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Behavioural Risk Factor Survey (April 2006)

Main Report

Commissioned by

Surveillance and Epidemiology Branch
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Executive Summary

Introduction

The Social Sciences Research Centre of the University of Hong Kong (SSRC) was commissioned by the Department of Health in April 2006 to conduct a survey on behavioural risk factors. This survey aimed to detect changes in health risk and behaviour as well as to collect further information on the health related behavioural issues among the Hong Kong population. This will provide information to facilitate the planning, implementation and evaluation of health promotion programmes on the prevention of diseases related to lifestyle and behaviour.

The scope of this survey encompassed the following:

1 Distribution of body mass index (BMI) and waist circumference
2 Prevalence of obesity/overweight/underweight
3 Pattern of physical activity
4 Prevalence of adequate/inadequate juice, fruit and vegetable consumption
5 Pattern of alcohol consumption
6 Smoking habits
7 General health status
8 Cervical screening (for female respondents only)
9 Food handling practices
10 Hand hygiene
11 Oral health practices
12 Stress management
13 Demographic information: gender, age, education, marital status, occupation, monthly personal income and monthly household income.

Research Methodology

This survey was conducted by using Computer Assisted Telephone Interviews (CATI). The sample was drawn randomly from a list of telephone numbers, which included unlisted and new numbers. The target respondents were Cantonese, Putonghua or English speaking residents in Hong Kong (excluding domestic helpers) aged 18-64. A bilingual (Chinese and English) questionnaire with 70 questions was used to collect data. Fieldwork took place between the 6th April and 15th May 2006. A sample size of 2 047 successful interviews was achieved. The contact rate was 42.4% and the overall response rate was 72.1%. The width of a 95% confidence interval was at most +/- 2.2%. Weighting was applied based on age and gender in order to make our findings more representative, using the Hong Kong population data compiled by the Census and Statistics Department for end-2005 as reference.

Statistical tests were applied to investigate if there is any significant association between demographics and the response variables. Only the statistically significant findings at the 5% level (2-tailed) are presented in the report.

Key Findings of the Survey

Body weight control

Using the Asian standard of World Health Organization (WHO) classification on weight status, less than half of the respondents (47.6%) were considered as 'normal'. About one quarter (24.4%) of the respondents were considered as 'obese' and 18.4% were regarded as 'overweight'. The rest (9.6%) was considered as 'underweight'.

Regarding the perception of respondents' current weight status, about half of respondents (50.7%) perceived their current weight as 'just right', more than two-fifths (41.5%) felt that they were 'overweight' and 7.8% found themselves 'underweight'. However, a significant proportion of respondents did not view their own weight status in the same way that the WHO classification for Asians suggested. More specifically, more than three-fifths of the 'underweight' respondents considered themselves as 'just right' (59.5%) or 'overweight' (3.6%). Females, the older respondents (aged 35 years or above), those with secondary education level or below and the divorced/separated/widowed or married respondents were more likely to view themselves as 'overweight'.

Only 15.7% of respondents claimed that they had a weight difference of more than 10 pounds when compared with one year ago. Among these respondents, 68.9% claimed that they had a weight increase.

During the 12 months prior to the survey, close to three-tenths (29.0%) of the respondents had done something deliberately to control their weight, of which 53.8% of them aimed to lose weight. Among those respondents who had done something deliberately to control their weight, the most commonly used methods to control weight were 'doing physical exercise' (85.5%) and 'changing dietary habit' (72.6%).

Exercise/physical activities

This survey revealed that most respondents engaged in limited physical activity. Over half of the respondents had not engaged in any moderate exercise (54.7%) or vigorous exercise (67.4%) for at least 10 minutes a day during the week prior to the survey. On the other hand, walking was the most common form of physical activity and 70.1% of the respondents had spent at least 10 minutes on walking everyday in the week prior to the survey. The survey also revealed that respondents had spent long hours sitting during the day, as shown by an average of 6.2 hours per day during weekdays (Monday to Friday) in the week prior to the survey.

Based on the categorical scoring of the International Physical Activity Questionnaire (IPAQ) analysis, most of the respondents' level of physical activity was classified as 'moderate' (54.7%) or 'low' (22.3%). The proportion of respondents having 'high' level of physical activity was 23.0%. Females, respondents aged 35-44, those with education level of completed secondary education or above and clerks were more likely to have 'low' level of physical activity than their respective counterparts.

Regarding the self perception of respondents' physical activity level, about half of the respondents (49.0%) considered that their physical activity level was 'low' and 42.8% considered it was 'moderate'. Among these respondents, their major barrier for not having more physical activity was 'lack of time/too busy' (51.1%), followed by 'laziness' (18.3%), 'poor health' (6.9%) and 'too tired' (5.9%).

Dietary habits

Most respondents (81.8%) had eaten vegetables on a daily basis while over half of the respondents (52.5%) had taken fruit everyday. However, the average daily intake of fruit and vegetables by the respondents was only 3.5 servings (excluding juice). Moreover, regular fruit/vegetable juice consumption was found to be uncommon amongst respondents, as only 4.6% of the respondents drank fruit/vegetable juice daily.

Around one-fifth of the respondents (including juice: 22.4%; excluding juice: 21.8%) had a daily average intake of 5 or more servings of fruit and vegetables in the week prior to the survey. Males, younger respondents (aged 18-34 years) and never married respondents were less likely to have consumed at least the recommended 5 servings of fruit and vegetables a day than their respective counterparts.

Pattern of alcohol consumption

About three-tenths of the respondents (29.7%) were drinkers who had drunk at least one alcoholic drink during the month prior to the survey. On the whole, drinking was more prevalent among males, those with tertiary education level or above, managerial/professional workers and those with monthly household income of $40,000 or above.

Among the drinkers in this survey, 28.0% of them reported that they had engaged in binge drinking (drinking 5 or more glasses/cans of alcohol on one occasion) at least once in the month prior to the survey. Binge drinking was more common among males, those aged 25-34, those not completed secondary education or those with a matriculation education level, divorced/separated/widowed respondents and service workers.

According to the British guidelines on safe drinking, 29.2% of the drinkers were found to have exceeded the recommended low risk level. Males, divorced/separated/widowed, service workers and those drinkers with lower education level were more likely to exceed the low risk level.

Smoking habits

16.3% of the respondents were smokers at time of this survey. Among them, the vast majority (94.9%) were daily smokers. A relatively higher proportion of smokers who reported smoking more than 20 cigarettes a day were found amongst males, those aged 55-64, those with primary education level or below, married respondents, blue collar workers and those with monthly household income of below $8,000.

General health status

38.0% of respondents claimed that their general health status was ‘good’, ‘very good’ or ‘excellent’ whereas 7.6% claimed that their general health status was ‘poor’.

Slightly more than one-third (34.4%) of the respondents considered that their health condition was ‘better’ or ‘much better’ when compared with people of their own age. On the other hand, 13.2% of respondents considered that their health condition was ‘worse’ or ‘much worse’ than those of their age.

Overall, 16.1% of respondents reported that their current health condition was ‘better’ or ‘much better’ when compared with 12 months ago. In contrast, over one-fifth (23.4%) of the respondents claimed that their current health condition was ‘worse’ or ‘much worse’.

Cervical screening

Near two-thirds (64.1%) of the female respondents reported that they had had a cervical smear before. Females aged below 35, those with matriculation education level or above, never married respondents and those with monthly household income of below $8,000 were less likely to have had a cervical smear than their counterparts.

Among those females who had had a cervical smear before, 87.4% reported having a cervical smear more than one time. Among these respondents, more than three quarters (77.9%) of them had a habit of regular cervical screening. Female respondents with primary education level or below, divorced/separated/widowed respondents and those with lower monthly household income were less likely to have regular screening.

Also, 70.9% of all female respondents claimed that they planned to have a cervical smear within the next three years.

Food handling practices

‘Wash all food thoroughly before cooking, especially seafood’ was the practice which the most respondents complied with (79.0% mentioned ‘all of the time’), followed by ‘cook/reheat food thoroughly, including seafood’ (72.7% mentioned ‘all of the time’), ‘wash your hands before handling food’ (69.7% mentioned ‘all of the time’) and ‘keep raw and cooked food separately’ (66.9% mentioned ‘all of the time’). Male respondents, those aged 18-24 and never married respondents were less likely to have conformed to these food handling practices.

Hand hygiene

Except for the practice of 'wash hands after going to the toilet', most respondents did not have good practices of hand hygiene. During the three days prior to the survey, less than three-fifths of the respondents reported that they had always 'washed hands before eating or handling food' (59.6%), always used liquid soap to wash hands (37.8%) and always 'washed hands after coughing or sneezing' (23.6%). Males and never married respondents and blue collar workers were less likely to have a good practice of hand hygiene.

Oral health practices

As regards oral health practice, most respondents (81.2%) brushed their teeth at least twice a day. However, the use of dental floss appears to be less popular as almost two-thirds (64.3%) of the respondents never used or did not currently use it. Males, those with primary education level or below, blue collar workers and those with monthly household income of below $8,000 were more likely not to use dental floss.

Besides, more than half (55.8%) of the respondents reported that they did not have regular dental checkups. These respondents were more likely to be males, those aged 18-24, those less educated, blue collar workers and those with lower monthly household income.

In general, 29.7% of respondents considered that their general oral health status was 'good' or 'very good'.

Stress management

Leisure activities (22.2%), exercise (15.9%) and listening to music (12.7%) were the most commonly used methods to cope with stress.

Recommendations

Some recommendations based on the survey findings are suggested below:

1. The importance of maintaining normal body weight, engaging in regular physical activity and having adequate daily fruit and vegetables consumption needs to be further emphasized. Using the Asian standard of WHO classification, more than three-fifths of the 'underweight' respondents considered themselves as 'just right' (59.5%) or 'overweight' (3.6%). Furthermore, the survey results showed that most of the respondents were physically inactive, about one-third (32.6%) of the respondents claimed that they spent at least one day in the week prior to the survey on vigorous physical activities and less that half (45.3%) engaged in moderate physical activities. This survey also revealed that respondents' daily consumption of fruit and vegetables was still far from satisfactory, only about one-fifth of the respondents (including juice: 22.4%;

excluding juice: 21.8%) had a daily average intake of five or more servings of fruit and vegetables in the week prior to the survey. Frequent and extensive promotion should be provided to educate the community about:

i. proper assessment of body weight status, such as using the Body Mass Index (BMI);

ii. proper methods of maintaining normal body weight, such as increased physical activity and having healthy diets;

iii. the benefits of regular physical activity, such as reducing the risk of developing various chronic diseases; and

iv. increasing the daily intake of fruit and vegetables to at least 5 servings a day.

2. Close to three-tenths of drinkers (29.2%) had their drinking habit exceeding the low risk level. Promotion of sensible drinking should be particularly targeted at male drinkers, those divorced/separated/widowed, service workers and those with lower education level.

3. Generally, respondents had poor practices of hand hygiene. The findings revealed that less than a quarter (23.6%) of the respondents had always washed hands after coughing or sneezing and less than two-fifths (37.8%) had always used liquid soap to wash hands, especially males, those never married and blue collar workers. More education about hand hygiene should be provided to these groups of people.

4. Using dental floss is not a common practice for many respondents. It was observed that only about a quarter (24.8%) of the respondents used dental floss regularly. The Government should emphasize the importance of oral hygiene including the use of dental floss in preventing oral diseases and periodontal problems.

5. It is essential to identify factors which attribute to the disparities of health related behaviour among segments of the population, including differences that occur across gender, age, education level, marital status, occupation and income level. It is important to address the extent of health problems affected by unhealthy behavioural practices which may not only be related to personal characteristics but also to some socio-economic and environmental factors. Health promotion programmes should therefore take such underlying factors into account and strategic plans should be formulated to enhance awareness of certain groups of people on the relevant areas that need to be improved.

Chapter 1 Introduction

The Social Sciences Research Centre of the University of Hong Kong (SSRC) was commissioned by the Department of Health in April 2006 to conduct a survey on behavioural risk factors. This survey aimed to detect changes in health risk and behaviour as well as to collect further information on the health related behavioural issues among the Hong Kong population. This will provide information to facilitate the planning, implementation and evaluation of health promotion programmes on the prevention of diseases related to lifestyle and behaviour.

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Chapter 2 Research Methodology

2.1 Sampling method

Telephone interview by using CATI (Computer Assisted Telephone Interview) was adopted. A random sample was drawn from 32 000 residential telephone numbers. These numbers were generated from the 2003 English residential telephone directory[1] by dropping the last digit, removing duplicates, adding all 10 possible final digits, randomizing order, and selecting as needed. This method provides an equal probability sample that covers unlisted and new numbers but excludes large businesses that used blocks of at least 10 numbers[2].

Where more than one eligible person resided in a household and more than one was present at the time of the telephone contact, the 'Next Birthday' rule was applied to each successful contacted residential unit, i.e., the household member who had his/her birthday the soonest was selected. This reduces the over-representation of housewives in the sample.

2.2 Target respondents

Eligible respondents were residents in different districts of Hong Kong aged between 18 and 64. They were Cantonese, Putonghua or English speaking. Domestic helpers were excluded.

2.3 Questionnaire design

A bilingual (Chinese and English) questionnaire with 54 pre-coded questions and 16 open-ended questions (with 9 demographics questions) was designed to cover the following 13 areas:

- Body height, weight and waist circumference
- Weight control
- Pattern of physical activity
- Prevalence of adequate/inadequate juice, fruit and vegetable consumption
- Pattern of alcohol consumption
- Smoking habits
- General health status
- Cervical screening (for female respondents only)
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[1] The Chinese residential telephone directory was not used because the total number of telephone contacts is less than the English residential telephone directory. This process has a lower response rate than pure directory sampling which does not cover unlisted and new numbers.

[2] This selection process includes some business and fax numbers so that the contact rate is lower than a pure directory sample.

A copy of the questionnaire is enclosed in Annex A.

2.4 Pilot study

A pilot study comprising 60 successfully completed interviews was conducted on 17th March 2006 to test the length, logic, wording and format of the questionnaire. The data collected from these pilot interviews were not counted as part of the survey report.

2.5 Fieldwork

Fieldwork took place between the 6th April and 15th May 2006. Because of the briefing, telephone calls were made between 8:30 p.m. and 10:30 p.m. on 6th April. From 7th to 28th April, 2nd to 12th May and 15th May, telephone calls were made between 4:30 p.m. and 10:30 p.m. For 30th April and 13th May, telephone calls were made between 2:00 p.m. and 6:00 p.m.

2.6 Response rate

A total of 26 870 telephone numbers were attempted. The number of successful interviews was 2 047. Refusal and dropout cases amounted to 791. All 'not available' (5 979), and 'no answer' (5 707) cases were attempted three times before being classified as non-contact cases. The contact rate was 42.4%[3] and the overall response rate was 72.1%[4]. Table 2.6 details the breakdown of telephone contact status.

Table 2.6: Final status of telephone numbers attempted

Type	Final status of contacts[5]	Number of cases
1	Success	2 047
2	Drop-out	153
3	Refusal	638
4	Language problems	45
5	Not eligible	536
6	Business lines	2 001
7	Not available	5 979
8	Busy tone	543

[3] Contact rate = the number of answered telephone calls divided by the total number of calls attempted, i.e. from Table 2.6, Sum of (types 1 to 7) / Total = (2 047+153+638+45+536+2 001+5 979)/26 870 = 42.4%.

[4] Response rate = the number of successful interviews divided by the sum of the numbers of successful interviews, drop-out cases and refusal cases, i.e. from Table 2.6, (type 1) / (type 1 + type 2 + type 3) = 2 047/(2 047+153+638)=72.1%.

[5] 'Drop-out': eligible respondents who initially accepted the interview but failed to complete the interview due to some reasons. 'Refusal': eligible respondents who refused the interview. 'Language problems': eligible respondents who were not able to speak clearly in any of our 3 languages. 'Not available': eligible respondents were busy at the time of telephone contact. 'Invalid': not a valid telephone line (because we used a random method to generate telephone numbers, see section 2.1).

9	No answer	5 707
10	Fax/data lines	1 265
11	Invalid	7 956
TOTAL		**26 870**

2.7 Sample size and sample error

A sample size of 2 047 successful interviews was achieved (the target sample size was 2 000). The width of a 95% confidence interval is at most +/– 2.2%[6]. This means that we can have 95% confidence that the true population proportion falls within the sample proportion plus or minus 2.2%. For example, 80% of the respondents in the sample claimed that their weights differed by more than 10 pounds when compared with one year ago. Then the conservative 95% confidence interval for the true percentage of the population stating a weight difference for the above question falls between 80% ± 2.2%, i.e. 77.8% and 82.2%.

2.8 Quality control

All SSRC interviewers were well trained in a standardized approach prior to the commencement of the survey. All interviews were conducted by experienced interviewers fluent in Cantonese, Putonghua and English.

The SSRC engaged in quality checks for each stage of the survey to ensure satisfactory standards of performance. At least 15% of the questionnaires completed by each interviewer were checked by the SSRC independently.

2.9 Data processing and statistical analysis

This survey revealed some differences in gender and age proportions when compared with the Hong Kong population data compiled by the Census and Statistics Department (C&SD) for end-2005. The proportions of respondents among age groups 18-24, 50-54 and 60-64 were higher than the population while the proportions of respondents aged 25-29 and 30-34 years old were lower. The sample also contained a higher percentage of females when compared with the population. Table 2.9a shows the differences in terms of age and gender.

[6] As the population proportion is unknown, 0.5 is put into the formula of the sampling error to produce the most conservative estimate of the sampling error. The confidence interval width is:

$$\pm 1.96 \times \sqrt{\frac{0.5 \times 0.5}{2\,047}} \times 100\% = 2.2\%$$

Table 2.9a: Distribution differences of age and gender between this survey and the Hong Kong population data compiled by the C&SD for end-2005

Age Group	This survey			Hong Kong population data – from the C&SD (end 2005)*		
	Male	**Female**	***Total***	**Male**	**Female**	***Total***
	% of Total	% of Total	*% of Total*	% of Total	% of Total	*% of Total*
18-24	**8.38**	**9.09**	*17.47*	**6.46**	**6.63**	*13.10*
25-29	**2.88**	**3.58**	*6.46*	**4.61**	**5.25**	*9.86*
30-34	**3.23**	**4.90**	*8.13*	**5.01**	**6.61**	*11.61*
35-39	**4.85**	**7.87**	*12.72*	**5.37**	**7.28**	*12.65*
40-44	**5.00**	**9.69**	*14.69*	**6.50**	**7.91**	*14.41*
45-49	**4.90**	**8.83**	*13.73*	**6.79**	**7.14**	*13.93*
50-54	**4.24**	**7.98**	*12.22*	**5.32**	**5.53**	*10.85*
55-59	**3.58**	**4.85**	*8.43*	**4.39**	**4.27**	*8.66*
60-64	**2.62**	**3.53**	*6.16*	**2.60**	**2.33**	*4.93*
Total	**39.68**	**60.32**	*100.00*	**47.05**	**52.95**	*100.00*

**Provisional figures obtained from the C&SD*

In view of the demographic differences between this sample and the population, weighting was applied to gender and age in order to make the results more representative of the general population. The weights are the ratio of the age and gender distribution of the population to that of this sample (Table 2.9b).

Table 2.9b: Weights by age and gender applied in the analyses

Age	Male	Female
18-24	0.771288739	0.730095498
25-29	1.601881203	1.464567027
30-34	1.550235730	1.348933190
35-39	1.107796500	0.924203489
40-44	1.301095068	0.816092324
45-49	1.387173976	0.808255314
50-54	1.255377340	0.693214634
55-59	1.224587013	0.881906221
60-64	0.990050049	0.658599971
Age data missing	1.000000000	1.000000000

Statistical tests were applied to study the significant differences between sub-groups. Associations between selected demographic information and responses of selected questions were examined. Significance testing was conducted at the 5% level (2-tailed). The statistical software, SPSS for Windows version 13.0, was used to perform all statistical analyses.

Chapter 3 Findings of the Survey

This chapter presents the findings of this survey after weighting for gender and age. Some percentages in the figures may not add up to the total or 100% because of rounding.

3.1 Demographics

This section briefly describes the characteristics of respondents in this survey (Table 3.1).

3.1.1 Gender and age

Weighting was applied to gender and age in the survey such that the distribution of gender and age reported in Table 3.1 matches the Hong Kong population data compiled by the C&SD for end-2005 (Table 2.9a).

3.1.2 Marital status

More than half (54.3%) of all respondents were married with child/children and 8.2% were married without child. Around one-third (31.6%) were never married, while 4.6% were divorced or separated. Only 1.2% of respondents were widowed.

3.1.3 Educational attainment

A larger proportion of the respondents had an education level of secondary or above. 38.6% had either completed secondary (F.5) or matriculation. 29.8% attained tertiary education or above while the rest (31.6%) had an education level of lower secondary or below.

3.1.4 Occupation

35.0% of respondents were not working. This included 8.3% students and 16.8% homemakers, 5.6% unemployed and 4.3% retired persons or other non-working persons.

For working respondents, the largest portion was clerks (13.9%), followed by service workers (9.3%) and associate professionals (8.2%).

3.1.5 Income

Most of the respondents had a monthly personal income of less than $20,000 (37.9% had a monthly personal income of $10,000-$19,999 and 32.6% had a monthly personal income of below $10,000).

Regarding the monthly household income, a larger proportion of the respondents were had income of $10,000-$19,999 (29.5%), followed by $30,000-$49,999 (20.8%) and $20,000-$29,999 (20.2%).

Table 3.1: Demographic information (D1 – D9)[7]

Gender	**Base =2 047**
Male	46.2%
Female	53.8%

Age	**Base = 1 981**
18-24	13.1%
25-29	9.9%
30-34	11.6%
35-39	12.6%
40-44	14.4%
45-49	13.9%
50-54	10.9%
55-59	8.7%
60-64	4.9%

Marital Status	**Base = 2 040**
Never married	31.6%
Married and with child(ren)	54.3%
Married and without child	8.2%
Divorced/ separated	4.6%
Widowed	1.2%

Educational Attainment	**Base = 2 044**
Primary or below	13.1%
Had not completed secondary	18.5%
Completed secondary (F.5)	30.3%
Matriculation	8.3%
Tertiary or above	29.8%

Occupation	**Base = 2 022**
Employer/ Manager/ Administrator	7.5%
Professional	7.6%
Associate professional	8.2%
Clerk	13.9%
Service worker	9.3%
Shop sales worker	2.2%
Skilled agricultural/ fishery worker	0.7%
Craft and related worker	5.2%
Plant and machine operator and assembler	4.5%
Unskilled worker	5.9%
Student	8.3%
Home-maker	16.8%
Unemployed person	5.6%
Retired person or other non-working person	4.3%

Monthly Personal Income	**Base =1 197**
Below $ 10,000	32.6%
$10,000-$19,999	37.9%
$20,000-$29,999	14.5%
$30,000-$49,999	9.6%
$50,000 or above	5.5%

Monthly Household Income	**Base =1 603**
Below $ 10,000	14.1%
$10,000-$19,999	29.5%
$20,000-$29,999	20.2%
$30,000-$49,999	20.8%
$50,000 or above	15.4%

[7] Refer to the question number in the survey questionnaire, see Annex A.

3.2 Body weight control

Fifteen questions were asked in this section to ascertain the respondents' height, weight, waist circumference and their weight controlling methods. According to respondents' reported height and weight, their Body Mass Index (BMI) was derived and classified to assess their weight status according to the World Health Organization (WHO) classifications (both European and Asian Standards).

Those respondents with a body height out of the suggested range 100-190cm or body weight out of the suggested range 37-120kg were treated as outliers and excluded from height, weight and BMI analyses. In addition, respondents who were pregnant at the time of the interviews were classified as outliers and were excluded from analyses in sections 3.2.1 to 3.2.9 also. A total of nine cases including four pregnant women were treated as outliers. Furthermore, eighty cases were excluded from the BMI analyses due to missing data for height or weight.

3.2.1 Height (when not wearing shoes)

The height of respondents when not wearing shoes ranged from 130.0 to 187.5cm. More than one-third (37.7%) of the respondents were within the range from 160.0 to less than 170.0cm, followed by 35.3% in the range from 150.0 to less than 160.0cm. The overall mean and median heights were 162.7cm and 162.0cm respectively (Table 3.2.1).

Table 3.2.1: Height distribution of respondents (percentage, mean and median) (Q1a)

Height (cm)	**Number**	**% of Total**
Less than 150.0	53	2.6%
150.0 – <160.0	705	35.3%
160.0 – <170.0	753	37.7%
170.0 – <180.0	414	20.7%
180.0 or above	74	3.7%
Total	***1 998****	***100.0%***
Other statistics	**cm**	
Mean	162.7	
Median	162.0	

**All respondents excluding outliers, 'don't know' and refusal*

3.2.2 Weight (wearing light clothes)

The weight of respondents when wearing simple clothes ranged from 38.2 to 113.6kg. More than one-third of the respondents (37.3%) fell into the weight range from 50.0 to less than 60.0kg, followed by 25.0% of the respondents in the range from 60.0 to less than 70.0kg. The overall mean and median weights were 60.4kg and 59.0kg respectively (Table 3.2.2).

Table 3.2.2: Weight distribution of respondents (percentage, mean and median) (Q1b)

Weight (kg)	Number	% of Total
Less than 40.0	6	0.3%
40.0 – <50.0	324	16.2%
50.0 – <60.0	744	37.3%
60.0 – <70.0	498	25.0%
70.0 – <80.0	284	14.2%
80.0 or above	139	7.0%
Total	***1 996****	***100.0%***
Other statistics	**kg**	
Mean	60.4	
Median	59.0	

**All respondents excluding outliers, 'don't know' and refusal*

3.2.3 Waist circumference

The waist circumference of the respondents ranged from 52.5 to 110.0cm. Close to two-fifths (38.5%) of the respondents had their waist circumference in the range from 70.0 to less than 80.0 cm (38.5%), followed by 29.3% in the range from 60.0 to less than 70.0cm. The overall mean and median waist circumferences were 74.1 and 72.5cm respectively (Table 3.2.3).

Table 3.2.3: Waist circumference distribution of respondents (percentage and mean, median) (Q1c)

Waist circumference (cm)	Number	% of Total
Less than 60.0	20	1.0%
60.0 – <70.0	576	29.3%
70.0 – <80.0	757	38.5%
80.0 – <90.0	511	26.0%
90.0 or above	102	5.2%
Total	***1 966****	***100.0%***
Other statistics	**cm**	
Mean	74.1	
Median	72.5	

**All respondents excluding outliers, 'don't know' and refusal*

3.2.4 Body Mass Index (BMI)

BMI scores were derived from weight and height by the following formula:

BMI = body weight (kg) / [height (m)]^2

3.2.5 Weight status by WHO classification

According to WHO's standard European and Asian classification of weight status, respondents were classified into four categories of weight status as in Table 3.2.5a and Table 3.2.5b respectively.

Based on the European standard, two-thirds of the respondents (66.0%) were classified as 'normal'. 20.8% of respondents were classified as 'overweight' and 3.5% were classified as 'obese'. In addition, about one-tenth (9.6%) of the respondents were regarded as 'underweight'.

Using the Asian standard, slightly less than half of the respondents (47.6%) were considered as 'normal'. About one quarter (24.4%) of the respondents were considered as 'obese' and 18.4% were regarded as 'overweight'. The rest (9.6%) was considered as 'underweight'.

Table 3.2.5a: WHO classification for weight status (European standard) (Q1a, Q1b)

Weight status by WHO classifications	BMI score	Number	% of Total
Underweight	BMI < 18.5	189	9.6%
Normal	BMI 18.5 – <25.0	1 295	66.0%
Overweight	BMI 25.0 – <30.0	409	20.8%
Obese	BMI ≥ 30.0	69	3.5%
	Total	***1 962****	***100.0%***

**All respondents excluding outliers and missing data for height or weight*

Table 3.2.5b: WHO classification for weight status (Asian standard) (Q1a, Q1b)

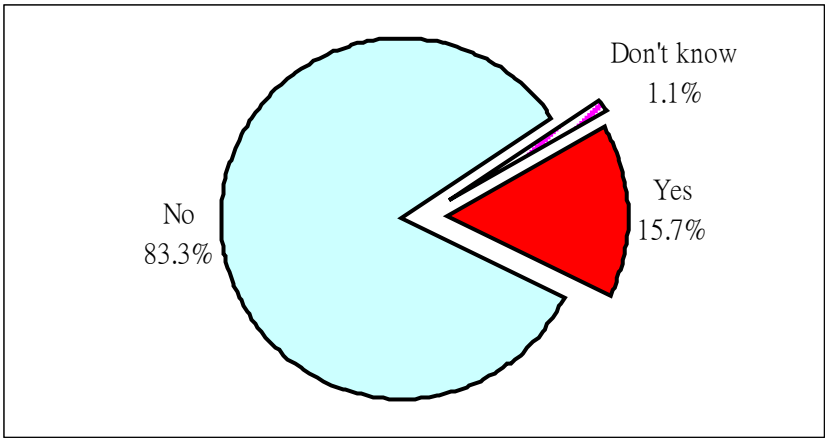
Weight status by WHO classifications	BMI score	Number	% of Total
Underweight	BMI < 18.5	189	9.6%
Normal	BMI 18.5 – <23.0	934	47.6%
Overweight	BMI 23.0 – <25.0	361	18.4%
Obese	BMI ≥ 25.0	478	24.4%
	Total	***1 962****	***100.0%***

**All respondents excluding outliers and missing data for height or weight*

3.2.6 Weight difference from one year ago

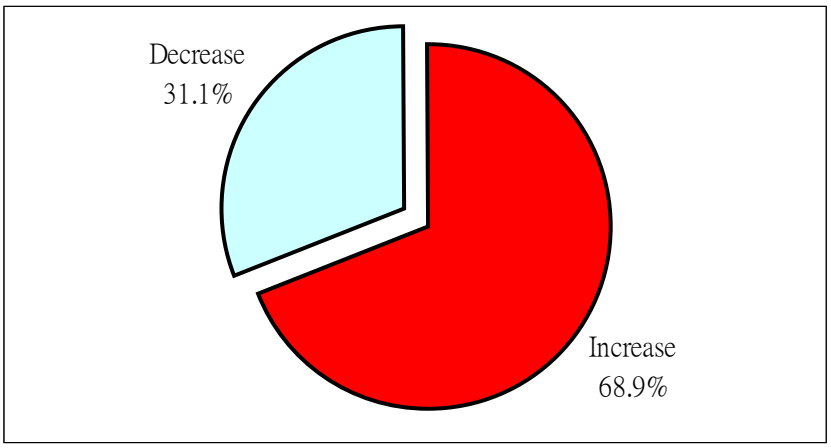
When respondents were asked whether they had a weight difference of more than 10 pounds when compared with one year ago, more than four-fifths (83.3%) of them did not report such a difference and 15.7% did so (Fig. 3.2.6a). Among those who had such a weight difference, 68.9% claimed that they had a weight increase while the rest (31.1%) reported that they had a weight reduction of more than 10 pounds (Fig. 3.2.6b).

Fig. 3.2.6a: Weight differed by more than 10 pounds when compared with one year ago (Q2a)



Base: All respondents excluding outliers = 2 037

Fig. 3.2.6b: Weight increased or decreased by more than 10 pounds when compared with last year (Q2b)



Base: Respondents who had a weight difference of more than 10 pounds when compared with one year ago = 319

3.2.7 Perception of current weight status

Slightly more than half of the respondents (50.7%) perceived their current weight status as 'just right'. 41.5% considered themselves as 'overweight' and only 7.8% considered themselves as 'underweight' (Table 3.2.7a).

Table 3.2.7a: Perception of current weight status (Q3)

Perception of current weight	Number	% of Total
Overweight	843	41.5%
Just right	1 030	50.7%
Underweight	159	7.8%
Total	***2 032****	***100.0%***

** All respondents excluding outliers and 'don't know'*

Table 3.2.7b shows the differences of weight status between the classification of the WHO (Asian standard) and the respondents' perception. 50.3% of respondents considered that their weight status as 'just right', but in fact 47.6% of respondents were actually 'normal' under the WHO classification (Asian standard). On the other hand, 41.8% of respondents perceived themselves as 'overweight', but in fact 42.7% were classified as 'overweight' or 'obese' according to the WHO criteria (Asian standard).

Table 3.2.7b: Comparison of weight status between WHO classification (Asian standard) and respondents' perception of their current weight (Q1a, Q1b, Q3)

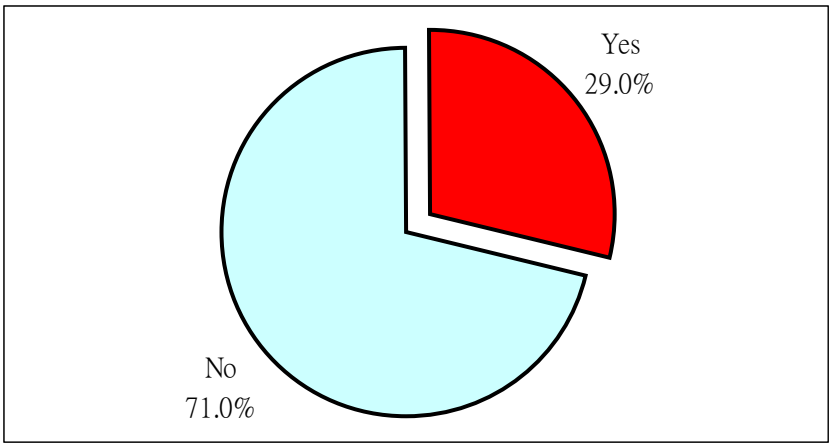
Cross-tabulation		Weight status by WHO classification (Asian standard)				
		Underweight	**Normal**	**Overweight**	**Obese**	***Total***
Respondents' perception of current weight	**Overweight**	7	215	199	398	**818**
	% of Total	0.3%	11.0%	10.1%	20.3%	**41.8%**
	Just right	112	641	156	76	**985**
	% of Total	5.7%	32.7%	7.9%	3.9%	**50.3%**
	Underweight	70	77	7	2	**155**
	% of Total	3.6%	3.9%	0.3%	0.1%	**7.9%**
	Total	**189**	**933**	**361**	**475**	**1 957**
	% of Total	**9.7%**	**47.6%**	**18.4%**	**24.3%**	**100.0%**

**All respondents excluding refusal, outliers and missing responses either in the question of perception about current weight or the weight status by WHO classification. The percentages of respondents' perception of current weight are slightly different from Table 3.2.7a since the bases are different*

3.2.8 Weight control

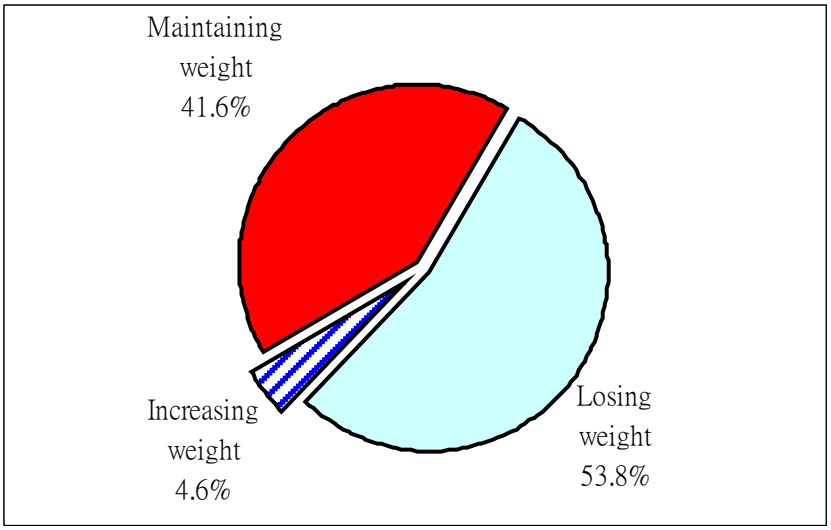
During the 12 months prior to the survey, close to three-tenths (29.0%) of the respondents had done something deliberately to control their weight (Fig. 3.2.8a). Among these respondents, 53.8% of them aimed to lose weight, 41.6% aimed to maintain weight and 4.6% reported trying to increase weight (Fig. 3.2.8b).

Fig. 3.2.8a: Controlling weight deliberately in 12 months prior to the survey (Q4a)



Base: All respondents excluding outliers = 2 037

Fig. 3.2.8b: Purpose of controlling weight (Q4b)

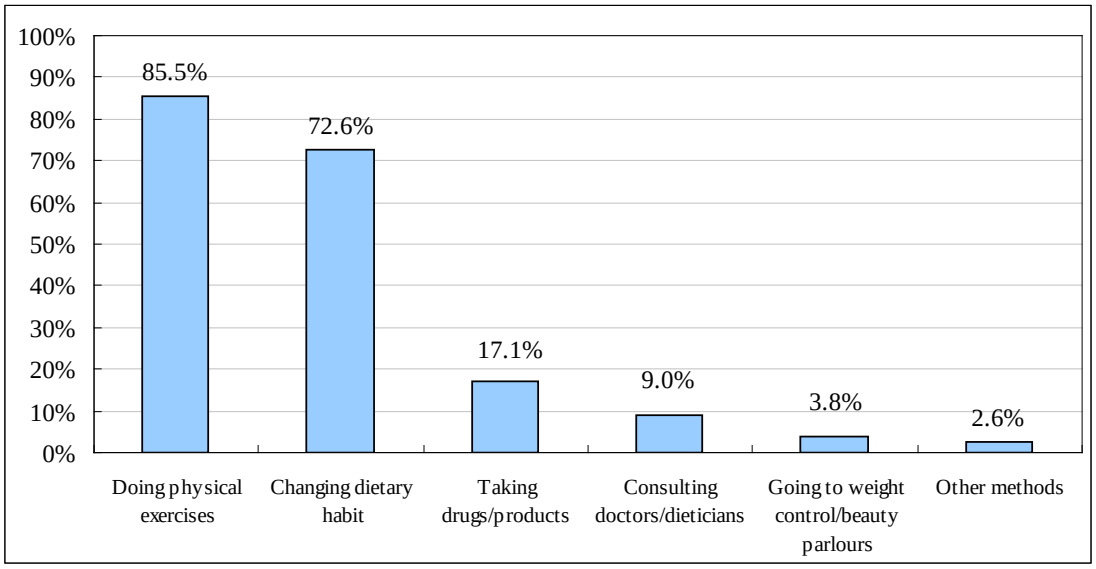


Base: Respondents who had deliberately controlled their weight = 591

3.2.9 Methods adopted to control weight

Among those respondents who had done something deliberately to control their weight, most of them considered that the methods to control their weight were 'doing physical exercises' (85.5%) and 'changing dietary habit' (72.6%). Other methods mentioned by respondents included 'taking drugs/products' (17.1%), 'consulting doctors/dieticians' (9.0%) and 'going to weight control/beauty parlours' (3.8%) (Fig. 3.2.9).

Fig. 3.2.9: Methods used to control weight (Q5a-f)



Base: Respondents who had deliberately controlled their weight = 591 (multiple responses)

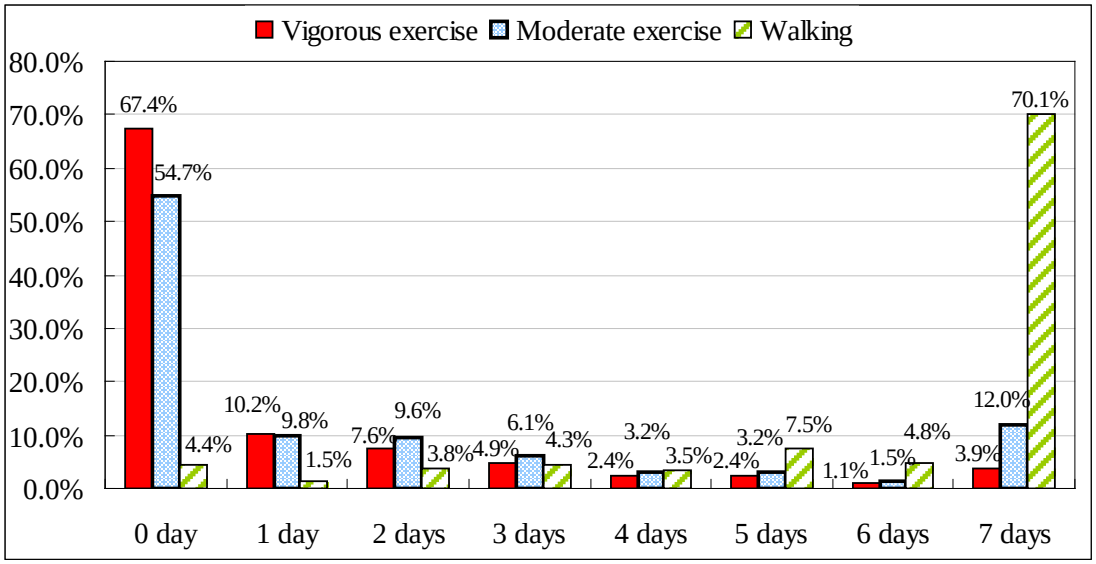
3.3 Physical activities/exercise

The questions about physical activities covered in this survey (see Annex A, Q6 – Q14) were adapted from the International Physical Activity Questionnaire (IPAQ) short form. Seven questions were asked to understand the frequency and duration with which respondents engaged in physical activities[8]/exercise. All the reported physical activities/exercise lasted for at least 10 minutes and was based on their experiences during the seven days prior to the survey.

3.3.1 Frequency of physical activities per week

On a weekly basis, walking was far more prevalent than vigorous and moderate physical activities. During the seven days prior to the survey, 70.1% of respondents spent at least 10 minutes walking every day. On the other hand, about one-third (32.6%) of the respondents claimed that they spent at least one day on vigorous physical activities in the week prior to the survey and less than half (45.3%) of the respondents engaged in moderate physical activities (Fig. 3.3.1a).

Fig. 3.3.1a: Number of days per week spent on doing each type of physical activities in the week prior to the survey (Q6, 8 & 10)



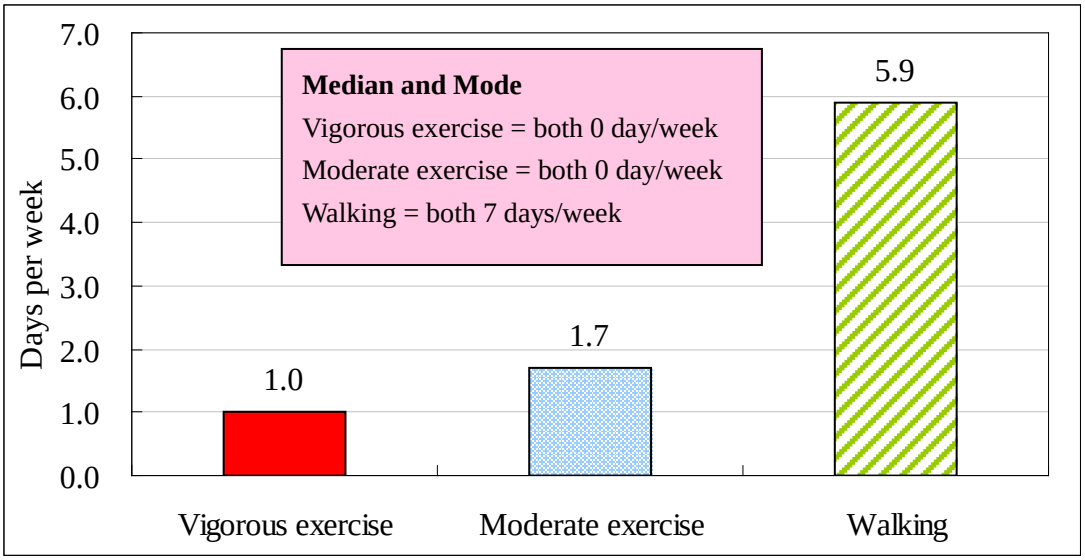
Base: All respondents excluding 'don't know' (Vigorous exercise = 2 047; Moderate exercise = 2 045; Walking = 2 044)

[8] Respondents were informed of the definitions of vigorous physical activities, moderate physical activities and walking. Vigorous physical activities are defined as those that make people breathe much harder than normal, for example aerobics, football, swimming, heavy physical work and jogging. Moderate physical activities are defined as those that make people breathe somewhat harder than normal, for example biking, washing cars/polishing, fast walking and cleaning windows. Walking includes walking to work or school, walking to travel from place to place and walking for leisure. All the questions about vigorous exercise, moderate exercise and walking only referred to those activities on which the respondents had spent at least 10 minutes at a time.

Fig. 3.3.1b shows the weekly average, i.e., the average number of days during the seven days prior to the survey engaged in walking, moderate or vigorous exercise/physical activities for at least 10 minutes.

On average, respondents spent 5.9 days on walking per week. In contrast, the average number of days spent on vigorous and moderate physical activities in a week was less frequent. The average number of days per week for these two physical activities was 1.0 and 1.7 respectively. Moreover, the median and mode values for vigorous and moderate physical activities were both zero days while those for walking were both seven days per week (Fig. 3.3.1b).

Fig. 3.3.1b: Weekly average number of days spent on different types of physical activities with median and mode (Q6, 8 & 10)



Base: All respondents excluding 'don't know' (Vigorous exercise = 2 047; Moderate exercise = 2 045; Walking = 2 044)

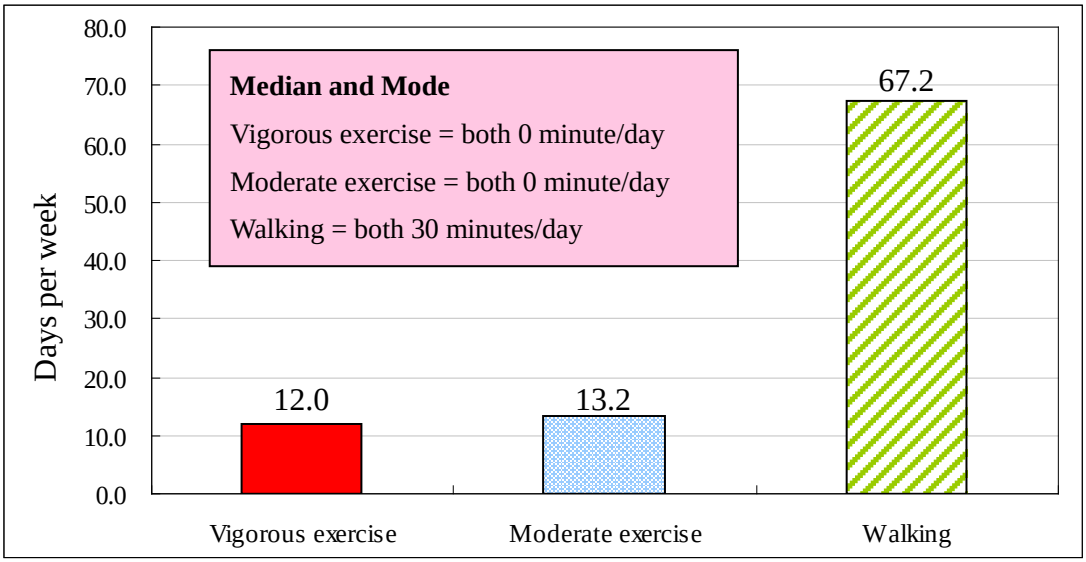
3.3.2 Daily average time spent on exercise/physical activities[9]

On average, respondents spent 12.0 minutes per day on vigorous physical activities, 13.2 minutes on moderate physical activities and 67.2 minutes on walking. The median and mode average time spent per day were both zero minute for vigorous and moderate physical activities and both were 30 minutes for walking (Fig. 3.3.2a).

It was observed that less than one-tenth of the respondents spent a daily average of 31 minutes or more on vigorous physical activities (7.8%) and moderate physical activities (9.3%). In contrast, 44.9% of respondents spent a daily average of 31 minutes or more on walking (Table 3.3.2b).

[9] The daily average minutes spent on each type of exercise was computed by multiplying the average number of days engaged in each type of exercise on a weekly basis and the average minutes of time spent on each type of exercise on those days they have done exercise and then divided by 7 days. Vigorous exercise: (Q6xQ7)/7; Moderate exercise: (Q8xQ9)/7; Walking: (Q10xQ11)/7.

Fig 3.3.2a: Daily average minutes spent on different types of exercise and median and mode (Q6, 7, 8, 9, 10 and 11)



Base: All respondents excluding 'don't know' (Vigorous exercise = 2 039; Moderate exercise = 2 029; Walking = 1 986)

Table 3.3.2b: Daily average time spent on doing different types of exercise (Q6, 7, 8, 9, 10 and 11)

Minutes	Vigorous exercise		Moderate exercise		Walking	
	Number	% of Total	Number	% of Total	Number	% of Total
Below 10	1 619	79.4%	1 489	73.4%	237	12.0%
10 – <16	77	3.8%	142	7.0%	207	10.4%
16 – <31	182	8.9%	209	10.3%	648	32.6%
31 – <61	74	3.6%	105	5.2%	458	23.0%
61 or above	86	4.2%	83	4.1%	435	21.9%
Total	***2 039****	***100.0%***	***2 029****	***100.0%***	***1 986****	***100.0%***

**All respondents excluding 'don't know' (Vigorous exercise = 2 039; Moderate exercise = 2 029; Walking = 1 986)*

3.3.3 Sitting[10]

Respondents were asked how much time per day on average they spent on sitting during weekdays (Monday to Friday) in the week prior to the survey. Table 3.3.3 indicates that 53.1% of respondents sat for at least six hours per day. On weekdays (Monday to Friday), respondents spent an average of 6.2 hours on sitting per day. The median and mode were six and ten hours respectively.

[10] Sitting includes time spent sitting at work, at home, visiting friends, reading, travelling on public transport and lying down to watch television.

Table 3.3.3: Average time spent on sitting per day during weekdays in the week prior to the survey (percentage, mean, median and mode) (Q12)

Sitting Hours	Number	% of Total
Below 2	100	5.0%
2 – <4	376	19.0%
4 - <6	453	22.8%
6 - <8	322	16.2%
8 - <10	318	16.0%
10 or above	415	20.9%
Total	***1 985****	***100.0%***

Other statistics	Hours
Mean	6.2
Median	6.0
Mode	10.0

**All respondents excluding 'don't know' and outliers*

3.3.4 Analysis of the International Physical Activity Questionnaire

The analysis in this section is based on the guidelines for data processing and analysis of the International Physical Activity Questionnaire (IPAQ) – Short Form (revised November 2005)[11]. A copy of the guidelines is enclosed in Annex B. The age range of respondents of this survey (18-64) is within the age criteria of the IPAQ analysis, i.e., 15-69. The analysis of the IPAQ short form provides two indicators of physical activity, namely categorical and continuous indicators.

According to the IPAQ data processing and cleaning rules, eighty-seven cases were excluded from this part of analyses for being classified as outliers, 'don't know' and 'refusal'.

[11] This document for data processing and analysis of the IPAQ is available on the website: http://www.ipaq.ki.se.

3.3.4.1 Categorical scoring

The categorical score comprises three levels of physical activity, namely 'low', 'moderate' and 'High'[12]. Table 3.3.4.1 details the criteria of classification.

Table 3.3.4.1: Categorical scoring classification of physical activity

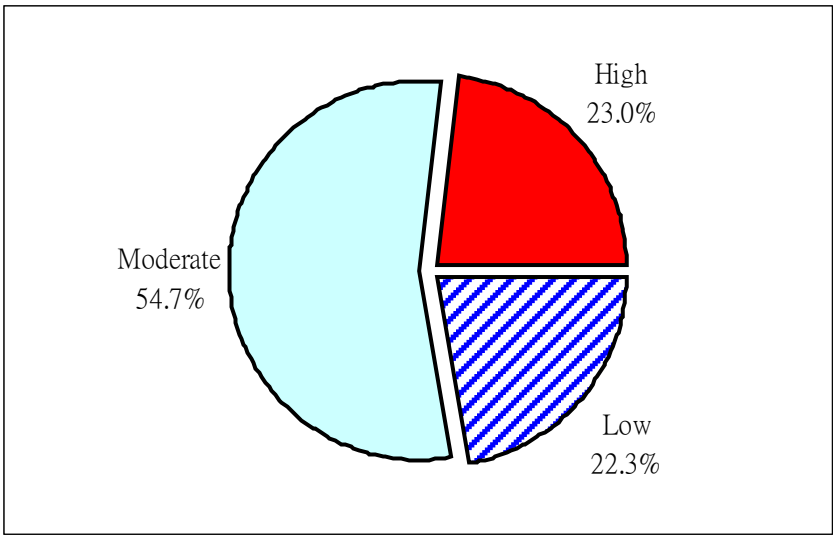
Level of physical activity	Categorical scoring classification criteria
Low	▪ No activity is reported OR ▪ Some activity is reported but not enough to meet categories 'Moderate' or 'High'
Moderate	Any one of the following 3 criteria ▪ 3 or more days of vigorous-intensity activity of at least 20 minutes per day OR ▪ 5 or more days of moderate-intensity activity or walking of at least 30 minutes per day OR ▪ 5 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum of at least 600 MET-min/week
High	Any one of the following 2 criteria ▪ Vigorous-intensity activity on at least 3 days and accumulating at least 1500 MET-minutes/week OR ▪ 7 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum of at least 3000 MET-minutes/week

Note: MET = multiples of resting metabolic rate
Source: Guidelines for data processing and analysis of the IPAQ – short form

[12] The current categories of IPAQ classification are "Low", "Moderate" and "High". The previous categories were known as "Inactive", "Minimally active" and "HEPA active".

According to the classification criteria listed in Table 3.3.4.1, more than half (54.7%) of the respondents were classified as having 'moderate' level of physical activity. In addition, the proportions of respondents having 'high' and 'low' level of physical activity were 23.0% and 22.3% respectively (Fig. 3.3.4.1).

Fig. 3.3.4.1: Classification of respondents' physical activity level (Q6-Q11)



Base: All respondents excluding 'don't know', 'refusal' and outliers according to the data processing rules of the IPAQ analysis guidelines = 1 960

3.3.4.2 Continuous scoring

Continuous scoring is another measurement of physical activity suggested in the IPAQ - short form guidelines. This is achieved by weighting each type of activity by its energy requirements defined in METs (METs are multiples of the resting metabolic rate) to yield a score in MET-minutes. A MET-minute score[13] is computed by multiplying the MET by the minutes performed. MET-minute scores are equivalent to kilocalories for a 60 kilogram person. Kilocalories can be computed from MET-minutes using the following equation: MET-minute x (weight in kilograms/60 kilograms). The selected MET values were derived from work undertaken during the IPAQ Reliability Study conducted in 2000-2001. This study yielded MET values for the three types of activity, namely 'walking'= 3.3 METs, 'moderate physical activity = 4.0 METs and 'vigorous physical activity' = 8.0 METs. These MET values are used for the continuous scoring analysis of IPAQ data in this part.

More specifically, the continuous score for each type of physical activity was computed according to the formula and examples in Table 3.3.4.2a.

[13] Source of information: Guideline for data processing and analysis of the IPAQ

Table 3.3.4.2a: Continuous score computation

MET-min per week for each activity	= (MET level) x (min of activity) x (events per week)
Total MET-min per week	= (Walk METs x min x days) + (Moderate PA METs x min x days) + (Vigorous PA METs x min x days)
Example:	***Given:*** *MET-min/week for 30 min episodes, 5 times/week, MET levels for walking = 3.3METs, Moderate PA= 4.0METs and Vigorous PA= 8.0METs*
MET-min/week for walking	= 3.3 x 30 x 5 = 495 MET-min/week
MET-min/week for Moderate PA	= 4.0 x 30 x 5 = 600 MET-min/week
MET-min/week for Vigorous PA	= 8.0 x 30 x 5 = 1,200 MET-min/week
Total MET-min/week	Total = 2 295 MET-min/week

Note: PA = physical activity
Source: Guidelines for data processing and analysis of the IPAQ – short form

As suggested by the IPAQ – short form guidelines, the continuous indicator is presented as median minutes or median MET-minutes rather than mean minutes or mean MET-minutes given the non-normal distribution of energy expenditure in many populations. However, median scores (unlike mean scores) are not additive, so the median score is not the sum of the median scores for each type of physical activity.

Table 3.3.4.2b shows the medians of the continuous scores for each type of physical activities. The medians for vigorous physical activity and moderate activity were both 0 while the median for walking was 693 MET-minutes per week. The median score of these three activities combined was 1 386 MET-minutes per week.

Table 3.3.4.2b: Medians of the IPAQ continuous score for each type of physical activity (Q6-Q11)

Statistics	Continuous Score (MET-minutes/week)			
	Vigorous exercise	Moderate exercise	Walking	**Total**
Median	0	0	693	1386

**All respondents excluding 'don't know', 'refusal' and outliers according to the data processing rules of the IPAQ analysis guideline (Vigorous exercise = 2 039; Moderate exercise = 2 029; Walking = 1 986)*

3.3.5 Perception of physical activity level

About half of the respondents (49.0%) considered their physical activity level was 'low' and 42.8% considered themselves as 'moderate'. On the other hand, 8.2% of respondents considered their physical activity level as 'high'. (Table 3.3.5a).

Table 3.3.5a: Perception of physical activity level (Q13)

Perception of physical activity level	Number	% of Total
Low	995	49.0%
Moderate	870	42.8%
High	167	8.2%
Total	***2 032****	***100.0%***

** All respondents excluding 'don't know'*

Table 3.3.5b shows the differences of physical activity level between the IPAQ classification and the respondents' perception. About half (49.1%) of the respondents considered that their physical activity level as 'low', but in fact 22.4% were actually 'low' under the IPAQ classification. In contrast, 7.7% of respondents considered 'high' compared to 23.0% were classified as 'high' according to the IPAQ classification.

Table 3.3.5b: Comparison of physical activity level between IPAQ classification and respondents' perception of physical activity level (Q6-Q11, Q13)

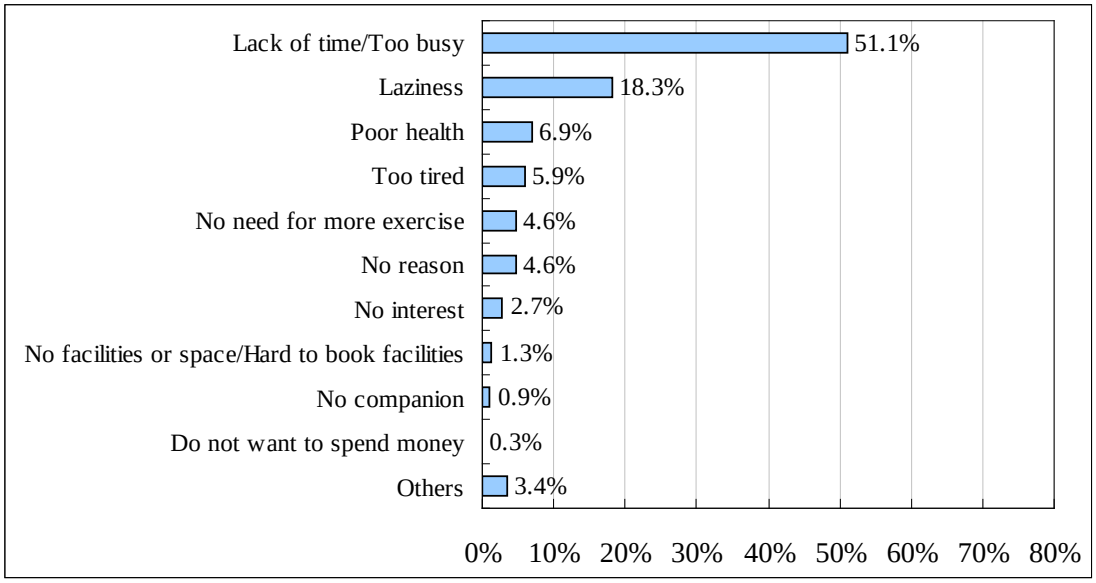
Cross-tabulation		Physical activity level by IPAQ classification			
		Low	**Moderate**	**High**	***Total***
Respondents' perception of physical activity level	**Low**	310	550	97	**957**
	% of Total	15.9%	28.2%	5.0%	**49.1%**
	Moderate	120	453	269	**842**
	% of Total	6.2%	23.2%	13.8%	**43.2%**
	High	5	62	83	**151**
	% of Total	0.3%	3.2%	4.3%	**7.7%**
	Total	**436**	**1 065**	**449**	**1 950**
	% of Total	**22.4%**	**54.6%**	**23.0%**	**100.0%**

**All respondents excluding refusal, outliers and missing responses either in the question of perception about physical activity level or the physical activity level by IPAQ classification. The percentages of respondents' perception of physical activity level are slightly different from Table 3.3.5a since the bases are different*

3.3.6 Major barrier for not having more physical activity

Among those who considered their physical activity level was 'moderate' or 'low', they were further asked their major barrier for not having more physical activity. More than half (51.1%) of them reported 'lack of time/too busy', followed by 'laziness' (18.3%), 'poor health' (6.9%) and 'too tired' (5.9%) (Fig. 3.3.6).

Fig. 3.3.6: Major barrier for not having more physical activity (Q14)



Base: Respondents who considered their physical activity level was 'moderate' or 'low' = 1 864

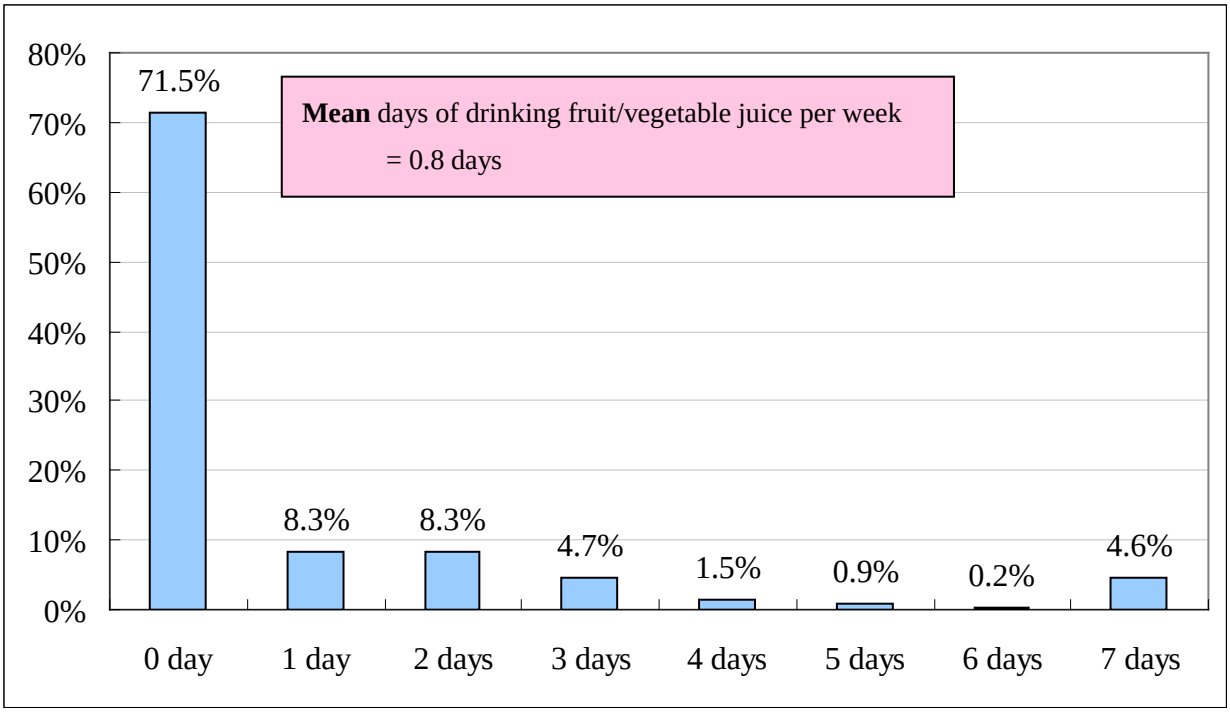
3.4 Dietary habits

Six questions were asked in this section to gauge respondents' dietary habits with particular reference to the consumption of fruit/vegetable juice[14], fruit and vegetables.

3.4.1 Frequency of consuming fruit/vegetable juice per week

Overall, 71.5% of the respondents did not consume any fruit/vegetable juice during the week prior to the survey. Only 4.6% of the respondents drank fruit/vegetable juice on a daily basis. The average days per week in which the respondents drank fruit/vegetable juice was 0.8 days (Fig 3.4.1).

Fig. 3.4.1: Number of days in the week when respondents drank fruit/vegetable juice (Q15a)



Base: All respondents excluding 'don't know' = 2 044

3.4.2 Amount of fruit/vegetable juice drunk per day

The vast majority (94.8%) of the respondents had drunk an average of less than one cup (250 ml) of fruit/vegetable juice per day in the week. The average number of cups of fruit/vegetable juice that respondents drank per day was 0.2 cups (about 50 ml). (Table 3.4.2)

[14] Fruit/vegetable juice refers to freshly squeezed juice or those labelled 100% or pure fruit/vegetable juice.

Table 3.4.2: Daily average amount of fruit/vegetable juice drunk (Q15a, Q15b)

Average no. of cups of fruit/vegetable juice drunk per day	No. of respondents	
	Number	% of Total
Less than 1	1 939	94.8%
1 – 2	90	4.4%
More than 2	16	0.8
Total	***2 044****	***100.0%***
Mean	0.2 cups	

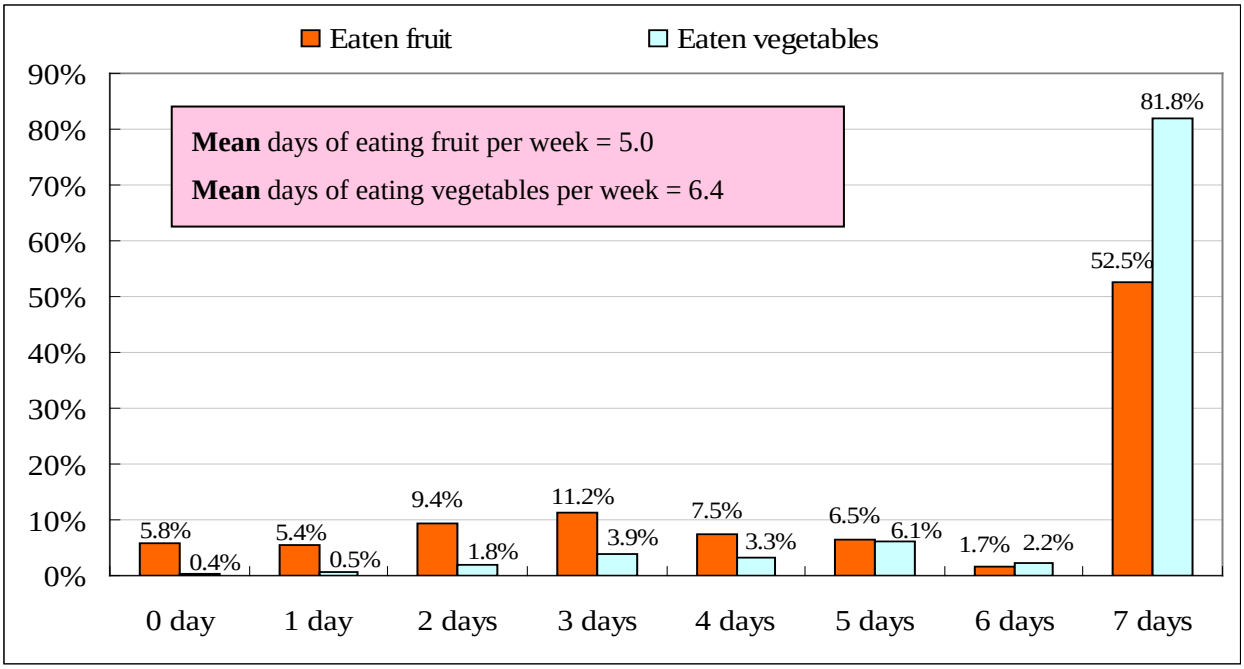
**All respondents excluding 'don't know'*

3.4.3 Frequency of consuming fruit and vegetables per week

On a daily basis, respondents consumed vegetables more frequently than fruit. Fig. 3.4.3 shows that more than four-fifths of the respondents (81.8%) had consumed vegetables everyday while slightly more than half of the respondents (52.5%) had eaten fruit on a daily basis. Similarly, the proportion of respondents consuming no fruit at all during the week (5.8%) was much higher than that for vegetables (0.4%) (Fig. 3.4.3).

The overall average number of days per week in which the respondents consumed vegetables was 6.4 days, which is more than the corresponding figure for consuming fruit (5.0 days).

Fig. 3.4.3 Number of days in the week when respondents ate fruit and vegetables (Q16a, Q17a)



Base: All respondents excluding 'don't know' (Eating fruit = 2 045, Eating vegetables =2 046)

3.4.4 Amount of fruit and vegetables eaten per day[15]

On average, nearly half of the respondents (44.6%) consumed less than one portion of fruit on a daily basis. In addition, less than one-third (29.8%) of the respondents ate less than one bowl of vegetables everyday on average. Overall, the daily average amount consumed was just 1.1 piece of fruit and 1.2 bowls of vegetables (Table 3.4.4).

Table 3.4.4: Daily average amount of fruit/vegetable eaten (Q16a, Q16b, Q17a and Q17b)

Average no. of fruit/bowl of vegetables eaten per day	No. of respondents			
	Fruit		Vegetables	
	Number	% of Total	Number	% of Total
Less than 1	910	44.6%	607	29.8%
1 – 2	1 003	49.2%	1 308	64.3%
More than 2	128	6.3%	118	5.8%
Total	***2 041****	***100.0%***	***2 033****	***100.0%***
Mean	1.1 fruit		1.2 bowls of vegetables	

**Base: All respondents excluding 'don't know' and 'refusal'*

3.4.5 The total number of servings of fruit and vegetables consumed per day

The WHO recommends that adults should eat at least five servings of fruit and vegetables per day or a daily intake of at least 400 grams of fruit and vegetables, to obtain optimal health benefits[16].

Total servings excluding fruit/vegetable juice

The number of servings of fruit and vegetables consumed per day was defined in this section as the sum of the average number of portions of fruit eaten per day and twice the average number of bowl of vegetables eaten per day (i.e. 1 piece of fruit was equated to 1 serving and 1 bowl of cooked vegetables was equated to 2 servings).

Only 21.8% of the respondents ate 5 or more servings of fruit and vegetables per day. The mean and median numbers of servings were 3.5 and 3.0 respectively (Table 3.4.5a).

[15] Respondents were informed that a portion of fruit was defined as one fruit equal in size to a medium sized apple or orange, one banana, two apricots or plums, or one bowl of small fruit like grapes or strawberries. A portion of vegetables was defined in terms of a bowl where one bowl refers to the size of a rice bowl. The average number of fruit eaten per day is calculated by: (the average number of days eating fruit per week x the average portion of fruit eaten on those days)/ 7. Similarly, the average number of bowls of vegetables eater per day is calculated by: (the average number of days eating vegetables per week x the average number of bowls of vegetable eaten on those days) / 7.

[16] Fruit, vegetables and NCD disease prevention. Geneva: World Health Organization; 2003. (http://www.who.int/dietphysicalactivity/media/en/gsfs_fv.pdf)

Table 3.4.5a: Number of servings of fruit and vegetables consumed per day (percentage, mean and median) (Q16a, Q16b, Q17a and Q17b)

No. of servings (excluding juice)	**No. of respondents**	
	Number	**% of Total**
Less than 3	872 (0 serving = 5)	42.9% (0 serving =0.3%)
3 - <5	716	35.3%
5 or above	443	21.8%
Total	***2 031****	***100.0%***
	No. of servings of fruit and vegetables eaten per day	
Mean	3.5 servings	
Median	3.0 servings	

**All respondents excluding 'don't know' and 'refusal' for either question*

Total servings including fruit/vegetable juice

The total number of servings of fruit and vegetables consumed per day was defined in this section as the sum of the average number of portions of fruit eaten per day and twice the average number of bowl of vegetables eaten per day (i.e. 1 piece of fruit was equated to 1 serving and 1 bowl of cooked vegetables was equated to 2 servings) and the average cups of fruit/ vegetable juice drunk per day (but fruit/vegetable juice only counted as 1 serving, regardless of how many cups of juice were drunk; less than 1 cup a day did not count[17]).

Overall, 22.4% of the respondents ate 5 or more servings of fruit and vegetables per day if fruit/vegetable juice was included in calculating the total servings per day. The mean and median numbers of servings were 3.5 and 3.0 respectively (Table 3.4.5b).

Table 3.4.5b: Number of servings of fruit and vegetables consumed per day (percentage, mean and median) (Q15a, Q15b, Q16a, Q16b, Q17a and Q17b)

No. of servings (including juice)	**No. of respondents**	
	Number	**% of Total**
Less than 3	851 (0 serving = 5)	41.9% (0 serving = 0.3%)
3 - <5	725	35.7%
5 or above	454	22.4%
Total	***2 030****	***100.0%***
	No. of servings of fruit and vegetables eaten per day	
Mean	3.5 servings	
Median	3.0 servings	

**All respondents excluding 'don't know', 'refusal' and outliers for either question*

[17] Juice (fruit or vegetable) only counted as 1 serving a day, regardless of how much is drunk, because it has very little fibre. It is also likely to lose some vitamins once juiced (particularly vitamin C, which is easily destroyed by light and air).

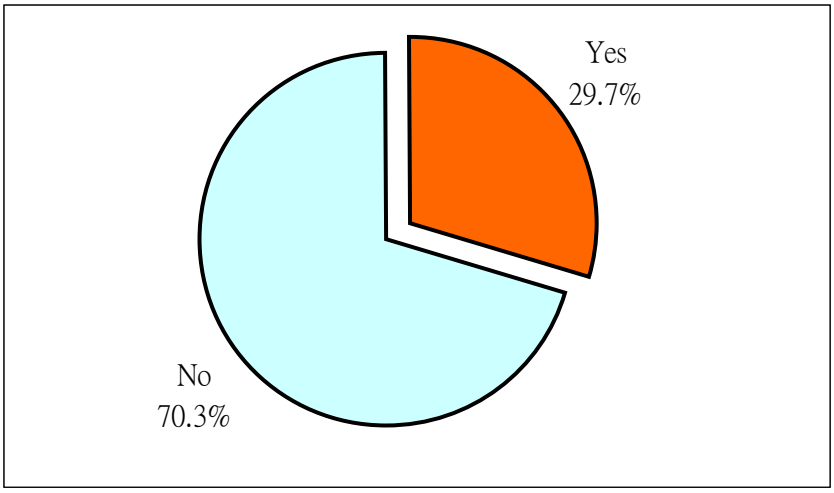
3.5 Pattern of alcohol consumption

Five questions were asked in order to understand respondents' alcohol drinking patterns and to assess if their drinking habits were within the low risk level defined by the British guidelines on safe drinking[18].

Five cases had reported the amount of standard drinks consumed out of the suggested range 0-24 standard units; therefore they were treated as outliers and excluded from the analyses from sections 3.5.1 to 3.5.4.

About three-tenths (29.7%) of the respondents consumed at least one alcoholic drink during the month prior to the survey (Fig. 3.5).

Fig. 3.5: Consumption of at least one alcoholic drink during the month prior to the survey (Q18a)



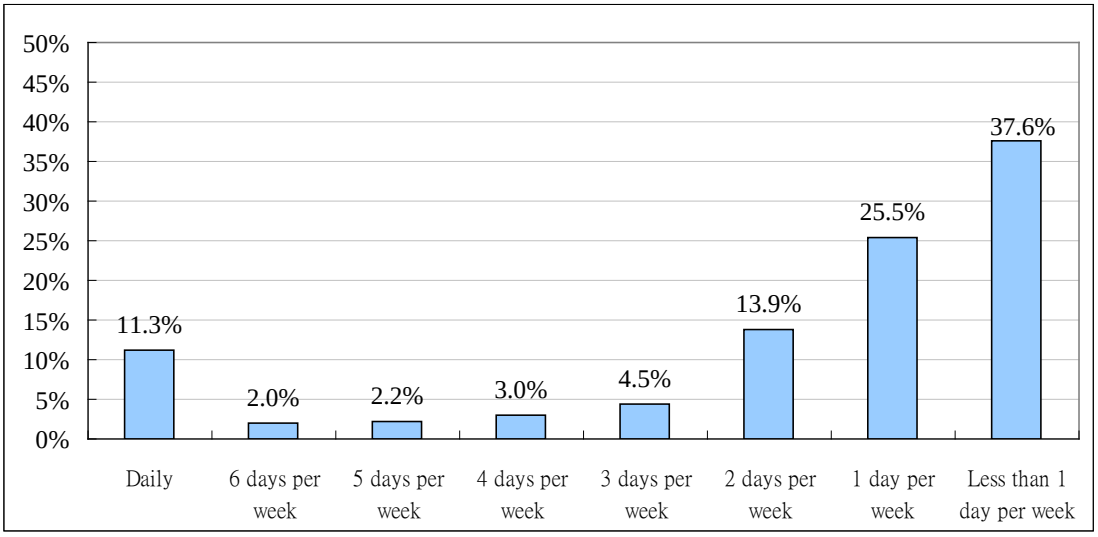
Base: All respondents = 2 047

3.5.1 Frequency of alcohol consumption

Alcohol drinkers were asked how many days per week they drank at least one alcoholic drink during the month prior to the survey. Slightly more than one-tenth (11.3%) of the drinkers consumed at least one alcoholic drink daily. On the other hand, more than three-fifths (63.1%) of the drinkers drank one day or less per week (Fig. 3.5.1).

[18] The British guidelines on safe drinking: http://www.dh.gov.uk/PolicyAndGuidance/HealthAndSocialCareTopics/AlcoholMisuse/AlcoholMisuseGeneralInformation/AlcoholMisuseGeneralArticle/fs/en?CONTENT_ID=4062199&chk=J782BY

Fig. 3.5.1: Frequency of drinkers consuming at least one alcoholic drink during the month prior to the survey (Q18b)



Base: All drinkers excluding 'don't know' and outliers = 599

3.5.2 Amount of alcoholic drinks consumed

Among those who drank at least one alcoholic drink during the month prior to the survey, they were further asked the number of standard drinks[19] consumed on each drinking day. On average, they consumed 2.9 standard drinks on each drinking day. The median was 1.5 standard drinks. Also, Table 3.5.2 shows that slightly more than three-tenths (31.4%) of the drinkers drank 3 or more standard drinks on average on those drinking days during the month prior to the survey.

Table 3.5.2: Average number of standard drinks consumed on the days they drank alcohol (percentage, mean and median) (Q18c)

No. of standard drinks	**No. of drinkers**	
	Number	**% of Total**
Less than 3	411	68.6%
3 – <5	106	17.7%
5 or above	82	13.6%
Total	***598****	***100.0%***
Mean	2.9 standard drinks	
Median	1.5 standard drinks	

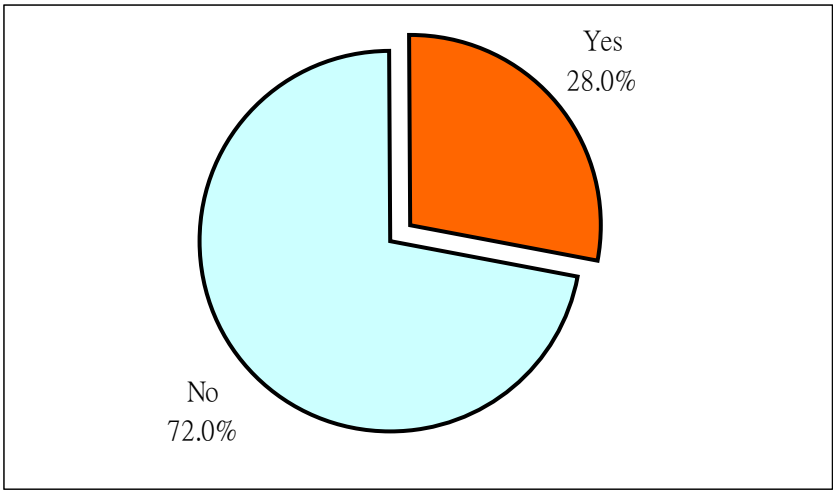
**All drinkers excluding 'don't know' and outliers*

[19] The amount of drinks consumed was measured by the following standard units: one can or small bottle of beer is approximately equal to 1.5 standard drinks, or one standard drink is approximately equal to one dining glass of wine, or one spirit nip of brandy/whisky, or one small glass of Chinese wine such as rice wine.

3.5.3 Drinking at least 5 glasses/cans of alcohol on one occasion (Binge drinking)

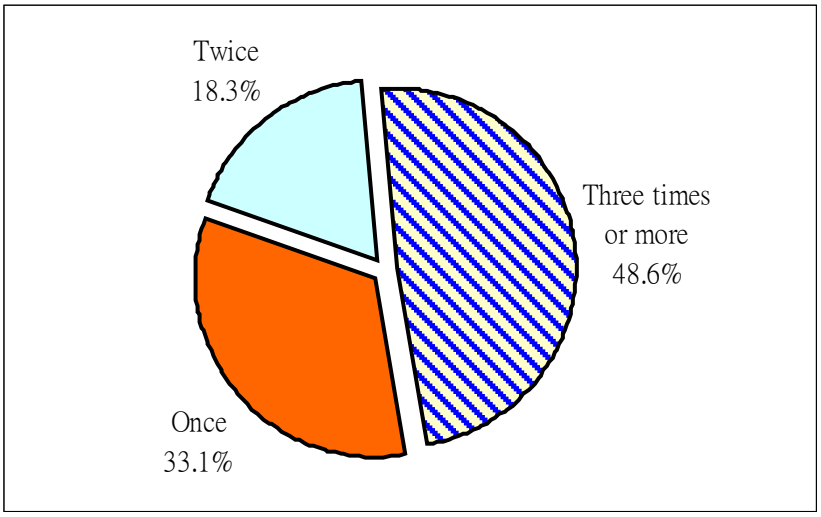
Among all drinkers, more than one quarter (28.0%) had consumed at least 5 glasses/cans of alcohol on one single occasion[20] during the month prior to the survey (Fig. 3.5.3a). Among these respondents, close to half (48.6%) of the respondents had engaged in binge drinking three times or more, 18.3% had this experience twice and about one-third (33.1%) had this heavy consumption once during the month prior to the survey (Fig. 3.5.3b).

Fig. 3.5.3a: Consumption of at least 5 glasses (or cans) of alcohol by drinkers on one single occasion during the month prior to the survey (Q18d)



Base: All drinkers excluding outliers = 604

Fig. 3.5.3b: Frequency of consuming at least 5 glasses (or cans) of alcohol on one single occasion by heavy drinkers during the month prior to the survey (Q18e)



Base: Drinkers who drank at least 5 glasses or cans of alcohol on at least one occasion, excluding outliers = 169

[20] Refer to total number of glasses/cans of any types of alcohol. One single occasion means a period of a few hours.

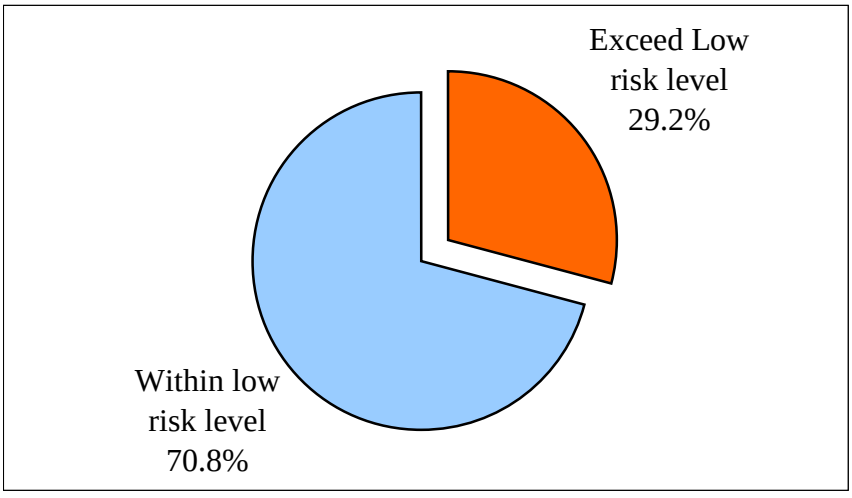
3.5.4 Drinking habits by low risk level

According to the British guidelines on safe drinking (Table 3.5.4), more than two-thirds (70.8%) of the drinkers were found to drink within the low risk level (Fig. 3.5.4).

Table 3.5.4: Classification of a low risk level drinking habit by the British guidelines on safe drinking

Gender	Classification of low risk level
Male	▪ No more than **4 standard drink**s a day, and ▪ At least **2 alcohol-free days** per week, and ▪ No more than **21 standard drinks** over a week[21]
Female	▪ No more than **2 standard drinks** a day, and ▪ At least **2 alcohol-free days** per week, and ▪ No more than **14 standard drinks** over a week[21]

Fig. 3.5.4: Classification of respondents' drinking habits (Q18a-Q18c)



Base: All drinkers excluding 'don't know' and outliers = 595

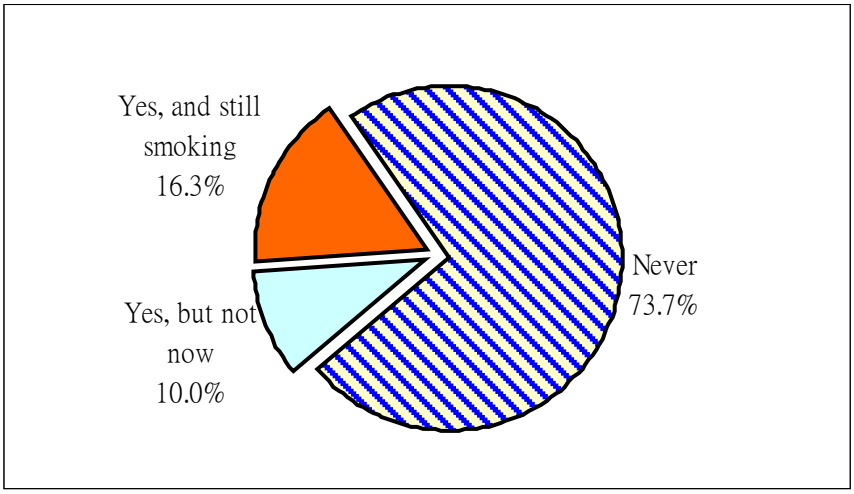
[21] The number of standard drinks per week was computed by multiplying 'weekly frequency in which drinkers drank at least one alcoholic drink during last month' (i.e. Q18b) and 'the number of standard drinks consumed each day on those drinking days' (i.e. Q18c). In Q18b, 0.5 day was used for 'less than one day per week' for the computations.

3.6 Smoking habits

Three questions were asked to understand respondents' smoking habits in this section.

Around three-quarters of the respondents (73.7%) reported that they had never smoked, 10.0% smoked in the past but now abstained and 16.3% of the respondents were current smokers (Fig. 3.6).

Fig. 3.6: Breakdown of smoking habits amongst respondents (Q19a)

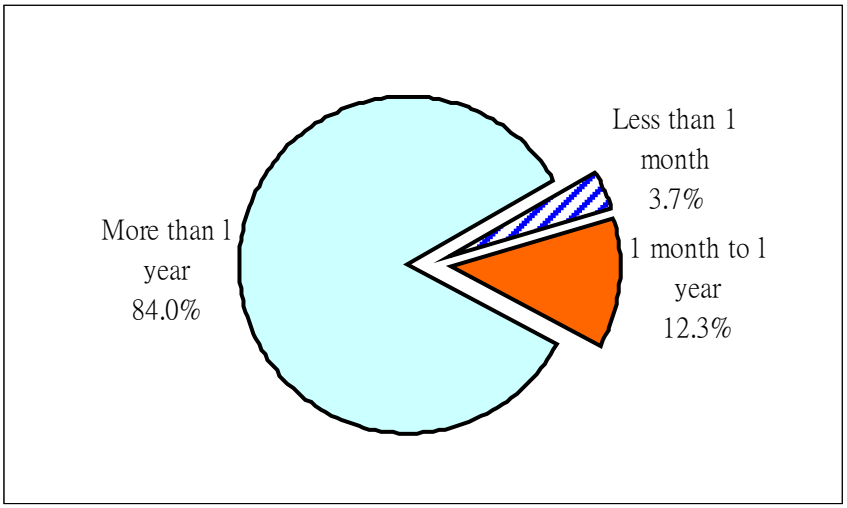


Base: All respondents = 2 047

3.6.1 Abstaining from smoking

Among those who smoked before but now abstained from smoking, the majority (84.0%) of them had given up smoking for more than one year and more than one-tenth (12.3%) had given up smoking for one month to one year. The rest (3.7%) had given up smoking for less than one month (Fig 3.6.1).

Fig. 3.6.1: Length of time abstained from smoking (Q19b)

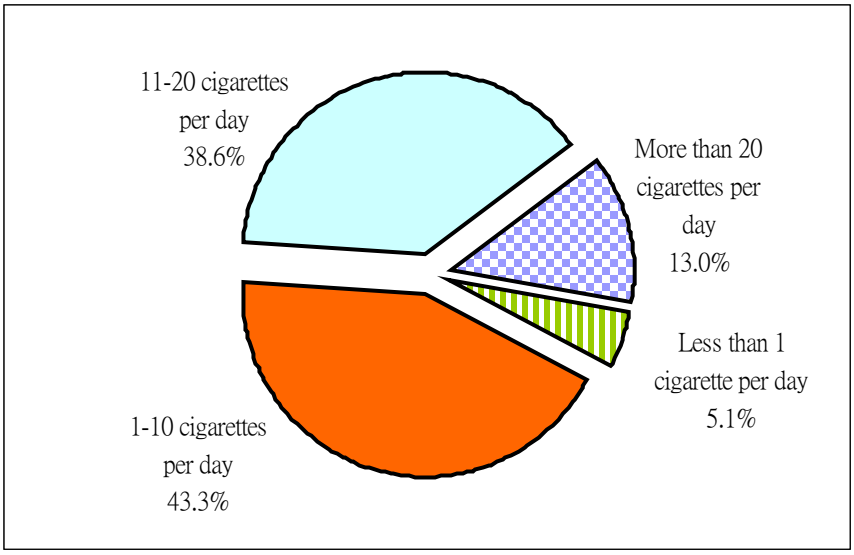


Base: All past smokers = 205

3.6.2 Cigarette consumption

Among the current smokers, the vast majority (94.9%) of them were daily smokers: more than two-fifths (43.3%) of them reported that they smoked 1- 10 cigarettes per day and over half of them (51.6%) smoked at least 11 cigarettes a day (Fig. 3.6.2).

Fig. 3.6.2: Number of cigarettes smoked on average per day by current smokers (Q19c)



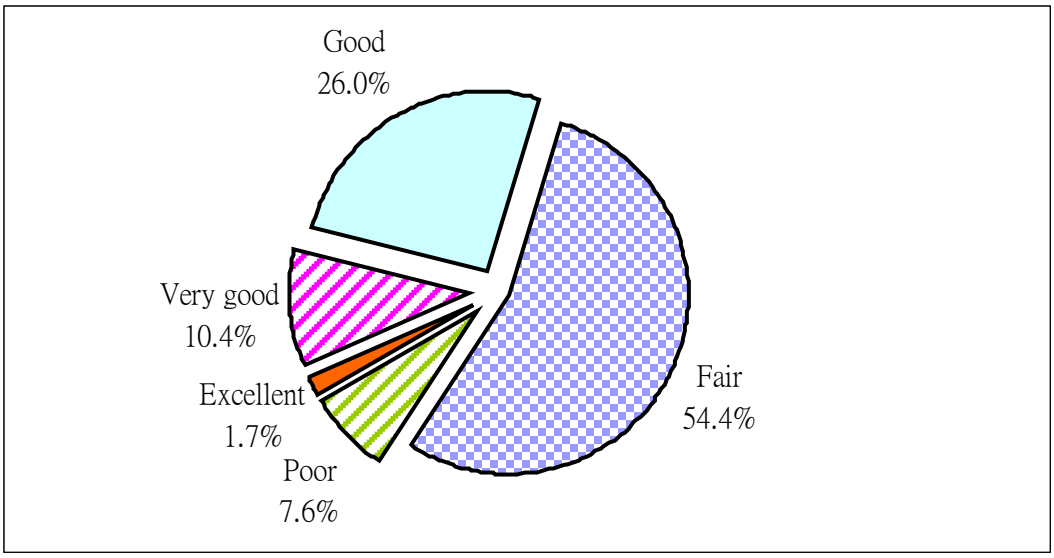
Base: All current smokers excluding 'don't know' = 331

3.7 General health status

Three questions in this survey were asked of the respondents to self assess their general health status.

Overall, only 1.7% of the respondents claimed that their general health status was 'excellent' and 36.3% claimed that their health status was 'good' or 'very good'. Moreover, more than half (54.4%) of the respondents considered that their health status was 'fair'. The rest (7.6%) of the respondents claimed that their status was 'poor' (Fig. 3.7.1).

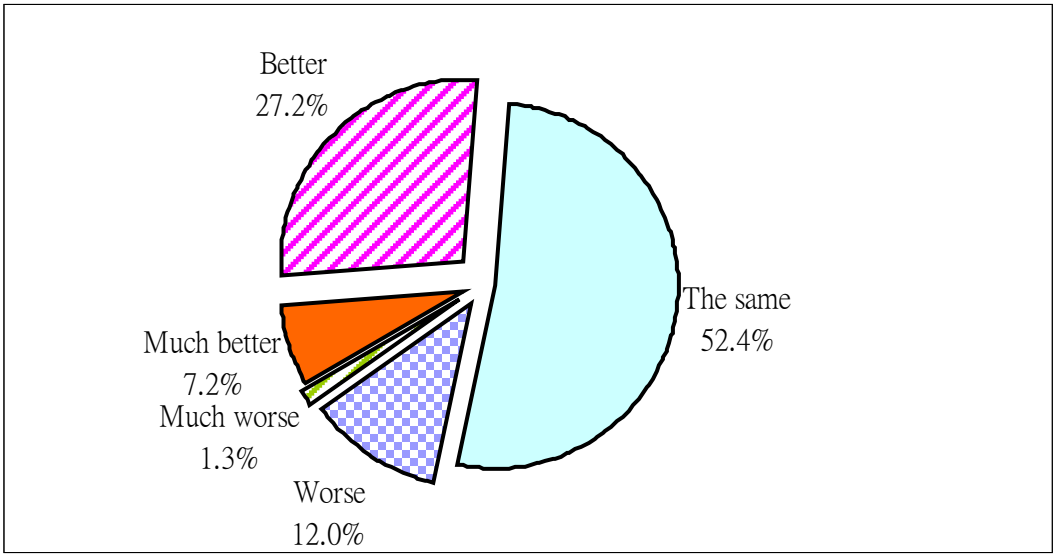
Fig. 3.7.1: Perception about general health status (Q20)



Base: All respondents excluding 'don't know' = 2 045

Respondents were further asked to compare their health condition with people of their age. Slightly more than one-third (34.4%) of the respondents considered that their health condition was "better" or "much better" than people of their age. On the other hand, 13.2% of respondents considered that their health condition was "worse" or "much worse" than people of their age. Furthermore, more than half (52.4%) claimed that their health condition was "the same" as people of their age (Fig. 3.7.2).

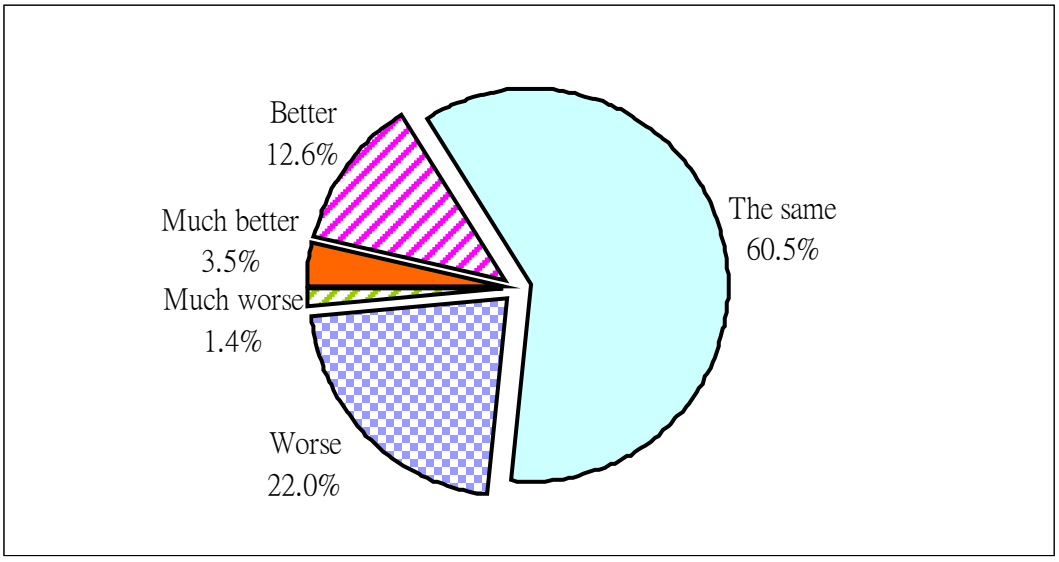
Fig. 3.7.2: Respondents compared their health condition with people of the same age (Q21)



Base: All respondents excluding 'don't know' and 'refusal' = 2 029

When respondents were asked to compare their current health condition with 12 months ago, 16.1% of respondents considered that their current health condition was "better" or" much better" than 12 months ago. In contrast, close to one quarter (23.4%) of the respondents claimed that their current health condition was "worse" or "much worse" than 12 months ago. In addition, three-fifths (60.5%) of the respondents claimed that their current health condition was "the same" as 12 months ago (Fig. 3.7.3).

Fig. 3.7.3: Compared with 12 months ago, perception about the present health condition (Q22)



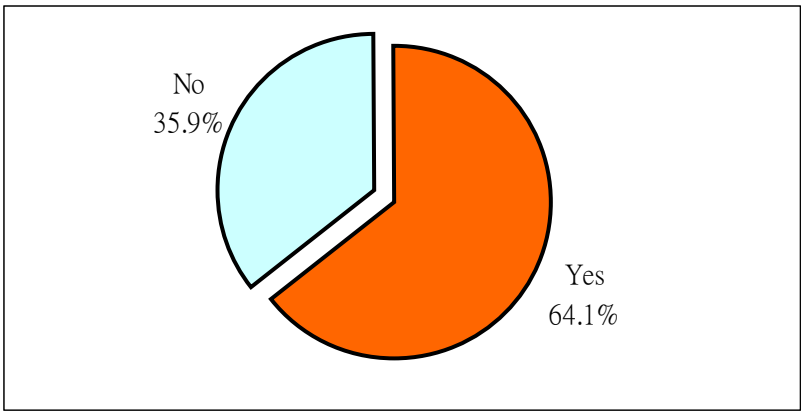
Base: All respondents excluding 'don't know' = 2 046

3.8 Cervical screening (for female respondents only)

Six questions were asked to understand female respondents' behaviour regarding cervical screening.

In this survey, 53.8% of the respondents were females after weighting. Overall, close to two-thirds (64.1%) of them reported that they had had a cervical smear before (Fig. 3.8).

Fig. 3.8: Being screened for cervical smear before (Q23a)

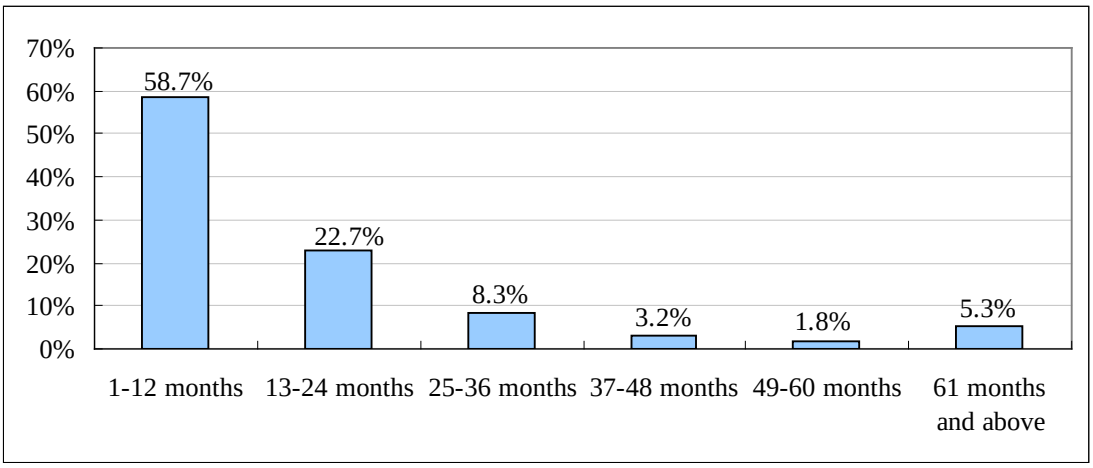


Base: All female respondents excluding 'not sure' and 'refusal'= 1 089

3.8.1 Last cervical smear

Among the female respondents who had a cervical smear before, more than half (58.7%) of them had their last cervical smear taken within the 12 months prior to the survey. 22.7% of them had the examination within 13-24 months, while 18.7% of them had their last cervical smear 25 or more months ago (Fig. 3.8.1).

Fig. 3.8.1: Period of time since last cervical smear if ever had a smear (Q23b)

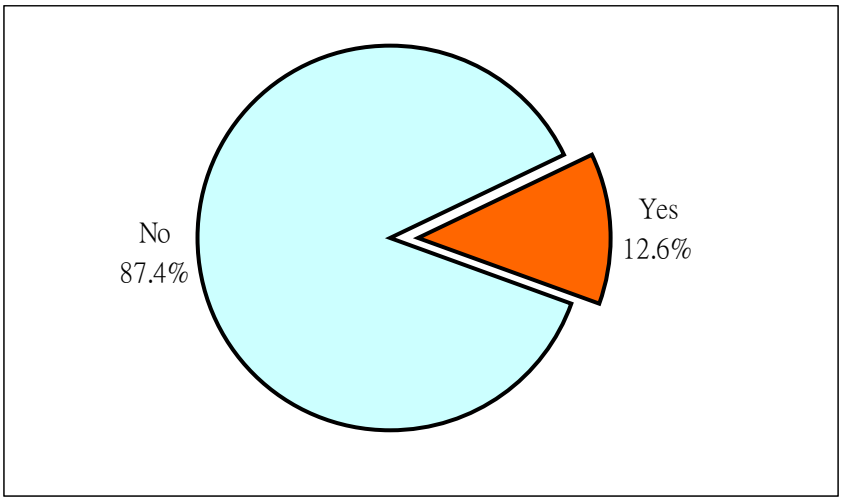


Base: Female respondents who ever had a cervical smear before, excluding 'can't remember' = 684

3.8.2 Whether the last cervical smear was the first visit

Of the female respondents who had a cervical smear before; most of them (87.4%) reported having a cervical smear more than one time. On the other hand, 12.6% claimed that the last visit was their first cervical smear (Fig. 3.8.2).

Fig. 3.8.2: Whether the last cervical smear was respondents' first visit (Q24)

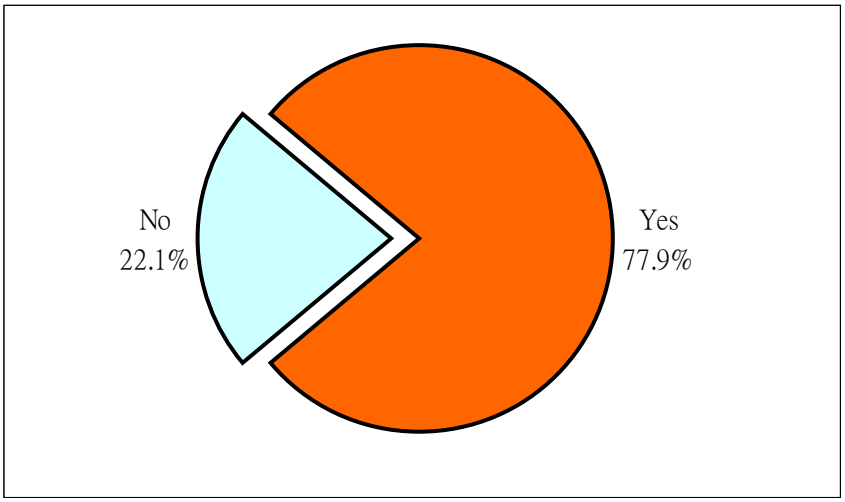


Base: Female respondents who ever had a cervical smear before = 699

3.8.3 Regular cervical screening

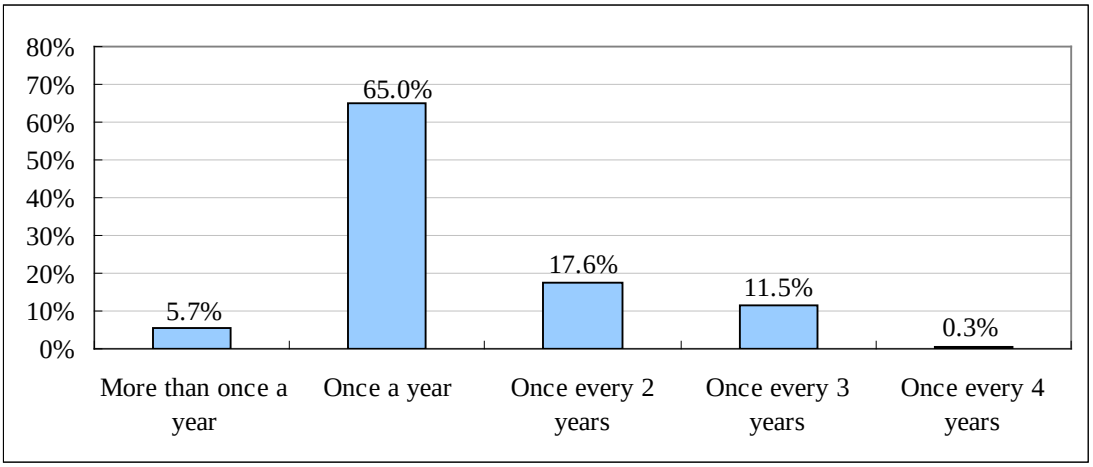
Of the female respondents who had more than one cervical smear before, more than three quarters (77.9%) of them claimed to have a cervical smear at a regular interval (Fig. 3.8.3a). Among these respondents, about two-thirds (65.0%) of them claimed that they would have a cervical smear once a year. About three-tenths (29.4%) have a cervical smear once every two to four years. (Fig. 3.8.3b).

Fig. 3.8.3a: Regular cervical screening (Q25a)



Base: Female respondents who had more than one cervical smear before = 610

Fig. 3.8.3b: Frequency of having cervical screening (Q25b)

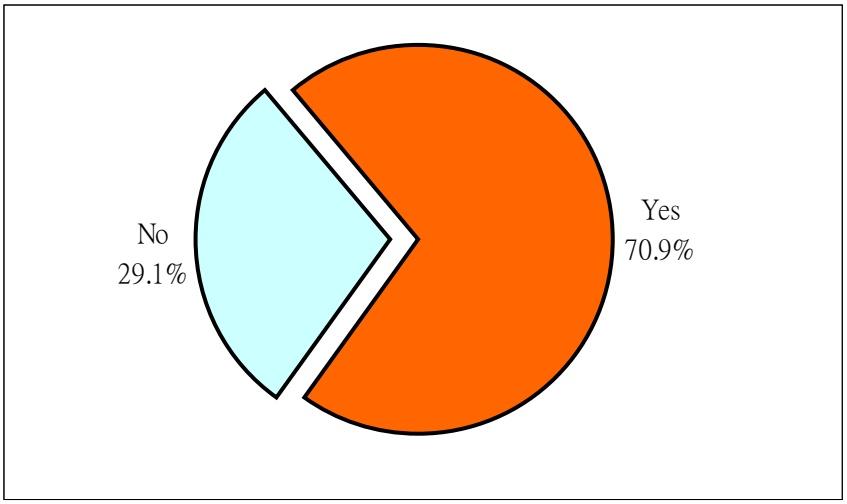


Base: Female respondents who have regular cervical screening, excluding 'cannot say /remember' = 467

3.8.4 Whether plan to have cervical smear within the next three years

Overall, 70.9% of the female respondents claimed that they planned to have a cervical smear within the next three years (Fig. 3.8.4).

Fig. 3.8.4: Whether plan to have a cervical smear within the next three years (Q26)



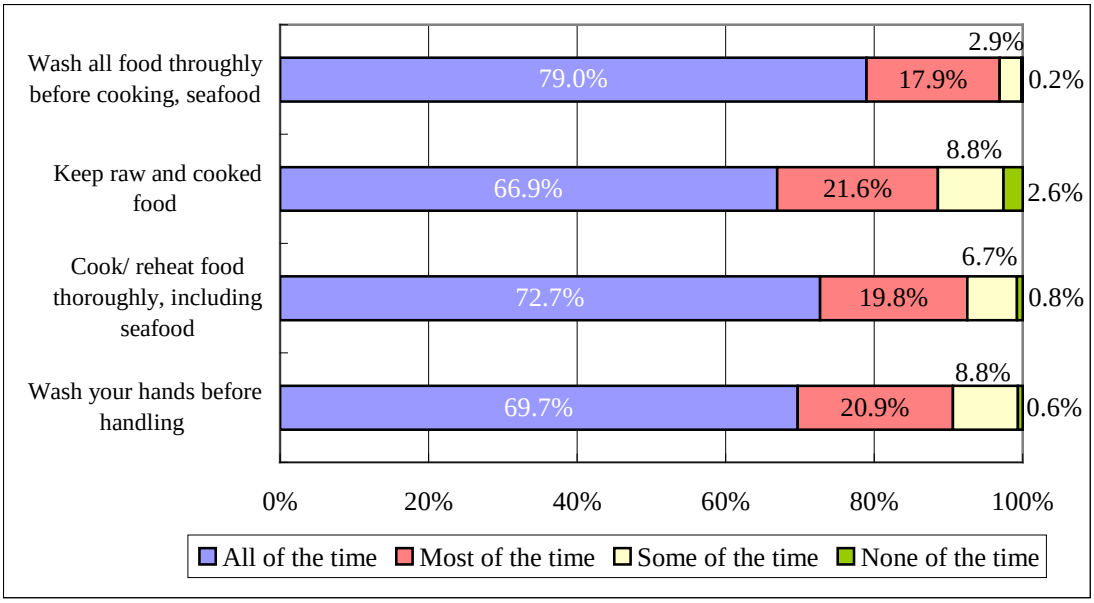
Base: All female respondents excluding those had hysterectomy = 1 080

3.9 Food handling practices

Four questions were asked to understand the respondents' food handling practices.

It was observed that most of the respondents were able to comply with good food handling practices. For the practice of 'wash all food thoroughly before cooking, especially seafood', the vast majority (96.9%) of the respondents claimed that they do it 'all of the time' (79.0%) or 'most of the time' (17.9%). The proportions of respondents maintaining the other three practices 'all of the time' or 'most of the time' were 92.5% for 'cook/reheat food thoroughly, including seafood', 90.6% for 'wash hands before handling food' and 88.6% for 'keep raw and cooked food separately' (Fig. 3.9).

Fig. 3.9: How often respondents conformed to the following food handling practices (Q27, Q28, Q29 and Q30)



Base: All respondents excluding N/A ('wash all food thoroughly before cooking, especially seafood' = 1 806, 'keep raw and cooked food separately' = 1 889, 'cook/reheat food thoroughly, including seafood' = 1 939 and 'wash your hands before handling food' = 1 989)

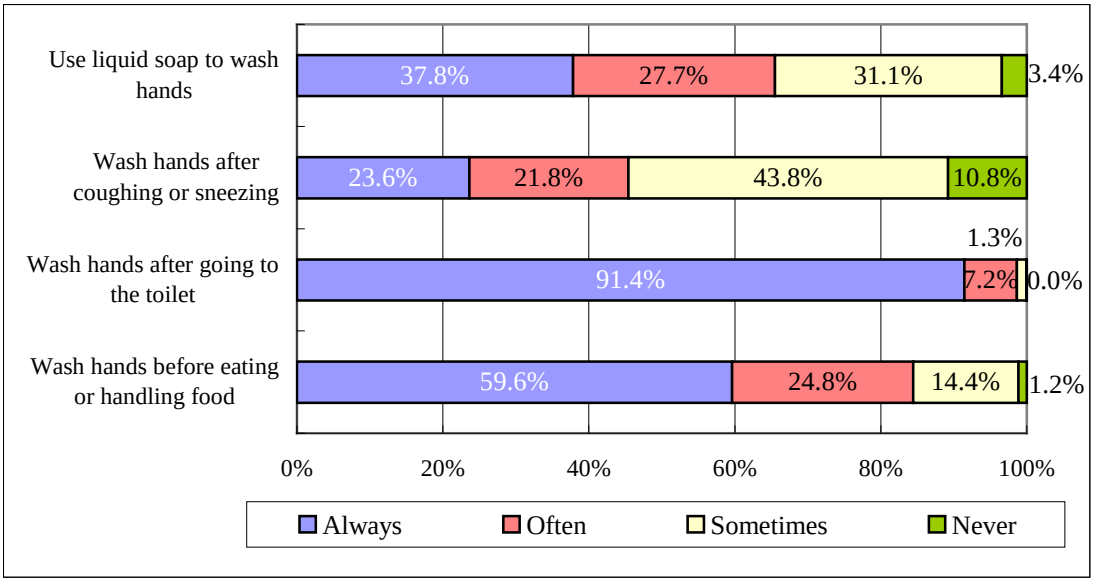
3.10 Hand hygiene

Five questions were asked to understand the respondents' hand hygiene and their awareness of the slogan "Wash Hands for Better Health".

3.10.1 Hand hygiene practices

During the three days prior to the survey, most of the respondents had always washed hands after going to the toilet (91.4%). However, less than three-fifths of the respondents reported that they had always washed hands before eating or handling food (59.6%), always used liquid soap to wash hands (37.8%) and always washed hands after coughing or sneezing (23.6%). (Fig. 3.10.1).

Fig. 3.10.1: How often did respondents wash hands in the following situations during the three days prior to the survey (Q31, Q32, Q33 and Q34)

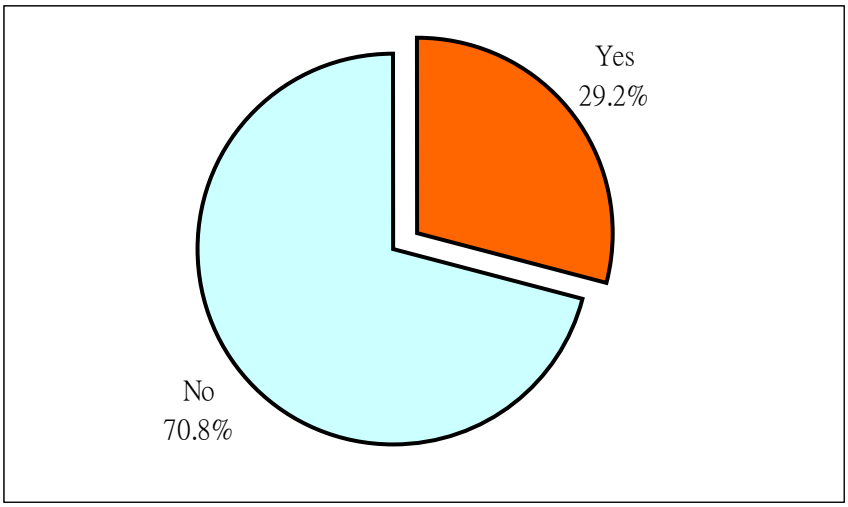


Base: All respondents excluding N/A and 'don't remember' ('use liquid soap to wash hands' = 2 046, 'wash hands after coughing or sneezing' = 1 740, 'wash hands after going to the toilet' = 2 047 and 'wash hands before eating or handling food' = 2 047)

3.10.2 Awareness of the slogan "Wash Hands for Better Health"

About three-tenths (29.2%) of the respondents had heard of the slogan "Wash Hands for Better Health" (Fig. 3.10.2).

Fig. 3.10.2: Awareness of the slogan "Wash Hands for Better Health" (Q35)



Base: All respondents excluding 'don't remember' = 1 979

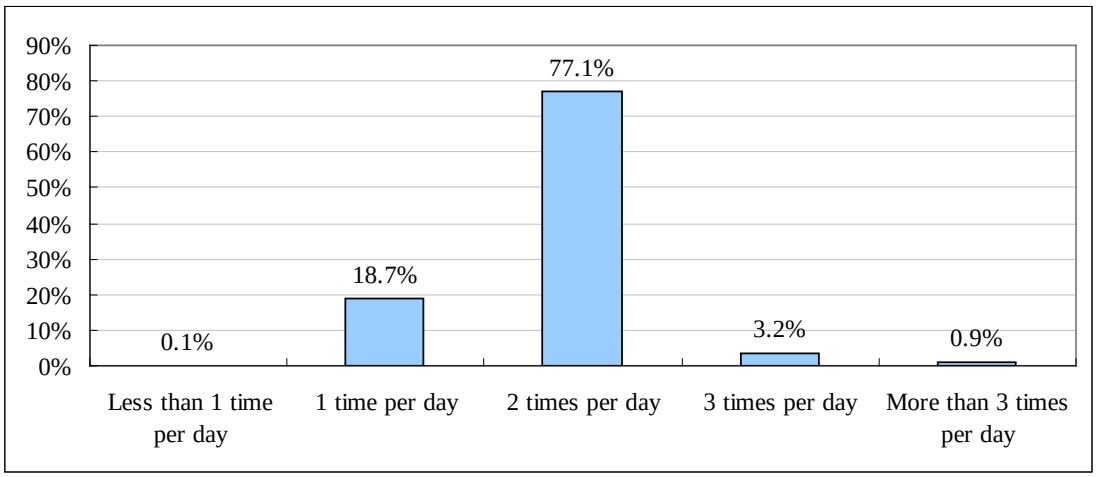
3.11 Oral health practices

Five questions were asked to understand the respondents' oral health practices.

3.11.1 Frequency of brushing teeth and using dental floss

More than three quarters (77.1%) of the respondents mentioned that they brush their teeth twice a day while 18.7% of respondents only brush their teeth once a day (Fig. 3.11.1a).

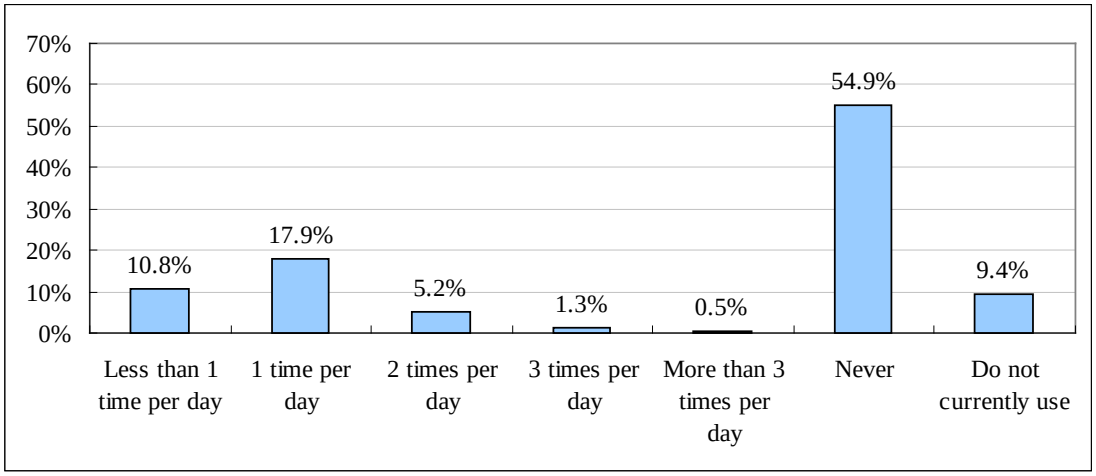
Fig. 3.11.1a: Frequency of brushing teeth (Q36)



Base: All respondents excluding 'no teeth' = 2 043

About two-thirds (64.3%) of the respondents claimed that they never or did not currently use dental floss. On the other hand, 24.8% of respondents used it at least once per day (Fig. 3.11.1b).

Fig. 3.11.1b: Frequency of using dental floss (Q37)

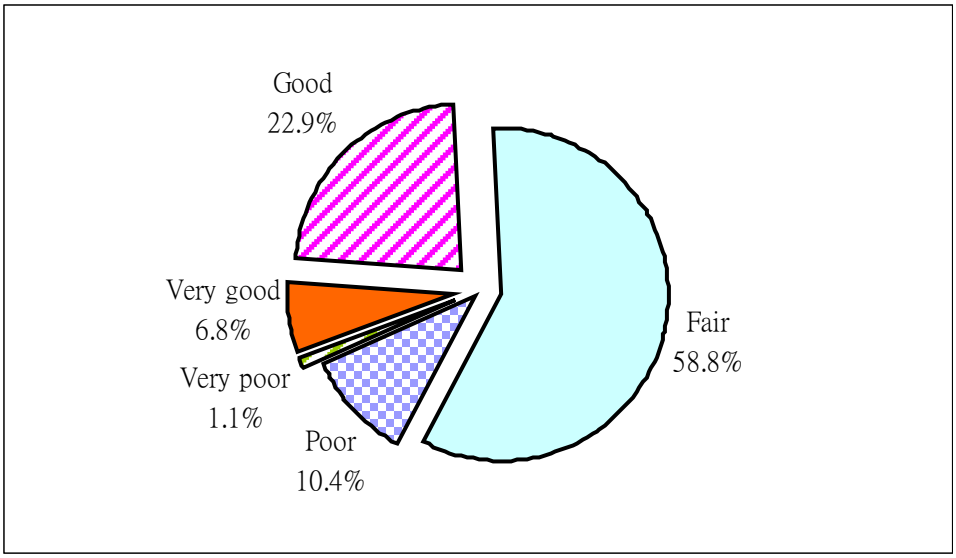


Base: All respondents excluding 'no teeth' and 'don't remember' = 2 036

3.11.2 General oral health status

Overall, about three-tenths (29.7%) of the respondents considered that their general oral health status was ‘good’ or ‘very good’. In contrast, only 11.6% of respondents considered it ‘poor’ or ‘very poor’. Moreover, close to three-fifths (58.8%) of the respondents claimed that their general oral health status as ‘fair’ (Fig. 3.11.2).

Fig. 3.11.2: Perception about general oral health status (Q38)

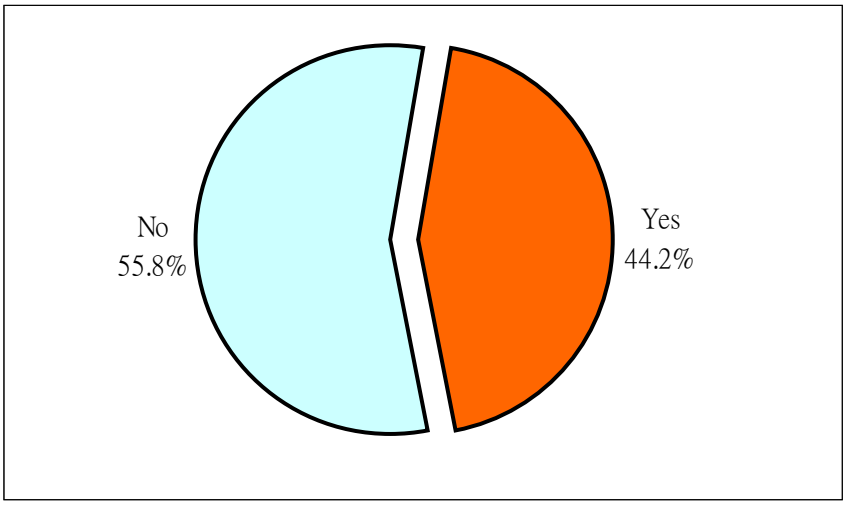


Base: All respondents excluding ‘don’t know’ = 2 045

3.11.3 Regular dental checkup

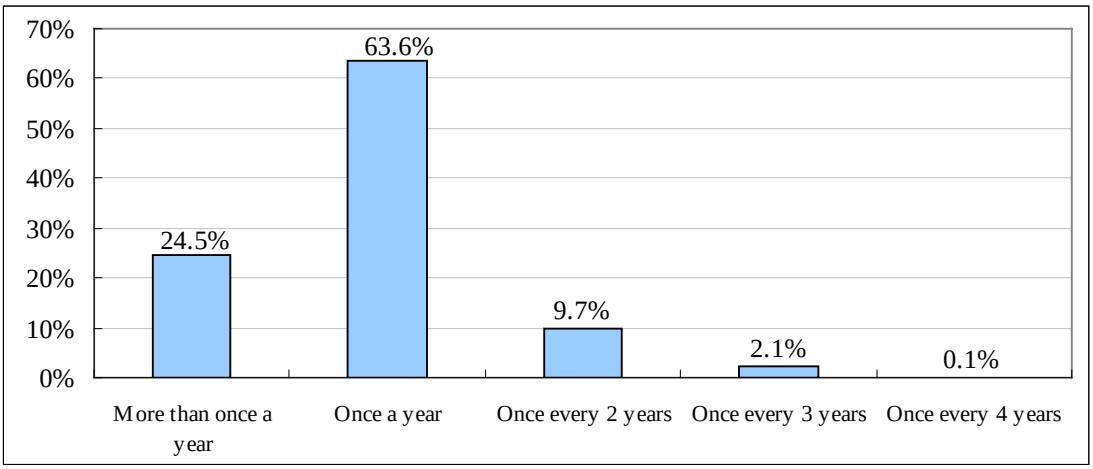
Overall, more than two-fifths (44.2%) of the respondents reported that they had regular dental checkups (Fig. 3.11.3a). Among these respondents, about one quarter (24.5%) of them have a dental checkup more than once a year and about two-thirds (63.6%) have it once a year. (Fig. 3.11.3b).

Fig. 3.11.3a: Regular dental checkup (Q39a)



Base: All respondents = 2 047

Fig. 3.11.3b: Frequency of having a dental checkup (Q39b)

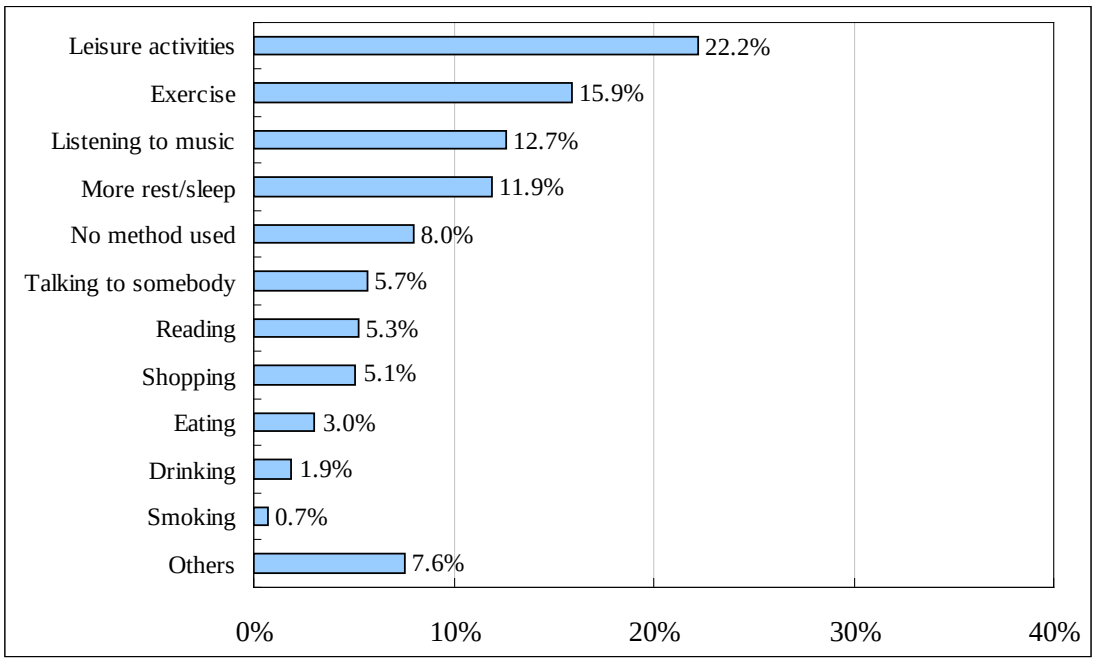


Base: Respondents who have a regular dental checkup, excluding 'cannot say /remember' = 901

3.12 Stress Management

Of the 92.9% of respondents who reported having experienced stress, 22.2% of them participated in leisure activities to cope with stress. Other frequently cited methods by respondents were 'exercise' (15.9%), 'listening to music' (12.7%) and taking 'more rest / sleep' (11.9%). (Fig. 3.12).

Figure 3.12: Most frequently adopted stress coping mechanism (Q40)



Base: All respondents who have experienced stress = 1 901

Chapter 4 Sub-group Analysis by Demographic Information and Related Questions

4.1 Re-grouping of variables

In this chapter, sub-group analyses are performed based on the breakdown of respondents' demographic information including gender, age, educational attainment, marital status, occupation and monthly household income to see if there are any significant associations between these demographic factors and the areas being investigated. In addition, cross tabulations are also done for special areas of interest. For example, Body Mass Index (BMI) is analyzed by perceptions about current weight.

Some of the responses have been re-grouped into smaller number of categories in order to make the sub-group analyses more robust and representative. Table 4.1a shows how the demographic variables have been re-grouped while Table 4.1b illustrates how the responses of some questions were combined. The response of 'don't know', 'can't remember', 'not sure', 'not applicable', 'refuse to answer' and 'outliers' have been excluded from all the sub-group analyses in this chapter.

Table 4.1a: Re-grouping the responses of demographic information (D1-D9)

Demographic variable	Original level	Re-grouped level	Sample size (weighted)
Gender	Male	Male	946
	Female	Female	1 101
Age group	No grouping	18 – 24	259
		25 – 34	425
		35 – 44	536
		45 – 54	491
		55 – 64	269
Educational attainment	Primary or below	Primary or below	268
	Had not completed secondary	Had not completed secondary	378
	Completed secondary (F.5)	Completed secondary (F.5)	619
	Matriculation	Matriculation	170
	Tertiary (non-degree)/degree or above	Tertiary or above	609
Martial status	Never married	Never married	645
	Married with child(ren)	Married	1 276
	Married without child(ren)		
	Divorced/Separated	Divorced/Separated/Widowed	118
	Widowed		

Occupation	Employer/Managers/ Administrator	Managerial/professional worker	471
	Professional		
	Associate professional		
	Clerk	Clerk	281
	Service worker	Service worker	233
	Shop sales worker		
	Skilled agricultural/ fishery worker	Blue collar worker	329
	Craft and related worker		
	Plant and machine operator and assembler		
	Unskilled worker		
	Student	Not working persons	708
	Home-maker		
	Unemployed person		
	Retired person		
	Other not-worker person		
Monthly household income	Less than $2,000	Below $8,000	149
	$2,000 - $3,999		
	$4,000 - $5,999		
	$6,000 - $7,999		
	$8,000 - $9,999	$8,000 - $13,999	339
	$10,000 - $11,999		
	$12,000 - $13,999		
	$14,000 - $15,999	$14,000 - $19,999	211
	$16,000 - $17,999		
	$18,000 - $19,999		
	$20,000 - $24,999	$20,000 - $39,999	540
	$25,000 - $29,999		
	$30,000 - $34,999		
	$35,000 - $39,999		
	$40,000 - $44,999	$40,000 or above	364
	$45,000 - $49,999		
	$50,000 - $54,999		
	$55,000 - $59,999		
	$60,000 or above		

Table 4.1b: Re-grouping the responses of questions

Question No.	Question content	Original level	Re-grouped level
Q6, Q8 and Q10	Average days per week spent on vigorous/moderate physical activities/exercise and walking	0 day	0 – 1 day
		1 day	
		2 days	2 – 3 days
		3 days	
Q15a, Q16a and Q17a	Average days per week that respondents drink fruit/vegetable juice, eat fruit/vegetable	4 days	4 – 5 days
		5 days	
		6 days	6 – 7 days
		7 days	
Q18b	Weekly frequency of drinking at least one alcoholic drink last month	Daily	6 days or more per week
		6 days per week	
		5 days per week	4 – 5 days per week
		4 days per week	
		3 days per week	2 – 3 days per week
		2 days per week	
		1 day per week	1 day or less per week
		Less than 1 day per week	
Q23b	Period of time since last cervical smear	1 – 12 months	1 – 12 months
		13 – 24 months	13-36 months
		25 – 36 months	
		37 – 48 months	37 or more months
		49 – 60 months	
		61 months or above	
Q25b	Frequency of having cervical smear	More than once a year	Once or more a year
		Once a year	
Q39b	Frequency of having a dental checkup	Once every 2 years	Once every 2-3 years
		Once every 3 years	
		Once every 4 years	Once every 4-5 years
		Once every 5 years	
		Once every 6-10 years	Once every 6 years or more
		Less frequent than once every 10 years	

Q36	Daily frequency of brushing teeth	1 time per day	One time per day
		2 times per day	Two times per day
		3 times per day	Three or more time per day
		More than 3 times per day	
		Less than 1 per day	Less than one time per day
		Never	Never
Q37	Daily frequency of using dental floss	1 time per day	One time per day
		2 times per day	Two times per day
		3 times per day	Three or more time per day
		More than 3 times per day	
		Less than 1 per day	Less than one time per day
		Never	Never or do not currently use
		Do not currently use	

Three types of statistical tests[22] are used for sub-group analysis in this report, namely Pearson chi-square test, Kruskal-Wallis test and Spearman's rank correlation. When both variables are nominal, the chi-square test is used. When one variable is nominal and the other one is ordinal, the Kruskal-Wallis test is adopted. Spearman's rank correlation is performed when both variables are ordinal. Only statistically significant results at the 5% level are presented in this chapter. As for the Pearson chi-square test, only those tables where no more than 20% of the cells had expected values of less than 5 are included.

Only Pearson chi-square test uses weighted data; the Kruskal-Wallis test and Spearman's rank correlation are carried out without weighting as SPSS is unable to handle non-integer weights for these two tests. However, all percentages are reported after weighting.

[22] These statistical tests used SPSS. Formulae for the three tests are included for reference.

Pearson chi-square statistics:

$$\lambda^2 = \sum_i \sum_j \frac{(Oij - eij)^2}{eij}$$

where O_{ij} is the observed value corresponding to the ith column and the jth row, e_{ij} is the expected value corresponding to the ith column and the jth row. The calculation of e_{ij} is as follows: expected value = (ith column total x jth row total) / Overall total

Kruskal-Wallis test:

$$U = N_1 N_2 + \frac{N_1(N_1+1)}{2} - T_1$$

where N_1 and N_2 are the sample sizes of the groups and T_1 is the sums of the ranks of the combined groups (adjustments are made if there are ties).

Spearman's rank correlation coefficient:

$$r = \sum_{i=1}^{N} \frac{(X_i - \overline{X})(Y_i - \overline{Y})}{(N-1)SxSy}$$

where N is the sample size and Sx and Sy are the standard deviations of the rank of the two variables and Xi and Yi are the ith rank of X and Y respectively and $\overline{X}$ and $\overline{Y}$ are the mean rank of X and Y respectively. The rank order of each data value is used in the above formula (adjustments are made if there are ties). Pairwise method is used to handle missing data.

4.2 Body weight control

4.2.1 Weight status

In this section, respondents are classified as 'underweight', 'normal', 'overweight' and 'obese' based on their BMI and the WHO classification for the Asian standard. 'Underweight' is defined as having a BMI below 18.5; 'normal' refers to having a BMI score between 18.5 and less than 23.0; 'overweight' is having a BMI score between 23.0 and less than 25.0; and 'obese' is defined as having a BMI score greater than or equal to 25.0.

Using the Asian standard of WHO classification, weight status is associated significantly with five demographic variables including gender, age, educational attainment, marital status and occupation (Table 4.2.1).

More males (31.9%) were classified as 'obese' while more females (13.1%) were classified as 'underweight'. In terms of age, respondents aged 34 or below (ranged from 13.5% to 27.6%) were more likely to be 'underweight' while those aged 35 or above were more likely to be classified as 'overweight' (ranged from 20.4% to 24.2%) or 'obese' (ranged from 26.0% to 37.3%) (Table 4.2.1).

A relatively higher proportion of respondents with primary education level or below (39.2%) were classified as 'obese' (Table 4.2.1).

The never married respondents (18.6%) were more likely to be 'underweight' than the married respondents (5.5%) and the divorced/separated/widowed respondents (5.3%). Relatively higher proportions of married respondents (29.8%) and divorced/separated/widowed respondents (29.0%) were classified as 'obese' (Table 4.2.1).

Regarding to the respondents' occupation, relatively higher proportion of blue collar workers (36.1%) were classified as 'obese' while not working respondents (13.4%) were more likely to be 'underweight' (Table 4.2.1).

Table 4.2.1: Weight status based on BMI score and the classification of WHO (Asian standard)

Variable	Level	Base	Under-weight	Normal	Over-weight	Obese	P-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	919	5.7%	41.4%	21.0%	31.9%		0.000	
	Female	1043	13.1%	53.1%	16.1%	17.8%			
Age	18-24	246	27.6%	58.6%	7.1%	6.7%			0.000
	25-34	405	13.5%	59.6%	13.2%	13.7%			
	35-44	520	7.7%	45.9%	20.4%	26.0%			
	45-54	476	3.1%	37.6%	22.0%	37.3%			
	55-64	256	2.6%	40.3%	24.2%	32.8%			

Educational attainment	Primary or below	249	3.2%	36.2%	21.3%	39.2%			0.000
	Had not completed secondary	359	6.2%	45.0%	19.8%	29.0%			
	Completed secondary (F.5)	596	9.3%	49.8%	18.7%	22.1%			
	Matriculation	163	18.6%	55.4%	14.0%	12.1%			
	Tertiary or above	592	12.3%	49.6%	17.2%	20.9%			
Marital status	Never married	619	18.6%	56.3%	12.2%	12.9%		0.000	
	Married	1222	5.5%	43.2%	21.5%	29.8%			
	Divorced/ Separated/ Widowed	116	5.3%	47.9%	17.8%	29.0%			
Occupation	Managerial/ Professional worker	463	7.7%	45.2%	20.9%	26.2%		0.000	
	Clerk	267	10.6%	56.0%	17.8%	15.5%			
	Service worker	225	8.7%	46.8%	17.9%	26.6%			
	Blue collar worker	315	4.2%	38.8%	20.9%	36.1%			
	Not working	668	13.4%	50.3%	15.4%	20.9%			

4.2.2 Perception about current weight status

Perception about current weight status is associated significantly with respondents' gender, age, educational attainment and marital status.

A relatively higher proportion of female respondents (46.3%) considered themselves as 'overweight' while male respondents (10.7%) were more likely to have perceived themselves as 'underweight'. Respondents aged 35 or above (ranged from 41.8% to 53.1%) were more likely to consider themselves as 'overweight' than those younger age groups (ranged from 27.2% to 32.8%) (Table 4.2.2a).

Regarding to the respondents' education level, a relatively higher proportion of respondents with secondary education level or below (ranged from 43.1% to 47.4%) considered themselves as 'overweight'. In terms of marital status, married respondents (46.1%) and divorced/separated/widowed respondents (44.8%) were more likely to have perceived themselves as 'overweight' (Table 4.2.2a).

Table 4.2.2a: Perception about current weight status (Q3)

Variable	Level	Base	Under-weight	Just right	Over-weight	P-value		
						Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	944	10.7%	53.4%	35.9%		0.000	
	Female	1088	5.4%	48.4%	46.3%			
Age	18-24	259	12.6%	60.1%	27.2%			0.000
	25-34	418	11.3%	55.9%	32.8%			
	35-44	536	6.3%	50.0%	43.6%			
	45-54	490	4.8%	42.1%	53.1%			
	55-64	262	6.5%	51.7%	41.8%			
Educational attainment	Primary or below	264	5.9%	46.7%	47.4%			0.000
	Had not completed secondary	378	5.6%	51.3%	43.1%			
	Completed secondary (F.5)	614	7.1%	49.4%	43.5%			
	Matriculation	170	9.5%	55.2%	35.3%			
	Tertiary or above	604	10.4%	52.2%	37.5%			
Marital status	Never married	642	11.7%	56.9%	31.4%		0.000	
	Married	1264	5.7%	48.2%	46.1%			
	Divorced/ Separated/ Widowed	118	9.8%	45.4%	44.8%			

Analyses of respondents' perception about their current weight by their weight status based on the Asian standard of WHO classification were carried out. There are significant associations between these two types of variables.

For those respondents who were classified as 'underweight', more than three-fifths considered themselves as 'just right' (59.5%) or 'overweight' (3.6%) (Table 4.2.2b).

Among those respondents who were classified as 'overweight', 43.1% of them considered themselves as 'just right'. Also, 15.9% of 'obese' respondents perceived themselves as 'just right' (Table 4.2.2b).

Table 4.2.2b: Perception about current weight status analysed by weight status based on WHO classification (Asian standard)

Variable	Level	Base	Peerception of current weight			P-value		
			Under -weight	Just right	Over-weight	Chi-square test	Kruskal-Wallis test	Rank correlation
WHO classification (Asian standard)	Underweight	189	36.9%	59.5%	3.6%			0.000
	Normal	933	8.2%	68.7%	23.1%			
	Overweight	361	1.8%	43.1%	55.1%			
	Obese	475	0.4%	15.9%	83.7%			

4.2.3 Weight control

Statistically significant associations exist between respondents' behaviour in controlling weight deliberately over the 12 months prior to the survey and their gender, educational attainment, occupation and monthly household income.

Comparatively speaking, more females (31.0%) reported that they had tried to control their weight deliberately during the 12 months prior to the survey. Respondents with higher educational attainment (completed secondary education or above) were more likely than those with lower education attainment to control their weight deliberately (ranged from 30.6% to 33.4%). Managerial/professional workers (35.1%) and clerks (32.1%) also tended to deliberately control their weight than respondents from other occupations. Also, the higher the monthly household income of respondents, the more likely that they had tried to control their weight deliberately (Table 4.2.3a).

Table 4.2.3a: Controlling weight deliberately in the 12 months prior to the survey (Q4a)

Variable	Level	Base	Yes	No	P-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	946	26.7%	73.3%	0.034		
	Female	1091	31.0%	69.0%			
Educational attainment	Primary or below	268	23.4%	76.6%		0.002	
	Had not completed secondary	378	21.0%	79.0%			
	Completed secondary (F.5)	614	33.4%	66.6%			
	Matriculation	170	30.6%	69.4%			
	Tertiary or above	604	31.6%	68.4%			

Occupation	Managerial/ Professional worker	469	35.1%	64.9%	0.000		
	Clerk	278	32.1%	67.9%			
	Service worker	233	29.3%	70.7%			
	Blue collar worker	329	19.9%	80.1%			
	Not working	703	28.4%	71.6%			
Monthly household income	Below $8,000	147	21.5%	78.5%		0.009	
	$8,000 - $13,999	338	24.2%	75.8%			
	$14,000 - $19,999	209	30.1%	69.9%			
	$20,000 - $39,999	537	32.9%	67.1%			
	$40,000 or above	363	34.3%	65.7%			

Respondents' behaviour in controlling weight is associated significantly with the weight status by the Asian standard of WHO classification.

Respondents who were classified as 'overweight' (37.4%) or 'obese' (35.4%) were more likely to have controlled their weight in the 12 months prior to the survey than other respondents (Table 4.2.3b).

Table 4.2.3b: Controlling weight deliberately in 12 months (Q4a) analysed by weight status

Variable	Level	Base	Yes	No	P-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Weight status by WHO classification (Asian standard)	Underweight	189	13.7%	86.3%		0.000	
	Normal	934	26.6%	73.4%			
	Overweight	361	37.4%	62.6%			
	Obese	478	35.4%	64.6%			

4.2.4 Methods adopted to control weight

4.2.4.1 Physical exercise

The weight control method of using physical exercise is associated significantly with respondents' gender.

A relatively higher proportion of males (90.5%) had engaged in physical exercise for weight control than females (81.7%) (Table 4.2.4.1).

Table 4.2.4.1: Doing physical exercise to control weight (Q5d)

Variable	Level	Base	Yes	No	P-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	253	90.5%	9.5%	0.003		
	Female	338	81.7%	18.3%			

4.2.4.2 Taking drugs/products

The weight control method of taking drugs/products is associated significantly with gender and monthly household income.

A higher proportion of females (21.3%) and those with monthly household income of $20,000 or above (ranged from 18.5% to 22.8%) reported that they had taken drugs/products to control weight (Table 4.2.4.2).

Table 4.2.4.2: Taking drugs/products to control weight (Q5a)

Variable	Level	Base	Yes	No	P-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	253	11.6%	88.4%	0.002		
	Female	338	21.3%	78.7%			
Monthly household income	Below $8,000	31	0.0%	100.0%		0.009	
	$8,000 - $13,999	82	13.8%	86.2%			
	$14,000 - $19,999	63	15.9%	84.1%			
	$20,000 - $39,999	177	22.8%	77.2%			
	$40,000 or above	125	18.5%	81.5%			

4.2.4.3 Going to weight control or beauty parlours

The weight control method of going to weight control or beauty parlours is associated significantly with gender.

Females (5.9%) were more likely than males to control their weight by going to weight control or beauty parlours (Table 4.2.4.3).

Table 4.2.4.3: Going to weight control or beauty parlours (Q5c)

Variable	Level	Base	Yes	No	P-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	253	0.9%	99.1%	0.002		
	Female	338	5.9%	94.1%			

4.2.4.4 Changing dietary habit

The weight control method of changing dietary habit is associated significantly with gender, age and marital status.

A relatively higher proportion of females (76.1%), those aged 44 or below (ranged from 74.1% to 83.2%) and never married respondents (81.2%) were more likely than their respective counterparts to control their weight by changing their dietary habits (Table 4.2.4.4).

Table 4.2.4.4: Changing dietary habit (Q5e)

Variable	Level	Base	Yes	No	P-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	253	67.7%	32.3%	0.024		
	Female	338	76.1%	23.9%			
Age	18-24	67	74.1%	25.9%		0.013	
	25-34	123	83.2%	16.8%			
	35-44	164	75.4%	24.6%			
	45-54	153	63.6%	36.4%			
	55-64	71	66.1%	33.9%			
Marital status	Never married	192	81.2%	18.8%	0.004		
	Married	360	69.1%	30.9%			
	Divorced/ Separated/ Widowed	38	63.5%	36.5%			

4.3 Physical activities/ exercise

4.3.1 Vigorous physical activities/exercise

The number of days spent on doing vigorous physical activities/exercise for at least 10 minutes in the week prior to the survey is associated significantly with respondents' demographic characteristics including gender, age, marital status and occupation.

Females (82.7%), married respondents (79.7%) and clerks (84.6%) or service workers (81.3%) were more likely than their respective counterparts to have engaged in vigorous physical activities/exercise for at least 10 minutes on one day or less in the week before interview. Also, the older the respondents, the more likely that they had spent one day or less on such activities for at least 10 minutes in the week before interview (Table 4.3.1).

Table 4.3.1: Number of days per week spent on doing vigorous physical activities/ exercise for at least 10 minutes in the week prior to the survey (Q6)

Variable	Level	Base	0 – 1 day	2 – 3 days	4 – 5 days	6 – 7 days	P-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	946	71.7%	16.5%	5.4%	6.4%		0.000	
	Female	1 101	82.7%	9.2%	4.3%	3.9%			
Age	18-24	259	70.0%	21.6%	4.6%	3.8%			0.000
	25-34	425	75.5%	14.7%	5.5%	4.2%			
	35-44	536	77.3%	11.7%	6.6%	4.3%			
	45-54	491	80.5%	8.5%	3.6%	7.3%			
	55-64	269	81.4%	10.5%	3.2%	4.9%			
Marital status	Never married	645	74.0%	17.8%	3.8%	4.5%		0.010	
	Married	1 276	79.7%	9.9%	5.4%	5.0%			
	Divorced/ Separated/ Widowed	118	75.0%	13.3%	4.4%	7.3%			
Occupation	Managerial/ Professional worker	471	75.7%	16.8%	3.9%	3.6%		0.000	
	Clerk	281	84.6%	11.8%	1.8%	1.8%			
	Service worker	233	81.3%	9.1%	4.0%	5.6%			
	Blue collar worker	329	69.5%	10.5%	9.3%	10.7%			
	Not working	708	78.8%	12.0%	5.0%	4.2%			

4.3.2 Moderate physical activities/exercise

Number of days spent on doing moderate physical activities/exercise for at least 10 minutes in the week prior to the survey is associated significantly with occupation.

Managerial/professional workers (69.1%) and clerks (68.9%) were more likely to have spent one day or less on moderate physical activities for at least 10 minutes in the week prior to the survey (Table 4.3.2).

Table 4.3.2: Number of days spent on doing moderate physical activities/exercise or at least 10 minutes in the week prior to the survey (Q8)

Variable	Level	Base	0 – 1 day	2 – 3 days	4 – 5 days	6 – 7 days	P-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Occupation	Managerial/ Professional worker	471	69.1%	15.7%	6.1%	9.1%		0.000	
	Clerk	281	68.9%	18.3%	6.7%	6.1%			
	Service worker	233	64.8%	13.8%	6.0%	15.5%			
	Blue collar worker	328	55.7%	15.8%	5.7%	22.7%			
	Not working	707	63.8%	15.2%	6.6%	14.3%			

4.3.3 Walking

Significant associations exist between number of days spent on walking for at least 10 minutes in the week prior to the survey and respondents' age, educational attainment, marital status and occupation.

A relatively higher proportion of respondents aged 45 or above (ranged from 79.9% to 80.9%), those had not completed secondary education (83.8%) or had an education attainment of primary or below (77.3%), married respondents (77.1%) and blue collar workers (83.7%) reported that they walked for at least 10 minutes on 6-7 days within the week prior to the survey (Table 4.3.3).

Table 4.3.3: Number of days spent on walking for at least 10 minutes in the week prior to the survey (Q10)

Variable	Level	Base	0 – 1 day	2 – 3 days	4 – 5 days	6 – 7 days	p-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Age	18-24	259	4.0%	8.9%	19.0%	68.0%			0.000
	25-34	425	4.3%	9.1%	12.7%	73.9%			
	35-44	536	8.5%	10.0%	10.8%	70.6%			
	45-54	490	5.5%	6.7%	7.9%	79.9%			
	55-64	268	6.9%	5.6%	6.6%	80.9%			

Educational attainment	Primary or below	268	7.5%	6.7%	8.6%	77.3%			0.001
	Had not completed secondary	375	4.5%	5.0%	6.7%	83.8%			
	Completed secondary (F.5)	619	5.4%	10.2%	12.4%	72.0%			
	Matriculation	170	5.6%	9.1%	12.8%	72.5%			
	Tertiary or above	609	6.6%	8.4%	13.1%	71.9%			
Marital status	Never married	645	4.8%	9.0%	15.2%	71.0%		0.018	
	Married	1 274	6.6%	7.5%	8.8%	77.1%			
	Divorced/ Separated/ Widowed	117	4.2%	9.4%	13.1%	73.3%			
Occupation	Managerial/ Professional worker	470	7.6%	8.2%	11.1%	73.1%		0.000	
	Clerk	281	9.1%	9.4%	12.1%	69.4%			
	Service worker	233	4.9%	5.1%	13.0%	77.0%			
	Blue collar worker	329	4.4%	4.9%	7.0%	83.7%			
	Not working	706	4.6%	10.2%	12.1%	73.2%			

4.3.4 Physical activity level based on the analysis of IPAQ

The physical activity level based on the IPAQ analysis is associated significantly with gender, age, educational attainment and occupation

Females (24.1%), respondents aged 35-44 (27.9%), those with education level of completed secondary education or above (ranged from 24.6% to 25.3%) and clerks (30.8%) were more likely to have their level of physical activity classified as 'low' (Table 4.3.4).

Table 4.3.4: Physical activity level classified based on categorical score derived from the analysis of IPAQ

Variable	Level	Base	Low	Moderate	High	p-value		
						Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	900	20.1%	54.4%	25.5%	0.018		
	Female	1 060	24.1%	55.0%	20.9%			

Age	18-24	251	24.1%	55.8%	20.1%		0.000	
	25-34	409	22.4%	55.4%	22.1%			
	35-44	513	27.9%	51.8%	20.3%			
	45-54	476	19.4%	54.5%	26.1%			
	55-64	255	15.8%	58.1%	26.1%			
Educational attainment	Primary or below	247	20.0%	50.2%	29.8%		0.000	
	Had not completed secondary	359	14.5%	54.4%	31.0%			
	Completed secondary (F.5)	596	24.6%	52.7%	22.7%			
	Matriculation	165	25.3%	54.7%	20.0%			
	Tertiary or above	590	24.7%	58.7%	16.5%			
Occupation	Managerial/ Professional worker	458	24.6%	57.4%	18.0%	0.000		
	Clerk	276	30.8%	57.1%	12.1%			
	Service worker	228	19.4%	47.3%	33.3%			
	Blue collar worker	304	15.3%	44.6%	40.1%			
	Not working	673	21.4%	58.4%	20.2%			

4.3.5 Self perception of physical activity level

Self perception of physical activity level is associated significantly with respondents' gender, age, educational attainment, marital status, occupation and monthly household income.

Females (53.0%), respondents aged 44 or below (ranged from 52.3% to 55.0%), never married respondents (55.0%), clerks (63.9%) and those with monthly household income of $20,000 or above (ranged from 53.2% to 57.3%) were more likely to consider that their physical activity level as 'low'. Also, the higher the education level of the respondents, the more likely that they considered their physical activity level as 'low'(Table 4.3.5a).

Table 4.3.5a: Self perception of physical activity level (Q13)

Variable	Level	Base	Low	Moderate	High	p-value		
						Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	940	44.3%	44.3%	11.4%		0.000	
	Female	1 091	53.0%	41.5%	5.5%			

Age	18-24	259	54.9%	37.7%	7.3%			0.000
	25-34	424	55.0%	35.7%	9.3%			
	35-44	535	52.3%	39.8%	7.9%			
	45-54	488	42.9%	48.8%	8.4%			
	55-64	263	37.0%	54.2%	8.7%			
Educational attainment	Primary or below	260	34.9%	56.5%	8.6%			0.000
	Had not completed secondary	373	40.0%	49.9%	10.1%			
	Completed secondary (F.5)	617	50.5%	41.1%	8.3%			
	Matriculation	169	51.4%	40.3%	8.4%			
	Tertiary or above	609	58.3%	34.9%	6.8%			
Marital status	Never married	644	55.0%	37.2%	7.8%		0.004	
	Married	1 266	46.2%	45.6%	8.2%			
	Divorced/ Separated/ Widowed	115	45.0%	44.2%	10.8%			
Occupation	Managerial/ Professional worker	470	56.0%	36.5%	7.5%		0.000	
	Clerk	281	63.9%	33.6%	2.5%			
	Service worker	232	39.2%	50.7%	10.1%			
	Blue collar worker	324	27.2%	54.4%	18.4%			
	Not working	701	52.0%	42.1%	5.8%			
Monthly household income	Below $8,000	146	48.0%	46.5%	5.5%			0.000
	$8,000 - $13,999	338	41.7%	48.0%	10.3%			
	$14,000 - $19,999	210	41.7%	50.9%	7.4%			
	$20,000 - $39,999	538	53.2%	39.3%	7.5%			
	$40,000 or above	363	57.3%	36.0%	6.7%			

Analyses of respondents' self perception about their physical activity level by IPAQ classification were carried out. Significant associations exist between these two types of variables.

For those respondents who were classified as having "low" level of physical activity, close to three-tenths of them considered that their physical activity level as 'moderate' (27.6%) or 'high' (1.2%) (Table 4.3.5b).

Among those respondents who were classified as having 'high' level of physical activity, more than four-fifths of the respondents considered that their physical activity level as 'low' (21.5%) or 'moderate' (59.9%) (Table 4.3.5b).

Table 4.3.5b: Self perceived leval of physical activity level (Q13) by IPAQ Classification

Variable	Level	Base	Self perceived level of physical activity			p-value		
			Low	Moderate	High	Chi-square test	Kruskal-Wallis test	Rank correlation
IPAQ classification	Low	436	71.2%	27.6%	1.2%		0.000	
	Moderate	1 065	51.6%	42.5%	5.8%			
	High	449	21.5%	59.9%	18.6%			

4.4 Dietary habits

4.4.1 Frequency of drinking fruit/vegetable juice per week

The frequency of fruit/vegetable juice consumption is associated significantly with respondents' age, educational attainment, marital status, occupation and monthly household income.

A relatively higher proportion of respondents aged 55-64 (88.5%), married respondents (83.2%) and blue collar workers (87.3%) reported that they drank juice/vegetable juice 1 day or less in a week. Also, the lower the monthly household income or the lower the education level of the respondents, the more likely that they drank fruit/vegetable juice 1 day or less in a week (Table 4.4.1).

Table 4.4.1: Number of days per week in which respondents consumed fruit/ vegetable juice (Q15a)

Variable	Level	Base	0 – 1 day	2 – 3 days	4 – 5 days	6 – 7 days	p-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Age	18-24	259	72.9%	18.1%	4.3%	4.7%			0.000
	25-34	424	73.5%	18.0%	3.8%	4.7%			
	35-44	536	79.6%	12.8%	1.2%	6.5%			
	45-54	491	84.9%	9.0%	2.5%	3.6%			
	55-64	268	88.5%	6.5%	1.0%	3.9%			
Educational attainment	Primary or below	268	90.6%	5.2%	1.4%	2.9%			0.000
	Had not completed secondary	376	84.3%	10.4%	2.1%	3.2%			
	Completed secondary (F.5)	618	80.8%	12.6%	2.5%	4.0%			
	Matriculation	170	73.9%	17.7%	2.6%	5.8%			
	Tertiary or above	609	73.0%	17.0%	2.9%	7.1%			
Marital status	Never married	644	73.6%	17.2%	3.9%	5.3%		0.000	
	Married	1 275	83.2%	10.8%	1.9%	4.2%			
	Divorced/ Separated/ Widowed	118	78.7%	12.3%	0.0%	9.0%			

Occupation	Managerial/ Professional worker	471	74.2%	15.2%	3.0%	7.6%		0.000	
	Clerk	281	80.3%	14.0%	2.5%	3.2%			
	Service worker	233	77.3%	14.3%	3.5%	5.0%			
	Blue collar worker	329	87.3%	8.1%	0.7%	3.8%			
	Not working	707	80.6%	12.9%	2.5%	3.9%			
Monthly household income	Below $8,000	149	88.5%	6.6%	0.8%	4.1%			0.000
	$8,000 - $13,999	338	86.3%	9.5%	0.8%	3.4%			
	$14,000 - $19,999	211	84.6%	9.9%	3.3%	2.3%			
	$20,000 - $39,999	540	77.9%	15.3%	1.7%	5.1%			
	$40,000 or above	364	73.7%	15.5%	4.6%	6.2%			

4.4.2 Number of cups of fruit/vegetable juice consumed per day

The average number of cups of fruit/vegetable juice consumed per day by the respondents in the week prior to the survey is associated significantly with age, educational attainment, marital status, occupation and monthly household income.

Respondents aged 44 or below (ranged from 5.8% to 6.7%), divorced/ separated/ widowed respondents (9.0%), managerial/professional workers (9.2%) and those with monthly households income of $40,000 or above (7.3%) were more likely than their respective counterparts to consume one or more cups of fruit/vegetable juice per day. Also, the higher the education level of the respondents, the more likely that they consumed one or more cups of fruit/vegetable juice per day (Table 4.4.2).

Table 4.4.2: Average number of cups per day which the respondents consumed of fruit/vegetable juice (Q15a, Q15b)

Variable	Level	Base	Less than 1 cup	1 - 2 cups	More than 2 cups	p-value		
						Chi-square test	Kruskal-Wallis test	Rank correlation
Age	18-24	259	93.9%	4.4%	1.7%			0.050
	25-34	424	94.2%	4.7%	1.1%			
	35-44	536	93.3%	6.5%	0.2%			
	45-54	491	96.4%	2.7%	0.9%			
	55-64	268	97.0%	3.0%	0.0%			

Educational attainment	Primary or below	268	97.5%	2.5%	0.0%			0.000
	Had not completed secondary	376	96.9%	2.1%	1.0%			
	Completed secondary (F.5)	618	95.4%	4.0%	0.5%			
	Matriculation	170	94.1%	4.1%	1.7%			
	Tertiary or above	609	91.9%	7.1%	0.9%			
Marital status	Never married	644	93.8%	5.3%	0.8%		0.032	
	Married	1 275	95.6%	3.6%	0.7%			
	Divorced/ Separated/ Widowed	118	91.0%	8.3%	0.7%			
Occupation	Managerial/ Professional worker	471	90.8%	8.0%	1.2%		0.001	
	Clerk	281	96.8%	3.2%	0.0%			
	Service worker	233	95.0%	4.2%	0.8%			
	Blue collar worker	329	96.9%	2.8%	0.4%			
	Not working	707	95.7%	3.4%	1.0%			
Monthly household income	Below $8,000	149	96.6%	3.4%	0.0%			0.002
	$8,000 - $13,999	338	96.5%	2.8%	0.7%			
	$14,000 - $19,999	211	97.4%	2.6%	0.0%			
	$20,000 - $39,999	540	94.6%	4.7%	0.7%			
	$40,000 or above	364	92.7%	5.4%	1.9%			

4.4.3 Frequency of consuming fruit per week

The frequency of fruit consumption is associated significantly with respondents' gender, age, educational attainment, marital status, occupation and monthly household income.

The proportion of people consuming fruit 6-7 days a week was higher among females (60.8%), those aged 55-64 (68.2%), those with primary education level or below (61.9%), married respondents (59.3%), not working respondents (62.9%) and those with monthly household income of $13,999 or below (ranged from 57.2% to 60.3%) (Table 4.4.3).

Table 4.4.3: Number of days per week in which respondents ate fruit (Q16a)

Variable	Level	Base	0 – 1 day	2 – 3 days	4 – 5 days	6 – 7 days	p-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	946	16.1%	24.2%	13.2%	46.5%		0.000	
	Female	1 099	7.0%	17.5%	14.7%	60.8%			
Age	18-24	259	11.8%	27.8%	14.1%	46.3%			0.000
	25-34	425	15.2%	26.4%	15.2%	43.2%			
	35-44	535	11.1%	23.1%	13.3%	52.5%			
	45-54	491	9.6%	14.4%	15.6%	60.5%			
	55-64	269	9.2%	11.3%	11.3%	68.2%			
Educational attainment	Primary or below	268	11.1%	13.0%	14.0%	61.9%			0.000
	Had not completed secondary	378	12.1%	16.3%	13.0%	58.6%			
	Completed secondary (F.5)	618	11.8%	21.6%	13.5%	53.2%			
	Matriculation	169	10.0%	23.2%	12.4%	54.4%			
	Tertiary or above	609	10.5%	24.7%	15.7%	49.0%			
Marital Status	Never married	644	14.2%	27.0%	13.8%	45.0%		0.000	
	Married	1 275	9.6%	17.2%	13.9%	59.3%			
	Divorced/ Separated/ Widowed	118	12.9%	20.4%	16.8%	49.9%			
Occupation	Managerial/ Professional worker	470	12.3%	23.7%	14.0%	50.1%		0.000	
	Clerk	281	12.3%	24.3%	18.9%	44.5%			
	Service worker	233	17.2%	23.0%	13.7%	46.1%			
	Blue collar worker	328	12.3%	20.7%	12.0%	55.0%			
	Not working	708	7.7%	16.3%	13.1%	62.9%			
Monthly household income	Below $8,000	149	13.2%	18.4%	11.1%	57.2%			0.005
	$8,000 - $13,999	339	9.0%	17.0%	13.7%	60.3%			
	$14,000 - $19,999	211	10.9%	20.4%	15.2%	53.4%			
	$20,000 - $39,999	540	10.7%	23.4%	14.7%	51.1%			
	$40,000 or above	364	13.2%	19.3%	17.3%	50.2%			

4.4.4 Frequency of consuming vegetables per week

The frequency of vegetable consumption in the week prior to the survey is associated significantly with gender, age, educational attainment, marital status and occupation.

A relatively higher proportion of females (88.0%), those with primary education level or below (87.4%) or those had not completed secondary education (86.7%), married respondents (88.2%) and not working respondents (87.5%) had consumed vegetables 6-7 days a week. Also, the older the respondents, the more likely that they had consumed vegetables 6-7 days a week (Table 4.4.4).

Table 4.4.4: Number of days per week in which respondents consumed vegetables (Q17a)

Variable	Level	Base	0 – 1 day	2 – 3 days	4 – 5 days	6 – 7 days	p-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	946	1.1%	9.2%	10.5%	79.2%		0.000	
	Female	1 100	0.8%	2.8%	8.4%	88.0%			
Age	18-24	259	2.6%	5.9%	13.0%	78.5%			0.000
	25-34	425	1.4%	7.2%	11.9%	79.5%			
	35-44	535	0.4%	5.6%	10.1%	83.9%			
	45-54	491	0.2%	5.5%	7.7%	86.7%			
	55-64	269	0.8%	5.0%	5.6%	88.5%			
Educational attainment	Primary or below	268	1.0%	6.1%	5.5%	87.4%			0.040
	Had not completed secondary	378	1.6%	4.1%	7.7%	86.7%			
	Completed secondary (F.5)	618	0.8%	8.0%	8.8%	82.3%			
	Matriculation	170	1.4%	4.7%	12.1%	81.7%			
	Tertiary or above	609	0.5%	4.7%	12.0%	82.8%			
Marital status	Never married	645	1.7%	9.3%	12.9%	76.2%		0.000	
	Married	1 275	0.4%	3.8%	7.7%	88.2%			
	Divorced/ Separated/ Widowed	118	1.9%	8.6%	9.2%	80.3%			

Occupation	Managerial/ Professional worker	471	0.8%	5.8%	9.4%	84.0%		0.004	
	Clerk	281	0.5%	7.4%	13.5%	78.6%			
	Service worker	233	1.4%	6.8%	13.4%	78.4%			
	Blue collar worker	328	0.7%	7.1%	8.1%	84.2%			
	Not working	708	1.2%	4.4%	7.0%	87.5%			

4.4.5 Number of servings of fruit and vegetables consumed per day (excluding fruit/vegetable juice consumption)

From this survey, the average number of servings of fruit and vegetables consumed per day[23] is associated significantly with gender, age and marital status.

Females (25.9%) and married respondents (24.3%) were more likely than their respective counterparts to have consumed 5 or more servings of fruit and vegetables per day. Also, the older the respondents, the more likely that they had consumed 5 or more servings of fruit and vegetables per day (Table 4.4.5).

Table 4.4.5: Proportion of respondents who had consumed at least 5 servings of fruit and vegetables a day in the week prior to the survey (Q16b & Q17b)

Variable	Level	Base	Less than 5 servings of fruit and vegetables	5 or more servings of fruit and vegetables	p-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	939	82.9%	17.1%		0.000	
	Female	1 091	74.1%	25.9%			
Age	18-24	259	84.2%	15.8%			0.000
	25-34	424	81.2%	18.8%			
	35-44	534	78.6%	21.4%			
	45-54	484	77.4%	22.6%			
	55-64	267	68.4%	31.6%			
Marital status	Never married	640	83.3%	16.7%		0.000	
	Married	1 266	75.7%	24.3%			
	Divorced/ Separated/ Widowed	118	77.8%	22.2%			

[23] Total average number of servings: average no. of servings of fruit eaten per day + average no. of servings of vegetables eaten per day

4.5 Pattern of alcohol consumption

4.5.1 Consumption of alcohol

The consumption of at least one alcoholic drink in the month prior to the survey is associated significantly with gender, educational attainment, occupation and monthly household income.

Males (44.4%), those with tertiary education level or above (34.8%) and managerial/professional workers (40.8%) were more likely to have consumed at least one alcoholic drink in the month prior to the survey. Also, the higher the monthly household income of the respondents, the more likely that they had consumed at least one alcoholic drink in the month prior to the survey (Table 4.5.1).

Table 4.5.1: Consumption of at least one alcoholic drink in the month prior to the survey (Q18a)

Variable	Level	Base	Yes	No	p-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	946	44.4%	55.6%	0.000		
	Female	1 101	17.1%	82.9%			
Educational attainment	Primary or below	268	25.4%	74.6%		0.001	
	Had not completed secondary	378	28.7%	71.3%			
	Completed secondary (F.5)	619	29.9%	70.1%			
	Matriculation	170	20.0%	80.0%			
	Tertiary or above	609	34.8%	65.2%			
Occupation	Managerial/ Professional worker	471	40.8%	59.2%	0.000		
	Clerk	281	25.6%	74.4%			
	Service worker	233	34.8%	65.2%			
	Blue collar worker	329	36.8%	63.2%			
	Not working	708	18.8%	81.2%			
Monthly household income	Below $8,000	149	19.2%	80.8%		0.000	
	$8,000 - $13,999	339	24.3%	75.7%			
	$14,000 - $19,999	211	28.4%	71.6%			
	$20,000 - $39,999	540	30.8%	69.2%			
	$40,000 or above	364	41.2%	58.8%			

4.5.2 Frequency of alcohol consumption

The frequency of alcohol consumption per week during the month prior to the survey is associated significantly with gender, age, educational attainment, marital status, occupation and monthly household income.

A relatively higher proportion of males (16.4%), those with primary education level or below (33.0%), divorced/separated/ widowed respondents (24.2%) and blue collar workers (18.7%) reported that they drank 6 days or more per week. Also, the older the respondents or the lower the monthly household income of the respondents, the more likely that they reported that they drank 6 days or more per week (Table 4.5.2).

Table 4.5.2: Frequency of consuming at least one alcoholic drink in the month prior to the survey (Q18b)

Variable	Level	Base	1 day or less per week	2-3 days per week	4-5 days per week	6 days or more per week	p-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	413	55.0%	23.2%	5.4%	16.4%		0.000	
	Female	187	81.0%	7.9%	4.6%	6.5%			
Age	18-24	64	69.2%	26.2%	0.0%	4.6%			0.000
	25-34	145	70.1%	19.4%	5.2%	5.3%			
	35-44	164	70.1%	16.1%	7.3%	6.5%			
	45-54	139	56.4%	19.9%	2.0%	21.7%			
	55-64	74	40.2%	13.7%	10.6%	35.5%			
Educational attainment	Primary or below	67	40.0%	18.0%	9.0%	33.0%			0.000
	Had not completed secondary	104	55.3%	21.5%	4.9%	18.3%			
	Completed secondary (F.5)	181	64.3%	19.5%	4.9%	11.3%			
	Matriculation	34	76.9%	17.7%	3.3%	2.1%			
	Tertiary or above	212	71.5%	16.2%	4.1%	8.2%			
Marital status	Never married	198	73.1%	20.0%	2.9%	4.0%		0.001	
	Married	362	58.5%	18.1%	6.2%	17.2%			
	Divorced/Separated /Widowed	40	55.3%	13.4%	7.1%	24.2%			
Occupation	Managerial/ Professional worker	192	66.9%	19.1%	3.1%	10.9%		0.044	
	Clerk	71	70.1%	13.6%	8.3%	8.0%			
	Service worker	80	58.6%	21.4%	6.1%	13.9%			
	Blue collar worker	115	52.7%	23.4%	5.2%	18.7%			
	Not working	133	66.5%	14.5%	4.5%	14.5%			

Monthly household income	Below $8,000	26	47.2%	20.7%	4.7%	27.4%			0.010
	$8,000 - $13,999	80	59.6%	18.5%	2.4%	19.5%			
	$14,000 - $19,999	59	54.7%	22.6%	7.7%	15.0%			
	$20,000 - $39,999	165	71.3%	15.3%	3.6%	9.8%			
	$40,000 or above	149	64.5%	23.1%	5.0%	7.5%			

4.5.3 Consumption of at least 5 glasses/cans of alcohol on one single occasion (Binge drinking)

Binge drinking during the month prior to the survey is associated significantly with respondents' gender, age, educational attainment, marital status and occupation.

A relatively higher proportion of males (35.0%), those aged 25-34 (36.3%), those had not completed secondary education (38.5%) or those had a matriculation education level (37.7%), divorced/separated/widowed respondents (53.2%) and service workers (45.5%) had engaged in binge drinking during the month prior to the survey (Table 4.5.3).

Table 4.5.3: Consumption of at least 5 glasses/cans of alcohol on one single occasion during the month prior to the survey (Q18d)

Variable	Level	Base	Yes	No	p-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	416	35.0%	65.0%	0.000		
	Female	188	12.4%	87.6%			
Age	18-24	64	29.7%	70.3%		0.046	
	25-34	145	36.3%	63.7%			
	35-44	165	23.8%	76.2%			
	45-54	141	22.8%	77.2%			
	55-64	75	32.1%	67.9%			
Educational attainment	Primary or below	67	31.3%	68.7%		0.000	
	Had not completed secondary	108	38.5%	61.5%			
	Completed secondary (F.5)	181	33.2%	66.8%			
	Matriculation	34	37.7%	62.3%			
	Tertiary or above	212	15.7%	84.3%			
Marital status	Never married	199	31.8%	68.2%	0.000		
	Married	363	23.2%	76.8%			
	Divorced/Separated /Widowed	41	53.2%	46.8%			

Occupation	Managerial/ Professional worker	192	25.9%	74.1%	0.000		
	Clerk	72	15.0%	85.0%			
	Service worker	81	45.5%	54.5%			
	Blue collar worker	117	40.0%	60.0%			
	Not working	133	17.1%	82.9%			

4.5.4 Drinking habit by low risk level

Classification of a low risk drinking habit by the British guidelines on safe drinking is associated significantly with gender, educational attainment, marital status and occupation.

Males (33.5%), divorced/separated/widowed respondents (58.4%) and service workers (39.4%) were more likely to have drunk exceeding the low risk level. Also, the lower the education level of respondents, the more likely that they had drunk exceeding the low risk level (Table 4.5.4).

Table 4.5.4: Classification of alcohol consumption by low risk level

Variable	Level	Base	Within low risk level	Exceed low risk level	p-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	411	66.5%	33.5%	0.001		
	Female	184	80.3%	19.7%			
Educational attainment	Primary or below	66	59.4%	40.6%		0.003	
	Had not completed secondary	104	60.5%	39.5%			
	Completed secondary (F.5)	178	67.5%	32.5%			
	Matriculation	33	73.1%	26.9%			
	Tertiary or above	212	81.6%	18.4%			
Marital status	Never married	197	72.5%	27.5%	0.000		
	Married	360	73.0%	27.0%			
	Divorced/Separated /Widowed	39	41.6%	58.4%			
Occupation	Managerial/ Professional worker	191	73.8%	26.2%	0.025		
	Clerk	71	80.2%	19.8%			
	Service worker	79	60.6%	39.4%			
	Blue collar worker	115	64.2%	35.8%			
	Not working	130	74.6%	25.4%			

4.6 Smoking habits

4.6.1 Smoking habits

Smoking habit is associated significantly with gender, age, educational attainment, occupation and monthly household income.

A relatively higher proportion of males (27.2%), those aged 25-34 (22.7%), those had not completed secondary education (25.7%), blue collar workers (31.7%) and those with monthly household income of $14,000-$19,999 (24.1%) were identified as current smokers (Table 4.6.1).

Table 4.6.1: Smoking habit (Q19a)

Variable	Level	Base	Yes, but not now	Yes, and still smoking	Never	p-value		
						Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	946	16.7%	27.2%	56.0%	0.000		
	Female	1 101	4.2%	6.9%	88.9%			
Age	18-24	259	9.0%	9.9%	81.0%		0.000	
	25-34	425	10.5%	22.7%	66.8%			
	35-44	536	10.0%	16.7%	73.3%			
	45-54	491	8.6%	15.1%	76.3%			
	55-64	269	13.2%	15.9%	70.8%			
Educational attainment	Primary or below	268	11.2%	19.8%	69.1%		0.000	
	Had not completed secondary	378	11.9%	25.7%	62.4%			
	Completed secondary (F.5)	619	11.5%	19.9%	68.6%			
	Matriculation	170	6.4%	8.9%	84.8%			
	Tertiary or above	609	7.8%	7.2%	85.0%			
Occupation	Managerial/ Professional worker	471	11.4%	14.0%	74.6%	0.000		
	Clerk	281	4.4%	9.7%	85.9%			
	Service worker	233	15.0%	22.6%	62.4%			
	Blue collar worker	329	14.0%	31.7%	54.3%			
	Not working	708	7.3%	11.0%	81.7%			
Monthly household income	Below $8,000	149	15.6%	19.4%	64.9%		0.022	
	$8,000 - $13,999	339	9.0%	15.8%	75.2%			
	$14,000 - $19,999	211	11.0%	24.1%	64.9%			
	$20,000 - $39,999	540	8.5%	15.3%	76.1%			
	$40,000 or above	364	11.9%	14.3%	73.8%			

4.6.2 Amount of cigarettes consumed

Amount of cigarettes consumed is associated significantly with respondents' gender, age, educational attainment, marital status, occupation and monthly household income.

A relatively higher proportion of males (15.8%), those with primary education level or below (36.0%), married respondents (16.5%), blue collar workers (21.1%) and those with monthly household income of below $8,000 (28.4%) reported that they smoked more than 20 cigarettes per day. Also, the older the respondents, the more likely that they smoked more than 20 cigarettes per day (Table 4.6.2).

Table 4.6.2: Average number of cigarettes which the respondents smoked per day (Q19c)

Variable	Level	Base	Less than 1 cigarette per day now	1-10 cigarettes per day now	11-20 cigarettes per day now	More than 20 cigarettes per day now	p-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	257	3.3%	38.0%	42.8%	15.8%		0.000	
	Female	74	11.1%	61.6%	23.9%	3.3%			
Age	18-24	26	5.8%	76.3%	17.9%	.0%			0.000
	25-34	95	4.6%	58.2%	32.2%	4.9%			
	35-44	89	8.3%	32.7%	41.9%	17.2%			
	45-54	74	3.4%	33.4%	44.6%	18.7%			
	55-64	42	0.0%	31.1%	47.1%	21.8%			
Educational attainment	Primary or below	53	2.4%	19.9%	41.7%	36.0%			0.000
	Had not completed secondary	95	3.3%	39.4%	44.0%	13.3%			
	Completed secondary (F.5)	123	6.9%	50.7%	35.3%	7.1%			
	Matriculation	15	0.0%	28.9%	62.7%	8.3%			
	Tertiary or above	44	6.8%	65.2%	24.8%	3.2%			
Marital status	Never married	100	3.9%	63.7%	26.0%	6.4%		0.000	
	Married	202	5.3%	32.9%	45.4%	16.5%			
	Divorced/Separated /Widowed	28	4.6%	47.9%	35.5%	12.0%			
Occupation	Managerial/ Professional worker	66	5.8%	53.0%	27.8%	13.5%		0.000	
	Clerk	27	4.9%	75.3%	19.8%	0.0%			
	Service worker	53	2.4%	53.9%	37.0%	6.7%			
	Blue collar worker	103	3.5%	24.7%	50.6%	21.1%			
	Not working	78	7.4%	41.5%	39.8%	11.4%			

Monthly household income	Below $8,000	29	0.0%	44.9%	26.7%	28.4%			0.033
	$8,000 - $13,999	54	1.4%	30.2%	49.3%	19.0%			
	$14,000 - $19,999	51	4.3%	41.4%	40.9%	13.5%			
	$20,000 - $39,999	83	9.4%	44.7%	38.3%	7.7%			
	$40,000 or above	52	3.9%	39.9%	48.4%	7.8%			

4.7 General health status

4.7.1 Perception about general health status

The perception about general health status is associated significantly with respondents' gender, age, educational attainment, occupation and monthly household income.

A relatively higher proportion of respondents of females (8.8%) and those aged 45-54 (8.4%), had primary education level or below (9.6%), were not working (10.0%) and had monthly household income of below $8,000 (14.2%) self-rated their health status as 'poor' (Table 4.7.1).

Table 4.7.1: Perception about general health status (Q20)

Variable	Level	Base	Excellent	Very good	Good	Fair	Poor	p-value		
								Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	945	2.1%	11.5%	26.7%	53.6%	6.1%		0.002	
	Female	1 100	1.3%	9.4%	25.4%	55.1%	8.8%			
Age	18-24	259	0.3%	8.7%	33.3%	50.3%	7.4%			0.021
	25-34	425	1.0%	13.2%	27.5%	50.9%	7.4%			
	35-44	536	1.7%	10.9%	26.3%	54.0%	7.1%			
	45-54	490	2.7%	7.8%	23.4%	57.8%	8.4%			
	55-64	268	2.2%	12.0%	22.0%	56.1%	7.8%			
Educational attainment	Primary or below	266	0.5%	6.1%	16.3%	67.5%	9.6%			0.000
	Had not completed secondary	378	1.6%	6.1%	23.8%	59.6%	8.9%			
	Completed secondary (F.5)	619	1.5%	10.1%	25.3%	56.6%	6.6%			
	Matriculation	170	2.2%	11.5%	32.1%	46.2%	8.0%			
	Tertiary or above	609	2.3%	14.9%	30.5%	45.5%	6.8%			
Occupation	Managerial/ Professional worker	471	2.5%	16.1%	28.7%	45.9%	6.9%		0.000	
	Clerk	281	2.0%	9.1%	26.9%	56.9%	5.1%			
	Service worker	232	0.5%	8.7%	27.3%	55.6%	7.9%			
	Blue collar worker	329	3.7%	6.5%	24.6%	59.4%	5.9%			
	Not working	708	0.5%	9.4%	23.7%	56.4%	10.0%			

Monthly household income	Below $8,000	148	1.6%	5.1%	21.4%	57.8%	14.2%			0.000
	$8,000 - $13,999	339	0.7%	8.2%	20.1%	60.8%	10.1%			
	$14,000 - $19,999	211	1.2%	8.6%	24.4%	60.9%	4.8%			
	$20,000 - $39,999	540	0.6%	11.7%	27.6%	55.2%	4.9%			
	$40,000 or above	364	3.3%	15.3%	31.5%	42.5%	7.4%			

4.7.2 Perception of health condition compared with people of the same age

The perception of health condition compared with people of the same age is associated significantly with the respondents' age, marital status, occupation and monthly household income.

Respondents aged 18-24 (17.5%), divorced/separated/widowed respondents (17.5%), not working respondents (18.5%) and those with monthly household income of below $8,000 (28.0%) were more likely to report their health status as 'worse' or 'much worse' when compared with people of the same age (Table 4.7.2).

Table 4.7.2: Perception of the health condition compared with people of the same age (Q21)

Variable	Level	Base	Much better	Better	The same	Worse	Much worse	p-value		
								Chi-square test	Kruskal-Wallis test	Rank correlation
Age	18-24	259	2.0%	18.8%	61.7%	16.1%	1.5%			0.000
	25-34	425	4.4%	22.2%	59.3%	13.1%	1.1%			
	35-44	533	7.2%	26.6%	54.1%	10.8%	1.4%			
	45-54	486	8.3%	31.6%	48.2%	10.4%	1.6%			
	55-64	261	14.1%	35.6%	37.7%	12.1%	0.6%			
Marital status	Never married	644	5.6%	21.8%	56.1%	15.2%	1.4%		0.000	
	Married	1 261	7.4%	29.5%	51.8%	10.4%	0.8%			
	Divorced/Separated /Widowed	115	12.1%	30.4%	40.0%	12.0%	5.5%			
Occupation	Managerial/ Professional worker	468	9.7%	29.9%	51.4%	8.3%	0.7%		0.000	
	Clerk	281	4.3%	26.1%	57.9%	10.7%	1.0%			
	Service worker	232	7.2%	27.2%	53.4%	11.7%	0.4%			
	Blue collar worker	324	9.8%	30.1%	49.6%	9.6%	0.8%			
	Not working	699	5.7%	24.4%	51.4%	16.2%	2.3%			

Monthly household income	Below $8,000	147	7.4%	28.6%	35.9%	23.8%	4.2%			0.000
	$8,000 - $13,999	333	4.5%	27.2%	49.9%	15.9%	2.6%			
	$14,000 - $19,999	211	9.8%	20.9%	59.5%	9.9%	0.0%			
	$20,000 - $39,999	539	5.9%	28.1%	56.6%	9.1%	0.3%			
	$40,000 or above	363	9.8%	29.0%	50.9%	9.1%	1.3%			

4.7.3 Perception of present health condition compared with 12 months ago

Respondents' perception of present health condition compared with 12 months ago is associated significantly with educational attainment and monthly household income.

Respondents having primary education level or below (32.9%) and monthly household income of $19,999 or below (ranged from 27.1% to 30.0%) were more likely than their respective counterparts to perceive their health status as "worse" or "much worse" compared with 12 months ago. (Table 4.7.3)

Table 4.7.3: Perception of the general health status compared with 12 months ago (Q22)

Variable	Level	Base	Much better	Better	The same	Worse	Much worse	p-value		
								Chi-square test	Kruskal-Wallis test	Rank correlation
Educational attainment	Primary or below	267	4.0%	11.8%	51.4%	28.9%	4.0%			0.005
	Had not completed secondary	378	3.7%	10.6%	60.0%	23.8%	1.9%			
	Completed secondary (F.5)	619	4.1%	12.5%	61.3%	21.1%	1.0%			
	Matriculation	170	3.7%	13.5%	62.4%	20.4%	0.0%			
	Tertiary or above	609	2.4%	14.2%	63.5%	19.2%	0.7%			
Monthly household income	Below $8,000	148	2.1%	11.4%	57.3%	24.6%	4.6%			0.002
	$8,000 - $13,999	339	4.9%	12.1%	55.9%	24.4%	2.7%			
	$14,000 - $19,999	211	3.8%	11.6%	54.6%	29.6%	0.3%			
	$20,000 - $39,999	540	3.1%	10.8%	65.9%	19.8%	0.4%			
	$40,000 or above	364	2.0%	14.4%	63.5%	19.3%	0.9%			

4.8 Cervical screening (for female respondents only)

4.8.1 Experience of cervical screening

Experience of cervical screening is associated significantly with female respondents' age, educational attainment, marital status and monthly household income.

Among all female respondents, those aged 35-54 (ranged from 79.2% to 79.5%), those with primary education level or below (75.2%), married respondents (82.7%) and those with monthly household income of $14,000-$19,999 (74.0%) or $40,000 or above (74.7%) were more likely to have had a cervical smear when compared to their respective counterparts (Table 4.8.1).

Table 4.8.1: Ever had cervical smear before (Q23a)

Variable	Level	Base	Yes	No	p-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Age	18-24	131	5.6%	94.4%		0.000	
	25-34	235	54.2%	45.8%			
	35-44	299	79.5%	20.5%			
	45-54	246	79.2%	20.8%			
	55-64	129	72.6%	27.4%			
Educational attainment	Primary or below	154	75.2%	24.8%		0.000	
	Had not completed secondary	188	72.1%	27.9%			
	Completed secondary (F.5)	350	72.3%	27.7%			
	Matriculation	100	38.6%	61.4%			
	Tertiary or above	294	52.3%	47.7%			
Marital status	Never married	314	19.7%	80.3%	0.000		
	Married	697	82.7%	17.3%			
	Divorced/ Separated/ Widowed	72	78.3%	21.7%			
Monthly household income	Below $8,000	83	58.3%	41.7%		0.013	
	$8,000 - $13,999	194	63.4%	36.6%			
	$14,000 - $19,999	113	74.0%	26.0%			
	$20,000 - $39,999	284	66.8%	33.2%			
	$40,000 or above	165	74.7%	25.3%			

4.8.2 Time since last cervical smear

The period since the female respondents' last cervical smear for those ever screened is associated significantly with age, marital status, occupation and monthly household income.

Among those females who had had a cervical smear before, a relatively higher proportion of respondents aged 55-64 (17.6%), divorced/separated/widowed respondents (16.0%), blue collar workers (17.5%) and those with monthly household income of below $8,000 (17.5%) reported that they had their last smear 37 or more months ago (Table 4.8.2).

Table 4.8.2: Period of time since last cervical smear (Q23b)

Variable	Level	Base	1-12 months ago	13-36 months ago	37 or more months ago	p-value		
						Chi-square test	Kruskal-Wallis test	Rank correlation
Age	18-24	7	70.0%	20.0%	10.0%			0.000
	25-34	126	65.0%	28.4%	6.6%			
	35-44	233	60.3%	32.0%	7.7%			
	45-54	191	57.7%	29.4%	12.9%			
	55-64	91	42.0%	40.3%	17.6%			
Marital status	Never married	62	67.9%	22.0%	10.1%		0.022	
	Married	563	59.3%	31.0%	9.7%			
	Divorced/ Separated/ Widowed	56	42.7%	41.2%	16.0%			
Occupation	Managerial/ Professional worker	115	62.8%	27.8%	9.3%		0.028	
	Clerk	121	70.2%	24.1%	5.8%			
	Service worker	68	60.6%	29.0%	10.5%			
	Blue collar worker	50	56.1%	26.4%	17.5%			
	Not working	320	52.8%	35.6%	11.6%			
Monthly household income	Below $8,000	48	47.4%	35.1%	17.5%			0.002
	$8,000 - $13,999	120	51.2%	35.0%	13.7%			
	$14,000 - $19,999	81	59.1%	27.3%	13.6%			
	$20,000 - $39,999	189	64.8%	26.9%	8.3%			
	$40,000 or above	121	64.4%	30.9%	4.7%			

4.8.3 Only one cervical smear

Having had only one cervical screening is associated significantly with age, marital status and monthly household income.

Of those females who had had a cervical smear before, respondents aged 18-24 (80.0%), never married respondents (30.8%) and those with monthly household income of below $8,000 (27.9%) were more likely to have been screened once than their counterparts (Table 4.8.3).

Table 4.8.3: Only one cervical smear (Q24)

Variable	Level	Base	Yes	No	p-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Age	18-24	7	80.0%	20.0%		0.000	
	25-34	127	18.7%	81.3%			
	35-44	238	11.7%	88.3%			
	45-54	195	5.8%	94.2%			
	55-64	93	12.3%	87.7%			
Marital status	Never married	62	30.8%	69.2%	0.000		
	Married	577	10.0%	90.0%			
	Divorced/ Separated/ Widowed	56	17.0%	83.0%			
Monthly household income	Below $8,000	48	27.9%	72.1%		0.006	
	$8,000 - $13,999	123	9.2%	90.8%			
	$14,000 - $19,999	83	15.7%	84.3%			
	$20,000 - $39,999	190	11.9%	88.1%			
	$40,000 or above	123	10.1%	89.9%			

4.8.4 Regular cervical screening

The habit of regular cervical screening is associated significantly with educational attainment, marital status and monthly household income.

Among those females who had more than one cervical smear before, respondents with primary education level or below (30.7%), and divorced/separated/widowed respondents (37.7%) were less likely to have regular screening. Also, the lower the monthly household income of respondents, the less likely that they had regular screening (Table 4.8.4).

Table 4.8.4: Regular cervical screening (Q25a)

Variable	Level	Base	Yes	No	p-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Educational attainment	Primary or below	106	69.3%	30.7%		0.014	
	Had not completed secondary	117	76.5%	23.5%			
	Completed secondary (F.5)	222	77.4%	22.6%			
	Matriculation	35	88.6%	11.4%			
	Tertiary or above	130	84.2%	15.8%			
Marital status	Never married	43	78.7%	21.3%	0.029		
	Married	519	79.2%	20.8%			
	Divorced/ Separated/ Widowed	47	62.3%	37.7%			
Monthly household income	Below $8,000	35	60.2%	39.8%		0.002	
	$8,000 - $13,999	111	68.7%	31.3%			
	$14,000 - $19,999	70	79.3%	20.7%			
	$20,000 - $39,999	167	82.0%	18.0%			
	$40,000 or above	111	84.3%	15.7%			

4.8.5 Whether plan to have cervical smear in future

Respondents' plan to have cervical smear within the next three years is associated significantly with age, educational attainment, marital status, occupation and monthly household income.

Among all female respondents, a relatively higher proportion of respondents aged 18-24 (75.6%), those had a matriculation education level (49.4%), never married respondents (53.8%) and not working respondents (34.7%) claimed that they did not plan to have a cervical smear within the next three years. Also, the lower the monthly household income of respondents, the less likely that they had a plan to have a cervical smear within the next three years (Table 4.8.5).

Table 4.8.5: Whether plan to have cervical smear within the next three years (Q26)

Variable	Level	Base	Yes	No	p-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Age	18-24	131	24.4%	75.6%		0.000	
	25-34	235	76.3%	23.7%			
	35-44	298	83.0%	17.0%			
	45-54	241	78.1%	21.9%			
	55-64	122	63.0%	37.0%			

Educational attainment	Primary or below	154	66.9%	33.1%		0.000	
	Had not completed secondary	184	73.8%	26.2%			
	Completed secondary (F.5)	346	79.5%	20.5%			
	Matriculation	99	50.6%	49.4%			
	Tertiary or above	295	67.9%	32.1%			
Marital status	Never married	315	46.2%	53.8%	0.000		
	Married	688	82.6%	17.4%			
	Divorced/ Separated/ Widowed	72	67.0%	33.0%			
Occupation	Managerial/ Professional worker	184	76.9%	23.1%	0.002		
	Clerk	201	76.9%	23.1%			
	Service worker	109	77.1%	22.9%			
	Blue collar worker	80	67.6%	32.4%			
	Not working	493	65.3%	34.7%			
Monthly household income	Below $8,000	82	46.9%	53.1%		0.000	
	$8,000 - $13,999	191	65.4%	34.6%			
	$14,000 - $19,999	112	76.1%	23.9%			
	$20,000 - $39,999	279	80.4%	19.6%			
	$40,000 or above	165	86.6%	13.4%			

4.9 Food handling practices

4.9.1 Washing all food thoroughly before cooking, especially seafood

Conformance to the practice 'washing all food thoroughly, especially seafood' is associated significantly with gender, age and marital status.

Males (4.8%), those aged 18-24 (7.7%) and never married respondents (5.2%) were more likely to report that they engaged in this practice infrequently ('some of the time' or 'none of the time') than their counterparts (Table 4.9.1).

Table 4.9.1: Frequency of respondents conformed to practice 'washing all food thoroughly before cooking, especially seafood' (Q27)

Variable	Level	Base	All of the time	Most of the time	Some of the time	None of the time	p-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	784	73.9%	21.3%	4.5%	0.3%		0.000	
	Female	1 022	82.8%	15.4%	1.7%	0.1%			
Age	18-24	206	69.9%	22.4%	7.0%	0.7%			0.001
	25-34	356	80.3%	17.2%	2.5%	0.0%			
	35-44	484	78.3%	19.1%	2.6%	0.0%			
	45-54	444	80.3%	17.4%	2.0%	0.3%			
	55-64	258	81.3%	16.4%	2.3%	0.0%			
Marital status	Never married	519	74.7%	20.2%	4.9%	0.3%		0.001	
	Married	1 171	80.8%	17.1%	2.1%	0.0%			
	Divorced/ Separated/ Widowed	111	79.9%	16.2%	2.7%	1.1%			

4.9.2 Keeping raw and cooked food separately

Conformance to the practice 'keeping raw and cooked food separately' is associated significantly with gender, age, educational attainment, marital status, occupation and monthly household income.

A relatively higher proportion of males (15.0%), those aged 18-24 (22.8%), those with secondary education level or below (ranged from 12.6% to 14.0%), never married respondents (16.6%) and blue collar workers (21.4%) stated that they carried out this practice 'some of the time' or 'none of the time'. Also, the lower the monthly household income of respondents, the more likely that they infrequently ('some of the time' or 'none of the time') kept raw and cooked food separately (Table 4.9.2).

Table 4.9.2: Frequency of respondents conformed to practice 'keeping raw and cooked food separately' (Q28)

Variable	Level	Base	All of the time	Most of the time	Some of the time	None of the time	p-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	839	61.5%	23.5%	10.9%	4.1%		0.000	
	Female	1 050	71.3%	20.2%	7.2%	1.4%			
Age	18-24	228	54.5%	22.7%	20.1%	2.7%			0.006
	25-34	384	68.7%	18.5%	11.3%	1.6%			
	35-44	501	70.9%	20.5%	6.1%	2.6%			
	45-54	465	68.0%	24.1%	4.9%	3.0%			
	55-64	253	62.4%	26.4%	7.5%	3.7%			
Educational attainment	Primary or below	246	59.8%	26.7%	7.0%	6.5%			0.001
	Had not completed secondary	358	64.1%	23.3%	9.0%	3.5%			
	Completed secondary (F.5)	581	66.5%	19.4%	11.6%	2.4%			
	Matriculation	157	68.1%	21.2%	8.9%	1.9%			
	Tertiary or above	544	72.1%	20.7%	6.6%	.7%			
Marital status	Never married	571	61.4%	22.0%	13.6%	3.0%		0.000	
	Married	1 201	68.7%	22.5%	6.6%	2.2%			
	Divorced/ Separated/ Widowed	110	75.2%	11.8%	8.2%	4.9%			
Occupation	Managerial/ Professional worker	426	72.7%	19.5%	6.9%	0.9%		0.000	
	Clerk	272	69.1%	20.7%	9.1%	1.1%			
	Service worker	211	69.3%	21.1%	6.7%	3.0%			
	Blue collar worker	296	55.5%	23.1%	14.4%	7.0%			
	Not working	664	66.2%	23.2%	8.3%	2.3%			
Monthly household income	Below $8,000	136	57.4%	23.7%	11.0%	7.9%			0.000
	$8,000 - $13,999	313	63.0%	22.3%	9.6%	5.1%			
	$14,000 - $19,999	199	58.2%	28.1%	9.7%	3.9%			
	$20,000 - $39,999	504	68.5%	20.7%	8.8%	1.9%			
	$40,000 or above	334	74.0%	19.8%	5.4%	0.8%			

4.9.3 Cooking/reheating food thoroughly, including seafood

Conformance to the practice 'cooking/reheating food thoroughly, including seafood' is associated significantly with gender, age, marital status and occupation.

Males (10.5%), those aged 18-24 (9.7%), never married respondents (9.1%) and managerial/professional workers (10.8%) or blue collars workers (10.9%) were more likely to report that they engaged in this practice 'some of the time' or 'none of the time' than their counterparts (Table 4.9.3).

Table 4.9.3: Frequency of respondents conformed to practice 'cooking/reheating food thoroughly, including seafood' (Q29)

Variable	Level	Base	All of the time	Most of the time	Some of the time	None of the time	p-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	878	67.0%	22.5%	9.4%	1.1%		0.000	
	Female	1 060	77.5%	17.6%	4.4%	0.5%			
Age	18-24	232	67.4%	22.8%	9.1%	0.7%			0.005
	25-34	397	70.5%	24.1%	5.0%	0.4%			
	35-44	512	73.1%	17.9%	7.7%	1.3%			
	45-54	472	75.9%	16.2%	6.8%	1.1%			
	55-64	263	74.0%	20.0%	6.0%	0.0%			
Marital status	Never married	589	67.6%	23.3%	7.6%	1.4%		0.000	
	Married	1 231	75.2%	18.1%	6.2%	0.4%			
	Divorced/ Separated/ Widowed	112	71.0%	20.8%	6.5%	1.7%			
Occupation	Managerial/ Professional worker	433	67.6%	21.6%	9.4%	1.4%		0.001	
	Clerk	270	75.7%	21.0%	3.3%	0.0%			
	Service worker	224	71.8%	21.7%	6.2%	0.3%			
	Blue collar worker	312	66.4%	22.7%	9.3%	1.6%			
	Not working	675	78.2%	16.3%	5.1%	0.4%			

4.9.4 Washing hands before handling food

Engaging in the practice 'washing hands before handling food' is associated significantly with gender, age, educational attainment, marital status, occupation and monthly household income.

Respondents who engaged in this practice 'some of the time' or 'none of the time' were more likely to be males (13.5%), those aged 18-24 (10.9%) or aged 45-54 (10.8%), those with primary education level or below (13.1%), never married respondents (11.8%), blue collar workers (16.0%) and those with monthly household income of $13,999 or below (ranged from 13.0% to 13.1%) (Table 4.9.4).

Table 4.9.4: Frequency of respondents conformed to practice 'washing hands before handling food' (Q30)

Variable	Level	Base	All of the time	Most of the time	Some of the time	None of the time	p-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	909	62.9%	23.5%	12.7%	0.8%		0.000	
	Female	1 080	75.4%	18.7%	5.4%	0.5%			
Age	18-24	245	60.6%	28.5%	10.9%	0.0%			0.001
	25-34	409	68.3%	22.0%	9.3%	0.4%			
	35-44	526	71.8%	19.6%	7.6%	1.0%			
	45-54	482	71.8%	17.4%	10.0%	0.9%			
	55-64	265	71.3%	21.0%	7.0%	0.7%			
Educational attainment	Primary or below	264	63.2%	23.7%	12.2%	1.0%			0.010
	Had not completed secondary	374	65.2%	22.8%	10.8%	1.3%			
	Completed secondary (F.5)	603	73.4%	17.7%	8.2%	0.7%			
	Matriculation	166	69.0%	24.1%	6.9%	0.0%			
	Tertiary or above	580	71.7%	21.0%	7.1%	0.1%			
Marital status	Never married	615	64.9%	23.2%	11.2%	0.6%		0.001	
	Married	1 248	71.3%	20.5%	7.8%	0.4%			
	Divorced/ Separated/ Widowed	118	77.6%	13.9%	5.8%	2.7%			
Occupation	Managerial/ Professional worker	450	69.9%	21.3%	8.3%	0.5%		0.000	
	Clerk	274	77.9%	18.4%	3.0%	0.7%			
	Service worker	228	67.9%	20.3%	11.2%	0.6%			
	Blue collar worker	320	59.6%	24.4%	15.3%	0.7%			
	Not working	693	71.5%	20.4%	7.4%	0.7%			
Monthly household income	Below $8,000	147	63.7%	23.3%	10.1%	2.9%			0.023
	$8,000 - $13,999	331	64.3%	22.5%	12.5%	0.7%			
	$14,000 - $19,999	204	71.3%	17.3%	10.4%	1.0%			
	$20,000 - $39,999	528	70.4%	22.0%	7.5%	0.1%			
	$40,000 or above	352	71.8%	21.0%	6.5%	0.7%			

4.10 Hand hygiene

4.10.1 Using liquid soap to wash hands

Frequency of using liquid soap to wash hands in the three days prior to the survey is associated significantly with gender, age, educational attainment, marital status, occupation and monthly household income.

Males (37.7%), those aged 18-24 (47.9%), never married respondents (38.8%), blue collar workers (42.2%) and those with monthly household income of $13,999 or below (ranged from 40.5% to 41.1%) were more likely to report that they infrequently ('sometimes' or 'never') used liquid soap to wash hands in the three days prior to the survey. Also, the lower the education level of respondents, the more likely that they infrequently ('sometimes' or 'never') used liquid soap to wash hands in the three days prior to the survey (Table 4.10.1).

Table 4.10.1: Frequency of using liquid soap to wash hands in the three days prior to the survey (Q31)

Variable	Level	Base	Always	Often	Some-times	Never	p-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	945	35.1%	27.2%	32.8%	4.9%		0.000	
	Female	1 101	40.2%	28.1%	29.7%	2.1%			
Age	18-24	259	23.6%	28.5%	42.7%	5.2%			0.000
	25-34	425	40.3%	29.6%	28.6%	1.5%			
	35-44	536	40.4%	27.0%	29.9%	2.7%			
	45-54	491	39.2%	27.2%	29.4%	4.3%			
	55-64	268	39.2%	28.2%	27.2%	5.3%			
Educational attainment	Primary or below	268	34.9%	23.8%	34.0%	7.3%			0.019
	Had not completed secondary	376	37.2%	24.1%	34.6%	4.0%			
	Completed secondary (F.5)	619	40.2%	24.5%	32.1%	3.2%			
	Matriculation	170	37.1%	29.8%	31.3%	1.8%			
	Tertiary or above	609	37.1%	34.2%	26.8%	1.9%			
Marital status	Never married	645	33.1%	28.1%	35.0%	3.8%		0.000	
	Married	1 275	39.7%	27.7%	29.6%	3.0%			
	Divorced/ Separated/ Widowed	118	42.1%	25.5%	26.4%	6.1%			

Occupation	Managerial/ Professional worker	471	39.6%	32.2%	26.3%	2.0%		0.001	
	Clerk	281	40.3%	32.2%	26.0%	1.5%			
	Service worker	233	37.9%	24.7%	34.9%	2.6%			
	Blue collar worker	329	34.7%	23.1%	34.9%	7.3%			
	Not working	707	36.8%	25.8%	33.8%	3.7%			
Monthly household income	Below $8,000	149	33.2%	26.3%	35.5%	5.0%			0.000
	$8,000 - $13,999	339	31.6%	27.3%	36.0%	5.1%			
	$14,000 - $19,999	211	38.5%	25.4%	32.3%	3.8%			
	$20,000 - $39,999	540	36.7%	29.9%	30.3%	3.0%			
	$40,000 or above	364	42.2%	31.5%	24.5%	1.8%			

4.10.2 Washing hands after coughing or sneezing

Frequency of washing hands after coughing or sneezing in the three days prior to the survey is associated significantly with gender, age, marital status and occupation.

A relatively higher proportion of males (60.7%), those aged 25-34 (59.1%), never married respondents (58.1%) and managerial/ professional workers (58.5%) or blue collar workers (59.3%) reported that they infrequently ('sometimes' or 'never') washed their hands after coughing or sneezing in the three days prior to the survey (Table 4.10.2).

Table 4.10.2: Frequency of washing hands after coughing or sneezing in the three days prior to the survey (Q32)

Variable	Level	Base	Always	Often	Some-times	Never	p-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	820	19.4%	19.9%	47.1%	13.7%		0.000	
	Female	920	27.4%	23.5%	40.8%	8.3%			
Age	18-24	234	15.7%	28.8%	49.5%	6.1%			0.002
	25-34	387	20.4%	20.5%	47.5%	11.6%			
	35-44	457	21.3%	22.8%	44.6%	11.3%			
	45-54	410	28.5%	18.2%	42.3%	11.0%			
	55-64	198	32.6%	20.1%	34.3%	13.1%			
Marital status	Never married	573	18.3%	23.6%	46.3%	11.8%		0.006	
	Married	1 064	26.6%	20.7%	42.4%	10.2%			
	Divorced/ Separated/ Widowed	98	21.7%	22.6%	44.4%	11.3%			

Occupation	Managerial/ Professional worker	408	18.2%	23.3%	46.3%	12.2%		0.024	
	Clerk	244	19.3%	25.5%	43.0%	12.2%			
	Service worker	211	28.2%	21.6%	40.0%	10.3%			
	Blue collar worker	277	21.4%	19.3%	45.4%	13.9%			
	Not working	578	28.2%	20.3%	43.2%	8.3%			

4.10.3 Washing hands after going to the toilet

Frequency of washing hands after going to the toilet in the three days prior to the survey is significantly associated with gender, age, educational attainment, occupation and monthly household income.

Males (12.4%), those with primary education level or below (15.6%), blue collar workers (15.1%) and those with monthly household income of $13,999 or below (14.2%) were more likely to report that they did not always wash their hands after going to the toilet in the three days prior to the survey. Also, the older the respondents, the more likely that they did not always wash their hands after going to the toilet in the three days prior to the survey (Table 4.10.3).

Table 4.10.3: Frequency of washing hands after going to the toilet in the three days prior to the survey (Q33)

Variable	Level	Base	Always	Often	Some-times	Never	p-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	946	87.6%	9.9%	2.5%	0.1%		0.000	
	Female	1 101	94.8%	4.9%	0.3%	0.0%			
Age	18-24	259	93.9%	4.1%	1.8%	0.3%			0.005
	25-34	425	93.0%	6.3%	0.7%	0.0%			
	35-44	536	91.9%	6.9%	1.1%	0.0%			
	45-54	491	90.3%	8.4%	1.4%	0.0%			
	55-64	269	87.2%	10.5%	2.3%	0.0%			
Educational attainment	Primary or below	268	84.4%	13.6%	2.0%	0.0%			0.000
	Had not completed secondary	378	89.5%	8.7%	1.8%	0.0%			
	Completed secondary (F.5)	619	93.0%	5.9%	1.1%	0.0%			
	Matriculation	170	91.7%	5.4%	2.4%	0.5%			
	Tertiary or above	609	94.2%	5.2%	0.6%	0.0%			

Occupation	Managerial/ Professional worker	471	92.6%	6.2%	1.2%	0.0%		0.000	
	Clerk	281	97.1%	2.9%	0.0%	0.0%			
	Service worker	233	89.8%	7.6%	2.6%	0.0%			
	Blue collar worker	329	84.9%	12.1%	3.0%	0.0%			
	Not working	708	92.1%	7.1%	0.7%	0.1%			
Monthly household income	Below $8,000	149	85.8%	14.2%	0.0%	0.0%			0.000
	$8,000 - $13,999	339	85.8%	10.6%	3.3%	0.2%			
	$14,000 - $19,999	211	92.3%	7.7%	0.0%	0.0%			
	$20,000 - $39,999	540	94.6%	4.4%	1.1%	0.0%			
	$40,000 or above	364	92.8%	5.5%	1.7%	0.0%			

4.10.4 Washing hands before eating or handling food

Frequency of washing hands before eating or handling food in the three days prior to the survey is associated significantly with gender, age and marital status.

A relatively higher proportion of males (19.6%), those aged 18-24 (21.8%) and never married respondents (20.9%) claimed that they 'sometimes' or 'never' washed their hands before eating or handling food in the three days prior to the survey (Table 4.10.4).

Table 4.10.4: Frequency of washing hands before eating or handling food in the three days prior to the survey (Q34)

Variable	Level	Base	Always	Often	Some-times	Never	p-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	946	53.6%	26.8%	17.9%	1.7%		0.000	
	Female	1 101	64.8%	23.2%	11.3%	0.7%			
Age	18-24	259	49.3%	28.9%	21.8%	0.0%			0.000
	25-34	425	53.2%	28.9%	16.9%	1.1%			
	35-44	536	58.8%	27.1%	13.2%	0.9%			
	45-54	491	66.8%	18.8%	13.2%	1.1%			
	55-64	269	66.1%	21.1%	10.0%	2.8%			
Marital status	Never married	645	50.6%	28.5%	19.8%	1.1%		0.000	
	Married	1 276	63.3%	23.2%	12.4%	1.1%			
	Divorced/ Separated/ Widowed	118	67.7%	22.5%	7.1%	2.7%			

4.10.5 Awareness of the slogan "Wash Hands for Better Health"

Awareness of the slogan "Wash Hands for Better Health" is associated significantly with gender, age, educational attainment and marital status.

Males (24.7%), those aged 18-24 (14.6%), those had a matriculation education level (21.3%) and never married respondents (20.5 %) were less likely to have heard the slogan "Wash Hands for Better Health" (Table 4.10.5).

Table 4.8.1: Awareness of the slogan "Wash Hands for Better Health" (Q35)

Variable	Level	Base	Yes	No	p-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	924	24.7%	75.3%	0.000		
	Female	1 055	33.2%	66.8%			
Age	18-24	256	14.6%	85.4%		0.000	
	25-34	408	30.3%	69.7%			
	35-44	517	30.0%	70.0%			
	45-54	474	30.0%	70.0%			
	55-64	263	38.0%	62.0%			
Educational attainment	Primary or below	259	40.3%	59.7%		0.000	
	Had not completed secondary	368	27.8%	72.2%			
	Completed secondary (F.5)	595	30.2%	69.8%			
	Matriculation	162	21.3%	78.7%			
	Tertiary or above	592	26.2%	73.8%			
Marital status	Never married	632	20.5%	79.5%	0.000		
	Married	1 225	33.2%	66.8%			
	Divorced/ Separated/ Widowed	116	34.8%	65.2%			

4.11 Oral health practices

4.11.1 Brushing teeth

Brushing teeth is associated significantly with respondents' gender, educational and occupation.

A relatively higher proportion of males (28.3%), those with primary education level or below (25.6%) and blue collar workers (31.6%) reported that they brushed their teeth once or less a day (Table 4.11.1).

Table 4.11.1: Frequency of brushing teeth (Q36)

Variable	Level	Base	Less than one time per day	One time per day	Two times per day	Three or more times per day	p-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	944	0.1%	28.2%	68.3%	3.4%		0.000	
	Female	1 099	0.0%	10.6%	84.6%	4.8%			
Educational attainment	Primary or below	266	0.0%	25.6%	71.5%	2.8%			0.000
	Had not completed secondary	377	0.0%	21.5%	74.3%	4.2%			
	Completed secondary (F.5)	619	0.0%	19.5%	76.7%	3.8%			
	Matriculation	169	0.8%	12.4%	79.9%	6.9%			
	Tertiary or above	609	0.0%	15.0%	80.7%	4.4%			
Occupation	Managerial/ Professional worker	471	0.0%	18.6%	76.3%	5.1%		0.000	
	Clerk	281	0.0%	11.5%	86.5%	2.1%			
	Service worker	233	0.0%	17.9%	78.2%	3.9%			
	Blue collar worker	328	0.4%	31.1%	65.5%	2.9%			
	Not working	705	0.0%	16.2%	78.7%	5.1%			

4.11.2 Using dental floss

The practice of using dental floss is associated significantly with gender, educational attainment, occupation and monthly household income.

Males (71.6%), those with primary education level or below (79.8%), blue collar workers (77.5%) and those with monthly household income of below $8,000 (75.5%) were more likely to report that they never used or did not currently use dental floss (Table 4.11.2).

Table 4.11.2: Frequency of using dental floss (Q37)

Variable	Level	Base	Never or do not currently use	Less than one time per day	One time per day	Two times per day	Three or more times per day	p-value		
								Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	944	71.6%	10.1%	13.5%	3.8%	1.0%		0.000	
	Female	1 092	58.1%	11.5%	21.6%	6.4%	2.4%			
Educational attainment	Primary or below	266	79.8%	6.8%	6.4%	5.0%	2.0%			0.000
	Had not completed secondary	376	72.4%	8.2%	14.1%	3.7%	1.6%			
	Completed secondary (F.5)	616	64.0%	11.2%	17.6%	4.5%	2.6%			
	Matriculation	169	64.7%	10.5%	17.6%	5.4%	1.8%			
	Tertiary or above	607	53.0%	14.0%	25.4%	6.8%	0.9%			
Occupation	Managerial/ Professional worker	471	56.5%	13.3%	22.0%	6.7%	1.6%		0.000	
	Clerk	279	59.0%	9.7%	23.0%	7.5%	0.9%			
	Service worker	233	68.0%	11.2%	15.2%	2.8%	2.8%			
	Blue collar worker	328	77.5%	7.4%	11.9%	2.5%	0.6%			
	Not working	700	65.5%	10.5%	16.2%	5.4%	2.4%			
Monthly household income	Below $8,000	147	75.5%	9.3%	10.1%	3.5%	1.6%			0.000
	$8,000 - $13,999	338	71.4%	9.9%	13.2%	4.9%	0.7%			
	$14,000 - $19,999	209	73.3%	5.9%	16.2%	2.6%	2.0%			
	$20,000 - $39,999	539	60.8%	11.7%	19.9%	6.1%	1.4%			
	$40,000 or above	363	51.3%	14.1%	26.5%	6.6%	1.6%			

4.11.3 Oral health status

The self perception of oral health status is associated significantly with gender, age, educational attainment, occupation and monthly household income.

Males (13.6%), those aged 45-54 (14.8%), those had not completed secondary education (15.9%) and blue collar workers (17.0%) were more likely to report that their oral health status was ‘poor’ or ‘very poor’ than their respective counterparts. Also, the lower the monthly household income of respondents, the more likely that they reported their oral health status as ‘poor’ or ‘very poor’ (Table 4.11.3).

Table 4.11.3: Perception about oral health status (Q38)

Variable	Level	Base	Very good	Good	Fair	Poor	Very poor	p-value		
								Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	944	5.8%	20.6%	60.1%	12.3%	1.3%		0.000	
	Female	1 101	7.7%	24.9%	57.6%	8.8%	1.0%			
Age	18-24	259	2.6%	25.0%	60.2%	11.7%	0.6%			0.034
	25-34	425	7.2%	21.2%	62.7%	8.3%	0.7%			
	35-44	536	6.5%	22.1%	60.7%	9.5%	1.3%			
	45-54	491	6.3%	22.3%	56.5%	13.5%	1.4%			
	55-64	267	11.5%	28.2%	49.0%	9.2%	2.0%			
Educational attainment	Primary or below	268	6.3%	16.8%	62.3%	12.5%	2.1%			0.000
	Had not completed secondary	375	7.6%	17.6%	58.9%	14.2%	1.7%			
	Completed secondary (F.5)	619	7.1%	21.2%	60.8%	9.9%	1.0%			
	Matriculation	170	4.5%	30.2%	52.2%	11.9%	1.2%			
	Tertiary or above	609	6.6%	28.7%	56.8%	7.3%	.5%			
Occupation	Managerial/ Professional worker	471	6.8%	28.9%	56.1%	7.8%	0.4%		0.000	
	Clerk	281	5.1%	20.6%	67.1%	7.0%	0.3%			
	Service worker	233	6.6%	19.4%	62.0%	10.8%	1.3%			
	Blue collar worker	328	7.3%	13.5%	62.1%	14.4%	2.6%			
	Not working	707	6.9%	25.4%	54.5%	11.9%	1.3%			
Monthly household income	Below $8,000	149	6.6%	19.8%	55.1%	15.5%	3.1%			0.000
	$8,000 - $13,999	339	5.0%	17.6%	61.1%	14.1%	2.2%			
	$14,000 - $19,999	211	7.6%	20.2%	59.3%	12.0%	1.0%			
	$20,000 - $39,999	540	7.0%	20.5%	63.9%	8.1%	0.4%			
	$40,000 or above	364	7.7%	29.4%	54.8%	7.5%	0.6%			

4.11.4 Regular dental checkup

The habit of having a regular dental checkup is associated significantly with gender, age, educational attainment, occupation and monthly household income.

Females (46.8%), those aged 35-44 (49.5%), those with tertiary education level or above (58.2%) and managerial/professional workers (57.9%) were more likely to report having regular dental checkups. Also, the higher the monthly household income of respondents, the more likely that they had regular dental checkups (Table 4.11.4).

Table 4.11.4: Regular dental checkup (Q39a)

Variable	Level	Base	Yes	No	p-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	946	41.1%	58.9%	0.009		
	Female	1 101	46.8%	53.2%			
Age	18-24	259	37.6%	62.4%		0.005	
	25-34	425	43.8%	56.2%			
	35-44	536	49.5%	50.5%			
	45-54	491	42.9%	57.1%			
	55-64	269	40.7%	59.3%			
Educational attainment	Primary or below	268	25.8%	74.2%		0.000	
	Had not completed secondary	378	31.0%	69.0%			
	Completed secondary (F.5)	619	45.6%	54.4%			
	Matriculation	170	46.5%	53.5%			
	Tertiary or above	609	58.2%	41.8%			
Occupation	Managerial/ Professional worker	471	57.9%	42.1%	0.000		
	Clerk	281	54.0%	46.0%			
	Service worker	233	43.1%	56.9%			
	Blue collar worker	329	25.9%	74.1%			
	Not working	708	39.0%	61.0%			
Monthly household income	Below $8,000	149	22.6%	77.4%		0.000	
	$8,000 - $13,999	339	26.3%	73.7%			
	$14,000 - $19,999	211	32.4%	67.6%			
	$20,000 - $39,999	540	52.2%	47.8%			
	$40,000 or above	364	64.6%	35.4%			

4.11.5 Frequency of having dental checkup

Frequency of having dental checkups is associated significantly with respondents' age.

Among those who claimed to have regular dental checkups, respondents aged 35 or above (ranged from 85.5% to 87.3%) were less likely than their younger counterparts to have regular dental checkups once or more a year (Table 4.11.5).

Table 4.11.5: Frequency of having a dental checkup (Q39b)

Variable	Level	Base	Once or more a year	Once every 2-3 years	Once every 4-5 years	p-value		
						Chi-square test	Kruskal-Wallis test	Rank correlation
Age	18-24	97	93.8%	5.4%	0.8%			0.036
	25-34	186	90.7%	9.3%	0.0%			
	35-44	264	86.8%	13.2%	0.0%			
	45-54	209	85.5%	14.5%	0.0%			
	55-64	109	87.3%	12.7%	0.0%			

Chapter 5 Conclusion and Recommendations

5.1 Conclusion

5.1.1 Body weight control

Using the Asian standard of World Health Organization (WHO) classification on weight status, less than half of the respondents (47.6%) were considered as 'normal'. About one quarter (24.4%) of the respondents were considered as 'obese' and 18.4% were regarded as 'overweight'. The rest (9.6%) was considered as 'underweight'.

Regarding the perception of respondents' current weight status, about half of respondents (50.7%) perceived their current weight as 'just right', more than two-fifths (41.5%) felt that they were 'overweight' and 7.8% found themselves 'underweight'. However, a significant proportion of respondents did not view their own weight status in the same way that the WHO classification for Asians suggested. More specifically, more than three-fifths of the 'underweight' respondents considered themselves as 'just right' (59.5%) or 'overweight' (3.6%). Females, the older respondents (aged 35 years or above), those with secondary education level or below and the divorced/separated/widowed or married respondents were more likely to view themselves as 'overweight'.

Only 15.7% of respondents claimed that they had a weight difference of more than 10 pounds when compared with one year ago. Among these respondents, 68.9% claimed that they had a weight increase.

During the 12 months prior to the survey, close to three-tenths (29.0%) of the respondents had done something deliberately to control their weight, of which 53.8% of them aimed to lose weight. Among those respondents who had done something deliberately to control their weight, the most commonly used methods to control weight were 'doing physical exercise' (85.5%) and 'changing dietary habit' (72.6%).

5.1.2 Physical activities/exercise

For people of all ages, sexes and bodily conditions, regular physical activity improves health[24]. However, this survey revealed that most respondents engaged in limited physical activity. Over half of the respondents had not engaged in any moderate exercise (54.7%) or vigorous exercise (67.4%) for at least 10 minutes a day during the week prior to the survey. On the other hand, walking was the most common form of physical activity and 70.1% of the respondents had spent at least 10 minutes on walking everyday in the week prior to the survey. The survey also revealed that respondents had spent long hours sitting during the day, as shown by an average of 6.2 hours per day during weekdays (Monday to Friday) in the week prior to the survey.

Based on the categorical scoring of the International Physical Activity Questionnaire

[24] "Fact Sheet on Physical Activity", Department of Health. (http://www.info.gov.hk/dh/do_you_k/eng/exercise.htm)

(IPAQ) analysis, most of the respondents' level of physical activity was classified as 'moderate' (54.7%) or 'low' (22.3%). The proportion of respondents having 'high' level of physical activity was 23.0%. Females, respondents aged 35-44, those with education level of completed secondary education or above and clerks were more likely to have 'low' level of physical activity than their respective counterparts.

Regarding the self perception of respondents' physical activity level, about half of the respondents (49.0%) considered that their physical activity level was 'low' and 42.8% considered it was 'moderate'. Among these respondents, their major barrier for not having more physical activity was 'lack of time/too busy' (51.1%), followed by 'laziness' (18.3%), 'poor health' (6.9%) and 'too tired' (5.9%).

5.1.3 Dietary habits

Eating enough fruit and vegetables has many health benefits. Adequate consumption of fruit and vegetables as part of the daily diet could help prevent major non-communicable diseases (NCD) such as cardiovascular diseases and certain cancers.[25] Eating a variety of vegetables and fruit could ensure an adequate intake of most micronutrients and dietary fibres. Moreover, increased fruit and vegetables consumption can help displace foods high in saturated fats, sugar or salt.

In general, vegetables appeared to be more frequently consumed than fruit by the respondents. Most respondents (81.8%) had eaten vegetables on a daily basis while over half of the respondents (52.5%) had taken fruit everyday. Moreover, regular fruit/vegetable juice consumption was found to be uncommon amongst respondents, as only 4.6% of the respondents drank fruit/vegetable juice daily. However, the average daily intake of fruit and vegetables by the respondents was only 3.5 servings (excluding juice).

Overall, around one-fifth of the respondents (including juice: 22.4%; excluding juice: 21.8%) had a daily average intake of 5 or more servings of fruit and vegetables in the week prior to the survey. Males, younger respondents (aged 18-34 years) and never married respondents were less likely to have consumed at least the recommended 5 servings of fruit and vegetables a day than their respective counterparts.

5.1.4 Pattern of alcohol consumption

About three-tenths of the respondents (29.7%) were drinkers who had drunk at least one alcoholic drink during the month prior to the survey. On the whole, drinking was more prevalent among males, those with tertiary education level or above, managerial/professional workers and those with monthly household income of $40,000 or above.

Among the drinkers in this survey, 28.0% of them reported that they had engaged in binge drinking (drinking 5 or more glasses/cans of alcohol on one occasion) at least once in the month prior to the survey. Binge drinking was more common among

[25] Fruit, vegetables and NCD prevention. Geneva: World Health Organization; 2003. (http://www.who.int/dietphysicalactivity/publications/facts/fruit/en/index.html)

males, those aged 25-34, those not completed secondary education or those with a matriculation education level, divorced/separated/widowed respondents and service workers.

According to the British guidelines on safe drinking, 29.2% of the drinkers were found to have exceeded the recommended low risk level. Males, divorced/ separated/ widowed, service workers and those drinkers with lower education level were more likely to exceed the low risk level.

5.1.5 Smoking habits

Cigarette smoking is a leading cause of death and diseases including heart disease, certain cancers and chronic lung disease. 16.3% of the respondents were smokers at time of this survey. Among them, the vast majority (94.9%) were daily smokers. A relatively higher proportion of smokers who reported smoking more than 20 cigarettes a day were found amongst males, those aged 55-64, those with primary education level or below, married respondents, blue collar workers and those with monthly household income of below $8,000.

5.1.6 General health status

38.0% of respondents claimed that their general health status was ‘good’, ‘very good’ or ‘excellent’ whereas 7.6% claimed that their general health status was ‘poor’.

Slightly more than one-third (34.4%) of the respondents considered that their health condition was ‘better’ or ‘much better’ when compared with people of their own age. On the other hand, 13.2% of respondents considered that their health condition was ‘worse’ or ‘much worse’ than those of their age.

Only 16.1% of respondents reported that their current health condition was ‘better’ or ‘much better’ when compared with 12 months ago. In contrast, over one-fifth (23.4%) of the respondents claimed that their current health condition was ‘worse’ or ‘much worse’.

5.1.7 Cervical screening

Near two-thirds (64.1%) of the female respondents reported that they had had a cervical smear before. Females aged below 35, those with matriculation education level or above, never married respondents and those with monthly household income of below $8,000 were less likely to have had a cervical smear than their counterparts.

Among those females who had had a cervical smear before, 87.4% reported having a cervical smear more than one time. Among these respondents, more than three quarters (77.9%) of them had a habit of regular cervical screening. Female respondents with primary education level or below, divorced/separated/widowed respondents and those with lower monthly household income were less likely to have regular screening.

Also, 70.9% of all female respondents claimed that they planned to have a cervical smear within the next three years.

5.1.8 Food handling practices

Most respondents comply well with the food handling practices. 'Wash all food thoroughly before cooking, especially seafood' was the practice which the most respondents complied with (79.0% mentioned 'all of the time), followed by 'cook/reheat food thoroughly, including seafood' (72.7% mentioned 'all of the time), 'wash your hands before handling food' (69.7% mentioned 'all of the time) and 'keep raw and cooked food separately' (66.9% mentioned 'all of the time). Male respondents, those aged 18-24 and never married respondents were infrequently conformed to the food handling practices.

5.1.9 Hand hygiene

Except for the practice of 'wash hands after going to the toilet', most respondents didn't have good practices of hand hygiene. During the three days prior to the survey, less than three-fifths of the respondents reported that they had always washed hands before eating or handling food (59.6%), always used liquid soap to wash hands (37.8%) and always washed hands after coughing or sneezing (23.6%). Males, never married respondents and blue collar workers were less likely to have a good practice of hand hygiene.

5.1.10 Oral health practices

As regards oral health practice, most respondents (81.2%) brushed their teeth at least twice a day. However, the use of dental floss appears to be less popular as almost two-thirds (64.3%) of the respondents have never used or did not currently use it. Males, those with primary education level or below, blue collar workers and those with monthly household income of below $8,000 were more likely not to use dental floss.

More than half (55.8%) of the respondents reported that they did not have regular dental checkups. These respondents were more likely to be males, those aged 18-24, those less educated, blue collar workers and those with lower monthly household income.

In general, only 29.7% of respondents considered that their general oral health status was 'good' or 'very good'.

5.1.11 Stress management

Leisure activities (22.2%), exercise (15.9%) and listening to music (12.7%) were the most commonly used methods to cope with stress.

5.2 Recommendations

Some recommendations based on the survey findings are suggested below:

1. The importance of maintaining normal body weight, engaging in regular physical activity and having adequate daily fruit and vegetables consumption needs to be further emphasized. Using the Asian standard of WHO classification, more than three-fifths of the 'underweight' respondents considered themselves as 'just right' (59.5%) or 'overweight' (3.6%). Furthermore, the survey results showed that most of the respondents were physically inactive, about one-third (32.6%) of the respondents claimed that they spent at least one day in the week prior to the survey on vigorous physical activities and less than half (45.3%) engaged in moderate physical activities. This survey also revealed that respondents' daily consumption of fruit and vegetables was still far from satisfactory, only about one-fifth of the respondents (including juice: 22.4%; excluding juice: 21.8%) had a daily average intake of five or more servings of fruit and vegetables in the week prior to the survey. Frequent and extensive promotion should be provided to educate the community about:
    i. proper assessment of body weight status, such as using the Body Mass Index (BMI);
    ii. proper methods of maintaining normal body weight, such as increased physical activity and having healthy diets;
    iii. the benefits of regular physical activity, such as reducing the risk of developing various chronic diseases; and
    iv. increasing the daily intake of fruit and vegetables to at least 5 servings a day.
2. Close to three-tenths of drinkers (29.2%) had their drinking habit exceeding the low risk level. Promotion of sensible drinking should be particularly targeted at male drinkers, those divorced/separated/widowed, service workers and those with lower education level.
3. Generally, respondents had poor practices of hand hygiene. The findings revealed that less than a quarter (23.6%) of the respondents had always washed hands after coughing or sneezing and less than two-fifths (37.8%) had always used liquid soap to wash hands, especially males, those never married and blue collar workers. More education about hand hygiene should be provided to these groups of people.
4. Using dental floss is not a common practice for many respondents. It was observed that only about a quarter (24.8%) of the respondents used dental floss regularly. The Government should emphasize the importance of oral hygiene including the use of dental floss in preventing oral diseases and periodontal problems.
5. It is essential to identify factors which attribute to the disparities of health related behaviour among segments of the population, including differences that occur across gender, age, education level, marital status, occupation and income

level. It is important to address the extent of health problems affected by unhealthy behavioural practices which may not only be related to personal characteristics but also to some socio-economic and environmental factors. Health promotion programmes should therefore take such underlying factors into account and strategic plans should be formulated to enhance awareness of certain groups of people on the relevant areas that need to be improved.

5.3 Limitations

1. Although the data were weighted by age and sex distribution in order to correct for over- or under-representation of all groups in the population, the data were not weighted for the number of eligible respondents in a household and the number of phones in a household, or to account directly for non-response.
2. The use of the 'Next Birthday' rule to select respondent when there is more than one eligible respondent resided in a household by the time of the telephone contact cannot cover people who are always not at home in the evening and weekends.
3. A household telephone survey, by definition, excludes the institutionalized population and households without fixed line telephones, so the findings cannot be generalized to these sub-populations. However, as the fixed line telephone coverage in households still exceeds 90%, this reason only excludes a small proportion of households.
4. The survey relied on self-reported data and had certain limitations.
    i. Respondents might not be willing to disclose to interviewers and deliberately under-report those behaviours that are socially undesirable or considered as unhealthy (such as high alcohol consumption). Conversely, respondents might over-report those behaviours that are considered desirable (such as consuming more fruit and vegetables).
    ii. Self-reporting behaviour or practices was also subjected to recall bias and recall error. However, the recall period was kept quite short in this survey that would reduce such bias.
5. Finally, this was a cross-sectional study. The causal or time relationship between various factors could not be identified.

Annex A Survey Questionnaire

Introduction

Hello! My name is _____, an interviewer from the Social Sciences Research Centre of the University of Hong Kong (SSRC). We are commissioned by the Department of Health to conduct a public survey on healthy living. Would you mind sparing some time to answer some questions? All the information provided by you will be kept strictly confidential and for collective analysis only. If you have any queries on this survey, you can call the SSRC at phone number: 2857 8333 during office hours from 9 am to 6 pm.

Respondent selection

Because we are choosing a respondent randomly, please tell me how many people are living in this household, including yourself but excluding live-in maids?
(_____ persons)

Then, how many household members excluding domestic helpers aged 18-64 years who are at home right now?
(_____ persons)

Who is the one who will next have a birthday? (Interviewer: explain the "Next Birthday" rule if respondent questions)

Telephone No._____

Interviewer No._____

Body weight control

Because the Department of Health wishes to gauge the height and weight of Hong Kong people, please provide the figures as accurate as possible in the following questions. (Interviewer: please convert the measurement scale as needed; if the respondent does not know his/her height/weight/waist circumference, input '998'. If the respondent refuses to report his/her height/weight/waist circumference, input '999'.)

Q1a. What is your height without wearing shoes?
_____ cm

Q1b. What is your weight wearing with simple clothes?
_____ Kg

Q1c. What is your waist circumference?
_____ cm

Q2a. Does your weight now differ by more than 10 pounds (about 4.5 Kgs) from your weight one year ago?

1. Yes
2. No (skip to Q3)
3. Don't know (skip to Q3)

Q2b. Did it increase or decrease?

1. Increase
2. Decrease

Q3. What do you think about your current weight?

1. Overweight
2. Just right
3. Underweight

Q4a. During the past 12 months, did you try to do something deliberately to control your weight for example increasing weight, decreasing weight or maintaining weight?

1. Yes
2. No (skip to Q6)

Q4b. Was it for increasing weight, losing weight or maintaining weight?

1. Losing weight
2. Increasing weight
3. Maintaining weight

Q5. During the past 12 months, did you use the following methods to control your weight?

Q5a. Taking the drugs or products including health food for controlling your weight?

1. Yes
2. No

Q5b. Consulting doctors or dieticians?

1. Yes
2. No

Q5c. Going to weight control or beauty parlours?

1. Yes
2. No

Q5d. Doing physical exercises?

1. Yes
2. No

Q5e. Changing dietary habit?

1. Yes
2. No

Q5f. Any other methods?

1. Yes, please specify
2. No

Physical exercises/activities

Please try your best to answer the following few questions, I am going to ask you about the time you spent on vigorous physical activities, moderate physical activities and walking in the last 7 days. These activities can be carried out in your work place, your home or in your leisure time.

Q6. During the last 7 days, on how many days did you do vigorous physical activities? Vigorous activities are those that make you breathe much harder than normal, e.g., aerobics, football, swimming, heavy physical work, jogging, etc., and you did these activities for at least 10 minutes at a time. (Interviewer: if the respondent does not know or hard to say, input ’998’)

_____days

Q7. [Ask those whose answers in Q6 are greater than or equal to “1”]
On those days that you have performed vigorous physical activity for at least 10 minutes, how much time on average per day did you usually spend on doing vigorous physical activities? (Interviewer: if the respondent does not know or hard to say, input ’998’)

_____minutes

Q8. During the last 7 days, on how many days did you do moderate physical activities? Moderate physical activities are those that make you breathe somewhat harder than normal, e.g., bicycling, washing cars/polishing, fast walking, cleaning windows, etc. and you did these activities for at least 10 minutes at a time. (Interviewer: if the respondent does not know or hard to say, input ’998’)

_____days

Q9. [Ask those whose answers in Q8 are greater than or equal to “1”]
On those days that you have performed moderate physical activity for at least 10 minutes, how much time on average per day did you usually spend on doing moderate physical activities? (Interviewer: if the respondent does not know or hard to say, input ’998’)

_____minutes

Q10. During the last 7 days, on how many days did you walk for at least 10 minutes at a time? This includes walking to offices/schools, walking to travel from place to place, and walking for leisure. (Interviewer: if the respondent does not know or hard to say, input '998')

_____days

Q11. [Ask those whose answers in Q10 are greater than or equal to "1"]
On those days that you have walked for at least 10 minutes, how much time on average did you usually spend on walking in one of those days? (Interviewer: if the respondent does not know or hard to say, input '998')

_____hours _____minutes

Q12. During the last 7 days, how much time on average did you usually spend on sitting on a weekday? This includes time spent sitting at work, at home, visiting friends, reading, traveling on public transport, and lying down to watch television. [If the respondent cannot answer the daily average time, then say: Please try to make an estimate as accurate as possible.] (Interviewer: if the respondent does not know or hard to say, input '998')

_____hours _____minutes

Q13. In general, would you say your physical activity level is:
(Interview read out answers)
1. High (skip to Q15a)
2. Moderate
3. Low
4. Don't know (skip to Q15a)

Q14. For those answering (2) and (3), what is the major barrier for not having more physical activity?
1. Lack of time/Too busy
2. No companion
3. No facilities or space/Hard to book facilities
4. Poor health
5. No interest
6. Laziness
7. Do not want to spend money
8. Too tired
9. No need for more exercise
10. No reason
11. Others (specify_____)

Dietary habits

Q15a. On average, how many days do you drink fruit or vegetable juice each week?
"Juice" refers to freshly squeezed juice or those are labeled 100% or pure fruit/vegetable juice.

_____days (skip to Q16a if less than "1" day)

Q15b. On the day(s) that you have drunk juice, how many cups do you usually drink?
A cup means 250 mls in volume or a standard-sized tetra pack of vitasoy.

_____ cups

Q16a. On average, how many days do you eat fruit each week? (not including fruit juice)

1. 1 day
2. 2 days
3. 3 days
4. 4 days
5. 5 days
6. 6 days
7. 7 days
8. None (skip to Q17a)

Q16b. [Ask those whose answers in Q16a are less than "8"]
How many fruit, on average, did you eat on one of those days? (interviewer's prompts on portion of fruit: One fruit equals to 1 medium sized apple or orange, 1 medium sized banana, or two kiwi fruits or plums, or one bowl of small fruits like grapes or strawberries) (Interviewer: ask exactly what they ate and then convert using table and the numbers can be recorded as half such as 0.5 or 1.5).

_____No. of fruit

Q17a. On average, how many days do you eat vegetables each week?

1. 1 day
2. 2 days
3. 3 days
4. 4 days
5. 5 days
6. 6 days
7. 7 days
8. None (skip to Q18a)

Q17b. [Ask those whose answers in Q17a are less than "8"]
How many bowls of cooked vegetables, on average, did you eat on one of those days? (Interviewer's prompts: one bowl refers to the size of a rice bowl. (Interviewer: ask exactly what they ate and then convert using table) (the numbers can be recorded as half such as 0.5 or 1.5. For uncooked leafy vegetables, half the total)

_____No. of bowls of vegetables

Pattern of alcohol consumption

Q18a. During the last month, have you had at least one alcoholic drink?
1. Yes
2. No (skip to Q19a)

Q18b. On how many days per week during the last month, on average, did you drink at least one alcoholic drink? (Interviewer: Do not read out the answers and if the respondent does not know or hard to say, input '998')
1. Daily
2. 6 days per week
3. 5 days per week
4. 4 days per week
5. 3 days per week
6. 2 days per week
7. 1 day per week
8. Less than 1 day per week

Q18c. How many standard drinks on average did you drink on those days? (Read out the types of standard drink) (A can or small bottle of beer is approximately equal to 1.5 standard drinks. Or 1 standard drink is approximately equal to one dining glass of wine, or 1 spirit nip of brandy/whisky, or one small glass of Chinese wine such as rice wine) (a can/ small bottle of beer approximately equals to about 330 – 375 mls. Be aware, a big bottle can range from 640 mls (most brands) to 960 mls (Blue Ribbon)). [Interviewer please refer to the standard drink information sheet- the illustrated guide to typical standard drinks- for other examples if needed] (Interviewer: if the respondent does not know or hard to say, input '998')

_____No. of drinks

Q18d. In the last month, did you drink at least 5 glasses or cans of alcohol on one occasion? That means the total number of glasses and cans of any type of alcohol, and one occasion means period of a few hours.
1. Yes
2. No (skip to Q19a)

Q18e. How many times did you do this in the last month? (Interviewer: Do not read out the answers)

1. Once
2. Twice
3. Three times or more

Smoking pattern

Q19a. Have you smoked before? (Interviewer: read out the answers one by one)

1. Yes, but not now
2. Yes, and still smoking (skip to Q19c)
3. Never (skip to Q20)

Q19b**.** How long have you abstained from smoking? (Interviewer: read out the answers one by one)

1. Had abstained for less than 1 month (skip to Q20)
2. Had abstained for 1 month to l year (skip to Q20)
3. Had abstained for more than l year (skip to Q20)

Q19c. How many cigarettes do you smoke on average per day? (Interviewer: Do not read out the answers)

1. Less than 1 cigarette per day now
2. 1-10 cigarettes per day now
3. 11-20 cigarettes per day now
4. More than 20 cigarettes per day now

General health status

Q20. In general, would you say your health is: (Interviewer: Read out the answers)

1. Excellent
2. Very good
3. Good
4. Fair
5. Poor

Q21. Compared with people of your age, do you consider that your health condition is: (Interviewer: Read out the answers)

1. Much better
2. Better
3. The same
4. Worse
5. Much worse

Q22. Compared with past 12 months, what do you think about your present health condition? (Interviewer: Read out the answers)

1. Much better
2. Better
3. The same
4. Worse
5. Much worse

Cervical screening (females only)

Q23a. Have you had a cervical smear before?

1. Yes
2. No (skip to Q26)
3. Not sure (skip to Q26)

Q23b. [Ask those whose answers in Q23a are "Yes"]
About how long ago did you have the last cervical smear? (Interviewer: Do not read out the answers)

1. Within 12 months
2. 13-24 months
3. 25-36 months
4. 37-48 months
5. 49-60 months
6. 61 months and above
7. Cannot remember

Q24. Was it your first cervical smear?

1. Yes, first smear (skip to Q26)
2. No, repeated smear
3. Not sure

Q25a. Do you have your cervical smear at a regular interval?

1. Yes, at a regular interval
2. No, not at a regular interval (skip to Q26)

Q25b. If regular, how often do you have cervical smear?

1. More than once a year
2. Once a year
3. Once every 2 years
4. Once every 3 years
5. Once every 4 years
6. Once every 5 years
7. Once every 6-10 years
8. Less frequent than once every 10 years
9. Cannot say/remember

Q26. Do you plan to have cervical smear within the next 3 years?

1. Yes
2. No

Food handling practices

Q27. How often do you wash all food thoroughly before cooking, especially seafood?

1. All of the time
2. Most of the time
3. Some of the time
4. None of the time
5. N/A as do not cook food

Q28. How often do you keep raw and cooked food separately?

1. All of the time
2. Most of the time
3. Some of the time
4. None of the time
5. N/A as do not handle food
6. N/A as do not keep raw or cooked food

Q29. How often do you cook /reheat food thoroughly, including seafood?

1. All of the time
2. Most of the time
3. Some of the time
4. None of the time
5. N/A as do not prepare food

Q30. How often do you wash your hands before handling food?

1. All of the time
2. Most of the time
3. Some of the time
4. None of the time
5. N/A as do not handling food

Hand hygiene

Q31. How often did you use liquid soap to wash your hands in the <u>past 3 days</u>?
(Interviewer: Read out the answers)

1. Always
2. Often
3. Sometimes
4. Never
5. Not applicable
6. Don’t remember

Q32. How often did you wash your hands after coughing or sneezing in the past 3 days? (Interviewer: Read out the answers)

1. Always
2. Often
3. Sometimes
4. Never
5. Not applicable
6. Don't remember

Q33. How often did you wash your hands after going to the toilet in the past 3 days? (Interviewer: Read out the answers)

1. Always
2. Often
3. Sometimes
4. Never
5. Not applicable
6. Don't remember

Q34. How often did you wash your hands before eating or handling food in the past 3 days? (Interviewer: Read out the answers)

1. Always
2. Often
3. Sometimes
4. Never
5. Not applicable
6. Don't remember

Q35. Had you heard of the slogan "Wash Hands for Better Health"?

1. Yes
2. No
3. Don't remember

Oral health practices

Q36. How many times a day do you brush your teeth?

1. 1 time per day
2. 2 times per day
3. 3 times per day
4. More than 3 times per day
5. Less than 1 per day
6. Never
7. No teeth
8. Don't remember

Q37. How many times a day do you use dental floss?

1. 1 time per day
2. 2 times per day
3. 3 times per day
4. More than 3 times per day
5. Less than 1 per day
6. Never
7. Do not currently use
8. No teeth
9. Don't remember

Q38. In general, would you say your oral health is:
(Interviewer: Read out the answers)

1. Very good
2. Good
3. Fair
4. Poor
5. Very poor

Q39a. Do you have regular dental checkup?

1. Yes
2. No(skip to Q40)

Q39b. If yes, how often do you have dental checkup?

1. More than once a year
2. Once a year
3. Once every 2 years
4. Once every 3 years
5. Once every 4 years
6. Once every 5 years
7. Once every 6-10 years
8. Less frequent than once every 10 years
9. Cannot say/remember

Stress management

Q40. What is your most frequently adopted stress coping mechanism?
(no prompt, one answer only)

1. Exercise
2. More rest/sleep
3. Talking to somebody
4. Smoking
5. Drinking
6. Eating
7. Shopping

8. Reading
9. Listening to music
10. Attend stress management class
11. Leisure activities
12. Others (please specify: _____)
13. No method used
14. N/A as no stress

Personal Information

Please tell us more about yourself in the order to facilitate our analysis. All information collected would be treated in strictest confidence.

D1. Record the gender
1. Male
2. Female

D2. What is your age?
_____years

D3. What is your highest educational attainment? (Interview: read out the answers one by one)
1. Primary or below
2. Had not completed secondary
3. Completed secondary (F5)
4. Matriculation
5. Tertiary (non-degree)/degree or above

D4. What is your marital status (Interview: read out the answers one by one)
1. Never married
2. Married and with child (ren)
3. Married and without child (ren)
4. Divorced or Separated
5. Widowed
6. Refuse to answer

D5. Are you currently engaged in a job?
1. Yes
2. No (skip to D7)

D6. What is your occupation?
1. Employers/Managers/Administrator (skip to D8)
2. Professional (skip to D8)
3. Associate Professional (skip to D8)
4. Clerk (skip to D8)
5. Service worker (skip to D8)

6. Shop sales worker (skip to D8)
7. Skilled agricultural/fishery worker (skip to D8)
8. Craft and related worker (skip to D8)
9. Plant and machine operator and assembler (skip to D8)
10. Un-skilled worker (skip to D8)

D7. Are you a ……..? (Interviewer: read out the answers one by one)

1. Student (skip to D9)
2. Home-maker (skip to D9)
3. Unemployed person (skip to D9)
4. Retired person (skip to D9)
5. Others（Please specify）(skip to D9)

D8. How much is your monthly personal income including all the income?

1. None
2. $1-1,999
3. $2,000-3,999
4. $4,000-5,999
5. $6,000-7,999
6. $8,000-9,999
7. $10,000-11,999
8. $12,000-13,999
9. $14,000-15,999
10. $16,000-17,999
11. $18,000-19,999
12. $20,000-24,999
13. $25,000-29,999
14. $30,000-34,999
15. $35,000-39,999
16. $40,000-44,999
17. $45,000-49,999
18. $50,000 or above
19. Refuse to answer

D9. How much is your monthly household income including all the income?

1. Less than $2,000
2. $2,000-3,999
3. $4,000-5,999
4. $6,000-7,999
5. $8,000-9,999
6. $10,000-11,999
7. $12,000-13,999
8. $14,000-15,999
9. $16,000-17,999
10. $18,000-19,999
11. $20,000-24,999

12. $25,000-29,999
13. $30,000-34,999
14. $35,000-39,999
15. $40,000-44,999
16. $45,000-49,999
17. $50,000-54,999
18. $55,000-59,999
19. $60,000 or above
20. Refuse to answer

The end:
The survey has come to the end. Thank you very much for your participation. Goodbye!

Annex B Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire (IPAQ)

Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire (IPAQ)

– Short and Long Forms

November 2005

Contents

1. Introduction

This document describes recommended methods of scoring the data derived from the telephone / interview administered and self-administered IPAQ short and long form instruments. The methods outlined provide a revision to earlier scoring protocols for the IPAQ short form and provide for the first time a comparable scoring method for IPAQ long form. Latest versions of IPAQ instruments are available from www.ipaq.ki.se.

Although there are many different ways to analyse physical activity data, to date there is no formal consensus on a 'correct' method for defining or describing levels of physical activity based on self–report population surveys. The use of different scoring protocols makes it very difficult to compare within and between countries, even when the same instrument has been used. Use of these scoring methods will enhance the comparability between surveys, provided identical sampling and survey methods have been used.

2. Uses of IPAQ Instruments

IPAQ short form is an instrument designed primarily for population surveillance of physical activity among adults. It has been developed and tested for use in adults (age range of 15-69 years) and until further development and testing is undertaken the use of IPAQ with older and younger age groups is not recommended.

IPAQ short and long forms are sometimes being used as an evaluation tool in intervention studies, but this was not the intended purpose of IPAQ. Users should carefully note the range of domains and types of activities included in IPAQ before using it in this context. Use as an outcome measure in small scale intervention studies is not recommended.

3. Summary Characteristics of IPAQ Short and Long Forms

1. IPAQ assesses physical activity undertaken across a comprehensive set of domains including:
    a. leisure time physical activity
    b. domestic and gardening (yard) activities
    c. work-related physical activity
    d. transport-related physical activity;

2. The IPAQ **short** form asks about three specific types of activity undertaken in the four domains introduced above. The specific types of activity that are assessed are walking, moderate-intensity activities and vigorous-intensity activities.

3. The items in the **short** IPAQ form were structured to provide separate scores on walking, moderate-intensity and vigorous-intensity activity. Computation of the total score for the short form requires summation of the duration (in minutes) and frequency (days) of walking, moderate-intensity and vigorous-intensity activities. Domain specific estimates cannot be estimated.

4. The IPAQ **long** form asks details about the specific types of activities undertaken within each of the four domains. Examples include walking for transportation and moderate-intensity leisure-time activity.

5. The items in the **long** IPAQ form were structured to provide separate domain specific scores for walking, moderate-intensity and vigorous-intensity activity within each of the work, transportation, domestic chores and gardening (yard) and leisure-time domains. Computation of the total scores for the long form requires summation of the duration (in minutes) and frequency (days) for all the types of activities in all domains. Domain specific scores or activity specific sub-scores may be calculated. Domain specific scores require summation of the scores for walking, moderate-intensity and vigorous-intensity activities within the specific domain, whereas activity-specific scores require summation of the scores for the specific type of activity across domains.

4. Overview of Continuous and Categorical Analyses of IPAQ

Both categorical and continuous indicators of physical activity are possible from both IPAQ forms. However, given the non-normal distribution of energy expenditure in many populations, it is suggested that the continuous indicator be presented as median minutes/week or median MET–minutes/week rather than means (such as mean minutes/week or mean MET-minutes/week).

4.1 Continuous Variables

Data collected with IPAQ can be reported as a continuous measure. One measure of the volume of activity can be computed by weighting each type of activity by its energy requirements defined in METs to yield a score in MET–minutes. METs are multiples of the resting metabolic rate and a MET-minute is computed by multiplying the MET score of an activity by the minutes performed. MET-minute scores are equivalent to kilocalories for a 60 kilogram person. Kilocalories may be computed from MET-minutes using the following equation: MET-min x (weight in kilograms/60 kilograms). MET-minutes/day or MET-minutes/week can be presented although the latter is more frequently used and is thus suggested.

Details for the computation for summary variables from IPAQ short and long forms are detailed below. As there are no established thresholds for presenting MET-minutes, the IPAQ Research Committee propose that these data are reported as comparisons of median values and interquartile ranges for different populations.

4.2 Categorical Variable: Rationale for Cut Point Values

There are three levels of physical activity proposed to classify populations:

1. Low
2. Moderate
3. High

The algorithms for the short and long forms are defined in more detail in Sections 5.3 and 6.3, respectively. Rules for data cleaning and processing prior to computing the algorithms appear in Section 7.

Regular participation is a key concept included in current public health guidelines for physical activity.[1] Therefore, both the total volume and the number of days/sessions are included in the IPAQ analysis algorithms.

The criteria for these levels have been set taking into account that IPAQ asks questions in all domains of daily life, resulting in higher median MET-minutes estimates than would have been estimated from leisure-time participation alone. The criteria for these three levels are shown below.

Given that measures such as IPAQ assess total physical activity in all domains, the "leisure time physical activity" based public health recommendation of 30 minutes on most days will be achieved by most adults in a population. Although widely accepted as a goal, in absolute terms 30 minutes of moderate-intensity activity is low and broadly equivalent to the background or basal levels of activity adult individuals would accumulate in a day. Therefore a new, higher cutpoint is needed to describe the levels of physical activity associated with health benefits for measures such as IPAQ, which report on a broad range of domains of physical activity.

'High'

This category was developed to describe higher levels of participation. Although it is known that greater health benefits are associated with increased levels of activity there is no consensus on the exact amount of activity for maximal benefit. In the absence of any established criteria, the IPAQ Research Committee proposes a measure which equates to approximately at least one hour per day or more, of at least moderate-intensity activity above the basal level of physical activity Considering that basal activity may be considered to be equivalent to approximately 5000 steps per day, it is proposed that "high active" category be considered as those who move at least 12,500 steps per day, or the equivalent in moderate and vigorous activities. This represents at least an hour more moderate-intensity activity over and above the basal level of activity, or half an hour of vigorous-intensity activity over and above basal levels daily. These calculations were based on emerging results of pedometers studies.[2]

This category provides a higher threshold of measures of total physical activity and is a useful mechanism to distinguish variation in population groups. Also it could be used to set population targets for health-enhancing physical activity when multi-domain instruments, such as IPAQ are used.

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[1] Pate RR, Pratt M, Blair SN, Haskell WL , Macera CA, Bouchard C et al. Physical activity and public health. A recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine. *Journal of American Medical Association* 1995; 273(5):402-7. and U.S. Department of Health and Human Services. *Physical Activity and Health: A Report of the Surgeon General*. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, The Presidents' Council on Physical Fitness and Sports: Atlanta, GA:USA. 1996.

[2] Tudor-Locke C, Bassett DR Jr. How many steps/day are enough? Preliminary pedometer indices for public health. Sports Med. 2004;34(1):1-8.

'Moderate'

This category is defined as doing some activity, more than the low active category. It is proposed that it is a level of activity equivalent to "half an hour of at least moderate-intensity PA on most days", the former leisure time-based physical activity population health recommendation.

'Low'

This category is simply defined as not meeting any of the criteria for either of the previous categories.

5. Protocol for IPAQ Short Form

5.1 Continuous Scores

Median values and interquartile ranges can be computed for walking (W), moderate-intensity activities (M), vigorous-intensity activities (V) and a combined total physical activity score. All continuous scores are expressed in MET-minutes/week as defined below.

5.2 MET Values and Formula for Computation of MET-minutes/week

The selected MET values were derived from work undertaken during the IPAQ Reliability Study undertaken in 2000-2001[3]. Using the Ainsworth et al. Compendium (*Med Sci Sports Med* 2000) an average MET score was derived for each type of activity. For example; all types of walking were included and an average MET value for walking was created. The same procedure was undertaken for moderate-intensity activities and vigorous-intensity activities. The following values continue to be used for the analysis of IPAQ data: Walking = 3.3 METs, Moderate PA = 4.0 METs and Vigorous PA = 8.0 METs. Using these values, four continuous scores are defined:

Walking MET-minutes/week = 3.3 * walking minutes * walking days
Moderate MET-minutes/week = 4.0 * moderate-intensity activity minutes * moderate days
Vigorous MET-minutes/week = 8.0 * vigorous-intensity activity minutes * vigorous-intensity days
Total physical activity MET-minutes/week = sum of Walking + Moderate + Vigorous MET-minutes/week scores.

5.3 Categorical Score

Category 1 Low

This is the lowest level of physical activity. Those individuals who not meet criteria for Categories 2 or 3 are considered to have a 'low' physical activity level.

[3] Craig CL,Marshall A , Sjostrom M et al. International Physical Activity Questionnaire: 12 country reliability and validity *Med Sci Sports Exerc* 2003;August

Category 2 Moderate

The pattern of activity to be classified as 'moderate' is either of the following criteria:

a) 3 or more days of vigorous-intensity activity of at least 20 minutes per day
OR
b) 5 or more days of moderate-intensity activity and/or walking of at least 30 minutes per day
OR
c) 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum Total physical activity of at least 600 MET-minutes/week.

Individuals meeting at least one of the above criteria would be defined as accumulating a minimum level of activity and therefore be classified as 'moderate'. See Section 7.5 for information about combining days across categories.

Category 3 High

A separate category labelled 'high' can be computed to describe higher levels of participation.
The two criteria for classification as 'high' are:

a) vigorous-intensity activity on at least 3 days achieving a minimum Total physical activity of at least 1500 MET-minutes/week
OR
b) 7 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum Total physical activity of at least 3000 MET-minutes/week.

See Section 7.5 for information about combining days across categories.

5.4 Sitting Question in IPAQ Short Form

The IPAQ sitting question is an additional indicator variable of time spent in sedentary activity and is not included as part of any summary score of physical activity. Data on sitting should be reported as median values and interquartile ranges. To-date there are few data on sedentary (sitting) behaviours and no well-accepted thresholds for data presented as categorical levels.

6. Protocol for IPAQ Long Form

The long form of IPAQ asks in detail about walking, moderate-intensity and vigorous-intensity physical activity in each of the four domains. Note: asking more detailed questions regarding physical activity within domains is likely to produce higher prevalence estimates than the more generic IPAQ short form.

6.1 Continuous Score

Data collected with the IPAQ long form can be reported as a continuous measure and reported as median MET-minutes. Median values and interquartile ranges can be computed for walking (W), moderate-intensity activities (M), and vigorous-intensity activities (V) within each domain using the formulas below. Total scores may also be calculated for walking (W), moderate-intensity activities (M), and vigorous-intensity activities (V); for each domain (work, transport, domestic and garden, and leisure) and for an overall grand total.

6.2 MET Values and Formula for Computation of MET-minutes

Work Domain

Walking MET-minutes/week at work = 3.3 * walking minutes * walking days at work

Moderate MET-minutes/week at work= 4.0 * moderate-intensity activity minutes * moderate-intensity days at work

Vigorous MET-minutes/week at work= 8.0 * vigorous-intensity activity minutes * vigorous-intensity days at work

Total Work MET-minutes/week =sum of Walking + Moderate + Vigorous MET-minutes/week scores at work.

Active Transportation Domain

Walking MET-minutes/week for transport = 3.3 * walking minutes * walking days for transportation

Cycle MET-minutes/week for transport= 6.0 * cycling minutes * cycle days for transportation

Total Transport MET-minutes/week = sum of Walking + Cycling MET-minutes/week scores for transportation.

Domestic and Garden [Yard Work] Domain

Vigorous MET-minutes/week yard chores= 5.5 * vigorous-intensity activity minutes * vigorous-intensity days doing yard work (**Note**: the MET value of 5.5 indicates that vigorous garden/yard work should be considered a moderate-intensity activity for scoring and computing total moderate intensity activities.)

Moderate MET-minutes/week yard chores= 4.0 * moderate-intensity activity minutes * moderate-intensity days doing yard work

Moderate MET-minutes/week inside chores= 3.0* moderate-intensity activity minutes * moderate-intensity days doing inside chores.

Total Domestic and Garden MET-minutes/week =sum of Vigorous yard + Moderate yard + Moderate inside chores MET-minutes/week scores.

Leisure-Time Domain

Walking MET-minutes/week leisure = 3.3 * walking minutes * walking days in leisure

Moderate MET-minutes/week leisure = 4.0 * moderate-intensity activity minutes * moderate-intensity days in leisure

Vigorous MET-minutes/week leisure = 8.0 * vigorous-intensity activity minutes * vigorous-intensity days in leisure

Total Leisure-Time MET-minutes/week = sum of Walking + Moderate + Vigorous MET-minutes/week scores in leisure.

Total Scores for all Walking, Moderate and Vigorous Physical Activities

Total Walking MET-minutes/week = Walking MET-minutes/week (at Work + for Transport + in Leisure)

Total Moderate MET-minutes/week total = Moderate MET-minutes/week (at Work + Yard chores + inside chores + in Leisure time) + Cycling Met-minutes/week for Transport + Vigorous Yard chores MET-minutes/week

Total Vigorous MET-minutes/week = Vigorous MET-minutes/week (at Work + in Leisure)

Note: Cycling MET value and Vigorous garden/yard work MET value fall within the coding range of moderate-intensity activities.

Total Physical Activity Scores

An overall total physical activity MET-minutes/week score can be computed as:

Total physical activity MET-minutes/week = sum of Total (Walking + Moderate + Vigorous) MET-minutes/week scores.

This is equivalent to computing:

Total physical activity MET-minutes/week = sum of Total Work + Total Transport + Total Domestic and Garden + Total Leisure-Time MET-minutes/week scores.

As there are no established thresholds for presenting MET-minutes, the IPAQ Research Committee proposes that these data are reported as comparisons of median values and interquartile ranges for different populations.

6.3 Categorical Score

As noted earlier, regular participation is a key concept included in current public health guidelines for physical activity.[4] Therefore, both the total volume and the number of day/sessions are included in the IPAQ analysis algorithms. There are three levels of physical activity proposed to classify populations – 'low', 'moderate', and 'high'. The criteria for these levels are the same as for the IPAQ short [described earlier in Section 4.2]

Category 1 Low

This is the lowest level of physical activity. Those individuals who not meet criteria for Categories 2 or 3 are considered 'low'.

Category 2 Moderate

The pattern of activity to be classified as 'moderate' is either of the following criteria:

d) 3 or more days of vigorous-intensity activity of at least 20 minutes per day
OR
e) 5 or more days of moderate-intensity activity and/or walking of at least 30 minutes per day
OR

[4] Pate RR, Pratt M, Blair SN, Haskell WL , Macera CA, Bouchard C et al. Physical activity and public health. A recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine. *Journal of American Medical Association* 1995; 273(5):402-7. and U.S. Department of Health and Human Services. *Physical Activity and Health: A Report of the Surgeon General*. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, The Presidents' Council on Physical Fitness and Sports: Atlanta, GA:USA. 1996.

f) 5 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum Total physical activity of at least 600 MET-minutes/week.

Individuals meeting at least one of the above criteria would be defined as accumulating a moderate level of activity. See Section 7.5 for information about combining days across categories.

Category 3 High

A separate category labelled 'high' can be computed to describe higher levels of participation.
The two criteria for classification as 'high' are:

a) vigorous-intensity activity on at least 3 days achieving a minimum Total physical activity of at least 1500 MET-minutes/week

OR

b) 7 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum Total physical activity of at least 3000 MET-minutes/week.

See Section 7.5 for information about combining days across categories.

6.4 IPAQ Sitting Question IPAQ Long Form

The IPAQ sitting question is an additional indicator variable and is not included as part of any summary score of physical activity. To-date there are few data on sedentary (sitting) behaviours and no well-accepted thresholds for data presented as categorical levels. For the sitting question 'Minutes' is used as the indicator to reflect time spent in sitting rather than MET-minutes which would suggest an estimate of energy expenditure.

IPAQ long assesses an estimate of sitting on a typical weekday, weekend day and time spent sitting during travel (see transport domain questions).

Summary sitting variables include

Sitting Total Minutes/week = weekday sitting minutes* 5 weekdays + weekend day sitting minutes* 2 weekend days

Average Sitting Total Minutes/day = (weekday sitting minutes* 5 weekdays + weekend day sitting minutes* 2 weekend days) / 7

Note: The above calculation of 'Sitting Total' excludes time spent sitting during travel because the introduction in IPAQ long directs the responder to NOT include this component as it would have already been captured under the Transport section. If a summary sitting variable including time spent sitting for transport is required, it should be calculated by adding the time reported (travelling in a motor vehicle) under transport to the above formula. Care should be taken in reporting these alternate data to clearly distinguish the 'total sitting' variable from a 'total sitting – including transport' variable.

7. Data Processing Rules

In addition to a standardized approach to computing categorical and continuous measures of physical activity, it is necessary to undertake standard methods for the cleaning and treatment of IPAQ datasets. The use of different approaches and rules would introduce variability and reduce the comparability of data.

There are no established rules for data cleaning and processing on physical activity. Thus, to allow more accurate comparisons across studies IPAQ Research Committee has established and recommends the following guidelines:

7.1 Data Cleaning

I. Any responses to duration (time) provided in the hours and minutes response option should be converted from hours and minutes into minutes.
II. To ensure that responses in 'minutes' were not entered in the 'hours' column by mistake during self-completion or during data entry process, values of '15', '30', '45', '60' and '90' in the 'hours' column should be converted to '15', '30', '45', '60' and '90' minutes, respectively, in the minutes column.
III. In some cases duration (time) will be reported as weekly (not daily) e.g., VWHRS, VWMINS. These data should be converted into an average daily time by dividing by 7.
IV. If 'don't know' or 'refused ' or data are missing for time or days then that case is removed from analysis.

Note: Both the number of days *and* daily time are required for the creation of categorical and continuous summary variables

7.2 Maximum Values for Excluding Outliers

This rule is to exclude data which are unreasonably high; these data are to be considered outliers and thus are excluded from analysis. All cases in which the sum total of all Walking, Moderate and Vigorous time variables is greater than 960 minutes (16 hours) should be excluded from the analysis. This assumes that on average an individual of 8 hours per day is spent sleeping.

The 'days' variables can take the range 0-7 days, or 8, 9 (don't know or refused); values greater than 9 should not be allowed and those cases excluded from analysis.

7.3 Minimum Values for Duration of Activity

Only values of 10 or more minutes of activity should be included in the calculation of summary scores. The rationale being that the scientific evidence indicates that episodes or bouts of at least 10 minutes are required to achieve health benefits. Responses of less than 10 minutes [and their associated days] should be re-coded to 'zero'.

7.4 Truncation of Data Rules

This rule attempts to normalize the distribution of levels of activity which are usually skewed in national or large population data sets.

In IPAQ short - it is recommended that all Walking, Moderate and Vigorous time variables exceeding ' 3 hours' or '180 minutes' are truncated (that is re-coded) to be equal to '180 minutes' in a new variable. This rule permits a maximum of 21 hours of activity in a week to be reported for each category (3 hours * 7 days).

In IPAQ long – the truncation process is more complicated, but to be consistent with the approach for IPAQ short requires that the variables total Walking, total Moderate-intensity and total Vigorous-intensity activity are calculated and then, for each of these summed behaviours, the total value should be truncated to 3 hours (180 minutes).

When analysing the data as categorical variable or presenting median and interquartile ranges of the MET-minute scores, the application of the truncation rule will not affect the results. This rule does have the important effect of preventing misclassification in the 'high' category. For example, an individual who reports walking for 10 minutes on 6 days and 12 hours of moderate activity on one day could be coded as 'high' because this pattern meets the '7 day" and "3000 MET-min" criteria for 'high'. However, this uncommon pattern of activity is unlikely to yield the health benefits that the 'high' category is intended to represent.

Although using median is recommended due to the skewed distribution of scores, if IPAQ data are analysed and presented as a continuous variable using mean values, the application of the truncation rule will produce slightly lower mean values than would otherwise be obtained.

7.5 Calculating MET-minute/week Scores

Data processing rules 7.2, 7.3, and 7.4 deals first with excluding outlier data, then secondly, with recoding minimum values and then finally dealing with high values. These rules will ensure that highly active people remain classified as 'high', while decreasing the chances that less active individuals are misclassified and coded as 'high'.

Using the resulting variables, convert time and days to MET-minute/week scores [see above Sections 5.2 and 6.2; METS x days x daily time].

7.6 Calculating Total Days for Presenting Categorical Data on Moderate and High Levels

Presenting IPAQ data using categorical variables requires the total number of 'days' on which all physical activity was undertaken to be assessed. This is difficult because frequency in 'days' is asked separately for walking, moderate-intensity and vigorous-intensity activities, thus allowing the total number of 'days' to range from a minimum

of 0 to a maximum of 21'days' per week in IPAQ short and higher in IPAQ long. The IPAQ instrument does not record if different types of activity are undertaken on the same day.

In calculating 'moderately active', the primary requirement is to identify those individuals who undertake activity on at least '5 days'/week [see Sections 4.2 and 5.3]. Individuals who meet this criterion should be coded in a new variable called "*at least five days*" and this variable should be used to identify those meeting criterion b) at least 30 minutes of moderate-intensity activity and/or walking; and those meeting criterion c) any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum of 600 MET-minutes/week.

Below are two examples showing this coding in practice:

i) an individual who reports '2 days of moderate-intensity' and '3 days of walking' should be coded as a value indicating "*at least five days*";

ii) an individual reporting '2 days of vigorous-intensity', '2 days of moderate-intensity' and '2 days of walking should be coded as a value to indicate "*at least five days*" [even though the actual total is 6].

The original frequency of 'days' for each type of activity should remain in the data file for use in the other calculations.

The same approach as described above is used to calculate total days for computing the 'high' category. The primary requirement according to the stated criteria is to identify those individuals who undertake a combination of walking, moderate-intensity and or vigorous-intensity activity on at least 7 days/week [See section 4.2]. Individuals who meet this criterion should be coded as a value in a new variable to reflect "*at least 7 days*".

Below are two examples showing this coding in practice:

i) an individual who reports '4 days of moderate-intensity' and '3 days of walking' should be coded as the new variable "*at least 7 days*".

ii) an individual reporting '3 days of vigorous-intensity', '3 days moderate-intensity' and '3 days walking' should be coded as "*at least 7 days*" [even though the total adds to 9] .

8. Summary algorithms

The algorithms in Appendix 1 and Appendix 2 to this document show how these rules work in an analysis plan, to develop the categories 1 [Low], 2 [Moderate], and 3 [High] levels of activity.

IPAQ Research Committee
November 2005

APPENDIX 1

At A Glance
IPAQ Scoring Protocol (Short Forms)

Continuous Score

Expressed as MET-min per week: MET level x minutes of activity/day x days per week

Sample Calculation

MET levels	**MET-minutes/week for 30 min/day, 5 days**
Walking = 3.3 METs	3.3*30*5 = 495 MET-minutes/week
Moderate Intensity = 4.0 METs	4.0*30*5 = 600 MET-minutes/week
Vigorous Intensity = 8.0 METs	8.0*30*5 = 1,200 MET-minutes/week
	TOTAL = 2,295 MET-minutes/week

Total MET-minutes/week = Walk (METs*min*days) + Mod (METs*min*days) + Vig (METs*min*days)

Categorical Score- three levels of physical activity are proposed

1. Low

   - No activity is reported **OR**
   - Some activity is reported but not enough to meet Categories 2 or 3.

2. Moderate

   Either of the following 3 criteria
   - 3 or more days of vigorous activity of at least 20 minutes per day **OR**
   - 5 or more days of moderate-intensity activity and/or walking of at least 30 minutes per day **OR**
   - 5 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum of at least 600 MET-minutes/week.

3. High

   Any one of the following 2 criteria
   - Vigorous-intensity activity on at least 3 days and accumulating at least 1500 MET-minutes/week **OR**
   - 7 or more days of any combination of walking, moderate- or vigorous-intensity activities accumulating at least 3000 MET-minutes/week

Please review the full document "Guidelines for the data processing and analysis of the International Physical Activity Questionnaire" for more detailed description of IPAQ analysis and recommendations for data cleaning and processing [www.ipaq.ki.se].

APPENDIX 2

At A Glance
IPAQ Scoring Protocol (Long Forms)

Continuous Score

Expressed as MET-minutes per week: MET level x minutes of activity/day x days per week

Sample Calculation

MET levels	MET-minutes/week for 30 min/day, 5 days
Walking at work= 3.3 METs	3.3*30*5 = 495 MET-minutes/week
Cycling for transportation= 6.0 METs	6.0*30*5 = 900 MET-minutes/week
Moderate yard work= 4.0 METs	4.0*30*5 = 600 MET-minutes/week
Vigorous intensity in leisure= 8.0 METs	8.0*30*5 = 1,200 MET-minutes/week
	TOTAL = 3,195 MET-minutes/week

Domain Sub Scores
Total MET-minutes/week at **work** = Walk (METs*min*days) + Mod (METs*min*days) + Vig (METs*min*days) at work

Total MET-minutes/week for **transportation** = Walk (METs*min*days) + Cycle (METs*min*days) for transportation

Total MET-minutes/week from **domestic and garden** = Vig (METs*min*days) yard work + Mod (METs*min*days) yard work + Mod (METs*min*days) inside chores

Total MET-minutes/week in **leisure-time** = Walk (METs*min*days) + Mod (METs*min*days) + Vig (METs*min*days) in leisure-time

Walking, Moderate-Intensity and Vigorous-Intensity Sub Scores

Total **Walking** MET-minutes/week = Walk MET-minutes/week (at Work + for Transport + in Leisure)

Total **Moderate** MET-minutes/week = Cycle MET-minutes/week for Transport + Mod MET-minutes/week (Work + Yard chores + Inside chores + Leisure) + Vigorous Yard chores MET-minutes

Note: The above is a total moderate activities only score. If you require a total of all moderate-intensity physical activities you would sum Total Walking and Total Moderate

Total **Vigorous** MET-minutes/week = Vig MET-minutes/week (at Work + in Leisure)

Total Physical Activity Score
Total Physical Activity MET-minutes/week = **Walking** MET-minutes/week + **Moderate** MET-minutes/week + Total **Vigorous** MET-minutes/week

Continued…….

Also

Total Physical Activity MET-minutes/week = Total MET-minutes/week (at Work + for Transport + in Chores + in Leisure)

Categorical Score- three levels of physical activity are proposed

1. **Low**

   No activity is reported **OR**
   a. Some activity is reported but not enough to meet Categories 2 or 3.

2. **Moderate**

   Either of the following 3 criteria
   a. 3 or more days of vigorous-intensity activity of at least 20 minutes per day **OR**
   b. 5 or more days of moderate-intensity activity and/or walking of at least 30 minutes per day **OR**
   c. 5 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum of at least 600 MET-min/week.

3. **High**

   Any one of the following 2 criteria
   - Vigorous-intensity activity on at least 3 days and accumulating at least 1500 MET-minutes/week **OR**
   - 7 or more days of any combination of walking, moderate- or vigorous- intensity activities accumulating at least 3000 MET-minutes/week

Please review the full document "Guidelines for the data processing and analysis of the International Physical Activity Questionnaire" for more detailed description of IPAQ analysis and recommendations for data cleaning and processing [www.ipaq.ki.se].