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# **Behavioural Risk Factor Survey (April 2005)**

## **Main Report**

Commissioned by



**Surveillance and Epidemiology Branch  
Centre for Health Protection  
Department of Health**

**July 2005**

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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 February 2005 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 health disorders related to lifestyle and behaviour.

The scope of this survey encompassed the following:

- 1 Distribution of body mass index 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 Eating out habits
- 6 Pattern of alcohol consumption
- 7 Smoking habits
- 8 Coverage of influenza vaccination
- 9 Mask wearing habits
- 10 Home cleansing practice
- 11 Cervical screening (for female respondents only)
- 12 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) and aged 18-64. A bilingual (Chinese and English) questionnaire with 61 questions was used to collect data. Fieldwork took place between the 19<sup>th</sup> April and 5<sup>th</sup> May 2005. A sample size of 2 102 successful interviews was achieved. The contact rate was 46.0% and the overall response rate was 73.8%. The width of a 95% confidence interval was at most +/- 2.1%. 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 2004 as reference.

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

## **Key Findings of the Survey**

### **Body weight control**

Survey results revealed that the weight status of more than two-thirds of respondents (69.8%) was classified as 'normal' using the European standard of World Health Organization (WHO) classification whereas over half (52.7%) of the respondents were considered 'normal' using the Asian standard.

Over one-third (37.7%) of the respondents were either 'overweight' or 'obese' (using the Asian standard) at the time this survey was conducted. Males were more likely to be classified as overweight (20.2%) or obese (28.2%), whereas more females (13.6%) were classified as underweight. Overweight and obesity were also more prevalent in respondents who were older, married and divorced/separated/widowed, having lower educational attainment and blue-collar workers.

Regarding self-perception of weight status, more respondents tended to consider themselves overweight (42.7%), however only 20.6% of all respondents were truly 'overweight/obese' according to the European standard of WHO classification and only 37.7% of all respondents were classified as 'overweight/obese' using the Asian standard. Females, the older respondents (aged 35 years or above), the lower educated and the married respondents were more likely to view themselves as 'overweight'.

Only 14.3% of the respondents reported a weight difference of more than 10 pounds when compared with one year ago and about two-thirds (65.0%) of these respondents reported an increase in weight. Nearly one-third (30.7%) of the respondents had done something to control their weight in the year prior to the survey, 57.5% of these respondents had aimed to lose weight. Doing physical exercise (79.8%) and changing dietary habit (67.5%) were the most common methods mentioned by the respondents as the ways to control their weight.

## **Physical exercise/activities**

The survey revealed that most respondents were not physically active in the week prior to the survey. Over half of the respondents had not engaged in any moderate exercise (56.6%) or vigorous exercise (67.2%) for at least 10 minutes a day during the week. On the other hand, walking was the most common form of physical activities in which 71.3% of the respondents had spent at least 10 minutes on walking everyday in the week prior to the survey. Based on the categorical scoring of the International Physical Activity Questionnaire (IPAQ) analysis, most of the respondents were found to be either 'minimally active' (59.7%) or 'inactive' (19.3%), only about two in ten (20.9%) respondents were found to be 'HEPA active'(health enhancing physical activity, a high active category). Middle aged respondents (35-54 years), better educated respondents, clerks and managerial/professional workers were more likely to be 'inactive'. The survey also revealed that respondents had spent long hours sitting during the day, as depicted by an average of 6.4 hours per day during weekdays (Monday to Friday) in the week prior to the survey.

## **Dietary habits**

Most respondents (80.8%) had eaten vegetables on a daily basis while only around half of the respondents (47.9%) had taken fruit everyday. Furthermore, the average daily intake of fruit and vegetables by the respondents was only 3.1 servings (excluding juice). Moreover, fruit/vegetable juice consumption was found to be uncommon amongst respondents, as only 6.1% of the respondents drank fruit/vegetable juice daily.

Only around one fifth of the respondents (including juice: 20.7%; excluding juice: 16.1%) had a daily average intake of 5 or more servings of fruit and vegetables in the week prior to the survey. Males, younger aged respondents (18-34 years) and the never married respondents were less likely to have consumed the recommended daily amount of fruit and vegetables.

## **Eating out habits**

Most respondents ate out for breakfast, lunch or dinner at least once a week in the month prior to the survey. In particular, for lunch, over half (52.8%) of the respondents had eaten out lunch five times or more a week. Three in ten respondents (30.1%) reported that they ate out for dinner two to four times a week. Male, younger aged (18-34 years), better educated, the never married and higher monthly household income respondents were all more likely to have eaten out lunch or dinner five times or more a week. On the other hand, males, the less educated respondents and blue-collar workers were more likely to have eaten out for breakfast this often.

## **Pattern of alcohol consumption**

About three in ten respondents (30.9%) 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, respondents aged 25-34 years and with higher education and monthly household income.

Of the drinkers in this survey, 29.2% of them reported binge drinking at least once in the month prior to the survey. Binge drinking was more common among males, younger respondents (18-34 years), the never married and service workers.

According to the British Alcohol Guidelines, 29.1% of the drinkers were found to have exceeded the recommended safe level. The males, never married and divorced/separated/widowed drinkers and those working as service workers were more likely to have drinking habits which exceeded the safe level.

## **Smoking habits**

Close to one-fifth of the respondents (17.0%) smoked currently and 16.0% were daily smokers. Around one in eight (11.9%) were heavy smokers who reported smoking more than 20 cigarettes a day. These heavy smokers were more likely to be male, aged 55-64 years, the less educated, blue-collar workers or those with monthly household income below \$14,000.

## **Coverage of influenza vaccination**

Over one-fifth of the respondents (22.6%) had ever been vaccinated and respondents aged 55-64 years, the better educated and those with higher monthly household income were more likely to ever have had the shot.

Three in ten respondents (30.2%) who had ever been vaccinated reported that they had their last injection more than one year.

## **Mask wearing habits**

Of the respondents who reported having symptoms of respiratory tract infection or fever during the three months prior to the survey, two-fifth (40.8%) reported that they never wore a mask when going out including at work and in school. Males, younger respondents, the never married and those who had lower monthly household income

were less likely to wear a mask when having symptoms of respiratory tract infection or fever.

## **Home cleansing practice**

Around half of the respondents (49.5%) reported that they or their family members had cleansed their home furniture and facilities with at least 1:99 diluted household bleach during the week prior to the survey. Males, younger respondents, the better educated, the never married and divorced/separated/widowed respondents, managerial/professional workers and clerks were less likely to have cleansed their home this way than their counterparts. Only 17.6% of those respondents reported that they had cleansed their home with at least 1:99 diluted household bleach everyday.

## **Cervical screening**

Nearly two-third of the female respondents (63.2%) had been screened for cervical cancer before. Females aged below 35 years, the better educated, the never married and those with lower monthly household income were less likely to have had a cervical smear before.

## **Recommendations**

Some recommendations based on the survey findings are suggested below:

1. Many respondents, in particular females and less educated respondents, had over-estimated their body weight. More promotion should be done to educate communities about the proper method to assess body weight status, such as using the Body Mass Index (BMI).

Methods of maintaining normal body weight should be further promoted as normal body weight is crucial for health. Over one-third (37.7%) of the respondents were either 'overweight' or 'obese' (using Asian standard of WHO classification) at the time this survey was conducted. Being overweight or obese is known to have a direct impact on chronic disease conditions, so maintaining a healthy weight thus will have direct implications on increasing the quality of life at the individual level as well as lowering the burden of disease in a community. More actions should be taken to educate the community about increased physical activity and healthy diets, using informed and interactive approaches.

2. Campaigns aim at encouraging the public to engage in regular physical exercise should be further sustained and strengthened to increase public awareness about the benefits of regular physical activity. The survey results showed that most of the respondents were physically inactive, especially among middle aged respondents (35-54 years), the better educated, clerks and

managerial/professional workers. Efforts should be made to create favourable environments for them to do more physical exercise.

3. Actively promote an increase in fruit and vegetables intake to the optimal amount in the public. This survey revealed that respondents' daily consumption of fruit and vegetables was still far from satisfactory, only around one fifth of the respondents (including juice: 20.7%; excluding juice: 16.1%) had a daily average intake of five or more servings of fruit and vegetables in the week prior to the survey. There is a need to develop a fruit and vegetables consumption awareness plan that is tailored to target groups of populations, especially those who reported insufficient consumption of fruit and vegetables, such as males, the younger age group, and the never married.
4. The practice of mask wearing while having symptoms of respiratory tract infection or fever should be promoted to prevent spreading of disease, particularly among males, younger people and those with lower monthly household income.

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 inadequate or lack of outreach and services. 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 February 2005 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 health disorders related to lifestyle and behaviour.

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- Eating out habits
- Pattern of alcohol consumption
- Smoking habits
- Coverage of influenza vaccination
- Mask wearing habits
- Home cleansing practice
- Cervical screening (for female respondents only)

## **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 22 500 residential telephone numbers. These numbers were generated from the 2003 English residential telephone directory<sup>1</sup> 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 use blocks of at least 10 numbers<sup>2</sup>.

Where more than one eligible person resided in a household and all were present at the time of the telephone contact, the 'Next Birthday' rules were applied to each successful contacted residential unit, i.e., the household member who has his/her birthday the soonest will be 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 and were 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 36 pre-coded questions and 15 open-ended questions (with 9 demographics questions) was designed to cover the following 12 areas:

- Body height, weight and waist circumference
- Weight control
- Pattern of physical activity
- Prevalence of adequate/inadequate juice, fruit and vegetable consumption
- Eating out habits
- Pattern of alcohol consumption
- Smoking habits
- Coverage of influenza vaccination
- Mask wearing habits
- Home cleansing practice
- Cervical screening (for female respondents only)
- Demographic information: gender, age, education, marital status, occupation, monthly personal income and monthly household income.

A copy of the questionnaire is enclosed in Appendix A.

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<sup>1</sup> Chinese residential telephone directory was not used because the total number of telephone contacts is less than the English residential telephone directory. This process would have a lower response rate than pure directory sampling which does not cover unlisted and new numbers.

<sup>2</sup> This selection process includes some business and fax numbers so that the contact rate is lower than a pure directory sample.

## 2.4 Pilot study

A pilot study comprising 63 successfully completed interviews was conducted on 1<sup>st</sup> April 2005 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 19<sup>th</sup> April and 5<sup>th</sup> May 2005. From 19<sup>th</sup> to 22<sup>nd</sup> April, telephone calls were made between 6:30 p.m. to 10:30 p.m. From 25<sup>th</sup> April to 5<sup>th</sup> May, fieldwork started earlier at 4:00 p.m. and finished at 10:30 p.m.

## 2.6 Response rate

A total of 16 718 telephone numbers were attempted. The number of successful interviews was 2 102. Refusal and dropout cases amounted to 745. The cases which were ‘not available’ (3 154), and ‘no answer’ (3 296) were attempted three times before being classified as non-contact cases. The contact rate was 46.0%<sup>3</sup> and the overall response rate was 73.8%<sup>4</sup>. Table 2.6 details the breakdown of telephone contact status.

**Table 2.6: Final status of telephone numbers attempted**

Type	Final status of contacts <sup>5</sup>	Number of cases
1	Success	2 102
2	Drop-out	217
3	Refusal	528
4	Language problems	28
5	Not eligible	420
6	Business lines	1 236
7	Not available	3 154
8	Busy tone	291
9	No answer	3 296
10	Fax/data lines	782
11	Invalid	4 664
<b>TOTAL</b>		<b>16 718</b>

<sup>3</sup> 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) / type 12 = (2 102+217+528+28+420+1 236+3 154)/16 718 = 46.0%.

<sup>4</sup> 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) = 2 102/(2 102+217+528)=73.8%.

<sup>5</sup> ‘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 language. ‘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).

## 2.7 Sample size and sample error

A sample size of 2 102 successful interviews was achieved (target sample size was 2 000). The width of a 95% confidence interval is at most  $\pm 2.1\%$ <sup>6</sup>. This means that we can have 95% confidence that the true population proportion falls within the sample proportion plus or minus 2.1%. For example, 80% of the respondents in the sample claimed that their weights differed by more than 10 pounds in comparison 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  $80\% \pm 2.1\%$ , i.e. 77.9% and 82.1%.

## 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 was 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 2004. The proportions of respondents among age groups 18-24 and 40-44 were higher than the population while the proportions of respondents aged 25-29, 30-34 and 45-49 years were lower. The sample also contained a higher percentage of females in comparison with the population. Table 2.9a shows the differences in terms of age and gender.

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<sup>6</sup> As the population proportion is unknown, 0.5 is put into the formula of the sampling error to produce the most conservative estimation of the sampling error. The confidence interval width is:

$$\pm 1.96 \times \sqrt{\frac{0.5 * 0.5}{2102}} \times 100\% = 2.1\%$$

**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 2004**

Age Group	This survey			Hong Kong population Data – from the C&SD (end 2004)*		
	Male	Female	Total	Male	Female	Total
	% of Total	% of Total	% of Total	% of Total	% of Total	% of Total
18-24	<b>8.74</b>	<b>7.35</b>	16.09	<b>6.63</b>	<b>6.67</b>	13.30
25-29	<b>3.84</b>	<b>3.60</b>	7.44	<b>4.67</b>	<b>5.29</b>	9.96
30-34	<b>4.27</b>	<b>6.63</b>	10.90	<b>5.18</b>	<b>6.89</b>	12.06
35-39	<b>4.47</b>	<b>8.69</b>	13.16	<b>5.64</b>	<b>7.42</b>	13.06
40-44	<b>5.28</b>	<b>11.58</b>	16.86	<b>6.91</b>	<b>8.02</b>	14.93
45-49	<b>3.75</b>	<b>7.88</b>	11.62	<b>6.59</b>	<b>6.85</b>	13.44
50-54	<b>3.89</b>	<b>7.44</b>	11.34	<b>5.21</b>	<b>5.33</b>	10.54
55-59	<b>2.98</b>	<b>4.51</b>	7.49	<b>3.97</b>	<b>3.84</b>	7.81
60-64	<b>2.02</b>	<b>3.07</b>	5.09	<b>2.62</b>	<b>2.28</b>	4.91
Total	39.24	60.76	100.00	47.41	52.59	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 our 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	0.758357728	0.907227534
25-29	1.216294652	1.468853805
30-34	1.210857549	1.039325076
35-39	1.262842638	0.853109103
40-44	1.307447396	0.693175257
45-49	1.757764305	0.869769233
50-54	1.338521528	0.715798333
55-59	1.331750533	0.850562187
60-64	1.300577914	0.742473774
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 12.0, 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 might not add up to the total or 100% because of rounding.

### **3.1 Demographic**

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 our 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 2004 (Table 2.9a).

#### **3.1.2 Marital status**

Over half of all respondents (54.8%) were married with child/children. Around one-third (31.1%) were never married. 9.3% were married without child while 3.4% were divorced or separated. There were also 1.3% of the respondents widowed.

#### **3.1.3 Educational attainment**

A larger proportion of the respondents had an education level of secondary or above. 39.8% had either completed secondary (F.5) or matriculation. 28.8% attained tertiary education or above while the rest (31.3%) had an education level of lower secondary or below.

#### **3.1.4 Occupation**

One-third of the respondents were not working (33.9%). This included 7.9% students and 16.4% homemakers, 5.2% unemployed and 4.4% retired persons or other non-working persons.

For working respondents, the largest portion was clerk (14.1%), followed by service workers (11.0%) and professionals (8.6%).

#### **3.1.5 Income**

Respondents more commonly had a monthly personal income within \$10,000-\$19,999 (37.7%) or below \$10,000 (33.4%).

In terms of monthly household income, a larger proportion of the respondents were from the category of \$10,000-\$19,999 (28.5%), followed by \$30,000-\$49,999 (21.2%).

**Table 3.1: Demographic information (Q24 - Q32)<sup>7</sup>**

<b>Gender</b>	<b>Base =2 102</b>	<b>Occupation</b>	<b>Base = 2 072</b>
Male	47.2%	Employers/ Managers/ Administrators	7.0%
Female	52.8%	Professionals	8.6%
		Associate professionals	8.4%
		Clerk	14.1%
		Service worker	11.0%
		Shop sales worker	2.8%
		Skilled agricultural/ fishery worker	0.7%
		Craft and related worker	4.7%
		Plant and machine operator and assembler	4.0%
		Unskilled worker	4.9%
		Student	7.9%
		Home-maker	16.4%
		Unemployed person	5.2%
		Retired person	4.1%
		Other non-working person	0.3%
<b>Age</b>	<b>Base = 2 082</b>	<b>Monthly Personal Income</b>	<b>Base =1 253</b>
18-24	13.3%	Below \$ 10,000	33.4%
25-29	10.0%	\$10,000-\$19,999	37.7%
30-34	12.1%	\$20,000-\$29,999	14.7%
35-39	13.1%	\$30,000-\$49,999	9.4%
40-44	14.9%	\$50,000 or above	4.9%
45-49	13.4%		
50-54	10.5%		
55-59	7.8%		
60-64	4.9%		
<b>Marital Status</b>	<b>Base = 2 094</b>	<b>Monthly Household Income</b>	<b>Base =1 600</b>
Never married	31.1%	Below \$ 10,000	15.5%
Married and with child	54.8%	\$10,000-\$19,999	28.5%
Married and without child	9.3%	\$20,000-\$29,999	19.9%
Divorced/ separated	3.4%	\$30,000-\$49,999	21.2%
Widowed	1.3%	\$50,000 or above	14.9%
<b>Educational Attainment</b>	<b>Base = 2 100</b>		
Primary or below	12.7%	Below \$ 10,000	15.5%
Had not completed secondary	18.6%	\$10,000-\$19,999	28.5%
Completed secondary (F.5)	31.9%	\$20,000-\$29,999	19.9%
Matriculation	7.9%	\$30,000-\$49,999	21.2%
Tertiary or above	28.8%	\$50,000 or above	14.9%

<sup>7</sup> Refer to the question number in the survey questionnaire, see Appendix A.

## 3.2 Body weight control

Eight questions were asked in this section to ascertain the respondents' height, weight, waist circumference and their weights controlling habits. Furthermore, 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).

Respondents who were pregnant at the time of the interviews were classified as outliers and were excluded from analyses. Three pregnant cases were treated as outliers for height, weight and waist circumference and for the BMI analyses. Where there were cases with missing data for height or weight, the responses of these cases were also excluded from the BMI analyses. As a result ninety-five cases including three pregnant women were excluded from the BMI analyses.

### 3.2.1 Height (without wearing shoes)

The height of the respondents without wearing shoes ranged from 142.0 to 213.4cm. Most respondents (39.8%) were within the range from 160.0 to less than 170.0 cm, followed by 28.0% in the range from 150.0 to less than 160.0 cm. The mean, median and mode heights were 164.0cm, 163.0cm and 160.0cm respectively (Table 3.2.1).

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

Height (cm)	Number	% of Total
Less than 150.0	54	2.6%
150.0 – <160.0	571	28.0%
160.0 – <170.0	813	39.8%
170.0 – <180.0	519	25.4%
180.0 or above	86	4.2%
<b>Total</b>	<b>2 043*</b>	<b>100.0%</b>
<b>Other statistics</b>		
	<b>cm</b>	
Mean	164.0	
Median	163.0	
Mode	160.0	

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

### 3.2.2 Weight (wearing simple clothes)

The weight of the respondents when wearing simple clothes ranged from 36.4 to 159.1kg. More than one-third of the respondents (35.8%) fell into the weight range from 50.0 to less than 60.0 kg, followed by 26.4% of the respondents in the range from 60.0 to less than 70.0 kg. The mean, median and mode weights were 60.6kg, 59.1kg and 50.0kg respectively (Table 3.2.2).

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

Weight (kg)	Number	% of Total
Less than 40.0	8	0.4%
40.0 – <50.0	333	16.3%
50.0 – <60.0	734	35.8%
60.0 – <70.0	542	26.4%
70.0 – <80.0	286	14.0%
80.0 or above	145	7.1%
<b>Total</b>	<b>2 048*</b>	<b>100.0%</b>
<b>Other statistics</b>		
	<b>kg</b>	
Mean	60.6	
Median	59.1	
Mode	50.0	

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

### 3.2.3 Waist circumference

The waist circumference of the respondents ranged from 53.3 to 124.5cm. More respondents had their waist circumference in the range from 70.0 to less than 80.0 cm (39.6%). The mean, median and mode waist circumferences were 75.4cm, 73.7cm and 76.2cm respectively (Table 3.2.3).

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

Waist circumference (cm)	Number	% of Total
Less than 60.0	19	1.0%
60.0 – <70.0	566	28.4%
70.0 – <80.0	789	39.6%
80.0 – <90.0	490	24.6%
90.0 or above	129	6.5%
<b>Total</b>	<b>1 993*</b>	<b>100.0%</b>
<b>Other statistics</b>		
	<b>cm</b>	
Mean	75.4	
Median	73.7	
Mode	76.2	

*\*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:

$$BMI = \text{body weight (kg)} / [\text{height (m)}]^2$$

### 3.2.5 Weight status by WHO classification

Respondents were classified into four categories of weight status according to the WHO classification criteria (both European and Asian Standards) in Table 3.2.5a and Table 3.2.5b respectively. Using the European standard, more than two-thirds of the respondents (69.8%) were classified as ‘normal’. ‘Overweight’ and ‘underweight’ respondents represented 17.5% and 9.6% of the sample respectively, while the rest (3.1%) were regarded as ‘obese’.

When using the Asian standard, 20.6% of the respondents were considered ‘obese’, while over half of the respondents (52.7%) was classified as ‘normal’. 17.1% were regarded as ‘overweight’, while 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	192	9.6%
Normal	BMI 18.5 – <25.0	1 400	69.8%
Overweight	BMI 25.0 – <30.0	352	17.5%
Obese	BMI ≥ 30.0	63	3.1%
<b>Total</b>		<b>2 007*</b>	<b>100.0%</b>

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

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

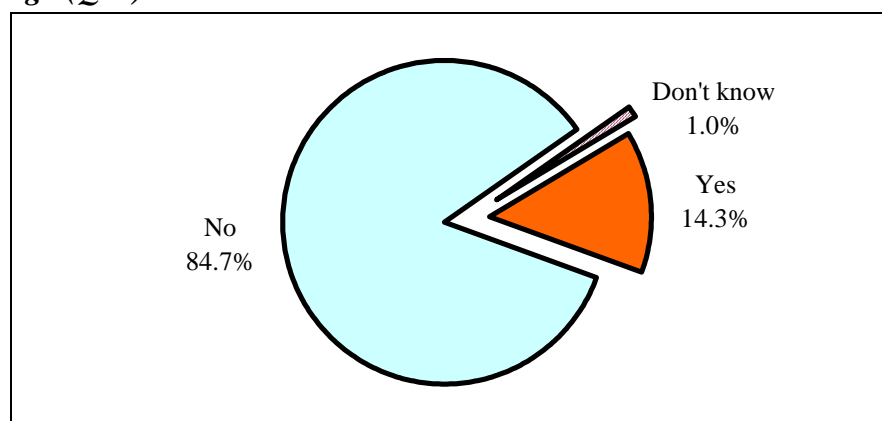
Weight status by WHO classifications	BMI score	Number	% of Total
Underweight	BMI < 18.5	192	9.6%
Normal	BMI 18.5 – <23.0	1 058	52.7%
Overweight	BMI 23.0 – <25.0	342	17.1%
Obese	BMI ≥ 25.0	415	20.6%
<b>Total</b>		<b>2 007*</b>	<b>100.0%</b>

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

### 3.2.6 Weight difference from one year ago

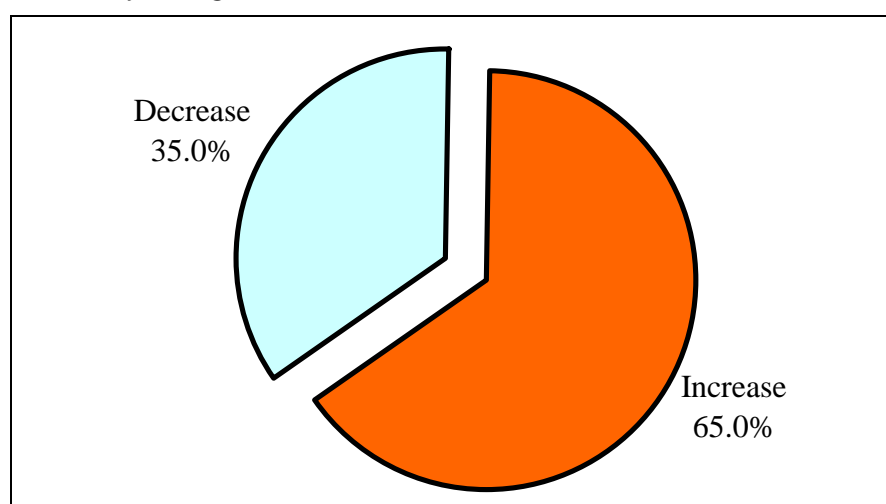
When respondents were asked whether they had a weight difference of more than 10 pounds when compared with one year ago, 84.7% of them did not find such a difference and 14.3% did have a difference (Fig. 3.2.6a). Of the respondents who had such a weight difference, about two-thirds (65.0%) claimed to have a weight increase while the rest (35.0%) 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*

**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 = 300*

### 3.2.7 Perception of current weight status

Almost half of the respondents (47.7%) perceived their current weight status as 'just right'. 42.5% felt being 'overweight' and only 9.8% found themselves 'underweight' (Table 3.2.7a).

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

Perception of current weight	Number	% of Total
Underweight	206	9.8%
Just right	1000	47.7%
Overweight	891	42.5%
<b>Total</b>	<b>2 097*</b>	<b>100.0%</b>

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

Table 3.2.7b shows the differences of weight status between the classification of the WHO (European standard) and the respondents' perception. Around half of the respondents (47.4%) viewed their weight status as 'just right' but 69.8% of the respondents were actually 'normal' under the WHO classification. More respondents perceived themselves as 'overweight' (42.7%), however, 20.6% were classified as 'overweight' or 'obese' according to the WHO criteria.

**Table 3.2.7b: Comparison of weight status between WHO classification (European standard) and respondents' perception of their current weight (Q3)**

Cross-tabulation		Weight status by WHO classification (European standard)				
		Underweight	Normal	Overweight	Obese	Total
<b>Respondents' perception of current weight</b>	<b>Overweight</b>	7	506	288	56	<b>857</b>
	% of Total	0.3%	25.2%	14.4%	2.8%	<b>42.7%</b>
	<b>Just right</b>	104	781	60	6	<b>951</b>
	% of Total	5.2%	38.9%	3.0%	0.3%	<b>47.4%</b>
	<b>Underweight</b>	81	113	4	1	<b>199</b>
	% of Total	4.0%	5.6%	0.2%	0.1%	<b>9.9%</b>
	<b>Total</b>	<b>192</b>	<b>1 400</b>	<b>352</b>	<b>63</b>	<b>2 007*</b>
	% of Total	<b>9.6%</b>	<b>69.8%</b>	<b>17.5%</b>	<b>3.1%</b>	<b>100.0%</b>

\*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 and their weight status by WHO classification are slightly different from Table 3.2.7a since the bases are different.

Table 3.2.7c shows the differences of weight status between the classification of the WHO (Asian standard) and the respondents' perception. Similarly, there is a discrepancy between the classification of the WHO (Asian standard) and the respondents' perception of their weight status, but the discrepancy was smaller when compared to that of the European standard. Around half of the respondents (47.4%) viewed their weight status as 'just right' but 52.7% of the respondents were actually 'normal' under the WHO classification (Asian standard). Similarly, 42.7% of the respondents perceived themselves as 'overweight', but in fact only 37.7% were classified as 'overweight' or 'obese' according to the WHO criteria (Asian standard).

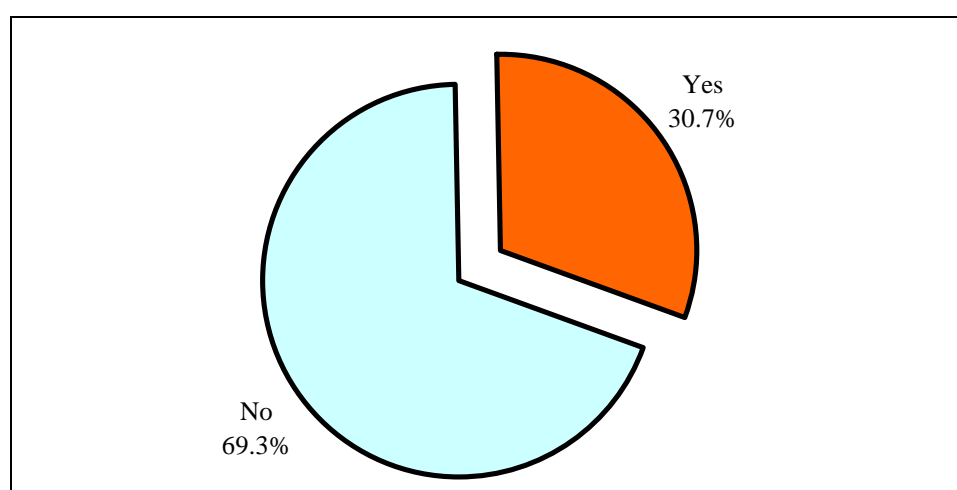
**Table 3.2.7c: Comparison of weight status between WHO classification (Asian standard) and respondents' perception of their current weight (Q3)**

Cross-tabulation		Weight status by WHO classification (Asian standard)				
		Underweight	Normal	Overweight	Obese	Total
<b>Respondents' perception of current weight</b>	<b>Overweight</b>	7	288	219	344	<b>857</b>
	% of Total	0.3%	14.3%	10.9%	17.1%	<b>42.7%</b>
	<b>Just right</b>	104	662	119	65	<b>951</b>
	% of Total	5.2%	33.0%	5.9%	3.3%	<b>47.4%</b>
	<b>Underweight</b>	81	108	5	5	<b>199</b>
	% of Total	4.0%	5.4%	0.2%	0.3%	<b>9.9%</b>
	<b>Total</b>	<b>192</b>	<b>1 058</b>	<b>342</b>	<b>414</b>	<b>2 007*</b>
	<b>% of Total</b>	<b>9.6%</b>	<b>52.7%</b>	<b>17.1%</b>	<b>20.6%</b>	<b>100.0%</b>

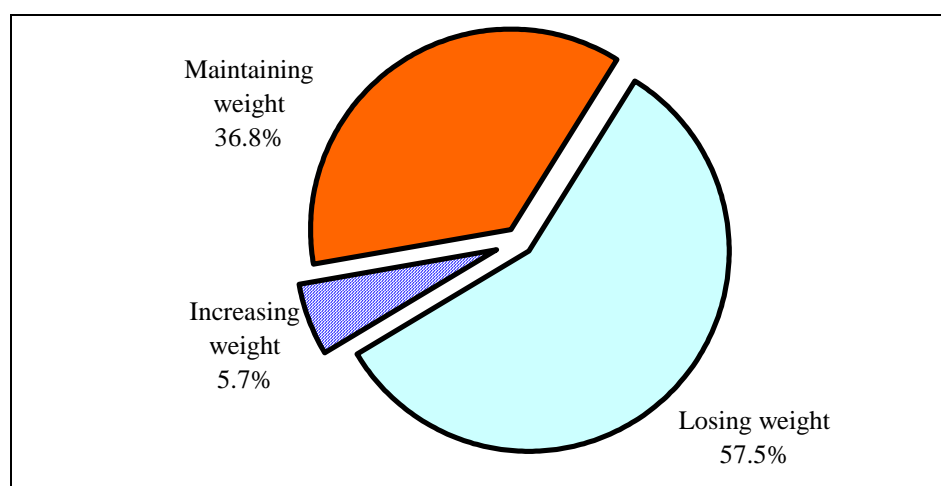
\*All respondents excluding refusal, outliers and missing responses either in the question of perception about current weight or the weight status by WHO classification. The percentages of respondents' perception of current weight and their weight status by WHO classification are slightly different from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

### 3.2.8 Weight control

During the 12 months prior to the survey, nearly one-third of the respondents (30.7%) had done something deliberately to control their weight (Fig. 3.2.8a). Among these respondents, 57.5% of them aimed to lose weight, 36.8% aimed to maintain weight and 5.7% reported trying to increase weight (Fig. 3.2.8b).

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

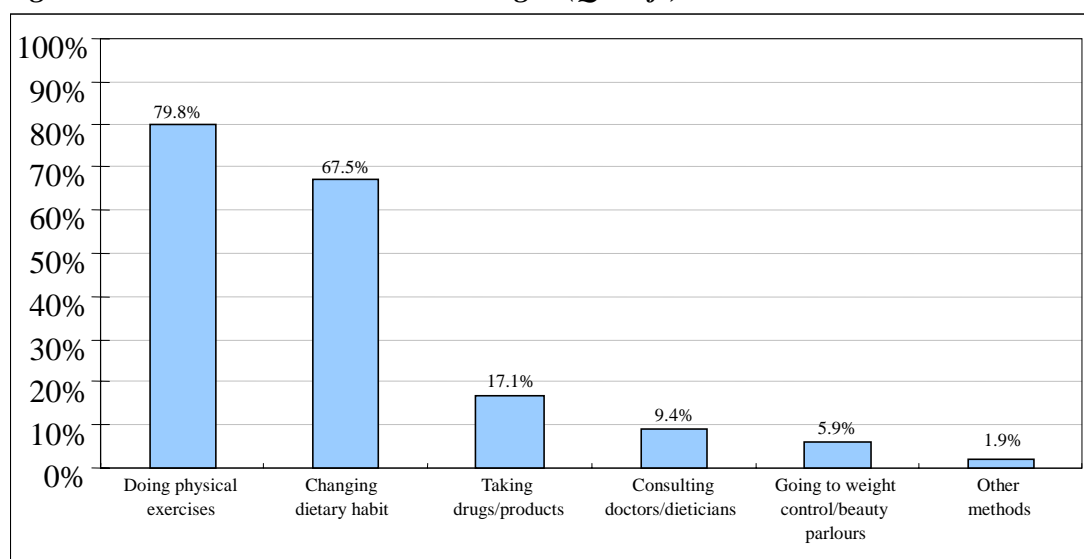
Base: All respondents

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

Base: Respondents who had deliberately controlled their weight = 644

### 3.2.9 Methods adopted to control weight

The most commonly used methods reported by respondents who intended to control weight were 'physical exercise' (79.8%) and 'changing dietary habits' (67.5%). The other less frequently mentioned methods included 'taking drugs/products' (17.1%), 'consulting doctors/dieticians' (9.4%) and 'going to weight control/beauty parlours' (5.9%) (Fig. 3.2.9).

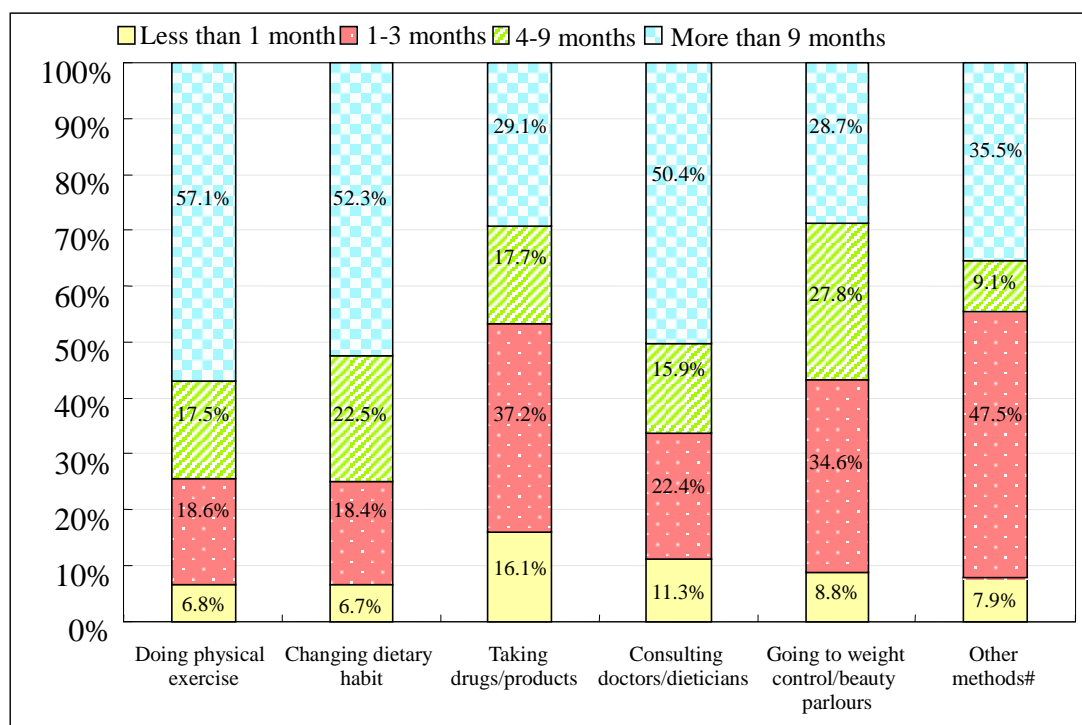
**Fig. 3.2.9: Methods used to control weight (Q5ai-fi)**

Base: Respondents who had deliberately controlled their weight = 644 (multiple responses)

### 3.2.10 Length of time engaged in weight controlling activities

Most of the respondents had used the aforementioned methods for at least one month. Respondents who adopted physical exercise, changing dietary habits and consultations from doctors or dieticians to control their weights appeared to be more determined and persistent. Over half of them had used these methods for more than 9 months. As for the respondents who controlled their weights by taking drugs or products, 37.2% of them have maintained this method for about 1 to 3 months, while 29.1% had engaged in it for more than 9 months (Fig 3.2.10).

**Fig. 3.2.10: Length of time in using different methods to control weight (Q5a-ii-fii)**



Base: Respondents who used these methods excluding 'don't know' or refusal. (Doing physical exercise = 507; Changing dietary habits = 430; Taking drugs/products = 109; Consulting doctors/dieticians = 61; Going to weight control/beauty parlours = 38; Other methods = 11)  
# small base: <30

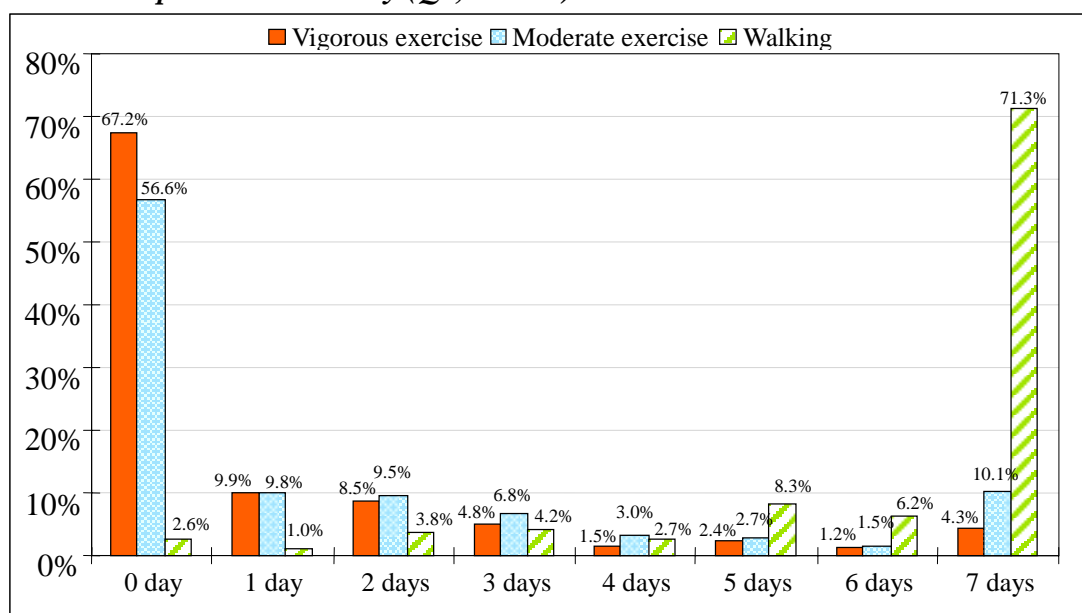
### 3.3 Physical exercise/activities

Seven questions were asked in this section to understand the frequency and duration with which respondents engaged in physical exercise/activities<sup>8</sup>. All the reported physical exercise/activities lasted for at least 10 minutes and were based on their experiences during the seven days prior to the survey. These questions were also used for analysing respondents' physical activity levels based on the International Physical Activity Questionnaire (IPAQ) analysis guidelines (Appendix B).

#### 3.3.1 Frequency of physical activities per week

On a weekly basis, walking appeared to be far more prevalent than vigorous and moderate physical activities. Over two-thirds (71.3%) of the respondents spent at least 10 minutes walking every day of the week prior to the survey. In contrast, only less than one-third of the respondents (32.8%) reported spending at least one day in the week prior to the survey engaged in vigorous physical activities and slightly more than two-fifths (43.4%) 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)**



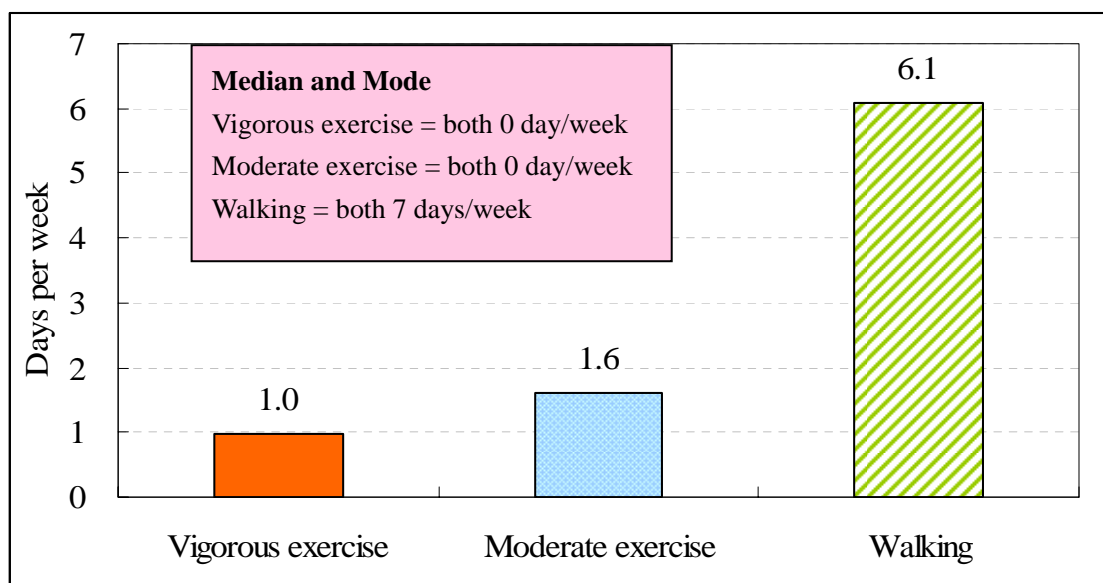
Base: All respondents excluding 'don't know'. (Vigorous exercise = 2 102; Moderate exercise = 2 099; Walking = 2 095)

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 vigorous physical activities, moderate physical activities or walking for at least 10 minutes.

<sup>8</sup> 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 bicycling, 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.

Walking is the most common physical activity, with the respondents, on average, spending 6.1 days per week. Days spent on vigorous and moderate physical activities in a week were rather less. The average number of days per week spent on these two physical activities was 1.0 and 1.6 respectively. In addition, the median and mode values for both vigorous and moderate physical activities were both zero days while those for walking were seven days per week.

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



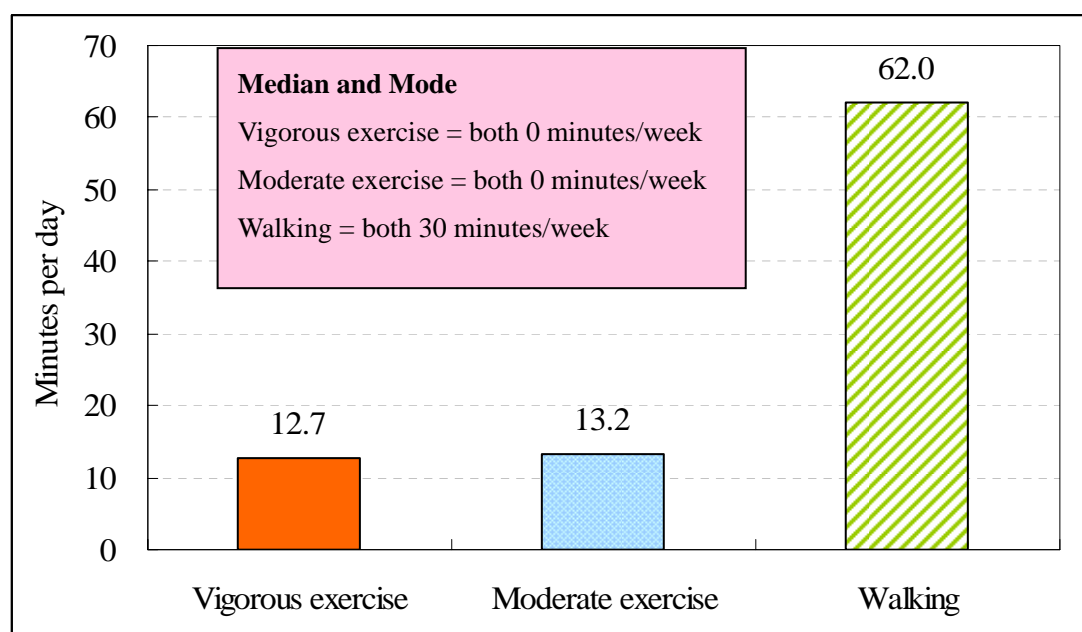
*Base: All respondents excluding 'don't know'. (Vigorous exercise = 2 102; Moderate exercise = 2 099; Walking = 2 095)*

### 3.3.2 Daily average time spent on physical exercise/activities<sup>9</sup>

The average time per day spent on each type of physical activity was 12.7 and 13.2 minutes for vigorous and moderate physical activities respectively, and 62.0 minutes for walking. The median and mode average time spent per day were both zero minute for vigorous and moderate physical activities and both 30 minutes for walking (Fig. 3.3.2a).

<sup>9</sup> 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:  $(Q6 \times Q7)/7$ ; Moderate exercise:  $(Q8 \times Q9)/7$ ; Walking:  $(Q10 \times Q11)/7$ .

**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 = 2 095; Moderate exercise = 2 089; Walking = 2 027)

The proportions of all respondents spending a daily average of 31 minutes or more time on vigorous physical activities, moderate physical activities and walking were 75.%, 8.7% and 42.2% respectively (Table 3.3.2b).

**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
<b>Below 10</b>	1 692	80.8%	1 570	75.1%	187	9.2%
<b>10 – &lt;16</b>	74	3.5%	142	6.8%	214	10.6%
<b>16 – &lt;31</b>	172	8.2%	197	9.4%	770	38.0%
<b>31 – &lt;61</b>	93	4.4%	95	4.6%	471	23.3%
<b>61 or above</b>	64	3.1%	86	4.1%	384	18.9%
<b>Total</b>	<b>2 095*</b>	<b>100.0%</b>	<b>2 089*</b>	<b>100.0%</b>	<b>2 027*</b>	<b>100.0%</b>

\*All respondents excluding 'don't know'. (Vigorous exercise = 2 095; Moderate exercise = 2 089; Walking = 2 027)

### 3.3.3 Sitting<sup>10</sup>

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 53.9% of the respondents sat for at least six hours per day. On weekdays

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

(Monday to Friday), respondents spent an average of 6.4 hours per day sitting. The median and mode were six hours and eight hours respectively.

**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
<b>Below 2</b>	87	4.3%
<b>2 – &lt;4</b>	374	18.6%
<b>4 - &lt;6</b>	466	23.2%
<b>6 - &lt;8</b>	313	15.6%
<b>8 - &lt;10</b>	331	16.5%
<b>10 or above</b>	438	21.8%
<b>Total</b>	<b>2 008*</b>	<b>100.0%</b>
<b>Other statistics</b>		
	<b>Hours</b>	
Mean	6.4	
Median	6.0	
Mode	8.0	

\*All respondents excluding 'don't know' and 'refusal'

### 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, version 2.0, April 2004-revised version<sup>11</sup>. A copy of the guidelines is enclosed in Appendix B.

The questions about physical activities covered in this survey (see Appendix A, part B, Q6 – Q12) aligned with the IPAQ short form which includes vigorous physical activities, moderate physical activities and walking. The age range of respondents of this survey (18-64) also matched with the age criteria of the IPAQ analysis, i.e., 15-69.

The IPAQ short form guideline provides standard methods for the cleaning and treatment of dataset. In this section, the analyses followed the data processing rules (see Appendix B for details) specified by the IPAQ short form guideline. Ninety-two cases were excluded from this part of analyses due to the classification of outliers according to the data cleaning rules of the guideline or the responses of 'don't know' and 'refusal'.

The analysis of the IPAQ short form provides two indicators of physical activity, namely categorical and continuous indicators.

<sup>11</sup> 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 ‘inactive’, ‘minimally active’ and ‘HEPA active’ (Health enhancing physical activity, a high active category). Table 3.3.4.1 details the criteria of classification.

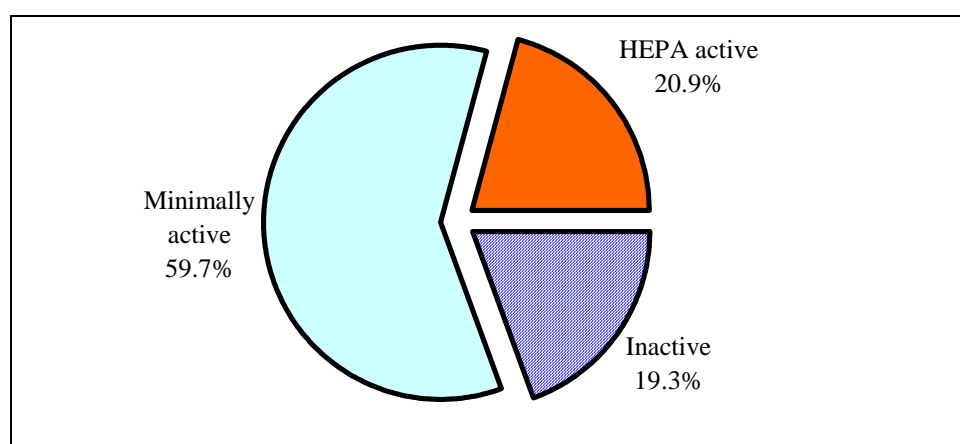
**Table 3.3.4.1: Categorical scoring classification of physical activity**

Level of physical activity	Categorical scoring classification criteria
<b>Inactive</b>	<ul style="list-style-type: none"> <li>▪ No activity is reported OR</li> <li>▪ Some activity is reported but not enough to meet Categories ‘Minimally active’ or ‘HEPA active’</li> </ul>
<b>Minimally active</b>	<p>Any one of the following 3 criteria</p> <ul style="list-style-type: none"> <li>▪ 3 or more days of vigorous-intensity activity of at least 20 minutes per day OR</li> <li>▪ 5 or more days of moderate-intensity activity or walking of at least 30 minutes per day OR</li> <li>▪ 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</li> </ul>
<b>HEPA active</b>	<p>Any one of the following 2 criteria</p> <ul style="list-style-type: none"> <li>▪ Vigorous-intensity activity on at least 3 days and accumulating at least 1500 MET-minutes/week OR</li> <li>▪ 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</li> </ul>

*Note: MET = multiples of resting metabolic rate.*

*Source: Guidelines for data processing and analysis of the IPAQ – short form*

According to the classification criteria listed in Table 3.3.4.1, more than half of the respondents (59.7%) in this survey were classified as ‘minimally active’, 20.9% were ‘HEPA active’ while less than one-fifth (19.3%) were regarded as ‘inactive’ (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 = 2 010.

### 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<sup>12</sup> 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 three MET values for each type 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 and were followed in the analyses 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.

<sup>12</sup> Source of information: Guideline for data processing and analysis of the IPAQ

**Table 3.3.4.2a: Continuous score computation**

<b>MET-min per week for each activity</b>	= (MET level) x (min of activity) x (events per week)
<b>Total MET-min per week</b>	= (Walk METs x min x days) + (Moderate PA METs x min x days) + (Vigorous PA METs x min x days)
<b>Example:</b>	<b>Given:</b> <i>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</i>
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
<u>MET-min/week for Vigorous PA</u>	<u>= 8.0 x 30 x 5 = 1,200 MET-min/week</u>
<b>Total MET-min/week</b>	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 1 262 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
<b>Median</b>	0	0	693	1 262

\*All respondents excluding 'don't know', 'refusal' and outliers according to the data processing rules of the IPAQ analysis guideline (Vigorous exercise = 2 095; Moderate exercise = 2 089; Walking = 2 027)

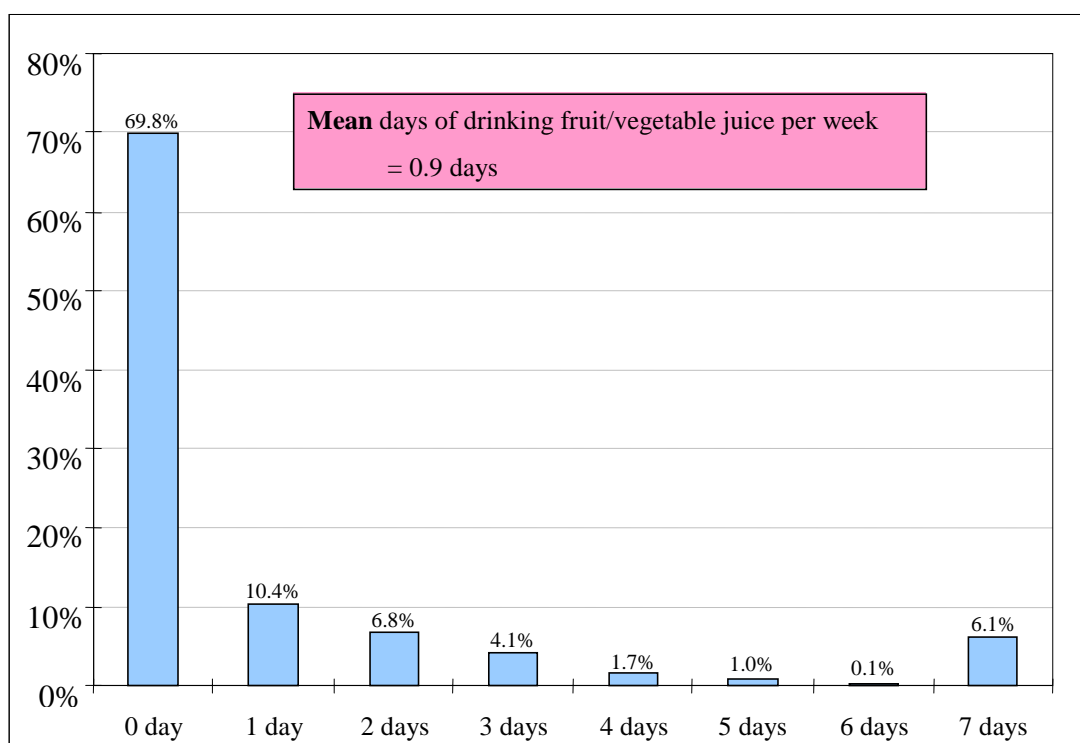
### 3.4 Dietary habits

Six questions were asked in this section to gauge respondents' dietary habits with particular reference to the consumption of fruit/vegetable juice<sup>13</sup>, fruit and vegetables. One case was treated as outlier for the response of drinking fruit/vegetable juice (Q13b) as the response was found to be out of the suggested range 0 – 8 cups.

#### 3.4.1 Frequency of consuming fruit/vegetable juice per week

More than two-thirds of the respondents (69.8%) did not consume any fruit/vegetable juice during the week prior to the survey. Only 6.1% of the respondents drank fruit/vegetable juice on a daily basis, however, this is higher than the proportion of respondents who drank three to six days per week. The average of days in the week in which the respondents drank fruit/vegetable juice was 0.9 days (Fig 3.4.1).

**Fig. 3.4.1: Number of days in the week when respondents drank fruit/vegetable juice (Q13a)**



Base: All respondents excluding 'don't know' and outliers = 2 098

#### 3.4.2 Amount of fruit/vegetable juice drunk per day

Most respondents (92.7%) had drunk an average of less than one cup (250 ml) of fruit/vegetable juice per day in the week. The average cups of fruit/vegetable juice that respondents drank per day was 0.2 cups (50 ml). (Table 3.4.2)

<sup>13</sup> 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 (Q13b)**

Average no. of cups of fruit/vegetable juice drunk per day	No. of respondents	
	Number	% of Total
Less than 1	1 945 (0 cup = 1 464)	92.7% (0 cup = 69.8%)
1 – 2	142	6.8%
More than 2	11	0.5%
<b>Total</b>	<b>2 098*</b>	<b>100.0%</b>
<b>Mean</b>	0.2 cups	

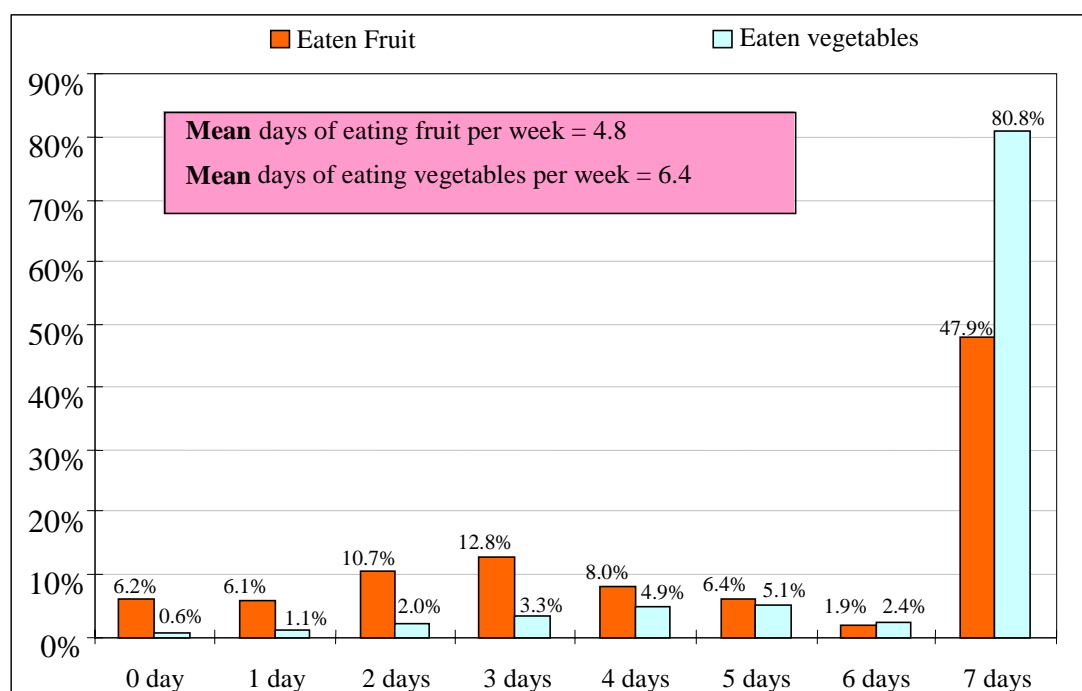
\*All respondents excluding 'don't know' and outlier

### 3.4.3 Frequency of consuming fruit and vegetables per week

Vegetables appeared to be more frequently consumed than fruit by the respondents. Fig. 3.4.3 shows that the majority of the respondents (80.8%) had consumed vegetables on a daily basis. In contrast, only around half of the respondents (47.9%) had eaten fruit on a daily basis. Furthermore, the proportion of respondents consuming no fruit at all during the week (6.2%) was much higher than that for vegetables (0.6%) (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 of consuming fruit (4.8 days).

**Fig. 3.4.3 Number of days in the week when respondents ate fruit and vegetables (Q14a, Q15a)**



Base: All respondents excluding 'don't know' and 'refusal'. (Eating fruit = 2 094; Eating vegetables = 2 101)

### 3.4.4 Amount of fruit and vegetables eaten per day<sup>14</sup>

On a daily basis, nearly half of the respondents (49.8%) consumed less than one portion of fruit and over one-third (34.4%) ate less than one bowl of vegetables on average. Overall, the daily average amount consumed was just 1.0 piece of fruit and 1.1 bowls of vegetables (Table 3.4.4).

**Table 3.4.4: Daily average amount of fruit/vegetable eaten (Q14a, Q14b, Q15a and Q15b)**

Average no. of fruit/bowl of vegetables eaten per day	No. of respondents			
	Fruit		Vegetables	
	Number	% of Total	Number	% of Total
Less than 1	1 037	49.8%	712	34.4%
1 – 2	960	46.1%	1 285	62.0%
More than 2	83	4.0%	74	3.6%
<b>Total</b>	<b>2 081*</b>	<b>100.0%</b>	<b>2 071*</b>	<b>100.0%</b>
<b>Mean</b>	1.0 fruit		1.1 bowls of vegetables	

\*Base: All respondents excluding 'don't know' and 'refusal'. (Eating fruit = 2 081; Eating vegetables = 2 071)

### 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 to obtain optimal health benefits<sup>15</sup>.

#### **Total servings of excluding fruit/vegetable juice**

The number of servings of fruit and vegetables consumed per day in this section was defined as the sum of the average number 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 vegetables was equated to 2 servings).

It was found that, only 16.1% of the respondents ate 5 or more servings of fruit and vegetables per day. The mean and median numbers of servings were 3.1 and 3.0 respectively (Table 3.4.5a).

<sup>14</sup> 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 eaten 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.

<sup>15</sup> Fruit, vegetables and NCD disease prevention. Geneva: World Health Organization; 2003. ([http://www.who.int/dietphysicalactivity/media/en/gsfv\\_fv.pdf](http://www.who.int/dietphysicalactivity/media/en/gsfv_fv.pdf))

**Table 3.4.5a: Number of servings of fruit and vegetables consumed per day (percentage, mean and median) (Q14a, Q14b, Q15a and Q15b)**

No. of servings (excluding juice)	No. of respondents	
	Number	% of Total
Less than 3	1 025 (0 serving = 5)	49.9% (0 serving = 0.3%)
3 - <5	700	34.1%
5 or above	331	16.1%
<b>Total</b>	<b>2 056*</b>	<b>100.0%</b>
	No. of servings of fruit and vegetables eaten per day	
<b>Mean</b>	3.1 servings	
<b>Median</b>	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 in this section was defined as the sum of the average number 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 vegetables was equated to 2 servings) and the average cups of fruit/vegetables 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<sup>16</sup>).

Overall, 20.7% 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 3.4 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) (Q13a, Q13b, Q14a, Q14b, Q15a and Q15b)**

No. of servings (including juice)	No. of respondents	
	Number	% of Total
Less than 3	836 (0 serving = 4)	40.7% (0 serving = 0.2%)
3 - <5	791	38.5%
5 or above	426	20.7%
<b>Total</b>	<b>2 053*</b>	<b>100.0%</b>
	No. of servings of fruit and vegetables eaten per day	
<b>Mean</b>	3.4 servings	
<b>Median</b>	3.0 servings	

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

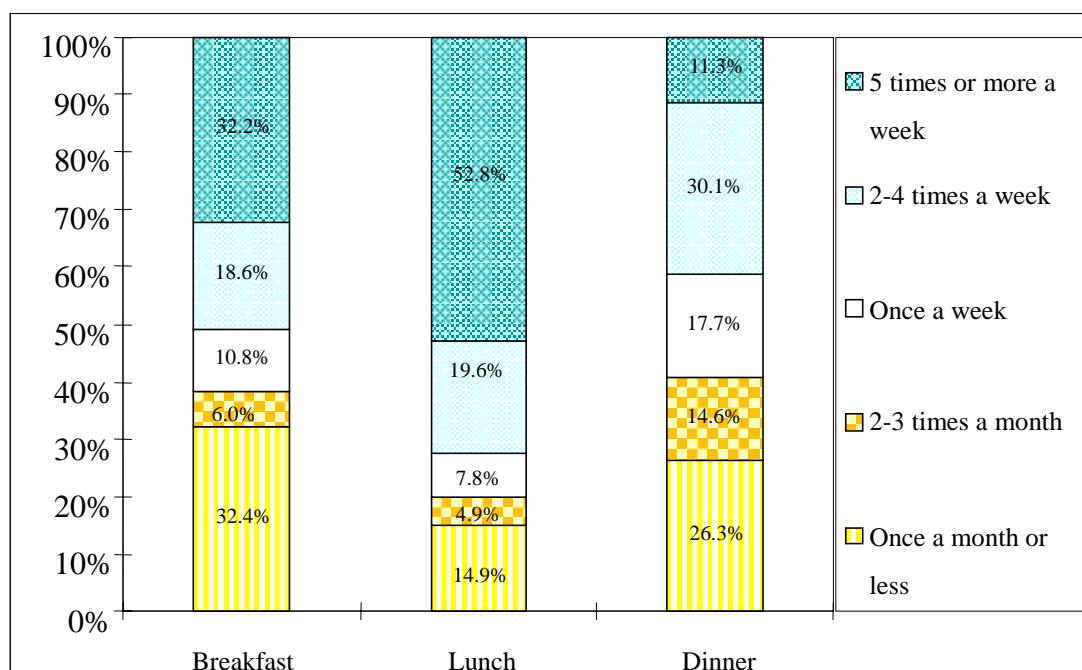
<sup>16</sup> Juice (fruit or vegetables) only counted as 1 serving a day, regardless of how much is drunk, because it has very little fibre. It is also likely to lose some vitamins once juiced (particularly vitamin C, which is easily destroyed by light and air).

### 3.5 Eating out habits

In this section, respondents were asked about the frequency of eating out for breakfast<sup>17</sup>, lunch<sup>18</sup> and dinner<sup>19</sup> in the month prior to the survey.

Most respondents ate out for breakfast, lunch or dinner at least once a week in the month prior to the survey. In particular, for lunch, over half of the respondents (52.8%) had eaten out for lunch five times or more a week in the month prior to the survey. Regarding eating out for dinner, three in ten respondents (30.1%) ate out two to four times a week. On the other hand, there were also around one-third of the respondents (32.4%) who ate out for breakfast once in a month or less (Fig 3.5.1).

**Fig. 3.5: Frequency of eating out for breakfast, lunch and dinner during the month prior to the survey (Q16a, b & c)**



*Base: All respondents excluding 'don't know', 'refusal' and 'skipped breakfast/lunch/dinner'. (Eating out for breakfast = 1 967; Eating out for lunch = 2 064; Eating out for dinner = 2 082)*

<sup>17</sup> "Eating out for breakfast" refers to the breakfast that is not made at home and bread that is bought from a bakery is also excluded.

<sup>18</sup> "Eating out for lunch" refers to the lunch that is not made at home.

<sup>19</sup> "Eating out for dinner" refers to the dinner that is not made at home.

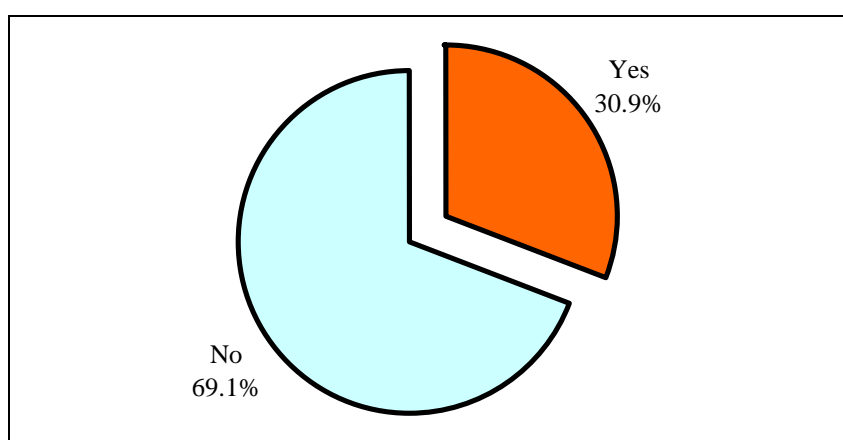
### 3.6 Pattern of alcohol consumption

Five questions were asked in order to understand respondents' alcohol drinking patterns and to assess if their drinking habits were within the safe level defined by the British Alcohol Guidelines<sup>20</sup>.

Two cases had reported the amount of standard drinks consumed out of the suggested range 0-24 units; therefore they were treated as outliers and excluded from the analyses from sections 3.6.1 to 3.6.4.

Less than one-third of the respondents (30.9%) consumed at least one alcoholic drink during the month prior to the survey (Fig. 3.6).

**Fig. 3.6: Consumption of at least one alcoholic drink during the month prior to the survey (Q17a)**



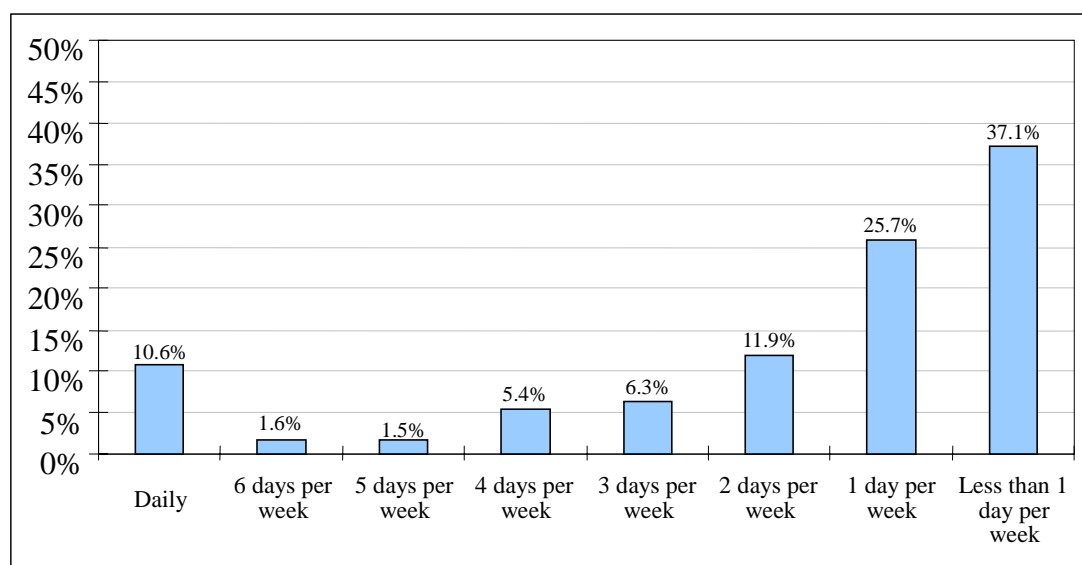
Base: All respondents = 2 102

#### 3.6.1 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. It was found that around one-tenth (10.6%) consumed at least one alcoholic drink daily; over half of the drinkers (62.9%) drank one day or less per week (Fig. 3.6.1).

<sup>20</sup> The British Alcohol Guidelines:  
[http://www.dh.gov.uk/PolicyAndGuidance/HealthAndSocialCareTopics/AlcoholMisuse/AlcoholMisuseGeneralInformation/AlcoholMisuseGeneralArticle/fs/en?CONTENT\\_ID=4062199&chk=J782BY](http://www.dh.gov.uk/PolicyAndGuidance/HealthAndSocialCareTopics/AlcoholMisuse/AlcoholMisuseGeneralInformation/AlcoholMisuseGeneralArticle/fs/en?CONTENT_ID=4062199&chk=J782BY)

**Fig. 3.6.1: Frequency of drinkers consuming at least one alcoholic drink during the month prior to the survey (Q17b)**



Base: All drinkers excluding 'don't know' and outliers = 642

### 3.6.2 Amount of alcoholic drinks consumed

Among those who drank at least one glass during the month prior to the survey, the average number of standard drinks<sup>21</sup> consumed each drinking day was 2.6. The median was 1.5 standard drinks. Table 3.6.2 also shows that over one-third of the drinkers (35.3%) drank 3 or more standard drinks on average on those drinking days during the month prior to the survey.

**Table 3.6.2: Average number of standard drinks consumed on the days they drink alcohol (percentage, mean and median) (Q17c)**

No. of standard drinks	No. of drinkers	
	Number	% of Total
Less than 3	408	64.7%
3 – <5	147	23.4%
5 or above	75	11.9%
<b>Total</b>	<b>629*</b>	<b>100.0%</b>
<b>Mean</b>	2.6 standard drinks	
<b>Median</b>	1.5 standard drinks	

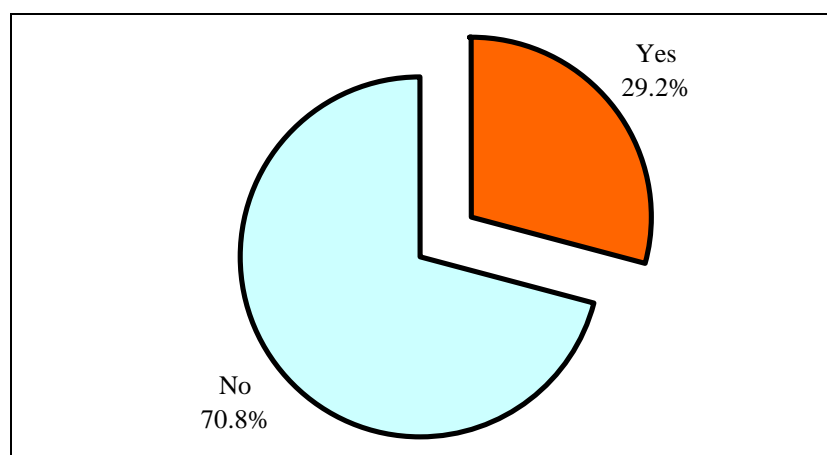
\*All drinkers excluding 'don't know' and outliers = 629

<sup>21</sup> 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.

### 3.6.3 Drinking at least 5 glasses/cans of alcohol on one occasion

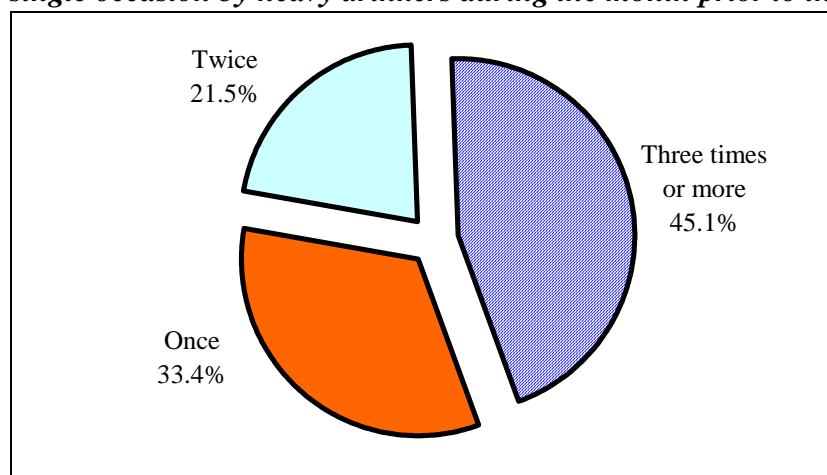
More than a quarter of the drinkers (29.2%) had consumed at least 5 glasses (or cans) of alcohol on one single occasion<sup>22</sup> during the month prior to the survey (Fig. 3.6.3a). Of these heavy drinkers, slightly less than half of them (45.1%) had consumed this volume of alcohol three times or more during the month, one-third of them (33.4%) had such heavy consumption once and 21.5% consumed twice during the month (Fig. 3.6.3b).

**Fig. 3.6.3a: Consumption of at least 5 glasses (or cans) of alcohol by drinkers on one single occasion during the month prior to the survey (Q17d)**



Base: All drinkers excluding outliers = 647

**Fig. 3.6.3b: 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 (Q17e)**



Base: Drinkers who drank at least 5 glasses or cans of alcohol on at least one occasion, excluding 'don't know' and outliers = 186

<sup>22</sup> Refer to total number of glasses/cans of any types of alcohol. One single occasion means a period of a few hours.

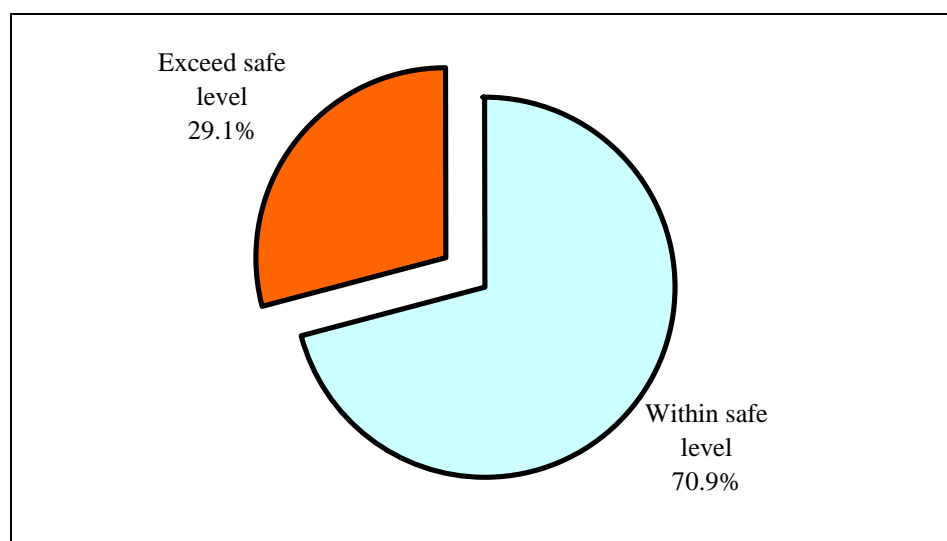
### 3.6.4 Drinking habits by safe level

According to the classification of safe level of drinking habits in the British Alcohol Guidelines (Table 3.6.4), more than two-thirds (70.9%) of the drinkers were found to drink within the safe level (Fig. 3.6.4).

**Table 3.6.4: Classification of safe level of drinking habit by the British Alcohol Guidelines**

Gender	British Alcohol Guidelines – classification of safe level
Male	<ul style="list-style-type: none"> <li>▪ No more than <b>4 standard drinks</b> a day, and</li> <li>▪ At least <b>2 alcohol-free days</b> per week, and</li> <li>▪ No more than <b>21 standard drinks</b> over a week<sup>23</sup></li> </ul>
Female	<ul style="list-style-type: none"> <li>▪ No more than <b>2 standard drinks</b> a day, and</li> <li>▪ At least <b>2 alcohol-free days</b> per week, and</li> <li>▪ No more than <b>14 standard drinks</b> over a week<sup>23</sup></li> </ul>

**Fig. 3.6.4: Classification of respondents' drinking habits (Q17a-Q17c)**



Base: All drinkers excluding 'don't know' and outliers = 629

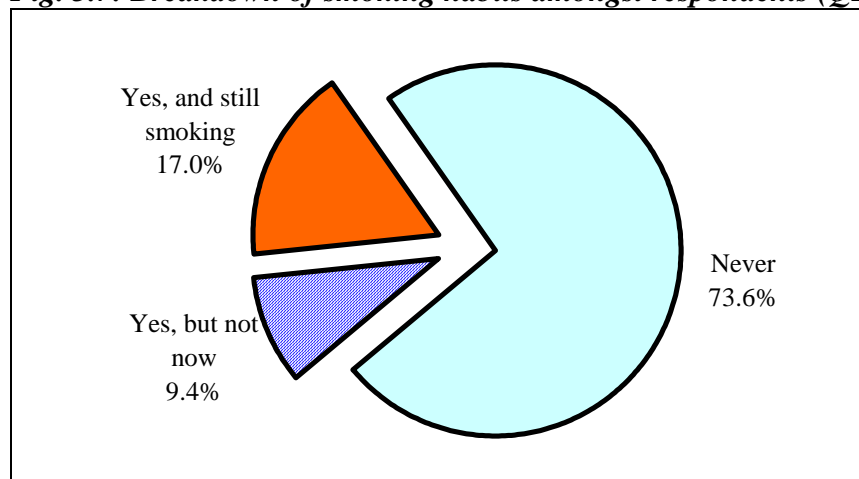
<sup>23</sup> The number of standard drinks per week was computed by multiplying 'weekly frequency in which drinkers drank at least one alcoholic drink during last month' (i.e. Q17b) and 'the number of standard drinks consumed each day on those drinking days' (i.e. Q17c). In Q17b, 0.5 day was used for 'less than one day per week' for the computations.

### 3.7 Smoking habits

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

Around three-quarters of the respondents (73.6%) reported that they had never smoked, 9.4% smoked in the past but now abstained and 17.0% of the respondents were current smokers (Fig. 3.7).

**Fig. 3.7: Breakdown of smoking habits amongst respondents (Q18a)**

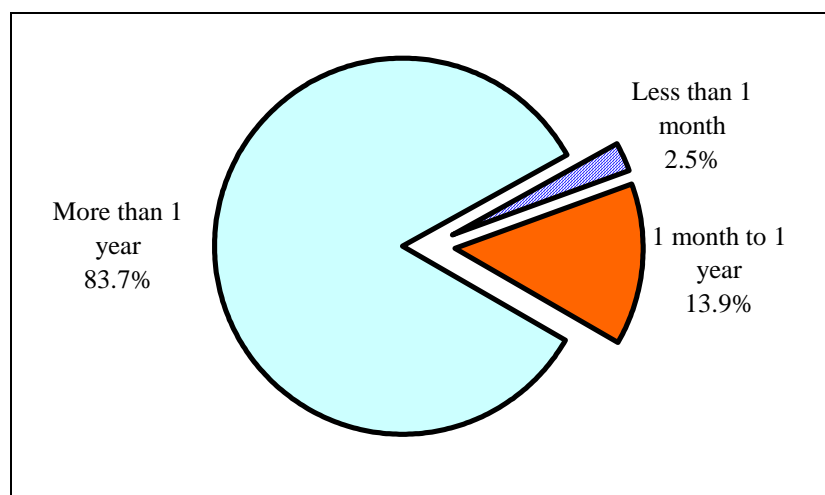


Base: All respondents = 2 102

#### 3.7.1 Abstaining from smoking

Among those who smoked before but now abstained from smoking, the majority of them (83.7%) had given up smoking for more than one year (Fig 3.7.1).

**Fig. 3.7.1: Length of time abstained from smoking (Q18b)**

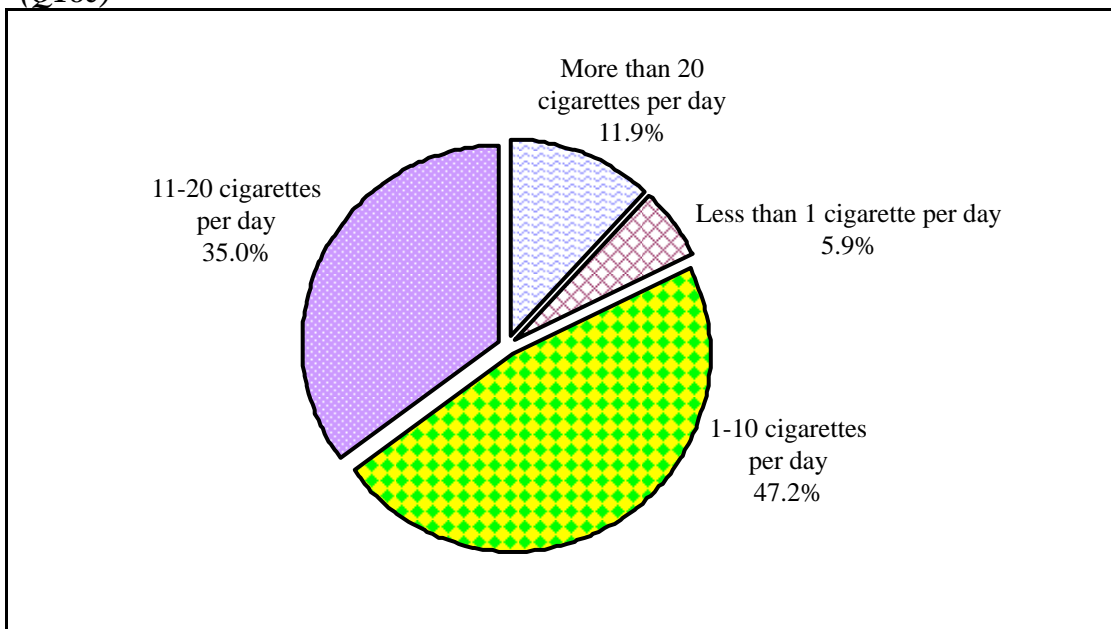


Base: All past smokers = 198

### 3.7.2 Cigarette consumption

Of the current smokers, 94.1% were daily smokers, with slightly less than half of them (47.2%) smoked 1- 10 cigarettes per day, and around half of them (46.9%) smoked at least 11 cigarettes or more a day (Fig. 3.7.2).

**Fig. 3.7.2: Number of cigarettes smoked on average per day by current smokers (Q18c)**



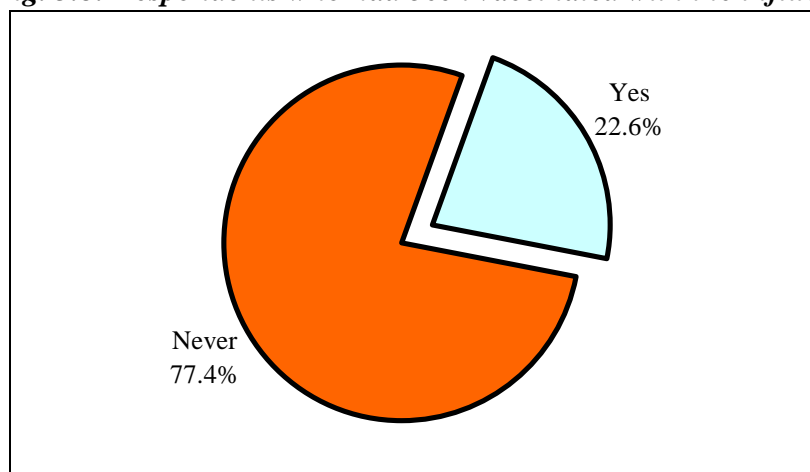
Base: All current smokers excluding 'don't know' = 356

### 3.8 Coverage of influenza vaccination

Two questions in this survey were asked to check the coverage of influenza vaccination among respondents.

Over three-quarters of the respondents (77.4%) had never had an influenza vaccination (Fig. 3.8).

**Fig. 3.8: Respondents who had been vaccinated with the influenza vaccine (Q19a)**

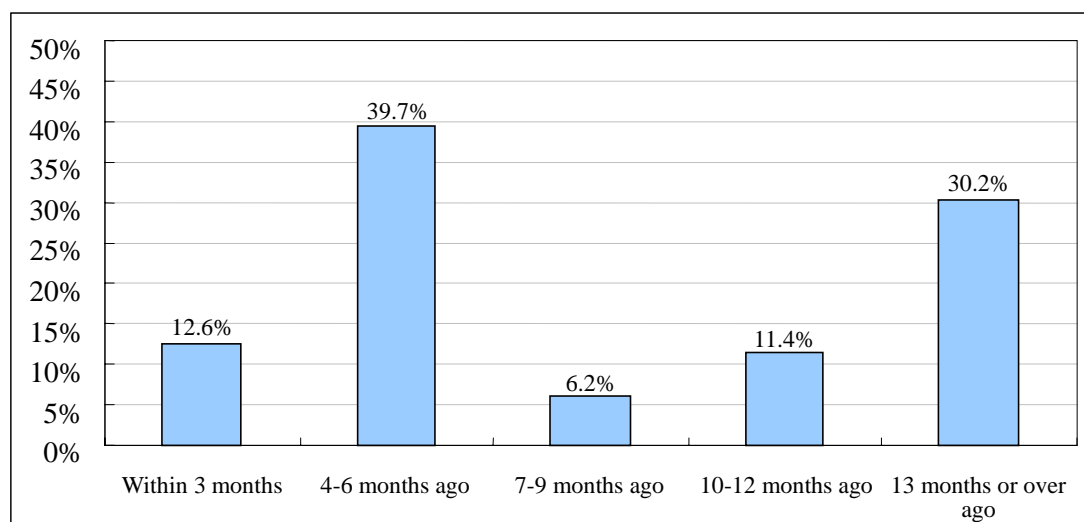


Base: All respondents excluding 'don't know' = 2 058

#### 3.8.1 Last influenza vaccination

Among the respondents who had been vaccinated, over half of them (52.2%) had their last injections within the 6 months prior to the survey; around one-third of the respondents (30.2%) had the last injection 13 months or longer ago (Fig. 3.8.1).

**Fig. 3.8.1: Period of time since last vaccination (Q19b)**



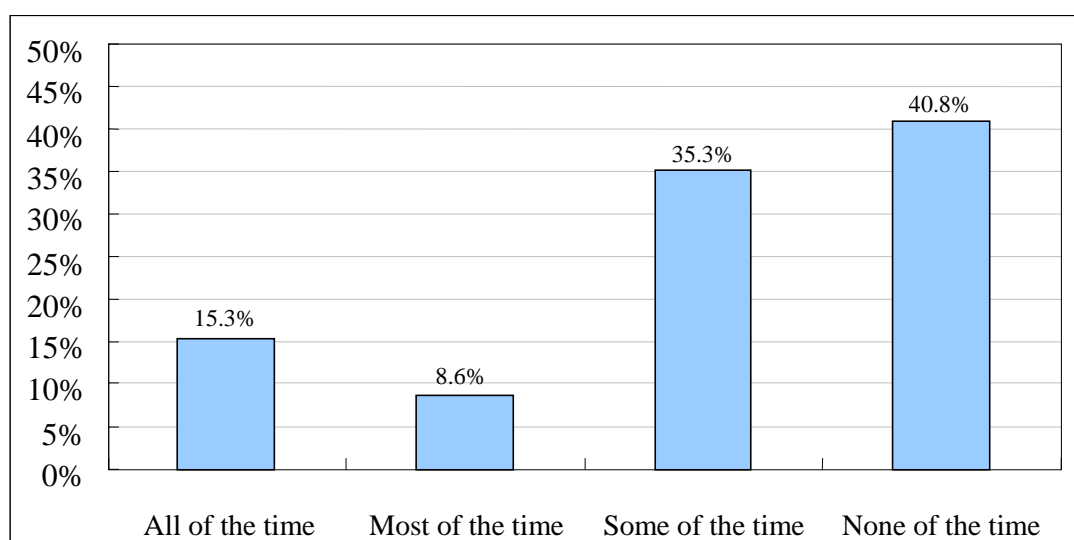
Base: Respondents who had an influenza vaccination prior to the survey excluding 'can't remember' = 436

### 3.9 Mask wearing habits

In this section, respondents were asked how often they had worn a mask when going out, including at work and in school, if they had symptoms of respiratory tract infection or fever during the three months prior to the survey.

Of the respondents who reported having symptoms of respiratory tract infection or fever during the three months prior to the survey, two-fifth of them (40.8%) went out never wearing a mask. Over one-third (35.3%) had worn a mask some of the time, while near a quarter of the respondents (24.0%) had done so most of the time or all of the time (Fig. 3.9).

**Fig. 3.9: Frequency of wearing mask when having symptoms of respiratory tract infection or fever during the three months prior to the survey (Q20)**



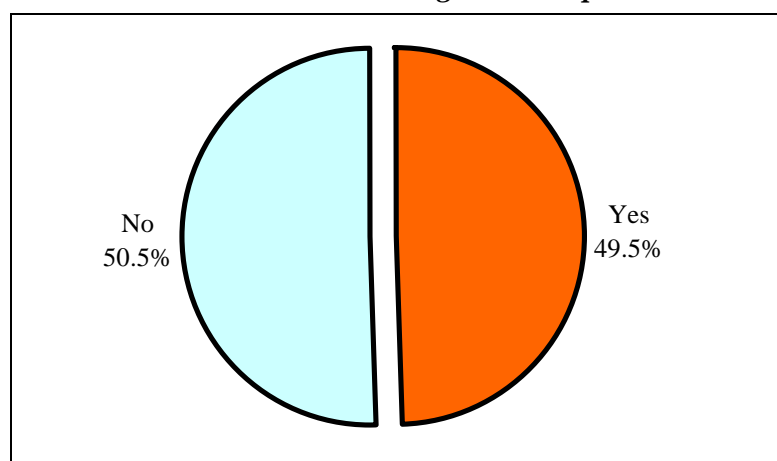
*Base: All respondents who had symptoms of respiratory tract infection or fever during the three months prior to the survey = 919*

### 3.10 Home cleansing practice

Respondents were asked how often they or their family members used at least 1:99 diluted household bleach solution to cleanse furniture and household facilities in the past 7 days.

About half of the respondents (49.5%) reported that they or their family members had cleansed their home furniture and household facilities with household bleach solution diluted at least in the ratio of 1:99 during the week prior to the survey (Fig. 3.10).

**Fig. 3.10: Cleansing furniture and household facilities with at least 1:99 diluted household bleach solution during the week prior to the survey (Q21a)**

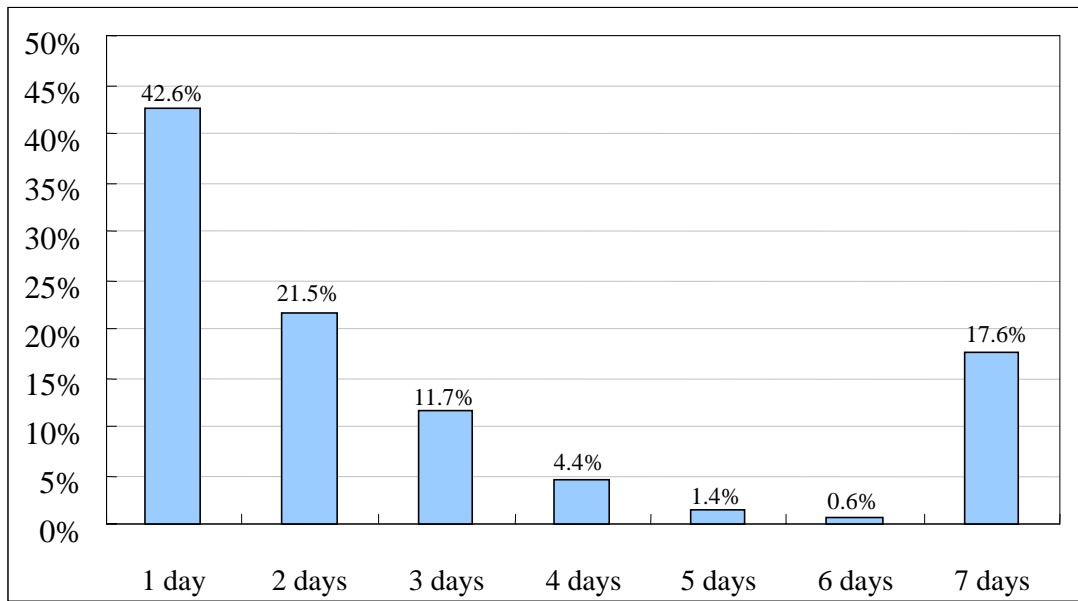


*Base: All respondents excluding 'not sure' = 2 021*

#### 3.10.1 Frequency of house cleansing with at least 1:99 bleach solution per week

Among those who had used diluted bleach solution to cleanse their homes in the week prior to the survey, 42.6% had done so for one day only in the week, while less than one-fifth (17.6%) had such cleansing practice on a daily basis (Fig. 3.10.1)

**Fig. 3.10.1: Number of days per week spent on house cleansing with at least 1:99 household bleach solution in the week prior to the survey (Q21b)**



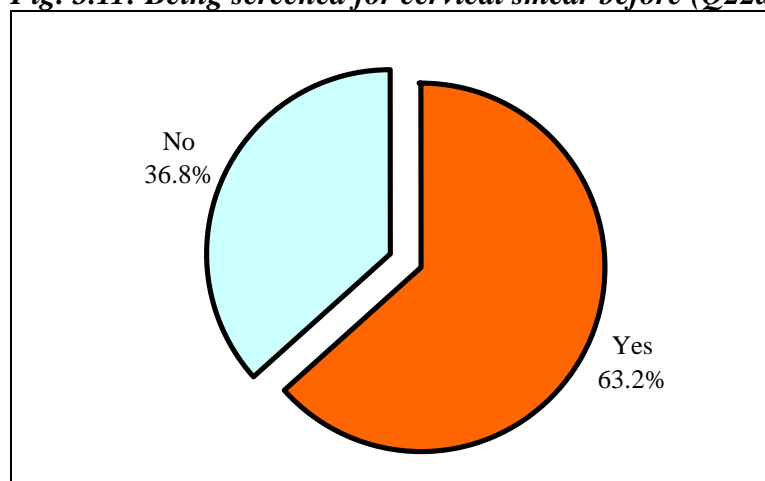
*Base: Respondents who had practised house cleansing with at least 1:99 household bleach solution, excluding 'can't remember/don't know' = 959*

### 3.11 Cervical screening (for female respondents only)

Two questions were asked to understand female respondents' behaviour of cervical screening.

In this survey, 52.8% of the respondents were females after weighting. Among the female respondents, over half of them (63.2%) had had a cervical smear before (Fig. 3.11).

**Fig. 3.11: Being screened for cervical smear before (Q22a)**

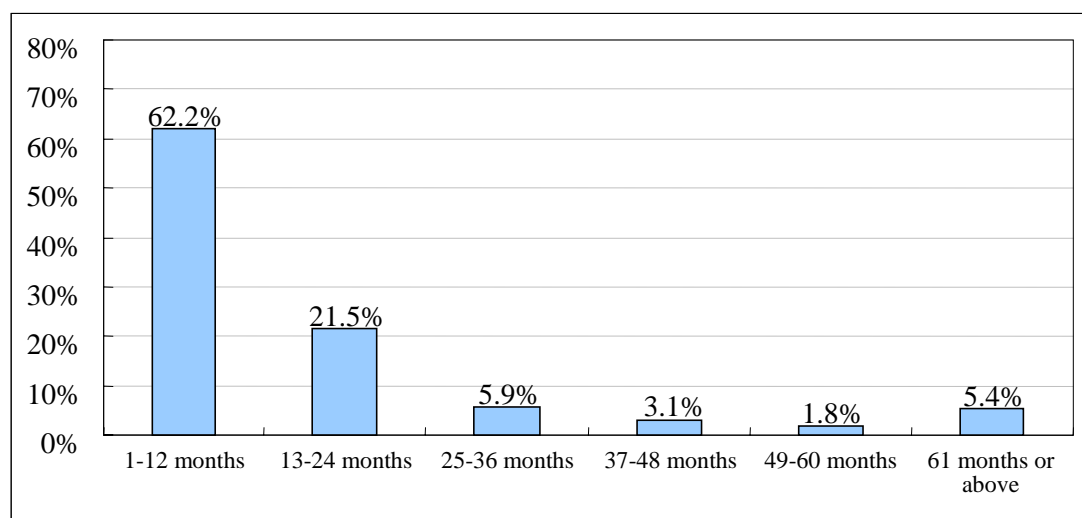


Base: All female respondents excluding 'not sure' = 1 097

#### 3.11.1 Last cervical smear

Of the female respondents who had a cervical smear before, over three-fifths of them (62.2%) had the last cervical smear taken within the 1-12 months prior to the survey. Around one-fifth of the female respondents (21.5%) had the examination within 13-24 months, while 16.3% of them had it 25 or more months ago (Fig. 3.11.1).

**Fig. 3.11.1: Period of time since last cervical smear if ever had a smear (Q22b)**



Base: Female respondents who ever had a cervical smear before, excluding 'can't remember' = 677

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

### 4.1 Re-grouping of variables

In this chapter, sub-group analyses were 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 were any significant associations between these demographic factors and the areas being investigated. Besides, cross tabulations were also done for special areas of interest. For example, Body Mass Index (BMI) was analysed by perceptions about current weight.

Some of the responses had 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 had 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' had been excluded from all the sub-group analyses in this chapter.

Three types of statistical tests<sup>24</sup> were used for sub-group analysis in this report, namely Pearson chi-square test, Kruskal-Wallis test and Spearman's rank correlation. When both variables were nominal, the chi-square test was used. When one variable was nominal while the other one was ordinal, the Kruskal-Wallis test was adopted. Spearman's rank correlation was performed when both variables were ordinal. Only significant results at the 5% level are presented in this chapter. As for the Pearson chi-square test, only those where no more than 20% of the cells had expected values of less than 5 were included.

<sup>24</sup> These statistical tests were based on SPSS application guide. Formulae for the three tests are included for reference.

**Pearson chi-square statistics:**

$$\chi^2 = \sum_i \sum_j \frac{(O_{ij} - e_{ij})^2}{e_{ij}}$$

where  $O_{ij}$  is the observed value corresponding to the  $i$ th column and the  $j$ th row,  $e_{ij}$  is the expected value corresponding to the  $i$ th column and the  $j$ th 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:**

$$r = \frac{\sum_{i=1}^N (X_i - \bar{X})(Y_i - \bar{Y})}{(N-1)S_x S_y}$$

where  $N$  is the sample size and  $S_x$  and  $S_y$  are the standard deviations of the rank of the two variables and  $X_i$  and  $Y_i$  are the  $i$ th rank of  $X$  and  $Y$  respectively and  $\bar{X}$  and  $\bar{Y}$  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.

Only Pearson chi-square tests were carried out with weighting; on the other hand, Kruskal-Wallis test and Spearman's rank correlation were carried out without weighting as SPSS is unable to handle non-integer weights for these two tests. However, all percentages reported were after weighting for gender and age.

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

Demographic variable	Original level	Re-grouped level	Sample size (weighted)
<b>Gender</b>	Male	Male	993
	Female	Female	1 109
<b>Age group</b>	No grouping	18 – 24	277
		25 – 34	459
		35 – 44	583
		45 – 54	499
		55 – 64	265
<b>Educational attainment</b>	Primary or below	Primary or below	266
	Had not completed secondary	Had not completed secondary	391
	Completed secondary (F.5)	Completed secondary (F.5)	670
	Matriculation	Matriculation	167
	Tertiary (non-degree)/degree or above	Tertiary or above	606
<b>Martial status</b>	Never married	Never married	652
	Married with child(ren)	Married	1 343
	Married without child(ren)		
	Divorced/Separated	Divorced/Separated/Widowed	99
	Widowed		
<b>Occupation</b>	Employer/Managers/ Administrator	Managerial/professional worker	496
	Professional		
	Associate professional		
	Clerk	Clerk	292
	Service worker	Service worker	286
	Shop sales worker		
	Skilled agricultural/ fishery worker	Blue collar worker	295
	Craft and related worker		
	Plant and machine operator and assembler		
	Unskilled worker		
	Student	Not working	703
	Home-maker		
	Unemployed person		

	Retired person		
	Other not-worker person		
<b>Monthly household income</b>	Less than \$2,000	Below \$8,000	159
	\$2,000 - \$3,999		
	\$4,000 - \$5,999		
	\$6,000 - \$7,999		
	\$8,000 - \$9,999	\$8,000 - \$13,999	330
	\$10,000 - \$11,999		
	\$12,000 - \$13,999		
	\$14,000 - \$15,999	\$14,000 - \$19,999	214
	\$16,000 - \$17,999		
	\$18,000 - \$19,999		
	\$20,000 - \$24,999		
	\$25,000 - \$29,999	\$20,000 - \$39,999	521
	\$30,000 - \$34,999		
	\$35,000 - \$39,999		
	\$40,000 - \$44,999		
	\$45,000 - \$49,999	\$40,000 or above	374
\$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
<b>Q5aii-fii</b>	Length of time engaged in methods to control weight	1 – 6 days	Less than 1 month
		1 – 3 weeks	
		1 month	1 – 3 months
		2 – 3 months	
		4 – 5 months	4 – 9 months
		6 – 9 months	
		10 – 12 months	More than 9 months
		13 months or above	
<b>Q6, Q8 and Q10</b>	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	

<b>Q13a, Q14a and Q15a</b>	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	
<b>Q16a, Q16b and Q16c</b>	Monthly frequency of eating out last month	5 times or more a week	5 times or more a week
		2 – 4 times a week	2 – 4 times a week
		Once a week	Once or less per week
		2 – 3 times a month	
		Once a month or less	
<b>Q17b</b>	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			
<b>Q19b</b>	Period of time since last flu shot	Within 3 months	Within 6 months ago
		4 – 6 months ago	
		7 – 9 months ago	7 – 12 months ago
		10 – 12 months ago	
		13 months or over ago	13 months or over ago
<b>Q21b</b>	Weekly frequency of house cleansing with at least 1:99 diluted household bleach solution	1 day	1 – 2 days
		2 days	
		3 days	3 – 4 days
		4 days	
		5 days	5 days or more
		6 days	
		7 days	
<b>Q22b</b>	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	

## 4.2 Body weight control

### 4.2.1 Weight status

In this section, respondents were classified as '*underweight*', '*normal*', '*overweight*' and '*obese*' based on their BMI score and the WHO classification (both European standard and Asian standard).

For the European standard, '*underweight*' is defined as having a BMI below 18.5; '*normal*' weight status is a BMI between 18.5 and less than 25.0; '*overweight*' BMI is between 25.0 and less than 30.0; while an '*obese*' weight status is a BMI  $\geq 30.0$ .

For the Asian standard, '*underweight*' is defined as having a BMI below 18.5; '*normal*' weight status is a BMI between 18.5 and less than 23.0; '*overweight*' BMI is between 23.0 and less than 25.0; while an '*obese*' weight status is a BMI  $\geq 25.0$ . As the cut-offs for '*overweight*' (BMI  $\geq 23.0$ ) and '*obese*' (BMI  $\geq 25.0$ ) are lower than the European standard, a portion of respondents who had been classified as '*normal*' using the European standard would be classified as '*overweight*' using the Asian standard. The same applied to a portion of respondents who had been classified as '*overweight*' by the European standard would be classified as '*obese*' using the Asian criteria.

These weight statuses were found to be significantly associated with five demographic variables including gender, age, educational attainment, marital status and occupation.

#### European Standard

Using the European standard of WHO classification, more males (24.1%) were found to be '*overweight*' than females (11.8%) while more females (13.6%) were classified as '*underweight*' than males (4.5%). In terms of age, younger respondents aged 18-24 (23.7%) were more likely to be '*underweight*'. Furthermore, respondents aged 45 or above were more likely to be '*overweight*' (ranged from 23.5%-27.4%) compared to respondents of other age groups (Table 4.2.1a).

Significant association between educational attainment and weight status was also found. Respondents with matriculation level of education (12.7%) were more likely to be '*underweight*' than their counterparts. Respondents with primary school education level or below were more likely to be '*overweight*' (23.5%) or '*obese*' (8.1%) than the better educated respondents (Table 4.2.1a).

The never married respondents (17.9%) were more likely to be classified as '*underweight*' than the married (5.0%) and the divorced/separated/widowed respondents (11.1%). On the other hand, the married (20.8%) and the divorced/separated/widowed respondents (23.4%) were much more likely to be '*overweight*' than the never married group (10.4%) (Table 4.2.1a).

In terms of occupation, blue collar workers (22.6%) were more likely to be classified as '*overweight*' while clerks (13.2%) and not working respondents (13.6%) were more likely to be '*underweight*' when compared to other groups of respondents (Table 4.2.1a).

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

Variable	Level	Base	Under-weight	Normal	Over-weight	Obese	P-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
<b>Gender</b>	Male	958	4.5%	67.3%	24.1%	4.2%		0.000	
	Female	1 049	13.6%	72.5%	11.8%	2.2%			
<b>Age</b>	18-24	259	23.7%	70.8%	4.9%	0.6%			0.000
	25-34	441	15.0%	71.4%	11.3%	2.2%			
	35-44	555	5.6%	71.6%	18.9%	3.9%			
	45-54	486	3.3%	68.7%	23.5%	4.6%			
	55-64	249	4.0%	65.6%	27.4%	3.0%			
<b>Educational attainment</b>	Primary or below	244	5.2%	63.2%	23.5%	8.1%			0.000
	Had not completed secondary	367	7.0%	72.1%	17.7%	3.2%			
	Completed secondary (F.5)	646	9.4%	72.1%	15.9%	2.6%			
	Matriculation	161	12.7%	70.7%	15.0%	1.6%			
	Tertiary or above	587	11.1%	69.1%	17.8%	2.0%			
<b>Marital status</b>	Never married	622	17.9%	68.9%	10.4%	2.9%		0.000	
	Married	1 285	5.0%	71.1%	20.8%	3.1%			
	Divorced/ Separated/ Widowed	93	11.1%	61.7%	23.4%	3.8%			
<b>Occupation</b>	Managerial/ Professional worker	486	8.0%	69.7%	18.9%	3.5%		0.000	
	Clerk	284	13.2%	72.0%	13.8%	0.9%			
	Service worker	272	5.0%	75.2%	17.3%	2.4%			
	Blue collar worker	281	1.8%	68.8%	22.6%	6.8%			
	Not working	655	13.6%	68.0%	15.7%	2.6%			

Asian Standard

Using the Asian standard of WHO classification, more males (28.2%) were found to be 'obese' while more females (13.6%) were classified as 'underweight'. In terms of age, similarly, younger respondents aged 34 or below were more likely to be 'underweight' (ranged from 15.0% to 23.7%) than those aged 35 or above (ranged from 3.3% to 5.6%). It is also worth-noting that, those aged 35 or above respondents were more likely to be classified as 'overweight' (ranged 17.7% to 27.0%) or 'obese' (ranged 22.8% to 30.5%) using the Asian standard. (Table 4.2.1b)

Respondents with lower educational attainment were more like to be ‘*overweight*’ or ‘*obese*’. It is depicted by higher proportions of respondents with primary school education level or below were ‘*overweight*’ (21.3%) or ‘*obese*’ (31.6%) when compared to their counterparts. (Table 4.2.1b)

The never married respondents (17.9%) were more likely to be ‘*underweight*’ than the married (5.0%) and the divorced/separated/widowed (11.1%). A higher proportion of divorced/separated/widowed respondents (27.2%) than never married (13.2%) and married (23.9%) were ‘*obese*’ using the Asian standard. (Table 4.2.1b)

With regard to occupation, blue-collar workers were more likely to be ‘*overweight*’ (23.9%) or ‘*obese*’ (29.4%) while clerks (13.2%) and the not working respondents (13.6%) were more likely to be ‘*underweight*’ (Table 4.2.1b)

**Table 4.2.1b: 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
<b>Gender</b>	Male	958	4.5%	47.1%	20.2%	28.2%		0.000	
	Female	1 049	13.6%	57.6%	14.9%	13.9%			
<b>Age</b>	18-24	259	23.7%	62.1%	8.6%	5.5%			0.000
	25-34	441	15.0%	60.3%	11.1%	13.5%			
	35-44	555	5.6%	53.9%	17.7%	22.8%			
	45-54	486	3.3%	46.3%	22.3%	28.1%			
	55-64	249	4.0%	38.6%	27.0%	30.5%			
<b>Educational attainment</b>	Primary or below	244	5.2%	41.8%	21.3%	31.6%			0.000
	Had not completed secondary	367	7.0%	52.9%	19.2%	20.9%			
	Completed secondary (F.5)	646	9.4%	54.1%	18.0%	18.5%			
	Matriculation	161	12.7%	54.8%	16.0%	16.6%			
	Tertiary or above	587	11.1%	54.6%	14.6%	19.8%			
<b>Marital status</b>	Never married	622	17.9%	57.3%	11.5%	13.2%		0.000	
	Married	1 285	5.0%	51.1%	20.0%	23.9%			
	Divorced/ Separated/ Widowed	93	11.1%	41.1%	20.5%	27.2%			
<b>Occupation</b>	Managerial/ Professional worker	486	8.0%	53.7%	16.0%	22.3%		0.000	
	Clerk	284	13.2%	57.1%	14.9%	14.8%			
	Service worker	272	5.0%	57.9%	17.3%	19.7%			

Blue collar worker	281	1.8%	44.9%	23.9%	29.4%		
Not working	655	13.6%	51.3%	16.7%	18.3%		

#### 4.2.2 Perception about current weight status

Perception about current weight status was found to have significant associations with gender, age, educational attainment and marital status.

A greater proportion of male respondents (13.4%) than female respondents (6.6%) considered themselves 'underweight', while more female respondents (45.5%) felt 'overweight' than male respondents (39.2%). Respondents aged 35 or above (ranged from 47.6% to 52.2%) were more likely to consider themselves 'overweight' than those of younger age groups. In terms of educational attainment, the lower the level of educational attainment, the more likely the respondents considered themselves 'overweight'. Married respondents (47.7%) were also found to be more likely to consider themselves 'overweight' when compared to other groups of respondents (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	992	13.4%	47.4%	39.2%		0.000	
	Female	1 105	6.6%	47.9%	45.5%			
Age	18-24	277	17.0%	59.3%	23.7%			0.000
	25-34	458	11.0%	54.9%	34.2%			
	35-44	581	8.5%	42.2%	49.4%			
	45-54	498	7.1%	45.3%	47.6%			
	55-64	263	8.6%	39.2%	52.2%			
Educational attainment	Primary or below	264	9.0%	41.6%	49.4%			0.000
	Had not completed secondary	391	8.8%	44.0%	47.2%			
	Completed secondary (F.5)	670	8.8%	50.2%	41.0%			
	Matriculation	167	12.9%	46.3%	40.8%			
	Tertiary or above	603	11.0%	50.4%	38.6%			
Marital status	Never married	652	14.5%	54.3%	31.2%		0.000	
	Married	1 338	7.5%	44.8%	47.7%			
	Divorced/ Separated/ Widowed	99	10.2%	43.9%	45.9%			

Analyses of respondents' perception about their current weight by their weight status based on the WHO classifications (both European standard and Asian standard) were carried out. Significant associations were found between these two types of variables.

#### European standard

Of respondents who considered themselves 'overweight', over half of these respondents (58.8%) were in fact having a 'normal' weight status according to the European standard of WHO classification. Similarly, over half (58.1%) of the respondents who considered themselves 'underweight' were in fact 'normal'.

Besides, 0.8% of the respondents considered themselves 'overweight' were in fact 'underweight' and 2.6% considered themselves 'underweight' but were in fact 'overweight' or 'obese' (Table 4.2.2b).

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

Variable	Level	Base	Under-weight	Normal	Over-weight	Obese	P-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Perception of current weight	Overweight	857	0.8%	58.8%	33.9%	6.5%			0.000
	Just right	951	10.6%	82.6%	6.3%	0.6%			
	Underweight	199	39.2%	58.1%	2.0%	0.7%			

#### Asian standard

Similar trends were found when analysing respondents' perception about their current weight by their weight status based on the Asian standard of classifications, however, the discrepancies between respondents' perceptions and their weight status classified by WHO were smaller when using the Asian standard. In particular amongst respondents who considered themselves 'overweight', over half of them (25.8% 'overweight'; 40.4% 'obese') had a perception consistent with the classification using the Asian standard and only about one-third (33.0%) of them were being classified as 'normal' (Table 4.2.2c).

In respondents who perceived themselves as 'underweight', over half of them (55.2%) were considered as 'normal' using the Asian standard of WHO classification (Table 4.2.2c).

Besides, 0.8% of the respondents who considered themselves as 'overweight' were in fact 'underweight' and 5.6% considered themselves as 'underweight' were in fact 'overweight' or 'obese' according to the Asian standard of WHO criteria (Table 4.2.2c).

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

Variable	Level	Base	Under-weight	Normal	Over-weight	Obese	P-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Perception of current weight	Overweight	857	0.8%	33.0%	25.8%	40.4%			0.000
	Just right	951	10.6%	69.7%	12.9%	6.9%			
	Underweight	199	39.2%	55.2%	3.0%	2.6%			

### 4.2.3 Weight control

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

The proportion of females (34.8%) who reported that they had tried to control their weights deliberately during the 12 months prior to the survey was significantly larger than the proportion of males (26.1%). The proportion of respondents who reported controlling their weights deliberately was the highest among those aged 35-44 years (35.7%). The tendency of controlling weight deliberately also increased with educational attainment, from 20.7% of respondents who had primary or lower educational attainment to 37.6% of respondents who had tertiary or above educational attainment. Clerks (35.0%) and managerial/professional workers (34.3%) were more likely than respondents from other occupations to control their weights. Respondents with monthly household income \$40,000 or above (40.2%) were more likely than any other income level to have controlled their weights during the 12 months prior to the survey (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	993	26.1%	73.9%	0.000		
	Female	1 109	34.8%	65.2%			
Age	18-24	277	28.3%	71.7%		0.002	
	25-34	459	29.8%	70.2%			
	35-44	583	35.7%	64.3%			
	45-54	499	29.2%	70.8%			
	55-64	265	25.1%	74.9%			
Educational attainment	Primary or below	266	20.7%	79.3%		0.000	
	Had not completed secondary	391	24.9%	75.1%			

	Completed secondary (F.5)	670	30.5%	69.5%			
	Matriculation	167	35.1%	64.9%			
	Tertiary or above	606	37.6%	62.4%			
<b>Occupation</b>	Managerial/ Professional worker	496	34.3%	65.7%	0.001		
	Clerk	292	35.0%	65.0%			
	Service worker	286	30.9%	69.1%			
	Blue collar worker	295	21.1%	78.9%			
	Not working	703	29.8%	70.2%			
<b>Monthly household income</b>	Below \$8,000	159	29.1%	70.9%	0.000		
	\$8,000 - \$13,999	330	21.0%	79.0%			
	\$14,000 - \$19,999	214	28.2%	71.8%			
	\$20,000 - \$39,999	521	33.1%	66.9%			
	\$40,000 or above	374	40.2%	59.8%			

Respondents' behaviour in controlling weight was found to be significantly associated with the weight status classification by the WHO under both European and Asian standards.

Respondents who were classified as 'obese' (European standard: 35.5%; Asian standard: 37.1%) and 'overweight' (European standard: 37.3%; Asian standard: 41.3%) were more likely to have controlled their weights in the 12 months prior to the survey than 'normal' (European standard: 31.3%; Asian standard: 28.0%) and 'underweight' (European standard: 16.2%; Asian standard: 16.2%) respondents (Table 4.2.3b).

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

Variable	Level	Base	Yes	No	P-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
<b>Weight status by WHO classification (European standard)</b>	Underweight	186	16.2%	83.8%	0.000		
	Normal	1405	31.3%	68.7%			
	Overweight	354	37.3%	62.7%			
	Obese	63	35.5%	64.5%			
<b>Weight status by WHO classification (Asian standard)</b>	Underweight	186	16.2%	83.8%	0.000		
	Normal	1055	28.0%	72.0%			
	Overweight	350	41.3%	58.7%			
	Obese	416	37.1%	62.9%			

#### 4.2.4 Reasons for controlling weight

Respondents' purpose of controlling weight was found to be associated significantly with their gender and marital status.

Among the respondents who had done something deliberately to control their weights during the 12 months prior to the survey, females (59.6%) were more likely to have intended to lose weight than males (54.4%), while males (9.2%) were more likely to have intended to increase their weights than females (3.3%). In terms of marital status, the married respondents (59.4%) were more likely to aim at losing weight than the other groups of respondents. On the contrary, the never married respondents (12.3%) were more likely to aim at increasing weight than the married (2.7%) and divorced/separated/widowed respondents (0.0%) (Table 4.2.4).

**Table 4.2.4: Purpose of controlling weight (Q4b)**

Variable	Level	Base	Losing weight	Increasing weight	Maintaining weight	P-value		
						Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	259	54.4%	9.2%	36.5%	0.006		
	Female	386	59.6%	3.3%	37.1%			
Marital status	Never married	210	53.8%	12.3%	33.9%	0.000		
	Married	397	59.4%	2.7%	37.9%			
	Divorced/ Separated/ Widowed	36	55.5%	0.0%	44.5%			

#### 4.2.5 Methods adopted to control weight

##### 4.2.5.1 Physical exercise

Some respondents had chosen to do physical exercise to control their weights, and this preference was significantly associated with gender and age.

Males (85.8%) were more likely to have adopted physical exercise as a method for controlling weight than females (75.7%). The youngest (aged 18-24 years: 89.0%) and the oldest (aged 55-64 years: 89.1%) groups of respondents were also more likely to have adopted this method when compared to other age groups (Table 4.2.5.1a).

**Table 4.2.5.1a: Doing physical exercise to control weight (Q5di)**

Variable	Level	Base	Yes	No	P-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	259	85.8%	14.2%	0.002		
	Female	386	75.7%	24.3%			
Age	18-24	78	89.0%	11.0%		0.012	

	25-34	137	78.8%	21.2%			
	35-44	208	75.9%	24.1%			
	45-54	146	77.7%	22.3%			
	55-64	66	89.1%	10.9%			

The length of time engaging in physical exercise was found to be significantly associated with gender, age, educational attainment, marital status and occupation.

Males tended to have engaged in this method for longer period of time than females. Over two-thirds (67.0%) of the males had been doing physical exercise for more than 9 months. The proportion of respondents who adopted physical exercise for more than 9 months increased with age. In terms of education level, respondents with primary or below education level were more likely to have engaged in physical exercise for more than 9 months (70.9%) (Table 4.2.5.1b).

Divorced/separated/widowed respondents tended to have engaged in this method for more than 9 months than other groups of respondents (70.1%). Clerks (3 months or less: 39.8%) were more likely than respondents with other occupations to have engaged in physical exercise for a shorter period of time (Table 4.2.5.1b)

**Table 4.2.5.1b: Length of time engaged in doing exercise (Q5dii)**

Variable	Level	Base	Less than 1 month	1 – 3 months	4 – 9 months	More than 9 months	P-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	219	3.9%	13.5%	15.5%	67.0%		0.001	
	Female	288	9.0%	22.5%	19.0%	49.5%			
Age	18-24	69	16.5%	32.7%	15.8%	35.0%			0.000
	25-34	107	7.2%	26.1%	19.0%	47.7%			
	35-44	155	5.5%	17.3%	21.5%	55.7%			
	45-54	113	5.4%	11.3%	15.6%	67.8%			
	55-64	57	1.5%	6.1%	8.1%	84.3%			
Educational attainment	Primary or below	44	7.3%	6.0%	15.8%	70.9%			0.019
	Had not completed secondary	81	6.3%	16.0%	18.9%	58.7%			
	Completed secondary (F.5)	154	6.0%	22.2%	16.4%	55.5%			
	Matriculation	47	8.9%	8.6%	18.5%	64.0%			
	Tertiary or above	182	7.1%	22.4%	18.0%	52.5%			
Marital status	Never married	172	9.8%	25.2%	16.8%	48.2%		0.004	
	Married	310	5.4%	15.7%	17.6%	61.3%			

	Divorced/ Separated/ Widowed	24	3.6%	11.5%	14.8%	70.1%			
<b>Occupation</b>	Managerial/ Professional worker	139	3.8%	17.6%	21.6%	56.9%		0.008	
	Clerk	80	9.4%	30.4%	18.8%	41.4%			
	Service worker	63	5.6%	23.8%	11.4%	59.1%			
	Blue collar worker	48	0.0%	12.3%	18.4%	69.3%			
	Not working	169	10.2%	13.8%	15.7%	60.3%			

#### 4.2.5.2 Taking drugs/products

Gender was found to be significantly associated with the weight control method of taking drugs/products.

Among those who had adopted this method to control their weight, a greater proportion of females (22.6%) than males (9.0%) reported they had taken drugs/product to control their weight (Table 4.2.5.2).

**Table 4.2.5.2: Taking drugs/products to control weight (Q5ai)**

Variable	Level	Base	Yes	No	P-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
<b>Gender</b>	Male	259	9.0%	91.0%	0.000		
	Female	386	22.6%	77.4%			

#### 4.2.5.3 Going to weight control or beauty parlours

Gender was also found to be significantly associated with weight control by going to weight control or beauty parlours.

Among those who had adopted this method to control their weight, a greater proportion of females (8.9%) than males (1.5%) reported they had gone to weight control or beauty parlours to control their weight (Table 4.2.5.3).

**Table 4.2.5.3: Going to weight control or beauty parlours (Q5ci)**

Variable	Level	Base	Yes	No	P-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
<b>Gender</b>	Male	259	1.5%	98.5%	0.000		
	Female	386	8.9%	91.1%			

#### 4.2.5.4 Consulting doctors or dieticians

The length of time of consulting doctors or dieticians for controlling weight was found to be significantly associated with age.

68.4% of respondents aged 55-64 years consulted doctors or dieticians for more than 9 months for controlling their weight which was higher than respondents of younger age groups. Respondents of the younger age groups (aged 18-24 years: 48.9%; 25-34 years: 53.5%) were more likely to have seek advice from doctors or dieticians for 3 months or less (Table 4.2.5.4).

**Table 4.2.5.4: Consulting doctors or dieticians (Q5bii)**

Variable	Level	Base	Less than 1 month	1 – 3 months	4 – 9 months	More than 9 months	P-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Age	18-24	7	11.1%	37.8%	11.1%	40.0%			0.032
	25-34	12	20.7%	32.8%	20.7%	25.7%			
	35-44	19	9.2%	21.2%	14.1%	55.5%			
	45-54	13	6.8%	18.1%	12.5%	62.6%			
	55-64	10	0.0%	8.9%	22.7%	68.4%			

#### 4.2.5.5 Changing dietary habit

The length of time engaging in changing dietary habit was found to be significantly associated with gender, age, educational attainment, marital status and occupation.

Males were more likely to have engaged in changing dietary habits for a longer period of time than females. Over three-fifths (60.5%) of the males had changed their dietary habits for more than 9 months. Similar to physical exercise, the proportion of respondents who changed dietary habits for more than 9 months increased with age. Furthermore, respondents with lower level of education were more likely than respondents with higher level of education to have changed dietary habit for more than 9 months (primary or below: 63.2%; had not completed secondary: 64.7%) (Table 4.2.5.5).

Divorced/separated/widowed respondents were also more likely to have changed dietary habit for more than 9 months than their counterparts. Moreover, more than three quarters (76.5%) of blue-collar workers reported changing their dietary habits for more than 9 months (Table 4.2.5.5).

**Table 4.2.5.5: Length of time engaged in changing dietary habit (Q5eii)**

Variable	Level	Base	Less than 1 month	1 – 3 months	4 – 9 months	More than 9 months	P-value		
							Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	167	2.5%	11.9%	25.1%	60.5%		0.005	
	Female	263	9.4%	22.6%	20.9%	47.1%			
Age	18-24	54	10.2%	35.6%	27.1%	27.1%			0.000
	25-34	90	6.4%	21.1%	28.6%	43.9%			
	35-44	151	5.1%	16.1%	26.2%	52.6%			

	45-54	93	9.9%	11.9%	14.8%	63.4%			
	55-64	38	2.2%	12.3%	5.7%	79.8%			
<b>Educational attainment</b>	Primary or below	33	10.0%	14.8%	12.1%	63.2%		0.046	
	Had not completed secondary	60	12.3%	13.7%	9.3%	64.7%			
	Completed secondary (F.5)	137	7.5%	19.0%	23.8%	49.7%			
	Matriculation	41	2.2%	15.0%	26.6%	56.2%			
	Tertiary or above	158	4.5%	21.4%	27.7%	46.4%			
<b>Marital status</b>	Never married	138	6.4%	26.2%	23.8%	43.7%		0.035	
	Married	270	7.1%	13.9%	22.7%	56.3%			
	Divorced/ Separated/ Widowed	21	4.1%	22.7%	13.0%	60.2%			
<b>Occupation</b>	Managerial/ Professional worker	119	3.2%	13.6%	33.5%	49.7%		0.013	
	Clerk	72	7.2%	27.5%	26.7%	38.6%			
	Service worker	53	15.2%	18.0%	17.8%	48.9%			
	Blue collar worker	41	4.2%	11.1%	8.2%	76.5%			
	Not working	135	7.0%	20.9%	17.9%	54.2%			

### 4.3 Physical exercise/activities

#### 4.3.1 Vigorous physical exercise/activities

Habits in doing vigorous physical activities/exercise in the week prior to the survey were found to be associated significantly with respondents' demographic characteristics including gender, age, marital status and occupation.

Male engaged in vigorous physical activities/exercise more often than females. More males (17.1%) had spent 2 to 3 days on vigorous exercise than females did (9.9%), and most females (82.1%) spent one day or less doing vigorous exercise per week compared to 71.6% of males (Table 4.3.1).

The older respondents engaged less often in vigorous physical activities/exercise. Most of the respondents aged 55-64 years (84.0%) spent one day or less on such exercise compared to 64.2% of those aged 18-24 years. In contrast, younger respondents (aged 18-24 years: 26.8%) were more likely to spend 2-3 days a week on vigorous exercise than older respondents (aged 55-64 years: 4.8%) (Table 4.3.1).

Married and divorced/separated/widowed respondents were less often than never married respondents to have engaged in such exercise. 19.1% of the never married respondents had spent 2-3 days a week on vigorous exercise compared to 11.3% of married respondents and 3.2% of divorced/separated/widowed respondents (Table 4.3.1).

In terms of occupation, blue collar workers (11.0%) were more likely to have engaged in vigorous exercise for 6-7 days a week than the other groups of respondents. In contrast, clerks tended to do vigorous exercise less often than respondents with other occupations. Most clerks (81.3%) reported that they had spent one day or less in a week on such exercise (Table 4.3.1).

**Table 4.3.1: Number of days per week spent on doing vigorous physical activities/exercise 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	993	71.6%	17.1%	4.4%	6.8%		0.000	
	Female	1 109	82.1%	9.9%	3.5%	4.5%			
Age	18-24	277	64.2%	26.8%	3.8%	5.2%			0.000
	25-34	459	78.7%	12.5%	3.0%	5.8%			
	35-44	583	77.8%	12.8%	3.7%	5.7%			
	45-54	499	79.0%	11.6%	4.4%	5.0%			
	55-64	265	84.0%	4.8%	5.4%	5.8%			
Marital status	Never married	652	72.0%	19.1%	3.8%	5.2%		0.000	
	Married	1 343	79.0%	11.3%	4.0%	5.8%			

	Divorced/ Separated/ Widowed	99	85.8%	3.2%	4.4%	6.5%			
<b>Occupation</b>	Managerial/ Professional worker	496	78.3%	15.5%	3.0%	3.2%	0.010		
	Clerk	292	81.3%	12.4%	4.2%	2.1%			
	Service worker	286	77.2%	13.1%	2.4%	7.4%			
	Blue collar worker	295	69.4%	12.8%	6.8%	11.0%			
	Not working	703	77.7%	12.4%	4.2%	5.8%			

### 4.3.2 Moderate physical exercise/activities

Frequency of doing moderate physical activities/exercise in the week prior to the survey was found to be significantly associated with occupation.

Clerks were found to engage in moderate exercise less often than their counterparts, with 73.9% of them spending one day or less a week on such activity. Blue collar workers (16.0%) and those not working respondents (13.9%) were more likely to have spent 6-7 days a week on such exercise than clerks (6.5%), service workers (9.8%) and managerial/professional worker (10.0%) (Table 4.3.2).

**Table 4.3.2: Number of days spent on doing moderate physical activities/exercise 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
<b>Occupation</b>	Managerial/ Professional worker	496	68.5%	17.2%	4.3%	10.0%	0.000		
	Clerk	291	73.9%	14.9%	4.6%	6.5%			
	Service worker	286	65.8%	18.8%	5.6%	9.8%			
	Blue collar worker	295	61.5%	15.2%	7.4%	16.0%			
	Not working	701	63.1%	16.2%	6.8%	13.9%			

### 4.3.3 Walking

Significant association was found between walking habit in the week prior to the survey and educational attainment, occupation and monthly household income.

Respondents with less education were likely to have walked more often (6-7 days in a week - primary or below: 80.8%; tertiary or above: 74.2%) than better educated respondents. Blue collar workers and service workers also walked more often than respondents with other occupations. In terms of monthly household income, more respondents with a monthly household income of \$8,000-13,999 (82.6%) reported having walked for 6-7 days in the week prior to the survey than respondents from

other income groups (Table 4.3.3).

**Table 4.3.3: Number of days spent on walking 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
<b>Educational attainment</b>	Primary or below	264	3.1%	8.6%	7.5%	80.8%			0.012
	Had not completed secondary	389	4.2%	8.7%	7.5%	79.6%			
	Completed secondary (F.5)	669	3.4%	6.8%	11.3%	78.6%			
	Matriculation	167	6.2%	7.7%	11.8%	74.3%			
	Tertiary or above	605	3.2%	8.4%	14.2%	74.2%			
<b>Occupation</b>	Managerial/ Professional worker	494	3.5%	9.3%	11.9%	75.4%		0.000	
	Clerk	292	4.9%	8.8%	16.7%	69.6%			
	Service worker	286	3.9%	5.1%	8.5%	82.5%			
	Blue collar worker	294	2.6%	6.3%	4.0%	87.1%			
	Not working	699	3.6%	8.6%	12.1%	75.7%			
<b>Monthly household income</b>	Below \$8,000	158	5.7%	7.0%	11.7%	75.7%			0.036
	\$8,000 - \$13,999	328	3.6%	6.8%	7.0%	82.6%			
	\$14,000 - \$19,999	214	3.2%	9.2%	8.8%	78.8%			
	\$20,000 - \$39,999	521	2.8%	9.4%	13.9%	74.0%			
	\$40,000 or above	374	4.0%	8.8%	13.3%	73.9%			

#### 4.3.4 Physical activity level based on the analysis of IPAQ

The physical activity level based on the IPAQ analysis was found to be associated significantly with age, educational attainment, occupation and monthly household income.

Respondents of age 35 – 54 years (35-44: 22.7%; 45-54: 21.3%) were more likely to be classified as ‘inactive’ compared to respondents from other age groups. In terms of educational attainment, the higher the education levels of the respondents, the less likely they were having ‘HEPA active’ physical activity level. A greater proportion of respondents who had educational attainment below secondary (F.5) (primary or below: 25.8%; had not completed secondary: 26.9%) were having ‘HEPA active’ physical activity level than those with higher education level. Furthermore, respondents of tertiary education or above (63.4%) were more likely to be ‘minimally active’ than respondents of lower educational attainment (Table 4.3.4).

Blue collar workers (35.8%) appeared to be the most ‘HEPA active’ group of respondents compared to other occupation groups, while clerks (67.5%) were more likely to have ‘minimally active’ level of physical activities.

A greater proportion of respondents with a monthly household income of \$8,000-13,999 (27.4%) reported to have “HEPA active” physical activity level than their counterparts (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	Inactive	Minimally Active	HEPA Active	p-value		
						Chi-square test	Kruskal-Wallis test	Rank correlation
Age	18-24	265	15.4%	61.1%	23.5%	0.004		
	25-34	444	18.1%	59.3%	22.6%			
	35-44	563	22.7%	60.2%	17.0%			
	45-54	474	21.3%	56.5%	22.2%			
	55-64	245	14.0%	64.8%	21.1%			
Educational attainment	Primary or below	248	16.3%	57.9%	25.8%	0.000		
	Had not completed secondary	365	18.1%	55.0%	26.9%			
	Completed secondary (F.5)	641	18.7%	59.8%	21.5%			
	Matriculation	164	20.8%	59.7%	19.5%			
	Tertiary or above	589	21.7%	63.4%	14.9%			
Occupation	Managerial/ Professional worker	479	21.1%	62.1%	16.8%	0.000		
	Clerk	286	22.4%	67.5%	10.1%			
	Service worker	274	19.2%	52.8%	27.9%			
	Blue collar worker	279	14.1%	50.1%	35.8%			
	Not working	663	19.0%	61.5%	19.5%			
Monthly household income	Below \$8,000	149	23.6%	56.3%	20.2%	0.043		
	\$8,000 - \$13,999	317	16.6%	56.0%	27.4%			
	\$14,000 - \$19,999	206	19.7%	57.3%	22.9%			
	\$20,000 - \$39,999	507	18.6%	63.0%	18.4%			
	\$40,000 or above	370	20.9%	62.6%	16.5%			

## 4.4 Dietary habits

### 4.4.1 Frequency of drinking fruit/vegetable juice per week

Age, educational attainment, marital status, occupation and monthly household income were all found to be associated significantly with the frequency of fruit/vegetable juice consumption.

As reported in previous chapter, only 6.1% of the respondents had consumed fruit/vegetable juice everyday during the week prior to the survey. When looking at the demographic characteristics of these respondents, it was found that younger respondents (18-24: 7.2%) were more likely to drink fruit/vegetable juice 6-7 days a week, while those aged 55-64 years (87.5%) were more likely to drink fruit/vegetable juice one day or less in a week (Table 4.4.1).

The frequency of fruit/vegetable juice drinking habit was higher among respondents with high educational attainment. The proportion of respondents reported that they consumed fruit/vegetable juice 6-7 days a week was 10.0% among those with tertiary education or above (Table 4.4.1).

The never married respondents appeared to have consumed fruit/vegetable juice more frequently than the married and divorced/separated/widowed respondents. 22.7% of the never married respondents had fruit/vegetable juice 2 days or more a week compared to 18.8% of married and 13.5% of divorced/separated/widowed respondents had done so.

On the other hand, a larger proportion of managerial/professional workers (9.1%) had consumed juice 6-7 days a week compared to respondents with other occupations. Analysed by household income, a higher proportion of respondents who had a household income between \$20,000 and \$39,999 (10.8%) and \$40,000 or above (13.5%) had consumed fruit/vegetable juice 4 days or more a week (Table 4.4.1).

**Table 4.4.1: Number of days per week in which respondents consumed fruit/vegetable juice (Q13a)**

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	276	76.8%	12.8%	3.1%	7.2%			0.000
	25-34	459	75.9%	14.4%	3.0%	6.7%			
	35-44	580	79.6%	10.7%	3.7%	6.0%			
	45-54	499	82.4%	9.4%	2.1%	6.1%			
	55-64	265	87.5%	6.9%	0.6%	5.0%			
Educational attainment	Primary or below	266	90.6%	5.0%	1.6%	2.9%			0.000
	Had not completed secondary	391	86.5%	9.5%	1.5%	2.5%			

	Completed secondary (F.5)	669	81.6%	10.1%	2.4%	5.9%		
	Matriculation	166	75.5%	12.4%	4.5%	7.7%		
	Tertiary or above	604	71.2%	15.0%	3.8%	10.0%		
<b>Marital status</b>	Never married	651	77.2%	13.8%	2.9%	6.0%	0.048	
	Married	1 341	81.1%	9.6%	2.8%	6.4%		
	Divorced/ Separated/ Widowed	98	86.6%	8.7%	0.0%	4.8%		
<b>Occupation</b>	Managerial/ Professional worker	494	73.1%	12.3%	5.5%	9.1%	0.000	
	Clerk	292	84.3%	8.9%	1.5%	5.4%		
	Service worker	285	76.0%	15.5%	1.3%	7.2%		
	Blue collar worker	295	87.7%	7.0%	2.2%	3.1%		
	Not working	702	82.2%	10.3%	2.0%	5.4%		
<b>Monthly household income</b>	Below \$8,000	159	84.4%	9.5%	0.0%	6.1%	0.000	
	\$8,000 - \$13,999	330	87.7%	6.6%	2.1%	3.6%		
	\$14,000 - \$19,999	213	80.8%	13.9%	2.6%	2.7%		
	\$20,000 - \$39,999	521	77.5%	11.6%	3.8%	7.0%		
	\$40,000 or above	374	72.4%	14.1%	4.6%	8.9%		

#### 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 was found to be associated significantly with educational attainment, occupation and monthly household income.

Respondents with better education (matriculation: 11.6%; tertiary or above: 11.6%) were more likely to drink at least one cup of fruit/vegetable juice per day than respondents with less education (2.9%-6.4%). In terms of occupation, more managerial/professional workers (11.5%) had consumed at least one cup of fruit/vegetable juice per day than respondents of other occupations. Furthermore, more respondents who had a monthly household income \$40,000 or above (11.3%) reported that they had consumed at least one cup of fruit/vegetable juice per day than their counterparts (Table 4.4.2).

**Table 4.4.2: Average number of cups per day which the respondents consumed of fruit/vegetable juice (Q13b)**

Variable	Level	Base	Less than 1 cup	1 - 2 cups	More than 2 cups	p-value		
						Chi-square test	Kruskal-Wallis test	Rank correlation
<b>Educational attainment</b>	Primary or below	266	97.1%	2.4%	0.5%			0.000
	Had not completed secondary	391	96.6%	3.0%	0.4%			
	Completed secondary (F.5)	669	93.6%	6.2%	0.2%			
	Matriculation	166	88.4%	11.6%	0.0%			
	Tertiary or above	604	88.3%	10.5%	1.1%			
<b>Occupation</b>	Managerial/ Professional worker	494	88.6%	11.1%	0.4%		0.001	
	Clerk	292	94.0%	5.6%	0.4%			
	Service worker	285	91.3%	7.6%	1.0%			
	Blue collar worker	295	97.3%	2.7%	0.0%			
	Not working	702	93.6%	5.8%	0.7%			
<b>Monthly household income</b>	Below \$8,000	159	93.1%	6.4%	0.4%			0.001
	\$8,000 - \$13,999	330	96.2%	3.2%	0.7%			
	\$14,000 - \$19,999	213	96.1%	3.9%	0.0%			
	\$20,000 - \$39,999	521	92.0%	7.8%	0.3%			
	\$40,000 or above	374	88.7%	9.9%	1.4%			

#### 4.4.3 Frequency of consuming fruit per week

The frequency of fruit consumption was found to be associated significantly with gender, age, educational attainment, marital status and occupation.

As mentioned in the previous chapter, 47.9% of the respondents had consumed fruit everyday in the week prior to the survey. The breakdown of the respondents by their demographic characteristics revealed that, females (56.2%) were more likely to consume fruit 6-7 days a week than males (42.6%) (Table 4.4.3).

The proportion of respondents consuming fruit 6-7 days a week was the highest among those aged 55-64 years (68.5%). Respondents with tertiary degree education or above (44.2%) were least likely to consume fruit this often than respondents with matriculation or below education. On the other hand, married respondents (55.6%) were more likely to consume fruit 6-7 days a week than never married (38.1%) and divorced/separated/widowed respondents (44.8%). Respondents who were not working (58.5%) were also more likely to consume fruit 6-7 days a week than the

working groups (Table 4.4.3).

**Table 4.4.3: Number of days per week in which respondents ate fruit (Q14a)**

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
<b>Gender</b>	Male	989	17.1%	26.4%	13.8%	42.6%		0.000	
	Female	1 105	7.9%	21.0%	14.8%	56.2%			
<b>Age</b>	18-24	276	15.5%	29.4%	15.6%	39.4%			0.000
	25-34	459	16.7%	30.0%	17.6%	35.8%			
	35-44	581	10.0%	24.7%	14.5%	50.8%			
	45-54	495	10.9%	19.0%	12.6%	57.5%			
	55-64	264	8.5%	12.6%	10.3%	68.5%			
<b>Educational attainment</b>	Primary or below	262	12.2%	19.0%	13.6%	55.2%			0.000
	Had not completed secondary	391	11.5%	19.9%	12.6%	56.0%			
	Completed secondary (F.5)	666	14.4%	24.7%	12.1%	48.8%			
	Matriculation	167	11.6%	23.6%	14.4%	50.4%			
	Tertiary or above	606	10.7%	26.7%	18.4%	44.2%			
<b>Marital Status</b>	Never married	651	17.0%	29.6%	15.3%	38.1%		0.000	
	Married	1 339	9.8%	20.8%	13.8%	55.6%			
	Divorced/ Separated/ Widowed	96	15.2%	23.3%	16.8%	44.8%			
<b>Occupation</b>	Managerial/ Professional worker	496	15.1%	25.2%	15.5%	44.2%		0.000	
	Clerk	292	11.9%	28.9%	17.6%	41.6%			
	Service worker	285	11.4%	27.4%	14.8%	46.5%			
	Blue collar worker	291	18.3%	17.7%	14.6%	49.4%			
	Not working	700	8.4%	21.1%	12.1%	58.5%			

#### 4.4.4 Frequency of consuming vegetables per week

The frequency of vegetables consumption in the week prior to the survey was also found to be related significantly with gender, age, educational attainment, marital status and occupation.

As reported in previous chapter, a majority (80.8%) of the respondents had consumed vegetables on a daily basis in the week prior to the survey. Similar to the pattern of fruit consumption, more females (87.7%) tended to consume vegetables as often as 6-7 days a week than males (78.0%). The proportion of respondents who consumed vegetables this often increased with age from 75.9% of those aged 18-24 years to 90.5% of those aged 55-64 years. On the other hand, respondents with primary education or below (90.3%) were more likely to have consumed vegetables this often than those who were more educated (Table 4.4.4).

Married respondents (86.8%) were also more likely to have consumed vegetables 6-7 days a week than the never married (76.1%) and divorced/separated/widowed respondents (77.9%). In terms of occupation, clerks (77.5%) were less likely to have consumed fruit as often as 6-7 days a week than respondents of other occupations (Table 4.4.4).

**Table 4.4.4: Number of days per week in which respondents consumed vegetables (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
Gender	Male	992	2.3%	6.3%	13.4%	78.0%		0.000	
	Female	1 109	1.1%	4.3%	6.9%	87.7%			
Age	18-24	277	3.7%	6.8%	13.6%	75.9%			0.000
	25-34	459	1.1%	5.8%	13.5%	79.6%			
	35-44	581	1.7%	5.4%	10.5%	82.3%			
	45-54	499	1.2%	4.9%	6.9%	87.1%			
	55-64	265	1.5%	3.4%	4.7%	90.5%			
Educational attainment	Primary or below	266	2.2%	3.4%	4.1%	90.3%			0.001
	Had not completed secondary	390	1.8%	4.1%	8.1%	85.9%			
	Completed secondary (F.5)	670	2.6%	6.4%	11.0%	80.0%			
	Matriculation	167	0.5%	4.7%	11.4%	83.5%			
	Tertiary or above	606	0.6%	5.7%	12.1%	81.7%			
Marital status	Never married	652	3.1%	7.8%	13.0%	76.1%		0.000	
	Married	1 341	0.9%	3.9%	8.3%	86.8%			

	Divorced/ Separated/ Widowed	99	2.2%	7.1%	12.8%	77.9%			
<b>Occupation</b>	Managerial/ Professional worker	496	1.1%	4.2%	9.4%	85.3%	0.009		
	Clerk	292	1.6%	8.7%	12.2%	77.5%			
	Service worker	285	2.7%	6.1%	11.1%	80.2%			
	Blue collar worker	295	1.5%	5.2%	10.8%	82.5%			
	Not working	703	1.9%	4.4%	8.8%	84.9%			

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

It is recommended by the WHO that adults should consume a minimum of five servings of fruit and vegetables a day or a daily intake of at least 400 grams of fruit and vegetables, to obtain optimal health benefits<sup>25</sup>. From this survey, the average number of servings of fruit and vegetables consumed<sup>26</sup> per day was found to be associated significantly with gender, age, educational attainment, marital status and occupation.

The proportion of males (88.5%) that did not consume at least 5 servings a day was significantly higher than for females (79.8%). Younger respondents (aged 18-24 years: 87.1%; aged 25-34 years: 88.8%) were more likely to have consumed less than 5 servings a day than other age groups. In terms of educational attainment, marital status and occupation, people with tertiary degree or above (86.0%), the never married respondents (89.0%) and clerks (86.7%) or service workers (86.7%) were less likely to have had adequate consumption of fruit and vegetables a day than their counterparts (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 (Q14b & Q15b)**

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
<b>Gender</b>	Male	971	88.5%	11.5%		0.000	
	Female	1 085	79.8%	20.2%			
<b>Age</b>	18-24	275	87.1%	12.9%			0.000
	25-34	456	88.8%	11.2%			
	35-44	567	85.2%	14.8%			

<sup>25</sup> Fruit, vegetables and NCD disease prevention. Geneva: World Health Organization; 2003. ([http://www.who.int/dietphysicalactivity/media/en/gsfv\\_fv.pdf](http://www.who.int/dietphysicalactivity/media/en/gsfv_fv.pdf))

<sup>26</sup> Total average number of servings: average no. of servings of fruit eaten per day + average no. of servings of vegetables eaten per day + average no. of servings of 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)

	45-54	484	80.6%	19.4%			
	55-64	254	74.8%	25.2%			
<b>Educational attainment</b>	Primary or below	257	77.7%	22.3%			0.009
	Had not completed secondary	377	83.4%	16.6%			
	Completed secondary (F.5)	656	85.2%	14.8%			
	Matriculation	166	82.0%	18.0%			
	Tertiary or above	598	86.0%	14.0%			
<b>Marital status</b>	Never married	646	89.0%	11.0%		0.000	
	Married	1 311	81.8%	18.2%			
	Divorced/ Separated/ Widowed	92	78.9%	21.1%			
<b>Occupation</b>	Managerial/ Professional worker	486	86.0%	14.0%		0.019	
	Clerk	288	86.7%	13.3%			
	Service worker	282	86.7%	13.3%			
	Blue collar worker	284	83.6%	16.4%			
	Not working	686	79.9%	20.1%			

## 4.5 Eating out habits

### 4.5.1 Frequency of eating out for breakfast

The frequency of eating out for breakfast was significantly associated with gender, educational attainment and occupation.

Males (41.3%) were more likely to have eaten out for breakfast five times or more a week than females (23.9%). Respondents who were better educated were less likely to have eaten out for breakfast five times or more a week. In terms of occupation, blue collar workers (50.7%) were more likely to have eaten out for breakfast five times or more a week than respondents of other occupations (Table 4.5.1).

**Table 4.5.1: Frequency of eating out for breakfast in the month prior to the survey (Q16a)**

Variable	Level	Base	5 times or more a week	2-4 times a week	Once or less per week	p-value		
						Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	939	41.3%	16.8%	41.9%		0.000	
	Female	1 028	23.9%	20.2%	55.9%			
Educational attainment	Primary or below	253	37.6%	12.6%	49.8%			0.000
	Had not completed secondary	367	39.9%	16.6%	43.5%			
	Completed secondary (F.5)	621	37.9%	18.4%	43.7%			
	Matriculation	156	23.6%	19.5%	56.9%			
	Tertiary or above	569	21.1%	22.4%	56.5%			
Occupation	Managerial/ Professional worker	468	32.2%	20.1%	47.7%		0.000	
	Clerk	282	27.6%	23.1%	49.3%			
	Service worker	262	39.8%	15.1%	45.1%			
	Blue collar worker	285	50.7%	12.6%	36.8%			
	Not working	643	23.4%	19.0%	57.6%			

### 4.5.2 Frequency of eating out for lunch

Gender, age, educational attainment, marital status, occupation and monthly household income were found to have significant association with the frequency of eating out for lunch.

A greater proportion of males (69.9%) had eaten out for lunch five times or more a week in the month prior to the survey than females (37.4%). The proportion of respondents who had eaten out for lunch this often decreased with age from 64.0% of those aged 18-24 years to 39.7% of those aged 55-64 years. Better educated

respondents were more likely to have eaten out lunch more often than respondents with lower education level. Furthermore, the never married respondents (64.9%) were more likely to have eaten out lunch as often as five times or more a week than their counterparts (Table 4.5.2).

In terms of occupation, not working respondents (32.0%) were least likely to have eaten out lunch as often as five times or more a week. The proportion of eating out for lunch five times or more a week increased with monthly household income (Table 4.5.2).

**Table 4.5.2: Frequency of eating out for lunch in the month prior to the survey (Q16b)**

Variable	Level	Base	5 times or more a week	2-4 times a week	Once or less per week	p-value		
						Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	981	69.9%	13.5%	16.6%		0.000	
	Female	1 083	37.4%	25.0%	37.6%			
Age	18-24	273	64.0%	22.1%	13.9%			0.000
	25-34	452	56.8%	20.9%	22.3%			
	35-44	572	54.0%	19.2%	26.8%			
	45-54	491	48.7%	17.8%	33.5%			
	55-64	257	39.7%	18.8%	41.5%			
Educational attainment	Primary or below	260	34.1%	19.0%	46.9%			0.000
	Had not completed secondary	381	46.2%	19.0%	34.8%			
	Completed secondary (F.5)	661	56.6%	18.9%	24.4%			
	Matriculation	163	60.1%	18.2%	21.7%			
	Tertiary or above	597	59.2%	21.3%	19.5%			
Marital status	Never married	640	64.9%	19.4%	15.7%		0.000	
	Married	1 317	48.5%	19.4%	32.1%			
	Divorced/ Separated/ Widowed	99	33.0%	24.4%	42.6%			
Occupation	Managerial/ Professional worker	488	66.0%	17.2%	16.9%		0.000	
	Clerk	286	59.3%	20.6%	20.1%			
	Service worker	281	61.5%	12.3%	26.3%			
	Blue collar worker	292	65.5%	10.6%	23.9%			
	Not working	687	32.0%	28.1%	39.8%			

<b>Monthly household income</b>	Below \$8,000	156	31.6%	20.0%	48.4%			0.000
	\$8,000 - \$13,999	328	49.0%	17.1%	33.9%			
	\$14,000 - \$19,999	210	51.4%	17.2%	31.4%			
	\$20,000 - \$39,999	516	57.0%	21.5%	21.6%			
	\$40,000 or above	369	61.8%	21.7%	16.5%			

### 4.5.3 Frequency of eating out for dinner

The frequency of eating out for dinner was significantly associated with gender, age, educational attainment, marital status, occupation and monthly household income.

Similar to the pattern of eating out for lunch, a higher proportion of males (14.1%) had eaten out for dinner five times or more a week in the month prior to the survey than females (8.8%). More respondents of aged 25-34 years (17.5%) had eaten out for dinner this often, on the other hand, greater percentages of respondents aged 45-54 (74.8%) and 55-64 years (78.3%) had eaten out for dinner once or less per week (Table 4.5.3).

Respondents with tertiary education or above (15.7%) were more likely to have eaten out for dinner five times or more a week than respondents with less education. The never married respondents (17.4%) were more likely to have eaten out for dinner this often than the married (8.4%) and divorced/separated/widowed (8.6%) respondents (Table 4.5.3).

In terms of occupation, managerial/professional workers (16.0%) and service workers (16.6%) were more likely to have eaten out dinner as often as five times or more a week than respondents of other occupations. Respondents who had higher monthly household income were also more likely to have eaten out dinner often than respondents earning lower monthly household income (Table 4.5.3).

**Table 4.5.3: Frequency of eating out for dinner in the month prior to the survey (Q16c)**

Variable	Level	Base	5 times or more a week	2-4 times a week	Once or less per week	p-value		
						Chi-square test	Kruskal-Wallis test	Rank correlation
<b>Gender</b>	Male	989	14.1%	30.5%	55.3%		0.000	
	Female	1 093	8.8%	29.6%	61.6%			
<b>Age</b>	18-24	277	13.3%	38.5%	48.3%			0.000
	25-34	456	17.5%	44.2%	38.3%			
	35-44	577	11.5%	31.4%	57.0%			
	45-54	493	6.0%	19.2%	74.8%			
	55-64	260	8.3%	13.4%	78.3%			

<b>Educational attainment</b>	Primary or below	259	5.5%	7.9%	86.6%			0.000
	Had not completed secondary	389	7.6%	21.7%	70.6%			
	Completed secondary (F.5)	663	12.6%	30.1%	57.4%			
	Matriculation	165	7.9%	38.5%	53.6%			
	Tertiary or above	605	15.7%	42.7%	41.6%			
<b>Marital status</b>	Never married	649	17.4%	40.1%	42.4%		0.000	
	Married	1 329	8.4%	25.3%	66.2%			
	Divorced/ Separated/ Widowed	96	8.6%	29.3%	62.1%			
<b>Occupation</b>	Managerial/ Professional worker	495	16.0%	42.8%	41.2%		0.000	
	Clerk	289	10.7%	38.8%	50.5%			
	Service worker	284	16.6%	30.8%	52.6%			
	Blue collar worker	293	10.0%	19.1%	70.9%			
	Not working	692	6.7%	21.9%	71.4%			
<b>Monthly household income</b>	Below \$8,000	155	7.1%	11.0%	81.9%			0.000
	\$8,000 - \$13,999	328	11.5%	17.4%	71.1%			
	\$14,000 - \$19,999	212	8.4%	25.0%	66.6%			
	\$20,000 - \$39,999	517	13.5%	38.1%	48.3%			
	\$40,000 or above	374	14.1%	40.5%	45.4%			

## 4.6 Pattern of alcohol consumption

### 4.6.1 Consumption of alcohol

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

More males (43.6%) reported having at least one alcoholic drink in the month prior to the survey than females (19.5%). In terms of age, respondents aged 18-24 years (27.1%) were least likely to have consumed alcohol while those aged 25-34 years (37.0%) were most likely to have done so. Respondents with tertiary education or above (38.2%) and managerial/professional workers (44.4%) were more likely to have consumed alcohol. The higher the monthly household income of the respondents, the more likely they had consumed alcohol (Table 4.6.1).

**Table 4.6.1: Consumption of at least one alcoholic drink in the month prior to the survey (Q17a)**

Variable	Level	Base	Yes	No	p-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	993	43.6%	56.4%	0.000		
	Female	1 109	19.5%	80.5%			
Age	18-24	277	27.1%	72.9%	0.001		
	25-34	459	37.0%	63.0%			
	35-44	583	31.3%	68.7%			
	45-54	499	28.4%	71.6%			
	55-64	265	28.7%	71.3%			
Educational attainment	Primary or below	266	26.3%	73.7%	0.000		
	Had not completed secondary	391	31.4%	68.6%			
	Completed secondary (F.5)	670	25.6%	74.4%			
	Matriculation	167	31.5%	68.5%			
	Tertiary or above	606	38.2%	61.8%			
Occupation	Managerial/ Professional worker	496	44.4%	55.6%	0.000		
	Clerk	292	21.5%	78.5%			
	Service worker	286	31.9%	68.1%			
	Blue collar worker	295	36.8%	63.2%			
	Not working	703	23.2%	76.8%			

<b>Monthly household income</b>	Below \$8,000	159	20.0%	80.0%		0.000	
	\$8,000 - \$13,999	330	24.0%	76.0%			
	\$14,000 - \$19,999	214	27.5%	72.5%			
	\$20,000 - \$39,999	521	32.4%	67.6%			
	\$40,000 or above	374	41.8%	58.2%			

#### 4.6.2 Frequency of alcohol consumption

The frequency of alcohol consumption per week during the month prior to the survey was found to have significant associations with gender, age, educational attainment, occupation and monthly household income.

Amongst the drinkers, males reported drinking alcohol more frequently than females. A higher proportion of male drinkers (16.0%) had consumed alcohol 6-7 days a week than female drinkers (4.6%). Alcohol consumption 6-7 days per week appeared to increase with age, on the other hand, this frequency also tended to increase with decreasing education level. In terms of occupation, blue collar workers (22.0%) were more likely to have drunk alcohol 6-7 days a week than respondents of other occupations. Increasing monthly household income was found to be associated with lower frequency of alcohol consumption (Table 4.6.2).

**Table 4.6.2: Frequency of consuming at least one alcoholic drink in the month prior to the survey (Q17b)**

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
<b>Gender</b>	Male	426	56.0%	19.9%	8.0%	16.0%		0.000	
	Female	216	76.1%	14.6%	4.6%	4.6%			
<b>Age</b>	18-24	75	78.4%	13.3%	3.0%	5.3%			0.000
	25-34	167	65.8%	21.3%	7.3%	5.6%			
	35-44	180	61.4%	20.3%	6.9%	11.5%			
	45-54	142	57.8%	16.0%	10.2%	16.0%			
	55-64	74	52.4%	15.6%	4.0%	28.0%			
<b>Educational attainment</b>	Primary or below	68	50.8%	9.9%	15.1%	24.2%			0.000
	Had not completed secondary	120	52.5%	22.1%	8.4%	17.0%			
	Completed secondary (F.5)	169	59.3%	24.6%	5.5%	10.6%			
	Matriculation	52	67.0%	17.8%	4.8%	10.5%			
	Tertiary or above	231	73.1%	14.0%	5.2%	7.8%			

<b>Occupation</b>	Managerial/ Professional worker	219	69.0%	14.5%	5.6%	11.0%	0.001
	Clerk	63	77.1%	17.4%	2.0%	3.5%	
	Service worker	90	54.5%	27.2%	7.9%	10.3%	
	Blue collar worker	107	50.4%	16.4%	11.2%	22.0%	
	Not working	159	61.3%	19.4%	7.3%	12.0%	
<b>Monthly household income</b>	Below \$8,000	31	46.7%	17.7%	15.7%	19.8%	0.013
	\$8,000 - \$13,999	77	61.2%	18.4%	10.0%	10.4%	
	\$14,000 - \$19,999	59	52.1%	28.6%	6.2%	13.1%	
	\$20,000 - \$39,999	169	64.8%	17.7%	4.9%	12.5%	
	\$40,000 or above	154	71.7%	14.6%	3.8%	9.9%	

#### 4.6.3 Consumption of at least 5 glasses/cans of alcohol on one occasion

The consumption of five or more glasses/cans of alcohol on one occasion (binge drinking) during the month prior to the survey was associated significantly with gender, age, marital status and occupation.

Males (36.7%) were more likely than females (14.3%) to have engaged in binge drinking. Respondents aged 25-34 years (39.3%) were most likely to have engaged in binge drinking while those aged 55-64 years (20.3%) were least likely to have done so. Married respondents (24.4%) were found to be least likely to have binge drinking compared to their counterparts. On the other hand, service workers (40.2%) were more likely to have engaged in binge drinking, while clerks (22.1%) and not working respondents (19.5%) were less likely to have done so (Table 4.6.3).

**Table 4.6.3: Consumption of at least 5 glasses/cans of alcohol on one occasion (Q17d)**

Variable	Level	Base	Yes	No	p-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
<b>Gender</b>	Male	430	36.7%	63.3%	0.000		
	Female	217	14.3%	85.7%			
<b>Age</b>	18-24	75	30.9%	69.1%	0.001		
	25-34	169	39.3%	60.7%			
	35-44	181	28.5%	71.5%			
	45-54	142	22.9%	77.1%			
	55-64	76	20.3%	79.7%			
<b>Marital status</b>	Never married	197	39.0%	61.0%	0.001		
	Married	422	24.4%	75.6%			

	Divorced/ Separated/ Widowed	27	31.3%	68.7%			
<b>Occupation</b>	Managerial/ Professional worker	219	31.0%	69.0%	0.003		
	Clerk	63	22.1%	77.9%			
	Service worker	92	40.2%	59.8%			
	Blue collar worker	108	33.6%	66.4%			
	Not working	161	19.5%	80.5%			

#### 4.6.4 Drinking habit by safe level

Gender, marital status and occupation were found to have significant association with drinking habit in terms of safety level as defined by the British Alcohol Guidelines.

A greater proportion of male drinkers (31.6%) had exceeded the safe level of alcohol drinking than female drinkers (24.0%). Never married (63.4%) and divorced/separated/widowed (66.1%) respondents were less likely to have a safe drinking habit than married respondents (74.6%). In terms of occupation, service workers (56.3%) were less likely to have a drinking habit within the safe level than respondents of other occupations (Table 4.6.4).

**Table 4.6.4: Classification of alcohol consumption by safe level**

Variable	Level	Base	Within safe level	Exceed safe level	p-value		
					Chi-square test	Kruskal- Wallis test	Rank correlation
<b>Gender</b>	Male	417	68.4%	31.6%	0.046		
	Female	212	76.0%	24.0%			
<b>Marital status</b>	Never married	190	63.4%	36.6%	0.017		
	Married	413	74.6%	25.4%			
	Divorced/ Separated/ Widowed	26	66.1%	33.9%			
<b>Occupation</b>	Managerial/ Professional worker	214	74.9%	25.1%	0.002		
	Clerk	62	82.2%	17.8%			
	Service worker	90	56.3%	43.7%			
	Blue collar worker	104	65.3%	34.7%			
	Not working	155	73.1%	26.9%			

## 4.7 Smoking habits

### 4.7.1 Smoking habits

Smoking habit was found to be associated significantly with gender, age, educational attainment, marital status and occupation.

A greater proportion of males (28.0%) reported themselves as current smokers than females (7.1%). Respondents aged 25-34 years (21.5%) were more likely to be current smokers while respondents aged 55-64 years (13.7%) were more likely to have abstained from smoking than the respondents of other age groups. In terms of educational attainment, respondents with tertiary education or above (10.3%) were least likely to smoke currently while those who had not completed secondary (22.9%) were most likely to be current smokers. Divorced/separated/widowed respondents (29.3%) were also more likely to smoke currently than the never married (18.6%) and married respondents (15.3%). Furthermore, service workers (27.6%) and blue collar workers (27.4%) were more likely to be current smokers than the respondents of other occupations (Table 4.7.1).

**Table 4.7.1: Smoking habit (Q18a)**

Variable	Level	Base	Yes, but not now	Yes, and still smoking	Never	p-value		
						Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	993	15.7%	28.0%	56.3%	0.000		
	Female	1 109	3.7%	7.1%	89.1%			
Age	18-24	277	6.0%	14.9%	79.0%	0.009		
	25-34	459	9.3%	21.5%	69.2%			
	35-44	583	7.9%	17.8%	74.4%			
	45-54	499	11.1%	15.1%	73.9%			
	55-64	265	13.7%	13.9%	72.4%			
Educational attainment	Primary or below	266	11.0%	16.7%	72.3%	0.000		
	Had not completed secondary	391	13.2%	22.9%	63.9%			
	Completed secondary (F.5)	670	8.5%	20.6%	70.9%			
	Matriculation	167	5.4%	13.5%	81.1%			
	Tertiary or above	606	8.3%	10.3%	81.3%			
Marital status	Never married	652	7.2%	18.6%	74.2%	0.000		
	Married	1 343	10.8%	15.3%	73.9%			
	Divorced/ Separated/ Widowed	99	5.2%	29.3%	65.5%			

<b>Occupation</b>	Managerial/ Professional worker	496	7.9%	16.2%	75.9%	0.000		
	Clerk	292	4.3%	13.0%	82.7%			
	Service worker	286	12.5%	27.6%	59.9%			
	Blue collar worker	295	14.9%	27.4%	57.7%			
	Not working	703	8.7%	10.9%	80.4%			

#### 4.7.2 Amount of cigarettes consumed

The number of cigarettes consumed per day was associated significantly with gender, age, educational attainment, occupation and monthly household income.

Current smokers who were most likely to smoke more than 20 cigarettes per day included males (14.9%), those aged 55-64 years (21.5%), those with primary education or below (24.9%), blue collar workers (28.1%) and those with monthly household income \$8,000-\$13,999 (21.6%) (Table 4.7.2).

**Table 4.7.2: Average number of cigarettes which the respondents smoked per day (Q18c)**

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
<b>Gender</b>	Male	277	5.3%	41.5%	38.3%	14.9%		0.000	
	Female	79	7.9%	67.3%	23.5%	1.3%			
<b>Age</b>	18-24	41	3.7%	69.4%	25.0%	1.9%			0.003
	25-34	99	5.4%	55.7%	35.4%	3.5%			
	35-44	104	6.8%	36.9%	42.6%	13.7%			
	45-54	75	6.4%	40.5%	31.9%	21.2%			
	55-64	37	5.8%	41.6%	31.0%	21.5%			
<b>Educational attainment</b>	Primary or below	44	3.0%	36.1%	36.0%	24.9%			0.000
	Had not completed secondary	89	2.4%	42.0%	44.1%	11.4%			
	Completed secondary (F.5)	138	4.8%	49.0%	34.5%	11.7%			
	Matriculation	22	11.2%	52.6%	25.7%	10.5%			
	Tertiary or above	63	13.2%	56.7%	25.9%	4.2%			
<b>Occupation</b>	Managerial/ Professional worker	80	7.5%	47.2%	33.5%	11.8%		0.000	
	Clerk	38	10.4%	61.7%	27.9%	0.0%			

	Service worker	78	7.6%	44.3%	45.5%	2.6%			
	Blue collar worker	81	1.7%	31.6%	38.7%	28.1%			
	Not working	77	4.7%	59.8%	24.9%	10.5%			
<b>Monthly household income</b>	Below \$8,000	26	3.3%	39.1%	42.7%	14.9%			0.042
	\$8,000 - \$13,999	64	2.0%	45.1%	31.3%	21.6%			
	\$14,000 - \$19,999	36	11.5%	45.6%	38.1%	4.9%			
	\$20,000 - \$39,999	81	0.9%	49.0%	42.2%	8.0%			
	\$40,000 or above	50	12.5%	53.6%	23.8%	10.2%			

## 4.8 Coverage of influenza vaccination

The coverage of influenza vaccination was found to be associated significantly with age, educational level and monthly household income.

Respondents aged 55-64 years (28.7%) were most likely to have ever had an influenza vaccination while those aged 45-54 years (19.1%) were least likely to have ever had it compared to respondents of other age groups. Respondents with tertiary education or above (28.0%) were most likely to have had influenza vaccination, while the higher monthly household income, the more likely that the respondents reported ever had an influenza vaccination (Table 4.8).

**Table 4.8: Coverage of influenza vaccination (Q19a)**

Variable	Level	Base	Ever had flu shot	Never had flu shot	p-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Age	18-24	252	25.1%	74.9%		0.032	
	25-34	451	22.4%	77.6%			
	35-44	579	21.4%	78.6%			
	45-54	494	19.1%	80.9%			
	55-64	262	28.7%	71.3%			
Educational attainment	Primary or below	265	17.5%	82.5%		0.003	
	Had not completed secondary	383	17.9%	82.1%			
	Completed secondary (F.5)	654	23.1%	76.9%			
	Matriculation	161	20.9%	79.1%			
	Tertiary or above	592	28.0%	72.0%			
Monthly household income	Below \$8,000	156	15.5%	84.5%		0.000	
	\$8,000 - \$13,999	326	16.4%	83.6%			
	\$14,000 - \$19,999	209	19.5%	80.5%			
	\$20,000 - \$39,999	511	22.6%	77.4%			
	\$40,000 or above	371	29.8%	70.2%			

## 4.9 Mask wearing habits

Significant associations existed between the mask wearing practice when having respiratory tract infection or fever and respondents' gender, age, marital status and monthly household income.

Females (20.3%), those aged 55-64 years (19.9%), divorced/separated/widowed respondents (20.6%) and those with monthly household income \$14,000-\$19,999 (18.9%) were more likely than their counterparts to report that they would wear a mask all of the time when having symptoms of respiratory tract infection or fever (Table 4.9).

**Table 4.9: Frequency of wearing a mask when experiencing symptoms of respiratory tract infection or fever during the three months prior to the survey (Q20)**

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	426	9.6%	6.5%	36.3%	47.6%		0.000	
	Female	493	20.3%	10.5%	34.4%	34.8%			
Age	18-24	132	12.0%	7.8%	35.6%	44.6%			0.001
	25-34	243	10.7%	7.4%	33.9%	48.0%			
	35-44	254	17.0%	12.5%	33.9%	36.6%			
	45-54	183	18.4%	7.6%	40.1%	33.8%			
	55-64	102	19.9%	5.3%	32.6%	42.3%			
Marital status	Never married	317	12.2%	8.4%	32.6%	46.8%		0.009	
	Married	555	16.8%	8.8%	37.8%	36.6%			
	Divorced/ Separated/ Widowed	43	20.6%	8.5%	20.5%	50.5%			
Monthly household income	Below \$8,000	77	10.8%	3.9%	32.4%	52.9%			0.000
	\$8,000 - \$13,999	137	10.6%	9.9%	32.1%	47.4%			
	\$14,000 - \$19,999	90	18.9%	9.3%	36.5%	35.2%			
	\$20,000 - \$39,999	243	14.5%	10.3%	37.4%	37.8%			
	\$40,000 or above	158	17.5%	10.8%	37.6%	34.1%			

## 4.10 Home cleansing practice

### 4.10.1 Use of household bleach solution

Gender, age, educational attainment, marital status and occupation all had a significant association with the practice of home cleansing with at least 1:99 diluted household bleach solution.

Females (52.7%) were more likely than males (45.8%) to have practised home cleansing with at least 1:99 diluted household bleach solution. Compared with the respondents aged 35 years or above, less than one-half of respondents aged 34 or below reported that they practised such cleansing method. The proportion of respondents reported that they cleansed home with at least 1:99 diluted household bleach solution was inversely related to education level. The proportion decreased from 61.0% of those with primary education or below to 39.3% of those with tertiary education or above. More married respondents (54.5%) had cleansed their home with at least 1:99 diluted household bleach solution than those who were never married (40.5%) and divorced/separated/widowed (40.6%). On the other hand, managerial/professional workers (40.6%) and clerks (43.2%) were both less likely to have cleansed their home with at least 1:99 diluted household bleach solution than their counterparts (Table 4.10.1).

**Table 4.10.1: Home cleansing with at least 1:99 diluted household bleach solution in the week prior to the survey (Q21a)**

Variable	Level	Base	Yes	No	p-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Gender	Male	947	45.8%	54.2%	0.002		
	Female	1 075	52.7%	47.3%			
Age	18-24	258	46.3%	53.7%		0.010	
	25-34	440	43.7%	56.3%			
	35-44	568	51.1%	48.9%			
	45-54	481	51.1%	48.9%			
	55-64	255	55.4%	44.6%			
Educational attainment	Primary or below	257	61.0%	39.0%		0.000	
	Had not completed secondary	378	55.1%	44.9%			
	Completed secondary (F.5)	653	52.1%	47.9%			
	Matriculation	161	43.7%	56.3%			
	Tertiary or above	572	39.3%	60.7%			
Marital status	Never married	616	40.5%	59.5%	0.000		
	Married	1 299	54.5%	45.5%			

	Divorced/ Separated/ Widowed	99	40.6%	59.4%			
<b>Occupation</b>	Managerial/ Professional worker	469	40.6%	59.4%	0.000		
	Clerk	285	43.2%	56.8%			
	Service worker	277	54.8%	45.2%			
	Blue collar worker	280	52.5%	47.5%			
	Not working	681	55.2%	44.8%			

#### 4.10.2 Frequency of cleansing home with diluted household bleach solution

The frequency of home cleansing using at least 1:99 diluted household bleach solution was found to be associated significantly with educational attainment, marital status and occupation.

Respondents with less education (had not completed secondary:25.0%; primary or below: 21.5%), married (22.4%) and service workers (22.7%) were more likely than their corresponding counterparts to report that they cleansed their home with at least 1:99 diluted household bleach solution five days or more a week (Table 4.10.2).

**Table 4.10.2: Frequency of home cleansing using at least 1:99 diluted household bleach solution in the week prior to the survey (Q21b)**

Variable	Level	Base	1 – 2 days	3 – 4 days	5 days or more	p-value		
						Chi-square test	Kruskal- Wallis test	Rank correlation
<b>Educational attainment</b>	Primary or below	150	53.8%	24.7%	21.5%			0.000
	Had not completed secondary	198	57.7%	17.3%	25.0%			
	Completed secondary (F.5)	329	67.0%	13.9%	19.1%			
	Matriculation	69	64.5%	18.7%	16.8%			
	Tertiary or above	211	72.8%	11.8%	15.4%			
<b>Marital status</b>	Never married	237	73.0%	15.6%	11.3%		0.002	
	Married	680	61.8%	15.9%	22.4%			
	Divorced/ Separated/ Widowed	39	57.2%	24.3%	18.6%			
<b>Occupation</b>	Managerial/ Professional worker	181	70.2%	13.4%	16.5%		0.043	
	Clerk	120	74.8%	11.1%	14.1%			
	Service worker	147	60.1%	17.2%	22.7%			

Blue collar worker	139	57.7%	20.3%	22.0%			
Not working	360	62.1%	17.1%	20.8%			

## 4.11 Cervical screening (for female respondents only)

### 4.11.1 Experience of cervical screening

Experience of cervical screening was found to be associated significantly with age, educational attainment, marital status and monthly household income.

Females aged 45-54 years (80.1%) were more likely to have ever had cervical screening than females of other age groups, while those aged 18-24 years (7.9%) were least likely to have ever done so (Table 4.11.1).

Female respondents with matriculation education and tertiary education or above (57.1% and 57.5% respectively) were less likely to have had this examination before than respondents with lower education. On the other hand, married (80.7%) and divorced/separated/widowed females (65.7%) were more likely to ever have been screened than the never married females (21.3%) (Table 4.11.1).

Those female respondents who had monthly household income \$20,000 or above (69.5% to 71.5%) were more likely to have had a cervical smear compared to those with lower household income (Table 4.11.1).

**Table 4.11.1: Ever had cervical smear before (Q22a)**

Variable	Level	Base	Yes	No	p-value		
					Chi-square test	Kruskal-Wallis test	Rank correlation
Age	18-24	138	7.9%	92.1%		0.000	
	25-34	250	57.4%	42.6%			
	35-44	319	75.8%	24.2%			
	45-54	254	80.1%	19.9%			
	55-64	123	68.1%	31.9%			
Educational attainment	Primary or below	165	63.5%	36.5%		0.016	
	Had not completed secondary	198	70.5%	29.5%			
	Completed secondary (F.5)	347	65.1%	34.9%			
	Matriculation	87	57.1%	42.9%			
	Tertiary or above	298	57.5%	42.5%			
Marital status	Never married	305	21.3%	78.7%	0.000		
	Married	722	80.7%	19.3%			
	Divorced/ Separated/ Widowed	64	65.7%	34.3%			
Monthly household income	Below \$8,000	94	61.0%	39.0%		0.001	
	\$8,000 - \$13,999	157	59.0%	41.0%			
	\$14,000 - \$19,999	113	58.2%	41.8%			
	\$20,000 - \$39,999	277	69.5%	30.5%			

	\$40,000 or above	183	71.5%	28.5%		
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#### 4.11.2 Time since last cervical smear

The period since the female respondents' last cervical smear for those ever screened was found to be associated significantly with age and monthly household income.

Of those women who had ever had a cervical smear before, respondents aged 25-34 (67.9%) had the highest proportion of people reported that they had their last cervical smear within a year, while those aged 55 years or above (18.0%) had the greatest proportion of people reported that they had their last cervical smear 37 or more months ago.

Those with monthly household income \$19,999 or below (12.7% to 17.9%) were also more likely to have had their last examination taken more than three years ago than those with monthly household income \$20,000 or above (6.1% to 7.6%) (Table 4.11.2).

**Table 4.11.2: Period of time since last cervical smear (Q22b)**

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	11	66.7%	33.3%	0.0%			0.001
	25-34	143	67.9%	24.3%	7.8%			
	35-44	238	64.3%	28.7%	7.0%			
	45-54	196	58.3%	27.5%	14.2%			
	55-64	81	53.7%	28.3%	18.0%			
Monthly household income	Below \$8,000	57	53.4%	31.0%	15.7%			0.004
	\$8,000 - \$13,999	91	57.1%	30.2%	12.7%			
	\$14,000 - \$19,999	64	56.9%	25.2%	17.9%			
	\$20,000 - \$39,999	191	65.1%	27.3%	7.6%			
	\$40,000 or above	128	69.0%	24.9%	6.1%			

## **Chapter 5 Conclusion and Recommendations**

### **5.1 Conclusion**

#### **5.1.1 Body weight control**

Survey results revealed that the weight status of more than two-thirds of respondents (69.8%) was classified as ‘normal’ using the European standard of WHO classification whereas over half (52.7%) of the respondents were considered ‘normal’ using the Asian standard.

Being overweight or obese is known to have a direct impact on chronic disease conditions. Over one-third (37.7%) of the respondents were either ‘overweight’ or ‘obese’ (using the Asian standard of WHO classification) at the time this survey was conducted. More males were at risk for being overweight (20.2%) or obese (28.2%), whereas more females (13.6%) were at risk of being underweight. Overweight and obesity were also more prevalent in older respondents, married and divorced/separated/widowed respondents and blue-collar workers. Lower educational attainment was also a significant factor in determining the risk for being overweight or obese.

Regarding self-perception of weight status, more respondents tended to consider themselves overweight (42.7%), however only 20.6% of all respondents were truly ‘overweight/obese’ according to the European standard of WHO classification and only 37.7% of all respondents were classified as ‘overweight/obese’ using the Asian standard. Females, the older respondents (aged 35 years or above), the lower educated and the married respondents were more likely to view themselves as ‘overweight’.

Only 14.3% of the respondents reported a weight difference of more than 10 pounds when compared with one year ago and about two-thirds (65.0%) of these respondents reported an increase in weight. Nearly one-third (30.7%) of the respondents had done something to control their weight in the year prior to the survey, 57.5% of these respondents had aimed to lose weight. Doing physical exercise (79.8%) and changing dietary habit (67.5%) were the most common methods mentioned by the respondents as the ways to control their weight.

#### **5.1.2 Physical exercise/activities**

For people of all ages, sexes and bodily conditions, regular physical activity improves health<sup>27</sup>. However, the survey revealed that most respondents were not physically active in the week prior to the survey. Over half of the respondents had not engaged in any moderate exercise (56.6%) or vigorous exercise (67.2%) for at least 10 minutes a day during the week. On the other hand, walking was the most common form of physical activities in which 71.3% of the respondents had spent at least 10 minutes on walking everyday in the week prior to the survey. Based on the categorical scoring of the IPAQ analysis, most of the respondents were found to be either ‘minimally active’

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<sup>27</sup> “Fact Sheet on Physical Activity”, Department of Health.  
([http://www.info.gov.hk/dh/do\\_you\\_k/eng/exercise.htm](http://www.info.gov.hk/dh/do_you_k/eng/exercise.htm))

(59.7%) or 'inactive' (19.3%), only about two in ten respondents were found to be 'HEPA' (20.9%). Middle aged respondents (35-54 years), better educated respondents, clerks and managerial/professional workers were more likely to be 'inactive'. Apart from being physically inactive, the survey has also revealed that respondents had spent long hours sitting during the day, as depicted by an average of 6.4 hours per day during weekdays (Monday to Friday) in the week prior to the survey.

### **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.<sup>28</sup> Eating a variety of vegetables and fruit could ensure an adequate intake of most micronutrients, dietary fibres and a host of essential non-nutrient substances. Moreover, increased fruit and vegetable consumption can help displace foods high in saturated fats, sugar or salt.<sup>28</sup> The WHO recommends that adults should eat at least 5 servings of fruit and vegetables per day to maintain good health. This survey revealed that respondents' daily consumption of fruit and vegetables was far from satisfactory, only around one fifth of the respondents (including juice: 20.7%; excluding juice: 16.1%) had a daily average intake of 5 or more servings of fruit and vegetables in the week prior to the survey. Males, younger aged respondents (18-34 years) and the never married respondents were less likely to have consumed sufficient amount of fruit and vegetables daily for optimal health benefits.

In general, vegetables appeared to be more frequently consumed than fruit by the respondents. Most respondents (80.8%) had eaten vegetables on a daily basis while only around half of the respondents (47.9%) had taken fruit everyday. Furthermore, the average daily intake of fruit and vegetables by the respondents was only 3.1 servings (excluding juice) and 3.4 servings (including juice). Moreover, fruit/vegetable juice consumption was found to be uncommon amongst respondents, as only 6.1% of the respondents drank fruit/vegetable juice daily.

### **5.1.4 Eating out habits**

Most respondents ate out for breakfast, lunch or dinner at least once a week in the month prior to the survey. In particular, for lunch, over half (52.8%) of the respondents had eaten out lunch five times or more a week. Three in ten respondents (30.1%) reported that they ate out for dinner two to four times a week. Male, younger aged (18-34 years), better educated, the never married and higher monthly household income respondents were all more likely to have eaten out lunch or dinner five times or more a week. On the other hand, males, the less educated respondents and blue-collar workers were more likely to have eaten out for breakfast this often.

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<sup>28</sup> Fruit, vegetables and NCD prevention. Geneva: World Health Organization; 2003. (<http://www.who.int/dietphysicalactivity/publications/facts/fruit/en/index.html>)

### **5.1.5 Pattern of alcohol consumption**

About three in ten respondents (30.9%) 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, the middle aged (25-34 years), and among respondents with higher education and monthly household income.

Binge drinking (having five or more glasses/cans of alcoholic drinks on one occasion) is associated with a wide range of concerns, including high blood pressure, cancer, foetal alcohol syndrome, and mental health problems<sup>29</sup>. Of the drinkers in this survey, 29.2% of them reported binge drinking at least once in the month prior to the survey. Binge drinking was more common among males and was most prevalent among younger (18-24 years) and middle aged (25-34 years) respondents, the never married and service workers.

According to the British Alcohol Guidelines, 29.1% of the drinkers were found to have exceeded the recommended safe level. The males, never married and divorced/separated/widowed drinkers and those working as service workers were more likely to have drinking habits which exceeded the safe level.

### **5.1.6 Smoking habits**

Cigarette smoking is a leading cause of death and diseases including heart disease, certain cancers and chronic lung disease. Less than one-fifth of the respondents (17.0%) smoked currently, and 16.0% were daily smokers. Around one in eight of smokers (11.9%) were heavy smokers who reported smoking more than 20 cigarettes a day. These heavy smokers were more likely to be male, aged 55-64 years, the less educated, blue-collar workers or those with monthly household income below \$14,000.

### **5.1.7 Coverage of influenza vaccination**

Influenza vaccination can help reduce complications and deaths due to influenza especially among the elderly and patients with chronic cardiac or respiratory diseases.<sup>30</sup> Over one-fifth of the respondents (22.6%) had ever been vaccinated and respondents aged 55-64 years, the better educated and those with higher monthly household income were more likely to ever have had the shot.

The vaccination, which is done through injection into muscle, has to be repeated yearly. As revealed by the results, around three in ten respondents (30.2%) who had ever been vaccinated had their last injection more than one year prior to the survey.

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<sup>29</sup> "Avoid alcohol abuse", Central Health Education Unit, Department of Health. ([http://www.cheu.gov.hk/eng/info/smoking\\_07.htm](http://www.cheu.gov.hk/eng/info/smoking_07.htm))

<sup>30</sup> "Communicable disease – Influenza", Central Health Education Unit, Department of Health. ([http://www.cheu.gov.hk/eng/info/communicable\\_05.htm](http://www.cheu.gov.hk/eng/info/communicable_05.htm))

### **5.1.8 Mask wearing habits**

Wearing a mask helps prevent the spread of respiratory tract infections<sup>31</sup>. Of the respondents who reported having symptoms of respiratory tract infection or fever during the three months prior to the survey, two-fifth (40.8%) reported that they never wore a mask when going out including at work and in school. Males, younger respondents, the never married and those who had lower monthly household income were less likely to wear a mask when having symptoms of respiratory tract infection or fever.

### **5.1.9 Home cleansing practice**

The Department of Health recommends at least 1:99 diluting household bleach for general household cleansing<sup>32</sup>. From the survey, around half of the respondents (49.5%) reported that they or their family members had cleansed their home furniture and facilities with at least 1:99 diluted household bleach during the week prior to the survey. Males, younger respondents, the better educated, the never married and divorced/separated/widowed respondents, managerial/professional workers and clerks were less likely to have cleansed their homes this way than their counterparts.

Only 17.6% of those respondents reported that they had cleansed their home with at least 1:99 diluted household bleach everyday.

### **5.1.10 Cervical screening**

Nearly two-third of the female respondents (63.2%) had been screened for cervical cancer before. Females aged below 35 years, the better educated, the never married and those with lower monthly household income were less likely to have had a cervical smear before.

## **5.2 Recommendations**

Some recommendations based on the survey findings are suggested below:

1. Many respondents, in particular females and less educated respondents, had over-estimated their body weight. More promotion should be done to educate communities about the proper method to assess body weight status, such as using the Body Mass Index (BMI).

Methods of maintaining normal body weight should be further promoted as normal body weight is crucial for health. Over one-third (37.7%) of the respondents were either 'overweight' or 'obese' (using Asian standard of WHO classification) at the time this survey was conducted. Being overweight or obese is known to have a direct impact on chronic disease conditions, so maintaining a healthy weight thus will have direct implications on increasing the quality of life at the individual level as well as lowering the burden of disease in a

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<sup>31</sup> "Wearing mask", Centre for Health Protection, Department of Health.  
(<http://www.chp.gov.hk/files/pdf/grp-facemask-en-2004052100.pdf>)

<sup>32</sup> "The use of bleach", Centre for Health Protection, Department of Health.  
(<http://www.chp.gov.hk/files/pdf/grp-useofbleach-en-2004052100.pdf>)

community. More actions should be taken to educate the community about increased physical activity and healthy diets, using informed and interactive approaches.

2. Campaigns aim at encouraging the public to engage in regular physical exercise should be further sustained and strengthened to increase public awareness about the benefits of regular physical activity. The survey results showed that most of the respondents were physically inactive, especially among middle aged respondents (35-54 years), the better educated, clerks and managerial/professional workers. Efforts should be made to create favourable environments for them to do more physical exercise.
3. Actively promote an increase in fruit and vegetables intake to the optimal amount in the public. This survey revealed that respondents' daily consumption of fruit and vegetables was still far from satisfactory, only around one fifth of the respondents (including juice: 20.7%; excluding juice: 16.1%) had a daily average intake of five or more servings of fruit and vegetables in the week prior to the survey. There is a need to develop a fruit and vegetables consumption awareness plan that is tailored to target groups of populations, especially those who reported insufficient consumption of fruit and vegetables, such as males, the younger age group and the never married.
4. The practice of mask wearing while having symptoms of respiratory tract infection or fever should be promoted to prevent spreading of disease, particularly among males, younger people and those with lower monthly household income.

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 inadequate or lack of outreach and services. 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 for non-response.
2. The use of the 'Next Birthday' rule to select respondent when there were more than one eligible respondent resided in a household by the time of the telephone contact could not cover people who were always not at home in the evening

and weekends.

3. Household telephone survey excludes households without telephones and does not attempt to contact institutionalized people at all, which might result in selection bias due to under-representation of certain segments of the population. However, the possibility of people not being interviewed for the first reason should be small as domestic telephone coverage in Hong Kong is greater than 99.0%.
4. The BRFS 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 fruits 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.

## Appendix 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 few 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 between 9 am and 6 pm.

### Respondent selection

Because we are choosing a respondent randomly, please tell me how many household members aged 18-64 years there are at home right now? (\_\_\_\_\_ persons)

Who is the one who will next have a birthday?

[v1] Telephone No.

[v2] Interviewer No.

### A. 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.

(Interview: If the respondent does not know/not sure about his/her height/weight/waist circumference, please input '998'; if the respondent refuses to report his/her height/weight/waist circumference, please input '999')

[v3]Q1a. What is your height without wearing shoes?

\_\_\_\_\_ cm (Interviewer: you may input, e.g. 5f8i or 168cm)

[v4]Q1b. What is your weight wearing with simple clothes?

\_\_\_\_\_ Kg (Interviewer: you may input, e.g. 60kg or 158lb)

[v5]Q1c. What is your waist circumference?

\_\_\_\_\_ cm (Interviewer: you may input, e.g. 30i or 85cm)

[v6]Q2a. Does your weight now differ by more than 10 pounds (about 4.5 Kg) from your weight one year ago?

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

[v7]Q2b. Did it increase or decrease?

1. Increase
2. Decrease

[v8]Q3. What do you think about your current weight?

1. Overweight
  2. Just right
  3. Underweight
- 998 Don't know  
999 Refused to answer

[v9]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.)

[v10]Q4b. Was it for increasing weight, losing weight or maintaining weight?

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

[v11]Q5. Did you use the following methods to control your weight?

Q5ai. Taking the drugs or products including health food for controlling your weight?

1. Yes
2. No (skip to Q5bi.)

[v12]Q5aii. How long had you been taking the drugs or products including health food?

1. 1-6 day
  2. 1-3 week
  3. 1 month
  4. 2-3 month
  5. 4-5 month
  6. 6-9 month
  7. 10-12 month
  8. 13 months or above
- 998 Don't know/Not sure

[v13]Q5bi. Consulting doctors or dieticians?

1. Yes
2. No (skip to Q5ci.)

[v14]Q5bii. How long had you been consulting doctors or dieticians?

1. 1-6 day
  2. 1-3 week
  3. 1 month
  4. 2-3 month
  5. 4-5 month
  6. 6-9 month
  7. 10-12 month
  8. 13 months or above
- 998 Don't know/Not sure

[v15]Q5ci. Going to weight control or beauty parlours?

1. Yes
2. No (skip to Q5di.)

[v16]Q5cii. How long had you been going to weight control or beauty parlours?

1. 1-6 day
  2. 1-3 week
  3. 1 month
  4. 2-3 month
  5. 4-5 month
  6. 6-9 month
  7. 10-12 month
  8. 13 months or above
- 998 Don't know/Not sure

[v17]Q5di. Doing physical exercises?

1. Yes
2. No (skip to Q5ei)

[v18]Q5dii. How long had you been doing physical exercises?

1. 1-6 day
  2. 1-3 week
  3. 1 month
  4. 2-3 month
  5. 4-5 month
  6. 6-9 month
  7. 10-12 month
  8. 13 months or above
- 998 Don't know/Not sure

[v19]Q5ei. Changing dietary habit?

1. Yes
2. No (skip to Q5fi.)

[v20]Q5eii. How long had you been changing dietary habit?

1. 1-6 day
  2. 1-3 week
  3. 1 month
  4. 2-3 month
  5. 4-5 month
  6. 6-9 month
  7. 10-12 month
  8. 13 months or above
- 998 Don't know/Not sure

[v21]Q5fi. Any other methods?

1. Yes, please specify: \_\_\_\_\_
2. No (skip to Q6.)

[v22]Q5fii. How long had you been using this method?

1. 1-6 day
  2. 1-3 week
  3. 1 month
  4. 2-3 month
  5. 4-5 month
  6. 6-9 month
  7. 10-12 month
  8. 13 months or above
- 998 Don't know/Not sure

## **B. Physical exercise/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.

[v23]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/not sure, please input '998'; if the respondent refuses to answer, please input '999')

\_\_\_\_\_ Days

[v24]Q7. [For those whose answer is 1 day or more in Q6.]

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/not sure, please input '998'; if the respondent refuses to answer, please input '999')

\_\_\_\_\_ Hours \_\_\_\_\_ Minutes (e.g. **1h30m** or **90m**)

[v25]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/hard to say, please input '998'; if the respondent refuses to answer, please input '999'.)

\_\_\_\_\_ Days

[v26]Q9. [For those whose answer is 1 day or more in Q8.]

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/hard to say, please input '998'; if the respondent refuses to answer, please input '999'.)

\_\_\_\_\_ Hours \_\_\_\_\_ Minutes (e.g. **1h30m** or **90m**)

[v27]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/hard to say, please input '998'; if the respondent refuses to answer, please input '999'.)

\_\_\_\_\_ Days

[v28]Q11. [For those whose answer is 1 day or more in Q10.]

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/hard to say, please input '998'; if the respondent refuses to answer, please input '999'.)

\_\_\_\_\_ Hours \_\_\_\_\_ Minutes (e.g. **1h30m** or **90m**)

[v29]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, travelling 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/hard to say, please input '998'; if the respondent refuses to answer, please input '999'.)

\_\_\_\_\_ Hours \_\_\_\_\_ Minutes (e.g. 1h30m or 90m)

### **C. Dietary habits**

#### **Juice**

[v30]Q13a. On average, how many days do you drink fruit or vegetable juice each week? 'Juice' refers to freshly squeezed juice or those are labelled 100% or pure fruit/vegetable juice.

(Interviewer: If the respondent does not know/hard to say, please input '998'; if the respondent refuses to answer, please input '999'.)

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 Q14a.)

[v31]Q13b. [For those whose answer in Q13a is less than "8"]

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

(Interviewer: If the respondent does not know/hard to say, please input '998'; if the respondent refuses to answer, please input '999'.)

\_\_\_\_\_ Cups

#### **Fruit and vegetable**

[v32]Q14a. On average, how many days do you eat fruit each week? (not including fruit/vegetable juice)

(Interviewer: If the respondent does not know/hard to say, please input '998'; if the respondent refuses to answer, please input '999'.)

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 Q15a.)

[v33]Q14b. [For those whose answer in Q15a is 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 apricots or plum, or one bowl of small fruit like grapes or strawberries.)

(Interviewer: If respondent cannot provide the answer in the unit of portion, ask exactly what they ate and then convert using the scale and the numbers can be recorded as half such as 0.5 or 1.5. If the respondent does not know/hard to say, please input '998'; if the respondent refuses to answer, please input '999'.)

\_\_\_\_\_ No. of fruit

[v34]Q15a. On average, how many days do you eat vegetables each week?

(Interviewer: If the respondent does not know/hard to say, please input '998'; if the respondent refuses to answer, please input '999'.)

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 Q16a)

[v35]Q15b. [For those whose answer in Q16a is less than "8"]

How many bowls of 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: If the respondent cannot provide the answer, ask exactly what they ate and then convert using rice bowl and the numbers can be recorded as half such as 0.5 or 1.5. If the respondent does not know/hard to say, please input '998'; if the respondent refuses to answer, please input '999'.)

\_\_\_\_\_ No. of bowls of vegetables

#### **D. Eating Out**

[v36]Q16a. In the past month, how often did you eat out for breakfast? 'Eat out for breakfast' refers to the breakfast that is not made at home and excludes the bread that is bought from a bakery. (Interviewer: Do not read out the answers. If the respondent does not know/hard to say, please input '998'; if the respondent refuses to answer, please input '999')

1. 5 times or more a week
2. 2-4 times a week
3. Once a week
4. 2-3 times a month
5. Once a month or less
6. Skipped breakfast

[v37]Q16b. In the past month, how often did you eat out for lunch? ‘Eat out for lunch’ refers to the lunch that is not made at home. (Interviewer: Do not read out the answers. If the respondent does not know/hard to say, please input ‘998’; if the respondent refuses to answer, please input ‘999’.)

1. 5 times or more a week
2. 2-4 times a week
3. Once a week
4. 2-3 times a month
5. Once a month or less
6. Skipped lunch

[v38]Q16c. In the past month, how often did you eat out for dinner? ‘Eat out for dinner’ refers to the dinner that is not made at home. (Interviewer: Do not read out the answers. If the respondent does not know/hard to say, please input ‘998’; if the respondent refuses to answer, please input ‘999’.)

1. 5 times or more a week
2. 2-4 times a week
3. Once a week
4. 2-3 times a month
5. Once a month or less
6. Skipped dinner

### **E. Pattern of Alcohol Consumption**

[v39]Q17a. During the last month, have you had at least one alcoholic drink?

1. Yes
2. No (skip to Q18a.)

[v40]Q17b. 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/hard to say, please input ‘998’)

1. 1 day per week
2. 2 days per week
3. 3 days per week
4. 4 days per week
5. 5 days per week
6. 6 days per week
7. Daily
8. Less than 1 day per week

[v41]Q17c. 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)

(Interviewer: A can/ small bottle of beer approximately equals to about 330 - 375 ml. Be aware, a big bottle can range from 640 ml (most brands) to 960 ml (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/hard to say, please input '998')

\_\_\_\_\_ No. of standard drinks

[v42]Q17d. 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 Q18a)

[v43]Q17e. How many times did you do this in the last month? (Interviewer: Do not read out the answers)

(Interviewer: If the respondent does not know/hard to say, please input '998')

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

## **F. Smoking habits**

[v44]Q18a. Have you smoked before? (Interviewer: please read out the answers one by one)

1. Yes, but not now
2. Yes, and still smoking (skip to Q18c.)
3. Never (skip to Q19a.)

[v45]Q18b. How long have you abstained from smoking? (Interviewer: please read out the answers one by one)

1. Had abstained for less than 1 month (skip to Q19a.)
2. Had abstained for 1 month to 1 year (skip to Q19a.)
3. Had abstained for more than 1 year (skip to Q19a.)

[v46]Q18c. How many cigarettes do you smoke on average per day? (Interviewer: Do not read out the answers)

(Interviewer: If the respondent does not know/hard to say, please input '998')

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

### **G. Influenza vaccination**

[v47]Q19a. Have you ever had influenza vaccine injection?

1. Yes
2. Never (skip to Q20.)
3. Don't know (skip to Q20.)

[v48]Q19b. [For those whose answer in Q19a.is 'Yes']

About how long ago did you have the last flu shot? (Interviewer: Do not read out the answers)

1. Within 3 months
2. 4-6 months
3. 7-9 months
4. 10 -12 months
5. 13 months or over
6. Can't remember

### **H. Mask wearing**

[v49]Q20. During the last 3 months, how often did you wear a mask when going out, including at work and in school, if you have symptoms of respiratory tract infection or fever? (Interviewer: Please read out the answers one by one)

1. All of the time
2. Most of the time
3. Some of the time
4. None of the time
5. Not applicable because do not have symptoms of respiratory tract infection or fever

### **I. Home cleansing practice**

[v50]Q21a. During the last 7 days, did you or your family members clean your furniture and household facilities with a diluted household bleach solution at least in the ratio of 1:99?

1. Yes
2. No (skip to Q22a.)
3. Not sure (skip to Q22a.)

[v51]Q21b. [For those whose answer in Q21a is 'Yes']

What is the exact number of days with such cleaning practice in the past 7 days?

1. 1 day
2. 2 days
3. 3 days
4. 4 days
5. 5 days

6. 6 days
7. 7 days
8. Can't remember/Don't know

**J. Cervical screening (for female respondents only)**

[v52]Q22a. (Interviewer: please input '97' for male respondent, then skip to next section) Have you had a cervical smear before?

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

[v53]Q22b. [For those whose answer in Q22a is 'Yes']

About how long ago did you have the last cervical smear? (Interviewer: Do not read out the answers)

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

## Personal Information

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

[v59]D1. Record the gender

1. Male
2. Female

[v60]D2. What is your age?

\_\_\_\_\_ Years (Interviewer: please input '999' if respondent refuse to answer)

[v61]D3. What is your highest educational attainment?

(Interview: please read out the answers one by one)

1. Primary or below
2. Had not completed secondary
3. Completed secondary (Form 5)
4. Matriculation
5. Tertiary (non-degree)/degree or above
- 999 Refuse to answer

[v62]D4. What is your marital status?

(Interview: please 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

[v63]D5. Are you currently engaged in a job?

1. Yes
2. No (skip to D7)

[v64]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)

999 Refuse to answer (skip to D8)

[v65]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)

999 Refuse to answer (skip to D9)

[v66]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

[v67]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

[v68]D10. Language used

1. Cantonese
2. Putonghua
3. English

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

## Appendix B Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire (IPAQ) – Short Form



Revised April 2004

### Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire (IPAQ) – Short Form,

Version 2.0. April 2004

#### Introduction

This document provides an revision to the outline for scoring the short form of the International Physical Activity Questionnaire (IPAQ). This is available on the website [www.ipaq.ki.se](http://www.ipaq.ki.se).

There are many different ways to analyse physical activity data, but to-date there is no consensus on a 'correct' method for defining or describing levels of activity based on self-report 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.

IPAQ is an instrument designed primarily for population surveillance of 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 is being used also as an evaluation tool in some intervention studies, but the range of domains and types of activities included in IPAQ should be carefully noted before using it in this context.

This document describes the *April 2004 revision* to the IPAQ short scoring protocol<sup>1</sup>. These revisions have been suggested by the IPAQ scientific group, to examine variation among countries in more detail<sup>2</sup>. Given the broad range of domains of physical activity asked in IPAQ, new cutpoints need to be trialed and developed to express physical activity in the population. These cutpoints are preliminary, in the sense that they are not yet supported by epidemiological studies, which have typically used Leisure time physical activity (LTPA) to examine benefits or risks of being active. Hence, "30 minutes of moderate intensity PA on most days of the week" was evidence-based, using the estimates of risk (reduction) from these LTPA measures in numerous epidemiological studies.

A new set of suggested cutpoints is based on work in the area of total physical activity, specifically total walking, where recommendations of at least 10,000 steps, and possibly 12,500 steps per day are considered 'high active' (Tudor Locke reference). This equates to at least 2 hours of all forms of walking per day, which includes all settings and domains of activity, and could be a population goal for total HEPA (health-enhancing physical activity). With this background, new cutpoints are proposed for expressing physical activity levels in populations using generic physical activity measures such as IPAQ<sup>3</sup>.

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<sup>1</sup> The first version of an IPAQ scoring protocol was in August 2003; this is a revised version, April 2004. This revised version does not change the continuous forms of reporting data, but does suggest a new category for describing the most active groups in populations. The changes from the August 2003 scoring protocol are indicated in this document.

<sup>2</sup> Previous scoring algorithms returned high prevalence rates with limited variation among countries; hence a higher cutpoint is sought, as the IPAQ instrument measures total PA, including LTPA as well as incidental, occupational and transport related PA all in one question. This results in much higher prevalence estimates than measures of LTPA alone.

<sup>3</sup> This results in changes to the categories used for levels of activity, and to the truncation rules [as greater than two hours per day may be required as usable data for walking and other physical activity behaviors].

**Characteristics of the IPAQ short-form instrument:**

- 1) IPAQ assesses physical activity undertaken across a comprehensive set of domains including leisure time, domestic and gardening (yard) activities, work-related and transport-related activity;
- 2) The IPAQ short form asks about three specific types of activity undertaken in the three domains introduced above and sitting. The specific types of activity that are assessed are walking, moderate-intensity activities and vigorous intensity activities; frequency (measured in days per week) and duration (time per day) are collected separately for each specific type of activity.
- 3) The items were structured to provide separate scores on walking; moderate-intensity; and vigorous-intensity activity as well as a combined total score to describe overall level of activity. Computation of the total score requires summation of the duration (in minutes) and frequency (days) of walking, moderate-intensity and vigorous-intensity activity;
- 4) Another measure of volume of activity can be computed 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 is computed by multiplying the MET score 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). The selected MET values were derived from work undertaken during the IPAQ Reliability Study undertaken in 2000-2001. 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. These 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<sup>4</sup>.

**Analysis of IPAQ**

Both categorical and continuous indicators of physical activity are possible from the IPAQ short form. However, given the non-normal distribution of energy expenditure in many populations, the continuous indicator is presented as median minutes or median MET-minutes rather than mean minutes or mean MET-minutes.

**Categorical score**

Regular participation is a key concept included in current public health guidelines for physical activity.<sup>5</sup> 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 suggested for classifying

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<sup>4</sup> Note that there is still some debate about whether 8 Mets for vigorous is sustainable, in occupational settings for several hours; we have no data on this, but it is likely to be less than that, maybe 7 METs or even less; however, for the moment, we suggest keeping with the compendium value of \* METs.

<sup>5</sup> 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.



populations; these are the new proposed levels, which take account of the concept of total physical activity of all domains. The proposed levels are:

- [i] 'inactive'
- [ii] 'minimally active'<sup>6</sup>
- [iii] 'HEPA active' (health enhancing physical activity; a high active category).

The criteria for these three levels are shown below.

### 1. Inactive (CATEGORY 1)

This is the lowest level of physical activity. Those individuals who not meet criteria for Categories 2 or 3 are considered '**insufficiently active**' [CATEGORY 1].

### 2. Minimally Active (CATEGORY 2)

The minimum pattern of activity to be classified as 'sufficiently active' is any one of the following 3 criteria:

- a) 3 or more days of vigorous activity of at least 20 minutes per day **OR**
- b) 5 or more days of moderate-intensity activity 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.

Individuals meeting at least one of the above criteria would be defined as achieving the minimum recommended to be considered '**minimally active**' [CATEGORY 2]. This category is more than the minimum level of activity recommended for adults in current public health recommendations, but is not enough for "total PA" when all domains are considered. IPAQ measures total physical activity whereas the recommendations are based on activity (usually leisure-time or recreational) over and above usual daily activities.

### 3. HEPA active (CATEGORY 3)

A separate category labeled '**HEPA**' level, which is a more active category [CATEGORY 3] can be computed for people who exceed the minimum public health physical activity recommendations, and are accumulating enough activity for a healthy lifestyle. This is a useful indicator because it is known that higher levels of participation can provide greater health benefits, although there is no consensus on the exact amount of activity for maximal benefit. Also, in considering lifestyle physical activity, this is a total volume of being active which reflects a healthy lifestyle. It is at least 1.5 - 2 hours of 'being active' throughout the day, which is more than the LTPA-based recommendations of 30 minutes<sup>7</sup>.

In the absence of any established criteria, the IPAQ scientific group proposes this new cutpoint, which equates to approximately at least 1.5 - 2 hours of total activity per day, of at least moderate-intensity activity. It is desirable to have a 'HEPA' activity category, because in some populations, a large proportion of the population may be classified as 'minimally active' because the IPAQ instrument assesses all domains of activity. Category 3 sets a higher threshold of activity and provides a useful mechanism to distinguish variation in sub-population groups.

<sup>6</sup>"Minimally active" implies some physical activity but is not an optimal level of total HEPA.

<sup>7</sup>As Tudor-Locke and others have indicated, there is a basal level of around 1 hour of activity just in activity of daily living, and an additional 0.5 – 1 hour of LTPA makes a healthy lifestyle amount of total PA – hence, these new cutpoints are still consistent with the general LTPA based public health recommendations of at least half an hour per day of additional activity or exercise.



The two criteria for classification as ‘HEPA active’ are:

- a) vigorous-intensity activity on at least 3 days achieving a minimum 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 of at least 3000 MET-minutes/week<sup>8</sup>

### **Continuous score**

Data collected with IPAQ can be reported as a continuous measure and reported as median MET-minutes. Median values can be computed for walking (W), moderate-intensity activities (M), and vigorous-intensity activities (V) using the following formulas:

### **MET values and Formula for computation of Met-minutes**

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

A combined total physical activity MET-min/week can be computed as the sum of Walking + Moderate + Vigorous MET-min/week scores.

The MET values used in the above formula were derived from the IPAQ validity and reliability study undertaken in 2000-2001<sup>9</sup>. A brief summary of the method is provided above (see page 1). 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.

### **IPAQ Sitting Question**

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

### **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 has established and recommends the following guidelines:

#### **1. Data cleaning**

- time should be converted from hours and minutes into minutes

<sup>8</sup> Note: this replaces the previous IPAQ short form cutpoint of 1500 mets.mins/ week

<sup>9</sup> Craig CL, Marshall A, Sjoström M et al. International Physical Activity Questionnaire: 12 country reliability and validity Med Sci Sports Exerc 2003;August.



- 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.
- time should be converted to daily time [usually is reported as daily time, but a few cases will be reported as optional weekly time - eg. VWHRS, VWMINS  $\alpha$  convert to daily time]
- convert time to mets-mins [see above; days x daily time]
- must have the number of days for the day variables; for the 'time' variables, either daily or weekly time is needed  $\alpha$  if 'don't know' or 'refused' or data are missing in walking, moderate or vigorous days or minutes, then that case is removed from analysis.

## 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 Walking, Moderate and Vigorous time variables which total at least or greater than '16 hours' should be excluded from the analysis. 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 data excluded from analysis.

## 3. Truncation of data rules

This rule is concerned with data truncation and attempts to normalize the distribution of levels of activity which are usually skewed in national or large population data sets. It is recommended that all Walking, Moderate and Vigorous time variables exceeding '4 hours' or '240 minutes' are truncated (that is re-coded) to be equal to '240 minutes' in a new variable<sup>10</sup>. This rule permits a maximum of 28 hours of activity in a week to be reported for each category of physical activity.

*This rule requires further testing, but is an initial manner proposed for classifying these population data.*

When analysing IPAQ data and presenting the results in categorical variables, this rule has the important effect of preventing misclassification in the 'high active' category. For example, an individual who reports walking for 2.5 hours every day and nothing else would be classified as 'HEPA active' (reaching the threshold of 7 days, and  $\geq$  3000 MET.mins. Similarly, someone who reported walking for 90 minutes on 5 days, and 4 hours (240 mins) of moderate activity on another day and 70 minutes of vigorous activity on another day, would also be coded as 'HEPA active' because this pattern meets the '7 day' and "3000 MET-min" criteria for 'HEPA active'.

## 4. Minimum Values for Duration of Activity

Only values of 10 or more minutes of activity will 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'.

## Summary of Data Processing Rules 1- 4 above

Data management rules 2, 3, and 4 deal with first excluding outlier data, then secondly, recoding high values to '4 hours', and finally describing minimum amounts of activity to be included in analyses.

<sup>10</sup> Note that this is a different truncation rule to the earlier scoring protocol; we have previously used 2 hours as a truncation point for LTPA measures. This higher truncation point is proposed in order to allow people who walk for 2.5 hours per day and do nothing else to be categorized as 'HEPA' active; if data were truncated, these individuals would be recoded to 2 hours per day, and over 7 days, total 2772 MET.mins, due to the truncation rule. The new truncation rule allows 2.5 hours to be counted in full. The initial purpose of truncation was to normalize the distributions, and was based on expert judgments. It is now suggested that 4 hours / day be proposed as a truncation threshold for more inclusive 'lifestyle PA measures' such as IPAQ.

These rules will ensure that highly active people remain highly active, while decreasing the chances that less active individuals are coded as highly active.

### 5. Calculating Total Days for ‘minimally Active’ [category 2] and ‘HEPA Active’ [category 3]

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 activity, thus allowing the total number of ‘days’ to range from a minimum of 0 to a maximum of 21 ‘days’ per week. The IPAQ instrument does not record if different types of activity are undertaken on the same day.

In calculating ‘**minimal activity**’, the primary requirement is to identify those individuals who undertake a combination of walking and/or moderate-intensity activity on at least ‘5 days’/week. Individuals who meet this criterion should be coded in a new variable called “*at least five days*”.

Below are two examples showing this coding in practice:

- i) an individual who reports ‘2 days of moderate’ and ‘3 days of walking’ should be coded as a value indicating “*at least five days*”;
- ii) an individual reporting ‘2 days of vigorous’, ‘2 days walking’ and ‘2 days moderate’ 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 ‘**HEPA active**’ 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 activity on at least 7 days/week. Individuals who meet this criterion should be coded in 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’ and ‘3 days of walking’ should be coded as the new variable “*at least 7 days*”.
- ii) an individual reporting ‘3 days of vigorous’, ‘3 days walking’ and ‘3 days moderate’ should be coded as “*at least 7 days*” [even though the total adds to 9].

**Summary:** The algorithm(s) in Annex 1 and Annex 2 to this document show how these rules work in an analysis plan, to develop the categories 1 [inactive], 2 [minimally], and 3 [HEPA] levels of activity. A short form [‘at a glance’] and a diagram showing these analytic steps for ‘sufficient physical activity’ and ‘high active’ categories are shown as appendix 1 at the end of this document.



*Annex 1*

**At A Glance  
IPAQ Scoring Protocol (Short Versions)**

**Categorical Score- three levels of physical activity are proposed**

1. Inactive

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

2. Minimally Active

Any one 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 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.

3. HEPA active

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

**Continuous Score**

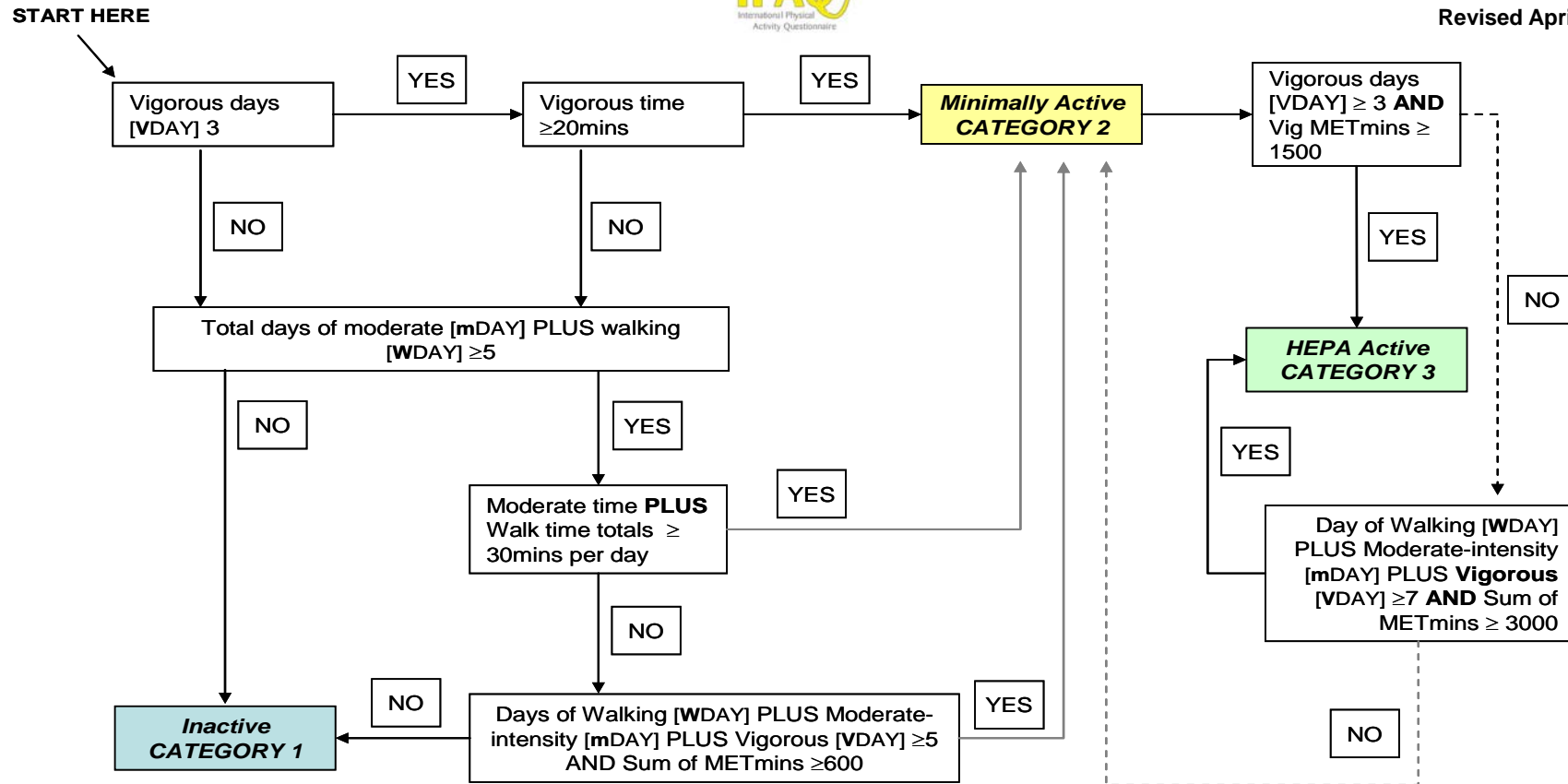
Expressed as MET-min per week: MET level x minutes of activity x events per week

*Sample Calculation*

<b>MET levels</b>	<b>MET-min/week for 30 min episodes, 5 times/week</b>
Walking = 3.3 METs	$3.3 \times 30 \times 5 = 495$ MET-min/week
Moderate Intensity = 4.0 METs	$4.0 \times 30 \times 5 = 600$ MET-min/week
Vigorous Intensity = 8.0 METs	$8.0 \times 30 \times 5 = 1,200$ MET-min/week
	TOTAL = 2,295 MET-min/week

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

**Please review the document “Guidelines for the data processing and analysis of the International Physical Activity Questionnaire (Short Form)” for more detailed description of IPAQ analysis and recommendations for data cleaning and processing [www.ipaq.ki.se].**



**Annex 2: Flow chart algorithm for the analysis of IPAQ short form**