal number of eligible participants to be seen each day was delayed by a few weeks.
- All eligible participants were invited to attend the survey through a personalized letter on a specific date. Eligible participants were informed that they could call to change their appointment.
- The total number of days allocated to the survey was limited to 12 weeks in Mahe and 2 weeks in Praslin/La Digue.
- Because participants needed to be fasting (blood glucose measurement), participants were asked to attend early in the morning, between 6:30 am and 10:00 am.
- Participants were informed that they would be served a breakfast at the study center after blood collection.

Sample size and sample strategy

- The goal was to examine approximately 150 persons within each sex- and 10-year category (i.e. age categories 25-34, 35-44, 45-54, and 55-64 for both men and women), hence a goal of 1200 participants altogether.
- This number (150 participants per each sex and 10-year category) was chosen because it allows sufficiently precise estimates for blood pressure and blood lipids (within each of the eight age and sex categories, as well as for estimates in the total population aged 25-64).
- Assuming a worst scenario of a participation rate of 50-60%, the requested total sample of eligible participants was set at n=3200.

Selection of eligible participants

- A sex- and age-stratified sample was drawn from the entire population of Seychelles aged 25-64 years.
- The sex- and age stratified random sample was prepared by the principal statistician of the National Bureau of Statistics (NBS, Helena Deletourdis).
- The sample initially included 3200 persons with 400 persons randomly selected in each sex and 10 year age categories.
- We excluded persons of non Seychellois descent (naturalization or marriage with a Seychellois person, based on their national identity number, n=457).
- We also excluded persons found to be dead, before and during the survey, by linkage with vital statistics (n=28), persons currently in prison (n=15), persons living abroad (n=16), persons who had moved to another island (n=16), and persons living in remote islands of the archipelago (n=5).
- When the exact dates to conduct the survey were known, we excluded fixed numbers of randomly selected eligible persons in order to not exceed the total numbers of eligible participants who could possibly be seen within the given time periods allocated to the survey (i.e. between 23 September and 20 December in Mahé and between 17 and 28 February 2014 in Praslin and La Digue).
- In the final participation rate, we excluded 176 persons for whom the letters of invitation were returned unopened with the mention "unknown addressee", which most likely represent persons who had moved to other (unknown) addresses.
- This left 1702 eligible persons and 1240 participants, an overall participation rate of 72.9% overall.

Strategies to increase the participation rate

- We used several strategies to increase the participation rate.
- All participants were offered the possibility to re-schedule their visit at another date.
- District administrators were contacted every week to help provide contacts of non-participants.
- Announcements were aired every week on the national radio (SBC) with the names of eligible participants who did not attend the survey, and inviting them to call the study center or just attend the survey at any other date at their convenience.
- A few further announcements were aired on the national radio at the end of the survey to further ask non-participants to attend the survey on a few catch up days organized after the end of the survey.
- Several general programs on the survey were aired on the radio and on the main TV news bulletin (which captures a very large audience in Seychelles) to publicize the survey.
- All participants were informed, in their invitation letter, that they would receive a voucher allowing to buy food for the value of SR 200 in a large supermarket (~US\$ 20, approximately corresponding to the daily wages for a low skilled worker), provided by Seychelles Trade Company. The voucher was deemed to cover for transport costs and time used to attend the survey.
- Participants were given a medical certificate to justify their absence of work.

Questionnaire

- A structured questionnaire was administered face-to-face to the participants by the survey officers (senior nurses) in a secluded and quite room.
- The questionnaire was applied in Creole but some participants preferred speaking in English.
- Several questions on lifestyle (tobacco, alcohol, nutrition, physical activity, etc) came from the WHO STEP instrument [17].
- Several questions on quality of life and frailty came from established instruments, e.g. the SF12 questionnaire [18-19] and the SHARE instrument [20]. The SF12 (12-Item Short Form Health Survey) is broadly used and was developed for the Medical Outcomes Study (MOS), a multi-year study of patients with chronic conditions. The instrument was designed to reduce the respondent burden while achieving minimum standards of precision for purposes of group comparisons involving multiple health dimensions in different populations.
- Questions on KAP on NCDs, nutrition, use of health services, and exposure to mass media were locally developed and pre-tested before the survey.

- Current and ideal body image, and body image discrepancy, was assessed using a nine-silhouette rating scale developed for multi-ethnic purposes (Pulvers KM et al. Development of a culturally relevant body image instrument among urban African Americans. *Obesity Obes Res.* 2004;12:1641-51).

Clinical investigations

- Blood pressure was measured 5 times (once at arrival to the survey center, 3 times during the interview, and once before leaving the study center).
- BP was measured after a 5 minute rest, using a validated automated device (Omron M3) with a cuff of appropriate size for the arm circumference (large cuff for arm circumference ≥ 32 cm).
- Measurement of weight with an electronic scale (Seca), height (stadiometer Seca), and waist followed standardized methods.
- Anthropometric measurements. Percent fat and abdominal fat was measured by bio-impedance using a body composition monitor (BF 511, Omron Healthcare). Given entry of height and sex, the instrument provides measurements for BMI, percent of total fat (normal values: 8-22%, women: 21-34%), percent of skeletal muscle mass (normal values 33% to 39% in men and 35%-30% in women), percent of visceral fat and resting metabolic rate. Imprecision of measurement of both fat and muscle is reported to be $<3\%$. The instrument is valid for persons aged 18 to 80 years and is clinically validated according to the manufacturer.
- Handgrip strength test, using a precision hydraulic hand dynamometer (Baseline Hydraulic Hand Dynamometer, FabricationEnterprises FEI, White Plains, New York). The subject holds the dynamometer in the dominant hand, with the arm at a right angle and the elbow by the side of the body. When ready the subject squeezes the dynamometer with maximum isometric effort for about 3 seconds. No other body movement is allowed. The test was run 3 times, with at least 15 seconds recovery between each effort. The values listed below give a guide to expected scores for adults (average of the best score).
- Chair stand test. The chair stand test is a physical performance test used to assess lower-extremity function. Lower-extremity function has been shown to predict subsequent development of disability because it reflects the effects of chronic diseases, coexisting conditions, and overall physiologic decline. A 5 time repetition test, as done in the survey, is a measure of strength.
- Procedure: The participant is seated on a standard solid and stable chair without arms. After having explained and demonstrated the test to the participant, the participant is asked to stand up without using his/her arms, returning completely to the correct starting seating position after each of the 5 repetitions. At the command "Ready, Set, Go" the tester begins timing by starting the stopwatch. The observer counts each chair stand out loud when the subject is in the standing position and provides continuous verbal encouragement during the test.
- Bone mass density was measured at the level of the calcaneus (heel bone) with an ultrasound system (Sahara Clinical Bone Sonometer, Hologic, USA). The system performs a quantitative ultrasound measurement of the calcaneus (heel bone) which can be used, in conjunction with other clinical risk factors, as an aid to the diagnosis of osteoporosis and medical conditions leading to reduced bone density, and ultimately in the determination of bone fracture risk. Sahara measures the speed of sound (SOS, in m/s) and broadband ultrasonic attenuation (BUA, in dB/MHz) of an ultrasound beam passed through the calcaneus, and combines these results linearly to obtain the Quantitative Ultrasound Index (QUI). The output is also expressed as a T-score (difference between a given patient's results and mean results for a young adult, in SD units) and as an estimate of the Bone Mineral Density (BMD, in g/cm²) of the calcaneus as would be measured by Dual Energy X-ray Absorptiometry (DEXA). The WHO criteria classify patients with BMD values more than 2.5 SDs below the young adult mean (T-score below -2.5) as "osteoporotic", and patients with T scores between -1 and -2.5 as "osteopenic".
- Procedure: Ultrasound measurement is performed with the patient seated, and his/her foot positioned and secured in the Sahara system using a positioning aide. After the patient's foot is secured, a pair of soft elastomer pads is brought into contact with opposite sides of the patient's heel by means of a motorized caliper mechanism. Each of the elastomer pads are acoustically coupled to the heel and to a sound transducer using ultrasound coupling gel. Inaudible high frequency sound waves, produced by one of the sound transducers, are transmitted through the heel and received by the opposite transducer. Quantitative parameters describing the speed and attenuation of the sound waves in the heel are measured.
- A 30-second one lead electrocardiographic recording was performed in all participants to assess selected rhythm abnormalities e.g. atrial fibrillation, ventricular ectopic beats, etc (Heart Scan HCG 801-E, Omron Healthcare, The Netherlands).

Blood tests

- Venous blood was collected at the study center using a venipuncture set (Venofix green, Luer 21G, Braun, Germany) equipped with a Sarstedt multiadapter for S-Monovette (Sarstedt, Germany). This system is optimal to prevent blood spillage and avoid contact of health staff with blood.
- For each participant, the following biological samples were collected: 1 Sarstedt serum Monovette of 9 ml, 1 Sarstedt EDTA Monovette of 9 ml, 1 yellow tube of 2.5 ml for plasma glucose (sodium fluoride and potassium oxalate, ISS), later replaced with 2.5 tubes (BD Plymouth, UK), and 1 violet tube of 2.5 ml EDTA tube (BD Plymouth, UK) for analysis of A1c on whole blood.
- Capillary blood was also taken from each participant at the fingertip with an automatic lancing device (Glucolet 2, Bayer, Germany) with disposable lancets (Ames Minilet Lancets, Bayer).
- Capillary blood was immediately tested at UPCCD for glucose with a glucometer (Ascensia Contour, Bayer) and for A1c (A1cNow+, Bayer). Results are obtained within 30 seconds (Contour) and 5 minutes (A1c).
- Blood sample tubes were labeled only with the participants' ID numbers. All tubes of a same participant were inserted in a sealed plastic envelope (Topgrip) on which the participant's number was written in large characters.
- Reserve samples of serum/plasma were kept frozen at minus 80°C at the Seychelles Hospital, but can be transferred in freezers at minus 25°C at UPCCD when needed. The freezers at UPCCD are equipped with a temperature monitoring system.
- Blood samples are expected to be deleted after a period of 10 years.
- Centrifugation of blood was done at the Public Health Laboratory: 1 serum Monovette of 9 ml was aliquotted in 2 microtubes with caps (Sarstedt, Germany) of 1.5 ml with 1 ml of serum, while 1 Monovette EDTA 9 ml was aliquotted in 1 Eppendorf of 1.5 ml with 0.5 ml of buffy coat and in 2 microtubes of 1.5 ml with caps (Sarstedt) with 1 ml of plasma.
- The following blood tests were performed within 2-3 hours of blood collection at the clinical laboratory of the Seychelles Hospital: total cholesterol, HDL-cholesterol, triglyceride, glucose, creatinine, uric acid, calcium, CRP (all these tests from 1 tube

with 1.5 ml serum), glucose (from yellow tube with sodium fluoride and potassium oxalate), A1c (violet EDTA tube). Insulin was analyzed 3 months later from one 1.5 ml microtube of serum.

- All analyses, except insulin and A1c, were done using a fully automatic analyzer Konelab 30i (Finland) with reagents from Thermo Fischer Scientific (USA).
- All tests performed using Konelab 30i were checked with controls on a daily basis.
- Glucose measurement used glucose oxydase (GOD) and a modified Trinder color reaction catalysed by the enzyme peroxidase (POD). Imprecision is <3% of total CV at average glucose level (e.g. repeatability within run CV 0.7% + between device CV 1.9% at mean of concentration of blood glucose of 4.3 mmol/l).
- Cholesterol was measured after enzymatic hydrolysis by cholesterol esterase to cholesterol and free fatty acids, and free cholesterol oxidized by PEG cholesterol oxydase in peroxide, and then submitted to peroxidase to form a chromophore. Imprecision is <3.5% total CV, e.g. repeatability (within run) of 0.9% CV + within device (total) 1.4% CV at concentration of cholesterol of 5.2 mmol/l.
- HDL-cholesterol was measured with an enzymatic colorimetric test after precipitation of non HDL lipoproteins. The cholesterol concentration of HDL-C is determined enzymatically similar as cholesterol (above). Imprecision is <4% of total CV, e.g. 0.5% CV within run + 1.1% CV between run + 1.6% CV between day; total %CV 2.0 at HDL concentration of 1.26 mmol/l.
- Triglycerides were measured by hydrolysis by lipase (LPL) to glycerol and fatty acids, glycerol is phosphorylated to glycerol-3-phosphate (by GK), then oxidized to hydrogen peroxide (GPO and POD) to form a quinone dye. Imprecision is <4% of total CV, e.g. 0.7% CV repeatability (within run) and CV 2.0% within device (total) at a concentration of triglyceride of 2.07 mmol/l.
- Calcium was measured based on highly coloured complex with Arsenazo III at neutral pH, measured at 660 nm. Imprecision is <3% CV 0.8% within run repeatability and CV 1.5% within device at calcium level of 2.10 mmol/l.
- Uric acid was measured after oxidation to allantoin with uricase and to indamines with POD. Imprecision is <4% total CV, e.g. 0.8% CV repeatability (within run) + 2.3% CV within device (total) at a concentration of 70 µmol/l.
- Creatinine was measured with the Jaffé method. Imprecision is <5%, e.g. CV 1.1% repeatability within run + CV 2.0% within device at concentration of creatinine of 105 mmol/l.
- CRP was based on an immunoturbidimetric method, with measuring range between 6 and 636 mg/l. Imprecision is <3.2% total CV, e.g. 1.75% CV within run+ 2.4% CV between day at a concentration of CRP of 30 mg/l.
- A1c was analyzed with a fully automated analyzer (D-10, Bio-Rad, Hercules, CA, USA). The D-10 Hemoglobin A1c Program utilizes principles of ion exchange high performance liquid chromatography (HPLC). The D-10 Haemoglobin A1c Program is certified by the NGSP as having traceability to the DCCT reference method. Precision is CV 0.78 within run, 0.68% CV between day, 0.52% CV between run, total precision 1.16% CV. Controls with a standard were performed once monthly.
- Insulin was analyzed with an automatic analyzer (Siemens Immulite 1000) using a solid-phase, enzyme-labeled chemiluminescent immunometric assay. Incubation time of 60 minutes. Range: 2-300 µIU/ml. Median value in healthy volunteers is around 9 µIU/ml. Precision is CV 6.4% within run and 8.0% CV total at low mean values. Control with a standard was done approximately once monthly.

Urine tests

- Urinalysis was tested semi-quantitatively with teststrips (Multistix 10SG, Siemens) for 10 urine indicators including glucose, ketone, protein, blood, leucocytes, nitrites, specific gravity, bilirubin, urobilinogen, and pH.
- A sample of urine was collected in 1 microtube of 2 ml for later analysis of Na, K, and creatinine.
- Na/K in urines were measured with the fully automated Konelab 30i analyzer (Thermo Scientific, Finland) using an ISE Calibrator (Ion Selection Electrodes). Control with a standard was done every day.
- The anonymized electronic database, after adequate data cleaning, as well as all reports deriving from the surveys, will be kept at the Ministry of Health for at least 10 years and will also be made available to the Seychelles National Archives.

Communication of the results to the participants

- Before being discharged from the study center, all participants received information on their own results, and relevant advice, from the medical doctor of the survey.
- Participants with a newly found abnormal medical condition received a referral form signed by the doctor of the survey (a copy of which is kept at UPCCD) and were advised to go to a health center or to a specialist clinic to confirm or manage the condition.
- Participants who presented a serious medical condition were sent to the casualty for further diagnosis or care.
- A letter with selected results (blood pressure, BMI) and selected laboratory results (blood lipids, uric acid, and creatinine) was sent to each individual participant shortly after the visit to the survey center, which color marking of abnormal results that would need further confirmation. The letter included a phone number of the study center to call for any further information.