



NATIONAL HEALTH AND MORBIDITY SURVEY 2011

Non Communicable
Diseases

VOLUME II

**NATIONAL HEALTH
AND
MORBIDITY SURVEY
2011**

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NON-COMMUNICABLE DISEASES

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Contributors

The following persons had contributed in the interpretation of findings, discussion on implication, conclusions and/or drawing recommendations for this report.

(In alphabetical order)

Abdul Kadir Abu Bakar, Ahmad Ali Zainuddin, Ang Kim Teng, Azizul Awaludin, Azli Baharuddin, Balkish Mahadir, Chan Ying Ying, Fatimah Salim, Fauziah Mohamed, Feisul Idzwan Mustapha, Firdaus Mukhtar, Gurpreet Kaur, Hamizatul Akmal Abd Hamid, Helen Tee Guat Hiong, Jamaiah Haniff, Jamalludin Ab Rahman, Jasvinder Kaur, Kamarul Imran Musa, Kee Chee Cheong, Khor Geok Lin, Letchuman Ramanathan, Lim Chong Hum, Lim Kuang Kuay, Loe Yak Khoon, Marhani Midin, Maniam Thambu, Mazni Mat Junus, Mohamed Ismail Lasa, Mohd Azahadi Omar, Mohd Hatta Abdul Mutalip, Mohd Hazrin Hashim, Mohd Yusoff Adon, Muhammad Fadhli Yusoff, Muhammad Fadzillah Abdul Razak, Nalachakravarthy Odhayakumar, Nazrila Hairizan Nasir, Ng Chee Kai, Noor Ani Ahmad, Noran Naqiah Mohd Hairi, Norhaniff Yahya, Norimah Ab Karim, Norsiah Ali, Norzawati Yoep, Noorzurani Md Haris Robson, Nurashikin Ibrahim, Nurhafizah Sahril, Nur Akmar Abd Razak, Poh Bee Koon, Rahama Samad, Ridhuan Mhd Dan, Rohana Ismail, Roslinah Ali, Rosnah Ramly, Rosnani Ab Hamid, Rozanim Kamarudin, Rusdi Rashid, Rushidi Ramly, Rusidah Selamat Ruzanna ZamZam, Salina Abdul Aziz, Selva Ratnasingam, Sharmini Selvarajah, Siti Zuraidah Mahmud, Suhaila Abdul Ghaffar, Teh Chien Huey, Ummi Nadiah Yusoff, Wan Nazaimoon Wan Mohamud

Editors

Gurpreet Kaur, Jasvinder Kaur, Nalachakravarthy Odhayakumar, Norzawati Yoep, Fadzilah Kamaludin, Helen Tee Guat Hiong, Haszreen Shariff, Mohd Ilham Hairon, Norazlina Muhammad, Noor Ani Ahmad, Tahir Aris.

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- i. Volume I : Methodology and General Findings
- ii. Volume II : Non-communicable Diseases
- iii. Volume III : Health Care Demands

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The National Health and Morbidity Survey 2011,
Institute for Public Health, National Institutes of Health, Ministry of Health,
Jalan Bangsar, 50590 Kuala Lumpur, Malaysia.
Tel: +603-22979400 / +60322979540 Fax: +603-22823114 / +603-22979555

Any enquiries about or comments on this report should be directed to:

Principal Investigator,
The National Health and Morbidity Survey 2011,
Institute for Public Health, National Institutes of Health, Ministry of Health,
Jalan Bangsar, 50590 Kuala Lumpur, Malaysia.
Tel: +60322979540 Fax: +603-22979555

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Table of contents

1 PREVALENCE OF CARDIOVASCULAR DISEASES

- 1.1 DIABETES MELLITUS
- 1.2 HYPERTENSION
- 1.3 HYPERCHOLESTEROLEMIA
- 1.4 IMPLICATIONS
- 1.5 CONCLUSION
- 1.6 RECOMMENDATIONS

2 PREVALENCE OF NUTRITIONAL STATUS/DIETARY PRACTICES

2.1 NUTRITIONAL STATUS OF MALAYSIAN ADULTS (AGED \geq 18 YEARS OLD)

- 2.1.1 Findings
- 2.1.2 Implications
- 2.1.3 Conclusion
- 2.1.4 Recommendations

2.2 DIETARY BEHAVIOUR OF ADULTS (AGED \geq 18 YEARS OLD)

- 2.2.1 Findings
- 2.2.2 Implications
- 2.2.3 Conclusion
- 2.2.4 Recommendations

2.3 NUTRITIONAL STATUS OF MALAYSIAN CHILDREN (AGED $<$ 18 YEARS OLD)

- 2.3.1 Findings
- 2.3.2 Implications
- 2.3.3 Conclusion
- 2.3.4 Recommendations

2.4 DIETARY BEHAVIOURS OF CHILDREN (AGED 13 - $<$ 18 YEARS OLD)

- 2.4.1 Findings
- 2.4.2 Implications
- 2.4.3 Conclusion
- 2.4.4 Recommendations

3 PREVALENCE OF PHYSICAL ACTIVITY

- 3.1 Findings
- 3.2 Implications
- 3.3 Conclusion
- 3.4 Recommendations

4 PREVALENCE OF ALCOHOL CONSUMPTION (\geq 13 YEARS)

- 4.1 Findings
- 4.2 Implications
- 4.3 Conclusion
- 4.4 Recommendations

5 PREVALENCE OF MENTAL HEALTH PROBLEMS IN ADULTS (\geq 16 YEARS)

5.1 GENERALIZED ANXIETY DISORDER (GAD)

- 5.1.1 Findings
- 5.1.2 Implications
- 5.1.3 Conclusion
- 5.1.4 Recommendations

5.2 MAJOR DEPRESSIVE DISORDER

- 5.2.1 Findings
- 5.2.2 Implications
- 5.2.3 Conclusion
- 5.2.4 Recommendations

5.3 SUICIDALITY

- 5.3.1 Findings
- 5.3.2 Implications
- 5.3.3 Conclusion
- 5.3.4 Recommendation

6 PREVALENCE OF MENTAL HEALTH PROBLEMS AMONG CHILDREN

- 6.1 Findings
- 6.2 Implications
- 6.3 Conclusion
- 6.4 Recommendations

7 PREVALENCE OF HOME INJURY AMONG CHILDREN AND ELDERLY IN MALAYSIA

- 7.1 Findings
- 7.2 Implications
- 7.3 Conclusion
- 7.4 Recommendations

LIST OF TABLES**PREVALENCE OF CARDIOVASCULAR DISEASES**

Table 1.1.1	Prevalence of overall diabetes by socio-demographic characteristics
Table 1.1.2	Prevalence of known diabetes by socio-demographic characteristics
Table 1.1.3	Prevalence of undiagnosed diabetes by socio-demographic characteristics
Table 1.1.4	Prevalence of impaired fasting glucose by socio-demographic characteristics
Table 1.2.1	Prevalence of overall hypertension by socio-demographic characteristics
Table 1.2.2	Prevalence of known hypertension by socio-demographic characteristics
Table 1.2.3	Prevalence of undiagnosed hypertension by socio-demographic characteristics
Table 1.3.1	Prevalence of overall hypercholesterolemia by socio-demographic characteristics
Table 1.3.2	Prevalence of known hypercholesterolemia by socio-demographic characteristics
Table 1.3.3	Prevalence of undiagnosed hypercholesterolemia by socio-demographic characteristics

NUTRITIONAL STATUS OF MALAYSIAN ADULTS (AGED \geq 18 YEARS OLD)

Table 2.1.1	Prevalence of normal BMI among adults (aged \geq 18 years old) by socio-demographic characteristics
Table 2.1.2	Prevalence of overweight among adults (aged \geq 18 years old) by socio-demographic characteristics
Table 2.1.3	Prevalence of obesity among adults (aged \geq 18 years old) by socio-demographic characteristics
Table 2.1.4	Prevalence of obesity I to III (WHO 1998) among adults (age \geq 18 years old) by socio-demographic characteristics
Table 2.1.5	Prevalence of obesity I to III (CPG 2004) among adults (aged \geq 18 years old) by socio-demographic characteristics
Table 2.1.6	Prevalence of underweight (BMI $<$ 18.5 kg/m ²) among adults (aged \geq 18 years old) by socio-demographic characteristics
Table 2.1.7	Mean BMI among adults by socio-demographic characteristics
Table 2.1.8	Prevalence of Abdominal Obesity (WHO 1998) by socio-demographic characteristics
Table 2.1.9	Prevalence of Abdominal Obesity (WHO 2000) by socio-demographic characteristics
Table 2.1.10	Prevalence of muscle wasting among elderly (aged 60 years old and above) by socio-demographic characteristics

DIETARY BEHAVIOUR OF ADULTS (AGED \geq 18 YEARS OLD)

- Table 2.2.1** Intake of fruit and/or vegetables consumption based on STEPS WHO criteria among adults (\geq 18 years old) by socio-demographic characteristics
- Table 2.2.2** Intake of fruits consumption as compared to Malaysian Dietary Guidelines among adults (\geq 18 years old) by socio-demographic characteristics
- Table 2.2.3** Intake of vegetables consumption as compared to Malaysian Dietary Guidelines among adults (\geq 18 years old) by socio-demographic characteristics
- Table 2.2.4** Intake of drinks with added sugar per day among adults (\geq 18 years old) by socio-demographic characteristics (KPI)
- Table 2.2.5** Intake of drinks with added sugar per day among adults (\geq 18 years old) by socio-demographic characteristics
- Table 2.2.6** Intake of drinks with sweetened condensed milk per day among adults (\geq 18 years old) by socio-demographic characteristics
- Table 2.2.7** Intake of sweetened condensed milk per day among adults (\geq 18 years old) by socio-demographic characteristics
- Table 2.2.8** Intake of carbonated drinks per day among adults (\geq 18 years old) by socio-demographic characteristics
- Table 2.2.9** Frequency of meal patterns among adults (\geq 18 years old)
- Table 2.2.10** Frequency of meal patterns among adults (\geq 18 years old) by location
- Table 2.2.11** Frequency of meal patterns among adults (\geq 18 years old) by sex

NUTRITIONAL STATUS OF MALAYSIAN CHILDREN (AGED $<$ 18 YEARS OLD)

- Table 2.3.1** BMI for age status for children $<$ 18 years old by socio-demographic characteristics
- Table 2.3.2** Height for age (3) status among children $<$ 18 years old by socio-demographic characteristics
- Table 2.3.3** Weight for age (WAZ) status among children ($<$ 18 years old) by socio-demographic characteristics
- Table 2.3.4** Weight for height (WHZ) status among children ($<$ 10 years old) by socio-demographic characteristics

DIETARY BEHAVIOURS OF CHILDREN (AGED 13 - <18 YEARS OLD)

- Table 2.4.1** Intake of fruits and/or vegetables consumption based on STEPS WHO criteria among adolescents (13 to <18 years old) by socio-demographic characteristics
- Table 2.4.2** Intake of fruits consumption as compared to Malaysian Dietary Guidelines among adolescents (13 to <18 years old) by socio-demographic characteristics
- Table 2.4.3** Intake of vegetables consumption as compared to Malaysian Dietary adolescents (13 to <18 years old) by socio-demographic characteristics
- Table 2.4.4** Intake of drinks with added sugar per day among adolescents (13 to <18 years old) by socio-demographic characteristics
- Table 2.4.5** Intake of drinks with sweetened condensed milk per day among adolescents (13 to <18 years old) by socio-demographic characteristics
- Table 2.4.6** Intake of sweetened condensed milk per day among adolescents (13 to <18 years old) by socio-demographic characteristics
- Table 2.4.7** Intake of carbonated drinks per day among adolescents (13 to < 18 years old) by socio-demographic characteristics
- Table 2.4.8** Frequency of meal patterns among adolescents (13 to <18 years old)
- Table 2.4.9** Frequency of meal patterns among adolescents (13 to <18 years old) by location
- Table 2.4.10** Frequency of meal patterns among adolescents (13 to <18 years old) by sex

PREVALENCE OF PHYSICAL ACTIVITY

- Table 3.1** Prevalence of physical activity (\geq 16 years old) by socio-demographic characteristics
- Table 3.2** Prevalence of physical activity (\geq 18 years old) by socio-demographic characteristics

PREVALENCE OF ALCOHOL CONSUMPTION (\geq 13 YEARS)

- Table 4.1** Prevalence of current drinkers (\geq 13 years old) by socio-demographic characteristics
- Table 4.2** Prevalence of current drinkers (\geq 18 years old) by socio-demographic characteristics
- Table 4.3** Prevalence of binge drinkers (\geq 13 years old) by socio-demographic characteristics

PREVALENCE OF MENTAL HEALTH PROBLEMS IN ADULTS (≥ 16 YEARS)

Table 5.1.1	Prevalence of general anxiety disorder by socio-demographic characteristics
Table 5.2.1	Prevalence of current depression by socio-demographic characteristics
Table 5.2.2	Prevalence of lifetime depression by socio-demographic characteristics
Table 5.3.1	Prevalence of suicidal ideation by socio-demographic characteristics
Table 5.3.2	Prevalence of suicide plan by socio-demographic characteristics
Table 5.3.3	Prevalence of suicidal attempt by socio-demographic characteristics
Table 5.3.4	Prevalence of life-time suicidal attempt by socio-demographic characteristics

PREVALENCE OF MENTAL HEALTH PROBLEMS AMONG CHILDREN

Table 6.1	Prevalence of mental health problems among children 5-16 years old by socio-demographic characteristic
Table 6.2	Mental health problems among children : Positive responses of each RQC items

PREVALENCE OF HOME INJURY AMONG CHILDREN AND ELDERLY IN MALAYSIA

Table 7.1	Prevalence of home injury among (<7 years old) by socio-demographic characteristics
Table 7.2	Prevalence of home injury among elderly(≥ 60 years old) by socio demographic characteristics

TOPIC 1

**CARDIOVASCULAR
DISEASES**

1. PREVALENCE OF CARDIOVASCULAR DISEASES

1.1 DIABETES MELLITUS

Contributors to this section: Feisul Idzwan Mustapha, Gurpreet Kaur, Helen Tee Guat Hiong, Wan Nazaimoon Wan Mohamud, Jamaiah Haniff, Sharmini Selvarajah, Noran Naqiah Hairi, Muhammad Fadhli Mohd Yusoff, Kamarul Imran Musa, Balkish Mahadir, Hamizatul Akmal Abd Hamid, Noor Ani Ahmad.

Findings

Overall Diabetes Prevalence

The diabetes survey was carried out on all respondents of 18 years old and above by questionnaire and measurement of finger-pricked fasting blood glucose. A total of 17,783 respondents responded to the diabetes questionnaire and 14,779 out of 16,168 (91.4%) respondents who claimed that they were not diabetic consented for the finger-prick test.

The overall prevalence of diabetes mellitus (known and undiagnosed) among adults of 18 years and above in this survey was 15.2% (95% CI: 14.3 - 16.1). There was a general increasing trend in prevalence with age, from 2.1% (95% CI: 1.2 - 3.7) in the 18-19 years old age group, reaching a peak of 36.6% (95% CI: 32.0 - 41.4) among the 65-69 year olds.

The prevalence was slightly higher in the rural areas at 15.5% (95% CI: 14.2 - 16.9) compared to urban at 15.1% (95% CI: 14.0 - 16.2), and the difference was not statistically significant. There was a large variation between states, with the highest prevalence in Perlis at 24.8% (95% CI: 20.9 - 29.3), followed by Kedah at 22.5% (95% CI: 18.2 - 27.4) and Negeri Sembilan at 22.0% (95% CI: 18.2 - 26.4); while the lowest being Sabah & Wilayah Persekutuan Labuan at 9.0% (95% CI: 7.2 - 11.3) and Wilayah Persekutuan Putrajaya at 8.8% (95% CI: 6.4 - 12.0).

No significant difference between gender was observed. In terms of the main ethnic groups, the differences were statistically significant. The Indians had the highest prevalence at 24.9% (95% CI: 22.0 - 28.1), followed by the Malays at 16.9% (95% CI: 15.8 - 18.1) and lastly, the Chinese at 13.8% (95% CI: 12.2 - 15.6).

Prevalence of Known Diabetes

For this survey, "known diabetes" is defined as self-report of being told to have diabetes by a doctor or medical assistant.

The prevalence of individuals with known diabetes was at 7.2% (95% CI: 6.7 - 7.7). There was also a general increasing trend with age, starting from 0.8% (95% CI: 0.5 - 1.6) within the age group of 20-24 years old, reaching a peak of 25.5% (95% CI: 21.4 - 30.2) at age group 65-69 years.

There was no significant difference in prevalence between urban and rural areas. Again, there was a large variation between states; the highest prevalence being in Negeri Sembilan at 11.5% (95% CI: 9.9 - 13.3), followed by Melaka at 10.4% (95% CI: 8.2 - 13.2) and Perak at 10.1% (95% CI: 8.4 - 12.2); while the lowest being Sabah/Wilayah Persekutuan Labuan at 2.6% (95% CI: 2.0 - 3.4). No significant difference between gender was observed. The Indians had the highest prevalence at 14.4% (95% CI: 12.3 - 16.8), followed by the Malays at 7.9% (95% CI: 7.3 - 8.6) and Chinese at 7.0% (95% CI: 6.0 - 8.2).

Among the known diabetics, 19.3% claimed that they were on insulin therapy, 79.9% claimed to be on oral anti-diabetic drugs within the past 2 weeks, 84.5% on specific diabetes diet advice, 72.2% claimed to have been advised by healthcare personnel to lose weight and 79.7% have been advised to be more physically active or start exercising. With regards to their usual place of treatment, majority sought treatment at MOH health clinics (56%) , followed by MOH hospitals (24.6%), private clinics (15.0%) and private hospitals (2.5%). About 1.6% self-medicated by purchasing medications directly from pharmacies and 0.2% opted for traditional and complementary medicine.

Prevalence of Undiagnosed Diabetes

For this survey, a respondent was classified as having "undiagnosed diabetes" when the respondent was not known to have diabetes and had a fasting capillary blood glucose (FBG) of 6.1 mmol/L or more (or non-fasting blood glucose of more than 11.1 mmol/L).

The prevalence of undiagnosed diabetes was 8.0% (95% CI: 7.2 - 8.7). There was also a general increasing trend with age, starting from 2.1% (95% CI: 1.2 - 3.7) at age group 18-19 years, reaching a peak of 13.7% (95% CI: 11.4 - 16.3) at age group 55-59 year olds.

The prevalence was higher in the rural compared to the urban areas, however the difference was not statistically significant. Again, there was a large variation between states; the highest prevalence being in Perlis at 16.1% (95% CI: 12.5 - 20.5), followed by Kedah at 13.4% (95% CI: 9.4 - 18.7) and Kelantan at 11.7% (95% CI: 8.9 - 15.2), while the lowest being Terengganu at 4.5% (95% CI: 2.8 - 7.1), Wilayah Persekutuan Putrajaya at 4.2% (95% CI: 2.5 - 6.9) and Wilayah Persekutuan Kuala Lumpur at 4.1% (95% CI: 2.3 - 7.4)

The prevalence was higher in males at 8.8% (95% CI: 7.9 - 9.8) compared to females at 7.1% (95% CI: 6.3 - 7.9), but the difference was not statistically significant. The Indians had the highest prevalence at 10.5% (95% CI: 8.3 - 13.2), followed by the Malays at 9.0% (95% CI: 8.0 - 10.1) and Chinese at 6.8% (95% CI: 5.6 - 8.2)

Prevalence of Impaired Fasting Glucose

For this survey, a respondent was classified as having "impaired fasting glucose" or IFG when the respondent was not known to have diabetes and had a fasting capillary blood glucose (FBG) of between 5.6 and less than 6.1 mmol/L.

The prevalence of IFG was 4.9% (95% CI: 4.4 - 5.4). The differences by age-groups were not statistically significant, hovering between 3.5% and 6.2%.

There was no significant difference in prevalence between urban and rural areas. There was a large variation between states; the highest prevalence being in Perlis at 11.9% (95% CI: 9.1 - 15.4), followed Kedah at 7.8% (95% CI: 5.5-10.9) and Kelantan at 7.6% (95% CI: 5.7 - 10.2); while the lowest being in Wilayah Persekutuan Kuala Lumpur at 2.2% (95% CI: 1.2 - 4.0) and Wilayah Persekutuan Putrajaya at 1.2% (95% CI: 0.4 - 3.1).

No significant difference in gender was observed. By ethnicity, the Malays had the highest prevalence at 5.7% (95% CI: 5.0 - 6.4), followed by the Indians at 4.9% (95% CI: 3.6 - 6.6), and lastly the Chinese at 4.3% (95% CI: 3.4 - 5.3).

1.2 HYPERTENSION

Contributors to this section: Feisul Idzwan Mustapha, Gurpreet Kaur, Helen Tee Guat Hiong, Wan Nazaimoon Wan Mohamud, Jamaiah Haniff, Sharmini Selvarajah, Noran Naqiah Hairi, Muhammad Fadhli Mohd Yusoff, Kamarul Imran Musa, Balkish Mahadir, Hamizatul Akmal Abd Hamid, Noor Ani Ahmad.

Findings

Overall Hypertension Prevalence

The hypertension survey was carried out on all respondents of 18 years old and above by questionnaire and measurement of their blood pressure. A total of 18,098 respondents responded to the hypertension, questionnaire and 14,845 out of 15,287 (97.1%) respondents who claimed that they were not hypertensive consented for the blood pressure measurement.

The overall prevalence of hypertension (known and undiagnosed) among adults of 18 years and above in this survey was 32.7% (95% CI: 31.6 - 33.7). There was a general increasing trend in prevalence with age, from 8.1% (95% CI: 6.1 - 10.7) in the 18-19 years old age group, reaching a peak of 74.1% (95% CI: 69.6 - 78.3) among the 65-69 year olds.

The prevalence was significantly higher in the rural areas at 37.4% (95% CI: 35.6 - 39.2) compared to urban at 30.9% (95% CI: 29.6 - 32.2). There was a large variation between states, with the highest prevalence in Perak at 42.9% (95% CI: 39.2 - 46.6), followed by Perlis at 41.1% (95% CI: 37.0 - 45.4) and Sarawak at 40.5% (95% CI: 36.7 - 44.3), while the lowest was Wilayah Persekutuan Putrajaya at 22.5% (95% CI: 19.0 - 26.4).

No significant difference between gender was observed. In terms of the main ethnic groups, the Other Bumiputeras had the highest prevalence at 36.4% (95% CI: 33.3 - 39.7), followed by the Malays at 34.0% (95% CI: 32.6 - 35.4), Chinese at 32.3% (95% CI: 30.1 - 34.7), and lastly the Indians at 30.6% (95% CI: 27.5 - 33.9)

Prevalence of Known Hypertension

For this survey, "known hypertension" has based on self-report, that is, being told to have hypertension by a doctor or a medical assistant.

The prevalence of individuals with known hypertension was 12.8% (95% CI: 12.2 - 13.5). There was a general increasing trend in prevalence with age, from 1.0% (95% CI: 0.4 - 2.2) in the 18-19 year old age group, reaching a peak of 42.0% (95% CI: 36.8 - 47.5) among the 75 years old and above.

The prevalence of known hypertension was significantly higher in the rural areas at 14.7% (95% CI: 13.6 - 15.9) compared to urban area at 12.2% (95% CI: 11.4 - 13.0). There was a large variation between states; the highest prevalence being in Perak at 18.0% (95% CI: 15.3 - 21.1), followed by Melaka at 16.0% (95% CI: 13.6 - 18.7) and Negeri Sembilan at 15.1% (95% CI: 12.5 - 18.2), while the lowest being Wilayah Persekutuan Putrajaya at 9.8% (95% CI: 6.7 - 14.0).

No significant difference between gender was observed. By ethnicity, the Chinese had the highest prevalence at 14.0% (95% CI: 12.6 - 15.6), followed by Malays at 13.4% (95% CI: 12.5 - 14.3), Other Bumiputeras at 12.9% (95% CI: 10.8 - 15.2), and lastly the Indians at 12.7% (95% CI: 10.9 - 14.8).

Among the known hypertensives, 78.4% claimed to be on oral anti-hypertensive drugs within the past 2 weeks, 82.7% on specific diet advice, 67.6% claimed to have been advised by healthcare personnel to lose weight and 75.2% had been advised to be more physically active or start exercising. With regards to their usual place of treatment, half of them sought treatment at MOH health clinics (53%), followed by MOH hospitals (23.0%), private clinics (19.7%) and private hospitals (2.5%). About 1.5% self-medicated by purchasing medications directly from pharmacies and 0.3% opted for traditional and complementary medicine.

Prevalence of Undiagnosed Hypertension

For this survey, a respondent has classified as having "undiagnosed hypertension" when the respondent was not known to have hypertension and had a systolic blood pressure of 140 mmHg or more and/or diastolic blood pressure of 90 mmHg or more.

The prevalence of undiagnosed hypertension was 19.8% (95% CI: 19.0 - 20.7). There was a general increasing trend in prevalence with age, from 7.1% (95% CI: 5.2 - 9.7) in the 18-19 year old age group, reaching a peak of 34.7% (95% CI: 30.1 - 39.5) among the 65-69 year olds.

The prevalence was significantly higher in the rural areas at 22.7% (95% CI: 21.3 - 24.1) compared to urban at 18.8% (95% CI: 17.7 - 19.9). There was a large variation between states; the highest prevalence being in Perlis at 28.3% (95% CI: 24.8 - 32.1), followed by Sarawak at 25.9% (95% CI: 22.7 - 29.3) and Perak at 24.9% (95% CI: 22.1 - 27.8), while the lowest was Wilayah Persekutuan Putrajaya at 12.7% (95% CI: 9.9 - 16.2).

The prevalence of undiagnosed hypertension was significantly higher in males at 21.8% (95% CI: 20.6 - 23.1) compared to females at 17.8 (95% CI: 16.8 - 18.8). By ethnicity, the Other Bumiputeras had the highest prevalence at 23.6% (95% CI: 21.2 - 26.2), followed by the Malays at 20.6% (95% CI: 19.5 - 21.7), Chinese at 18.3% (95% CI: 16.5 - 20.2), and lastly Indians at 17.9% (95% CI: 15.3 - 20.7).

1.3 HYPERCHOLESTEROLEMIA

Contributors to this section: Feisul Idzwan Mustapha, Gurpreet Kaur, Helen Tee Guat Hiong, Wan Nazaimoon Wan Mohamud, Jamaiah Haniff, Sharmini Selvarajah, Noran Naqiah Hairi, Muhammad Fadhli Mohd Yusoff, Kamarul Imran Musa, Balkish Mahadir, Hamizatul Akmal Abd Hamid, Noor Ani Ahmad.

Findings

Overall Hypercholesterolemia Prevalence

The hypercholesterolemia survey was carried out on all respondents of aged 18 years old and above by questionnaire and measurement of finger-pricked total cholesterol. A total of 17,988 respondents responded to the hypercholesterolemia questionnaire, and 14,843 out of 16,297 (91.1%) respondents who claimed that they were not having high cholesterol consented for the finger-prick test.

The overall prevalence of hypercholesterolemia (known and undiagnosed) among adults of 18 years and above in this survey was 35.1% (95% CI: 33.9 - 36.2). There was a general increasing trend in the prevalence of hypercholesterolemia with age, from 11.3% (95% CI: 8.9 - 14.4) in the 18-19 year old age group, reaching a peak of 57.2% (95% CI: 52.3 - 62.0) among the 65-69 year olds.

The prevalence of hypercholesterolemia was higher in the rural areas at 37.0% (95% CI: 35.1 - 39.0) compared to urban at 34.3% (95% CI: 32.9 - 35.7), however the difference was not statistically significant. There was a large variation between states, with the highest prevalence in Perlis at 45.1% (95% CI: 40.7 - 49.5), followed by Perak at 45.0% (95% CI: 40.9 - 49.2) and Kedah at 43.4% (95% CI: 39.6 - 47.4), while the lowest was Wilayah Persekutuan Kuala Lumpur at 29.4% (95% CI: 23.9 - 35.5).

The prevalence was significantly higher among females at 40.2% (95% CI: 38.7 - 41.7) compared to males at 30.1% (95% CI: 28.7 - 31.6). In terms of the main ethnic groups, the Malays have the highest prevalence at 38.4% (95% CI: 36.9 - 39.8), followed by the Indians at 35.5% (95% CI: 31.9 - 39.2), and lastly the Chinese at 33.4% (95% CI: 31.2 - 35.7).

Prevalence of Known Hypercholesterolemia

For this survey, "known hypercholesterolemia" is based on self-report, that is being told to have hypercholesterolemia by a doctor or a medical assistant.

The prevalence of individuals with known hypercholesterolemia was 8.4% (95% CI: 7.8 - 9.0). There was also a general increasing trend with age, starting from 0.6% (95% CI: 0.2 - 1.6) within the age group of 18-19 years old, reaching a peak of 23.8% (95% CI: 20.4 - 27.6) in the 60-64 year s old age group.

The prevalence was significantly higher in the urban areas at 9.1% (95% CI: 8.3 - 9.9) compared to rural at 6.6% (95% CI: 5.9 - 7.4). Again, there was a large variation between states, the highest prevalence being in Perak at 13.8% (95% CI: 11.6 - 16.3), followed by Wilayah Persekutuan Kuala Lumpur at 10.8% (95% CI: 8.0 - 14.4) and Johor at 10.1% (95% CI: 8.1 - 12.6), while the lowest was in Kelantan at 3.6% (95% CI: 2.6 - 4.9).

No significant difference between gender was observed. By ethnicity, the Indians had the highest prevalence at 11.3% (95% CI: 9.4 - 13.7), followed by the Chinese at 11.2% (95% CI: 9.8 - 12.8), and lastly the Malays at 8.0% (95% CI: 7.3 - 8.8).

Among the known hypercholesterolemia, 64.2% claimed to be on oral drugs within the past 2 weeks, 84.1% on specific diet advice, 69.1% claimed to have been advised by healthcare personnel to lose weight and 80.5% have been advised to be more physically active or start exercising. With regards to their usual place of treatment, half of them seek treatment at MOH health clinics (46.1%), followed by private clinics (24.3%), MOH hospitals (23.1%), and private hospitals (4.1%). About 2.1% self-medicate by purchasing medications directly from pharmacies and 0.4% opt for traditional and complementary medicine.

Prevalence of Undiagnosed Hypercholesterolemia

For this survey, a respondent was classified as having "undiagnosed hypercholesterolemia" when the respondent was not known to have hypercholesterolemia and had a total blood cholesterol of 5.2 mmol/L or more.

The prevalence of undiagnosed hypercholesterolemia was 26.6% (95% CI: 25.6 - 27.7). There was also a general increasing trend with age starting from 10.7% (95% CI: 8.3 - 13.7) at age group of 18-19 years, old reaching a peak of 37.3% (95% CI: 33.9 - 40.7) at the age group of 55-59 years old.

The prevalence was significantly higher in the rural areas at 30.4% (95% CI: 28.6 - 32.3) compared to urban at 25.3% (95% CI: 24.1 - 26.5). Again there was a large variation between states; the highest prevalence was recorded in Perlis at 36.1% (95% CI: 32.1 - 40.3), followed by Kedah at 35.5% (95% CI: 31.3 - 40.1), Perak at 31.2% (95% CI: 27.6 - 35.1) and Negeri Sembilan at 31.1% (95% CI: 25.9 - 36.8), while the lowest prevalence was found in Wilayah Persekutuan Kuala Lumpur at 18.6% (95% CI: 14.3 - 23.7).

The prevalence of undiagnosed hypercholesterolemia was much higher in females at 32.0% (95% CI: 30.6 - 33.3) compared to males at 21.5% (95% CI: 20.3 - 22.8). By ethnicity, Malays had the highest prevalence at 30.3% (95% CI: 29.0 - 31.7), followed by the Indians at 24.1% (95% CI: 20.8 - 27.7), Other Bumiputeras at 23.9% (95% CI: 21.3 - 26.7), and lastly the Chinese at 22.2% (95% CI: 20.4 - 24.0).

1.4 IMPLICATIONS

The prevalence of diabetes in Malaysia has increased 31.0% in the space of just 5 years, from 11.6% in 2006 to the current 15.2%. The increase was mostly contributed by the increased proportion of "undiagnosed diabetes". The prevalence of "impaired fasting glucose" has also risen, from 4.2% in 2006 to 4.9% in 2011. The prevalences of diabetes in Sabah, WP Labuan and Sarawak are currently on par with several other states in the Peninsular. However, of note, Sabah had the highest proportion of "undiagnosed diabetes" compared to total diabetes, at 71.7% of total diabetes were due to undiagnosed, compared to the national average of 52.5%.

Due to late detection of diabetes, people with diabetes are more likely to present for the first time already with diabetes-related complications. The expected increase in the number of patients seeking treatment will further increase the country's health expenditures substantially. This will be further augmented by the presence of diabetes-related complications. With over 80% of diabetes patients currently seeking treatment at MOH healthcare facilities, the burden to the government will be enormous.

The prevalence of hypertension in Malaysia has increased only slightly from 32.2% in 2006 to the current 32.7%, an increase of about 1.6%. Unfortunately, similar to diabetes, about 60.6% of total hypertensives was attributed to "undiagnosed hypertension". Of note, the gaps of "undiagnosed" versus "known hypertensives" were much bigger in the age groups less than 50 years of age.

The prevalence of hypercholesterolemia in Malaysia has increased almost double in the space of five years, from 20.7% in 2006 to the current prevalence of 32.6%, an increase of 57.5%. The proportion of "undiagnosed hypercholesterolemia" versus "known hypercholesterolemia" was even more staggering at 75.8% i.e. 3 out of 4 adults in Malaysia with high cholesterol was undiagnosed. Similar to hypertension, this gap was even more pronounced in the lower age groups.

Hypertension and hypercholesterolemia are two major risk factors for cardiovascular diseases. Presently, cardiovascular diseases are the main causes of death in MOH hospitals (contributing to 25.4% of deaths in 2010). Due to late detection of hypertension, people with hypertension are more likely to present for the first time with target organ damage and target organ complications while failure to detect and treat hypercholesterolemia early increases the risk of cardiovascular events.

1.5 CONCLUSION

Hypertension, diabetes mellitus and hypercholesterolemia are major risk factors for major and minor cardiovascular events, and the prevalences of these major risk factors continue to rise in Malaysia.

Current efforts in strengthening Non-Communicable Diseases (NCD) risk factor screening strategies using the voluntary population-based, high risk-based and opportunistic approach still fails to detect a substantial proportion of the population with high blood pressure, high blood sugars and hypercholesterolemia.

1.6 RECOMMENDATIONS

Increasing attention is being devoted to Non-Communicable Diseases (NCD) at the global level, and NCDs are discussed within economic forums and included in national development agendas. At the 66th Session of the United Nations General Assembly in New York, world leaders have discussed and all Member States have adopted the "Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases" (document A/66/L.1, adopted 19 September 2011).

In Malaysia, the MOH has published the National Strategic Plan for Non-Communicable Diseases (NSP-NCD) 2011-2015 on 17 December 2010. This document already provides the necessary framework for actions needed to decrease the prevalence of NCD (using diabetes as the entry-point) in Malaysia. The challenge now is in operationalizing the strategies contained in the NSP-NCD.

The responsibility for NCD prevention goes beyond the Ministry of Health. While increasing knowledge is important, and the MOH continues to strengthen health promotion and education activities, including within schools, to achieve behavioural change, we need a supportive environment. The major challenge for the MOH is that these policies and regulations that create a health-promoting environment are under the responsibilities of many ministries other than MOH. The "whole-of-government" approach, as described in NSP-NCD, needs to be further emphasised.

While the government has the responsibility to protect the health of its populations, communities and individuals have to take on responsibilities for their own health as well, to decrease their exposure to NCD risk factors or unhealthy lifestyles. NGOs can play a major role in community empowerment. The Malaysian Health Promotion Board (also known as "MySihat"), established in 2006, is in a position to support NGO and community empowerment. MySihat should continue to evolve to take on a bigger role in enhancing health promotion in the country.

Specifically for NCD risk factor screening, MOH have to look beyond voluntary screenings which are currently conducted either as population-based, high-risk based or opportunistic, and look at possibilities of introducing regulations or policies to make basic NCD risk factor screening compulsory. With the prevalence of hypercholesterolemia at 17.4% even among the 20-24 years old age group (with undiagnosed hypercholesterolemia at 16.1%), and hypertension at 11.8% recommendations for NCD risk factor screening must begin now much earlier than the current 30 years of age.

The MOH must also strengthen chronic disease management at the primary care level, to cater for existing patients and also the expected major increase in numbers in the next 5 to 10 years. While the 1Care Blueprint (transformation of healthcare system in Malaysia) which is currently being developed will address many of the current deficiencies in chronic disease management in the country, the human resources will still need to be adequately planned and trained. These include not only doctors, but other healthcare providers such as nurses, assistant medical officers, dieticians and nutritionists.

Definition of variables: Diabetes Mellitus

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
Impaired Fasting Glucose	Impaireddm3	weight4	Not known to have diabetes and has a fasting capillary blood glucose (FBG) between 5.6 and to less than 6.1 mmol/L	IF (e020 = 2 & fasting_status = 1 & k4020_new >= 5.6 & k4020_new < 6.1) Impaireddm3=1.
Known Diabetes	known_dm		Self-reported by subject, as having diagnosed with diabetes previously by medical personnel	RECODE e020=1 ELSE=0
Undiagnosed Diabetes	newlydm4		Not known to have diabetes and has a fasting capillary blood glucose (FBG) equal to or more than 6.1 mmol/L (or non-fasting blood glucose or more than 11.1 mmol/L)	IF (e020 = 2 & fasting_status = 1 & k4020_new >= 6.1) newlydm3=1. EXECUTE. IF (e020 = 2 & fasting_status = 2 & k4020_new >= 11.2) newlydm3=2. EXECUTE. IF (denominator2 = 1) newlydm4=0. IF (newlydm3 = 1 newlydm3 = 2) newlydm4=1.
Diabetes status	total3		Known diabetes plus undiagnosed diabetes	IF (denominator2 = 1) total3=0. EXECUTE. IF (e020 = 1) total3=1. EXECUTE. IF (newlydm4 = 1) total3=1. EXECUTE.

Definition of variables: Hypertension

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
Known hypertension	knownhpt	weight4	Self-reported by subject, as having diagnosed with hypertension previously by medical personnel	RECODE g020=1 ELSE=0
Undiagnosed hypertension	newlyhpt2		Not known to have hypertension and has an average systolic blood pressure equal to or more than 140 mmHg and/or diastolic blood pressure equal to or more than 90 mmHg.	IF (denominator = 1) newlyhpt2=0. EXECUTE. IF (newhpt = 1) newlyhpt2=1. EXECUTE.
Hypertension status	totalhpt2		Known hypertension plus undiagnosed hypertension.	IF (denominator = 1) totalhpt2=0. EXECUTE. IF (knownhpt = 1 newlyhpt2 = 1) totalhpt2=1. EXECUTE.

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
Known hypercholesterolemia	known_hyperchol	weight4	Self-reported by subject, as having diagnosed with hypercholesterolemia previously by medical personnel	RECODE F020=1 ELSE=0
Undiagnosed hypercholesterolemia	newlydx2		Not known to have hypercholesterolemia and has a total blood cholesterol level equals to or more than 5.2 mmol/L.	IF (denominator = 1) newlydx2=0. EXECUTE. IF (new_among_unknown = 1) newlydx2=1. EXECUTE.
hypercholesterolemia status	total		Known hypercholesterolemia plus undiagnosed hypercholesterolemia.	IF (denominator = 1) total=0. EXECUTE. IF (known_hyperchol = 1 newlydx2 = 1) total=1. EXECUTE.

Table 1.1.1 Prevalence of overall diabetes by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	3,202	2,622,284	15.2	14.3	16.1
State					
Johor	234	275,123	13.4	11.3	15.9
Kedah	267	247,084	22.5	18.2	27.4
Kelantan	236	168,256	19.7	16.5	23.3
Melaka	208	87,688	17.1	13.5	21.3
Negeri Sembilan	238	139,298	22.0	18.2	26.4
Pahang	171	137,881	16.7	12.9	21.3
Penang	205	158,201	15.0	11.7	18.9
Perak	189	235,723	16.2	13.7	19.1
Perlis	260	34,975	24.8	20.9	29.3
Selangor	514	588,990	16.5	14.3	19.1
Terengganu	141	68,581	11.6	9.1	14.6
Sabah & WP Labuan	229	171,163	9.0	7.2	11.3
Sarawak	177	178,771	12.3	9.4	16.0
WP Kuala Lumpur	81	126,560	11.3	8.8	14.5
WP Putrajaya	52	3,991	8.8	6.4	12.0
Location					
Urban	1,849	1,901,142	15.1	14.0	16.2
Rural	1,353	721,142	15.5	14.2	16.9
Sex					
Male	1,555	1,390,158	15.8	14.6	17.0
Female	1,647	1,232,126	14.5	13.6	15.6
Age Group					
18-19	20	18,324	2.1	1.2	3.7
20-24	92	128,465	4.9	3.8	6.4
25-29	113	132,151	5.3	4.1	6.7
30-34	179	188,283	9.4	7.9	11.1
35-39	206	194,638	10.9	9.1	12.9
40-44	324	292,814	17.6	15.3	20.2
45-49	400	313,049	20.6	18.2	23.1
50-54	458	341,799	26.7	24.0	29.5
55-59	461	319,289	31.6	28.4	35.0
60-64	368	274,537	36.2	32.2	40.3
65-69	247	178,246	36.6	32.0	41.4
70-74	171	109,288	30.3	25.6	35.6
75+	163	131,402	31.9	26.6	37.7
Ethnicity					
Malay	1,927	1,454,143	16.9	15.8	18.1
Chinese	565	606,996	13.8	12.2	15.6
Indians	403	306,027	24.9	22.0	28.1
Other Bumiputras	191	173,912	9.1	7.2	11.6
Others	116	81,205	7.0	4.9	9.8
Marital Status					
Single	240	269,340	5.5	4.6	6.5
Married	2559	2,074,926	18.4	17.3	19.5
Widow/widower/divorcee	412	285,114	27.2	24.4	30.3

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>Education Level</i>					
No formal education	358	234,530	22.4	19.5	25.5
Primary education	1100	826,956	22.2	20.4	24.1
Secondary education	1281	1,114,804	13.7	12.6	14.9
Tertiary education	432	419,821	10.2	8.9	11.7
Unclassified education	19	17,425	10.9	6.6	17.6
<i>Occupation</i>					
Government/semi government employee	332	257,839	14.6	12.5	16.9
Private employee	681	690,212	10.5	9.3	11.8
Self employed	663	533,056	16.8	15.1	18.7
Unpaid worker/home maker	652	464,852	17.5	15.8	19.3
Retiree	620	472,483	36.0	32.9	39.3
<i>Income Group</i>					
Less than RM 400	324	257,077	22.1	19.1	25.5
RM 400 - RM 699	183	125,262	15.8	13.1	19.0
RM 700 - RM 999	224	163,939	16.1	13.6	19.0
RM 1000 - RM 1999	659	469,394	14.8	13.2	16.6
RM 2000 - RM 2999	490	415,251	14.2	12.5	16.0
RM 3000 - RM 3999	413	349,630	14.8	13.1	16.7
RM 4000 - RM 4999	254	233,956	13.4	11.4	15.8
RM 5000 & above	655	607,775	14.8	13.1	16.6

Table 1.1.2 Prevalence of known diabetes by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	1615	1,247,366	7.2	6.7	7.7
State					
Johor	136	154,787	7.6	6.3	9.1
Kedah	117	99,566	9.1	7.0	11.7
Kelantan	103	68,447	8.0	6.4	10.0
Melaka	139	53,560	10.4	8.2	13.2
Negeri Sembilan	138	72,690	11.5	9.9	13.3
Pahang	83	70,894	8.6	6.4	11.5
Penang	115	90,341	8.5	5.8	12.5
Perak	118	147,542	10.1	8.4	12.2
Perlis	99	12,303	8.7	6.9	11.0
Selangor	219	229,909	6.5	5.4	7.7
Terengganu	90	42,123	7.1	5.8	8.7
Sabah & WP Labuan	86	49,199	2.6	2.0	3.4
Sarawak	88	73,294	5.1	3.9	6.5
WP Kuala Lumpur	56	80,642	7.2	5.4	9.5
WP Putrajaya	28	2,070	4.6	3.0	6.9
Location					
Urban	946	920,029	7.3	6.7	7.9
Rural	669	327,337	7.0	6.3	7.8
Sex					
Male	709	614,529	7.0	6.3	7.8
Female	906	632,837	7.5	6.9	8.1
Age Group					
18-19	0	0	0.0	0.0	0.0
20-24	15	22,157	0.8	0.5	1.6
25-29	15	19,865	0.8	0.4	1.4
30-34	48	51,688	2.6	1.8	3.6
35-39	70	60,963	3.4	2.5	4.7
40-44	133	126,892	7.6	6.0	9.7
45-49	180	139,166	9.1	7.6	10.9
50-54	258	193,183	15.1	13.0	17.4
55-59	269	181,102	17.9	15.5	20.6
60-64	241	175,205	23.1	20.0	26.5
65-69	162	124,437	25.5	21.4	30.2
70-74	118	73,001	20.3	16.2	25.0
75+	106	79,706	19.4	15.3	24.2
Ethnicity					
Malay	944	681,268	7.9	7.3	8.6
Chinese	308	309,700	7.0	6.0	8.2
Indians	256	177,323	14.4	12.3	16.8
Other Bumiputras	73	60,393	3.2	2.4	4.1
Others	34	18,683	1.6	0.8	3.0
Marital Status					
Single	54	53,485	1.1	0.8	1.5
Married	1,298	1,015,138	9.0	8.3	9.7
Widow/widower/divorcee	263	178,743	17.1	14.8	19.6

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>Education Level</i>					
No formal education	208	134,003	12.8	10.7	15.1
Primary education	622	440,588	11.8	10.6	13.2
Secondary education	596	510,629	6.3	5.6	7.0
Tertiary education	164	139,399	3.4	2.8	4.1
Unclassified education	9	9,837	6.2	3.0	12.1
<i>Occupation</i>					
Government/semi government employee	140	105,645	6.0	4.6	7.7
Private employee	253	239,368	3.6	3.1	4.3
Self employed	291	230,602	7.3	6.2	8.5
Unpaid worker/home maker	357	245,544	9.2	8.1	10.5
Retiree	432	315,747	24.1	21.5	26.8
<i>Income Group</i>					
Less than RM 400	188	143,860	12.4	10.3	14.8
RM 400 - RM 699	81	47,160	5.9	4.4	8.0
RM 700 - RM 999	116	82,875	8.1	6.4	10.3
RM 1000 - RM 1999	326	213,297	6.7	5.8	7.8
RM 2000 - RM 2999	251	209,039	7.1	6.0	8.5
RM 3000 - RM 3999	218	174,862	7.4	6.3	8.7
RM 4000 - RM 4999	130	125,838	7.2	5.8	9.1
RM 5000 & above	305	250,435	6.1	5.3	7.0

Table 1.1.3 Prevalence of undiagnosed diabetes by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	1,587	1,374,918	8.0	7.2	8.7
<i>State</i>					
Johor	98	120,336	5.9	4.2	8.1
Kedah	150	147,518	13.4	9.4	18.7
Kelantan	133	99,809	11.7	8.9	15.2
Melaka	69	34,127	6.6	4.5	9.6
Negeri Sembilan	100	66,608	10.5	7.5	14.6
Pahang	88	66,987	8.1	5.4	12.0
Penang	90	67,860	6.4	4.8	8.5
Perak	71	88,181	6.1	4.8	7.6
Perlis	161	22,672	16.1	12.5	20.5
Selangor	295	359,081	10.1	8.3	12.2
Terengganu	51	26,458	4.5	2.8	7.1
Sabah & WP Labuan	143	121,964	6.4	4.8	8.7
Sarawak	89	105,477	7.3	4.8	10.8
WP Kuala Lumpur	25	45,918	4.1	2.3	7.4
WP Putrajaya	24	1,921	4.2	2.5	6.9
<i>Location</i>					
Urban	903	981,114	7.8	6.9	8.7
Rural	684	393,804	8.5	7.3	9.7
<i>Sex</i>					
Male	846	775,629	8.8	7.9	9.8
Female	741	599,289	7.1	6.3	7.9
<i>Age Group</i>					
18-19	20	18,324	2.1	1.2	3.7
20-24	77	106,308	4.1	3.0	5.5
25-29	98	112,286	4.5	3.4	5.9
30-34	131	136,595	6.8	5.6	8.3
35-39	136	133,675	7.5	5.9	9.3
40-44	191	165,922	10.0	8.4	11.9
45-49	220	173,882	11.4	9.6	13.5
50-54	200	148,615	11.6	9.7	13.8
55-59	192	138,187	13.7	11.4	16.3
60-64	127	99,332	13.1	10.3	16.5
65-69	85	53,809	11.0	8.5	14.2
70-74	53	36,287	10.1	7.4	13.6
75+	57	51,695	12.5	8.7	17.8
<i>Ethnicity</i>					
Malay	983	772,875	9.0	8.0	10.1
Chinese	257	297,296	6.8	5.6	8.2
Indians	147	128,704	10.5	8.3	13.2
Other Bumiputras	118	113,520	6.0	4.2	8.5
Others	82	62,523	5.4	3.6	8.0
<i>Marital Status</i>					
Single	186	215,856	4.4	3.6	5.4
Married	1,261	1,059,788	9.4	8.5	10.3
Widow/widower/divorcee	149	106,370	10.2	8.0	12.9

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>Education Level</i>					
No formal education	150	100,527	9.6	7.5	12.2
Primary education	478	386,368	10.4	9.1	11.8
Secondary education	685	604,175	7.4	6.6	8.3
Tertiary education	268	280,422	6.8	5.6	8.2
Unclassified education	10	7,589	4.8	2.4	9.4
<i>Occupation</i>					
Government/semi government employee	192	152,194	8.6	7.1	10.4
Private employee	431	452,410	6.9	5.9	8.0
Self employed	376	306,722	9.7	8.4	11.2
Unpaid worker/home maker	295	219,309	8.2	7.0	9.6
Retiree	188	156,735	12.0	9.9	14.3
<i>Income Group</i>					
Less than RM 400	136	113,217	9.7	7.5	12.6
RM 400 - RM 699	102	78,102	9.9	7.6	12.6
RM 700 - RM 999	108	81,065	8.0	6.2	10.2
RM 1000 - RM 1999	333	256,097	8.1	6.8	9.5
RM 2000 - RM 2999	239	206,212	7.0	5.9	8.4
RM 3000 - RM 3999	195	174,768	7.4	6.0	9.1
RM 4000 - RM 4999	124	108,118	6.2	4.9	7.8
RM 5000 & above	350	357,340	8.7	7.3	10.3

Table 1.1.4 Prevalence of impaired fasting glucose by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	931	841,477	4.9	4.4	5.4
<i>State</i>					
Johor	52	71,947	3.5	2.5	4.9
Kedah	83	86,006	7.8	5.5	10.9
Kelantan	88	65,064	7.6	5.7	10.2
Melaka	42	22,647	4.4	2.8	6.8
Negeri Sembilan	62	44,138	7.0	5.0	9.6
Pahang	51	43,314	5.2	3.7	7.4
Penang	32	30,248	2.9	1.9	4.4
Perak	37	51,804	3.6	2.5	5.1
Perlis	123	16,722	11.9	9.1	15.4
Selangor	171	223,595	6.3	5.1	7.7
Terengganu	50	26,621	4.5	2.9	6.8
Sabah & WP Labuan	83	83,695	4.4	3.1	6.2
Sarawak	37	50,739	3.5	1.9	6.5
WP Kuala Lumpur	13	24,399	2.2	1.2	4.0
WP Putrajaya	7	537	1.2	0.4	3.1
<i>Location</i>					
Urban	560	640,120	5.1	4.5	5.7
Rural	371	201,358	4.3	3.7	5.0
<i>Sex</i>					
Male	449	445,494	5.1	4.4	5.8
Female	482	395,983	4.7	4.1	5.3
<i>Age Group</i>					
18-19	40	35,562	4.1	2.9	5.9
20-24	73	91,702	3.5	2.5	5.0
25-29	87	110,724	4.4	3.4	5.8
30-34	99	104,846	5.2	4.1	6.6
35-39	101	99,280	5.5	4.4	7.0
40-44	91	76,864	4.6	3.6	5.9
45-49	108	93,921	6.2	4.9	7.8
50-54	108	78,513	6.1	4.8	7.8
55-59	81	51,671	5.1	3.6	7.2
60-64	46	32,355	4.3	3.0	6.0
65-69	43	27,931	5.7	3.9	8.4
70-74	33	16,900	4.7	3.0	7.3
75+	21	21,208	5.1	2.9	8.8
<i>Ethnicity</i>					
Malay	579	490,076	5.7	5.0	6.4
Chinese	160	188,022	4.3	3.4	5.3
Indians	74	59,610	4.9	3.6	6.6
Other Bumiputras	66	73,924	3.9	2.8	5.3
Others	52	29,846	2.6	1.6	4.0
<i>Marital Status</i>					
Single	172	201,769	4.1	3.3	5.0
Married	692	592,895	5.2	4.7	5.9
Widow/widower/divorcee	67	46,813	4.5	3.4	5.9

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>Education Level</i>					
No formal education	70	45,351	4.3	3.2	5.8
Primary education	228	171,662	4.6	3.7	5.7
Secondary education	442	435,281	5.3	4.7	6.1
Tertiary education	186	184,121	4.5	3.7	5.4
Unclassified education	3	3,542	2.2	0.7	7.1
<i>Occupation</i>					
Government/semi government employee	155	122,501	4.6	3.8	5.6
Private employee	277	310,166	4.7	4.1	5.5
Self employed	214	161,577	5.1	4.2	6.2
Unpaid worker/home maker	2964	2,536,901	95.4	94.4	96.2
Retiree	87	62,944	4.8	3.6	6.3
<i>Income Group</i>					
Less than RM 400	55	46,879	4.0	2.7	5.9
RM 400 - RM 699	54	31,538	4.0	2.8	5.6
RM 700 - RM 999	63	44,117	4.3	3.1	6.0
RM 1000 - RM 1999	173	139,421	4.4	3.6	5.4
RM 2000 - RM 2999	160	137,596	4.7	3.9	5.7
RM 3000 - RM 3999	133	134,582	5.7	4.4	7.3
RM 4000 - RM 4999	88	92,094	5.3	3.9	7.1
RM 5000 & above	205	215,252	5.2	4.4	6.2

Table 1.2.1 Prevalence of overall hypertension by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	6700	5,777,280	32.7	31.6	33.7
<i>State</i>					
Johor	627	770,467	36.4	33.0	40.0
Kedah	470	437,140	38.2	34.0	42.6
Kelantan	342	238,940	27.9	23.9	32.3
Melaka	400	171,109	32.8	29.1	36.8
Negeri Sembilan	407	218,489	34.1	29.8	38.7
Pahang	334	255,667	29.9	25.6	34.5
Penang	421	305,467	28.4	24.5	32.6
Perak	493	627,661	42.9	39.2	46.6
Perlis	434	57,917	41.1	37.0	45.4
Selangor	889	1,069,017	28.7	26.3	31.3
Terengganu	341	158,463	26.8	23.0	30.9
Sabah & WP Labuan	677	551,963	29.1	26.3	32.0
Sarawak	536	587,505	40.5	36.7	44.3
WP Kuala Lumpur	196	317,127	27.1	22.2	32.6
WP Putrajaya	133	10,350	22.5	19.0	26.4
<i>Location</i>					
Urban	3636	4,005,295	30.9	29.6	32.2
Rural	3064	1,771,986	37.4	35.6	39.2
<i>Sex</i>					
Male	3130	3,039,844	33.7	32.2	35.2
Female	3570	2,737,436	31.6	30.3	32.9
<i>Age Group</i>					
18-19	63	71,637	8.1	6.1	10.7
20-24	237	319,708	11.8	10.1	13.8
25-29	294	369,825	14.3	12.4	16.5
30-34	402	454,635	22.2	19.9	24.6
35-39	497	498,275	27.2	24.6	30.0
40-44	669	610,163	35.8	33.0	38.7
45-49	784	686,289	44.0	40.9	47.2
50-54	883	671,624	51.6	48.7	54.5
55-59	913	623,736	61.0	57.7	64.1
60-64	673	528,234	68.7	65.0	72.1
65-69	487	366,257	74.1	69.6	78.3
70-74	386	266,117	72.8	66.8	78.0
75+	412	310,782	73.4	68.0	78.1
<i>Ethnicity</i>					
Malay	3871	2,989,386	34.0	32.6	35.4
Chinese	1335	1,453,114	32.3	30.1	34.7
Indians	524	380,924	30.6	27.5	33.9
Other Bumiputras	676	694,463	36.4	33.3	39.7
Others	294	259,393	20.9	17.4	24.8
<i>Marital Status</i>					
Single	707	821,891	16.2	14.7	17.9
Married	5044	4,282,075	37.0	35.8	38.3
Widow/widower/divorcee	947	672,179	62.9	59.3	66.3

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>Education Level</i>					
No formal education	877	605,489	56.3	52.2	60.4
Primary education	2249	1,759,656	46.4	44.2	48.7
Secondary education	2650	2,471,072	29.6	28.3	31.0
Tertiary education	854	877,344	20.7	19.0	22.6
Unclassified education	41	35,694	22.2	15.4	30.9
<i>Occupation</i>					
Government/semi government employee	921	753,209	41.8	38.6	45.1
Private employee	1478	1,598,060	23.6	22.2	25.1
Self employed	1426	1,166,833	36.0	33.9	38.1
Unpaid worker/home maker	1607	1,450,892	53.9	51.6	56.1
Retiree	1238	958,380	72.5	69.6	75.1
<i>Income Group</i>					
Less than RM 400	681	563,265	47.8	43.6	52.0
RM 400 - RM 699	434	303,313	38.0	33.7	42.4
RM 700 - RM 999	510	387,416	37.4	33.7	41.1
RM 1000 - RM 1999	1381	1,083,828	33.8	31.6	36.1
RM 2000 - RM 2999	1103	958,658	32.3	30.1	34.6
RM 3000 - RM 3999	862	764,830	31.7	29.3	34.3
RM 4000 - RM 4999	537	540,177	29.2	26.1	32.6
RM 5000 & above	1192	1,175,792	27.7	25.7	29.8

Table 1.2.2 Prevalence of known hypertension by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	2811	2,271,995	12.8	12.2	13.5
<i>State</i>					
Johor	264	296,283	14.0	12.2	16.0
Kedah	175	162,930	14.2	11.5	17.5
Kelantan	144	94,565	11.1	9.0	13.5
Melaka	200	83,258	16.0	13.6	18.7
Negeri Sembilan	192	96,943	15.1	12.5	18.2
Pahang	140	102,161	11.9	9.4	15.0
Penang	169	120,402	11.2	8.8	14.1
Perak	203	263,722	18.0	15.3	21.1
Perlis	146	18,057	12.8	10.7	15.3
Selangor	385	422,918	11.4	9.9	13.0
Terengganu	137	61,776	10.4	8.8	12.4
Sabah & WP Labuan	271	194,916	10.3	8.7	12.1
Sarawak	232	211,882	14.6	12.4	17.1
WP Kuala Lumpur	96	137,688	11.8	8.8	15.6
WP Putrajaya	57	4,494	9.8	6.7	14.0
<i>Location</i>					
Urban	1551	1,573,701	12.2	11.4	13.0
Rural	1260	698,294	14.7	13.6	15.9
<i>Sex</i>					
Male	1169	1,073,390	11.9	11.0	12.9
Female	1642	1,198,605	13.8	13.0	14.7
<i>Age Group</i>					
18-19	7	8,620	1.0	0.4	2.2
20-24	45	53,674	2.0	1.4	2.8
25-29	62	78,724	3.0	2.2	4.1
30-34	86	86,895	4.2	3.3	5.5
35-39	137	135,286	7.4	6.0	9.1
40-44	206	197,854	11.6	9.9	13.5
45-49	314	269,782	17.3	15.1	19.8
50-54	417	320,038	24.6	22.1	27.3
55-59	452	307,047	30.0	27.1	33.1
60-64	370	291,817	37.9	34.1	41.9
65-69	259	195,057	39.5	34.9	44.3
70-74	219	149,125	40.8	34.3	47.6
75+	237	178,077	42.0	36.8	47.5
<i>Ethnicity</i>					
Malay	1588	1,176,648	13.4	12.5	14.3
Chinese	634	631,199	14.0	12.6	15.6
Indians	237	158,641	12.7	10.9	14.8
Other Bumiputras	272	245,467	12.9	10.8	15.2
Others	80	60,040	4.8	3.2	7.2
<i>Marital Status</i>					
Single	159	166,190	3.3	2.7	4.0
Married	2149	1,748,579	15.1	14.3	16.0
Widow/widower/divorcee	503	357,226	33.4	30.5	36.5

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>Education Level</i>					
No formal education	456	314,683	29.3	26.1	32.6
Primary education	1037	772,423	20.4	18.8	22.1
Secondary education	975	860,574	10.3	9.5	11.2
Tertiary education	309	300,716	7.1	6.2	8.2
Unclassified education	19	13,104	8.1	4.8	13.5
<i>Occupation</i>					
Government/semi government employee	262	199,432	11.0	9.4	12.9
Private employee	444	453,381	6.7	6.0	7.5
Self employed	521	431,050	13.3	11.9	14.8
Unpaid worker/home maker	346	262,512	9.7	8.5	11.1
Retiree	698	529,523	40.0	37.0	43.2
<i>Income Group</i>					
Less than RM 400	326	241,595	20.5	18.0	23.3
RM 400 - RM 699	184	129,594	16.2	13.6	19.3
RM 700 - RM 999	224	152,572	14.7	12.5	17.3
RM 1000 - RM 1999	526	395,739	12.4	11.1	13.7
RM 2000 - RM 2999	432	365,774	12.3	10.7	14.1
RM 3000 - RM 3999	367	298,023	12.4	10.8	14.1
RM 4000 - RM 4999	213	212,716	11.5	9.5	13.9
RM 5000 & above	539	475,983	11.2	10.1	12.5

Table 1.2.3 Prevalence of undiagnosed hypertension by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	3889	3,505,286	19.8	19.0	20.7
<i>State</i>					
Johor	363	474,184	22.4	19.6	25.5
Kedah	295	274,210	24.0	20.4	27.9
Kelantan	198	144,375	16.9	13.7	20.6
Melaka	200	87,851	16.9	14.2	19.9
Negeri Sembilan	215	121,546	19.0	15.9	22.4
Pahang	194	153,506	17.9	15.2	21
Penang	252	185,065	17.2	14.5	20.3
Perak	290	363,938	24.9	22.1	27.8
Perlis	288	39,859	28.3	24.8	32.1
Selangor	504	646,099	17.4	15.6	19.3
Terengganu	204	96,687	16.3	13.4	19.7
Sabah & WP Labuan	406	357,047	18.8	16.5	21.3
Sarawak	304	375,623	25.9	22.7	29.3
WP Kuala Lumpur	100	179,439	15.3	11.8	19.8
WP Putrajaya	76	5,855	12.7	9.9	16.2
<i>Location</i>					
Urban	2085	2,431,594	18.8	17.7	19.9
Rural	1804	1,073,692	22.7	21.3	24.1
<i>Sex</i>					
Male	1961	1,966,454	21.8	20.6	23.1
Female	1928	1,538,831	17.8	16.8	18.8
<i>Age Group</i>					
18-19	56	63,017	7.1	5.2	9.7
20-24	192	266,034	9.9	8.3	11.7
25-29	232	291,101	11.3	9.5	13.3
30-34	316	367,739	17.9	15.8	20.3
35-39	360	362,990	19.8	17.4	22.4
40-44	463	412,309	24.2	21.7	26.9
45-49	470	416,507	26.7	24.0	29.6
50-54	466	351,586	27.0	24.5	29.7
55-59	461	316,689	31.0	27.8	34.3
60-64	303	236,416	30.7	27.3	34.4
65-69	228	171,200	34.7	30.1	39.5
70-74	167	116,991	32.0	26.8	37.7
75+	175	132,705	31.3	26.6	36.5
<i>Ethnicity</i>					
Malay	2283	1,812,739	20.6	19.5	21.7
Chinese	701	821,915	18.3	16.5	20.2
Indians	287	222,284	17.9	15.3	20.7
Other Bumiputras	404	448,996	23.6	21.2	26.2
Others	214	199,352	16.0	13.3	19.3
<i>Marital Status</i>					
Single	548	655,701	13.0	11.6	14.5
Married	2895	2,533,496	21.9	20.9	23
Widow/widower/divorcee	444	314,953	29.5	26.5	32.7

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>Education Level</i>					
No formal education	421	290,806	27.1	24.0	30.3
Primary education	1212	987,234	26.1	24.2	28
Secondary education	1675	1,610,498	19.3	18.2	20.4
Tertiary education	545	576,628	13.6	12.2	15.2
Unclassified education	22	22,590	14.0	8.6	22
<i>Occupation</i>					
Government/semi government employee	669	539,131	29.9	27.0	33.0
Private employee	1034	1,144,679	16.9	15.7	18.2
Self employed	905	735,783	22.7	20.9	24.6
Unpaid worker/home maker	1201	980,715	36.4	34.3	38.6
Retiree	540	428,857	32.4	29.6	35.4
<i>Income Group</i>					
Less than RM 400	355	321,671	27.3	23.8	31.1
RM 400 - RM 699	250	173,719	21.7	18.6	25.2
RM 700 - RM 999	286	234,844	22.6	19.8	25.8
RM 1000 - RM 1999	855	688,089	21.5	19.7	23.4
RM 2000 - RM 2999	671	592,884	20.0	18.2	21.8
RM 3000 - RM 3999	495	466,808	19.4	17.3	21.6
RM 4000 - RM 4999	324	327,461	17.7	15.3	20.4
RM 5000 & above	653	699,809	16.5	14.9	18.3

Table 1.3.1 Prevalence of overall hypercholesterolemia by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	7011	6,167,623	35.1	33.9	36.2
<i>State</i>					
Johor	651	792,896	37.7	33.5	42.2
Kedah	491	494,521	43.4	39.6	47.4
Kelantan	405	288,889	33.8	29.0	38.9
Melaka	436	184,906	35.9	31.1	41.0
Negeri Sembilan	435	251,890	39.7	34.6	45.1
Pahang	337	269,530	31.7	27.2	36.5
Penang	444	351,045	32.7	29.7	35.8
Perak	508	655,512	45.0	40.9	49.2
Perlis	466	63,522	45.1	40.7	49.5
Selangor	953	1,186,027	31.9	29.5	34.5
Terengganu	406	205,906	34.9	31.1	38.9
Sabah & WP Labuan	673	588,365	31.1	27.9	34.5
Sarawak	421	485,414	33.5	30.3	36.8
WP Kuala Lumpur	200	333,948	29.4	23.9	35.5
WP Putrajaya	185	15,252	33.3	28.6	38.3
<i>Location</i>					
Urban	3995	4,424,659	34.3	32.9	35.7
Rural	3016	1,742,964	37.0	35.1	39.0
<i>Sex</i>					
Male	2775	2,705,633	30.1	28.7	31.6
Female	4236	3,461,990	40.2	38.7	41.7
<i>Age Group</i>					
18-19	91	99,282	11.3	8.9	14.4
20-24	365	466,516	17.4	15.4	19.6
25-29	498	578,871	22.4	20.2	24.8
30-34	575	618,633	30.4	28.0	32.9
35-39	641	630,306	34.6	31.6	37.7
40-44	757	690,081	40.5	37.7	43.5
45-49	847	721,925	46.7	43.6	49.8
50-54	907	665,732	51.4	48.5	54.4
55-59	852	568,826	55.9	52.4	59.4
60-64	547	427,029	55.7	51.5	59.9
65-69	366	279,707	57.2	52.3	62.0
70-74	270	194,293	53.9	47.7	60.1
75+	295	226,423	54.2	48.5	59.7
<i>Ethnicity</i>					
Malay	4224	3,354,723	38.4	36.9	39.8
Chinese	1334	1,495,309	33.4	31.2	35.7
Indians	550	440,125	35.5	31.9	39.2
Other Bumiputras	569	566,017	29.8	27.1	32.6
Others	334	311,449	25.2	20.9	30.2
<i>Marital Status</i>					
Single	839	975,885	19.4	17.9	21.0
Married	5369	4,605,920	40.0	38.9	41.1
Widow/widower/divorcee	802	584,382	55.5	52.3	58.6

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>Education Level</i>					
No formal education	689	480,759	45.4	42.0	48.7
Primary education	1974	1,545,852	41.0	39.1	43.0
Secondary education	2951	2,724,244	32.7	31.5	34.0
Tertiary education	1333	1,363,139	32.4	30.6	34.3
Unclassified education	39	33,033	20.8	14.6	28.7
<i>Occupation</i>					
Government employee	809	648,563	41.8	38.8	44.8
Semi government employee	112	104,647	42.0	34.8	49.5
Private employee	1644	1,780,549	26.4	25.0	27.8
Self employed	1441	1,180,550	36.6	34.6	38.6
Unpaid worker/home maker					
Retiree	945	748,846	57.0	54.0	60.0
<i>Income Group</i>					
Less than RM 400	627	516,301	40.0	36.8	43.4
RM 400 - RM 699	325	228,321	33.6	29.7	37.7
RM 700 - RM 999	476	375,661	36.4	33.0	39.8
RM 1000 - RM 1999	1379	1,087,251	34.1	32.1	36.1
RM 2000 - RM 2999	1152	1,004,678	34.0	31.9	36.2
RM 3000 - RM 3999	897	828,426	34.6	32.2	37.0
RM 4000 - RM 4999	607	616,291	33.7	30.8	36.6
RM 5000 & above	1548	1,510,692	35.8	33.9	37.7

Table 1.3.2 Prevalence of known hypercholesterolemia by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	1691	1,478,453	8.4	7.8	9.0
<i>State</i>					
Johor	176	212,412	10.1	8.1	12.6
Kedah	87	89,712	7.9	5.7	10.8
Kelantan	46	30,410	3.6	2.6	4.9
Melaka	123	41,267	8.0	5.9	10.7
Negeri Sembilan	112	54,918	8.7	7.0	10.7
Pahang	68	55,584	6.5	4.5	9.4
Penang	110	84,887	7.9	5.8	10.6
Perak	151	200,642	13.8	11.6	16.3
Perlis	100	12,684	9.0	7.0	11.5
Selangor	270	314,005	8.5	7.1	10.1
Terengganu	59	26,076	4.4	3.3	6.0
Sabah & WP Labuan	141	99,943	5.3	4.1	6.8
Sarawak	118	129,043	8.9	7.2	11.0
WP Kuala Lumpur	80	122,717	10.8	8.0	14.4
WP Putrajaya	50	4,154	9.1	6.1	13.4
<i>Location</i>					
Urban	1080	1,167,466	9.1	8.3	9.9
Rural	611	310,988	6.6	5.9	7.4
<i>Sex</i>					
Male	765	769,913	8.6	7.8	9.4
Female	926	708,540	8.2	7.5	9.0
<i>Age Group</i>					
18-19	5	5,386	0.6	0.2	1.6
20-24	24	35,182	1.3	0.8	2.1
25-29	46	65,537	2.5	1.7	3.7
30-34	63	78,834	3.9	2.9	5.2
35-39	93	98,297	5.4	4.0	7.2
40-44	144	147,940	8.7	7.2	10.5
45-49	227	210,033	13.6	11.4	16.1
50-54	266	201,539	15.6	13.4	18.1
55-59	282	189,817	18.7	16.3	21.3
60-64	220	182,342	23.8	20.4	27.6
65-69	128	110,477	22.6	18.6	27.2
70-74	97	79,215	22.0	16.0	19.4
75+	96	73,855	17.7	13.4	23.0
<i>Ethnicity</i>					
Malay	896	703,138	8.0	7.3	8.8
Chinese	449	502,037	11.2	9.8	12.8
Indians	192	140,747	11.3	9.4	13.7
Other Bumiputras	118	112,382	5.9	4.7	7.4
Others	36	20,149	1.6	0.8	3.3
<i>Marital Status</i>					
Single	109	139,215	2.8	2.2	3.5
Married	1347	1,179,496	10.3	9.6	11.0
Widow/widower/divorcee	235	159,743	15.2	13.0	17.6

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>Education Level</i>					
No formal education	155	107,314	10.1	8.4	12.2
Primary education	554	423,624	11.2	10.1	12.5
Secondary education	661	606,579	7.3	6.6	8.1
Tertiary education	307	327,596	7.8	6.8	8.9
Unclassified education	8	7,381	4.6	2.1	9.9
<i>Occupation</i>					
Government/semi government employee	252	214,078	11.9	10.1	13.9
Private employee	325	345,592	5.1	4.5	5.9
Self employed	304	254,347	7.9	6.8	9.1
Unpaid worker/home maker	346	262,512	9.7	8.5	11.1
Home maker	345	262,449	9.9	8.7	11.2
Retiree	345	296,192	22.6	19.8	25.6
<i>Income Group</i>					
Less than RM 400	165	133,588	10.4	8.6	12.4
RM 400 - RM 699	56	35,667	5.2	3.8	7.2
RM 700 - RM 999	107	74,658	7.2	5.7	9.1
RM 1000 - RM 1999	277	202,860	6.4	5.5	7.4
RM 2000 - RM 2999	232	202,958	6.9	5.7	8.3
RM 3000 - RM 3999	220	206,250	8.6	7.2	10.2
RM 4000 - RM 4999	169	163,449	8.9	7.5	10.6
RM 5000 & above	465	459,024	10.9	9.7	12.2

Table 1.3.3 Prevalence of undiagnosed hypercholesterolemia by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	5320	4,689,169	26.6	25.6	27.7
<i>State</i>					
Johor	475	580,484	27.6	24.3	31.3
Kedah	404	404,809	35.5	31.3	40.1
Kelantan	359	258,479	30.2	25.7	35.1
Melaka	313	143,638	27.9	23.6	32.6
Negeri Sembilan	323	196,972	31.1	25.9	36.8
Pahang	269	213,945	25.2	21.2	29.6
Penang	334	266,159	24.8	22.4	27.3
Perak	357	454,871	31.2	27.6	35.1
Perlis	366	50,838	36.1	32.1	40.3
Selangor	683	872,022	23.5	21.5	25.6
Terengganu	347	179,831	30.4	26.7	34.4
Sabah & WP Labuan	532	488,422	25.8	22.9	29.0
Sarawak	303	356,371	24.6	21.8	27.6
WP Kuala Lumpur	120	211,231	18.6	14.3	23.7
WP Putrajaya	135	11,098	24.2	20.2	28.8
<i>Location</i>					
Urban	2915	3,257,193	25.3	24.1	26.5
Rural	2405	1,431,976	30.4	28.6	32.3
<i>Sex</i>					
Male	2010	1,935,719	21.5	20.3	22.8
Female	3310	2,753,450	32.0	30.6	33.3
<i>Age Group</i>					
18-19	86	93,896	10.7	8.3	13.7
20-24	341	431,333	16.1	14.1	18.2
25-29	452	513,334	19.9	17.8	22.1
30-34	512	539,800	26.5	24.2	28.9
35-39	548	532,009	29.2	26.5	32.1
40-44	613	542,141	31.9	29.3	34.6
45-49	620	511,891	33.1	30.3	36.1
50-54	641	464,193	35.9	33.2	38.7
55-59	570	379,009	37.3	33.9	40.7
60-64	327	244,687	31.9	28.6	35.5
65-69	238	169,230	34.6	30.0	39.5
70-74	173	115,077	32.0	26.8	37.5
75+	199	152,568	36.5	31.0	42.3
<i>Ethnicity</i>					
Malay	3328	2,651,585	30.3	29.0	31.7
Chinese	885	993,272	22.2	20.4	24.0
Indians	358	299,377	24.1	20.8	27.7
Other Bumiputras	451	453,635	23.9	21.3	26.7
Others	298	291,299	23.6	19.5	28.3
<i>Marital Status</i>					
Single	730	836,671	16.6	15.2	18.1
Married	4022	3,426,424	29.8	28.8	30.8
Widow/widower/divorcee	567	424,639	40.3	37.2	43.5

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>Education Level</i>					
No formal education	534	373,445	35.2	32.1	38.5
Primary education	1420	1,122,228	29.8	28.1	31.6
Secondary education	2290	2,117,666	25.5	24.3	26.6
Tertiary education	1026	1,035,543	24.6	23.0	26.4
Unclassified education	31	25,652	16.2	10.8	23.5
<i>Occupation</i>					
Government/semi government employee	390	310,211	17.2	15.2	19.4
Private employee	1319	1,434,957	21.3	20.0	22.6
Self employed	1137	926,202	28.7	26.8	30.6
Unpaid worker/home maker	765	631,043	23.3	21.4	25.2
Home maker	1191	969,543	36.5	34.5	38.6
Retiree	600	452,653	34.5	31.6	37.5
<i>Income Group</i>					
Less than RM 400	462	382,713	29.7	26.8	32.8
RM 400 - RM 699	269	192,654	28.3	24.7	32.3
RM 700 - RM 999	369	301,003	29.1	26.0	32.4
RM 1000 - RM 1999	1102	884,391	27.7	25.9	29.7
RM 2000 - RM 2999	920	801,721	27.1	25.2	29.1
RM 3000 - RM 3999	677	622,176	25.9	23.8	28.2
RM 4000 - RM 4999	438	452,843	24.7	22.2	27.5
RM 5000 & above	1083	1,051,668	24.9	23.3	26.6

TOPIC 2

NUTRITIONAL STATUS/DIETARY PRACTICES

2. PREVALENCE OF NUTRITIONAL STATUS/DIETARY PRACTICES

2.1 NUTRITIONAL STATUS OF MALAYSIAN ADULTS (AGED ≥ 18 YEARS OLD)

Contributors to this section: Ahmad Ali Zainuddin, Kee Chee Cheong, Khor Geok Lin, Rusidah Selamat, Suhaila Abdul Ghaffar, Poh Bee Koon, Azli Baharuddin, Ng Chee Kai, Norimah Ab Karim, Fatimah Salim, Jamaluddin Ab Rahman, Noor Ani Ahmad.

2.1.1 Findings

Based on the classification from the Malaysian Clinical Practice Guidelines on Management of Obesity (2004), the national prevalence of underweight among the adults was 8.3% (95% CI: 7.7 - 9.0), while that of normal weight was 31.2% (95% CI: 30.0 - 32.3). The prevalence of pre-obese and obese adults was 33.3% (95% CI: 32.4 - 34.3) and 27.2% (95% CI: 26.2 - 28.3) respectively. Among the states, Perlis had the highest obesity prevalence [34.6% (95% CI: 31.1 - 38.2)] followed by Perak [30.1% (25.7 - 34.9)] and Kelantan [29.4% (95% CI: 26.9 - 32.0)]. In contrast, Sabah and Wilayah Persekutuan Labuan had the lowest prevalence of obesity [21.1% (95% CI: 17.9 - 24.7)]. The Wilayah Persekutuan Kuala Lumpur and Sarawak also had relatively lower prevalence levels at 22.8% (95% CI: 18.5 - 27.8) and 26.7% (95% CI: 23.2 - 30.5) respectively. There was no significant difference in obesity prevalence between the urban [27.3% (95% CI: 26.0 - 28.60)] and rural areas [26.9% (95% CI: 25.3 - 28.5)]. The prevalence of obesity was significantly higher in women [29.6% (95% CI: 28.2 - 31.1)] compared to men [25.0% (95% CI: 23.6 - 26.30)]. The highest obesity prevalence was among adults aged 45-49 years [35.2% (95% CI: 32.1 - 38.3)] followed by the 55-59 years group [34.4% (95% CI: 31.2 - 37.8)] and 50-54 years 32.6% (95% CI: 30.0 - 35.5). Comparison among the ethnic groups showed that Indians had the highest prevalence of obesity [35.8% (95% CI: 32.4 - 39.3)], followed by Malays [32.0% (95% CI: 30.6 - 33.4)], the Other Bumiputras [25.3% (95% CI: 22.0 - 28.8)], Chinese [19.7 (95% CI: 17.9 - 21.6)] and Others [13.8 (95% CI: 10.4 - 18.0)]. The differences in obesity prevalence were statistically significant between the Indians and Chinese, and between the Malays and Chinese.

In comparison with the Malaysian Clinical Practice Guidelines (2004), the classification of the World Health Organization (1998) showed an overall higher prevalence of normal weight but lower proportions of pre-obese and obese adults. There were 47.2% (95% CI: 46.02 - 48.4) normal weight, 29.4% (95% CI: 28.4 - 30.4) pre-obese and 15.1% (95% CI: 14.3 - 15.9) obese, while 8.3% (95% CI: 7.72 - 8.99) were underweight (WHO, 1998). Likewise, the WHO classification showed comparatively lower obesity prevalence for the other parameters.

As for assessing central obesity or abdominal obesity, the International Diabetes Institute/Western Pacific World Health Organization/ International Association for the study of Obesity/International Obesity Task Force (WHO/IASO/IOTF, 2000) has recommended the use of waist circumference (WC) cut-offs > 90 cm for men and >80 cm for women. The national prevalence of abdominal obesity was 43.0% (95% CI: 41.7 - 44.3). Among the states, Kedah [58.1% (95% CI: 53.8 - 62.3)] had the highest prevalence of abdominal obesity followed by Perlis [57.4% (95% CI: 52.3 - 62.4)] and Perak [55.7% (95% CI: 55.7 - 51.6)]. Abdominal obesity prevalence was slightly higher in the urban areas [43.8% (95% CI: 42.2 - 45.4)] as compared to the rural areas [40.7% (95% CI: 38.6 - 42.9)] but this difference was not statistically significant. Women showed a significantly higher prevalence of abdominal obesity [51.3% (95% CI: 49.6 - 52.9)] than men [35.4% (95% CI: 42.3 - 45.7)]. The prevalence of abdominal obesity increased with age peaking at 65 to 69 years. Approximately 60% the adults between 50- 69 years had abdominal obesity. Among the three major ethnic groups, the abdominal obesity prevalence was significantly higher among the Indians [61.8% (95% CI: 58.3 - 65.2)] than the Malays and [45.3% (95% CI: 43.8 - 46.8)] Chinese [40.4% (95% CI: 38.0 - 42.7)] as shown in Table 2.1.8.

In using the calf circumference to identify individuals aged 60 year and above at risk of malnutrition or peripheral muscle wasting (<30.1 cm for men and <27.3cm for women) (Sakinah et al. 2004), the survey found an overall prevalence of peripheral muscular wasting of 19.5% (95% CI: 17.5 - 21.7). Older persons from rural areas had significantly increased risk of malnutrition [24.2% (95% CI: 21.2 - 27.5)] compared to those living in rural areas [16.9% (95% CI: 14.4 - 19.80)]. The prevalence of increased risk of malnutrition became higher with age. Men showed a significantly higher risk of peripheral muscle wasting [21.9% (95% CI: 18.8 - 25.3)] than women [17.2% (95% CI: 14.9 - 19.8)] as shown in Table 2.1.10.

2.1.2 Implications

Overweight and obesity have become a major public health problem. Based on the Malaysia CPG (2004) classification, approximately 60% of Malaysian adults were pre-obese and obese. In addition, it was estimated 40% of the adults had abdominal obesity. When compared the obesity prevalence using the BMI cut-off value of 27.5 kg/m² for defining obesity, the NHMS 2011 found that the prevalence of obesity (27.2%) was slightly higher than that in 2006 (26.2%). The increasing prevalence of obesity threatens public health and clinical care burden of this country, notably in light of the increasing prevalence of non-communicable diseases, including type 2 diabetes mellitus, cardiovascular disease, metabolic syndrome, and cancers. Increased resources and innovative strategies are needed to address this public health challenge.

2.1.3 Conclusion

The findings of NHMS 2011 showed that the prevalence of overweight and obesity (29.4% and 15.1%) was comparable to that reported in NHMS III 2006 (28.6% and 14.0%) based on the WHO (1998) classification. However, based on the Malaysian Clinical Practice Guidelines on Management of Obesity (2004) classification, it was estimated that more than 60% of Malaysian adults were pre-obese and obese. The overall prevalence of abdominal obesity (>90cm for men and >80 cm for women) was 43.0%. It was found that women, Indians ethnicity and age of 50 to 69 years were at greater risk of having abdominal obesity. The prevalence of peripheral muscle wasting or risk of malnutrition among the older people was not markedly lower compared to the NHMS III (19.5% vs 19.9%). It was observed that those living in rural areas and older had increased risk of malnutrition compared to their counterparts in urban areas.

2.1.4 Recommendations

There is increasing evidence that the current international recommendation for classification of overweight and obesity may not be appropriate for Asian countries. Studies found that Asian populations had the higher risk of diabetes mellitus and cardiovascular disease as compared to Western populations at lower BMI cut-off values. Hence, it is suggested that studies be conducted to identify specific BMI cut-off values for overweight and obesity based on their associations with the risk of co-morbidities for Malaysian adults. These cut-off values will serve as public health action points for formulating public health policy, to enhance existing health promotion programs and to evaluate the effectiveness of intervention programmes.

Recent studies revealed that waist circumference (WC) measurement is a better predictor of type II diabetes, metabolic syndrome and cardiovascular disease as compared to BMI. WC measurement is being used as surrogate for assessment of abdominal fat adiposity because it is a simple, inexpensive, convenient and reliable tool. Therefore, WC should be measured in routine clinical practice and health screening programmes for identification of those at risk of type II diabetes, metabolic syndrome and cardiovascular disease and targeted for early weight management.

There were gender and ethnic disparities in the prevalence of overweight and obesity. We propose further studies should be undertaken to identify factors that might contribute to differences in obesity prevalence, including dietary preferences and patterns, socio-cultural characteristics, lifestyle and genetic factors.

Collaborative efforts among the health authority, private organizations and the communities should be enhanced toward the prevention of overweight and obesity including building more public sport facilities and exemption of taxes for purchasing of sports or exercise equipment, providing incentives to those having normal body weight such as deduction of individual income tax and cost of medical insurance coverage.

In targeting young people to practice healthy lifestyles, social-networks such as the Facebook, Twitter, and Blogs should be made greater use of, besides the printed and electronic media. Health promotion should focus on the spreading of positive health behaviours. There should be greater emphasis on physical activity and healthy eating habits in compliance with the Malaysian Dietary Guidelines to facilitate weight changes among those who are overweight and obese.

2.2 DIETARY BEHAVIOUR OF ADULTS (AGED \geq 18 YEARS OLD)

Contributors to this section: Rusidah Selamat, Norimah Ab Karim, Ahmad Ali Zainuddin, Azli Baharudin, Suhaila Abdul Ghaffar, Khor Geok Lin, Poh Bee Koon, Ng Chee Kai, Kee Chee Cheong, Fatimah Salim, Jamaluddin Ab Rahman, Noor Ani Ahmad.

2.2.1 Findings

As recommended by WHO, intake of five servings of fruits and/or vegetables daily is important for the prevention of chronic disease. However, our findings showed that there were 92.5 % (95% CI: 92.0 - 92.9) of Malaysian adults not taking adequate fruits and/or vegetables as recommended intake by WHO. By state, the highest proportion of adults not taking adequate fruits and/or vegetables was in Melaka at 95.7% (95% CI: 94.0 - 97.0) and lowest in Selangor at 89.8% (95% CI: 88.5-91.0). In addition, by age groups, the highest proportion of inadequate intake of fruits and/or vegetables was noted among young adults aged 18-19 years at 97.45% (95% CI: 96.0 - 98.4).

Meanwhile, the Malaysian Dietary Guidelines (MDG) has recommended daily intake of at least three servings of vegetables and two servings of fruits. However, our findings showed that only 15.5% (95% CI: 14.9 - 16.2) and 13.7% (95% CI: 13.0 - 14.3) of Malaysian adults (\geq 18 years old) had met the recommendations for vegetables and fruits intake respectively. The consumption of fruits was slightly higher in urban areas at 16.4% (95% CI: 15.5 -17.2) compared to rural areas at 13.3% (95% CI: 12.3 - 14.2). [However, intakes of vegetables are significant to both areas at 13.8% (95% CI: 13.1 - 4.7) and 13.1% (95% CI: 12.1 - 14.2)]. The proportion of fruit intake was significantly higher among female [16.6% (95% CI: 15.7 - 17.5)] than male [14.5% (95% CI: 13.6 - 15.5)]. Meanwhile, there was no significant different in vegetable consumption between males and females at 13.8% (95% CI: 12.7 - 14.4) and 13.5% (95% CI: 12.8 - 14.7) respectively.

The proportion of adults taking 3 cups or more of drinks with added sweetened condensed milk/creamer was significantly higher in males [18.3% (95% CI: 17.2 - 19.3)] than that in females [9.0% (95% CI: 8.3 - 9.7)]. By ethnicity, the intake of drinks with sweetened condensed milk/creamer was highest among Indians at 19.7% (95% CI: 17.1 - 22.7).

There was a higher proportion of rural population [81.7% (95% CI: 80.5 - 82.8)] taking breakfast everyday as compared to urban population [78.2%; (95% CI: 77.2 - 79.2)]. The proportion by gender also showed that, eating breakfast daily was more commonly practiced by female adults [80.4% (95% CI: 79.3 - 81.5)] than in male adults [77.9% (95% CI: 76.7 - 79.1)]. As for taking heavy meals after dinner, there was a higher proportion of urban adults than rural adults at 27.3% and 19.8% respectively and it was higher in male at 31.7% than in female at 28.7%.

2.2.2 Implications

Apart from physical inactivity, unhealthy diet is one of the key contributing factors for chronic Non-Communicable Diseases (NCD) such as diabetes, coronary heart disease, hypertension, cancers and obesity which have become global or public health problems especially in Malaysia.

2.2.3 Conclusion

In general, the consumptions of adequate fruits and/or vegetables among adults was low for both urban and rural areas in Malaysia. In addition, the overall proportion for the intake of drinks with added sweetened condensed milk/creamer in a day was relatively high in the population. Taking daily breakfast was still commonly practiced among both urban and rural population while taking heavy meals after dinner was not commonly practiced across the age groups except for urban female adults.

2.2.4 Recommendations

Recognizing the key roles of healthy diet, specifically adequate consumption of fruit and/or vegetables in the prevention of cardiovascular diseases, cancer and diabetes, it is therefore greatly necessary to have long term solutions to the nutritional problems in Malaysia. Specific intervention strategies for Malaysian population at large are urgently needed since the economic cost of non-communicable diseases (NCD) is intolerable. As highlighted in the National Plan of Action for Nutrition Malaysia (NPANM), a concerted effort for more comprehensive policies and multi-sectoral collaboration to support the behavioural changes towards healthier eating practices among Malaysians. In the meantime, availability of cheaper local fruits should be the national agenda. Inculcating healthy eating habits especially for vegetables consumption should start at early age.

2.3 NUTRITIONAL STATUS OF MALAYSIAN CHILDREN (AGED < 18 YEARS OLD)

Contributors to this section: Azli Baharudin, Rusidah Selamat, Khor Geok Lin, Ahmad Ali Zainuddin, Poh Bee Koon, Kee Chee Cheong, Suhaila Abdul Ghaffar, Ng Chee Kai, Norimah Ab Karim, Fatimah Salim, Jamaluddin Ab Rahman, Noor Ani Ahmad.

2.3.1 Findings

Nutritional status for children below 18 years old was calculated based on Centre of Disease Control Growth Chart (CDC Growth Chart) 2000. There were three major indices used to reflect nutritional status that were height for age z-score (HAZ), [body mass index (BMI) for age] and weight for age (WAZ).

The findings of the survey showed that the national prevalence of thinness (BMI for age < -2SD), was 12.2% (95% CI: 11.3 - 13.3). The state of Sabah/Labuan had the highest thinness prevalence [15.0% (95% CI: 11.2 - 19.9)] and lowest in Penang at 9.9% (95% CI: 6.9 - 14.9). The prevalence of thinness was higher in urban areas than in rural areas [12.8% (95% CI: 11.5 - 14.2) vs 11.0% (95% CI: 9.9 - 12.3)] and among male children at 13.6% (95% CI: 13.6 - 15.2). By age groups, the highest prevalence was noted among children aged below 5 years [18.7% (95% CI: 16.2 - 21.3)] and lowest among children aged 15-17 years old [11.2% (95% CI: 8.8 - 14.1)]. According to the ethnic groups, Indians had the highest prevalence of thinness [21.2% (95% CI: 17.0-26.1)], followed by Other Bumiputras [15.3% (11.6 - 19.8)], while low prevalence was found in Chinese ethnic [8.6% (95% CI: 6.9 - 10.6)].

Meanwhile, national prevalence of obesity (BMI for age > +2SD) was only 6.1% (95% CI: 5.6 - 6.8). The state of Perak had the highest obesity prevalence [9.0% (95% CI: 6.3 - 12.8)] and lowest in Sabah/Labuan at 3.2% (95% CI: 2.3 - 4.6). The obesity prevalence was higher among children in urban areas at 6.5% (95% CI: 5.7 - 7.3) than in rural areas and also among male [7.6% (95% CI: 6.7 - 8.7)] than female. By age groups, the highest prevalence was noted among children aged 5-9 years [6.7% (95% CI: 5.7 - 7.9)] and lowest among children aged 15-17 years old [4.9% (95% CI: 3.6 - 6.5)]. Among ethnic groups, Indians had the highest prevalence of obesity [7.8% (95% CI: 4.7 - 2.5)], followed by Malays and Other Bumiputras respectively [7.0% (95% CI: 6.3 - 7.9)] and [5.1 (95% CI: 3.8 - 6.9)].

The national prevalence of stunting (height for age < -2SD) among children was 13.4% (95% CI: 12.5 - 14.4) which was higher in rural areas at 15.8% (95% CI: 14.5 - 17.3). The highest prevalence of stunting was noted in Sabah/Labuan at 19.8% (95% CI: 16.3 - 23.9) and lowest in Putrajaya at 6.3% (95% CI: 3.9 - 10.1). By age group, the highest prevalence of stunting was noted among children aged 15-17 years at 16.3% (95% CI: 13.8 - 19.2) and lowest among children below 5 years old at 11.3% (95% CI: 10.0 - 12.8). Comparisons of ethnic groups, Other Bumiputras had the highest prevalence of stunting at [20.7% (95% CI: 17.1 - 24.7)], followed by Malay [19.5% (95% CI: 13.5 - 15.6)].

2.3.2 Implications

Thinness and stunting as a form of malnutrition are more prevalent than obesity. Even though the prevalence of obesity is small, but the impact affects not only the children, but also the family, the society and the nation in the future. The increasing prevalence of obesity has threatened the public health and clinical care of this country, notably the increasing prevalence of non-communicable diseases, including type 2 diabetes mellitus, cardiovascular disease, metabolic syndrome, and cancers. That will mean more resources such as the increasing national health care expenditure and more trained health personnel will be pooled to handle this issue.

2.3.3 Conclusion

In conclusion, this survey suggests that the prevalence of stunting is predominantly in rural areas compared to urban areas. Prevalence of thinness and obesity are both obviously higher in urban areas compared to rural areas. Inappropriate dietary intakes during adolescence can have several consequences. It can potentially retard physical growth, reduce intellectual capacity and delay sexual maturation. Rapid physical growth creates an increased demand for energy and nutrients. It may also affect concentration, learning and school performance in school going adolescents. Long-term implications such as low calcium intake during adolescence is associated with low bone density and an increased risk for osteoporosis later in life. Being overweight as an adolescent is associated with higher risk for diabetes as an adult; and high fat intake during adolescence and adulthood is associated with an increased risk of heart disease. Furthermore, stunting and underweight among girls during adolescence, continuing into adulthood, and early pregnancies, increases the obstetric risk for women. Thus, the compromised nutritional status and poor growth in adolescent years affects the reproductive role.

2.3.4 Recommendations

The result indicates the need for continued efforts of all stakeholders including the non-governmental agencies, towards further improving the status of Malaysian children especially those aged 18 years old and below. Studies should be undertaken to identify the determinants including socio cultural factors, which may have contributed to the prevalence of thinness and stunting. The varying levels of prevalence of thinness, stunting and obesity in rural and urban stresses the need to further investigate the underlying factors that have influenced the variation.

2.4 DIETARY BEHAVIOURS OF CHILDREN (AGED 13 - <18 YEARS OLD)

Contributors to this section: Suhaila Abdul Ghaffar, Rusidah Selamat, Norimah Ab Karim, Khor Geok Lin, Poh Bee Koon, Ng Chee Kai, Azli Baharudin, Kee Chee Cheong, Ahmad Ali Zainuddin, Fatimah Salim, Jamaluddin Ab Rahman, Noor Ani Ahmad.

2.4.1 Findings

The World Health Organisation (WHO) and Food and Agriculture Organisation (FAO) have recommended all nations to increase fruits and vegetables intake to five servings per day (WHO, 2002). However, the findings from National Health and Morbidity Survey 2011 revealed that 96.3% (95% CI: 95.3 - 97.1) of population aged 13 to less than 18 years old consumed less than the recommended servings (Table 2.4.1). The findings also indicated that the prevalence of this age group did not fulfill the recommended servings; urban and rural area were 96.9% (95% CI: 95.7 - 97.8) and 94.9% (95% CI: 93.1 - 96.3) respectively.

Meanwhile, slightly different percentages were derived by using Malaysian Dietary Guidelines (MDG), where 90.9% (95% CI: 89.6 - 92.2) of older adolescents were taking less than two servings of fruits and 89.4% (95% CI: 87.8 - 90.8) less than three servings of vegetables (Table 2.4.2). The consumption of fruits was higher among female respondents [10.3% (95% CI: 9.3 - 11.3)] compared to male respondents [7.9% (95% CI: 6.4 - 9.7)]. In contrast, male respondents consumed more vegetables [12.1% (95% CI: 9.9 - 14.6)] compared to female respondents [9.0% (95% CI: 7.3 - 11.1)].

In this survey, the finding indicates that 6.7% (95% CI: 5.7 - 7.8) of older adolescents consumed more than three cups of drinks with added sugar. Malays had highest intakes of 9.9% (95% CI: 8.4 - 11.8) compared to other ethnic groups. The consumption patterns were noticeably different between gender, whereby male consumed slightly higher [7.4% (95% CI: 6.0 - 9.1)] than female [5.9% (95% CI: 4.7 - 7.6)].

The finding states that 15.1% (95% CI: 13.5 - 16.8) of older adolescents consumed two to three cups of drinks with sweetened condensed milk, followed by 8.4% (95% CI: 7.3 - 9.7) of the respondents who consumed more than three cups per day. However, majority of the population [76.5%] consumed less than two cups of drinks with sweetened condensed milk. Again, Malays had a higher percentage compared to other ethnic groups.

Nearly half of the population consumed less than two cups of carbonated drinks per day and only 7% (95% CI: 5.9 - 8.4) of them consumed more than two cups everyday which are considered as high intakes for young population.

This survey showed that less than three quarters of the respondents (67.2%) had breakfast daily and the number of female and male respondents who had breakfast everyday is almost similar. In addition, similar trend was also observed at rural and urban areas where the percentage of breakfast consumption were 66.7% (95% CI: 60.5 - 72.9) and 67.7% (95% CI: 64.8 - 70.6) respectively.

With regard to heavy meals after dinner, 70.7% of older adolescents claimed they had never consumed heavy meals after dinner in a week. In contrast, 7.3% (95% CI: 5.9 - 9.1) of urban adolescents stated that they had heavy meals after dinner regularly about three times per week.

2.4.2 *Implications*

In summary, cultivating healthy lifestyle among adolescents is important and it is part of the preparation to be in great state of physical health before venturing into adulthood. The consumption of more fruits and vegetables, reduce the intake of sugar and sweetened condensed milk in drinks and the need to take breakfast are highly necessary. Meanwhile, frequent drinks with added sugar, sweetened condensed milk in drinks and intakes of carbonated drinks can adversely affect adolescent health status. In addition, high-caloric and high fat breakfast should be avoided and adolescents should be encouraged to consume more nutritious and balanced diet for their breakfast.

2.4.3 *Conclusion*

Even though regular adequate fruits and vegetables intake can contribute to good nutrition and prevent against major non-communicable disease, the findings of the present survey showed intakes among adolescents are far behind the recommendation made by WHO and from Malaysia Dietary Guidelines (MDG). Meanwhile, the consumption of drinks with added sugar and sweetened condensed milk is significantly quite high, whereby, with the accessibility to carbonated drink might be a factor that encouraged nearly half of the older adolescents to consume at least once per day. The dietary pattern particularly on breakfast consumption indicated nearly one third of the adolescents had skipped breakfast and it might affect concentration in class and may contribute to further development of obesity. It is therefore highly important to promote breakfast consumption with healthy food choices. Heavy meal after dinner also represents unhealthy meal pattern among older adolescents.

2.4.4 *Recommendations*

From the findings, it is urgently needed to inculcate and encourage Malaysia's adolescents to increase the consumption of fruit and vegetables in their daily intake. Campaigns and interventions should be rigorously promoted through creative messages in order to educate this young group. Relevant authorities should work closely to ensure these are integrated into the national Non-Communicable Disease (NCD) prevention activities as well as participation in school health programmes.

In addition, to increase the fruit and vegetables consumption requires easier access and availability through policies and environmental incentives. This will subsequently lead to an increase in output of local fruits and vegetables production thus making them more affordable and accessible in the markets, school canteens, restaurants and retails in Malaysia.

Another important and effective approach is to address individual factors such as knowledge, attitude, social influence and behavior. For example, awareness on the benefit of healthy dietary intakes coupled with parents' participation will create positive behaviors among adolescents.

Definition of variables: Nutritional Status of Malaysian adults (aged > 18 years old)

Variable Name	Variable in STATA	Weight	Definition	STATA Variable Definition
BMI Status (CPG2004)	bmicat3	weight4	BMI Status (CPG2004) <18.5 Underweight 18.5-22.99 Normal 23-27.49 Pre-obese 27.5-34.99 Obese I 35-39.99 Obese II 40++ Obese III	svysetebid [pweight=weight4], strata(strata2) fpc(fpc1) display "BMI Status (CPG2004)" svy linearized : tabulate bmicat3, cell ci obs percent vertical format(%9.2f) stubwidth(25) svy linearized : tabulate bmicat3, count obs format(%9.0f) stubwidth(25)
BMI Status (WHO1998)	bmicat2new	weight4	BMI Status (WHO1998) < 18.5 Underweight 18.5-24.99 Normal 25-29.99 Overweight 30-34.99 Obese 1 35-39.99 Obese 2 40++ Obese 3	svysetebid [pweight=weight4], strata(strata2) fpc(fpc1) display "BMI Status (WHO1998)" svy linearized : tabulate bmicat2new, cell ci obs percent vertical format(%9.2f) stubwidth(25) svy linearized : tabulate bmicat2new, count obs format(%9.0f) stubwidth(25)
Mean BMI	bmi2	weight4	Mean of Body Mass Index by sociodemographic status	svysetebid [pweight=weight4], strata(strata2) fpc(fpc) display "Mean BMI (mmol/L)" svy linearized : mean bmi2 display "DISTRIBUTION OF MEAN BMI BY SES" foreachvar of varlist state2 strata agegp gender citizen edumaritalgp work2 race3 hhincome_gp { svy linearized : mean bmi2, over(`var') }

Variable Name	Variable in STATA	Weight	Definition	STATA Variable Definition
Abdominal obesity (WHO1998)	obese_abd2	weight4	Abdominal obesity (WHO1998) Men >= 108 Women >= 88	display "Abdominal obesity (WHO1998)" svy linearized : tabulate obese_abd2, cell ci obs percent vertical format(%9.2f) stubwidth(25) svy linearized : tabulate obese_abd2, count obs format(%9.0f) stubwidth(25) display "Abdominal obesity (WHO1998) by Each SES" foreachvar of varlist state2 strata agegp gender citizen edumaritalgp work2 race3 hhincome_gp { svy linearized : tabulate `var' obese_abd2, row ci obs percent vertical format(%9.2f) stubwidth(25) svy linearized : tabulate `var' obese_abd2, count obs format(%9.0f) stubwidth(25) }
Abdominal obesity (WHO/IASO/IOTF , 2000)	obese_abd	weight4	Abdominal obesity (WHO2000) Men >= 90 Women >= 80	svysetebid [pweight=weight4], strata(strata2) fpc(fpc) display "Abdominal obesity (WHO/IASO/IOTF (2000))" svy linearized : tabulate obese_abd, cell ci obs percent vertical format(%9.2f) stubwidth(25) svy linearized : tabulate obese_abd, count obs format(%9.0f) stubwidth(25) display "Abdominal obesity (WHO/IASO/IOTF (2000)) by Each SES" foreachvar of varlist state2 strata agegp gender citizen edumaritalgp work2 race3 hhincome_gp { svy linearized : tabulate `var' obese_abd, row ci obs percent vertical format(%9.2f) stubwidth(25) svy linearized : tabulate `var' obese_abd, count obs format(%9.0f) stubwidth(25) }
Peripheral muscle wasting (Sakinah 2004)	calfcat	weight4	Peripheral muscle wasting (Sakinah 2004) Calf -3 < Calf < 6	display "Peripheral muscle wasting (Sakinah 2004)" svy linearized : tabulate calfcat, cell ci obs percent vertical format(%9.2f) stubwidth(25) svy linearized : tabulate calfcat, count obs format(%9.0f) stubwidth(25)

Definition of variables: Nutritional Status of Malaysian children (aged ≤ 18 years old)

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
Body weight	bodywtfinal		body weight in kilogram (kg)	<pre>COMPUTE bodywtav = (bodywt1+ bodywt2) / 2. EXECUTE. RECODE bodywtav (Lowest thru -7.00=SYSMIS) (175.00 thru Highest=SYSMIS) (ELSE=Copy) INTO bodywtfinal. EXECUTE.</pre>
Body height	bodyhtfinal		body height in centimeter (cm)	<pre>COMPUTE bodyhtav = (bodyht1+ bodyht2) / 2. EXECUTE. RECODE bodyhtav (Lowest thru 40.00=SYSMIS) (189.00 thru Highest=SYSMIS) (ELSE=Copy) INTO bodyhtfinal. EXECUTE.</pre>
BMI for age	BMIzCLarecod		BMI for age <-2SD -2SD-<+2SD ≥ +2SD Thinness Normal Obesity	<pre>RECODE fidBMIZ (-5.00 thru -3.01=1) (-3.00 thru -2.01=2) (-2.00 thru 1.99=3) (2.00 thru 2.99=4) (3.00 thru 5.00=5) (ELSE=SYSMIS) INTO BAZDCCLLA. EXECUTE. RECODE BAZDCCLLA (1 = 1) (2 = 1) (3 = 2) (4 = 3) (5 = 3) INTO BMIzCLarecod. VALUE LABELS BMIzCLarecod 1 'Severe and moderate thinness' 2 'Normal' 3 'Overweight/obese' EXECUTE.</pre>

Definition of variables: Nutritional Status of Malaysian children (aged ≤ 18 years old)

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
Height for age	HAZCDCCLARECOD		Height for age <-2SD -2SD-<+2SD ≥ +2SD Stunting Normal Tall	RECODE fldCDCCHAZ (-6.00 thru -3.01=1) (-3.00 thru -2.01=2) (-2.00 thru 1.99=3) (2.00 thru 6.00=4) (ELSE=SYSMIS) INTO HAZCDCCLCLA. EXECUTE. RECODE HAZCDCCLCLA (1 =1) (2 = 1) (3 = 2) (4 = 3) (5 = 3) INTO HAZCDCCLARECOD. VALUE LABELS HAZCDCCLARECOD 1 'Severe and moderate stunting' 2 'Normal' 3 'Tall' EXECUTE.
Weight for age	WAZCDCCLARECOD		Weight for age <-2SD -2SD-<+2SD ≥ +2SD Underweight Normal Obesity	RECODE fldCDCWAZ (-6.00 thru -3.01=1) (-3.00 thru -2.01=2) (-2.00 thru 1.99=3) (2.00 thru 5.00=4) (ELSE=SYSMIS) INTO WAZCDCCLCLA. EXECUTE. RECODE WAZCDCCLCLA (1 =1) (2 = 1) (3 = 2) (4 = 3) (5 = 3) INTO WAZCDCCLARECOD. VALUE LABELS WAZCDCCLARECOD 1 'Severe and moderate underweight' 2 'Normal' 3 'Obese' EXECUTE.

Definition of variables: Nutritional Status of Malaysian children (aged ≤ 18 years old)

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
Weight for height	WHZCDCrecod		Weight for height <-2SD Wasting -2SD-<+2SD Normal ≥ 2SD Obesity	<pre> RECODE fldCDCWHZ (-5.00 thru -3.01=1) (-3.00 thru -2.01=2) (-2.00 thru 1.99=3) (2.00 thru 2.99=4) (3.00 thru 5.00=5) (ELSE=SYSMIS) INTO CDCWHZCLA. EXECUTE. RECODE CDCWHZCLA (1 =1) (2 = 1) (3 = 2) (4 = 3) (5 = 3) INTO WHZCDCrecod. VALUE LABELS WHZCDCrecod 1 'Severe and moderate wasting' 2 'Normal' 3 'Overweight/Obese' EXECUTE. </pre>

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
Number of days taking added sugar in drinks in a week.	c030recode		Number of days taking added sugar in drinks in a week.	RECODE c030 (0=0) (1=1) (2=2) (3=3) (4=4) (5=5) (6=6) (7=7) (ELSE=SYSMIS) INTO c030recode. VALUE LABELS c030recode 0 '0 day' 1 '1 day' 2 '2 days' 3 '3 days' 4 '4 days' 5 '5 days' 6 '6 days' 7 '7 days' . EXECUTE.
Number of days taking sweetened condensed milk or creamer in a week.	c040recode		Number of days taking sweetened condensed milk or creamer in a week.	RECODE c040 (0=0) (1=1) (2=2) (3=3) (4=4) (5=5) (6=6) (7=7) (ELSE=SYSMIS) INTO c040recode. VALUE LABELS c040recode 0 '0 day' 1 '1 day' 2 '2 days' 3 '3 days' 4 '4 days' 5 '5 days' 6 '6 days' 7 '7 days' . EXECUTE.
Number of days taking carbonated drinks in a week.	c050recode		Number of days taking carbonated drinks in a week.	RECODE c050 (0=0) (1=1) (2=2) (3=3) (4=4) (5=5) (6=6) (7=7) (ELSE=SYSMIS) INTO c050recode. VALUE LABELS c050recode 0 '0 day'

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
Number of days taking breakfast in a week.	c060recode		Number of days taking breakfast in a week.	RECODE c060 (0=0) (1=1) (2=2) (3=3) (4=4) (5=5) (6=6) (7=7) (ELSE=SYSMIS) INTO c060recode. VALUE LABELS c060recode 0 '0 day' 1 '1 day' 2 '2 days' 3 '3 days' 4 '4 days' 5 '5 days' 6 '6 days' 7 '7 days' . EXECUTE.
Number of days taking heavy meal after dinner in a week.	c070recode		Number of days taking heavy meal after dinner in a week.	RECODE c070 (0=0) (1=1) (2=2) (3=3) (4=4) (5=5) (6=6) (7=7) (ELSE=SYSMIS) INTO c070recode. VALUE LABELS c070recode 0 '0 day' 1 '1 day' 2 '2 days' 3 '3 days' 4 '4 days' 5 '5 days' 6 '6 days' 7 '7 days' . EXECUTE.

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
Intake of fruits consumption based on Malaysian Dietary Guidelines.	c010C011tkrecode		Intake of fruits consumption based on Malaysian Dietary Guidelines. < 2 servings per day = Inadequate. ≥ 2 servings per day = Adequate.	COMPUTE c010C011tk = c010recode * c011ok2 /7. EXECUTE . RECODE c010C011tk (0.00 thru 1.99=1) (2.00 thru 28.00=2) (ELSE=SYSMIS) INTO c010C011tkrecode. VALUE LABELS c010C011tkrecode 1 'Inadequate (less than 2 serving per day)' 2 'Adequate (2 or more servings per day)' EXECUTE.
Intake of vegetables consumption based on Malaysian Dietary Guidelines.	c020C021tkrecode		Intake of vegetables consumption based on Malaysian Dietary Guidelines. < 3 servings per day = Inadequate. ≥ 3 servings per day = Adequate.	COMPUTE c020C021tk = c020recode * c021ok2 /7. EXECUTE . RECODE c020C021tk (0.00 thru 2.99=1) (3.00 thru 28.00=2) (ELSE=SYSMIS) INTO c020C021tkrecode. VALUE LABELS c020C021tkrecode 1 'Inadequate (less than 3 serving per day)' 2 'Adequate (3 or more servings per day)' EXECUTE.
Intake of fruits and/or vegetables consumption based on STEPS WHO criteria.	fruitvegstep		Intake of fruits and/or vegetables consumption based on STEPS WHO criteria. ≥ 5 servings per day = Adequate. < 5 servings per day = Inadequate.	COMPUTE fruitveg = (c010C011tk + c020C021tk). EXECUTE . RECODE fruitveg (0.00 thru 4.99=1) (5.00 thru 28.00=2) (ELSE=SYSMIS) INTO fruitvegstep. VALUE LABELS fruitvegrecod 1 'Inadequate (less than 5 servings per day)' 2 'Adequate (5 or more servings per day)' EXECUTE.

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
Intake of drinks with added sugar (cups) in a day based on KPI DG.	c030C031tkrecode		Intake of drinks with added sugar (cups) in a day based on KPI DG. ≤ 3 cups per day. > 3 cups per day.	COMPUTE c030C031tk = c030recode * c031ok2 /7. EXECUTE. RECODE c030C031tk (0.00 thru 3.00=1) (3.01 thru 30.00=2) (ELSE=SYSMIS) INTO c030C031tkrecode. VALUE LABELS c030C031tkrecode 1 'Inadequate (less than 3 servings per day)' 2 'Adequate (3 or more servings per day)' EXECUTE.
Intake of drinks with sweetened condensed milk) in a day (cups) based on Malaysian Dietary Guidelines.	c040C041tkrecode		Intake of drinks with sweetened condensed milk) in a day (cups) based on Malaysian Dietary Guidelines. 0 cup per day. 1 - <2 cups per day. 2 - <3 cups per day. ≥ 3 cups per day.	COMPUTE c040C041tk = c040recode * c041ok2 /7. EXECUTE. RECODE c040C041tk (0.00 thru 0.99=1) (1.00 thru 1.99=2) (2.00 thru 2.99=3) (3.00 thru 30.00=4) (ELSE=SYSMIS) INTO c040C041tkrecode. VALUE LABELS c040C041tkrecode 1 '0 cup per day' 2 '1 - <2 cups per day' 3 '2 - <3 cups per day' 4 '≥ 3 cups per day' EXECUTE.
Intake of carbonated drinks (cups) in a day based on Malaysian Dietary Guidelines.	c050C051tkrecode		Intake of carbonated drinks (cups) in a day based on Malaysian Dietary Guidelines. 0 cup per day. 1 - <2 cups per day. ≥ 2 cups per day.	COMPUTE c050C051tk = c050recode * c051ok2 /7. EXECUTE. RECODE c050C051tk (0.00 thru 0.99=1) (0.00 thru 1.99=2) (2.00 thru 30.00=3) (ELSE=SYSMIS) INTO c050C051tkrecode. VALUE LABELS c050C051tkrecode 1 '0 cup per day'

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
Intake of carbonated drinks (cups) in a day based on Malaysian Dietary Guidelines.	c050C051tkrecode		Intake of carbonated drinks (cups) in a day based on Malaysian Dietary Guidelines. 0 cup per day. 1 - <2 cups per day. ≥ 2 cups per day.	COMPUTE c050C051tk = c050recode * c051ok2 /7. EXECUTE . RECODE c050C051tk (0.00 thru 0.99=1) (0.00 thru 1.99=2) (2.00 thru 30.00=3) (ELSE=SYSMIS) INTO c050C051tkrecode. VALUE LABELS c050C051tkrecode 1 '0 cup per day' 2 '1 - <2 cups per day' 3 '≥ 2 cups per day'

Table 2.1.1 Prevalence of normal BMI among adults (aged ≥18 years old) by socio-demographic characteristics

Sociodemographic characteristics	CPG 2004 (BMI 18.5-22.9 kg/m ²)				WHO 1998 (BMI 18.5 to 24.9 kg/m ²)			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
MALAYSIA	4,946	5,086,228	31.1	30.0 32.3	7,630	7,710,309	47.2	46.0 48.4
State								
Johor	403	602,602	30.4	26.4 34.6	656	942,925	47.5	43.5 51.6
Kedah	283	319,105	29.0	25.6 32.6	447	489,047	44.5	40.7 48.3
Kelantan	301	231,453	28.6	26.0 31.5	479	368,612	45.6	42.8 48.5
Melaka	325	148,131	30.3	26.1 34.8	498	243,925	49.8	46.5 53.1
Negeri Sembilan	277	199,408	33.4	30.1 37.0	429	294,060	49.3	45.8 52.8
Pahang	296	238,610	31.0	27.9 34.4	434	352,923	45.9	42.3 49.6
Penang	304	283,653	29.9	25.5 34.8	496	466,098	49.2	43.5 54.9
Perak	279	381,115	28.6	25.0 32.5	413	559,583	42.0	37.3 46.9
Perlis	239	38,037	28.5	25.0 32.2	363	54,805	41.0	37.6 44.5
Selangor	695	1,031,595	30.3	27.9 32.8	1,064	1,576,859	46.3	43.8 48.8
Terengganu	306	171,867	31.3	27.2 35.7	462	248,441	45.2	41.4 49.1
Sabah & WP Labuan	579	656,650	36.4	32.1 41.1	890	947,741	52.6	48.4 56.8
Sarawak	334	435,258	33.0	28.7 37.5	497	630,745	47.8	43.6 51.9
WP Kuala Lumpur	172	336,508	32.0	26.8 37.7	266	515,241	49.0	43.3 54.7
WP Putrajaya	153	12,236	28.0	23.7 32.7	236	19,303	44.1	39.4 49.0
Location								
Urban	2,853	3,667,227	30.7	29.3 32.2	4,463	5,612,728	47.0	45.5 48.5
Rural	2,093	1,419,001	32.4	30.7 34.1	3,167	2,097,581	47.9	46.1 49.7
Sex								
Male	2,441	2,624,277	30.9	29.2 32.6	3,833	4,077,620	48.0	46.4 49.6
Female	2,505	246,195	31.4	30.0 32.8	3,797	3,632,689	46.4	44.8 47.9
Age Group								
18-19	335	364,017	43.3	38.9 47.9	400	430,425	51.3	46.7 55.8
20-24	793	1,042,171	41.5	38.6 44.5	1,065	1,394,133	55.6	52.6 58.5
25-29	704	920,092	39.5	36.3 42.8	963	1,231,679	52.9	49.7 56.0
30-34	500	573,581	30.6	28.0 33.4	777	900,904	48.1	45.1 51.2
35-39	444	472,229	27.9	25.0 30.9	718	743,869	43.9	40.7 47.1
40-44	405	387,833	24.0	21.4 26.7	721	683,285	42.3	39.3 45.3
45-49	387	340,986	23.0	20.6 25.5	682	610,369	41.1	38.2 44.1
50-54	366	290,747	23.2	20.8 25.8	624	500,222	39.9	37.0 42.8
55-59	313	219,781	22.6	19.7 25.9	559	400,921	41.3	37.8 44.8
60-64	251	174,848	24.5	21.1 28.2	415	310,480	43.5	39.2 47.9
65-69	162	110,422	24.4	20.3 29.0	278	197,062	43.5	38.4 48.8
70-74	151	95,827	31.9	26.4 37.9	227	161,370	53.7	47.0 60.2
75+	135	93,694	32.4	26.8 38.6	201	145,590	50.4	43.5 57.2

Table 2.1.1 Prevalence of normal BMI among adults (aged ≥18 years old) by socio-demographic characteristics

Sociodemographic characteristics	CPG 2004 (BMI 18.5<22.9 kg/m ²)				WHO 1998 (BMI 18.5 to 24.9 kg/m ²)					
	Count	Estimated Population	% (Prevalence)	95% CI		Count	Estimated Population	95% CI		
				Lower	Upper			Lower	Upper	
Ethnicity										
Malay	2,546	2,202,126	26.9	25.7	28.1	4,023	3,475,970	42.5	41.2	43.8
Chinese	1,104	1,430,288	35.4	33.3	37.5	1,677	2,169,435	53.6	51.4	55.9
Indians	345	304,733	25.9	22.7	29.3	539	471,983	40.0	36.6	43.5
Other Bumiputras	496	584,191	33.2	29.1	37.7	757	849,246	48.3	44.6	52.1
Others	455	564,890	48.1	42.2	54.2	634	743,674	63.4	58.1	68.4
Marital Status										
Single	1,600	1,961,261	41.0	38.9	43.3	2,134	2,569,549	53.8	51.6	55.9
Married	3,002	2,869,873	27.0	25.8	28.3	4,953	4,744,199	44.7	43.3	46.1
Widow/widower/divorcee	343	253,120	27.2	24.2	30.5	542	394,588	42.4	38.5	46.5
Education Level										
No formal education	382	295,742	31.9	28.4	35.5	581	439,076	47.3	43.8	50.8
Primary education	1,167	1,083,443	30.7	28.6	32.9	1,875	1,702,553	48.3	46.0	50.5
Secondary education	2,180	2,328,443	29.9	28.4	31.5	3,354	3,512,520	45.1	43.5	46.7
Tertiary education	1,150	1,304,871	33.6	31.7	35.6	1,719	1,944,418	50.1	47.8	52.3
Unclassified education	44	42,032	30.0	21.4	40.2	66	63,320	45.1	35.0	55.6
Occupation										
Government/semi government employee	470	404,228	24.0	21.4	26.9	797	695,243	41.3	38.0	44.7
Private employee	1,784	2,193,654	34.9	33.1	36.7	2,624	3,180,488	50.6	48.8	52.3
Self employed	964	891,816	28.8	26.5	31.1	1,567	1,424,921	46.0	43.6	48.4
Unpaid worker/home maker	697	640,602	25.7	23.7	27.8	1,152	1,046,784	42.0	39.6	44.4
Retiree	422	305,607	27.1	24.3	30.2	663	506,772	45.0	41.3	48.7
Income Group										
Less than RM 400	320	297,430	29.3	26.0	32.9	533	477,472	47.0	43.2	51.0
RM 400 - RM 699	289	273,013	36.5	31.6	41.6	417	381,837	51.0	46.1	55.9
RM 700 - RM 999	337	315,766	33.5	29.7	37.5	495	460,776	48.9	45.1	52.7
RM 1000 - RM 1999	1,047	984,405	32.8	30.7	35.1	1,589	1,448,665	48.3	46.0	50.7
RM 2000 - RM 2999	831	855,507	31.0	28.6	33.5	1,292	1,295,563	46.9	44.3	49.5
RM 3000 - RM 3999	618	635,503	28.7	26.3	31.1	938	988,817	44.6	41.8	47.5
RM 4000 - RM 4999	446	535,230	31.0	26.8	35.6	697	798,894	46.3	42.1	50.6
RM 5000 & above	1,058	1,189,373	30.3	28.2	32.5	1,669	1,858,284	47.3	44.9	49.8

Table 2.1.2 Prevalence of overweight among adults (aged 18 years old) by socio-demographic characteristics

Sociodemographic characteristics	PRE-OBESE						OVERWEIGHT					
	CPG 2004 (BMI 23.0 to 27.49 kg/m ²)			WHO 1998 (BMI 25.0 to 29.9 kg/m ²)								
	Count	Estimated Population	% (Prevalence)	Lower	Upper	Count	Estimated Population	% (Prevalence)	Lower	Upper		
MALAYSIA	5,709	5,444,985	33.3	32.4	34.3	5,155	4,800,998	29.4	28.4	30.4		
<i>State</i>												
Johor	497	654,627	33.0	30.2	36.0	431	564,904	28.5	25.6	31.5		
Kedah	350	374,107	34.0	30.3	37.9	329	347,311	31.6	28.4	34.9		
Kelantan	373	284,199	35.2	32.1	38.4	335	254,832	31.5	28.8	34.4		
Melaka	337	165,006	33.7	30.2	37.4	296	126,075	25.7	22.9	28.9		
Negeri Sembilan	316	186,911	31.3	28.1	34.8	287	164,849	27.6	24.1	31.4		
Pahang	293	247,208	32.2	28.8	35.7	280	232,296	30.2	27.0	33.6		
Penang	386	343,985	36.3	32.8	40.0	341	294,695	31.1	27.1	35.4		
Perak	318	418,484	31.4	28.3	34.7	317	425,122	31.9	27.8	36.3		
Perlis	276	38,870	29.1	25.8	32.6	274	39,373	29.5	26.3	32.8		
Selangor	35	1,098,041	32.3	30.0	34.6	716	930,549	27.3	25.5	29.2		
Terengganu	346	179,818	32.7	28.4	37.4	326	180,223	32.8	29.5	36.3		
Sabah & WP Labuan	664	621,066	34.5	31.3	37.7	547	518,184	28.8	25.3	32.5		
Sarawak	371	428,368	32.4	29.3	35.8	341	400,658	30.3	27.2	33.7		
WP Kuala Lumpur	208	388,428	36.9	33.1	40.9	167	307,673	29.2	24.2	34.9		
WP Putrajaya	182	15,867	36.3	32.5	40.2	168	14,253	32.6	28.6	36.8		
<i>Location</i>												
Urban	3,388	4,025,625	33.7	32.5	34.9	2,994	3,513,530	29.4	28.2	30.6		
Rural	2,321	1,419,360	32.4	31.0	33.8	2,161	1,287,468	29.4	27.9	31.0		
<i>Sex</i>												
Male	2,937	3,038,102	35.8	34.3	37.2	2,539	2,626,215	30.9	29.5	32.3		
Female	2,772	2,406,883	30.7	29.5	32.0	2,616	2,174,783	27.8	26.5	29.0		
<i>Age Group</i>												
18-19	124	132,084	15.7	12.8	19.1	109	118,037	14.1	11.3	17.4		
20-24	480	613,647	24.5	22.1	26.9	357	454,059	18.1	15.9	20.5		
25-29	511	607,010	26.1	23.7	28.6	437	499,780	21.5	19.3	23.8		
30-34	595	662,695	35.4	32.6	38.3	524	576,884	30.8	28.1	33.7		
35-39	592	604,676	35.7	32.9	38.5	539	559,939	33.0	30.3	35.9		
40-44	709	662,968	41.0	38.4	43.7	662	608,749	37.6	34.8	40.6		
45-49	658	57,374	38.6	35.8	41.6	634	556,715	37.5	34.6	40.5		
50-54	619	50,520	40.3	37.3	43.3	637	496,368	39.6	36.7	42.5		
55-59	533	382,724	39.4	36.0	42.9	497	339,680	35.0	32.0	38.0		
60-64	348	287,257	40.2	36.4	44.2	323	257,117	36.0	32.0	40.2		
65-69	247	185,712	41.0	36.0	46.2	200	157,801	34.9	30.0	40.0		
70-74	163	120,593	40.1	33.4	47.2	139	88,570	29.5	24.1	35.5		
75+	130	106,678	36.9	30.6	43.7	97	87,299	30.2	23.7	37.6		

Table 2.1.2 Prevalence of overweight among adults (aged 18 years old) by socio-demographic characteristics

Sociodemographic characteristics	PRE-OBESE					OVERWEIGHT				
	CPG 2004 (BMI 23.0 to 27.49 kg/m ²)					WHO 1998 (BMI 25.0 to 29.9 kg/m ²)				
	Count	Estimated Population	% (Prevalence)	Lower	Upper	Count	Estimated Population	% (Prevalence)	Lower	Upper
Ethnicity										
Malay	3,200	2,727,890	33.4	32.1	34.6	3,038	2,539,845	31.1	29.9	32.3
Chinese	1,162	1,448,423	35.8	33.8	37.9	925	1,114,409	27.6	25.7	29.6
Indians	427	350,897	29.8	26.8	33.0	439	363,461	30.8	27.8	34.0
Other Bumiputras	564	588,729	33.5	30.5	36.7	496	544,202	31.0	27.5	34.6
Others	356	329,047	28.0	24.0	32.5	257	239,081	20.4	17.0	24.2
Marital Status										
Single	973	1,129,692	23.6	22.0	25.4	762	884,701	18.5	16.9	20.2
Married	4,311	4,005,858	37.7	36.6	38.9	3,983	3,610,192	34.0	32.8	35.2
Widow/widower/divorcee	424	308,000	33.1	30.1	36.3	409	304,670	32.8	29.3	36.5
Education Level										
No formal education	433	322,955	34.8	31.4	38.3	371	282,968	30.5	27.3	33.9
Primary education	1,445	1,217,856	34.5	32.5	36.6	1,282	1,054,960	29.9	28.0	31.9
Secondary education	2,564	2,559,951	32.9	31.6	34.2	2,397	2,351,823	30.2	28.9	31.6
Tertiary education	1,202	1,277,395	32.9	30.9	35.0	1,046	1,057,619	27.2	25.4	29.1
Unclassified education	43	42,966	30.6	22.3	40.5	43	40,939	29.2	20.6	39.5
Occupation										
Government/semi government employee	737	618,429	36.8	34.0	39.6	709	575,815	34.2	31.5	37.1
Private employee	1,745	2,010,296	32.0	30.4	33.6	1,499	1,684,221	26.8	25.3	28.3
Self employed	1,270	1,119,455	36.1	34.0	38.3	1,139	1,010,373	32.6	30.4	34.9
Unpaid worker/home maker	994	851,048	34.2	32.0	36.4	974	793,350	31.8	29.9	33.9
Retiree	542	427,077	37.9	34.6	41.4	481	370,571	32.9	29.6	36.3
Income Group										
Less than RM 400	405	362,395	35.7	32.3	39.3	319	292,951	28.9	25.5	32.5
RM 400 - RM 699	290	228,667	30.5	26.8	34.5	261	194,355	26.0	22.4	29.8
RM 700 - RM 999	344	292,950	31.1	27.5	34.9	334	267,747	28.4	25.2	31.9
RM 1000 - RM 1999	1,129	958,364	32.0	30.0	34.1	1,004	866,926	28.9	26.9	31.0
RM 2000 - RM 2999	963	904,221	32.7	30.5	35.1	870	805,344	29.2	26.8	31.7
RM 3000 - RM 3999	747	778,513	35.1	32.8	37.5	735	697,558	31.5	28.9	34.2
RM 4000 - RM 4999	525	553,185	32.1	28.9	35.4	484	509,235	29.5	26.5	32.8
RM 5000 & above	1,306	1,366,691	34.8	32.9	36.8	1,146	1,165,754	29.7	27.8	31.7

Table 2.1.3 Prevalence of obesity among adults (aged ≥18 years old) by socio-demographic characteristics

Sociodemographic characteristics	CPG 2004 (BMI ≥27.5 kg/m ²)				WHO 1998 (BMI ≥30.0 kg/m ²)			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
MALAYSIA	4,878	4,441,119	27.2	26.2 28.3	2,750	2,462,152	15.1	14.3 15.9
State								
Johor	432	566,761	28.6	25.5 31.9	245	316,161	15.9	13.7 18.4
Kedah	313	309,935	28.2	24.6 32.1	170	166,789	15.2	12.4 18.4
Kelantan	306	237,745	29.4	26.9 32.0	167	130,579	16.2	14.1 18.4
Melaka	318	143,582	29.3	24.4 34.8	186	86,719	17.7	13.5 23.0
Negeri Sembilan	279	167,889	28.2	25.4 31.0	156	95,299	16.0	13.5 18.8
Pahang	271	216,656	28.2	24.8 31.9	146	117,255	15.3	13.0 17.8
Penang	323	254,454	26.9	22.7 31.5	176	121,300	12.8	9.6 16.9
Perak	290	400,792	30.1	25.7 34.9	157	215,686	16.2	13.2 19.7
Perlis	332	46,203	34.6	31.1 38.2	210	28,932	21.7	18.5 25.1
Selangor	759	958,753	28.2	25.8 30.7	467	581,483	17.1	15.0 19.4
Terengganu	278	154,155	28.1	25.0 31.3	142	77,176	14.0	11.3 17.4
Sabah & WP Labuan	394	379,830	21.1	17.9 24.7	200	191,621	10.6	8.5 13.3
Sarawak	289	352,587	26.7	23.2 30.5	156	184,809	14.0	11.2 17.4
WP Kuala Lumpur	145	239,802	22.8	18.5 27.8	92	141,824	13.5	10.1 17.7
WP Putrajaya	149	11,972	27.4	22.3 33.1	80	6,519	14.9	11.2 19.5
Location								
Urban	2,847	3,265,241	27.3	26.0 28.6	1,631	1,831,835	15.3	14.3 16.4
Rural	2,031	1,175,877	26.9	25.3 28.5	1,119	630,317	14.4	13.3 15.6
Sex								
Male	2,014	2,121,048	25.0	23.6 26.3	1,021	1,080,095	12.7	11.7 13.8
Female	2,864	2,320,071	29.6	28.2 31.1	1,729	1,382,057	17.6	16.5 18.9
Age Group								
18-19	125	135,583	16.1	13.1 19.7	75	83,223	9.9	7.6 12.9
20-24	365	464,284	18.5	16.1 21.1	216	271,910	10.8	9.2 12.8
25-29	470	563,295	24.2	21.8 26.7	285	358,938	15.4	13.5 17.5
30-34	514	526,715	28.1	25.4 31.1	308	285,202	15.2	13.1 17.7
35-39	544	527,066	31.1	28.3 34.0	323	300,163	17.7	15.6 20.0
40-44	572	510,898	31.6	29.0 34.3	304	270,168	16.7	14.6 19.1
45-49	617	522,085	35.1	32.1 38.3	346	269,729	18.2	15.9 20.6
50-54	578	409,492	32.6	29.9 35.5	302	208,848	16.7	14.5 19.1
55-59	506	334,574	34.4	31.2 37.8	296	196,479	20.2	17.6 23.1
60-64	277	219,501	30.7	27.0 34.8	138	114,009	16.0	13.2 19.2
65-69	163	125,583	27.7	23.2 32.7	94	66,853	14.8	11.3 19.1
70-74	92	53,457	17.8	13.9 22.5	41	20,560	6.8	4.7 9.9
75+	55	48,588	16.8	11.8 23.4	22	16,070	5.6	3.5 8.6

Table 2.1.3 Prevalence of obesity among adults (aged ≥18 years old) by socio-demographic characteristics

Sociodemographic characteristics	CPG 2004 (BMI ≥27.5 kg/m ²)				WHO 1998 (BMI ≥30.0 kg/m ²)					
	Count	Estimated Population	% (Prevalence)	95% CI Lower	Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower	Upper
Ethnicity										
Malay	3,156	2,617,404	32.0	30.6	33.4	1,843	1,532,732	18.7	17.7	19.9
Chinese	660	797,032	19.7	17.9	21.6	324	391,899	9.7	8.4	11.2
Indians	488	421,415	35.8	32.4	39.3	282	241,600	20.5	17.4	24.0
Other Bumiputras	403	443,754	25.3	22.0	28.8	210	223,225	12.7	10.2	15.7
Others	171	161,514	13.8	10.4	18.0	91	72,695	6.2	4.3	8.9
Marital Status										
Single	801	932,979	19.5	17.8	21.3	479	570,184	11.9	10.6	13.4
Married	3,667	3,209,939	30.2	29.0	31.5	2,044	1,731,280	16.3	15.4	17.3
Widow/widower/divorcee	408	297,065	32.0	28.7	35.4	225	159,553	17.2	14.7	19.9
Education Level										
No formal education	310	219,691	23.7	20.6	27.0	173	116,344	12.5	10.3	15.2
Primary education	1,220	989,910	28.1	26.2	30.1	676	534,320	15.2	13.7	16.8
Secondary education	2,358	2,222,797	28.6	27.1	30.0	1,352	1,247,351	16.0	14.9	17.2
Tertiary education	947	967,939	24.9	23.0	27.0	534	548,168	14.1	12.6	15.7
Unclassified education	31	29,588	21.1	14.1	30.3	9	10,327	7.4	3.6	14.5
Occupation										
Government/semi government employee	707	586,833	34.9	32.0	37.8	408	338,432	20.1	17.8	22.6
Private employee	1,317	1,462,244	23.3	21.8	24.8	724	801,988	12.8	11.6	14.0
Self employed	1,021	882,170	28.5	26.5	30.6	550	458,771	14.8	13.2	16.6
Unpaid worker/home maker	1,102	868,363	34.9	32.5	37.3	667	519,880	20.9	19.0	22.9
Retiree	398	301,495	26.8	23.8	29.9	218	156,837	13.9	11.8	16.3
Income Group										
Less than RM 400	298	259,435	25.6	22.4	29.1	171	148,837	14.7	12.1	17.7
RM 400 - RM 699	225	176,560	23.6	19.9	27.7	126	102,049	13.6	10.8	17.0
RM 700 - RM 999	323	244,449	25.9	22.7	29.4	175	124,642	13.2	11.0	15.9
RM 1000 - RM 1999	956	794,976	26.5	24.5	28.6	539	422,153	14.1	12.6	15.7
RM 2000 - RM 2999	849	756,849	27.4	25.1	29.8	481	415,670	15.1	13.3	17.0
RM 3000 - RM 3999	694	629,298	28.4	25.9	31.0	386	356,938	16.1	14.1	18.3
RM 4000 - RM 4999	484	512,196	29.7	26.3	33.3	274	292,481	17.0	14.3	19.9
RM 5000 & above	1,049	1,067,355	27.2	25.0	29.5	598	599,380	15.3	13.6	17.1

Table 2.1.4 Prevalence of obesity I to III (WHO 1998) among adults (aged ≥ 18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Obesity I (BMI 30.0-34.9 kg/m ²)			Obesity II (BMI 35.0-39.9 kg/m ²)			Obesity III (BMI ≥ 40.0 kg/m ²)						
	Count	Estimated % (Prevalence)	95% CI Lower Upper	Count	Estimated % (Prevalence)	95% CI Lower Upper	Count	Estimated % (Prevalence)	95% CI Lower Upper				
MALAYSIA	1,942	1,728,264	10.6	10.0	11.2	3.2	2.8	3.5	237	219,028	1.3	1.1	1.6
State													
Johor	149	189,339	9.5	8.0	11.3	4.8	3.7	6.3	22	30,782	1.6	1.0	2.5
Kedah	124	121,666	11.1	9.0	13.5	2.8	1.7	4.4	14	14,585	1.3	0.7	2.5
Kelantan	117	93,114	11.5	10.0	13.3	3.3	2.3	4.7	14	9,977	1.2	0.7	2.1
Melaka	130	59,840	12.2	9.2	16.1	3.9	2.2	7.0	16	7,741	1.6	0.8	3.1
Negeri Sembilan	110	65,842	11.0	9.2	13.2	3.7	2.4	5.5	13	7,691	1.3	0.8	2.2
Pahang	111	89,685	11.7	10.0	13.6	2.7	1.8	4.2	9	6,659	0.9	0.4	1.8
Penang	134	92,602	9.8	7.0	13.5	2.2	1.3	3.8	16	7,903	0.8	0.3	2.1
Perak	112	153,436	11.5	9.3	14.2	3.0	2.0	4.6	13	21,880	1.6	0.7	4.0
Perlis	143	19,956	14.9	12.3	18.0	4.3	3.0	5.4	24	3,617	2.7	1.8	4.0
Selangor	316	396,572	11.7	10.1	13.3	3.5	2.8	4.4	48	65,114	1.9	1.4	2.7
Terengganu	100	54,192	9.9	7.8	12.3	2.7	1.7	4.2	14	8,155	1.5	0.8	2.8
Sabah & WP Labuan	157	150,482	8.4	6.4	10.9	1.6	1.0	2.7	12	11,801	0.7	0.4	1.2
Sarawak	123	144,896	11.0	8.8	13.6	2.1	1.4	3.3	10	11,706	0.9	0.5	1.7
WP Kuala Lumpur	64	92,504	8.8	6.6	11.6	3.6	2.0	6.4	6	10,985	1.0	0.4	2.5
WP Putrajaya	52	4,139	9.5	6.9	12.8	4.5	2.9	6.9	6	430	1.0	0.5	2.2
Location													
Urban	1,148	1,283,145	10.7	10.0	11.6	3.2	2.7	3.6	145	171,722	1.4	1.2	1.8
Rural	794	445,119	10.2	9.3	11.1	3.1	2.6	3.7	92	47,305	1.1	0.8	1.4
Sex													
Male	761	788,732	9.3	8.5	10.2	2.4	2.0	2.9	70	86,225	1.0	0.7	1.4
Female	1,181	939,532	12.0	11.1	12.9	4.0	3.4	4.5	167	132,802	1.7	1.4	2.1
Age Group													
18-19	56	61,215	7.3	5.4	9.8	1.4	0.8	2.7	7	9,915	1.2	0.5	2.6
20-24	141	177,247	7.1	5.8	8.6	2.6	1.9	3.7	29	28,493	1.1	0.7	1.8
25-29	183	230,439	9.9	8.3	11.7	3.4	2.5	4.5	33	49,852	2.1	1.5	3.1
30-34	207	190,391	10.2	8.5	12.1	3.6	2.7	4.8	30	27,308	1.5	1.0	2.2
35-39	231	215,133	12.7	10.9	14.7	3.6	2.7	4.8	27	24,320	1.4	0.9	2.2
40-44	211	189,015	11.7	10.0	13.6	3.4	2.5	4.6	25	26,279	1.6	0.8	3.5
45-49	249	202,995	13.7	11.6	16.0	3.3	2.5	4.3	25	17,764	1.2	0.8	1.9
50-54	221	155,075	12.4	10.5	14.5	3.5	2.6	4.7	17	9,702	0.8	0.4	1.4
55-59	214	144,785	14.9	12.7	17.4	3.9	2.9	5.2	24	13,724	1.4	0.8	2.5
60-64	104	83,075	11.6	9.4	14.3	3.2	1.9	5.3	13	8,371	1.2	0.6	2.4
65-69	74	48,926	10.8	8.0	14.4	3.6	1.7	7.2	4	1,836	0.4	0.1	1.1
70-74	31	15,607	5.2	3.3	8.0	1.3	0.6	2.7	2	565	0.2	0.0	1.2
75+	20	14,362	5.0	3.1	8.0	0.3	0.0	2.0	1	898	0.3	0.0	2.2

Table 2.1.4 Prevalence of obesity I to III (WHO 1998) among adults (aged ≥18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Obesity I (BMI 30.0-34.9 kg/m ²)			Obesity II (BMI 35.0-39.9 kg/m ²)			Obesity III (BMI ≥40.0 kg/m ²)		
	Count	Estimated Population	% (Prevalence)	Count	Estimated Population	% (Prevalence)	Count	Estimated Population	% (Prevalence)
Ethnicity									
Malay	1,262	1,040,436	12.7	397	336,027	4.1	182	155,142	1.9
Chinese	255	304,624	7.5	57	75,438	1.9	12	11,838	0.3
Indians	198	157,544	13.4	61	52,843	4.5	23	31,213	2.7
Other Bumiputras	158	165,872	9.4	37	40,378	2.3	15	16,975	1.0
Others	69	59,788	5.1	17	9,047	0.8	5	3,860	0.3
Marital Status									
Single	309	370,842	7.8	107	124,362	2.6	62	74,477	1.6
Married	1,472	1,238,958	11.7	412	356,075	3.4	160	136,246	1.3
Widow/widower/divorcee	161	118,464	12.7	48	32,160	3.5	15	8,304	0.9
Education Level									
No formal education	125	84,160	9.1	42	28,267	3.1	6	3,916	0.4
Primary education	500	398,064	11.3	126	105,415	3.0	49	30,217	0.9
Secondary education	947	863,698	11.1	278	260,648	3.4	126	122,503	1.6
Tertiary education	363	375,302	9.7	120	116,111	3.0	51	56,754	1.5
Unclassified education	4	4,786	3.4	1	639	0.5	4	4,902	3.5
Occupation									
Government/semi government employee	266	218,331	13.0	107	82,368	4.9	35	37,733	2.2
Private employee	510	565,806	9.0	156	166,640	2.7	57	69,039	1.1
Self employed	397	329,730	10.6	106	95,496	3.1	46	32,921	1.1
Unpaid worker/home maker	468	361,850	14.5	139	107,133	4.3	60	50,897	2.0
Home maker	466	359,963	14.7	137	106,489	4.3	59	49,625	2.0
Retiree	168	116,481	10.3	35	32,676	2.9	15	7,680	0.7
Income Group									
Less than RM 400	135	119,577	11.8	21	20,097	2.0	15	9,163	0.9
RM 400 - RM 699	87	65,044	8.7	24	25,193	3.4	15	11,813	1.6
RM 700 - RM 999	111	75,946	8.1	52	41,482	4.4	12	7,214	0.8
RM 1000 - RM 1999	400	316,139	10.6	93	72,672	2.4	46	33,343	1.1
RM 2000 - RM 2999	348	302,834	11.0	102	86,850	3.2	31	25,986	0.9
RM 3000 - RM 3999	263	243,379	11.0	85	74,925	3.4	38	38,634	1.7
RM 4000 - RM 4999	187	202,639	11.7	62	58,091	3.4	25	31,751	1.8
RM 5000 & above	413	403,834	10.3	130	134,422	3.4	55	61,124	1.6

Table 2.1.5 Prevalence of obesity I to III (CPG 2004) among adults (aged ≥18 years old) by socio-demographic characteristics

Sociodemographic characteristics		Obesity I (BMI 27.5-34.9 kg/m ²)			Obesity II (BMI 35.0-39.9 kg/m ²)			Obesity III (BMI ≥40.0 kg/m ²)								
		Count	Estimated % (Prevalence)	95% CI Lower Upper	Count	Estimated % (Prevalence)	95% CI Lower Upper	Count	Estimated % (Prevalence)	95% CI Lower Upper						
MALAYSIA		4,072	3,708,358	22.7	21.8	23.6	569	513,733	3.2	2.8	3.5	237	219,028	1.3	1.1	1.6
State																
	Johor	336	439,939	22.2	19.5	25.1	74	96,041	4.8	3.7	6.3	22	30,782	1.6	1.0	2.5
	Kedah	336	264,812	24.1	20.9	27.6	32	30,539	2.8	1.7	4.4	14	14,585	1.3	0.7	2.5
	Kelantan	257	200,906	24.9	22.7	27.2	35	26,862	3.3	2.3	4.7	14	9,977	1.2	0.7	2.1
	Melaka	262	116,703	23.8	19.9	28.3	40	19,138	3.9	2.2	7.0	16	7,741	1.6	0.8	3.1
	Negeri Sembilan	233	138,432	23.2	20.6	26.1	33	21,766	3.7	2.4	5.5	13	7,691	1.3	0.8	2.2
	Pahang	236	189,086	24.6	21.3	28.2	26	20,910	2.7	1.8	4.2	9	6,659	0.9	0.4	1.8
	Penang	281	225,757	23.8	19.9	28.3	26	20,794	3.8	1.3	2.2	16	7,903	0.8	0.3	2.1
	Perak	245	338,543	25.4	21.8	29.4	32	40,370	3.0	2.0	4.6	13	21,880	1.6	0.7	4.0
	Perlis	265	37,226	27.9	24.6	31.4	43	5,359	4.0	3.0	5.4	24	3,617	2.7	1.8	4.0
	Selangor	609	774,345	22.7	20.8	24.9	102	119,295	3.5	2.8	4.4	48	65,114	1.9	1.4	2.7
	Terengganu	236	131,171	23.9	21.4	26.6	28	14,830	2.7	1.7	4.2	14	8,155	1.5	0.8	2.8
	Sabah & WP Labuan	351	338,691	18.8	15.8	22.2	31	29,338	1.6	1.0	2.7	12	11,801	0.7	0.4	1.2
	Sarawak	256	312,674	23.7	20.8	26.9	23	28,206	2.1	1.4	3.3	10	11,706	0.9	0.5	1.7
	WP Kuala Lumpur	117	190,482	18.1	14.7	22.1	22	38,335	3.6	2.0	6.4	6	10,985	1.0	0.4	2.5
	WP Putrajaya	121	9,592	21.9	17.6	27.1	22	1,949	4.5	2.9	6.9	6	430	1.0	0.5	2.2
Location																
	Urban	2,364	2,716,551	22.7	21.6	23.9	338	376,968	3.2	2.7	3.6	145	171,722	1.4	1.2	1.8
	Rural	1,708	991,807	22.6	21.3	24.0	231	136,765	3.1	2.6	3.7	92	47,305	1.1	0.8	1.4
Sex																
	Male	1,755	1,830,188	21.5	20.3	22.8	189	204,635	2.4	2.0	2.9	70	86,225	1.0	0.7	1.4
	Female	2,317	1,878,170	24.0	22.7	25.3	380	309,098	4.0	3.4	4.5	167	132,802	1.7	1.4	2.1
Age Group																
	18-19	106	113,575	13.5	10.8	16.8	12	12,092	1.4	0.8	2.7	7	9,915	1.2	0.5	2.6
	20-24	290	369,620	14.7	12.6	17.1	46	66,170	2.6	1.9	3.7	29	28,493	1.1	0.7	1.8
	25-29	368	434,795	18.7	16.6	20.9	69	78,647	3.4	2.5	4.5	33	49,852	2.1	1.5	3.1
	30-34	413	431,903	23.1	20.6	25.8	71	67,503	3.6	2.7	4.8	30	27,308	1.5	1.0	2.2
	35-39	452	442,036	26.1	23.5	28.8	65	60,710	3.6	2.7	4.8	27	24,320	1.4	0.9	2.2
	40-44	480	430,248	26.6	24.2	29.1	67	54,371	3.4	2.5	4.6	25	26,279	1.6	0.8	3.5
	45-49	520	455,351	30.7	27.7	33.8	72	48,971	3.3	2.5	4.3	25	17,764	1.2	0.8	1.9
	50-54	497	355,719	28.4	25.7	31.1	64	44,071	3.5	2.6	4.7	17	9,702	0.8	0.4	1.4
	55-59	424	282,881	29.1	26.1	32.3	58	37,969	3.9	2.9	5.2	24	13,724	1.4	0.8	2.5
	60-64	243	188,567	26.4	22.9	30.3	21	22,563	3.2	1.9	5.3	13	8,371	1.2	0.6	2.4
	65-69	143	107,655	23.8	19.6	28.5	16	16,091	3.6	1.7	7.2	4	1,836	0.4	0.1	1.1
	70-74	83	49,128	16.3	12.6	20.9	7	3,764	1.3	0.6	2.7	2	565	0.2	0.0	1.2
	75+	53	46,880	16.2	11.2	22.9	1	810	0.3	0.0	2.0	1	898	0.3	0.0	2.2

Table 2.1.5 Prevalence of obesity I to III (CPG 2004) among adults (aged ≥18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Obesity I (BMI 27.5-34.9 kg/m ²)			Obesity II (BMI 35.0-39.9 kg/m ²)			Obesity III (BMI ≥40.0 kg/m ²)			
	Count	Estimated % (Prevalence)	95% CI Lower Upper	Count	Estimated % (Prevalence)	95% CI Lower Upper	Count	Estimated % (Prevalence)	95% CI Lower Upper	
Ethnicity										
Malay	2,577	2,126,236	26.0 24.8 27.2	397	336,027	4.1 3.6 4.7	182	155,142	1.9 1.6 2.3	
Chinese	591	709,757	17.6 15.9 19.4	57	75,438	1.9 1.3 2.6	12	11,838	0.3 0.1 0.6	
Indians	404	337,358	28.6 25.8 31.6	61	52,843	4.5 3.2 6.3	23	31,213	2.7 1.4 4.9	
Other Bumiputras	351	386,401	22.0 19.0 25.3	37	40,378	2.3 1.5 3.5	15	16,975	1.0 0.6 1.7	
Others	149	148,607	12.7 9.4 16.8	17	9,047	0.8 0.4 1.7	5	3,860	0.3 0.1 1.0	
Marital Status										
Single	632	734,139	15.4 13.9 17.0	107	124,362	2.6 2.1 3.3	62	74,477	1.6 1.2 2.1	
Married	3,095	2,717,618	25.6 24.5 26.7	412	356,075	3.4 2.9 3.8	160	136,246	1.3 1.0 1.6	
Widow/widower/divorcee	345	256,601	27.6 24.5 31.0	48	32,160	3.5 2.5 4.8	15	8,304	0.9 0.5 1.6	
Education Level										
No formal education	262	187,508	20.2 17.4 23.4	42	28,267	3.1 2.1 4.4	6	3,916	0.4 0.2 1.0	
Primary education	1,045	854,278	24.2 22.5 26.1	126	105,415	3.0 2.4 3.8	49	30,217	0.9 0.6 1.3	
Secondary education	1,954	1,839,647	23.6 22.4 24.9	278	260,648	3.4 2.9 3.9	126	122,503	1.6 1.2 2.0	
Tertiary education	776	795,073	20.5 18.7 22.4	120	116,111	3.0 2.4 3.8	51	56,754	1.5 1.1 2.0	
Unclassified education	26	24,047	17.1 11.1 25.4	1	639	0.5 0.1 3.2	4	4,902	1.1 1.1 10.3	
Occupation										
Government/semi government employee	565	466,731	27.7 25.2 30.5	107	82,368	4.9 3.8 6.3	35	37,733	2.2 1.3 3.9	
Private employee	1,104	1,226,565	19.5 18.2 20.9	156	166,640	2.7 2.2 3.2	57	69,039	1.1 0.8 1.5	
Self employed	869	753,753	24.3 22.5 26.3	106	95,496	3.1 2.4 4.0	46	32,921	1.1 0.7 1.5	
Unpaid worker/home maker	565	466,731	27.7 25.2 30.5	107	82,368	4.9 3.8 6.3	35	37,733	2.2 1.3 3.9	
Home maker	893	701,712	28.6 26.4 30.8	137	106,489	4.3 3.5 5.4	59	49,625	2.0 1.5 2.8	
Retiree	348	261,139	23.2 20.4 26.2	35	32,676	2.9 1.9 4.4	15	7,680	0.7 0.3 1.4	
Income Group										
Less than RM 400	262	230,175	22.7 19.7 26.0	21	20,097	2.0 1.1 3.5	15	9,163	0.9 0.5 1.7	
RM 400 - RM 699	186	139,555	18.6 15.6 22.1	24	25,193	3.4 1.9 6.0	15	11,813	1.6 0.8 3.1	
RM 700 - RM 999	259	195,752	20.8 17.9 23.9	52	41,482	4.4 3.0 6.4	12	7,214	0.8 0.4 1.5	
RM 1000 - RM 1999	817	688,961	23.0 21.1 25.0	93	72,672	2.4 1.8 3.2	46	33,343	1.1 0.8 1.6	
RM 2000 - RM 2999	716	644,013	23.3 21.2 25.6	102	86,850	3.2 2.4 4.1	31	25,986	0.9 0.6 1.4	
RM 3000 - RM 3999	571	515,739	23.3 21.0 25.7	85	74,925	3.4 2.6 4.4	38	38,634	1.7 1.2 2.6	
RM 4000 - RM 4999	397	422,354	24.5 21.7 27.5	62	58,091	3.4 2.4 4.7	25	31,751	1.8 1.0 3.3	
RM 5000 & above	864	871,808	22.2 20.3 24.3	130	134,422	3.4 2.8 4.2	55	61,124	1.6 1.1 2.2	

Table 2.1.6 Prevalence of underweight (BMI < 18.5 kg/m²) among adults (aged ≥ 18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	1277	1,360,608	8.3	7.7	9.0
<i>State</i>					
Johor	123	160,156	8.1	6.2	10.4
Kedah	81	96,522	8.8	6.7	11.4
Kelantan	69	54,984	6.8	5.3	8.6
Melaka	77	33,034	6.8	4.8	9.4
Negeri Sembilan	61	42,198	7.1	5.1	9.8
Pahang	72	66,175	8.6	6.8	10.8
Penang	88	65,381	6.9	5.1	9.3
Perak	84	131,049	9.8	7.9	12.2
Perlis	59	10,534	7.9	5.7	10.8
Selangor	183	316,366	9.3	7.8	11.1
Terengganu	74	43,692	8.0	5.8	10.9
Sabah & WP Labuan	137	144,453	8.0	6.0	10.7
Sarawak	91	104,602	7.9	6.5	9.7
WP Kuala Lumpur	38	87,808	8.3	6.0	11.5
WP Putrajaya	40	3,655	8.4	5.4	12.7
<i>Location</i>					
Urban	705	994,844	8.3	7.6	9.2
Rural	572	365,764	8.4	7.6	9.2
<i>Sex</i>					
Male	638	714,893	8.4	7.6	9.3
Female	639	645,715	8.2	7.4	9.1
<i>Age Group</i>					
18-19	169	208,157	24.8	20.8	29.3
20-24	317	389,570	15.5	13.3	18.0
25-29	197	239,816	10.3	8.5	12.4
30-34	96	108,927	5.8	4.6	7.3
35-39	86	91,373	5.4	4.1	7.0
40-44	60	55,469	3.4	2.5	4.6
45-49	55	48,758	3.3	2.4	4.4
50-54	57	49,035	3.9	2.9	5.3
55-59	46	34,831	3.6	2.6	5.0
60-64	49	32,608	4.6	3.3	6.3
65-69	43	31,121	6.9	4.8	9.7
70-74	45	30,796	10.2	7.1	14.6
75+	57	40,148	13.9	10.1	18.8
<i>Ethnicity</i>					
Malays	699	631,395	7.7	7.0	8.5
Chinese	259	368,355	9.1	7.9	10.5
Indians	98	101,830	8.6	6.5	11.4
Other Bumiputras	129	140,837	8.0	6.0	10.7
Others	92	118,191	10.1	7.3	13.7
<i>Marital Status</i>					
Single	633	755,026	15.8	14.1	17.6
Married	541	534,043	5.0	4.6	5.6
Widow/widower/divorcee	103	71,540	7.7	6.1	9.6

Table 2.1.6 Prevalence of underweight (BMI < 18.5 kg/m²) among adults (aged ≥ 18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>Education Level</i>					
No formal education	105	89,652	9.7	7.7	12.0
Primary education	247	235,379	6.7	5.4	8.2
Secondary education	621	673,894	8.7	7.8	9.6
Tertiary education	273	332,756	8.6	7.3	10.1
Unclassified education	28	25,768	18.4	12.3	26.5
<i>Occupation</i>					
Government/semi government employee	91	73,449	4.4	3.3	5.8
Private employee	485	623,671	9.9	8.8	11.2
Self employed	203	205,959	6.7	5.5	8.0
Unpaid worker/home maker	143	132,046	5.3	4.4	6.4
Retiree	126	92,735	8.2	6.7	10.1
<i>Income Group</i>					
Less than RM 400	104	95,668	9.4	7.5	11.8
RM 400 - RM 699	85	70,828	9.5	7.0	12.6
RM 700 - RM 999	89	89,198	9.5	7.6	11.8
RM 1000 - RM 1999	274	259,701	8.7	7.4	10.2
RM 2000 - RM 2999	222	244,863	8.9	7.3	10.8
RM 3000 - RM 3999	164	173,988	7.9	6.3	9.7
RM 4000 - RM 4999	104	124,743	7.2	5.6	9.3
RM 5000 & above	235	301,620	7.7	6.4	9.2

Table 2.1.7 Mean BMI among adults by socio-demographic characteristics

Sociodemographic characteristics	Mean	Linearized Std. Err.	95% CI	
			Lower	Upper
MALAYSIA	25.0	0.1	24.8	25.1
<i>State</i>				
Johor	25.2	0.2	24.8	25.6
Kedah	25.0	0.2	24.6	25.5
Kelantan	25.3	0.2	25.0	25.6
Melaka	25.2	0.4	24.6	26.0
Negeri Sembilan	25.0	0.2	24.6	25.4
Pahang	24.9	0.2	24.4	25.3
Penang	24.9	0.3	24.4	25.4
Perak	25.2	0.3	24.6	25.9
Perlis	25.9	0.3	25.3	26.4
Selangor	25.1	0.2	24.8	25.5
Terengganu	25.0	0.2	24.6	25.5
Sabah & WP Labuan	24.2	0.2	23.7	24.7
Sarawak	24.9	0.2	24.4	25.3
WP Kuala Lumpur	24.7	0.3	24.0	25.3
WP Putrajaya	25.1	0.4	24.4	25.8
<i>Location</i>				
Urban	25.0	0.1	24.8	25.2
Rural	24.8	0.1	24.6	25.0
<i>Sex</i>				
Male	24.8	0.1	24.6	24.9
Female	25.2	0.1	25.0	25.4
<i>Age Group</i>				
15-19	22.2	0.3	21.7	22.7
20-24	23.3	0.2	23.0	23.6
25-29	24.5	0.2	24.1	24.8
30-34	25.2	0.2	24.9	25.6
35-39	25.6	0.2	25.3	26.0
40-44	26.0	0.2	25.6	26.5
45-49	26.2	0.1	25.9	26.5
50-54	26.0	0.1	25.7	26.3
55-59	26.3	0.2	25.9	26.6
60-64	25.7	0.2	25.3	26.1
65-69	25.4	0.3	24.9	25.9
70-74	23.9	0.2	23.4	24.3
75+	23.3	0.3	22.8	23.9
<i>Ethnicity</i>				
Malays	25.6	0.1	25.4	25.8
Chinese	24.1	0.1	23.8	24.3
Indians	26.0	0.3	25.4	26.7
Other Bumiputras	24.7	0.2	24.2	25.2
Others	23.0	0.2	22.6	23.4
<i>Marital Status</i>				
Single	23.5	0.1	23.2	23.7
Married	25.6	0.1	25.5	25.8
Widow/widower/divorcee	25.4	0.2	25.0	25.7

Table 2.1.7 Mean BMI among adults by socio-demographic characteristics

Sociodemographic characteristics	Mean	Linearized Std. Err.	95% CI	
			Lower	Upper
<i>Education Level</i>				
No formal education	24.4	0.2	24.1	24.8
Primary education	25.1	0.1	24.9	25.3
Secondary education	25.1	0.1	24.9	25.3
Tertiary education	24.8	0.1	24.5	25.0
Unclassified education	23.8	0.6	22.6	25.0
<i>Occupation</i>				
Government/semi government employee	26.4	0.2	25.9	26.8
Private employee	24.4	0.1	24.2	24.6
Self employed	25.2	0.1	25.0	25.5
Unpaid worker/home maker	26.1	0.1	25.8	26.3
Home maker	26.1	0.1	25.8	26.4
Retiree	25.0	0.2	24.7	25.4
<i>Income Group</i>				
Less than RM 400	24.8	0.2	24.4	25.2
RM 400 - RM 699	24.5	0.3	23.9	25.1
RM 700 - RM 999	24.6	0.2	24.2	25.0
RM 1000 - RM 1999	24.7	0.1	24.5	25.0
RM 2000 - RM 2999	24.9	0.2	24.6	25.2
RM 3000 - RM 3999	25.3	0.2	24.9	25.6
RM 4000 - RM 4999	25.3	0.3	24.8	25.9
RM 5000 & above	25.1	0.2	24.8	25.4

Table 2.1.8 Prevalence of Abdominal Obesity (WHO 1998) by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	3,865	3,340,871	20.9	20.0	21.9
<i>State</i>					
Johor	367	440,495	22.2	19.7	25.0
Kedah	353	335,463	30.7	27.2	34.4
Kelantan	160	118,249	14.6	12.6	16.9
Melaka	276	114,841	23.5	19.1	28.5
Negeri Sembilan	233	129,110	21.8	18.3	25.6
Pahang	118	92,661	17.9	14.2	22.3
Penang	245	181,109	19.2	15.6	23.5
Perak	301	392,449	28.6	25.5	31.8
Perlis	363	47,471	35.6	31.1	40.3
Selangor	595	695,879	20.7	18.7	23.0
Terengganu	124	66,921	14.3	11.4	17.8
Sabah & WP Labuan	241	228,352	12.7	9.6	16.5
Sarawak	264	290,996	21.9	18.6	25.6
WP Kuala Lumpur	128	199,249	18.9	14.8	23.8
WP Putrajaya	97	7,628	17.4	13.3	22.4
<i>Location</i>					
Urban	2,280	2,511,049	21.4	20.2	22.6
Rural	1,585	829,822	19.5	18.1	21.0
<i>Sex</i>					
Male	873	903,767	10.9	10.0	11.9
Female	2,992	2,437,104	31.8	30.3	33.2
<i>Age Group</i>					
18-19	64	75,445	9.3	6.8	12.5
20-24	199	269,706	11.0	9.2	13.1
25-29	298	355,360	15.7	13.6	17.9
30-34	349	348,907	19.2	17.0	21.6
35-39	360	333,884	20.3	17.9	22.8
40-44	416	356,797	22.7	20.4	25.3
45-49	479	392,185	27.2	24.4	30.1
50-54	510	347,973	28.5	25.9	31.1
55-59	482	314,136	33.3	30.2	36.5
60-64	284	224,322	31.0	27.2	35.0
65-69	179	145,453	32.1	27.3	37.3
70-74	140	92,288	28.9	23.7	34.7
75+	105	84,414	27.5	21.9	33.8
<i>Ethnicity</i>					
Malays	2,371	1,894,158	24.1	22.9	25.3
Chinese	600	667,464	16.7	14.9	18.6
Indians	499	407,061	34.6	31.6	37.7
Other Bumiputras	267	294,914	16.8	13.5	20.6
Others	128	77,274	6.6	4.8	9.0
<i>Marital Status</i>					
Single	469	573,383	12.3	10.9	13.9
Married	2,884	2,383,612	23.0	21.8	24.1
Widow/widower/divorcee	510	382,741	40.7	37.3	44.2

Table 2.1.8 Prevalence of Abdominal Obesity (WHO 1998) by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>Education Level</i>					
No formal education	400	277,747	29.5	26.3	33.0
Primary education	1,112	852,195	24.5	22.6	26.5
Secondary education	1,695	1,565,206	20.6	19.3	22.0
Tertiary education	628	622,065	16.5	14.8	18.3
Unclassified education	19	16,521	11.5	6.6	19.2
<i>Occupation</i>					
Government/semi government employee	475	372,337	23.0	20.6	25.7
Private employee	838	900,998	14.6	13.4	15.9
Self employed	669	546,432	18.2	16.5	20.1
Unpaid worker/home maker	1,151	908,721	37.3	34.9	39.7
Home maker	1,142	899,892	37.5	35.1	39.9
Retiree	469	360,611	31.4	28.4	34.6
<i>Income Group</i>					
Less than RM 400	338	286,410	28.6	25.2	32.3
RM 400 - RM 699	221	163,872	22.4	18.8	26.5
RM 700 - RM 999	273	197,270	21.1	18.3	24.3
RM 1000 - RM 1999	769	618,304	21.1	19.3	23.1
RM 2000 - RM 2999	624	530,151	19.6	17.8	21.6
RM 3000 - RM 3999	515	452,400	21.0	18.6	23.5
RM 4000 - RM 4999	349	343,667	20.4	17.6	23.5
RM 5000 & above	776	748,797	19.4	17.5	21.5

Table 2.1.9 Prevalence of Abdominal Obesity (WHO 2000) by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	7,902	7,263,189	45.4	44.1	46.7
<i>State</i>					
Johor	751	943,749	47.7	43.8	51.6
Kedah	637	640,123	58.6	54.3	62.8
Kelantan	397	298,158	36.8	33.2	40.6
Melaka	511	220,359	45.0	40.0	50.1
Negeri Sembilan	477	270,054	45.5	41.2	49.9
Pahang	262	213,967	41.3	35.7	47.1
Penang	526	418,212	44.4	39.6	49.3
Perak	567	776,223	56.5	52.3	60.7
Perlis	560	76,997	57.7	52.6	62.6
Selangor	1,199	1,514,643	45.1	42.3	48.0
Terengganu	314	162,293	34.7	30.0	40.0
Sabah & WP Labuan	656	624,222	34.6	29.7	39.8
Sarawak	526	600,222	45.2	40.7	50.0
WP Kuala Lumpur	289	485,846	46.1	39.6	52.7
WP Putrajaya	230	18,121	41.3	35.0	47.9
<i>Location</i>					
Urban	4,668	5,443,599	46.4	44.8	48.0
Rural	3,234	1,819,590	42.8	40.7	45.0
<i>Sex</i>					
Male	2,955	3,109,064	37.4	35.7	39.1
Female	4,947	4,154,124	54.1	52.5	55.7
<i>Age Group</i>					
18-19	147	159,131	19.6	16.2	23.5
20-24	495	701,281	28.6	25.7	31.6
25-29	629	761,665	33.6	30.8	36.5
30-34	763	813,415	44.7	41.6	47.9
35-39	796	792,223	48.0	44.7	51.4
40-44	879	800,548	51.0	48.1	54.0
45-49	963	803,420	55.7	52.4	58.9
50-54	992	768,008	62.8	59.7	65.8
55-59	870	596,879	63.2	59.8	66.6
60-64	542	445,062	61.4	57.2	65.6
65-69	356	287,011	63.2	58.6	67.7
70-74	271	179,520	56.2	49.2	63.0
75+	199	155,025	50.4	44.2	56.6
<i>Ethnicity</i>					
Malays	4,574	3,781,174	48.0	46.6	49.5
Chinese	1,479	1,753,545	43.8	41.4	46.1
Indians	885	746,970	63.5	60.1	66.8
Other Bumiputras	651	700,653	39.8	35.3	44.5
Others	313	280,847	24.0	19.6	29.0
<i>Marital Status</i>					
Single	1,070	1,305,005	28.0	26.0	30.1
Married	6,013	5,359,426	51.6	50.2	53.1
Widow/widower/divorcee	817	597,623	63.5	60.2	66.7

Table 2.1.9 Prevalence of Abdominal Obesity (WHO 2000) by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>Education Level</i>					
No formal education	685	498,311	53.0	48.7	57.3
Primary education	2,118	1,716,264	49.3	46.9	51.8
Secondary education	3,569	3,427,022	45.2	43.4	46.9
Tertiary education	1,458	1,554,914	41.2	38.9	43.6
Unclassified education	50	47,575	33.1	24.4	43.1
<i>Occupation</i>					
Government/semi government employee	1,000	832,237	51.4	48.2	54.7
Private employee	2,065	2,298,267	37.1	35.2	39.1
Self employed	1,539	1,359,363	45.3	42.8	47.8
Unpaid worker/home maker	1,848	1,516,746	62.3	59.8	64.6
Retiree	890	695,470	60.6	56.9	64.1
<i>Income Group</i>					
Less than RM 400	598	517,134	51.6	47.4	55.9
RM 400 - RM 699	401	306,327	41.9	36.9	47.0
RM 700 - RM 999	508	400,073	42.9	39.0	46.9
RM 1000 - RM 1999	1,540	1,293,936	44.2	41.6	46.9
RM 2000 - RM 2999	1,291	1,150,791	42.6	40.0	45.3
RM 3000 - RM 3999	1,099	1,046,089	48.5	45.3	51.7
RM 4000 - RM 4999	740	779,226	46.3	42.3	50.4
RM 5000 & above	1,725	1,769,613	45.9	43.2	48.5

Table 2.1.10 Prevalence of muscle wasting among elderly (aged 60 years old and above) by socio-demographic characteristics

Sociodemographic characteristics	Normal				Malnutrition			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
MALAYSIA	1,785	1,371,172	80.5	78.3 82.5	512	331,659	19.5	17.5 21.7
State								
Johor	200	194,226	84.6	78.6 89.2	37	35,333	15.4	10.9 21.4
Kedah	106	95,428	62.4	52.7 71.1	73	57,558	37.6	28.9 47.3
Kelantan	123	75,589	71.9	64.5 78.3	53	29,581	28.1	21.7 35.5
Melaka	133	51,648	79.5	65.5 88.7	28	13,361	20.6	11.3 34.5
Negeri Sembilan	113	54,103	75.1	61.1 85.3	42	17,901	24.9	14.7 38.9
Pahang	102	74,747	90.6	79.7 96.0	12	7,728	9.4	4.0 20.3
Penang	155	103,013	92.1	84.9 96.0	21	8,852	7.9	4.0 15.1
Perak	138	178,432	83.5	75.9 89.0	30	35,234	16.5	11.0 24.1
Perlis	75	11,303	57.5	45.1 69.0	55	8,367	42.5	31.0 54.9
Selangor	188	215,576	82.1	75.3 87.4	44	46,966	17.9	12.6 24.8
Terengganu	110	44,410	73.8	65.9 80.4	42	15,768	26.2	19.6 34.1
Sabah & WP Labuan	128	67,592	76.1	64.8 84.7	43	21,208	23.9	15.3 35.2
Sarawak	147	122,863	83.7	76.1 89.2	25	24,020	16.4	10.9 23.9
WP Kuala Lumpur	61	81,767	89.3	78.7 95.0	7	9,783	10.7	5.0 21.3
WP Putrajaya	6	476	100.0	- -	0	0	0.0	0.0 0.0
Location								
Urban	921	919,631	83.1	80.2 85.6	220	187,343	16.9	14.4 19.8
Rural	864	451,541	75.8	72.5 78.8	292	144,316	24.2	21.2 27.5
Sex								
Male	806	647,538	78.1	74.7 81.2	271	181,334	21.9	18.8 25.3
Female	979	723,634	82.8	80.2 85.1	241	150,325	17.2	14.9 19.8
Age Group								
60-64	737	584,931	88.2	85.5 90.4	130	78,472	11.8	9.6 14.5
65-69	476	361,694	83.7	79.7 87.0	117	70,576	16.3	13.0 20.3
70-74	326	228,854	74.5	68.9 79.4	124	78,318	25.5	20.6 31.1
75+	246	195,694	65.2	58.5 71.4	141	104,292	34.8	28.6 41.5
Ethnicity								
Malays	946	641,368	77.2	74.2 79.9	319	189,235	22.8	20.1 25.8
Chinese	564	554,845	86.1	82.5 89.0	102	89,716	13.9	11.0 17.5
Indians	132	75,814	78.2	68.0 85.8	38	21,197	21.9	14.3 32.0
Other Bumiputras	122	93,460	76.8	67.8 83.9	39	28,229	23.2	16.1 32.2
Others	21	5,686	63.4	32.4 86.2	14	3,282	36.6	13.8 67.6

Table 2.1.10 Prevalence of muscle wasting among elderly (aged 60 years old and above) by socio-demographic characteristics

Sociodemographic characteristics	Normal				Malnutrition			
	Count	Estimated Population	% (Prevalence)		Count	Estimated Population	% (Prevalence)	
			Lower	Upper			Lower	Upper
Marital Status								
Single	29	25,309	80.6	60.5	8	6,078	19.4	8.1
Married	1,222	961,346	82.0	79.2	324	210,817	18.0	15.5
Widow/widower/divorcee	534	384,517	77.0	73.2	180	114,764	23.0	19.6
Education Level								
No formal education	459	308,433	75.6	71.4	174	99,316	24.4	20.6
Primary education	909	680,759	78.9	75.7	266	182,393	21.1	18.3
Secondary education	300	274,718	88.2	83.9	53	36,703	11.8	8.5
Tertiary education	95	89,361	92.5	84.0	12	7,273	7.5	3.4
Unclassified education	12	8,834	76.7	46.5	4	2,689	23.3	7.4
Occupation								
Government/semi government employee	13	7089.0	78.2	41.0	2	1,974	22	5.1
Private employee	112	94,182	81.7	72.9	30	21,151	18.3	11.9
Self employed	346	236,504	78.7	73.1	113	64,172	21.3	16.7
Unpaid worker/home maker	329	269,562	87.3	82.9	57	39,338	13	9.3
Retiree	847	650,690	78.5	75.0	272	178,266	21.5	18.4
Income Group								
Less than RM 400	319	255,035	76.2	71.0	116	79,557	23.8	19.3
RM 400 - RM 699	154	100,866	74.5	67.1	71	34,467	25.5	19.3
RM 700 - RM 999	181	142,051	82.6	74.7	49	29,982	17.4	11.6
RM 1000 - RM 1999	356	245,274	79.8	74.2	102	62,034	20.2	15.5
RM 2000 - RM 2999	257	191,157	80.4	74.2	74	46,600	19.6	14.6
RM 3000 - RM 3999	178	145,651	84.1	76.4	37	27,509	15.9	10.3
RM 4000 - RM 4999	108	96,392	86.3	76.4	19	15,384	13.8	7.6
RM 5000 & above	232	194,747	84.4	77.8	44	36,125	15.7	10.8

Table 2.2.1 Intake of fruit and/or vegetables consumption based on STEPS WHO criteria among adults (≥ 18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Intake of (≥ 5 servings of fruits and/or vegetables per day)				Intake of (< 5 servings of fruits and/or vegetables per day)			
	Count	Estimated Population	% (Prevalence)		Count	Estimated Population	% (Prevalence)	
			Lower	Upper			Lower	Upper
MALAYSIA	1,358	1,341,929	7.5	8.0	16,836	16,436,385	92.5	92.9
<i>State</i>								
Johor	117	151,335	7.1	8.6	1,441	1,975,070	92.9	94.1
Kedah	53	59,277	5.2	7.0	1,025	1,087,051	94.8	96.2
Kelantan	118	85,102	9.9	11.9	985	772,379	90.1	91.7
Melaka	60	22,409	4.3	6.0	1,070	500,417	95.7	97.0
Negeri Sembilan	69	41,583	6.4	8.3	940	605,710	93.6	95.0
Pahang	88	79,377	9.1	11.3	952	789,516	90.9	92.7
Penang	84	83,405	7.7	10.3	1,147	996,412	92.3	94.3
Perak	73	102,980	7.0	8.9	1,014	1,366,823	93.0	94.5
Pertlis	40	6,237	4.4	6.1	919	134,848	95.6	96.8
Selangor	285	380,609	10.2	11.5	2,365	3,347,457	89.8	91.0
Terengganu	105	47,551	8.0	9.9	985	547,903	92.0	93.6
Sabah & WP Labuan	112	92,302	4.5	6.1	1,759	1,807,722	95.1	96.1
Sarawak	64	77,063	5.3	7.1	1,143	1,383,164	94.7	96.1
WP Kuala Lumpur	62	110,026	9.3	12.1	565	1,078,219	90.7	93.0
WP Putrajaya	28	2,674	5.8	8.4	526	43,696	94.2	96.1
<i>Location</i>								
Urban	867	1,032,931	7.9	8.6	9,720	11,974,407	92.1	92.6
Rural	491	308,998	6.5	7.2	7,116	4,461,978	93.5	94.2
<i>Sex</i>								
Male	616	657,342	7.2	8.0	7,895	8,412,287	92.8	93.4
Female	742	684,587	7.9	8.5	8,941	8,024,099	92.1	92.8
<i>Age Group</i>								
18-19	24	22,820	2.6	4.0	758	864,403	97.4	98.4
20-24	105	134,495	5.0	6.2	1,997	2,571,729	95.0	96.1
25-29	115	144,399	5.6	6.9	1,982	2,456,925	94.4	95.6
30-34	145	167,671	8.2	9.8	1,734	1,888,854	91.8	93.2
35-39	150	174,056	9.4	11.4	1,646	1,667,823	90.6	92.2
40-44	158	161,755	9.4	11.3	1,677	1,553,703	90.6	92.1
45-49	158	130,264	8.3	9.9	1,641	1,437,768	91.7	93.1
50-54	139	125,508	9.6	11.6	1,541	1,185,146	90.4	92.1
55-59	150	113,317	11.0	13.3	1,311	913,168	88.9	90.8
60-64	91	76,741	9.9	12.6	906	695,822	90.1	92.2
65-69	66	51,164	10.3	13.8	607	447,884	89.7	92.4
70-74	33	23,481	6.4	9.6	505	344,715	93.6	95.8
75+	24	16,259	3.8	6.1	531	408,445	96.2	97.6

Table 2.2.1 Intake of fruit and/or vegetables consumption based on STEPS WHO criteria among adults (≥ 18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Intake of (≥ 5 servings of fruits and/or vegetables per day)					Intake of (< 5 servings of fruits and/or vegetables per day)						
	Count	Estimated Population	% (Prevalence)	95% CI		Count	Estimated Population	% (Prevalence)	95% CI			
				Lower	Upper				Lower	Upper		
Ethnicity												
Malays	754	672,913	7.6	7.0	8.3	9,606	8,162,884	92.4	91.7	93.0		
Chinese	343	413,154	9.1	8.0	10.3	3,178	4,116,184	90.9	89.7	92.0		
Indians	75	65,151	5.2	4.0	6.8	1,382	1,187,876	94.8	93.2	96.0		
Other Bumiputras	102	98,512	5.2	4.1	6.5	1,621	1,810,824	94.8	93.5	95.9		
Others	84	92,199	7.4	5.4	10.0	1,049	1,158,617	92.6	90.0	94.6		
Marital Status												
Single	217	258,027	5.1	4.3	6.0	4,008	4,819,264	94.9	94.0	95.7		
Married	1,047	1,014,045	8.7	8.1	9.4	11,442	10,607,740	91.3	90.6	91.9		
Widow/widower/divorcee	94	69,857	6.5	5.1	8.3	1,375	1,001,358	93.5	91.7	94.9		
Education Level												
No formal education	71	44,956	4.2	3.1	5.5	1,379	1,037,484	95.8	94.5	96.9		
Primary education	292	246,231	6.5	5.6	7.5	4,072	3,568,925	93.5	92.5	94.4		
Secondary education	621	643,782	7.7	7.0	8.4	7,652	7,746,673	92.3	91.6	93.0		
Tertiary education	361	391,328	9.2	8.2	10.4	3,495	3,845,439	90.8	89.6	91.8		
Unclassified education	12	9,801	6.1	3.3	11.0	154	152,073	93.9	89.0	96.7		
Occupation												
Government/semi government employee	1,953	1,633,294	9.5	8.1	11.3	191	172,343	90.5	88.7	91.9		
Private employee	365	436,949	6.4	5.7	7.2	5,325	6,364,092	93.6	92.8	94.3		
Self employed	319	312,001	9.5	8.3	10.9	3,294	2,958,262	90.5	89.1	91.7		
Unpaid worker/home maker	259	222,631	8.2	7.1	9.4	2,935	2,504,630	91.8	90.6	92.9		
Retiree	131	100,788	7.6	6.2	9.3	1,606	1,228,343	92.4	90.7	93.8		
Income Group												
Less than RM 400	84	78,115	6.6	5.1	8.4	1,218	1,109,524	93.4	91.6	94.9		
RM 400 - RM 699	54	40,505	5.0	3.6	7.0	912	768,998	95.0	93.0	96.4		
RM 700 - RM 999	72	62,641	6.0	4.6	7.9	1,113	976,883	94.0	92.1	95.4		
RM 1000 - RM 1999	250	232,520	7.2	6.2	8.4	3,420	2,999,141	92.8	91.6	93.8		
RM 2000 - RM 2999	215	235,121	7.9	6.7	9.2	2,871	2,757,894	92.1	90.8	93.3		
RM 3000 - RM 3999	184	180,701	7.5	6.3	8.9	2,221	2,236,401	92.5	91.1	93.7		
RM 4000 - RM 4999	117	127,640	6.9	5.6	8.5	1,543	1,724,372	93.1	91.5	94.4		
RM 5000 & above	382	384,685	9.1	8.0	10.2	3,538	3,863,173	90.9	89.8	92.0		

Table 2.2.2 Intake of fruits consumption as compared to Malaysian Dietary Guidelines among adults (≥ 18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Intake of (2 or more servings per day)				Intake of (less than 2 servings per day)					
	Count	Estimated Population	95% CI		Count	Estimated Population	95% CI			
			% (Prevalence)	Lower			Upper	% (Prevalence)	Lower	Upper
MALAYSIA	2947	2757084	15.5	14.9	16.2	15213	14998989	84.5	83.8	85.1
<i>State</i>										
Johor	175	235287	11.1	9.5	13.0	1380	1887056	88.9	87.0	90.5
Kedah	153	169610	14.8	12.3	17.6	926	980146	85.2	82.4	87.7
Kelantan	250	183532	21.4	19.1	24.1	851	672106	78.6	75.9	80.9
Melaka	149	64705	12.4	10.0	15.2	980	458019	87.6	84.8	90.0
Negeri Sembilan	148	86000	13.3	11.1	15.8	861	561293	86.7	84.2	88.9
Pahang	176	151123	17.5	15.0	20.2	859	714672	82.5	79.8	85.0
Penang	254	238553	22.2	18.9	25.8	976	837807	77.8	74.2	81.1
Perak	165	218035	14.8	12.6	17.4	921	1250750	85.2	82.6	87.4
Pertis	146	19777	14.1	12.0	16.6	803	120216	85.9	83.4	88.0
Selangor	480	634643	17.0	15.5	18.6	2169	3092362	83.0	81.4	84.5
Terengganu	228	111162	18.8	16.4	21.5	860	481935	81.2	73.5	83.6
Sabah & WP Labuan	247	194420	10.2	8.8	11.9	1621	1702920	89.8	88.1	91.2
Sarawak	184	220977	15.2	12.8	17.9	1019	1234867	84.8	82.1	87.2
WP Kuala Lumpur	124	223127	18.8	15.6	22.4	502	964183	81.2	77.6	84.4
WP Putrajaya	68	5634	12.2	9.5	15.5	485	40656	87.8	84.5	90.5
<i>Location</i>										
Urban	130	172966	8.8	7.3	10.6	1426	1791045	91.2	89.4	92.7
Rural	116	85431	9.6	7.8	11.8	1106	803580	90.4	88.2	92.2
<i>Sex</i>										
Male	1284	1313151	14.5	13.6	15.5	7218	7745805	85.5	84.5	86.4
Female	1663	1443933	16.6	15.7	17.5	7995	7253183	83.4	82.5	84.3
<i>Age Group</i>										
18-19	62	54245	6.1	4.6	8.1	719	832388	93.9	91.9	95.4
20-24	235	291278	10.8	9.2	12.6	1860	2408645	89.2	87.4	90.8
25-29	258	301827	11.6	10.0	13.4	1837	2297680	88.4	86.6	90.0
30-34	291	312926	15.2	13.3	17.3	1585	1744640	84.8	82.7	86.7
35-39	295	289691	15.7	13.8	17.9	1497	1551963	84.3	82.1	86.2
40-44	334	326685	19.0	16.9	21.4	1500	1389663	81.0	78.6	83.1
45-49	322	290809	18.6	16.5	21.0	1472	1271067	81.4	79.0	83.5
50-54	342	274925	21.0	18.7	23.6	1332	1031679	79.0	76.4	81.3
55-59	332	242003	23.6	20.8	26.7	1126	783270	76.4	73.3	79.2
60-64	197	158686	20.5	17.5	23.9	800	613876	79.5	76.1	82.5
65-69	130	101786	20.4	16.5	25.0	543	397263	79.6	75.0	83.5
70-74	79	50358	13.8	10.5	17.8	457	315783	86.2	82.2	89.5
75+	70	61865	14.6	10.7	19.5	485	362839	85.4	80.5	89.3

Table 2.2.2 Intake of fruits consumption as compared to Malaysian Dietary Guidelines among adults (≥ 18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Intake of (2 or more servings per day)					Intake of (less than 2 servings per day)						
	Count	Estimated Population	% (Prevalence)	95% CI		Count	Estimated Population	% (Prevalence)	95% CI			
				Lower	Upper				Lower	Upper		
Ethnicity												
Malays	1,697	1,398,260	15.8	15.0	16.7	8,642	7,428,981	84.2	83.3	85.0		
Chinese	687	839,018	18.6	17.0	20.2	2,831	3,683,786	81.4	79.8	83.0		
Indians	182	145,825	11.6	9.7	13.9	1,274	1,106,586	88.4	86.1	90.3		
Other Bumiputras	228	221,022	11.6	10.0	13.5	1,490	1,684,298	88.4	86.5	90.0		
Others	153	152,958	12.3	9.7	15.3	976	1,095,338	87.7	84.7	90.3		
Marital Status												
Single	493	557,056	11.0	9.9	12.2	3,722	4,512,315	89.0	87.8	90.1		
Married	2,212	2,006,193	17.3	16.5	18.1	10,257	9,603,965	82.7	81.9	83.5		
Widow/widower/divorcee	240	190,427	17.8	15.3	20.6	1,225	878,095	82.2	79.4	84.7		
Education Level												
No formal education	158	105,125	9.7	8.1	11.7	1,289	974,125	90.3	88.3	91.9		
Primary education	645	5185,60	13.6	12.3	15.0	3,711	3,290,509	86.4	85.0	87.7		
Secondary education	1,390	1,325,891	15.8	14.9	16.8	6,867	7,055,601	84.2	83.2	85.1		
Tertiary education	726	779,034	18.4	16.9	20.0	3,125	3,454,911	81.6	80.0	83.1		
Unclassified education	20	18,641	11.6	7.2	18.1	144	142,052	88.4	81.9	92.8		
Occupation												
Government/semi government employee	400	342,468	19.0	16.9	21.2	1,742	1,463,965	81.0	78.8	83.1		
Private employee	803	943,175	13.9	12.8	15.0	4,880	5,850,517	86.1	85.0	87.2		
Self employed	669	587,796	18.0	16.5	19.7	2,937	2,678,370	82.0	80.3	83.5		
Unpaid worker/home maker	552	443,158	16.3	14.8	17.9	2,633	2,280,542	83.7	82.1	85.2		
Retiree	313	252,087	19.0	16.6	21.7	1,422	1,074,531	81.0	78.3	83.4		
Income Group												
Less than RM 400	186	177,984	15.0	12.6	17.9	1,112	1,007,296	85.0	82.1	87.4		
RM 400 - RM 699	111	84,787	10.5	8.4	13.0	853	724,495	89.5	87.0	91.6		
RM 700 - RM 999	788	123,452	11.9	9.9	14.3	1,023	913,584	88.1	85.7	90.1		
RM 1000 - RM 1999	531	443,083	13.7	12.4	15.2	3,130	2,782,867	86.3	84.8	87.6		
RM 2000 - RM 2999	453	433,317	14.5	13.0	16.2	2,629	2,557,747	85.5	83.8	87.0		
RM 3000 - RM 3999	400	366,113	15.2	13.5	17.0	2,000	2,047,340	84.8	83.0	86.5		
RM 4000 - RM 4999	282	288,633	15.6	13.6	17.8	1,376	1,563,510	84.4	82.2	86.4		
RM 5000 & above	826	839,715	19.8	18.3	21.4	3,090	3,402,154	80.2	78.6	81.7		

Table 2.2.3 Intake of vegetables consumption as compared to Malaysian Dietary Guidelines among adults (≥ 18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Intake of (3 or more servings per day)				Intake of (less than 3 servings per day)					
	Count	Estimated Population	% (Prevalence)		Count	Estimated Population	% (Prevalence)			
			Lower	Upper			Lower	Upper		
MALAYSIA	2339	24,212,76.5	13.7	13.0	14.3	15815	15,316,206	86.3	85.7	87.0
State										
Johor	250	353,845	16.7	14.6	19.0	1306	1,770,217	83.3	81.0	85.4
Kedah	98	103,162	9.0	7.2	11.2	980	1,043,166	91.0	88.8	92.8
Kelantan	155	117,017	13.7	11.7	15.9	947	739,812	86.3	84.1	88.3
Melaka	123	55,887	10.7	8.4	13.5	1005	466,670	89.3	86.5	91.6
Negeri Sembilan	133	83,082	12.9	10.7	15.5	872	561,948	87.1	84.5	89.3
Pahang	174	150,169	17.3	14.9	20.0	865	717,503	82.7	80.0	85.1
Penang	97	88,122	8.2	6.2	10.7	1134	991,694	91.8	89.3	93.8
Perak	124	174,209	12.0	9.9	14.4	956	1,281,910	88.0	85.6	90.1
Perlis	71	11,264	8.0	6.3	10.2	881	129,134	92.0	89.8	93.7
Selangor	438	631,393	17.0	15.4	18.6	2206	3,087,012	83.0	81.4	84.6
Terengganu	181	94,171	15.8	13.6	18.3	908	500,734	84.2	81.7	86.4
Sabah & WP Labuan	211	211,964	11.2	9.5	13.2	1655	1,682,193	88.8	86.8	90.5
Sarawak	173	205,811	14.1	11.9	16.7	1033	1,254,179	85.9	83.3	88.1
WP Kuala Lumpur	72	137,763	11.6	9.0	14.8	553	1,047,147	88.4	85.2	91.0
WP Putrajaya	39	3,416	7.4	5.3	10.2	514	42,878	92.6	89.8	94.7
Location										
Urban	1420	1,796,611	13.8	13.1	14.7	9144	11,180,150	86.2	85.3	86.9
Rural	919	624,666	13.1	12.1	14.2	6671	4,136,056	86.9	85.8	87.9
Sex										
Male	1136	1,243,960	13.8	12.8	14.7	7358	7,801,860	86.2	85.3	87.2
Female	1203	1,177,317	13.5	12.7	14.4	8457	7,514,310	86.5	85.6	87.3
Age Group										
18-19	76	83,878	9.5	7.3	12.1	705	803,264	90.5	87.9	92.7
20-24	252	325,820	12.1	10.4	13.9	1848	2,378,006	87.9	86.1	89.6
25-29	263	364,493	14.0	12.2	16.1	1833	2,235,273	86.0	83.9	87.8
30-34	254	301,381	14.7	12.8	16.8	1622	1,747,237	85.3	83.2	87.2
35-39	254	286,730	15.6	13.6	17.9	1536	1,547,167	84.4	82.1	86.4
40-44	242	239,705	14.0	12.1	16.2	1589	1,469,857	86.0	83.8	87.9
45-49	242	221,248	14.2	12.3	16.3	1550	1,340,422	85.8	83.7	87.7
50-54	219	190,260	14.5	12.5	16.8	1455	1,117,922	85.5	83.2	87.5
55-59	200	152,290	14.9	12.5	17.7	1260	871,905	85.1	82.3	87.5
60-64	137	108,224	14.0	11.6	16.9	857	663,234	86.0	83.1	88.4
65-69	99	76,133	15.3	12.0	19.2	572	422,498	84.7	80.8	88.0
70-74	54	37,201	10.1	7.2	14.1	483	330,864	89.9	85.9	92.8
75+	47	33,914	8.0	5.5	11.6	505	388,559	92.0	88.4	94.5

Table 2.2.3 Intake of vegetables consumption as compared to Malaysian Dietary Guidelines among adults (≥18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Intake of (3 or more servings per day)				Intake of (less than 3 servings per day)			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
Ethnicity								
Malays	1221	1,135,269	12.9	12.1 13.7	9121	7,686,822	87.1	86.3 87.9
Chinese	556	716,533	15.9	14.4 17.4	2952	3,794,095	84.1	82.6 85.6
Indians	163	137,458	11.0	9.1 13.2	1293	1,115,095	89.0	86.8 90.9
Other Bumiputras	211	221,567	11.6	9.9 13.6	1507	1,684,853	88.4	86.4 90.1
Others	188	210,450	16.9	13.9 20.4	942	1,035,341	83.1	79.6 86.1
Marital Status								
Single	479	626,957	12.4	11.1 13.7	3743	4,447,856	87.6	86.3 88.9
Married	1708	1,684,367	14.5	13.8 15.4	10749	9,902,544	85.5	84.6 86.2
Widow/widower/divorcee	152	109,953	10.3	8.5 12.4	1312	957,783	89.7	87.6 91.5
Education Level								
No formal education	160	105,833	9.8	8.1 11.9	1282	971,872	90.2	88.1 91.9
Primary education	572	538,793	14.1	12.8 15.6	3785	3,271,532	85.9	84.4 87.2
Secondary education	1034	1,114,512	13.3	12.4 14.3	7218	7,248,911	86.7	85.7 87.6
Tertiary education	544	629,899	14.9	13.5 16.3	3308	3,602,634	85.1	83.7 86.5
Unclassified education	22	24,404	15.1	8.6 25.1	144	137,469	84.9	74.9 91.4
Occupation								
Government/semi government employee	271	250,561	13.9	12.1 15.9	1,867	1,550,891	86.1	84.1 87.9
Private employee	735	918,802	13.5	12.4 14.7	4948	5,869,719	86.5	85.3 87.5
Self employed	527	510,128	15.6	14.1 17.3	3077	2,749,716	84.4	82.7 85.9
Unpaid worker/home maker	400	365,043	13.4	12.0 14.9	2786	2,356,562	86.6	85.1 88.0
Retiree	204	163,040	12.3	10.5 14.4	1527	1,161,355	87.7	85.6 89.5
Income Group								
Less than RM 400	146	134,387	11.3	9.3 13.7	1154	1,052,580	88.7	86.3 90.7
RM 400 - RM 699	119	102,7198	12.7	10.0 16.1	844	703,728	87.3	83.9 90.0
RM 700 - RM 999	123	114,442	11.0	8.9 13.7	1060	921,744	89.0	86.3 91.1
RM 1000 - RM 1999	456	423,100	13.1	11.8 14.6	3206	2,798,866	86.9	85.4 88.2
RM 2000 - RM 2999	420	434,182	14.5	13.0 16.2	2659	2,550,091	85.5	83.8 87.0
RM 3000 - RM 3999	286	303,188	12.6	10.9 14.5	2109	2,104,651	87.4	85.5 89.1
RM 4000 - RM 4999	216	268,285	14.5	12.4 16.9	1440	1,579,419	85.5	83.1 87.6
RM 5000 & above	573	640,975	15.1	13.8 16.5	3343	3,605,128	84.9	83.5 86.2

Table 2.2.4. Intake of drinks with added sugar among adults (≥18 years old) by socio-demographic characteristics

Sociodemographic characteristics	≤3 cups per day			>3 cups per day		
	Count	Estimated Population	% (Prevalence)	Count	Estimated Population	% (Prevalence)
Ethnicity			95% CI Lower	95% CI Lower		95% CI Upper
Malays	9,002	7,604,727	86.1	85.3	1,345	13.9
Chinese	3,370	4,359,318	96.5	95.6	146	3.5
Indians	1,341	1,147,236	91.7	89.7	114	8.3
Other Bumiputras	1,567	1,751,484	91.7	90.1	155	8.3
Others	1,048	1,174,817	94.1	91.7	83	5.9
Marital Status			95% CI Lower	95% CI Lower		95% CI Upper
Single	3,775	4,583,297	90.5	89.4	438	9.5
Married	11,162	10,432,281	89.8	89.1	1,317	10.2
Widow/widower/divorcee	1,380	1,013,981	94.8	93.3	88	5.2
Education Level			95% CI Lower	95% CI Lower		95% CI Upper
No formal education	1,351	1,003,723	92.8	90.7	97	7.2
Primary education	3,925	3,475,753	91.2	90.1	433	8.8
Secondary education	7,348	7,487,563	89.4	88.5	913	10.6
Tertiary education	3,471	3,837,102	90.6	89.5	382	9.3
Unclassified education	150	145,373	89.8	82.9	16	10.2
Occupation			95% CI Lower	95% CI Lower		95% CI Upper
Government/semi government employee	1,904	1,589,105	87.8	85.8	241	12.2
Private employee	5,050	6,107,759	89.9	89.0	631	10.1
Self employed	3,122	2,846,599	87.1	85.7	490	12.9
Unpaid worker/home maker	2,979	2,554,439	93.8	92.8	210	6.2
Retiree	1,609	1,236,975	93.1	91.6	127	6.9
Income Group			95% CI Lower	95% CI Lower		95% CI Upper
Less than RM 400	1,216	1,119,775	94.4	92.5	83	5.6
RM 400 - RM 699	867	735,679	90.8	88.4	99	9.2
RM 700 - RM 999	1,060	921,291	88.9	86.5	122	11.1
RM 1000 - RM 1999	3,254	2,902,232	89.9	88.6	412	10.1
RM 2000 - RM 2999	2,729	2,675,159	89.5	88.1	352	10.5
RM 3000 - RM 3999	2,172	2,187,712	90.6	89.0	229	9.4
RM 4000 - RM 4999	1,510	1,694,870	91.4	89.6	152	8.6
RM 5000 & above	3,520	3,800,862	89.7	88.4	394	10.3

Table 2.2.5 Intake of drinks with added sugar a day among adults (≥18 years old) by socio-demographic characteristics

Sociodemographic characteristics	<3 cups per day				≥3 cups per day			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
MALAYSIA	14,509	14,410,644	82.7	80.4 81.9	3,662	3,347,492	18.9	18.1 19.6
State								
Johor	1,216	1,672,071	78.8	76.4 81.0	338	450,043	21.2	19.0 23.6
Kedah	752	796,008	69.2	65.7 72.5	328	354,561	30.8	27.5 34.3
Kelantan	850	656,084	76.4	73.7 79.0	254	202,163	23.6	21.0 26.3
Melaka	890	428,150	82.2	79.0 85.0	235	92,537	17.8	15.0 21.0
Negeri Sembilan	849	534,568	82.9	79.8 85.7	156	110,085	17.1	14.3 20.2
Pahang	817	671,825	77.6	74.6 80.4	219	193,375	22.4	19.6 25.4
Penang	1,034	934,195	86.5	83.6 89.0	197	145,621	13.5	11.0 16.4
Perak	855	1,168,965	79.6	76.7 82.2	231	299,917	20.4	17.8 23.3
Perlis	669	96,138	68.2	64.8 71.4	289	44,845	31.8	28.6 35.2
Selangor	2,231	3,159,681	84.9	83.3 86.4	417	562,553	15.1	13.6 16.7
Terengganu	810	431,148	72.5	69.5 75.4	278	163,149	27.5	24.6 30.5
Sabah & WP Labuan	1,561	1,627,528	85.7	83.6 87.5	309	272,226	14.3	12.5 16.4
Sarawak	997	1,233,168	84.4	81.9 86.6	211	228,549	15.6	13.4 18.1
WP Kuala Lumpur	499	961,862	81.3	77.8 84.4	126	220,823	18.7	15.6 22.2
WP Putrajaya	479	39,253	84.8	81.1 87.9	74	7,045	15.2	12.1 18.9
Location								
Urban	8,723	10,748,148	82.7	81.8 83.6	1,856	2,245,241	17.3	16.4 18.2
Rural	5,786	3,662,496	76.9	75.6 78.0	1,806	1,102,252	23.1	22.0 24.4
Sex								
Male	6,169	6,790,228	75.0	73.8 76.1	2,327	2,266,296	25.0	23.9 26.2
Female	8,340	7,620,416	87.6	86.8 88.3	1,335	1,081,196	12.4	11.7 13.2
Age Group								
18-19	634	737,418	83.3	80.1 86.1	147	147,589	16.7	13.9 19.9
20-24	1,691	2,233,133	82.8	80.7 84.6	401	464,627	17.2	15.4 19.3
25-29	1,615	2,076,861	79.9	77.8 81.9	478	521,504	20.1	18.1 22.2
30-34	1,503	1,648,540	80.1	77.8 82.2	379	410,030	19.9	17.8 22.2
35-39	1,428	1,468,314	79.9	77.4 82.2	367	369,699	20.1	17.8 22.6
40-44	1,464	1,385,764	80.8	78.4 82.9	370	330,243	19.2	17.1 21.6
45-49	1,411	1,251,749	79.8	77.3 82.1	387	317,124	20.2	17.9 22.7
50-54	1,302	1,032,638	78.8	76.3 81.1	377	277,944	21.2	18.9 23.7
55-59	1,167	832,893	81.2	78.6 83.6	293	192,372	18.8	16.4 21.4
60-64	795	629,603	81.8	78.6 84.6	199	140,250	18.2	15.4 21.4
65-69	561	421,591	84.5	80.6 87.7	112	77,457	15.5	12.3 19.4
70-74	453	318,621	86.8	82.9 89.9	84	48,489	13.2	10.1 17.1
75+	485	373,520	88.2	84.3 91.1	68	50,165	11.8	8.9 15.7

Table 2.2.5 Intake of drinks with added sugar a day among adults (≥18 years old) by socio-demographic characteristics

Sociodemographic characteristics	<3 cups per day				> 3cups per day						
	Count	Estimated Population	% (Prevalence)		Count	Estimated Population	% (Prevalence)				
			Lower	Upper			Lower	Upper			
Ethnicity											
Malays	7,740	6,515,586	73.8	72.7	74.9	2,607	2,314,027	26.2	25.1	27.3	
Chinese	3,206	4,180,339	92.5	91.4	93.5	310	339,297	7.5	6.5	8.6	
Indians	1,229	1,061,524	84.8	82.3	87.0	226	189,813	15.2	13.0	17.7	
Other Bumiputras	1,391	1,582,014	82.9	80.6	84.9	331	327,052	17.1	15.1	19.4	
Others	943	1,071,182	85.8	82.5	88.5	188	177,302	14.2	11.5	17.5	
Marital Status											
Single	3,371	4,143,148	81.8	80.3	83.2	842	922,680	18.2	16.8	19.7	
Married	9,879	9,335,767	80.4	79.5	81.2	2,600	2,278,619	19.6	18.8	20.5	
Widow/widower/divorcee	1,248	923,707	86.3	84.1	88.3	220	146,193	13.7	11.7	15.9	
Education Level											
No formal education	1,203	898,172	83.0	80.3	85.4	245	183,669	17.0	14.6	19.7	
Primary education	3,449	3,103,890	81.4	79.9	82.8	909	708,837	18.6	17.2	20.1	
Secondary education	6,521	6,719,415	80.2	79.1	81.2	1,740	1,658,725	19.8	18.8	20.9	
Tertiary education	3,126	3,478,468	82.2	80.7	83.6	727	753,465	17.8	16.4	19.3	
Unclassified education	133	127,578	78.8	69.0	86.1	33	34,295	21.2	13.9	31.0	
Occupation											
Government/semi government employee	1,680	1,378,564	76.2	73.6	78.5	465	431,439	23.8	21.5	26.4	
Private employee	4,485	5,517,617	81.2	80.0	82.4	1,196	1,273,955	18.8	17.6	20.0	
Self employed	2,663	2,465,549	75.4	73.6	77.2	949	802,271	24.6	22.8	26.4	
Unpaid worker/home maker	2,732	2,361,361	86.7	85.3	88.1	457	360,813	13.3	11.9	14.7	
Retiree	1,438	1,123,853	84.6	82.5	86.5	298	204,435	15.4	13.5	17.5	
Income Group											
Less than RM 400	1,105	1,044,917	88.1	85.8	90.0	194	141,808	11.9	10.0	14.2	
RM 400 - RM 699	758	655,433	80.9	77.7	83.7	208	154,958	19.1	16.3	22.3	
RM 700 - RM 999	914	795,162	76.7	73.5	79.7	268	240,897	23.3	20.3	26.5	
RM 1000 - RM 1999	2,864	2,580,760	79.9	78.2	81.5	802	648,202	20.1	18.5	21.8	
RM 2000 - RM 2999	2,390	2,369,343	79.2	77.4	81.0	691	621,185	20.8	19.0	22.6	
RM 3000 - RM 3999	1,948	1,976,221	81.8	79.8	83.7	453	438,747	18.2	16.3	20.2	
RM 4000 - RM 4999	1,357	1,525,938	82.3	79.9	84.5	305	327,978	17.7	15.5	20.1	
RM 5000 & above	3,173	3,462,869	81.7	80.2	83.2	741	773,717	18.3	16.8	19.8	

Table 2.2.6 Intake of drinks with sweetened condensed milk/creamer a day among adults (≥ 18 years old) by socio-demographic characteristics

Sociodemographic characteristics	0 cup per day				1- < 2 cups per day					
	Count	Estimated Population	% (Prevalence)		Count	Estimated Population	% (Prevalence)			
			Lower	Upper			Lower	Upper		
MALAYSIA	8,640	8,321,178	46.8	45.9	47.8	4,203	4,262,476	24.0	23.2	24.8
State										
Johor	650	852,626	40.2	37.4	43.0	376	541,893	25.5	23.0	28.2
Kedah	598	581,046	50.6	46.9	54.2	262	294,660	25.6	22.6	28.9
Kelantan	452	348,348	40.7	37.7	43.8	228	177,420	20.7	18.3	23.4
Melaka	504	224,783	43.1	39.1	47.1	235	115,857	22.2	19.0	25.7
Negeri Sembilan	441	276,896	43.0	39.2	46.8	153	91,261	14.2	11.7	17.0
Pahang	429	363,879	41.9	38.6	45.4	266	218,657	25.2	22.4	28.2
Penang	611	536,087	49.8	45.7	53.9	250	213,373	19.8	16.8	23.2
Perak	539	717,213	48.9	45.4	52.4	269	366,345	25.0	22.1	28.2
Perlis	519	71,781	50.8	47.3	54.3	232	35,981	25.5	22.5	28.7
Selangor	1,124	1,526,288	40.9	38.8	43.1	688	1,035,667	27.8	25.8	29.8
Terengganu	432	218,101	36.7	33.6	39.9	310	187,553	31.6	28.5	34.8
Sabah & WP Labuan	1,042	1,031,733	54.4	51.3	57.4	427	436,468	23.0	20.6	25.6
Sarawak	801	972,435	66.6	63.3	69.7	220	279,172	19.1	16.6	22.0
WP Kuala Lumpur	309	584,248	49.2	44.6	53.7	132	254,913	21.4	17.9	25.5
WP Putrajaya	189	15,713	33.9	29.8	38.3	155	13,255	28.6	24.7	32.9
Location										
Urban	4,881	5,985,647	46.1	44.9	47.2	2,508	3,155,458	24.3	23.3	25.3
Rural	3,759	2,335,532	49.0	47.5	50.5	1,695	1,107,018	23.2	22.0	24.5
Sex										
Male	3,594	3,832,389	42.3	40.9	43.7	1,917	2,099,718	23.2	22.0	24.4
Female	5,046	4,488,789	51.6	50.3	52.9	2,286	2,162,758	24.9	23.8	26.0
Age Group										
18-19	346	393,517	44.4	40.0	48.9	237	279,141	31.5	27.4	35.9
20-24	849	1,112,416	41.2	38.5	43.9	655	853,869	31.6	29.1	34.3
25-29	855	1,108,581	42.6	39.8	45.5	573	692,669	36.6	24.3	29.2
30-34	825	921,110	44.7	42.0	47.4	489	503,254	24.4	22.2	26.8
35-39	792	828,858	45.1	42.2	48.0	441	438,868	23.9	21.5	26.4
40-44	870	820,089	47.9	45.0	50.8	387	369,275	21.6	19.3	24.0
45-49	854	773,629	49.4	46.4	52.4	390	320,714	20.5	18.3	22.8
50-54	856	656,975	50.2	47.3	53.2	332	276,775	21.2	18.8	23.8
55-59	797	527,167	51.5	48.1	54.8	267	195,166	19.0	16.6	21.7
60-64	537	410,170	53.1	49.2	57.0	178	150,377	19.5	16.4	22.9
65-69	403	303,407	60.9	55.9	65.6	93	69,756	14.0	10.7	18.0
70-74	315	216,789	58.9	52.5	65.0	87	52,242	14.2	10.9	18.3
75+	341	248,468	58.5	53.0	63.8	74	60,370	14.2	10.7	18.6

Table 2.2.6 Intake of drinks with sweetened condensed milk/creamer a day among adults (≥ 18 years old) by socio-demographic characteristics

Sociodemographic characteristics	0 cup per day				1- < 2 cups per day				
	Count	Estimated Population	% (Prevalence)		Count	Estimated Population	% (Prevalence)		
			Lower	Upper			Lower	Upper	
Ethnicity									
Malays	4376	3,546,297	40.2	39.0	2657	2,376,755	26.9	25.8	28.0
Chinese	2025	2,502,785	55.4	53.3	645	917,470	20.3	18.7	22.0
Indians	679	585,681	46.8	43.3	231	200,615	16.0	13.8	18.6
Other Bumiputras	1022	1,138,244	59.7	56.6	400	440,012	23.1	20.6	25.7
Others	538	548,172	43.8	39.5	270	327,623	26.2	22.2	30.6
Marital Status									
Single	1,774	2,159,300	42.6	40.7	1,206	1,477,480	29.2	27.4	31.0
Married	5,992	5,530,892	47.6	46.5	2,749	2,590,879	22.3	21.3	23.3
Widow/widower/divorcee	864	624,398	58.2	55.0	247	192,681	18.0	15.6	20.7
Missing									
Education Level									
No formal education	911	672,726	62.3	58.9	219	166,246	15.4	12.6	18.2
Primary education	2,302	1,954,414	51.3	49.2	861	817,362	21.4	19.8	23.2
Secondary education	3,672	3,726,600	44.5	43.1	2,011	2,034,886	24.3	23.1	25.5
Tertiary education	1,625	1,840,180	43.4	41.4	1,048	1,173,132	27.7	25.9	29.5
Unclassified education	81	75,246	46.9	37.8	45	48,697	30.3	22.0	40.2
Occupation									
Government/semi government employee	886	758,358	41.9	39.2	558	474,676	26.2	23.8	28.8
Private employee	2,448	2,920,120	43.0	41.3	1,399	1,743,614	25.7	24.2	27.2
Self employed	1,719	1,531,153	46.8	44.7	780	725,088	22.2	20.5	24.0
Unpaid worker/home maker	1,700	1,433,157	52.7	50.5	715	629,774	23.2	21.4	25.0
Retiree	982	750,641	56.4	53.3	282	204,661	15.4	13.3	17.7
Income Group									
Less than RM 400	812	733,553	56.3	52.9	273	264,778	20.3	17.7	23.2
RM 400 - RM 699	465	394,050	56.8	52.3	162	134,908	19.4	16.3	23.0
RM 700 - RM 999	605	546,917	52.6	48.9	265	232,274	22.3	19.5	25.5
RM 1000 - RM 1999	1,744	1,469,099	45.5	43.4	840	778,234	24.1	22.3	26.0
RM 2000 - RM 2999	1,423	1,374,139	46.0	43.7	724	702,832	23.5	21.7	25.5
RM 3000 - RM 3999	1,070	1,055,937	43.8	41.2	588	634,658	26.3	24.1	28.7
RM 4000 - RM 4999	764	857,226	46.2	43.1	419	479,404	13.1	11.3	15.2
RM 5000 & above	1,757	1,890,257	44.5	42.6	932	1,035,388	24.4	22.7	26.2

Table 2.2.7 Intake of sweetened condensed milk/creamer a day among adults (≥ 18 years old) by socio-demographic characteristics

Sociodemographic characteristics	2- < 3 cups per day					≥ 3 cups per day				
	Count	Estimated Population	% (Prevalence)	95% CI		Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	2,836	2,742,771	15.4	14.8	16.1	2,497	2,437,157	13.7	13.1	14.4
State										
Johor	273	361,599	17.0	15.0	19.3	256	367,374	17.3	15.2	19.6
Kedah	99	116,250	10.1	8.1	12.5	121	157,311	13.7	11.1	16.8
Kelantan	266	212,328	24.8	22.2	27.6	155	117,338	13.7	11.7	16.0
Melaka	193	99,097	19.0	16.0	22.4	195	82,356	15.8	13.0	19.0
Negeri Sembilan	215	142,586	22.1	19.2	25.4	196	133,687	20.7	17.8	24.1
Pahang	189	153,533	17.7	15.2	20.5	154	131,624	15.2	12.9	17.8
Penang	203	183,406	17.0	14.0	20.5	165	143,889	13.4	10.9	16.3
Perak	161	218,362	14.9	12.5	17.7	116	164,697	11.2	9.2	13.6
Perlis	94	14,293	10.1	8.1	12.5	116	19,295	13.7	11.3	16.3
Selangor	429	608,812	16.3	14.7	18.1	411	558,411	15.0	13.5	16.5
Terengganu	203	111,730	18.8	16.4	21.5	142	76,329	12.9	10.9	15.2
Sabah & WP Labuan	198	216,469	11.4	9.5	13.6	202	213,625	11.3	9.5	13.3
Sarawak	98	118,325	8.1	6.4	10.2	88	90,422	6.2	4.9	7.9
WP Kuala Lumpur	95	176,326	14.8	11.9	18.3	91	173,124	14.6	11.7	18.0
WP Putrajaya	120	9,655	20.9	17.4	24.8	89	7,675	16.6	13.4	20.3
Location										
Urban	1,688	2,015,897	15.5	14.7	16.4	1,499	1,839,638	14.2	13.4	15.0
Rural	1,148	726,875	15.2	14.2	16.3	998	597,520	12.5	11.6	13.5
Sex										
Male	1,421	1,477,909	16.3	15.3	17.4	1,572	1,654,484	18.3	17.2	19.3
Female	1,415	1,264,862	14.5	13.6	15.5	925	782,673	9.0	8.3	9.7
Age Group										
18-19	113	123,223	13.9	11.3	17.0	85	89,732	10.1	8.0	12.7
20-24	319	399,101	14.8	12.9	16.9	273	335,575	12.4	10.8	14.3
25-29	331	423,763	16.3	14.3	18.5	336	375,247	14.4	12.7	16.4
30-34	287	310,984	15.1	13.3	17.1	283	326,674	15.8	13.8	18.1
35-39	315	310,241	16.9	14.9	19.1	246	261,767	14.2	12.3	16.4
40-44	307	271,331	15.8	13.9	18.0	268	251,696	14.7	12.7	16.9
45-49	291	243,673	15.6	13.5	17.9	261	228,291	14.6	12.6	16.8
50-54	261	195,379	14.9	13.0	17.1	227	178,736	13.7	11.8	15.8
55-59	205	160,227	15.6	13.4	18.2	191	141,989	13.9	11.7	16.4
60-64	147	115,686	15.0	12.4	18.0	135	96,329	12.5	10.1	15.3
65-69	94	63,210	12.7	9.8	16.3	82	62,240	12.5	9.5	16.2
70-74	83	62,275	16.9	11.5	24.2	53	36,891	10.0	7.2	13.8
75+	83	63,677	15.0	11.6	19.1	57	51,991	12.2	8.8	16.8

Table 2.2.7 Intake of sweetened condensed milk/creamer a day among adults (≥ 18 years old) by socio-demographic characteristics

Sociodemographic characteristics	2- < 3 cups per day				≥ 3 cups per day			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
Ethnicity								
Malays	1753	1,497,709	17.0	16.1 17.9	1566	1,411,689	16.0	15.1 16.9
Chinese	501	661,531	14.6	13.2 16.2	343	439,402	9.7	8.6 11.0
Indians	272	218,073	17.4	14.8 20.4	274	247,152	19.7	17.1 22.7
Other Bumiputras	144	169,234	8.9	7.2 10.9	155	160,117	8.4	6.9 10.1
Others	166	196,224	15.7	12.7 19.2	159	178,797	14.3	11.5 17.6
Marital Status								
Single	638	747,602	14.8	13.4 16.0	597	684,000	13.5	12.3 14.8
Married	1,984	1,847,725	15.9	15.1 16.8	1,755	1,645,326	14.2	13.4 15.0
Widow/widower/divorcee	214	147,444	13.7	11.8 16.0	145	107,831	10.1	8.2 12.2
Missing								
Education Level								
No formal education	182	130,308	12.1	10.1 14.3	136	110,604	10.2	8.3 12.6
Primary education	615	522,379	13.7	12.4 15.1	583	518,974	13.6	12.3 15.0
Secondary education	1,367	1,407,295	16.8	15.8 17.9	1,214	1,213,211	14.5	13.5 15.5
Tertiary education	644	654,497	15.4	14.1 16.9	536	568,636	13.4	12.1 18.8
Unclassified education	15	13,627	8.5	5.0 14.0	24	22,940	14.3	9.1 21.7
Occupation								
Government/semi government employee	368	287,742	15.9	14.0 18.0	333	288,484	15.9	14.0 18.1
Private employee	962	1,113,764	16.4	15.2 17.7	873	1,016,682	15.0	13.8 16.2
Self employed	544	493,525	15.1	13.7 16.7	570	518,909	15.9	14.4 17.5
Unpaid worker/home maker	434	381,311	14.0	12.6 15.6	337	275,359	10.1	8.9 11.5
Retiree	274	217,550	16.4	13.9 19.1	200	157,418	11.8	10.0 14.0
Income Group								
Less than RM 400	190	166,348	12.8	10.8 15.1	160	138,091	10.6	8.7 12.9
RM 400 - RM 699	100	83,677	12.1	9.5 15.2	106	81,672	11.8	9.3 14.7
RM 700 - RM 999	171	140,816	13.5	11.2 16.3	144	119,518	11.5	9.4 13.9
RM 1000 - RM 1999	576	528,421	16.4	14.8 18.1	508	454,377	14.1	12.6 15.6
RM 2000 - RM 2999	491	471,089	15.8	14.1 17.6	440	439,189	14.7	13.1 16.5
RM 3000 - RM 3999	402	393,600	16.3	14.5 18.3	340	327,718	13.6	12.0 15.4
RM 4000 - RM 4999	239	243,080	13.1	11.3 15.2	238	273,937	14.8	12.7 17.1
RM 5000 & above	667	715,740	16.9	15.4 18.4	561	602,656	14.2	12.9 15.6

Table 2.2.8 Intake of carbonated drinks in a day among adults (≥18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	0 cup per day			1 cup per day			2 cups per day		
				Count	Estimated Population	% (Prevalence)	Count	Estimated Population	% (Prevalence)	Count	Estimated Population	% (Prevalence)
MALAYSIA	12,979	11,752,010	66.2	4,602	5,239,637	29.5	585	755,363	4.3	585	755,363	4.7
<i>State</i>												
Johor	1,106	1,396,817	65.8	394	617,524	29.1	57	109,195	5.1	57	109,195	7.0
Kedah	898	911,691	79.4	163	220,976	19.2	17	16,157	1.4	17	16,157	2.4
Kelantan	884	670,349	78.3	204	175,690	20.5	13	9,928	1.2	13	9,928	2.1
Melaka	897	422,061	81.0	198	86,354	16.6	31	12,649	2.4	31	12,649	3.9
Negeri Sembilan	831	521,272	87.0	147	98,497	15.2	29	26,327	4.1	29	26,327	6.3
Pahang	735	605,619	70.0	272	236,553	27.3	29	23,036	2.7	29	23,036	3.9
Penang	968	810,611	75.1	232	240,512	22.3	26	27,742	2.6	26	27,742	4.1
Perak	790	1,044,450	71.1	273	392,782	26.7	25	32,780	2.2	25	32,780	3.5
Perlis	756	1,07,838	76.3	186	30,664	21.7	19	2,848	1.2	19	2,848	3.2
Selangor	1,739	2,256,726	68.0	794	1,264,336	34.1	112	190,825	5.1	112	190,825	6.3
Terengganu	841	433,116	72.8	227	149,016	25.0	22	13,155	2.2	22	13,155	3.4
Sabah & WP Labuan	961	872,524	46.1	797	866,086	45.7	108	155,823	8.2	108	155,823	10.5
Sarawak	755	868,647	59.5	388	503,211	34.5	62	87,935	6.0	62	87,935	8.4
WP Kuala Lumpur	425	798,025	67.1	176	344,112	29.0	26	46,334	3.9	26	46,334	5.9
WP Putrajaya	393	32,265	69.8	151	13,323	28.8	9	629	1.4	9	629	2.8
<i>Location</i>												
Urban	7,400	8,491,749	65.4	2,800	3,897,987	30.0	371	590,621	4.6	371	590,621	5.2
Rural	5,579	3,260,261	68.4	1,802	1,341,650	28.1	214	164,741	3.5	214	164,741	4.1
<i>Sex</i>												
Male	5,461	5,332,525	58.9	2,635	3,172,732	35.1	399	542,421	6.0	399	542,421	6.8
Female	7,518	6,419,485	73.8	1,967	2,066,905	23.8	186	212,942	2.4	186	212,942	3.0
<i>Age Group</i>												
18-19	358	389,977	44.0	364	415,292	46.9	58	80,104	9.0	58	80,104	12.5
20-24	1,044	1,280,193	47.5	882	1,167,356	43.4	165	244,869	9.1	165	244,869	11.0
25-29	1,220	1,360,606	52.4	780	1,097,666	42.2	92	140,049	5.4	92	140,049	7.1
30-34	1,224	1,291,736	62.9	576	679,428	33.1	77	82,021	4.0	77	82,021	5.1
35-39	1,270	1,242,159	67.9	479	528,016	28.8	43	60,507	3.3	43	60,507	4.9
40-44	1,323	1,218,325	70.9	458	445,334	25.9	55	54,422	3.2	55	54,422	4.3
45-49	1,403	1,186,881	75.6	366	350,316	22.3	31	32,824	2.1	31	32,824	3.2
50-54	1,373	1,053,129	80.4	284	231,779	17.7	23	25,746	2.0	23	25,746	3.2
55-59	1,249	852,539	83.2	188	153,241	15.0	20	18,304	1.8	20	18,304	3.0
60-64	889	687,241	86.4	96	77,971	10.1	10	6,377	0.8	10	6,377	2.0
65-69	613	458,115	91.9	56	37,350	7.5	3	3,097	0.6	3	3,097	2.0
70-74	500	344,163	93.5	34	21,196	5.8	4	2,838	0.8	4	2,838	2.9
75+	513	386,947	99.0	39	34,692	8.1	4	4,205	1.0	4	4,205	2.8

Table 2.2.8 Intake of carbonated drinks in a day among adults (≥18 years old) by socio-demographic characteristics

Sociodemographic characteristics	0 cup per day						1 cup per day						2 cups per day					
	Count	Estimated Population	% (Prevalence)	95% CI		Count	Estimated Population	% (Prevalence)	95% CI		Count	Estimated Population	% (Prevalence)	95% CI				
				Lower	Upper				Lower	Upper				Lower	Upper			
Ethnicity																		
Malays	7736	6,229,414	70.5	69.4	71.6	2360	2,338,503	26.5	25.4	27.6	256	266,362	3.0	2.6	3.6			
Chinese	2607	3,098,660	68.6	66.6	70.5	813	1,271,529	28.1	26.3	30.1	92	147,025	3.3	2.6	4.0			
Indians	1058	852,215	68.2	64.8	71.4	351	346,442	27.7	24.7	31.0	47	51,294	4.1	3.0	5.3			
Other Bumiputras	915	942,767	49.5	46.4	52.5	688	802,911	42.1	39.1	45.2	115	159,834	8.4	6.5	10.3			
Others	663	628,955	50.7	46.2	55.2	390	480,251	38.7	34.4	43.2	75	130,847	10.6	7.8	13.4			
Marital Status																		
Single	2,215	2,486,427	49.3	47.3	51.2	1,717	2,184,564	43.3	41.3	45.2	274	377,343	7.5	6.5	8.5			
Married	9,470	8,328,528	71.7	70.6	72.7	2,713	2,922,178	25.1	24.1	26.2	297	368,308	3.2	2.7	3.7			
Widow/widower/divorcee	1,284	929,325	86.7	84.3	88.9	171	132,602	12.4	10.3	14.8	14	9,711	0.9	0.5	1.3			
Missing																		
Education Level																		
No formal education	1,230	866,162	82.0	76.9	83.2	190	180,622	16.7	14.1	19.8	26	33,164	3.1	1.7	4.5			
Primary education	3,404	2,729,453	71.7	69.7	73.7	841	909,864	23.9	22.1	25.8	116	166,775	4.4	3.4	5.4			
Secondary education	5,694	5,423,754	64.7	63.3	66.0	2,266	2,566,935	30.6	29.3	31.9	303	393,328	4.7	4.1	5.3			
Tertiary education	2,493	2,581,966	61.1	59.1	63.1	1,222	1,491,080	35.3	33.4	37.3	131	152,185	3.6	2.9	4.3			
Unclassified education	88	82,080	51.2	42.0	60.5	70	70,705	44.1	35.0	53.7	7	7,373	4.6	2.1	7.1			
Occupation																		
Government/semi government employee	1,520	1,234,649	68.2	65.5	70.8	577	527,805	29.2	26.7	31.8	48	47,776	2.6	1.8	3.4			
Private employee	3,543	3,964,529	58.5	56.8	60.1	1,845	2,389,461	35.2	33.7	36.9	288	42,139	6.3	5.4	7.2			
Self employed	2,555	2,136,296	65.3	63.2	67.5	932	993,852	30.4	28.4	32.5	125	136,427	4.3	3.3	5.3			
Unpaid worker/home maker	2,608	2,104,976	77.4	75.4	79.3	538	569,472	20.9	19.1	22.9	41	45,761	1.7	1.2	2.2			
Retiree	1,584	1,206,775	90.8	88.9	92.5	139	111,863	84.0	6.9	10.3	12	9,875	0.7	0.3	1.1			
Income Group																		
Less than RM 400	1,177	995,106	76.7	73.2	79.8	239	280,405	21.6	18.5	25.0	18	22,678	1.7	1.0	2.4			
RM 400 - RM 699	644	503,932	72.8	68.5	76.7	170	168,543	24.3	20.6	28.5	18	19,789	2.9	1.6	4.2			
RM 700 - RM 999	886	730,424	70.4	66.8	73.8	258	264,101	25.5	22.2	29.0	37	42,612	4.1	2.7	5.5			
RM 1000 - RM 1999	2,636	2,133,903	66.1	63.9	68.2	910	950,203	29.4	27.5	31.5	121	145,417	4.5	3.5	5.5			
RM 2000 - RM 2999	2,201	2,006,762	67.3	65.0	69.5	778	863,593	29.0	26.8	31.2	98	112,548	3.8	3.0	4.6			
RM 3000 - RM 3999	1,680	1,568,827	65.2	62.6	67.6	650	752,198	31.2	28.8	33.8	70	86,617	3.6	2.8	4.4			
RM 4000 - RM 4999	1,106	1,138,888	61.4	58.1	64.5	481	572,593	30.8	28.4	33.8	74	144,646	7.8	5.8	9.8			
RM 5000 & above	2,649	2,674,168	63.0	61.0	65.0	1,116	1,388,001	32.7	30.8	34.7	149	181,055	4.3	3.5	5.1			

Table 2.2.9 Frequency meal patterns among adults (≥18 years old)

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>No of days taking fruits</i>					
0 day	1,713	1,822,656	10.3	9.7	10.9
1 day	2,466	2,542,389	14.4	13.7	15.1
2 days	2,938	2,926,327	16.6	15.9	17.3
3 days	3,640	3,506,411	19.9	19.1	20.6
4 days	1,304	1,280,317	7.2	6.8	7.8
5 days	645	614,961	3.5	3.2	3.8
6 days	82	78,801	0.4	0.3	0.6
7 days	5,263	4,891,290	27.7	26.9	28.5
<i>No of days taking vegetables</i>					
0 day	542	560,883	3.2	2.8	3.5
1 day	346	333,242	1.9	1.6	2.2
2 days	773	708,145	4.0	3.6	4.4
3 days	1,401	1,312,154	7.4	6.9	7.9
4 days	795	700,458	4.0	3.6	4.3
5 days	590	533,443	3.0	2.7	3.3
6 days	129	113,104	0.6	0.5	0.8
7 days	13,553	13,463,068	76.0	75.1	76.7
<i>No of days taking added sugar in drinks</i>					
0 day	3,174	3,312,021	18.7	9.7	19.5
1 day	663	734,609	4.1	13.7	4.6
2 days	929	977,344	5.5	15.9	6.0
3 days	990	1,005,929	5.7	19.1	6.1
4 days	460	482,927	2.7	6.8	3.1
5 days	366	373,138	2.1	3.2	2.4
6 days	109	104,251	0.6	0.3	0.7
7 days	11,431	10,725,067	60.5	26.9	61.5
<i>No of days taking sweetened condensed milk or creamer</i>					
0 day	8,507	8,202,563	46.4	45.4	47.3
1 day	1,127	1,117,779	6.3	5.9	6.8
2 days	1,306	1,295,490	7.3	6.8	7.8
3 days	1,333	1,411,575	8.0	7.4	8.5
4 days	517	525,595	3.0	2.7	3.3
5 days	346	351,922	2.0	1.7	2.3
6 days	89	88,059	0.5	0.4	0.6
7 days	4,872	4,703,400	26.6	25.7	27.4

Table 2.2.9 Frequency meal patterns among adults (≥18 years old)

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>No of days taking carbonated drinks</i>					
0 day	12,821	11,612,586	65.7	64.8	66.6
1 day	2,539	2,781,419	15.7	15.0	16.5
2 days	1,287	1,490,928	8.4	7.9	9.0
3 days	736	883,990	5.0	4.6	5.5
4 days	208	265,821	1.5	1.3	1.8
5 days	90	130,874	0.7	0.6	1.0
6 days	15	13,536	0.1	0.0	0.2
7 days	376	494,528	2.8	2.4	3.2
<i>No of days taking breakfast</i>					
0 day	1,176	1,297,493	7.3	6.8	7.9
1 day	260	337,311	1.9	1.6	2.2
2 days	437	459,526	2.6	2.3	2.9
3 days	638	676,095	3.8	3.5	4.2
4 days	386	400,033	2.3	2.0	2.6
5 days	343	373,242	2.1	1.8	2.4
6 days	166	155,132	0.9	0.7	1.1
7 days	14,716	14,024,029	79.1	78.3	79.9
<i>No of days taking heavy meals after dinner</i>					
0 day	13,991	13,202,821	74.7	73.8	75.5
1 day	671	749,691	4.2	3.9	4.7
2 days	1,083	1,174,431	6.6	6.2	7.1
3 days	854	958,631	5.4	5.0	5.9
4 days	295	304,554	1.7	1.5	2.0
5 days	144	155,401	0.9	0.7	1.1
6 days	37	45,649	0.3	0.2	0.4
7 days	1,012	1,091,056	6.2	5.7	6.7

Table 2.2.10 Frequency meal patterns among adults (≥ 18 years old) by location

Sociodemographic characteristics	Urban					Rural						
	Count	Estimated Population	% (Prevalence)		95% CI		Count	Estimated Population	% (Prevalence)		95% CI	
			Lower	Upper	Lower	Upper			Lower	Upper		
<i>No of days taking fruits</i>												
0 day	992	1,316,738	10.2	9.5	11.0	721	505,918	10.7	9.5	11.0		
1 day	1,255	1,689,738	13.1	12.3	13.9	1,211	852,652	18.0	12.3	13.9		
2 days	1,601	2,046,055	15.8	15.0	16.7	1,337	880,272	18.6	15.0	16.7		
3 days	2,059	2,547,233	19.7	18.8	20.7	1,581	959,178	20.2	18.8	20.7		
4 days	810	980,532	7.6	7.0	8.2	494	299,785	6.3	7.0	8.2		
5 days	403	459,392	3.6	3.2	4.0	242	155,569	3.3	3.2	4.0		
6 days	56	65,957	0.5	0.4	0.7	26	12,845	0.3	0.4	0.7		
7 days	3,323	3,815,174	29.5	28.5	30.6	1,940	1,076,116	22.7	28.5	30.6		
<i>No of days taking vegetables</i>												
0 day	329	432,511	3.3	2.9	3.8	213	128,372	2.7	2.3	3.2		
1 day	162	205,002	1.6	1.3	1.9	184	128,240	2.7	2.2	3.3		
2 days	371	451,708	3.5	3.1	3.9	402	256,438	5.4	4.8	6.1		
3 days	716	870,376	6.7	6.2	7.3	685	441,778	9.3	8.5	10.2		
4 days	404	466,914	3.6	3.2	4.1	394	233,544	4.9	4.3	5.6		
5 days	301	340,196	2.6	2.3	3.0	289	193,248	4.1	3.5	4.7		
6 days	67	74,353	0.6	0.4	0.8	62	38,751	0.8	0.6	1.1		
7 days	8,199	10,130,260	78.1	77.1	79.1	5,354	3,332,808	70.1	68.8	71.4		
<i>No of days taking added sugar in drinks</i>												
0 day	2,053	2,646,703	20.4	19.5	21.4	1,121	665,318	14.0	13.0	15.1		
1 day	434	577,253	4.5	4.0	5.0	229	157,356	3.3	2.8	3.9		
2 days	588	767,436	5.9	5.4	6.5	341	209,908	4.4	3.9	5.0		
3 days	614	768,212	5.9	5.4	6.5	376	237,718	5.0	4.4	5.7		
4 days	286	365,138	2.8	2.4	3.2	174	117,789	2.5	2.0	3.0		
5 days	229	290,702	2.2	1.9	2.6	137	82,437	1.7	1.4	2.1		
6 days	48	62,161	0.5	0.3	0.7	61	42,090	0.9	0.7	1.2		
7 days	6,286	7,482,339	57.7	56.5	58.9	5,145	3,242,728	68.2	66.8	69.6		
<i>No of days taking sweetened condensed milk or creamer</i>												
0 day	4,796	5,897,039	45.5	44.4	46.7	3,711	2,305,525	48.6	47.7	50.0		
1 day	661	803,311	6.2	5.7	6.8	466	314,468	6.6	5.9	7.4		
2 days	767	952,465	7.4	6.8	8.0	539	343,025	7.2	6.5	8.0		
3 days	806	1,065,692	8.2	7.6	9.0	527	345,884	7.3	6.6	8.1		
4 days	323	394,899	3.0	2.7	3.5	194	130,696	2.8	2.3	3.3		
5 days	203	249,725	1.9	1.6	2.3	143	102,197	2.2	1.8	2.6		
6 days	49	63,716	0.5	0.4	0.7	40	24,343	0.5	0.4	0.7		
7 days	2,924	3,522,528	27.2	26.2	28.3	1,948	1,180,872	24.9	23.6	26.2		

Table 2.2.10 Frequency meal patterns among adults (≥ 18 years old) by location

Sociodemographic characteristics	Urban				Rural				
	Count	Estimated Population	% (Prevalence)		Count	Estimated Population	(Prevalence)		
			Lower	Upper			Lower	Upper	
<i>No of days taking carbonated drinks</i>									
0 day	7,297	8,385,378	64.9	63.7	5,524	3,227,208	68.0	66.5	69.4
1 day	1,530	2,048,493	15.8	15.0	1,009	732,926	15.4	14.4	16.6
2 days	797	1,141,272	8.8	8.2	490	349,656	7.4	6.6	8.2
3 days	437	610,092	5.0	4.4	299	243,897	5.1	4.4	6.0
4 days	140	214,613	1.7	1.4	68	51,208	1.1	0.8	1.4
5 days	63	104,672	0.8	0.6	27	26,202	0.6	0.3	0.9
6 days	7	9,183	0.1	0.0	8	4,353	0.1	0.0	0.2
7 days	234	383,843	3.0	2.5	142	110,685	2.3	1.9	2.9
<i>No of days taking breakfast</i>									
0 day	722	997,900	7.7	7.1	454	299,592	6.3	5.6	7.1
1 day	163	261,163	2.0	1.6	97	76,148	1.6	1.3	2.1
2 days	261	334,180	2.6	2.2	176	125,346	2.6	2.2	3.2
3 days	395	517,084	4.0	3.5	243	159,011	3.4	2.8	3.9
4 days	251	313,207	2.4	2.1	135	86,826	1.8	1.4	2.3
5 days	242	305,100	2.4	2.0	101	68,142	1.4	1.1	1.8
6 days	81	101,384	0.8	0.6	85	53,749	1.1	0.9	1.5
7 days	8,434	10,146,449	78.2	77.2	6,282	3,877,580	81.7	80.5	82.8
<i>No of days taking heavy meals after dinner</i>									
0 day	7,966	9,407,686	72.7	71.6	6,025	3,795,136	80.1	78.9	81.2
1 day	430	606,683	4.7	4.2	241	143,008	3.0	2.6	3.5
2 days	673	925,734	7.2	6.6	410	248,697	5.2	4.6	5.9
3 days	537	756,748	5.8	5.3	317	202,083	4.3	3.7	4.9
4 days	183	245,967	1.9	1.6	112	58,587	1.2	1.0	1.6
5 days	98	128,532	1.0	0.8	46	26,870	0.6	0.4	0.8
6 days	22	37,468	0.3	0.2	15	8,182	0.2	0.1	0.3
7 days	617	834,434	6.4	5.9	395	256,621	5.4	4.8	6.1

Table 2.2.11 Frequency meal patterns among adults (18 years old) by sex

Sociodemographic characteristics	Male					Female				
	Count	Estimated Population	% (Prevalence)	95% CI		Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper				Lower	Upper
<i>No of days taking fruits</i>										
0 day	890	1,051,609	11.7	10.8	12.6	823	771,046	8.9	8.2	9.7
1 day	1,266	1,426,995	15.8	14.8	16.9	1,200	1,115,395	12.9	12.0	13.8
2 days	1,481	1,550,854	17.2	16.2	18.2	1,457	1,375,472	15.9	15.0	16.9
3 days	1,691	1,730,043	19.2	18.1	20.3	1,949	1,776,368	20.5	19.5	21.6
4 days	614	655,107	7.3	6.6	8.0	690	625,210	7.2	6.6	7.9
5 days	303	312,103	3.5	3.0	4.0	342	302,858	3.5	3.1	4.0
6 days	35	34,629	0.4	0.2	0.6	47	44,172	0.5	0.3	0.8
7 days	2,182	2,255,525	25.0	23.8	26.2	3,081	2,635,764	30.5	29.3	31.7
<i>No of days taking vegetables</i>										
0 day	293	317,893	3.5	3.1	4.0	249	242,990	2.8	2.3	3.3
1 day	196	189,873	2.4	1.7	2.5	150	143,369	1.7	1.3	2.0
2 days	409	404,253	4.5	3.9	5.1	364	303,892	3.5	3.1	4.0
3 days	725	739,304	8.2	7.5	9.0	676	572,850	6.6	6.0	7.2
4 days	386	366,183	4.0	3.6	4.6	409	334,274	3.9	3.4	4.4
5 days	302	289,473	3.2	2.8	3.7	288	243,970	2.8	2.4	3.3
6 days	59	55,579	0.6	0.4	0.9	70	57,525	0.7	0.5	0.9
7 days	6,116	6,679,697	73.9	72.7	75.1	7,437	6,783,371	78.1	77.1	79.2
<i>No of days taking added sugar in drinks</i>										
0 day	1,282	1,480,700	16.4	15.3	17.5	1,892	1,831,321	21.1	20.0	22.2
1 day	242	303,634	3.4	2.9	3.9	421	430,975	5.0	4.4	5.6
2 days	370	460,212	5.1	4.5	5.8	559	517,132	6.0	5.4	6.6
3 days	397	457,257	5.1	4.5	5.7	593	548,672	6.3	5.7	7.0
4 days	195	222,146	2.5	2.1	2.9	265	260,781	3.0	2.6	3.5
5 days	154	196,790	1.9	1.5	2.3	212	203,348	2.3	2.0	2.8
6 days	49	54,888	0.6	0.4	0.9	60	49,363	0.6	0.4	0.8
7 days	5,798	5,893,647	65.2	63.8	66.5	5,633	4,831,420	55.7	54.4	57.0

Table 2.2.11 Frequency meal patterns among adults (18 years old) by sex

Sociodemographic characteristics	Male				Female			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
<i>No of days taking sweetened condensed milk or creamer</i>								
0 day	3,539	3,772,763	41.8	40.4 43.2	4,968	4,429,801	51.1	49.8 52.4
1 day	450	475,266	5.3	4.7 5.9	677	642,514	7.4	6.7 8.1
2 days	611	639,134	7.1	6.4 7.8	695	656,357	7.6	6.9 8.3
3 days	674	783,752	8.7	7.9 9.6	659	627,823	7.2	6.6 7.9
4 days	267	296,170	3.3	2.8 3.8	250	229,424	2.6	2.3 3.1
5 days	170	183,941	2.0	1.7 2.4	176	167,980	1.9	1.6 2.4
6 days	48	48,325	0.5	0.4 0.8	41	39,734	0.5	0.3 0.7
7 days	2,711	2,825,202	31.3	30.0 32.6	2,161	1,878,196	21.7	20.6 22.7
<i>No of days taking carbonated drinks</i>								
0 day	5,393	5,257,869	58.3	56.9 59.7	7,428	6,354,717	73.4	72.2 74.6
1 day	1,357	1,593,336	17.7	16.6 18.8	1,182	1,188,083	13.7	12.8 14.7
2 days	780	919,483	10.2	9.4 11	507	571,445	6.6	5.9 7.3
3 days	475	606,222	6.7	6.0 7.5	261	277,768	3.2	2.8 3.7
4 days	145	194,621	2.2	1.8 2.6	63	71,199	0.8	0.6 1.2
5 days	59	86,688	1.0	0.7 1.4	31	44,186	0.5	0.3 0.8
6 days	12	12,103	0.1	0.1 0.3	3	1,433	0.0	0.0 0.1
7 days	244	348,409	3.9	3.3 4.5	132	146,120	1.7	1.3 2.1
<i>No of days taking breakfast</i>								
0 day	604	734,095	8.1	7.4 8.9	572	563,398	6.5	5.8 7.2
1 day	130	191,527	2.1	1.7 2.7	130	145,784	1.7	1.3 2.1
2 days	228	258,364	2.9	2.4 3.3	209	201,162	2.3	2.0 2.7
3 days	290	323,960	3.6	3.1 4.1	348	352,135	4.1	3.5 4.7
4 days	202	225,877	2.5	2.1 3.0	184	174,156	2.0	1.6 2.4
5 days	156	191,852	2.1	1.8 2.6	187	181,389	2.1	1.7 2.5
6 days	82	72,522	0.8	0.6 1.1	84	82,610	1.0	0.7 1.3
7 days	6,788	7,046,240	77.9	76.7 79.1	7,928	6,977,789	80.4	79.3 81.5
<i>No of days taking heavy meals after dinner</i>								
0 day	5,943	6,161,977	68.3	67.0 69.6	8,048	7,040,844	81.3	80.2 82.3
1 day	358	427,133	4.7	4.2 5.4	313	322,558	3.7	3.3 4.3
2 days	634	700,897	7.8	7.1 8.5	449	473,533	5.5	4.9 6.1
3 days	521	610,085	6.8	6.1 7.5	333	348,746	4.0	3.5 4.6
4 days	180	191,815	2.1	1.8 2.6	115	112,739	1.3	1.0 1.7
5 days	85	100,270	1.1	0.9 1.4	59	55,131	0.6	0.5 0.9
6 days	28	37,658	0.4	0.3 0.7	9	7,992	0.1	0.0 0.2
7 days	710	788,917	8.7	8.0 9.6	302	302,138	3.5	3.0 4.0

Table 2.3.1 BMI for age status for children <18 years old by socio-demographic characteristics

Sociodemographic characteristics	Thinness (BMI for age < -2SD)			Normal (BMI for age -2SD <= <= 2SD)			Obesity (BMI for age >= 2SD)		
	Count	Estimated Population	% (Prevalence)	Count	Estimated Population	% (Prevalence)	Count	Estimated Population	% (Prevalence)
MALAYSIA	1,023	950,686	12.2	11.3	6,847	81.6	523	477,010	6.1
State				Lower	Upper	Lower	Upper	Lower	Upper
Johor	93	106,087	11.5	9.4	649	768,087	39	51,230	5.5
Kedah	59	67,093	11.5	8.4	440	480,947	29	33,623	5.8
Kelantan	84	63,606	12.3	10.0	535	419,119	44	33,045	6.4
Melaka	48	27,553	12.1	8.2	330	188,639	21	10,701	2.7
Negeri Sembilan	64	35,441	12.5	9.5	361	233,666	19	14,264	5.0
Pahang	59	50,441	11.9	9.2	384	342,917	36	30,449	7.2
Penang	60	35,912	9.9	6.9	369	313,042	17	12,438	3.4
Perak	54	88,382	13.6	10.1	324	500,796	33	58,620	6.3
Perlis	49	8,071	12.3	9.3	308	51,562	36	5,738	8.8
Selangor	136	163,544	12.6	10.6	883	1,040,865	86	95,150	7.3
Terengganu	72	39,483	11.4	9.1	524	287,050	36	18,968	5.5
Sabah & Labuan	128	151,602	15.0	11.2	871	826,592	45	32,735	3.2
Sarawak	70	72,209	10.2	7.9	509	581,253	51	57,052	8.0
WP Kuala Lumpur	24	39,049	11.3	7.2	180	284,697	16	21,614	6.3
WP Putrajaya	23	2,213	11.8	7.9	180	15,141	15	1,382	7.4
Location				Lower	Upper	Lower	Upper	Lower	Upper
Urban	587	681,975	12.8	11.5	3,829	4,298,229	319	343,748	6.5
Rural	436	268,711	11.0	9.9	3,018	2,036,145	204	133,262	5.5
Sex				Lower	Upper	Lower	Upper	Lower	Upper
Male	578	538,773	13.6	12.2	3,328	3,114,866	325	301,532	7.6
Female	445	411,912	10.8	9.6	3,519	3,219,508	198	175,478	4.6
Age groups				Lower	Upper	Lower	Upper	Lower	Upper
0-4	261	227,618	18.7	16.2	1,067	912,708	103	79,812	6.5
5-9	349	316,218	13.4	11.9	2,122	1,878,931	187	157,955	6.7
10-14	240	211,473	8.7	7.3	2,317	2,071,464	159	154,274	6.3
15-17	173	195,376	11.2	8.8	1,341	1,471,272	74	84,969	4.9
Ethnicity				Lower	Upper	Lower	Upper	Lower	Upper
Malays	633	526,474	11.8	10.8	4,390	3,616,244	377	312,939	7.0
Chinese	115	130,104	8.6	6.9	1,031	1,320,457	56	69,354	3.4
Indians	109	102,894	21.2	17.0	423	345,241	29	37,758	7.8
Other Bumiputras	127	165,884	15.3	11.6	762	863,212	51	55,635	5.1
Others	39	25,330	11.7	7.0	241	189,220	10	1,325	0.6
Marital Status				Lower	Upper	Lower	Upper	Lower	Upper
Single	258	260,188	9.8	8.1	2,235	2,269,560	122	129,627	4.9
Married	4	7,216	25.4	5.7	20	21,164	0	0	0.0

Table 2.3.2 Height for age among children <18 years old by socio-demographic characteristics

Sociodemographic characteristics	Stunting (HAZ < -2SD)			Normal (HAZ -2SD <= +2SD)			Tall (HAZ >= +2SD)								
	Count	Estimated Population	% (Prevalence)	Lower	Upper	Count	Estimated Population	% (Prevalence)	Lower	Upper					
MALAYSIA	1,255	1,169,685	13.4	12.5	14.4	7,977	7,295,665	83.8	82.8	84.7	278	245,212	2.8	2.4	3.3
State															
Johor	99	122,765	12.1	9.9	14.6	746	870,242	85.5	82.8	87.8	23	24,965	2.5	1.6	3.8
Kedah	57	60,972	9.4	7.1	12.3	510	561,783	86.6	82.8	89.6	22	26,297	4.1	2.2	7.4
Kelantan	139	107,455	18.9	16.2	21.9	585	450,972	79.2	76.0	82.0	16	11,250	2.0	1.2	3.2
Melaka	52	30,912	11.9	8.5	16.4	385	222,237	85.4	80.7	89.2	16	6,952	2.7	1.4	5.1
Negeri Sembilan	45	29,553	9.3	6.8	12.7	446	282,970	89.2	85.6	91.9	9	4,811	1.5	0.7	3.2
Pahang	86	73,612	15.5	12.6	18.9	440	383,744	80.6	76.9	83.8	22	18,822	4.0	2.5	6.1
Penang	46	32,849	8.2	5.5	12.2	439	353,536	88.6	84.1	91.9	14	12,777	3.2	1.6	6.3
Perak	43	73,416	10.2	7.3	13.9	411	627,116	86.7	82.7	89.9	16	22,655	3.1	1.8	5.3
Pertis	40	6,486	8.9	6.5	12.0	385	63,662	86.9	83.3	89.8	21	3,123	4.3	2.7	6.6
Selangor	144	159,702	10.9	9.2	12.8	1,089	1,268,882	86.4	84.3	88.3	35	39,248	2.7	1.9	3.8
Terengganu	145	74,652	19.4	16.5	22.6	535	296,486	77.0	73.6	80.1	23	13,718	3.6	2.4	5.3
Sabah & Labuan	206	235,914	19.8	16.3	23.9	982	915,520	76.9	72.8	80.6	34	38,821	3.3	2.1	5.1
Sarawak	116	129,623	16.6	13.5	20.2	576	645,960	82.6	78.9	85.7	10	6,879	0.9	0.4	1.7
WP Kuala Lumpur	20	30,324	8.1	4.8	13.1	216	331,827	88.2	82.6	92.1	9	14,184	3.8	1.9	7.4
WP Putrajaya	17	1,450	6.3	3.9	10.1	232	20,728	90.6	86.1	93.7	8	710	3.1	1.5	6.5
Location															
Urban	656	737,834	12.3	11.2	13.5	4,536	5,060,930	84.6	83.3	85.8	171	185,516	3.1	2.6	3.7
Rural	599	431,851	15.8	14.5	17.3	3,441	2,234,735	82.0	80.4	83.4	107	59,697	2.2	1.7	2.7
Sex															
Male	578	538,773	13.6	12.2	15.2	3,328	3,114,866	78.8	77.1	80.4	325	301,532	7.6	6.7	8.7
Female	445	411,912	10.8	9.6	12.2	3,519	3,219,508	84.6	83.1	85.9	198	175,478	4.6	3.9	5.4
Age groups															
0-4	261	227,618	18.7	16.2	21.3	1,067	912,708	74.8	72.0	77.5	103	79,812	6.5	5.2	8.1
5-9	349	316,218	13.4	11.9	15.1	2,122	1,878,931	79.8	77.9	81.6	187	157,955	6.7	5.7	7.9
10-14	240	211,473	8.7	7.3	10.2	2,317	2,071,464	85.0	83.2	86.7	159	154,274	6.3	5.3	7.6
15-17	173	195,376	11.2	8.8	14.1	1,341	1,471,272	84.0	80.9	86.6	74	84,969	4.9	3.6	6.5
Ethnicity															
Malays	633	526,474	11.8	10.8	12.9	4,390	3,616,244	81.2	79.9	82.4	377	312,939	7.0	6.3	7.9
Chinese	115	130,104	8.6	6.9	10.6	1,031	1,320,457	86.9	84.5	88.9	56	69,354	4.6	3.4	6.0
Indians	109	102,894	21.2	17.0	26.1	423	345,241	71.1	65.5	76.0	29	37,758	7.8	4.7	12.5
Other Bumiputras	127	165,884	15.3	11.6	19.8	762	863,212	79.6	75.1	83.4	51	55,635	5.1	3.8	6.9
Others	39	25,330	11.7	7.0	18.9	241	189,220	87.7	80.5	92.4	10	1,325	0.6	0.3	1.2
Marital Status															
Single	258	260,188	9.8	8.1	11.8	2,235	2,269,560	85.3	83.2	87.3	122	129,627	4.9	3.9	6.1
Married	4	7,216	25.4	5.7	65.9	20	21,164	74.6	34.1	94.3	0	0	0.0	0.0	0.0

Table 2.3.3 Weight for age (WAZ) status among children (<18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Underweight (WAZ < -2SD)				Normal (-2SD ≤ WAZ <= +2SD)				Obese (HAZ ≥ +2SD)			
	Count	Estimated Population	% (Prevalence)	95% CI	Count	Estimated Population	% (Prevalence)	95% CI	Count	Estimated Population	% (Prevalence)	95% CI
MALAYSIA	1,602	1,435,281	16.1	15.2 - 17.1	7,733	7,122,469	80.0	78.9 - 81.0	382	3,455,606	3.9	3.4 - 4.4
State												
Johor	111	130,745	12.7	10.5 - 15.2	731	851,481	82.5	79.5 - 85.1	37	49,779	4.8	3.3 - 7.1
Kedah	91	99,372	15.2	12.1 - 18.8	480	525,170	80.2	76.3 - 83.6	25	30,238	4.6	3.1 - 6.9
Kelantan	145	109,749	19.3	16.5 - 22.3	572	441,518	77.5	74.3 - 80.4	25	18,682	3.3	2.2 - 4.8
Melaka	67	37,533	14.4	10.5 - 19.4	375	217,718	83.4	78.3 - 87.5	18	5,788	2.2	1.1 - 4.3
Negeri Sembilan	75	40,764	12.8	10.0 - 16.3	413	267,223	83.8	79.9 - 87.1	15	10,997	3.4	1.9 - 6.1
Pahang	95	81,042	16.8	13.8 - 20.2	443	384,396	79.5	75.7 - 82.8	20	18,349	3.8	2.4 - 6.0
Penang	83	49,629	12.2	8.9 - 16.4	409	344,720	84.6	79.9 - 88.3	22	13,309	3.3	1.7 - 6.2
Perak	60	89,295	12.2	9.0 - 16.3	395	600,611	82.0	77.4 - 85.8	24	42,926	5.9	3.8 - 9.0
Perlis	56	9,468	12.9	9.8 - 16.7	367	60,214	81.7	77.5 - 85.3	25	3,978	5.4	3.6 - 8.0
Selangor	188	212,356	14.0	12.1 - 16.2	1,060	1,241,152	81.9	79.5 - 84.0	60	62,269	4.1	3.2 - 5.3
Terengganu	134	70,802	18.1	15.4 - 21.3	558	307,710	78.8	75.5 - 81.8	21	11,990	3.1	2.0 - 4.8
Sabah & Labuan	291	302,651	24.0	20.5 - 27.9	963	926,085	73.5	69.6 - 77.1	34	31,327	2.5	1.6 - 3.8
Sarawak	148	161,539	20.4	17.1 - 24.1	534	598,594	75.6	71.8 - 79.1	29	31,453	4.0	2.7 - 5.8
WP Kuala Lumpur	25	36,946	9.5	6.0 - 14.8	217	337,136	87.1	81.6 - 91.1	10	12,909	3.3	1.8 - 6.2
WP Putrajaya	33	3,389	14.3	10.2 - 19.6	216	18,742	78.9	73.1 - 83.8	17	1,611	6.8	4.2 - 10.8
Location												
Urban	806	899,220	14.8	13.6 - 16.0	4,424	4,935,051	81.0	79.6 - 82.3	234	259,757	4.3	3.7 - 5.0
Rural	796	536,061	19.1	17.7 - 20.6	3,309	2,187,418	77.9	76.3 - 79.4	148	85,849	3.1	2.5 - 3.7
Sex												
Male	840	761,006	16.6	15.3 - 18.1	3,836	3,581,640	78.4	76.8 - 79.8	248	228,682	5.0	4.3 - 5.8
Female	762	674,275	15.6	14.3 - 16.9	3,897	3,540,829	81.7	80.3 - 83.1	134	116,925	2.7	2.2 - 3.3
Age groups												
0-4	528	433,967	19.6	17.8 - 21.6	1,999	1,724,825	78.0	76.0 - 79.9	70	51,897	2.3	1.7 - 3.2
5-9	466	400,057	16.3	14.7 - 18.1	2,152	1,930,755	78.9	77.0 - 80.7	139	116,328	4.8	3.9 - 5.8
10-14	339	306,478	12.3	10.8 - 14.0	2,301	2,055,750	82.8	80.9 - 84.5	125	121,790	4.9	4.0 - 6.0
15-17	269	294,778	16.7	14.2 - 19.7	1,281	1,411,140	80.1	77.1 - 82.5	48	55,592	3.2	2.1 - 4.6
Ethnicity												
Malays	1,030	834,902	16.4	15.4 - 17.5	4,933	4,030,343	79.3	78.1 - 80.5	267	214,821	4.2	3.7 - 4.9
Chinese	100	107,934	6.4	5.1 - 8.0	1,192	1,516,337	90.2	88.3 - 91.8	43	56,945	3.4	2.5 - 4.6
Indians	95	88,911	16.1	12.2 - 21.0	507	425,998	77.2	71.8 - 81.8	33	37,076	6.7	4.1 - 10.9
Other Bumiputras	295	348,209	26.7	23.2 - 30.7	822	920,446	70.7	66.8 - 74.3	29	33,417	2.6	1.7 - 3.9
Others	82	55,325	19.2	14.1 - 25.6	279	229,345	79.6	73.2 - 84.9	10	3,347	1.2	0.4 - 3.2
Marital Status												
Single	377	380,093	14.2	12.4 - 16.3	2,172	2,208,247	82.5	80.3 - 84.5	85	89,354	3.3	2.5 - 4.4
Married	5	8,226	29.0	7.8 - 66.3	19	20,154	71.0	33.7 - 92.2	0	0	0.0	0.0 - 0.0

Table 2.3.4 Weight for height (WHZ) status among children (<10 years old) by socio-demographic characteristics

Sociodemographic characteristics	Wasting (WHZ < -2SD)			Normal (WHZ -2SD -<= 2SD)			Obese (WHZ ≥ +2SD)										
	Count	Estimated Population	% (Prevalence)	Lower	Upper	95% CI	Count	Estimated Population	% (Prevalence)	Lower	Upper	95% CI					
MALAYSIA	673	579,649	17.8	16.3	19.3	19.3	2,913	2,511,713	76.9	75.3	78.6	78.6	214	172,777	5.3	4.5	6.2
<i>State</i>																	
Johor	59	65,531	17.5	13.6	22.3	22.3	271	296,618	79.3	74.3	83.5	83.5	12	11,903	3.2	1.8	5.6
Kedah	44	50,900	21.9	15.1	30.6	30.6	159	166,286	71.5	62.9	78.8	78.8	14	15,389	6.6	3.8	11.3
Kelantan	48	34,517	17.0	13.0	21.9	21.9	222	155,536	76.7	71.4	81.3	81.3	8	12,740	4.3	4.0	9.8
Melaka	20	13,284	15.9	9.5	25.3	25.3	129	66,470	79.3	69.5	86.6	86.6	8	4,019	4.8	2.0	11.1
Negeri Sembilan	41	22,425	19.3	13.7	26.3	26.3	129	86,161	74.0	66.4	80.4	80.4	12	7,859	6.7	3.8	11.8
Pahang	49	38,639	21.0	16.0	27.2	27.2	157	130,609	71.1	64.4	77.0	77.0	19	14,402	7.8	5.0	12.1
Penang	35	22,531	16.0	10.3	24.0	24.0	155	115,548	82.0	73.7	88.1	88.1	4	2,824	2.0	0.5	7.3
Perak	39	56,151	24.9	17.5	34.1	34.1	119	157,392	69.7	60.6	77.5	77.5	10	12,136	5.4	2.8	10.2
Perlis	28	3,701	16.1	11.2	22.6	22.6	120	17,720	77.1	70.0	83.0	83.0	11	1,550	6.7	3.8	11.8
Selangor	90	92,993	16.3	13.2	19.9	19.9	408	435,002	76.1	71.9	79.7	79.7	38	43,969	7.7	5.6	10.5
Terengganu	44	23,657	17.4	13.1	22.7	22.7	202	102,758	75.5	69.8	80.5	80.5	21	9,602	7.1	4.6	10.8
Sabah & Labuan	93	84,245	16.8	13.2	21.1	21.1	418	396,391	78.9	74.4	82.8	82.8	28	21,629	4.3	2.8	6.5
Sarawak	51	49,334	16.1	12.0	21.1	21.1	239	249,286	81.2	75.9	85.6	85.6	11	8,332	2.7	1.2	5.8
WP Kuala Lumpur	13	19,589	13.0	7.4	21.7	21.7	90	125,691	83.2	73.6	89.8	89.8	3	5,835	3.9	1.2	11.9
WP Putrajaya	19	2,152	16.6	10.7	24.8	24.8	95	10,245	78.9	70.1	85.6	85.6	5	589	4.5	1.8	10.8
<i>Location</i>																	
Urban	362	388,639	17.5	15.6	19.6	19.6	1,642	1,714,256	77.4	75.2	79.5	79.5	121	112,617	5.1	4.2	6.2
Rural	311	191,009	18.2	16.2	20.5	20.5	1,271	797,457	76.0	73.6	78.4	78.4	93	60,161	5.7	4.6	7.2
<i>Sex</i>																	
Male	349	293,966	17.9	15.9	20.0	20.0	1,427	1,255,479	76.3	73.9	78.5	78.5	120	96,753	5.9	4.8	7.2
Female	324	285,683	17.7	15.5	20.0	20.0	1,486	1,256,234	77.6	75.2	79.9	79.9	94	76,024	4.7	3.7	5.9
<i>Age groups</i>																	
0-4	461	386,478	19.1	17.2	21.1	21.1	1,816	1,552,382	76.6	74.4	78.6	78.6	109	88,244	4.4	3.5	5.4
5-9	209	190,111	15.8	13.6	18.3	18.3	1,077	940,679	78.2	75.5	80.8	80.8	86	71,644	6.0	4.7	7.6
10-14	3	3,060	8.8	2.7	25.1	25.1	20	18,652	53.9	35.8	71.0	71.0	19	12,889	37.2	22.4	55.0
15-17	0	0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	0.0
<i>Ethnicity</i>																	
Malays	446	341,237	18.0	16.3	19.8	19.8	1,896	1,442,141	75.9	73.9	77.8	77.8	153	116,760	6.1	5.2	7.3
Chinese	47	60,089	11.7	8.3	16.2	16.2	343	431,369	83.7	78.9	87.6	87.6	22	23,819	4.6	2.8	7.5
Indians	51	58,998	33.1	24.0	43.8	43.8	132	113,188	63.6	53.2	72.8	72.8	7	5,859	3.3	1.3	7.9
Others Bumiputras	98	100,446	18.4	14.7	22.8	22.8	396	422,857	77.6	73.0	81.5	81.5	21	21,865	4.0	2.5	6.3
Others	31	18,879	15.0	9.5	23.1	23.1	146	102,158	81.4	73.0	87.6	87.6	11	4,475	3.6	1.4	8.6
<i>Marital Status</i>																	
Single	0	0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	0.0	0.0	2	1,656	100.0	0.0	100.0
Married	0	0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	0.0

Table 2.4.1 Intake of fruits and/or vegetables consumption based on STEPS WHO criteria among adolescents (13 to <18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Intake of (≥ 5 servings per day)					Intake of (<5 servings per day)				
	Count	Estimated Population	% (Prevalence)	Lower	Upper	Count	Estimated Population	% (Prevalence)	Lower	Upper
MALAYSIA	98	105,089	3.7	2.9	4.7	2,683	2,750,663	96.3	95.3	97.1
State										
Johor	5	5,095	1.7	0.6	4.3	228	301,795	98.3	95.7	99.4
Kedah	6	6,751	3.1	1.3	7.4	174	205,297	96.8	92.6	98.7
Kelantan	16	14,038	7.0	4.3	11.1	220	186,771	93.0	88.9	95.7
Melaka	6	4,370	4.7	1.7	12.5	151	88,535	95.3	87.5	98.3
Negeri Sembilan	4	3,098	3.2	1.2	8.4	141	94,328	96.8	91.6	98.8
Pahang	5	7,055	4.7	1.9	11.1	148	143,459	95.3	88.9	98.1
Penang	2	2,358	1.7	0.3	9.2	153	135,030	98.3	90.8	99.7
Perak	6	6,690	2.6	1.1	5.8	144	254,145	97.4	94.2	98.9
Perlis	5	1,241	4.3	1.8	10.0	137	27,788	95.7	90.0	98.2
Selangor	20	27,192	5.7	3.5	9.0	332	450,552	94.3	90.1	96.5
Terengganu	9	5,432	4.3	2.2	8.4	194	120,270	95.7	91.6	97.8
Sabah & WP Labuan	8	10,193	2.7	1.2	6.0	350	373,722	97.3	94.0	98.8
Sarawak	4	6,343	2.5	0.8	7.5	187	244,931	97.5	92.5	99.2
WP Kuala Lumpur	1	5,173	4.1	0.6	23.8	66	120,341	95.9	76.2	99.4
WP Putrajaya	1	61	1.6	0.2	10.6	58	3,699	98.4	89.4	99.8
Location										
Urban	46	60,060	3.1	2.2	4.3	1,512	1,906,525	96.9	95.7	97.8
Rural	52	45,029	5.1	3.7	6.9	1,171	844,137	94.9	93.1	96.3
Sex										
Male	52	57,110	3.9	2.8	5.4	1,361	1,406,942	96.1	94.6	97.2
Female	46	47,979	3.4	2.5	4.8	1,322	1,343,720	96.6	95.2	97.5
Ethnicity										
Malays	70	63,040	4.0	3.1	5.1	1,663	1,523,613	96.0	94.9	96.9
Chinese	14	23,834	3.9	2.0	7.2	445	591,728	96.1	92.8	98.0
Indians	5	3,754	1.9	0.7	4.9	218	194,914	98.1	95.1	99.3
Other Bumiputras	7	11,188	2.9	1.3	6.4	282	369,921	97.1	93.6	98.7
Others	2	3,272	4.4	0.7	23.0	75	70,486	95.6	77.0	99.3

Table 2.4.1 Intake of fruits and/or vegetables consumption based on STEPS WHO criteria among adolescents (13 to <18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Intake of (≥ 5 servings per day)				Intake of (<5 servings per day)			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
Marital Status								
Single	97	104,120	3.7	3.0 4.7	2,649	2,711,841	96.3	95.3 97.1
Married	1	969	2.9	0.4 18.5	28	32,610	97.1	81.5 99.6
Widow/widower/divorcee	0	0	0.0	0.0 0.0	0	0	0.0	0.0 0.0
Education level								
No formal education	2	4,123	9.3	2.0 33.8	24	40,185	90.7	66.2 98.0
Primary education	42	41,660	3.8	2.6 5.6	1,117	1,046,075	96.2	94.4 97.4
Secondary education	43	47,391	3.6	2.6 5.1	1,158	1,256,301	96.4	94.9 97.4
Tertiary education	1	210	2.3	0.3 16.0	8	9,013	97.7	84.0 99.7
Unclassified education	10	11,704	2.9	1.5 5.6	370	393,229	97.1	94.4 98.5

Table 2.4.2 Intake of fruits consumption as compared to Malaysian Dietary Guidelines among adolescents (13 to <18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Intake of (2 or more servings per day)			Intake of (less than 2 servings per day)		
	Count	Estimated % (Prevalence)	95% CI Lower Upper	Count	Estimated % (Prevalence)	95% CI Lower Upper
MALAYSIA	246	258,397	9.1 7.8 10.4	2532	2,594,626	90.9 89.6 92.2
<i>State</i>						
Johor	13	17,226	5.6 3.2 9.6	220	289,664	94.4 90.4 96.8
Kedah	16	19,712	9.3 5.6 15.1	164	192,335	90.7 84.9 94.4
Kelantan	26	23,235	11.6 8.0 16.6	209	176,922	88.4 83.4 92.0
Melaka	13	6,031	6.5 2.8 14.2	144	86,874	93.5 85.8 97.2
Negeri Sembilan	8	4,756	4.9 2.4 9.8	137	92,669	95.1 90.2 97.6
Pahang	16	19,453	12.9 7.9 20.4	137	131,060	87.1 79.6 92.1
Penang	13	17,837	13.0 6.6 24.1	142	119,550	87.0 75.9 93.4
Perak	16	22,059	8.5 4.7 14.7	134	238,775	91.5 85.3 95.3
Perlis	14	3,180	11.0 6.5 17.9	128	25,848	89.0 82.1 93.5
Selangor	38	56,159	11.8 8.5 16.1	313	419,662	88.2 83.9 91.5
Terengganu	20	12,152	9.7 6.1 15.0	183	113,549	90.3 85.0 93.9
Sabah & WP Labuan	27	27,492	7.2 4.6 11.0	330	356,267	92.8 89.0 95.4
Sarawak	20	26,653	10.6 6.7 16.5	171	224,620	89.4 83.5 93.3
WP Kuala Lumpur	2	2,203	1.8 0.4 6.9	65	123,310	98.2 93.1 99.6
WP Putrajaya	4	243	6.5 2.4 16.0	55	3,516	93.5 84.0 97.6
<i>Location</i>						
Urban	130	172,966	8.8 7.3 10.6	1426	1,791,045	91.2 89.4 92.7
Rural	116	85,431	9.6 7.8 11.8	1106	803,580	90.4 88.2 92.2
<i>Sex</i>						
Male	116	115,733	7.9 6.4 9.7	1297	1,348,319	92.1 90.3 93.6
Female	130	142,664	10.3 8.4 12.4	1235	1,246,306	89.7 87.6 91.6
<i>Ethnicity</i>						
Malays	146	128,499	8.1 6.8 9.7	1586	1,456,230	91.9 90.3 93.2
Chinese	61	84,256	13.7 10.4 17.8	397	530,654	86.3 82.2 89.6
Indians	12	13,502	6.8 3.1 14.2	211	185,165	93.2 85.8 96.9
Other Bumiputras	23	28,603	7.5 4.8 11.6	266	352,506	92.5 88.4 95.2
Others	4	3,534	4.8 0.9 22.1	72	70,069	95.2 77.9 99.1

Table 2.4.2 Intake of fruits consumption as compared to Malaysian Dietary Guidelines among adolescents (13 to <18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Intake of (2 or more servings per day)			Intake of (less than 2 servings per day)		
	Count	Estimated Population	% (Prevalence)	Count	Estimated Population	% (Prevalence)
				Lower	Upper	95% CI
<i>Marital Status</i>						
Single	243	255,768	9.1	7.9	10.5	92.1
Married	3	2,628	7.8	2.3	23.2	97.7
Widow/widower/divorcee	0	0	0.0	0.0	0.0	0.0
<i>Education level</i>						
No formal education	2	1,127	2.5	0.4	16.1	99.6
Primary education	103	96,884	8.9	7.1	11.1	92.9
Secondary education	100	106,452	8.2	6.5	10.2	93.5
Tertiary education	1	209	2.3	0.3	16.0	99.7
Unclassified education	40	53,722	13.3	9.7	18.0	90.3

Table 2.4.3 Intake of vegetables consumption as compared to Malaysian Dietary Guidelines among adolescents (13 to <18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Intake of (3 or more servings per day)				Intake of (less than 3 servings per day)			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
MALAYSIA	260	301,638	10.6	9.2 12.2	2,518	2,550,071	89.4	87.8 90.8
State								
Johor	15	20,940	6.8	4.1 11.3	218	285,950	93.2	88.7 95.9
Kedah	13	14,921	7.0	3.9 12.3	167	197,126	93.0	87.7 96.1
Kelantan	40	34,236	17.1	12.7 22.7	195	165,407	82.9	77.3 87.3
Melaka	9	3,255	3.5	1.3 9.3	148	89,649	96.5	90.7 98.7
Negeri Sembilan	10	6,942	7.1	3.6 13.6	135	90,483	92.9	86.4 96.4
Pahang	17	19,254	12.8	8.0 19.9	136	131,259	87.2	80.1 92.0
Penang	4	5,514	4.0	1.3 12.1	151	131,873	96.0	87.9 98.7
Perak	13	18,973	7.3	4.1 12.7	137	241,861	92.7	87.3 95.9
Perlis	11	2,498	8.6	4.7 15.1	131	26,530	91.4	84.9 95.3
Selangor	47	68,266	14.3	10.7 18.8	305	409,478	85.7	81.2 89.3
Terengganu	16	9,045	7.2	4.3 11.7	187	116,655	92.8	88.3 95.7
Sabah & WP Labuan	37	57,279	14.9	9.8 22.0	321	326,635	85.1	78.0 90.2
Sarawak	21	23,645	9.5	6.0 14.7	169	226,324	90.5	85.3 94.0
WP Kuala Lumpur	6	16,804	13.6	5.6 29.4	60	107,136	86.4	70.6 94.4
WP Putrajaya	1	60	1.6	0.2 10.6	58	3,698	98.4	89.4 99.8
Location								
Urban	143	201,997	10.3	8.5 12.4	1,413	1,761,850	89.7	87.6 91.5
Rural	117	99,641	11.2	9.2 13.7	1,105	788,221	88.8	86.3 90.8
Sex								
Male	148	176,098	12.1	9.9 14.6	1,263	1,285,216	87.9	85.4 90.1
Female	112	125,540	9.0	7.3 11.1	1,255	1,264,854	91.0	88.9 92.7
Ethnicity								
Malays	142	137,727	8.7	7.3 10.4	1,589	1,446,187	91.3	89.6 92.7
Chinese	55	77,584	12.6	9.3 16.9	404	537,978	87.4	83.1 90.7
Indians	19	18,139	9.1	5.5 14.7	204	180,528	90.9	85.3 94.5
Other Bumiputras	30	36,255	9.5	6.4 14.0	258	343,550	90.5	86.0 93.6
Others	14	31,931	43.3	24.6 64.2	63	41,826	56.7	35.8 75.4

Table 2.4.3 Intake of vegetables consumption as compared to Malaysian Dietary Guidelines among adolescents (13 to <18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Intake of (3 or more servings per day)				Intake of (less than 3 servings per day)			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
Marital Status								
Single	258	297,656	10.6	9.2 12.2	2,485	2,514,263	89.4	87.8 90.8
Married	2	3,981	11.9	2.5 41.4	27	29,597	88.1	58.6 97.5
Widow/widower/divorcee	0	0	0.0	0.0 0.0	0	0	0.0	0.0 0.0
Education Level								
No formal education	2	4,161	9.4	2.1 33.9	24	40,146	90.6	66.1 97.9
Primary education	107	124,247	11.4	9.1 14.3	1,051	962,323	88.6	85.7 90.9
Secondary education	114	134,688	10.3	8.3 12.8	1,087	1,169,003	89.7	87.2 91.7
Tertiary education	3	2,405	26.1	6.9 62.8	6	6,817	73.9	37.2 93.1
Unclassified education	34	36,134	9.0	6.3 12.7	344	365,921	91.0	87.3 93.7

Table 2.4.4 Intake of drinks with added sugar a day among adolescents (13 to <18 years old) by socio-demographic characteristics (KPI)

Sociodemographic characteristics	≤3 cups per day				> 3 cups per day			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
MALAYSIA	2,560	2,660,705	93.3	92.2 94.3	214	190,808	6.7	5.7 7.8
State								
Johor	214	279,216	91.8	87.1 94.9	17	24,802	8.2	5.1 12.9
Kedah	162	190,165	89.7	83.7 93.6	18	21,883	10.3	6.4 16.3
Kelantan	218	185,647	92.4	88.3 95.2	18	15,162	7.6	4.8 11.7
Melaka	142	84,693	91.5	83.6 95.7	13	7,914	8.5	4.3 16.4
Negeri Sembilan	137	91,381	94.9	88.6 97.8	6	4,915	5.1	2.2 11.4
Pahang	147	144,675	96.1	91.5 98.3	6	5,839	3.9	1.7 8.5
Penang	141	128,290	93.4	86.6 96.9	14	9,097	6.6	3.1 13.4
Perak	138	242,646	93.0	87.1 96.3	12	18,189	7.0	3.7 12.9
Perlis	118	24,385	84.0	76.6 89.4	24	4,644	16.0	10.6 23.4
Selangor	328	451,394	94.5	91.6 96.4	24	26,351	5.5	3.6 8.4
Terengganu	183	113,197	90.4	85.2 94.0	19	11,970	9.6	6.0 14.8
Sabah & WP Labuan	347	375,889	97.9	95.9 98.9	11	8,026	2.1	1.1 4.1
Sarawak	177	236,082	93.3	89.0 96.0	15	16,913	6.7	4.0 11.0
WP Kuala Lumpur	56	109,718	88.2	78.7 93.8	10	14,673	11.8	6.2 21.3
WP Putrajaya	52	3,327	88.5	77.7 94.4	7	432	11.5	5.6 22.3
Location								
Urban	1,446	1,844,453	93.9	92.4 95.0	110	120,601	6.1	5.0 7.6
Rural	1,114	816,252	92.1	90.2 93.6	104	70,207	7.9	6.4 9.8
Sex								
Male	1,280	1,350,742	92.6	90.9 94.0	126	108,014	7.4	6.0 9.1
Female	1,280	1,309,963	94.1	92.4 95.3	88	82,795	5.9	4.7 7.6
Age Group								
10-14 yrs	1,047	946,176	94.0	92.1 95.5	74	59,875	6.0	4.5 7.9
15-19 yrs	1,513	1,714,530	92.9	91.4 94.1	140	130,933	7.1	5.9 8.6
Ethnicity								
Malays	1,548	1,425,420	90.1	88.2 91.6	179	157,404	9.9	8.4 11.8
Chinese	451	607,820	98.8	97.4 99.5	7	7,334	1.2	0.5 2.6
Indians	216	189,880	95.6	90.9 97.9	7	8,789	4.4	2.1 9.1
Other Bumiputras	272	364,445	95.6	92.7 97.4	17	16,664	4.4	2.6 7.3
Others	73	73,141	99.2	97.3 99.7	4	618	0.8	0.3 2.7

Table 2.4.4 Intake of drinks with added sugar a day among adolescents (13 to <18 years old) by socio-demographic characteristics (KPI)

Sociodemographic characteristics	≤ 3 cups per day				> 3 cups per day			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
Marital Status								
Single	2,527	2,623,142	93.3	92.2 94.3	212	188,581	6.7	5.7 7.8
Married	27	31,352	93.4	75.5 98.5	2	2,227	6.6	1.5 24.5
Widow/widower/divorcee	0	0	0.0	0 0.0	0	0	0.0	0 0.0
Education Level								
No formal education	24	40,965	92.5	73.4 98.2	2	3,343	7.5	1.8 26.6
Primary education	1,068	1,016,458	93.4	91.6 94.9	91	71,277	6.6	5.1 8.4
Secondary education	1,098	1,213,737	93.2	91.5 94.6	99	88,586	6.8	5.4 8.5
Tertiary education	7	6,754	73.2	34.4 93.4	2	2,469	26.8	6.6 65.6
Unclassified education	357	376,932	93.7	90.3 96.0	20	25,133	6.3	4.0 9.7

Table 2.4.5 Intake of drinks with sweetened condensed milk/creamer a day among adolescents (13 to <18 years old) by socio-demographic characteristics

Sociodemographic characteristics	0 cup per day				1- < 2 cups per day					
	Count	Estimated Population	% (Prevalence)	95% CI Lower	Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower	Upper
MALAYSIA	1217	1296711	45.5	43.1	47.8	865	885369	31.0	28.9	33.3
State										
Johor	83	13567	34.9	28.4	42	78	101616	33.1	27.0	39.8
Kedah	70	84239	39.7	32.3	47.7	72	81361	38.4	31.1	46.2
Kelantan	84	69143	34.4	28.6	40.8	57	49843	24.8	19.6	30.9
Melaka	52	37170	40.0	30.2	50.7	49	23813	25.6	17.9	35.2
Negeri Sembilan	76	52997	54.8	45.3	64	27	20113	20.8	13.9	30.0
Pahang	68	69684	46.3	38.3	54.5	43	39529	26.3	19.9	33.8
Penang	71	64763	47.1	36.1	58.4	59	48660	35.4	25.5	46.7
Perak	78	141383	54.2	44.8	63.3	47	78924	30.3	22.7	39.0
Perlis	52	10709	36.9	28.9	45.7	56	12015	41.4	33.0	50.3
Selangor	128	176988	37.1	31.8	42.8	129	177188	37.2	31.8	42.8
Terengganu	78	45951	36.6	29.9	43.7	70	44275	35.2	28.6	42.5
Sabah & WP Labuan	201	211738	55.2	46.8	63.2	95	107297	27.9	20.3	37.1
Sarawak	124	155797	62.4	54.3	69.9	43	66815	8.5	5.0	13.8
WP Kuala Lumpur	28	67519	53.8	40.2	66.8	22	32780	26.1	16.9	38.1
WP Putrajaya	24	1497	39.8	28.2	52.7	18	1133	30.2	19.8	43.0
Location										
Urban	672	879493	44.8	41.7	47.9	491	617494	31.5	28.6	34.4
Rural	545	417217	46.9	43.5	50.3	374	267874	30.1	27.0	33.4
Sex										
Male	601	655605	44.8	41.5	48.1	429	447449	30.6	27.4	33.9
Female	616	641105	46.2	42.8	49.5	436	437920	31.5	28.6	34.6
Ethnicity										
Malays	653	599402	37.8	35.1	40.6	601	552425	34.8	32.4	37.6
Chinese	246	337562	55.0	49.6	60.2	118	158038	25.7	21.3	30.7
Indians	110	101716	51.4	42.5	60.2	49	43776	22.1	15.9	29.9
Other Bumiputras	176	220732	57.9	49.4	66	79	117329	30.8	22.9	40.0
Others	32	37297	50.6	31.1	69.8	18	13799	18.7	8.4	36.6

Table 2.4.5 Intake of drinks with sweetened condensed milk/creamer a day among adolescents (13 to <18 years old) by socio-demographic characteristics

Sociodemographic characteristics	0 cup per day			1- < 2 cups per day		
	Count	Estimated Population	% (Prevalence)	Count	Estimated Population	% (Prevalence)
						95% CI
						Lower
						Upper
						95% CI
						Lower
						Upper
Marital Status						
Single	1199	1273677	45.3	853	871819	31.0
Married	13	18138	54.0	11	12233	36.4
Widow/widower/divorcee	0	0	0.0	0	0	0.0
Education level						
No formal education	19	34370	77.6	4	4393	9.9
Primary education	508	501620	46.2	358	333646	30.7
Secondary education	511	561368	43.1	390	432786	33.2
Tertiary education	3	3211	34.8	2	490	5.3
Unclassified education	171	190650	47.2	110	113683	28.1
						28.8
						17.0
						0.0
						0.0
						25.8
						34.1
						37.0
						21.8
						33.6

Table 2.4.6 Intake of sweetened condensed milk/cream in a day among adolescents (13 to <18 years old) by socio-demographic characteristics

Sociodemographic characteristics	2- < 3 cups per day				≥3 cups per day			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
MALAYSIA	434	430,181	15.1	13.5 16.8	261	240,010	8.4	7.3 9.7
State								
Johor	55	73,999	7.5	4.5 12.1	1	1,215	0.4	0.1 2.8
Kedah	16	16,966	8.0	4.7 13.2	22	29,479	13.9	9.1 20.6
Kelantan	62	54,154	27.0	21.6 33.1	33	27,667	13.8	9.9 18.9
Melaka	38	25,480	27.4	19.0 37.8	18	6,440	6.9	3.5 13.3
Negeri Sembilan	24	13,735	14.2	9.3 21.1	16	9,841	10.2	5.9 17.0
Pahang	25	25,909	17.2	11.7 24.5	17	15,390	10.2	6.4 16.0
Penang	15	13,449	9.8	5.0 18.4	10	10,514	7.7	3.3 16.8
Perak	20	34,356	13.2	7.6 21.9	5	6,170	2.4	0.9 6.0
Perlis	19	4,005	13.8	8.6 21.3	15	2,298	7.9	4.5 13.6
Selangor	58	76,751	16.1	12.4 20.7	36	45,790	9.6	6.9 13.3
Terengganu	31	20,499	16.3	11.5 22.6	24	14,975	11.9	8.0 17.4
Sabah & WP Labuan	41	40,032	10.4	6.6 16.1	21	24,846	6.5	3.5 11.5
Sarawak	18	211,009	5.0	3.8 5.9	5	5,843	2.3	0.9 5.9
WP Kuala Lumpur	5	9,270	7.4	3.0 17.1	12	15,943	12.7	7.0 21.9
WP Putrajaya	7	471	12.5	6.1 24.1	10	657	17.5	9.7 29.6
Location								
Urban	241	295,873	15.1	13.1 17.3	150	170,244	8.7	7.2 10.4
Rural	193	134,307	15.1	12.9 17.6	111	69,766	7.8	6.3 9.7
Sex								
Male	222	209,138	14.3	12.3 16.6	160	151,419	10.3	8.6 12.4
Female	212	221,042	15.9	13.6 18.5	101	88,590	6.4	5.1 8.0
Ethnicity								
Malays	291	269,796	17	15 19.3	187	164,001	10.3	8.8 12.1
Chinese	70	91,168	14.9	11.6 18.8	24	27,076	4.4	2.8 7.0
Indians	35	26,715	13.5	9.1 19.6	27	25,722	13.0	8.6 19.3
Other Bumiputras	22	30,022	7.9	4.8 12.6	12	13,025	3.4	1.7 6.6
Others	16	12,477	16.9	6.2 38.6	11	10,184	13.8	4.3 36.3

Table 2.4.6 Intake of sweetened condensed milk/cream in a day among adolescents (13 to <18 years old) by socio-demographic characteristics

Sociodemographic characteristics	2- < 3 cups per day			≥3 cups per day		
	Count	Estimated % (Prevalence) Population	95% CI Lower Upper	Count	Estimated % (Prevalence) Population	95% CI Lower Upper
Marital Status						
Single	432	429,237	15.3 13.7 17	258	237,747	8.5 7.3 9.8
Married	2	943	2.8 0.6 11.8	3	2,263	6.7 1.7 22.7
Widow / widower / divorcee	0	0	0.0 0.0 0.0	0	0	0.0 0.0 0.0
Education level						
No formal education	1	1,149	2.6 0.4 16.7	2	4,395	9.9 2.3 34.4
Primary education	178	160,602	14.8 12.4 17.5	182	192,126	9.0 7.3 11.0
Secondary education	182	192,126	14.7 12.4 17.4	117	117,112	9.0 7.3 11.0
Tertiary education	4	5,520	59.9 25.8 86.4	0	0	0.0 0.0 0.0
Unclassified education	69	70,782	17.5 13.7 22.2	29	28,791	7.1 4.8 10.4

Table 2.4.7 Intake of carbonated drinks in a day among adolescents (13 to <18 years old) by socio-demographic characteristics

Sociodemographic characteristics	0 cup per day				1-2 cups per day				≥2 cups per day			
	Count	Estimated Population	% (Prevalence)		Count	Estimated Population	% (Prevalence)		Count	Estimated Population	% (Prevalence)	
			Lower	Upper			Lower	Upper			Lower	Upper
MALAYSIA	1,297	1,306,649	45.9	48.3	1,279	1,337,752	47.0	49.4	193	200,369	7	8.4
State												
Johor	107	141,203	46.0	53.1	118	155,645	50.7	57.7	6	7,571	0.8	3.2
Kedah	98	117,958	55.6	63.2	78	88,772	41.9	49.7	4	5,317	2.5	6.9
Kelantan	138	116,330	57.9	64.2	94	81,148	40.4	46.9	4	3,329	1.7	4.4
Melaka	87	53,793	58.0	67.8	59	37,592	40.5	51.1	10	1,407	1.5	2.9
Negeri Sembilan	81	55,908	58.3	67.4	49	32,863	34.3	25.9	11	7,051	7.4	14.6
Pahang	70	71,702	47.6	55.8	70	68,770	45.7	53.9	13	10,041	6.7	11.3
Penang	87	67,458	49.2	58.1	56	60,062	43.8	55.3	11	9,681	7.1	14.8
Perak	68	124,270	47.6	57.0	73	125,084	48.0	57.3	9	11,480	4.4	8.5
Pertis	70	14,118	48.6	57.4	64	13,592	46.8	55.7	8	1,317	4.5	9.3
Selangor	152	206,852	43.3	51.8	162	220,306	46.1	55.8	38	50,585	10.6	14.5
Terengganu	121	75,962	60.4	67.2	78	47,388	37.7	44.9	4	2,350	1.9	5.1
Sabah & WP Labuan	98	115,541	30.2	39.6	225	228,068	59.5	67.8	34	39,486	10.3	16.4
Sarawak	62	85,630	34.9	43.0	97	126,776	51.7	59.6	28	32,833	13.4	19.5
WP Kuala Lumpur	31	58,187	47.2	61.2	27	49,836	40	54.7	8	15,259	12.4	25.6
WP Putrajaya	27	1,730	46.0	58.8	29	1,843	49.0	61.6	3	185	4.9	14.2
Location												
Urban	739	931,527	47.6	50.7	705	887,337	45.3	48.4	108	138,638	7.1	8.9
Rural	558	375,121	42.3	45.7	574	450,415	50.8	54.2	85	61,730	7.0	9.0
Sex												
Male	624	624,124	42.7	46.1	683	726,790	49.8	53.1	101	109,480	7.5	9.6
Female	673	682,525	49.3	52.7	596	610,961	44.1	40.8	92	90,889	6.6	8.3
Ethnicity												
Malays	883	804,663	50.9	53.7	737	678,243	42.9	40.1	108	99,454	6.3	7.8
Chinese	221	290,800	47.6	53.0	213	292,308	47.9	53.3	22	27,689	4.5	7.7
Indians	94	81,162	41.0	50.3	103	97,195	49.1	58.0	23	19,701	9.9	15.5
Other Bumiputras	75	119,222	31.4	41.0	184	225,456	59.4	67.6	29	35,114	9.2	13.8
Others	24	10,800	14.6	29.1	42	44,548	60.4	77.9	11	18,409	25.0	48.5
Marital Status												
Single	1,279	1,293,423	46.1	48.5	1,265	1,315,459	46.9	49.3	190	196,099	7	8.3
Married	14	9,455	28.2	50.8	12	19,853	59.1	79.8	3	4,270	12.7	37.7
Widow / widower / divorcee	0	0	0.0	0.0	0	0	0.0	0.0	0	0	0	0
Education level												
No formal education	13	20,265	45.7	68.5	9	18,304	41.3	21.2	4	5,737	13.0	34.7
Primary education	540	480,487	44.4	47.9	536	524,616	48.4	44.9	79	78,036	7.2	9.6
Secondary education	552	611,975	47.1	50.9	565	607,240	46.7	43.0	78	80,907	6.2	8.2
Tertiary education	6	5,655	61.3	88.7	3	3,567	38.7	19.3	0	0	0.0	0.0
Unclassified education	183	185,033	46.0	40.3	163	181,395	45.1	39.3	32	35,687	8.9	12.8

Table 2.4.8 Frequency meal patterns among adolescents (13 to <18 years old)

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>No of days taking fruits</i>					
0 day	326	359,775	12.9	11.1	14.8
1 day	439	487,101	17.4	15.6	19.4
2 days	574	588,330	21.0	19.2	23.0
3 days	636	606,733	21.7	19.9	23.6
4 days	180	188,041	6.7	5.6	8.0
5 days	119	117,083	4.2	3.4	5.1
6 days	9	14,594	0.5	0.3	1.0
7 days	437	436,274	15.6	14.0	17.3
<i>No of days taking vegetables</i>					
0 day	271	299,418	10.6	9.2	12.2
1 day	86	85,618	3.0	2.4	3.9
2 days	223	224,933	8.0	6.8	9.3
3 days	336	329,504	11.7	10.3	13.2
4 days	155	150,139	5.3	4.4	6.5
5 days	114	134,166	4.8	3.5	6.5
6 days	14	14,320	0.5	0.3	0.9
7 days	1,546	1,580,427	56.1	53.7	58.5
<i>No of days taking added sugar in drinks</i>					
0 day	405	442,660	15.7	14.0	17.5
1 day	137	144,658	5.1	4.2	6.3
2 days	220	243,823	8.6	7.4	10.0
3 days	251	266,654	9.4	8.2	10.9
4 days	122	116,687	4.1	3.3	5.1
5 days	101	102,579	3.6	2.8	4.6
6 days	27	31,869	1.1	0.7	1.8
7 days	1,489	1,476,213	52.3	49.9	54.6
<i>No of days taking sweetened condensed milk or creamer</i>					
0 day	1,175	1,240,711	44.0	41.7	46.4
1 day	235	266,267	9.5	7.9	11.3
2 days	291	292,873	10.4	9.1	11.9
3 days	274	282,219	10.0	8.7	11.5
4 days	95	87,057	3.1	2.4	3.9
5 days	63	62,316	2.2	1.7	2.9
6 days	16	17,018	0.6	0.3	1.1
7 days	595	568,808	20.2	18.4	22.1
<i>No of days taking carbonated drinks</i>					
0 day	1,251	1,256,523	44.7	42.3	47.1
1 day	644	673,968	24.0	22.0	26.0
2 days	387	401,763	14.3	12.7	16.0
3 days	233	249,902	8.9	7.7	10.3
4 days	67	76,243	2.7	2.1	3.6
5 days	41	46,137	1.6	1.1	2.4
6 days	7	4,899	0.2	0.1	0.4
7 days	110	101,543	3.6	2.8	4.6

Table 2.4.8 Frequency meal patterns among adolescents (13 to <18 years old)

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>No of days taking breakfast</i>					
0 day	332	337,312	11.9	10.5	13.6
1 day	58	60,480	2.1	1.6	2.9
2 days	151	146,125	5.2	4.3	6.2
3 days	124	136,701	4.8	3.9	6.0
4 days	79	77,952	2.8	2.1	3.6
5 days	125	140,134	5.0	4.0	6.1
6 days	24	24,057	0.9	0.5	1.3
7 days	1,858	1,902,627	67.3	65.1	69.5
<i>No of days taking heavy meals after dinner</i>					
0 day	1,937	1,959,129	69.6	67.4	71.7
1 day	134	138,133	4.9	4.0	6.0
2 days	233	254,725	9.0	7.8	10.5
3 days	187	191,739	6.8	5.7	8.1
4 days	60	78,926	2.8	2.0	3.9
5 days	28	39,393	1.4	0.9	2.3
6 days	4	3,617	0.1	0.0	0.4
7 days	158	149,373	5.3	4.4	6.4

Table 2.4.9 Frequency meal patterns among adolescents (13 to <18 years old) by location

Sociodemographic characteristics	Urban				Rural			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
<i>No of days taking fruits</i>								
0 day	207	279,973	14.5	12.2 17.2	119	79,800	9.2	7.4 11.4
1 day	223	305,551	15.8	13.6 18.4	216	181,549	20.9	18.1 24.2
2 days	323	407,106	21.1	18.7 23.7	251	181,223	20.9	18.3 23.8
3 days	340	392,150	20.3	18.0 22.8	296	214,582	24.8	21.9 27.8
4 days	111	144,084	7.5	6.0 9.3	69	43,956	5.1	3.9 6.7
5 days	76	88,087	4.6	3.6 5.8	43	28,995	3.3	2.4 4.7
6 days	7	11,812	0.6	0.3 1.4	2	2,781	0.3	0.1 1.3
7 days	239	302,490	15.7	13.7 17.9	198	133,783	15.4	13.2 18.0
<i>No of days taking vegetables</i>								
0 day	164	222,358	11.4	9.6 13.7	107	77,060	8.8	7.1 10.8
1 day	51	59,585	3.1	2.2 4.2	35	26,032	3.0	2.0 4.5
2 days	112	139,529	7.2	5.8 8.8	111	85,404	9.7	7.8 12.1
3 days	176	212,236	10.9	9.2 12.9	160	117,267	13.4	11.3 15.8
4 days	89	104,810	5.4	4.2 6.9	66	45,328	5.2	3.9 6.8
5 days	57	90,726	4.7	3.0 7.2	57	43,439	5.0	3.5 6.9
6 days	10	11,712	0.6	0.3 1.2	4	2,607	0.3	0.1 1.0
7 days	877	1,101,576	56.7	53.6 59.8	669	478,850	54.7	51.2 58.1
<i>No of days taking added sugar in drinks</i>								
0 day	268	353,922	18.2	16.0 20.6	137	88,738	10.1	8.2 12.3
1 day	77	99,438	5.1	3.9 6.6	60	45,219	5.1	3.8 6.9
2 days	136	180,676	9.3	7.7 11.1	84	63,146	7.2	5.6 9.2
3 days	157	193,549	9.9	8.4 11.8	94	73,104	8.3	6.5 10.5
4 days	69	82,690	4.2	3.2 5.6	53	33,996	3.9	2.8 5.3
5 days	60	71,706	3.7	2.7 5.0	41	30,871	3.5	2.4 5.1
6 days	12	19,269	1.0	0.5 1.9	15	12,599	1.4	0.8 2.7
7 days	761	945,526	48.6	45.5 51.7	728	530,686	60.4	57.0 63.7

Table 2.4.9 Frequency meal patterns among adolescents (13 to <18 years old) by location

Sociodemographic characteristics	Urban				Rural				
	Count	Estimated Population	% (Prevalence)		Count	Estimated Population	% (Prevalence)		
			Lower	Upper			Lower	Upper	
<i>No of days taking breakfast</i>									
0 day	188	235,475	12.1	10.2	144	101,837	11.6	9.6	14.0
1 day	33	44,363	2.3	1.5	25	16,116	1.8	1.1	2.9
2 days	71	90,892	4.7	3.6	80	55,232	6.3	4.9	8.1
3 days	60	85,586	4.4	3.3	64	51,114	5.8	4.3	7.9
4 days	43	51,363	2.6	1.9	36	26,588	3.0	2.0	4.5
5 days	88	110,256	5.7	4.4	37	29,877	3.4	2.4	4.9
6 days	9	12,633	0.6	0.3	15	11,423	1.3	0.7	2.3
7 days	1050	1,318,680	67.7	64.7	808	583,946	66.7	63.3	69.8
<i>No of days taking heavy meals after dinner</i>									
0 day	1064	1,316,225	67.8	64.8	873	642,903	73.6	70.5	76.5
1 day	77	100,389	5.2	4.1	57	37,743	4.3	3.1	6.0
2 days	145	193,507	10.0	8.3	88	61,217	7.0	5.5	8.8
3 days	112	142,216	7.3	5.9	75	49,521	5.7	4.4	7.4
4 days	38	60,817	3.1	2.1	22	18,108	2.1	1.2	3.6
5 days	20	29,166	1.5	0.8	8	10,226	1.2	0.5	2.6
6 days	3	2,339	0.1	0.0	1	1,277	0.1	0.0	1.0
7 days	77	96,986	5.0	3.9	81	52,386	6.0	4.7	7.6

Table 2.4.9 Frequency meal patterns among adolescents (13 to <18 years old) by location

Sociodemographic characteristics	Urban				Rural			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
<i>No of days taking breakfast</i>								
0 day	188	235,475	12.1	10.2 14.2	144	101,837	11.6	9.6 14.0
1 day	33	44,363	2.3	1.5 3.4	25	16,116	1.8	1.1 2.9
2 days	71	90,892	4.7	3.6 6.0	80	55,232	6.3	4.9 8.1
3 days	60	85,586	4.4	3.3 5.8	64	51,114	5.8	4.3 7.9
4 days	43	51,363	2.6	1.9 3.7	36	26,588	3.0	2.0 4.5
5 days	88	110,256	5.7	4.4 7.2	37	29,877	3.4	2.4 4.9
6 days	9	12,633	0.6	0.3 1.3	15	11,423	1.3	0.7 2.3
7 days	1050	1,318,680	67.7	64.7 70.4	808	583,946	66.7	63.3 69.8
<i>No of days taking heavy meals after dinner</i>								
0 day	1064	1,316,225	67.8	64.8 70.6	873	642,903	73.6	70.5 76.5
1 day	77	100,389	5.2	4.1 6.6	57	37,743	4.3	3.1 6.0
2 days	145	193,507	10.0	8.3 11.9	88	61,217	7.0	5.5 8.8
3 days	112	142,216	7.3	5.9 9.1	75	49,521	5.7	4.4 7.4
4 days	38	60,817	3.1	2.1 4.7	22	18,108	2.1	1.2 3.6
5 days	20	29,166	1.5	0.8 2.8	8	10,226	1.2	0.5 2.6
6 days	3	2,339	0.1	0.0 0.5	1	1,277	0.1	0.0 1.0
7 days	77	96,986	5.0	3.9 6.4	81	52,386	6.0	4.7 7.6

Table 2.4.10 Frequency meal patterns among adolescents (13 to <18 years old) by sex

Sociodemographic characteristics	Male				Female			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
<i>No of days taking fruits</i>								
0 day	188	213,800	14.9	12.2 18.1	138	145,974	10.7	8.8 13.0
1 day	205	242,974	17.0	14.4 19.8	234	244,125	17.9	15.3 20.7
2 days	293	289,849	20.2	17.8 22.9	281	298,480	21.8	19.1 24.9
3 days	333	333,684	23.3	20.7 26.2	303	2,703,048	20.0	17.6 22.7
4 days	91	88,635	6.2	4.8 7.9	89	99,405	7.3	5.6 9.4
5 days	63	62,711	4.4	3.3 5.8	56	54,371	4.0	3.0 5.3
6 days	4	5,307	0.4	0.1 1.0	5	9,287	0.7	0.3 1.7
7 days	202	194,807	13.6	11.6 15.9	235	241,466	17.7	15.3 20.3
<i>No of days taking vegetables</i>								
0 day	140	156,919	10.9	9.0 13.2	131	142,498	10.3	8.3 12.8
1 day	43	39,549	2.7	1.9 3.9	43	46,069	3.3	2.3 4.8
2 days	115	116,132	8.1	6.5 10.0	108	108,800	7.9	6.4 9.8
3 days	172	167,048	11.6	9.8 13.7	164	162,455	11.8	9.8 14.1
4 days	80	80,469	5.6	4.3 7.2	75	69,669	5.1	3.7 6.8
5 days	57	76,575	5.3	3.2 8.6	57	57,590	4.2	3.0 5.8
6 days	8	8,352	0.6	0.3 1.2	6	5,967	0.4	0.2 1.0
7 days	774	795,086	55.2	51.8 58.6	772	785,340	57.0	53.6 60.3

Table 2.4.10 Frequency meal patterns among adolescents (13 to <18 years old) by sex

Sociodemographic characteristics	Male				Female			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
<i>No of days taking added sugar in drinks</i>								
0 day	177	192,083	13.3	11.2 15.6	228	250,576	18.2	15.7 20.9
1 day	55	60,861	4.2	3.1 5.7	82	83,796	6.1	4.6 8.0
2 days	113	127,770	8.8	7.1 10.9	107	116,052	8.4	6.8 10.4
3 days	123	144,431	10.0	8.1 12.2	128	122,222	8.9	7.3 10.7
4 days	56	52,385	3.6	2.7 4.9	66	64,302	4.7	3.5 6.3
5 days	60	49,712	3.4	2.5 4.7	41	52,866	3.8	2.6 5.6
6 days	13	14,367	1.0	0.5 1.9	14	17,502	1.3	0.6 2.5
7 days	799	805,283	55.7	52.3 59.0	690	670,929	48.7	45.3 52.0
<i>No of days taking sweetened condensed milk or creamer</i>								
0 day	579	630,579	43.7	40.4 47.1	596	610,130	44.4	41.1 47.8
1 day	107	124,608	8.6	6.3 11.7	128	141,659	10.3	8.4 12.6
2 days	146	149,051	10.3	8.6 12.4	145	143,821	10.5	8.6 12.7
3 days	148	153,100	10.6	8.8 12.7	126	129,118	9.4	7.6 11.6
4 days	49	46,357	3.2	2.3 4.5	46	40,699	3.0	2.1 4.1
5 days	32	30,133	2.1	1.4 3.1	31	32,182	2.3	1.6 3.5
6 days	4	5,705	0.4	0.1 1.3	12	11,312	0.8	0.4 1.6
7 days	328	303,678	21.0	18.6 23.7	267	265,129	19.3	16.8 22.0

Table 2.4.10 Frequency meal patterns among adolescents (13 to <18 years old) by sex

Sociodemographic characteristics	Male				Female			
	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper	Count	Estimated Population	% (Prevalence)	95% CI Lower Upper
<i>No of days taking breakfast</i>								
0 day	166	188,240	13.0	10.8 15.6	166	149,072	10.8	9.0 12.9
1 day	24	26,781	1.8	1.1 3.0	34	33,697	2.4	1.6 3.7
2 days	72	72,873	5.0	3.8 6.6	79	73,251	5.3	4.1 6.9
3 days	65	73,781	5.1	3.8 6.7	59	62,919	4.6	3.3 6.3
4 days	37	37,640	2.6	1.8 3.8	42	40,311	2.9	2.0 4.2
5 days	57	56,778	3.9	2.9 5.2	68	83,355	6.1	4.5 8.1
6 days	16	15,156	1.0	0.6 1.8	8	8,901	0.6	0.3 1.5
7 days	958	976,956	67.5	64.3 70.5	900	925,670	67.2	64.0 70.3
<i>No of days taking heavy meals after dinner</i>								
0 day	946	980,718	68.0	64.9 71.0	991	978,410	71.2	67.9 74.3
1 day	68	76,653	5.3	4.0 7.0	66	61,479	4.5	3.4 5.9
2 days	126	135,036	9.4	7.7 11.4	107	119,688	8.7	7.0 10.8
3 days	102	97,355	6.8	5.4 8.4	85	94,382	6.9	5.3 8.9
4 days	32	37,574	2.6	1.7 3.9	28	41,350	3.0	1.7 5.2
5 days	16	21,459	1.5	0.8 2.8	12	17,933	1.3	0.6 2.8
6 days	3	2,843	0.2	0.1 0.8	1	773	0.1	0.0 0.4
7 days	98	89,633	6.2	4.9 7.8	60	59,739	4.3	3.2 5.8

TOPIC 3

PHYSICAL ACTIVITY

3. PREVALENCE OF PHYSICAL ACTIVITY

Contributors to this section: Mohd Azahadi Omar, Umami Nadiyah Yusoff, Teh Chien Huey, Hamizatul Akmal Ab Hamid, Chan Ying Ying, Lim Kuang Kuay

3.1 Findings

Generally, 64.3% (95% CI: 63.1 - 65.5) Malaysian adults aged 16 and above were active physically. Amongst this physically active population, the male population had reported a significantly higher percentage [69.5% (95% CI: 67.9 - 71.0)] over the female population [59.0% (95% CI: 57.5 - 60.5)]. In addition, it was observed that there was an increasing level of physical activity from adolescents aged 16-19 years old to adults aged 40-44 years old, whereby the latter was the most physically active group amongst all age groups. Nonetheless, the level of physical activity gradually decreased as the age increased and this was particularly apparent in the elderly. The rural population [67.2% (95% CI: 65.3 - 69.2)] had higher level of physical activity compared to the urban population [63.2% (95% CI: 61.8 - 64.7)]. The highest prevalence of physical activity was observed among "Others" [82.2% (95% CI: 78.1 - 86.2)], followed by Other Bumiputras [72.5% (95% CI: 69.4 - 75.5)], Indians [64.8% (95% CI: 61.3 - 68.2)], Malays [61.6% (95% CI: 60.0 - 63.2)] and Chinese [61.4% (95% CI: 58.9 - 63.9)]. The state of Penang had the highest prevalence of physical activity [80.1% (CI: 76.4 - 83.8)], followed by Sabah [74.6% (95% CI: 71.4 - 77.7)] and Wilayah Persekutuan Kuala Lumpur [68.8% (95% CI: 63.4 - 74.2)].

3.2 Implications

There was an increase in the prevalence of physical activity as compared to NHMS III [64.3% (95% CI: 63.1 - 65.5) vs 56.3% (95% CI: 55.5 - 57.1)].

3.3 Conclusion

The prevalence of physical activity amongst the general population was relatively high.

3.4 Recommendations

Both government and non-government agencies should carry out intensive efforts to further promote active lifestyle and intervention on physical inactivity among Malaysian population, particularly the elderly. Future studies should include younger groups (<16 years old) to gauge their physical activity pattern.

Definition of variables: Physical Activity

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
Physical Activity	PA		<p>1. Inactive (Low) No activity is reported OR Some activity is reported but not enough to meet moderate or high categories.</p> <p>2. Active (Moderate and High) Combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum of at least 600 MET-minutes/week.</p> <p>MET Values and Formula for Computation of MET-minutes/week</p> <p>The selected MET values were derived from work undertaken during the IPAQ Reliability Study undertaken in 2000-20013. Using the Ainsworth et al. Compendium (Med Sci Sports Med 2000) an average MET score was derived for each type of activity. For example; all types of walking were included and an average MET value for walking was created. The same procedure was undertaken for moderate-intensity activities and vigorous-intensity activities. The following values continue to be used</p>	<p>*compute days of vigorous activity</p> <p>RECODE d010 (CONVERT) (MISSING=SYSMIS) INTO vig_day. VARIABLE LABELS vig_day 'Days of vigorous activity'. EXECUTE.</p> <p>*cleaning days of vigorous activity</p> <p>RECODE vig_day (8 thru highest=SYSMIS). EXECUTE. MISSING VALUES vig_day (-44 to -7).</p> <p>*compute minutes of vigorous activity</p> <p>RECODE d011 (CONVERT) (MISSING=SYSMIS) INTO vig_min. VARIABLE LABELS vig_min 'Minutes of vigorous activity'. EXECUTE. DO IF (vig_day = 0). RECODE vig_min (-44 thru -8=0). END IF. EXECUTE. MISSING VALUES vig_min (-44 to -7).</p> <p>RECODE vig_min (961 thru Highest=960). EXECUTE.</p> <p>*compute days of moderate activity</p> <p>RECODE d020 (CONVERT) (MISSING=SYSMIS) INTO mod_day. VARIABLE LABELS mod_day 'Days of moderate activity'. EXECUTE.</p> <p>*cleaning days of moderate activity</p>

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
			<p>for the analysis of IPAQ data: Walking = 3.3 METs, Moderate PA = 4.0 METs and Vigorous PA = 8.0 METs. Using these values, four continuous scores are defined:</p> <p>Walking MET-minutes/week = 3.3 * walking minutes * walking days Moderate MET-minutes/week = 4.0 * moderate-intensity activity minutes * moderate days Vigorous MET-minutes/week = 8.0 * vigorous-intensity activity minutes * vigorous-intensity days Total physical activity MET-minutes/week = sum of Walking + Moderate + Vigorous METminutes/week scores.</p>	<p>RECODE mod_day (8 thru highest=SYSMIS). EXECUTE. MISSING VALUES mod_day (-44 to -7). *compute minutes of moderate activity</p> <p>RECODE d021 (CONVERT) (MISSING=SYSMIS) INTO mod_min. VARIABLE LABELS mod_min 'Minutes of moderate activity'. EXECUTE. DO IF (mod_day = 0). RECODE mod_min (-44 thru -8=0). END IF. EXECUTE. MISSING VALUES mod_min (-44 to -7).</p> <p>DO IF (vig_day = -44 vig_day = -7 vig_day = -9 vig_day = -8). RECODE vig_min (ELSE=SYSMIS). END IF. EXECUTE.</p> <p>RECODE mod_min (961 thru Highest=960). EXECUTE.</p> <p>*compute days of walking activity RECODE d030 (CONVERT) (MISSING=SYSMIS) INTO walk_day. VARIABLE LABELS walk_day 'Days of walking activity'. EXECUTE.</p> <p>*cleaning days of walking activity RECODE walk_day (8 thru highest=SYSMIS).</p>

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
				<p>EXECUTE. MISSING VALUES walk_day (-44 to -7). *compute minutes of walking activity RECODE d031 (CONVERT) (MISSING=SYSMIS) INTO walk_min. VARIABLE LABELS walk_min 'Minutes of walking activity'. EXECUTE. DO IF (walk_day = 0). RECODE walk_min (-44 thru -8=0). END IF. EXECUTE. MISSING VALUES walk_min (-44 to -7). RECODE walk_min (961 thru Highest=960). EXECUTE. RECODE vig_minmod_minwalk_min (0.1 thru 9=0). EXECUTE. COMPUTE Total_min=SUM(vig_min,mod_min,walk_min). EXECUTE. DO IF (vig_day = -44 vig_day = -7 vig_day = -9 vig_day = -8). RECODE vig_min (ELSE=SYSMIS). END IF. EXECUTE. COMPUTE met_vig=(vig_day * vig_min * 8) . EXECUTE. COMPUTE met_mod=(mod_day * mod_min * 4) . EXECUTE.</p>

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
				<pre> COMPUTE met_walk=(walk_day * walk_min * 3.3). EXECUTE. COMPUTE MET_total=SUM(met_vig,met_mod,met_walk). EXECUTE. DO IF (Total_min > 960). RECODE MET_total (ELSE=SYSMIS). END IF. EXECUTE. RECODE MET_total (MISSING=SYSMIS) (600 thru Highest=1) (Lowest thru 599=2) INTO pa_level. VARIABLE LABELS pa_level 'Level of PA'. EXECUTE. VALUE LABELS pa_level 1 'Active' 2 'Inactive'. *missing items COUNT miss=vig_dayvig_minmod_daymod_minwalk_daywalk_min (-44 thru -7). VARIABLE LABELS miss 'no of missing items'. EXECUTE. </pre>

Table 3.1 Prevalence of physical activity (≥ 16 years old) by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	12,196	12,133,802	64.3	63.1	65.5
State					
Johor	924	1,294,838	57.9	53.3	62.4
Kedah	751	797,026	65.1	62.1	68.1
Kelantan	642	504,652	53.4	47.7	59.1
Melaka	746	338,196	60.6	54.6	66.6
Negeri Sembilan	686	428,942	62.5	56.4	68.6
Pahang	599	517,054	56.2	51.2	61.2
Penang	1019	911,501	80.1	76.4	83.8
Perak	765	1,018,893	65.4	62.0	68.8
Perlis	676	102,262	67.0	62.9	71.1
Selangor	1673	2,392,508	61.4	58.5	64.2
Terengganu	679	378,920	57.9	53.0	62.8
Sabah & WP Labuan	1456	1,523,098	74.6	71.4	77.7
Sarawak	858	1,050,025	67.4	63.9	70.9
WP Kuala Lumpur	452	855,048	68.8	63.4	74.2
WP Putrajaya	270	20,839	43.5	38.7	48.4
Location					
Urban	6807	8,707,603	63.2	61.8	64.7
Rural	5389	3,426,200	67.2	65.3	69.2
Sex					
Male	6192	6,660,203	69.5	67.9	71.0
Female	6004	5,473,599	59.0	57.5	60.5
Age Group					
16-19	1062	1,191,430	57.2	54.3	60.1
20-24	1282	1,667,840	62.3	59.2	65.3
25-29	1334	1,700,862	65.8	62.7	68.8
30-34	1221	1,366,286	66.8	64.3	69.4
35-39	1214	1,261,550	68.8	66.0	71.6
40-44	1315	1,235,657	72.4	69.7	75.1
45-49	1259	1,101,097	70.7	67.9	73.4
50-54	1146	891,816	68.7	65.9	71.5
55-59	1001	691,207	67.6	64.2	71.0
60-64	603	455,925	59.3	55.3	63.3
65-69	364	271,528	55.0	49.9	60.2
70-74	235	169,021	46.2	39.9	52.4
75+	160	129,585	30.4	25.0	35.8
Ethnicity					
Malay	6768	5,824,843	61.6	60.0	63.2
Chinese	2243	2,923,428	61.4	58.9	63.9
Indians	982	857,045	64.8	61.3	68.2
Other Bumiputras	1321	1,499,688	72.5	69.4	75.5
Others	882	1,028,798	82.2	78.1	86.2
Marital Status					
Single	3169	3,810,952	61.3	59.4	63.2
Married	8290	7,768,443	67.1	65.8	68.5
Widow/widower/divorcee	732	548,739	51.5	48.0	54.9

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>Education Level</i>					
No formal education	752	607,936	55.3	51.7	58.9
Primary education	2945	2,637,757	68.5	66.4	70.6
Secondary education	6004	6,103,647	65.6	64.1	67.1
Tertiary education	2296	2,571,811	60.8	58.3	63.2
Unclassified education	161	165,793	55.9	48.4	63.4
<i>Occupation</i>					
Government/semi government employee	1332	1,174,619	65.0	61.8	68.0
Private employee	3890	4,621,261	67.1	65.2	69.0
Self employed	2702	2,431,181	73.5	71.4	75.7
Unpaid worker/home maker	2100	1,797,814	65.6	63.3	67.8
Retiree	782	630,749	47.6	44.3	50.9
<i>Income Group</i>					
RM 1000 - RM 1999	2577	2,315,390	66.7	64.5	68.9
RM 2000 - RM 2999	2136	2,100,323	66.7	64.3	69.2
RM 3000 - RM 3999	1630	1,660,716	64.2	61.7	66.8
RM 4000 - RM 4999	1103	1,279,796	65.2	61.3	69.1
RM 5000 & above	2545	2,789,505	62.2	59.8	64.6

Table 3.2 Prevalence of physical activity (≥ 18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	11,590	11,449,400	64.8	63.6	66.1
<i>State</i>					
Johor	882	1,238,000	58.6	53.8	63.1
Kedah	711	749,700	65.6	62.4	68.7
Kelantan	602	471,100	55.0	48.8	61.0
Melaka	711	312,800	60.3	53.9	66.3
Negeri Sembilan	649	400,700	62.4	56.1	68.4
Pahang	580	497,600	57.9	52.6	62.9
Penang	975	861,900	80.1	76.1	83.6
Perak	731	968,600	66.8	63.4	70.0
Perlis	647	95,080	67.6	63.5	71.5
Selangor	1,599	2,270,000	61.3	58.3	64.2
Terengganu	638	350,800	59.0	53.6	64.1
Sabah & WP Labuan	1,367	1,409,000	75.2	71.8	78.3
Sarawak	812	983,400	67.6	63.8	71.2
WP Kuala Lumpur	436	821,100	69.2	63.7	74.3
WP Putrajaya	250	19,620	42.7	37.7	47.8
<i>Location</i>					
Urban	6,460	8,228,000	63.5	62.0	65.0
Rural	5,130	3,221,000	68.4	66.3	70.4
<i>Sex</i>					
Male	5,851	6,284,000	69.9	68.3	71.4
Female	5,739	5,165,000	59.6	58.0	61.1
<i>Age Group</i>					
18-19	456	506,400	57.6	53.2	62.0
20-24	1,282	1,668,000	62.3	59.2	65.2
25-29	1,334	1,701,000	65.8	62.6	68.8
30-34	1,221	1,366,000	66.8	64.3	69.3
35-39	1,214	1,262,000	68.8	66.0	71.6
40-44	1,315	1,236,000	72.4	69.7	75.0
45-49	1,259	1,101,000	70.7	67.8	73.4
50-54	1,146	891,800	68.7	65.9	71.4
55-59	1,001	691,200	67.6	64.1	70.9
60-64	603	455,900	59.3	55.3	63.2
65-69	364	271,500	55.0	49.8	60.1
70-74	235	169,000	46.2	40.0	52.5
75+	160	129,600	30.4	25.3	36.1
<i>Ethnicity</i>					
Malay	6,393	5,453,000	62.1	60.4	63.7
Chinese	2,157	2,786,000	61.8	59.3	64.3
Indians	932	815,900	65.5	62.0	68.9
Other Bumiputras	1,248	1,388,000	73.2	70.0	76.3
Others	860	1,006,000	82.0	77.6	85.7
<i>Marital Status</i>					
Single	2,574	3,139,000	62.4	60.2	64.5
Married	8,280	7,756,000	67.1	65.8	68.4
Widow/widower/divorcee	732	548,700	51.5	48.0	54.9

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>Education Level</i>					
No formal education	746	594,800	55.1	51.6	58.5
Primary education	2,914	2,595,000	68.7	66.5	70.7
Secondary education	5,497	5,548,000	66.6	65.0	68.1
Tertiary education	2,293	2,569,000	60.8	58.3	63.3
Unclassified education	103	96,040	59.7	49.7	69.0
<i>Occupation</i>					
Government/semi government employee	1,332	1,174,619	65.0	61.8	68.0
Private employee	3,810	4,521,652	67.1	65.2	69.0
Self employed	2,667	2,377,842	73.3	71.0	75.4
Unpaid worker/home maker	2,088	1,782,394	65.6	63.4	67.8
Retiree	782	630,749	47.6	44.3	50.9
<i>Income Group</i>					
RM 700 - RM 999	2,088	1,871,000	62.3	59.8	64.8
RM 1000 - RM 1999	2,440	2,164,000	67.5	65.3	69.7
RM 2000 - RM 2999	2,032	1,990,000	67.1	64.5	69.6
RM 3000 - RM 3999	1,546	1,557,000	64.8	62.1	67.4
RM 4000- RM 4999	1,060	1,218,000	66.0	61.9	69.8
RM 5000 & above	2,424	2,648,000	62.5	60.1	64.9

TOPIC 4

ALCOHOL CONSUMPTION

4. PREVALENCE OF ALCOHOL CONSUMPTION (\geq 13 YEARS)

Contributors to this section: Rozanim Kamarudin, Rushidi Ramly, Noorzurani Md Haris Robson, Norsiah Ali, Nalachakravarthy Odhayakumar, Mohd Hatta Abdul Mutalip, Loe Yak Khoon

4.1 Findings

The response rate for this module was 99.7% (n=20,954) and out of this, there were 91.6% (n=1759) current drinkers who responded to the AUDIT questionnaire. The prevalence of non-drinker was 81.7% (95% CI: 80.3 - 83.1) and ever consumed alcohol was 17.8% (95% CI: 16.4 - 19.2). Meanwhile the prevalence of current drinkers among 13 years old and above was 11.6% (95% CI: 10.5 - 12.7) and ever consumed alcohol who had stopped drinking for the past one year (ex-drinker) was 6.1% (95% CI: 5.5 - 6.7).

Among the current drinkers, the consumption prevalence was highest in urban areas (12.6%, 95% CI: 11.3 - 14.0), Malaysian citizen (11.7%, 95% CI: 10.6 - 12.9), males (17.2%, 95% CI: 15.6 - 18.9), Chinese (27.5%, 95% CI: 25.2 - 30.0), age group between 20-24 years old (15.7%, 95% CI: 13.1 - 18.6), singles (12.4%, 95% CI: 11.0 - 14.1), working in private sectors (17.9%, 95% CI: 16.0 - 19.9), with tertiary education (15%, 95% CI: 12.8 - 17.4) and have a household income \geq RM 5000 (17.3%, 95% CI: 14.9 - 20.0). The reported mean age of starting to drink alcohol was 21 years old. Beer was the most common alcoholic beverage consumed by the respondents with a prevalence of 59.7% (95% CI: 56.8 - 62.6).

The prevalence of binge drinking was 5.7% (95% CI: 5.1 - 6.4) and its proportion among the current drinkers was 50.2% (95% CI: 46.9 - 53.5). While the prevalence of heavy episodic drinking was 1.0% (95% CI: 0.9 - 1.3) with its proportion among the current drinkers was 18.3% (95% CI: 15.7 - 21.1). Binge drinkers were more common in rural areas (53.0%, 95% CI: 47.3 - 58.7), higher among males (53.5%, 95% CI: 49.8 - 57.2), Malays ethnicity (62.9%, 95% CI: 49.6 - 74.5), and those age group between 30-34 years old (57.1%, 95% CI: 49.3 - 64.5).

Most of the current drinkers were low risk drinkers (49.2%, 95% CI: 46.3 - 52.0), followed by risky drinkers (14%, 95% CI: 12.3 - 15.9) and probable dependence (1.2%, 95% CI: 0.8 - 1.7).

4.2 Implications

Among the current drinkers, although about half of them were in low risk group at the point of the survey, they may be at risk of becoming risky group in time to come especially if under pressure and prolonged drinking with friends. Among the current drinkers half of them were binge drinkers and most of the binge drinkers were also in risky and probable dependence group. Appropriate intervention is essential to be implemented to modify the drinking behaviour.

4.3 Conclusion

High prevalence of current drinkers was found among the urban population, age 20-24 years old, males, Chinese, singles, with tertiary education, working in private sectors and those with high income. Inversely for binge drinkers, high prevalence of binge drinkers was found in rural areas, males and among age group 20 - 34 years old. More than half of Malaysian current drinkers were either in low risk or risky group based on AUDIT score.

4.4 *Recommendations*

As noted in this study that the reported mean age of starting to drink was 21 years old (young adulthood), awareness campaigns on the dangers and adverse effects of alcohol can be initiated at an earlier age, especially at upper secondary school level, colleges and universities. Parents play a significant role in guiding and showing good role models for the younger generations to emulate. The aim is to encourage alcohol abstinence and to reduce irresponsible drinking habits among the current drinkers. Another task is to prevent the young adults which are now in the low risk group from becoming binge drinkers and heavy episodic drinkers at social functions and entertainment outlets.

Information on the prevalence and the drinking pattern of alcohol consumption among age group 13 years old and above is important for formulation of national policy and strategies to prevent and reduce the alcohol-related harm. Meanwhile, emphasis on the risky population will direct the planning of prevention and harm minimization program. The intervention includes health promotion, psycho-education, awareness program and brief intervention. Intervention and Health promotion needs to focus on the identified target group.

Definition of variables: Alcohol Consumption

Variable Name	Variable in SPSS	Definition	SPSS Variable Definition
Ever drinker	Ever	Respondent who had history of consuming alcoholic beverages at least once in his life time	RECODE b9101 (1=1) (2=0) (-44 thru -7=-44) INTO ever. VARIABLE LABELS ever 'Ever drinker'. EXECUTE. VALUE LABELS ever 1 'Yes' 0 'No'. MISSING VALUES ever (- 44).
Current drinker	Current	Respondent who is still consuming alcoholic beverages for the past 12 months	RECODE i030 (1 thru 4=1) (0=0) (- 44 thru -7=-44) INTO current. VARIABLE LABELS current 'Current drinker'. EXECUTE. VALUE LABELS current 1 'Yes' 0 'No'. MISSING VALUES current (- 44). DO IF (i030 = 0). RECODE i040 i050 i060 i070 i080 i090 i100 i110 i120 (ELSE=-8). END IF. EXECUTE.
Audit score	L040_i050	Eligible criteria for respondent to answer i060 and above	IF (i040 = 0 & i050 = 0) i040_i050=1. EXECUTE. RECODE i040_i050 (MISSING=2). EXECUTE.
Stop drink	L060a	Unable to stop drinking	COMPUTE i060a=i060. EXECUTE. DO IF (i040_i050 = 1). RECODE i060a (ELSE=0). END IF. EXECUTE.
Fail expect	L070a	Failed to do what was expected normally	COMPUTE i070a=i070. EXECUTE.

Variable Name	Variable in SPSS	Definition	SPSS Variable Definition
First drink morning	L080a	Needed a drink first in the morning	DO IF (I040_I050 = 1). RECODE I070a (ELSE=0). END IF. EXECUTE. COMPUTE I080a=I080. EXECUTE. DO IF (I040_I050 = 1). RECODE I080a (ELSE=0). END IF. EXECUTE.
Remorse after rink	L090a	Feeling of remorse and guilt after drinking	COMPUTE I090a=I090. EXECUTE. DO IF (I040_I050 = 1). RECODE I090a (ELSE=0). END IF. EXECUTE.
Forget	L100a	Unable to remember what happened	COMPUTE I100a=I100. EXECUTE. DO IF (I040_I050 = 1). RECODE I100a (ELSE=0). END IF. EXECUTE.
Injury self/others	L110a	Injury to self or others	COMPUTE I110a=I110. EXECUTE.
Advice drinking	L120a	Advice on drinking	COMPUTE I120a=I120. EXECUTE. MISSING VALUES I030 I040 I050 I060a I070a I080a I090a I100a I110a I120a (-44thru-7).
Total	Totalscore2	The total AUDIT score from all respondents comprises of all responses from 10 AUDIT questionnaires, L030 until L120.	COMPUTE totalscore2=I030 + I040 + I050 + I060a + I070a + I080a + I090a + I100a + I110a + I120a. EXECUTE.

Variable Name	Variable in SPSS	Definition	SPSS Variable Definition
Categories score	Cat_score2	Level of risk scores according to total scores and categorized into 3 level of risk categories: a. Low risk (total scores: 0 - 7), b. Moderate risk (Total scores: 8 - 19), and c. High risk (Total scores: 20 and above).	RECODE totalscore2 (Lowest thru 7=1) (8 thru 19=2) (20 thru Highest=3) INTO cat_score2. VARIABLE LABELS cat_score2 'cat_score2'. EXECUTE. VALUE LABELS cat_score2 1 'low risk' 2 'moderate risk' 3 'high risk'.
Drinking status	Status	Classification of drinking status whether: 0 : Non drinker 1 : Ex drinker 2: Current Drinker 3: Unclassified (Declared as current drinker in question B9100 but did not answered module L).	RECODE ever (ELSE=Copy) INTO status. VARIABLE LABELS status 'Drinking status'. EXECUTE. DO IF (current = 1). RECODE status (1=2). END IF. EXECUTE. RECODE status (-44=3). EXECUTE. VALUE LABELS status 0 'Non drinker' 1 'Ex-drinker' 2 'Current drinker' 3 'Unclassified'.
Drinkers Pyramid	pyramid	The categories of alcohol risk based on total score from AUDIT Questionnaire. There are 4 groups : 0 - Abstinence 1 - Low-risk drinkers 2 - High-risk drinkers 3 - Probable alcohol dependence	IF (status = 1) pyramid=0. EXECUTE. IF (cat_score2 = 1) pyramid=1. EXECUTE. IF (cat_score2 = 2) pyramid=2. EXECUTE. IF (cat_score2 = 3) pyramid=3. EXECUTE.

Variable Name	Variable in SPSS	Definition	SPSS Variable Definition
Binge drinker among current drinker	Binge	Consumption of ≥ 6 standard drink per-sitting among current drinkers	VALUE LABELS pyramid 0 'Abstinence' 1 'Low-risk drinkers' 2 'High-risk drinkers' 3 'Probable alcohol dependence'.
Heavy episodic drinking among current drinker	heavybinge	Consumption of ≥ 6 standard drink per-sitting once a week among current drinkers	RECODE I050 (0=0) (1 thru 4=1) INTO binge. VARIABLE LABELS binge 'binge drinker'. EXECUTE. VALUE LABELS binge 0 'No' 1 'Yes'.
			DO IF (binge = 1). RECODE I050 (0 thru 2=0) (3 thru 4=1) INTO heavybinge. END IF. VARIABLE LABELS heavybinge 'heavy binge drinker'. EXECUTE. VALUE LABELS heavybinge 0 'No' 1 'Yes'.

Table 4.1 Prevalence of current drinker (≥ 13 years old) by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	1759	2,394,204	11.6	10.5	12.7
Location					
Urban	1144	1,887,084	12.6	11.3	14.0
Rural	615	507,119	8.9	7.3	10.9
Sex					
Male	1314	1,815,499	17.2	0.2	18.9
Female	445	578,705	5.7	0.0	6.6
Age Group					
13-14	16	16,408	1.6	0.9	2.8
15-19	130	188,609	6.9	5.5	8.5
20-24	244	424,747	15.7	13.1	18.6
25-29	197	357,939	13.7	11.3	16.5
30-34	229	304,433	14.7	12.6	17.2
35-39	189	263,627	14.3	12.0	16.9
40-44	198	239,775	13.9	11.5	16.7
45-49	156	195,380	12.4	10.0	15.4
50-54	138	144,644	11.0	8.9	13.6
55-59	112	100,021	9.7	7.6	12.5
60-64	68	75,964	9.8	7.3	13.2
65-69	41	41,799	8.4	5.7	12.1
70-74	22	19,815	5.4	3.3	8.7
75+	19	21,044	4.9	3.0	8.1
Ethnicity					
Malay	71	89,354	0.9	0.6	1.2
Chinese	966	1,416,402	27.5	25.2	30.0
Indians	255	272,440	18.8	15.7	22.3
Other Bumiputras	360	466,266	20.3	16.8	24.3
Others	107	149,743	11.3	7.7	16.1
Marital Status					
Single	606	982,985	12.4	11.0	14.1
Married	1097	1,359,082	0.1	10.5	12.9
Widow/widower/divorcee	56	52,137	4.9	3.6	6.5
Education Level					
No formal education	86	103,355	9.2	6.4	13.0
Primary education	388	460,830	9.4	8.1	10.9
Secondary education	855	1,160,078	12.0	10.7	13.4
Tertiary education	401	635,858	15.0	12.8	17.4
Unclassified education	21	27,442	4.8	2.8	8.4
Occupation					
Government/semi government employee	77	95,173	69.2	57.4	78.9
Private employee	842	1,252,184	17.9	16.0	19.9
Self employed	457	570,177	17.0	14.7	19.6
Unpaid worker/home maker	2	6,663	14.7	4.2	40.3
Retiree	90	96,507	7.3	5.6	9.3

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>Income Group</i>					
Less than RM 400	81	97,918	7.1	5.2	9.6
RM 400 - RM 699	71	73,342	7.5	5.2	10.8
RM 700 - RM 999	88	109,316	8.9	6.5	12.1
RM 1000 - RM 1999	255	300,914	7.8	6.5	9.4
RM 2000 - RM 2999	289	378,867	10.9	9.1	13.1
RM 3000 - RM 3999	219	317,155	11.1	9.0	13.7
RM 4000 - RM 4999	197	285,343	13.5	10.7	16.8
RM 5000 & above	559	831,350	17.3	14.9	20.0

Table 4.2 Prevalence of current drinker (≥ 18 years old) by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	1,676	2,273,151	12.8	12.1	13.6
<i>State</i>					
Johor	192	291,031	13.8	11.8	16.1
Kedah	57	75,320	6.6	4.7	9.3
Kelantan	8	3,278	0.4	0.2	0.8
Melaka	111	53,424	10.3	8	13.1
Negeri Sembilan	110	64,035	10	7.9	12.6
Pahang	34	41,728	4.8	3.3	7
Penang	135	171,955	15.9	12.9	19.5
Perak	119	204,334	14	11.5	16.9
Perlis	25	3,075	2.2	1.3	3.6
Selangor	269	480,205	12.9	11.5	14.6
Terengganu	22	6,614	1.1	0.6	2
Sabah & WP Labuan	298	349,905	18.4	16.1	21
Sarawak	191	286,004	19.7	16.8	22.8
WP Kuala Lumpur	96	241,900	20.3	16.5	24.7
WP Putrajaya	9	344	0.7	0.3	1.7
<i>Location</i>					
Urban	1,098	1,805,278	13.9	13.1	14.9
Rural	578	467,873	9.9	8.9	11.0
<i>Sex</i>					
Male	1,258	1,735,094	19.2	18.0	20.4
Female	418	538,057	6.2	5.5	7.0
<i>Age Group</i>					
18-19	63	83,964	9.5	7.2	12.5
20-24	244	424,747	15.8	13.7	18.1
25-29	197	357,939	13.8	11.6	16.3
30-34	229	304,433	14.8	12.9	17.0
35-39	189	263,627	14.4	12.3	16.7
40-44	198	239,775	14.0	11.9	16.5
45-49	156	195,380	12.5	10.4	15.0
50-54	138	144,644	11.1	9.1	13.5
55-59	112	100,021	9.8	7.8	12.1
60-64	68	75,964	10.0	7.6	13.0
65-69	41	41,799	8.5	5.8	12.2
70-74	22	19,815	5.4	3.3	8.9
75+	19	21,044	5.0	3.1	8.0
<i>Ethnicity</i>					
Malay	68	84,638	1.0	0.7	1.3
Chinese	920	1,349,013	29.9	28.0	31.9
Indians	244	260,775	20.9	18.0	24.2
Other Bumiputras	338	434,680	22.8	20.2	25.6
Others	106	144,044	11.5	8.9	14.9
<i>Marital Status</i>					
Single	523	861,933	17.0	15.5	18.7
Married	1097	1,359,082	11.7	10.9	12.6
Widow/widower/divorcee	56	52,137	4.9	3.6	6.6

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
<i>Education Level</i>					
No formal education	86	103,355	9.6	7.5	12.2
Primary education	362	426,437	11.2	9.9	12.8
Secondary education	807	1,086,204	13.0	12.0	14.1
Tertiary education	400	634,796	15.0	13.4	16.7
Unclassified education	13	15,717	9.7	5.4	16.8
<i>Occupation</i>					
Government/semi government employee	77	95,173	5.3	3.9	7.1
Private employee	831	1,233,815	18.2	16.9	19.6
Self employed	448	559,643	17.2	15.4	19.2
Unpaid worker/home maker	115	134,029	4.9	4.0	6.1
Retiree	90	96,507	7.3	5.8	9.2
<i>Income Group</i>					
Less than RM 400	74	88,367	7.5	5.7	9.8
RM 400 - RM 699	68	69,866	8.6	6.5	11.3
RM 700 - RM 999	83	101,845	9.8	7.6	12.6
RM 1000 - RM 1999	242	282,524	8.8	7.5	10.2
RM 2000 - RM 2999	276	359,111	12.1	10.4	13.9
RM 3000 - RM 3999	205	296,203	12.3	10.5	14.4
RM 4000 - RM 4999	188	273,515	14.8	12.4	17.6
RM 5000 & above	540	801,720	18.9	17.3	20.7

Table 4.3 Prevalence of binge drinker among current drinker (≥ 13 years old) by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	832	1,183,141	50.2	46.9	53.5
Location					
Urban	535	914,136	49.4	45.6	53.3
Rural	297	269,005	53.0	47.3	58.7
Sex					
Male	683	961,600	53.5	49.8	57.2
Female	149	221,541	39.6	34.0	45.4
Age Group					
13-14	6	6,280	38.3	16.2	66.6
15-19	64	95,238	52.1	42.0	62.0
20-24	125	225,820	53.4	45.8	60.8
25-29	102	181,993	51.8	41.7	61.8
30-34	121	172,133	57.1	49.3	64.5
35-39	86	115,286	45.1	36.2	54.4
40-44	88	110,668	47.2	38.1	56.6
45-49	82	105,647	53.9	44.7	62.9
50-54	60	66,249	47.6	37.2	58.3
55-59	42	41,452	41.4	30.9	52.9
60-64	27	31,313	42.2	29.5	56.0
65-69	17	18,391	44.2	26.5	63.4
70-74	6	6,265	31.6	12.4	60.2
75+	6	6,406	30.4	12.7	56.9
Ethnicity					
Malay	47	56,201	62.9	49.6	74.5
Chinese	401	624,737	45.2	41.1	49.4
Indians	109	120,641	44.8	36.0	54.0
Other Bumiputras	218	292,592	62.8	56.7	68.4
Others	57	88,969	59.4	43.4	73.7

Table 4.4 Types of current drinker

Group	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
Abstinence	1,046	1,268,826	35.6	32.8	38.5
Low-risk drinkers	1,297	1,750,306	49.2	46.3	52.0
High-risk drinkers	359	499,843	14.0	12.3	15.9
Probable alcohol dependence	36	41,045	1.2	0.8	1.7

TOPIC 5

MENTAL HEALTH PROBLEMS IN ADULTS

5. PREVALENCE OF MENTAL HEALTH PROBLEMS IN ADULTS (≥ 16 YEARS)

5.1 GENERALIZED ANXIETY DISORDER (GAD)

Contributors to this section: Abdul Kadir Abu Bakar, Ang Kim Teng, Azizul Awaludin, Firdaus Mukhtar, Jasvinder Kaur, Lim Chong Hum, Maniam Thambu, Marhani Midin, Mazni Mat Junus, Muhammad Fadzillah Abdul Razak, Nalachakravarthy Odhayakumar, Norzawati Yoep, Nurashikin Ibrahim, Ruzanna Zam Zam, Salina Abdul Aziz, Jamalludin Abd Rahman, Mohd Azahadi Omar.

5.1.1 Findings

The prevalence of GAD was 1.7% (95% CI: 1.5 – 2.0), urban prevalence was 1.8% (95% CI: 1.5 – 2.2) and rural 1.5% (95% CI: 1.2 – 1.8). GAD was higher in age groups 16 – 24 years 2.1% (95% CI: 1.5 – 2.7), almost twice more in females 2.2% (95% CI: 1.8 – 2.6) than 1.3% (95% CI: 0.9 – 1.6) in males. GAD was highest amongst Indians 4.5% (95% CI: 2.8 – 6.2%), followed by other Bumis 2.0% (95% CI: 1.3 – 2.7) and the Malays 1.7% (95% CI: 1.4 – 2.0). Chinese had GAD rate of 1.0% (95% CI: 0.6 – 1.5). GAD was higher amongst those with tertiary education 2.1% (95% CI: 1.5 – 2.8) compared to those with primary education 1.8% (95% CI: 1.3 – 2.4). Prevalence of GAD in homemaker/unpaid workers and private employee were both 1.7% which was higher as compared to retirees (1.6%), self-employed (1.5%) and government/semi-government employee (0.7%). Prevalence was high among those with household income less than RM3000 in which the highest prevalence was shown in the income group of RM2000 – RM2999 1.9% (95% CI: 1.1 – 2.7).

5.1.2 Implications

Prevalence of GAD in current survey is 1.7%, in keeping with international figures (1.9% - 2.5%). GAD was higher in younger age group (2.1%), females (2.2%) and Indians (4.5%). The GAD figures could be higher if lay interviewers had more training; the modules were used earlier during the interview process and language barrier addressed. Further studies should investigate bio-psycho-social factors, adolescent and young adult and Indians. Mental health programmes must address the higher rate of GAD among adolescent and young adult and Indians.

5.1.3 Conclusion

Notwithstanding the limitations of the study, this survey has yielded several important findings for better understanding about GAD behavior in Malaysia. The high prevalence among certain sub groups in the community needs to be addressed appropriately through various collaborative efforts among relevant agencies.

5.1.4 Recommendations

1. Future research must examine factors that might explain the variability in the prevalence.
2. Promotion of mental health on targeted groups for example women, teenagers and young adults on awareness and early detection of GAD must be enhanced.
3. The Minda Sihat Programme must be further strengthened to involve multiagency intervention.

5.2 MAJOR DEPRESSIVE DISORDER

Contributors to this section: Abdul Kadir Abu Bakar, Ang Kim Teng, Azizul Awaludin, Firdaus Mukhtar, Jasvinder Kaur, Lim Chong Hum, Maniam Thambu, Marhani Midin, Mazni Mat Junus, Muhammad Fadzillah Abdul Razak, Nalachakravarthy Odhayakumar, Norzawati Yoep, Nurashikin Ibrahim, Ruzanna ZamZam, Salina Abdul Aziz, Jamalludin Ab Rahman, Mohd Azahadi Omar.

5.2.1 Findings

Lifetime Depression

The prevalence for lifetime depression was 2.4% (95% CI: 2.1 - 2.8). Higher prevalence was noted in urban areas compared to the rural areas (2.6% and 2.1% respectively). With regards to the age group, highest prevalence was noted among age group of 16-24 years, followed by those 65 years and above 2.8% (95% CI: 1.5 - 4.2). Females were two times than males [females (3.1%, 95% CI: 2.6 - 3.6), males (1.8%, 95% CI: 1.4 - 2.1)]. Indians had reported lifetime rates of 5.5% (95% CI: 3.7 - 7.3), other Bumis 2.6% (95% CI: 1.7 - 3.5), Malays 2.2% (95% CI: 1.9 - 2.6) and Chinese 1.6% (95% CI 0.9 - 2.3). Looking at other socio-demographic profile, prevalence was high in those with primary education 3.1% (95% CI: 2.5 - 3.8), among widow/divorcee 4.4% (95% CI: 2.9 - 6.0), among unpaid worker 6.2% (95% CI: 3.4 - 15.8) and in those of income RM1000 - RM1999 2.8% (95% CI: 2.0 - 3.6).

Current Depression

The prevalence for current depression was 1.8% (95% CI: 1.5 - 2.1). The prevalence was high in urban areas [urban 1.9% (95% CI: 1.5 - 2.3) compared to rural 1.6% (95% CI: 1.2 - 1.9)]. With regards to the age group, highest prevalence was noted among age groups 16 - 24 2.5% (95% CI: 1.7 - 3.2) and 65 and above 2.2% (95% CI: 1.0 - 3.3). Females had almost twice rates than males [females 2.3% (95% CI: 1.8 - 2.7): males 1.4% (95% CI: 1.0 - 1.7)]. Indians had highest rate 4.6% (95% CI: 2.9 - 6.3), followed by other Bumis 1.8% (95% CI: 1.1 - 2.5), Malays 1.6% (95% CI: 1.3 - 1.9) and Chinese 1.3% (95% CI: 0.6 - 2.0). Prevalence of depression was high amongst lower education group. The widowed and single groups also had high prevalence of current depression with the figure of [2.9% (95% CI: 1.7 - 4.1), 2.5% (95% CI: 1.8 - 3.2)], respectively.

5.2.2 Implications

Prevalence of lifetime depression is 2.4% and current depression is 1.8%. Lifetime depression rate in Japan is 3.2%, China 3.6%, South Korea 4.3% and USA is 16.9%. Current depression in Singapore is 5.5%, South Korea 1.7%, Australia 4.1% and Thailand 4.4%. The depression figures could be higher if lay interviewers had more training; the modules were used earlier during the interview process and language barrier addressed. Further study should address the high rate in the special group, for example females, unemployed, Indians, poor and lower education groups. Mental health programme must address these groups specifically.

5.2.3 Conclusion

Not with standing limitation of the study, this survey has yielded several important findings for better understanding about Major Depressive Disorder in Malaysia. The high prevalence among certain sub groups in the community needs to be addressed appropriately through various collaborative efforts among relevant agencies.

5.2.4 Recommendations

1. Future research must examine factors that might explain the variability in the prevalence.
2. Increase promotion and enhance awareness about the importance of mental health issues to the specific target groups for example working adults, women, teenager and young adults and also elderly age group.
3. Early recognition/detection and early treatment of depression must be enhanced.
4. The Minda Sihat Programme must be further expanded
5. To strengthen the ongoing training using clinical practice guidelines for Major Depression especially to the primary care providers.

5.3 SUICIDALITY

Contributors to this section: Abdul Kadir Abu Bakar, Ang Kim Teng, Azizul Awaludin, Firdaus Mukhtar, Jasvinder Kaur, Lim Chong Hum, Maniam Thambu, Marhani Midin, Mazni Mat Junus, Muhammad Fadzillah Abdul Razak, Nalachakravarthy Odhayakumar, Norzawati Yoep, Nurashikin Ibrahim, Ruzanna ZamZam, Salina Abdul Aziz, JamalludinAbRahman, MohdAzahadi Omar.

5.3.1 Findings

Suicidal ideation

The prevalence of respondents who ever had suicidal ideation was 1.7% (95% CI: 1.4 - 1.9). There was no difference amongst urban or rural, highest in young age group 16-24 years 2.4% (95% CI: 1.8 - 3.0%), higher in females 2.0% (95% CI: 1.6 - 2.4), Indians 4.4% (95% CI: 3.0 - 5.8%), no formal education, widowed 2.6% (95% CI: 1.6 - 3.6) and single 2.1% (95% CI: 1.6 - 2.6%).

Suicide plan

The prevalence of respondents with suicide plan was 0.9% (95% CI: 0.7 - 1.1), higher in young people 16 - 24 years 1.3% (95% CI: 0.9 - 1.8), no difference among males and females. The prevalence in Indians was 2.8% (95% CI: 1.8 - 3.9), other Bumis was 1.1% (95% CI: 0.6 - 1.5), Chinese was 0.9% (95% CI: 0.5 - 1.3) and Malays was 0.7% (95% CI: 0.5 - 0.9). Higher rate of having suicide plan was noted amongst single 1.4% (95% CI: 1.0 - 1.9) and widowed 1.2% (95% CI: 0.5 - 1.9).

Suicide attempt

The prevalence of suicide attempt was 0.5% (95% CI: 0.4 - 0.7). Frequency of suicide attempts was between 1 - 30 times. More attempts amongst urban 0.6% (95% CI: 0.4 - 0.7) and younger age group, 16-24 years, 0.7% (95% CI: 0.4 - 1.1); females had almost twice the attempts as compared to the males. Among those who attempted suicide, there were more Malays (36%) followed by Indians (31%). However with regards to the prevalence in the population, Indians reported the highest 1.8% (95% CI: 0.9 - 2.7) followed by other Bumis 0.7% (95% CI: 0.3 - 1.0), Chinese 0.4% (95% CI: 0.2 - 0.7) and the Malays 0.4% (95% CI: 0.2 - 0.6). The prevalence of suicide attempts was highest amongst the widowed group 1.0% (95% CI: 0.3 - 1.7), followed by single 0.7% (95% CI: 0.4 - 1.0).

5.3.2 Implications

The prevalence of suicide ideation, plan and attempt are 1.7%, 0.9% and 0.5% respectively. These figures could be higher if lay interviewers had more training; the modules were used earlier during the interview process and language barrier addressed. These behaviors are associated with the females, younger age groups, and fewer years of formal education and either single or widowed. With regards to the Indians, the prevalence is much higher for suicide ideation, plan and attempt. There is an urgent need to embark and emphasize on suicide prevention, plan and programmes among females, Indians, younger age groups and those with lower education. The validity of only few questions on suicide attempts is a major concern.

5.3.3 Conclusion

Notwithstanding limitation of the study, this survey has yielded several important findings for better understanding about suicidality in Malaysia. The high prevalence among certain sub groups in the community needs to be addressed appropriately through various collaborative efforts among relevant agencies.

5.3.4 Recommendations

1. Future research must examine factors that might explain the variability in the prevalence.
2. Promotion of mental health and early intervention of suicidality must be enhanced. There is an urgent need to implement suicide prevention activities among the high risk groups.
3. The Minda Sihat Programme must be further expanded.

Definition of variables: Mental Health Problems among Adults

Variable Name	Variable iSPSS	Weight	Definition	SPSS Variable Definition
Generalized Anxiety Disorder	GAD cases	weight4	Persistent period of at least 6 months experience of excessive anxiety and worry, occurring for more days during that period. Worries are about a number of events surrounding daily routine and activities which very difficult to control. The intensity, duration of frequency of anxiety is far out of proportion to the actual likelihood or impact of the event.	<p>Creating gad1 variable</p> <p>IF (j1010 = 1 & j1011 = 1 & j1012 = 1) gad1=1. EXECUTE.</p> <p>IF (j1010 = 2 j1011 = 2 j1012 = 2) gad1=0. EXECUTE.</p> <p>VALUE LABELS gad1 0 'No' 1 'Yes'.</p> <p>Creating gad2 variable</p> <p>COUNT j1013_18=j1013 j1014 j1015 j1016 j1017 j1018(1). VARIABLE LABELS j1013_18 'Yes to j1013 - j1018'. EXECUTE.</p> <p>COUNT miss_1=j1013 j1014 j1015 j1016 j1017 j1018(-44). VARIABLE LABELS miss_1 'Missing to j1013 - j1018'. EXECUTE.</p> <p>RECODE j1013_18 (3 thru Highest=1) (Lowest thru 2=0) INTO gad2. EXECUTE.</p> <p>DO IF (miss_1 >=4). RECODE gad2 (0=SYSMIS). END IF. EXECUTE.</p> <p>VALUE LABELS gad2 0 'No' 1 'Yes'.</p> <p>Creating gad3 variable</p> <p>RECODE j1019 (1=1) (2=0) (-8=0) (-44=SYSMIS) INTO gad3. EXECUTE.</p> <p>VALUE LABELS gad3 0 'No' 1 'Yes'.</p>

Variable Name	Variable iSPSS	Weight	Definition	SPSS Variable Definition
Lifetime Depression	PD_case	weight4	Feature of persistent depressed mood or loss of interest in nearly all activities of at least for 2 weeks duration in which causes significant distress or impairment in social, occupational or other important areas of functioning. Symptoms are associated with concurrent disturbed sleep or appetite, decreased energy, feeling of worthlessness or difficult thinking and concentration.	<p>Creating gad case variable IF (gad1 = 1 & gad2 = 1 & gad3 = 1) gad_case=1. EXECUTE. IF (gad1 = 0 gad2 = 0 gad3 = 0) gad_case=0. EXECUTE. VARIABLE LABELS gad_case 'GAD'. VALUE LABELS gad_case 1 'GAD cases' 0 'Non-GAD'.</p> <p>Creating pd1 IF (j2010 = 1 j2020 = 1) pd1=1. EXECUTE. IF (j2010 = 2 & j2020 = 2) pd1=2. EXECUTE. VALUE LABELS pd1 1 'Yes' 2 'No'.</p> <p>Creating pd2 RECODE j2030_37 (MISSING=SYSMIS) (5 thru Highest=1) (Lowest thru 4=2) INTO pd2. EXECUTE. DO IF (miss >= 5). RECODE pd2 (2=SYSMIS). END IF. EXECUTE. VALUE LABELS pd2 1 'Yes' 2 'No'.</p> <p>Creating pd3 RECODE j2040 (1=1) (2=2) (-8=2) (-44=SYSMIS) INTO pd3. EXECUTE. VALUE LABELS pd3 1 'Yes' 2 'No'.</p>

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
				<p>Creating current depression case IF (cd1 = 1 & cd2 = 1 & cd3 = 1) cd_case=1. EXECUTE. IF (cd1 = 2 cd2 = 2 cd3 = 2) cd_case=0. VARIABLE LABELS cd_case 'Current Depression'. EXECUTE. VALUE LABELS cd_case 1 'Current depression' 0 'No depression'.</p>
Suicide Ideation	suicide	weight4	Respondent who had think about suicide	<p>Cleaning J3010-J3014 RECODE j3010 j3011 j3012 j3013 j3014 (-8=-44). EXECUTE. MISSING VALUES j3010 j3011 j3012 j3013 j3014 (-44 thru -8). Creating suicide case RECODE j3010 (1=1) (2=0) (MISSING=SYSMIS) INTO suicide. VARIABLE LABELS suicide 'Suicide Cases'. EXECUTE. VALUE LABELS suicide 1 'Suicide' 0 'Non-suicide'.</p>
Suicide Plan	S_plan	weight4	Respondent who had plan or have suicide method or plan in mind (e.g how, when, or where)	<p>RECODE j3012 (1=1) (2=0) (MISSING=SYSMIS) INTO s_plan. VARIABLE LABELS s_plan 'Suicide Plan'. EXECUTE. VALUE LABELS s_plan 1 'Suicide Plan'</p>
Suicide Attempt	S_attempt		Respondent who did something where he or she could possibly be injured, with at least a slight intent to die	<p>0 'Non-suicide Plan'. RECODE j3013 (1=1) (2=0) (MISSING=SYSMIS) INTO s_att. VARIABLE LABELS s_att 'Suicide attempt'. EXECUTE. VALUE LABELS s_att 1 'Suicide attempt' 0 'Non-suicide attempt'.</p>

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
Lifetime Suicide Attempt	Lts_attempt		Respondent who had plan or have suicide method or plan in mind (e.g how, when, or where) in his/her lifetime	RECODE j3014 (1=1) (2=0) (MISSING=SYSMIS) INTO lts_att. VARIABLE LABELS lts_att 'Lifetime Suicide attempt'. EXECUTE. VALUE LABELS lts_att 1 'Lifetime Suicide attempt' 0 'Non-suicide attempt'.

Table 5.1.1 Prevalence of general anxiety disorder by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	330	328,835	1.7	1.5	2.0
Location					
Urban	202	251,643	1.8	1.5	2.2
Rural	128	77,193	1.5	1.2	1.8
Sex					
Male	109	122,184	1.3	0.9	1.6
Female	221	206,651	2.2	1.8	2.6
Age Group					
16-24	87	99,169	2.1	1.5	2.7
25-34	81	89,430	1.9	1.4	2.5
35-44	58	64,174	1.8	1.2	2.4
45-54	49	38,958	1.4	0.9	1.8
55-64	31	22,392	1.3	0.7	1.8
65+	24	14,713	1.1	0.6	1.7
Ethnicity					
Malay	184	159,147	1.7	1.4	2.0
Chinese	31	49,424	1.0	0.6	1.5
Indians	62	59,747	4.5	2.8	6.2
Other Bumiputras	36	41,481	2.0	1.3	2.7
Others	17	19,036	1.5	0.5	2.5
Marital Status					
Single	124	142,159	2.3	1.7	2.8
Married	170	162,308	1.4	1.1	1.7
Widow/widower/divorcee	35	23,053	2.2	1.3	3.0
Education Level					
No formal education	24	14,350	1.3	0.7	1.9
Primary education	76	71,456	1.8	1.3	2.4
Secondary education	142	146,484	1.6	1.2	1.9
Tertiary education	78	89,110	2.1	1.5	2.8
Unclassified education	9	6,708	2.3	0.6	4.0
Occupation					
Government/semi government employee	21	12,719	0.7	0.4	1.3
Private employee	98	119,525	1.7	1.3	2.2
Self employed	48	49,802	1.5	1.0	2.3
Unpaid worker/home maker	53	47,359	1.7	1.2	2.4
Retiree	27	20,646	1.6	1.0	2.5
Income Group					
Less than RM1000	75	56,999	1.8	1.2	2.3
RM 1000 - RM 1999	63	61,615	1.8	1.2	2.3
RM 2000 - RM 2999	57	60,129	1.9	1.1	2.7
RM 3000 - RM 3999	36	43,155	1.7	1.1	2.3
RM 4000 - RM 4999	28	32,443	1.7	0.9	2.4
RM 5000 & above	71	74,494	1.7	1.1	2.2

Table 5.2.1 Prevalence of current depression by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	318	339,028	1.8	1.5	2.1
Location					
Urban	197	260,149	1.9	1.5	2.3
Rural	121	78,879	1.6	1.2	1.9
Sex					
Male	112	131,969	1.4	1.0	1.7
Female	206	207,060	2.3	1.8	2.7
Age Group					
16-24	91	116,674	2.5	1.7	3.2
25-34	59	79,628	1.7	1.2	2.3
35-44	68	66,115	1.9	1.3	2.4
45-54	44	31,571	1.1	0.7	1.6
55-64	26	17,500	1.0	0.5	1.4
65+	30	27,541	2.2	1.0	3.3
Ethnicity					
Malay	160	150,169	1.6	1.3	1.9
Chinese	33	60,982	1.3	0.6	2.0
Indians	64	59,639	4.6	2.9	6.3
Other Bumiputras	33	37,185	1.8	1.1	2.5
Others	28	31,054	2.5	1.1	3.9
Marital Status					
Single	115	154,501	2.5	1.8	3.2
Married	165	154,337	1.3	1.1	1.6
Widow/widower/divorcee	38	30,191	2.9	1.7	4.1
Education Level					
No formal education	26	20,860	1.9	1.0	2.9
Primary education	90	87,995	2.3	1.7	2.9
Secondary education	139	140,436	1.5	1.2	1.9
Tertiary education	54	76,567	1.8	1.1	2.5
Unclassified education	6	10,631	3.7	-0.1	7.4
Occupation					
Government/semi government employee	20	16,799	0.9	0.5	1.7
Private employee	105	126,395	1.8	1.4	2.4
Self employed	52	54,750	1.7	1.1	2.5
Unpaid worker/home maker	39	36,605	1.3	0.9	2.0
Retiree	26	18,814	1.4	0.9	2.3
Income Group					
Less than RM1000	66	57,899	1.8	1.2	2.4
RM 1000 - RM 1999	74	69,973	2.0	1.4	2.6
RM 2000 - RM 2999	52	65,519	2.1	1.3	2.9
RM 3000 - RM 3999	38	43,440	1.7	1.1	2.3
RM 4000 - RM 4999	27	43,440	1.6	0.9	2.3
RM 5000 & above	61	70,872	1.6	0.9	2.3

Table 5.2.2 Prevalence of lifetime depression by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	434	455,304	2.4	2.1	2.8
Location					
Urban	268	350,007	2.6	2.1	3.0
Rural	166	105,298	2.1	1.6	2.5
Sex					
Male	154	169,727	1.8	1.4	2.1
Female	280	285,577	3.1	2.6	3.6
Age Group					
16-24	123	149,524	3.1	2.4	3.9
25-34	83	114,154	2.5	1.8	3.2
35-44	88	84,104	2.4	1.8	3.0
45-54	68	49,529	1.7	1.2	2.3
55-64	34	21,703	1.2	0.7	1.7
65+	38	36,290	2.8	1.5	4.2
Ethnicity					
Malay	221	210,166	2.2	1.9	2.6
Chinese	48	74,330	1.6	0.9	2.3
Indians	79	71,915	5.5	3.7	7.3
Other Bumiputras	47	54,510	2.6	1.7	3.5
Others	39	44,383	3.5	1.7	5.3
Marital Status					
Single	149	189,160	3.0	2.3	3.8
Married	231	219,178	1.9	1.6	2.2
Widow/widower/divorcee	54	46,967	4.4	2.9	6.0
Education Level					
No formal education	34	28,278	2.6	1.4	3.8
Primary education	124	120,871	3.1	2.5	3.8
Secondary education	183	187,598	2.0	1.6	2.4
Tertiary education	82	102,969	2.4	1.7	3.2
Unclassified education	8	13,050	4.5	0.6	8.3
Occupation					
Government/semi government employee	31	25,159	1.4	0.9	2.2
Private employee	142	169,080	2.5	2.0	3.1
Self employed	74	75,135	2.3	1.6	3.2
Unpaid worker/home maker	61	56,332	2.1	1.5	2.8
Retiree	32	26,120	2.0	1.2	3.1
Income Group					
Less than RM1000	90	80,222	2.5	1.8	3.2
RM 1000 - RM 1999	95	96,568	2.8	2.0	3.6
RM 2000 - RM 2999	72	78,523	2.5	1.7	3.4
RM 3000 - RM 3999	58	66,526	2.6	1.1	3.3
RM 4000 - RM 4999	37	66,526	2.2	1.3	3.0
RM 5000 & above	82	91,154	2.0	1.3	2.8

Table 5.3.1 Prevalence of suicidal ideation by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	319	313,405	1.7	1.4	1.9
Location					
Urban	192	230,640	1.7	1.4	2.0
Rural	127	82,765	1.6	1.2	2.0
Sex					
Male	115	124,661	1.3	1.0	1.6
Female	204	188,744	2.0	1.6	2.4
Age Group					
16-24	102	112,904	2.4	1.8	3.0
25-34	70	73,482	1.6	1.1	2.1
35-44	54	53,205	1.5	1.0	2.0
45-54	56	43,098	1.5	1.0	2.0
55-64	28	18,791	1.1	0.6	1.5
65+	9	11,925	0.9	0.1	1.7
Ethnicity					
Malay	141	131,652	1.4	1.1	1.7
Chinese	54	69,469	1.5	1.0	1.9
Indians	74	58,561	4.4	3.0	5.8
Other Bumiputras	32	36,258	1.7	1.0	2.5
Others	18	17,466	1.4	0.5	2.3
Marital Status					
Single	120	131,585	2.1	1.6	2.6
Married	165	154,342	1.3	1.1	1.6
Widow/widower/divorcee	34	27,478	2.6	1.6	3.6
Education Level					
No formal education	21	21,682	2.0	1.0	3.0
Primary education	85	75,905	2.0	1.4	2.5
Secondary education	159	150,380	1.6	1.3	1.9
Tertiary education	49	57,819	1.4	0.9	1.9
Unclassified education	3	5,850	2.0	0.2	4.2
Occupation					
Government/semi government employee	17	11,700	0.6	0.3	1.3
Private employee	103	131,847	1.9	1.5	2.4
Self employed	52	42,622	1.3	0.9	1.9
Unpaid worker/home maker	58	49,171	1.8	1.3	2.5
Retiree	15	11,875	0.9	0.5	1.6
Income Group					
Less than RM1000	67	52,405	1.6	1.1	2.1
RM 1000 - RM 1999	67	61,635	1.8	1.2	2.4
RM 2000 - RM 2999	55	59,195	1.9	1.3	2.5
RM 3000 - RM 3999	35	41,409	1.6	1.1	2.3
RM 4000 - RM 4999	27	31,485	1.6	0.8	2.4
RM 5000 & above	68	67,277	1.5	1.0	2.0

Table 5.3.2 Prevalence of suicide plan by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	170	168,490	0.9	0.7	1.1
Location					
Urban	111	132,926	1.0	0.7	1.2
Rural	59	35,564	0.7	0.5	0.9
Sex					
Male	71	83,015	0.9	0.6	1.1
Female	99	85,475	0.9	0.7	1.1
Age Group					
16-24	62	64,065	1.3	0.9	1.8
25-34	32	37,437	0.8	0.5	1.1
35-44	23	25,667	0.7	0.4	1.1
45-54	34	29,027	1.0	0.5	1.5
55-64	14	8,799	0.5	0.2	0.8
65+	5	3,494	0.3	0.0	0.6
Ethnicity					
Malay	68	62,770	0.7	0.5	0.9
Chinese	29	43,133	0.9	0.5	1.3
Indians	48	37,673	2.8	1.8	3.9
Other Bumiputras	20	22,273	1.1	0.6	1.5
Others	5	2,641	0.2	0.1	0.5
Marital Status					
Single	76	89,859	1.4	1.0	1.9
Married	79	65,872	0.6	0.4	0.7
Widow/widower/divorcee	15	12,760	1.2	0.5	1.9
Education Level					
No formal education	13	11,618	1.1	0.4	1.7
Primary education	43	29,416	0.8	0.5	1.1
Secondary education	83	82,826	0.9	0.7	1.1
Tertiary education	27	39,240	0.9	0.5	1.4
Unclassified education	2	3,620	1.2	0.5	2.9
Occupation					
Government/semi government employee	7	5,728	0.3	0.1	0.8
Private employee	56	70,146	1.0	0.7	1.4
Self employed	30	24,958	0.7	0.4	1.3
Unpaid worker/home maker	23	21,083	0.8	0.5	1.2
Retiree	8	7,323	0.6	0.2	1.2
Income Group					
Less than RM1000	26	17,407	0.5	0.3	0.8
RM 1000 - RM 1999	34	33,063	1.0	0.6	1.3
RM 2000 - RM 2999	30	38,199	1.2	0.6	1.8
RM 3000 - RM 3999	19	20,874	0.8	1.1	1.2
RM 4000 - RM 4999	17	19,692	1.0	0.4	1.6
RM 5000 & above	44	39,255	0.9	0.5	1.2

Table 5.3.3 Prevalence of suicidal attempt by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	100	102,654	0.5	0.4	0.7
Location					
Urban	66	78,211	0.6	0.4	0.7
Rural	34	24,443	0.5	0.3	0.7
Sex					
Male	35	36,695	0.4	0.2	0.6
Female	65	65,959	0.7	0.5	0.9
Age Group					
16-24	36	34,919	0.7	0.4	1.1
25-34	18	26,301	0.6	0.3	0.9
35-44	17	18,993	0.5	0.2	0.9
45-54	16	10,436	0.4	0.1	0.6
55-64	12	10,256	0.6	0.2	1.0
65+	1	1,749	0.1	0.1	0.4
Ethnicity					
Malay	36	37,585	0.4	0.2	0.6
Chinese	16	21,058	0.4	0.2	0.7
Indians	31	24,101	1.8	0.9	2.7
Other Bumiputras	13	13,745	0.7	0.3	1.0
Others	4	6,164	0.5	0.1	1.1
Marital Status					
Single	39	44,273	0.7	0.4	1.0
Married	50	47,677	0.4	0.3	0.6
Widow/widower/divorcee	11	10,704	1.0	0.3	1.7
Education Level					
No formal education	8	8,278	0.8	0.1	1.4
Primary education	30	28,059	0.7	0.4	1.1
Secondary education	51	53,152	0.6	0.4	0.8
Tertiary education	9	10,439	0.3	0.1	0.4
Unclassified education	1	1,326	0.5	0.4	1.3
Occupation					
Government/semi government employee	3	4,211	0.2	0.1	0.8
Private employee	33	42,257	0.6	0.4	0.9
Self employed	10	6,929	0.2	0.1	0.5
Unpaid worker/home maker	19	17,824	0.7	0.4	1.1
Retiree	4	5,228	0.4	0.1	1.1
Income Group					
Less than RM1000	18	11,573	0.4	0.2	0.6
RM 1000 - RM 1999	25	28,598	0.8	0.4	1.3
RM 2000 - RM 2999	15	16,664	0.5	0.2	0.9
RM 3000 - RM 3999	11	11,474	0.4	1.1	0.8
RM 4000 - RM 4999	12	15,739	0.8	0.2	1.4
RM 5000 & above	19	18,606	0.4	0.2	0.6

Table 5.3.4 Prevalence of life-time suicidal attempt by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	201	211,900	1.1	0.9	1.3
Location					
Urban	130	171,201	1.2	1.0	1.5
Rural	71	40,699	0.8	0.5	1.0
Sex					
Male	71	78,288	0.8	0.6	1.1
Female	130	133,612	1.4	1.1	1.8
Age Group					
16-24	70	75,898	1.6	1.1	2.1
25-34	46	63,607	1.4	0.9	1.9
35-44	30	31,068	0.9	0.5	1.3
45-54	28	21,390	0.7	0.4	1.1
55-64	21	15,458	0.9	0.4	1.3
65+	6	4,479	0.4	0.0	0.7
Ethnicity					
Malay	69	67,313	0.7	0.5	0.9
Chinese	44	66,169	1.4	0.8	2.0
Indians	51	37,933	2.9	1.7	4.0
Other Bumiputras	24	21,669	1.0	0.6	1.5
Others	13	18,817	1.5	0.4	2.6
Marital Status					
Single	89	103,574	1.7	1.2	2.2
Married	94	94,678	0.8	0.6	1.0
Widow/widower/divorcee	18	13,649	1.3	0.5	2.0
Education Level					
No formal education	12	10,898	1.0	0.3	1.6
Primary education	48	46,508	1.2	0.8	1.6
Secondary education	108	103,757	1.1	0.9	1.4
Tertiary education	28	42,609	1.0	0.5	1.5
Unclassified education	3	6,358	2.2	1.2	5.5
Occupation					
Government/semi government employee	10	8,844	0.5	0.2	1.1
Private employee	68	88,898	1.3	1.0	1.7
Self employed	28	23,378	0.7	0.4	1.2
Unpaid worker/home maker	32	28,870	1.1	0.7	1.6
Retiree	10	9,205	0.7	0.3	1.4
Income Group					
Less than RM1000	34	24,731	0.8	0.5	1.1
RM 1000 - RM 1999	46	49,568	1.4	0.9	2.0
RM 2000 - RM 2999	25	28,056	0.9	0.4	1.4
RM 3000 - RM 3999	25	21,685	0.8	1.1	1.2
RM 4000 - RM 4999	23	27,577	1.4	0.7	2.1
RM 5000 & above	48	60,283	1.3	0.7	2.0

TOPIC 6

MENTAL HEALTH PROBLEMS AMONG CHILDREN

6. PREVALENCE OF MENTAL HEALTH PROBLEMS AMONG CHILDREN

Contributors to this section: Fauziah Mohamed, Selva Ratnasingam, Nazrila Hairizan Nasir, Rohana Ismail, Noor Ani Ahmad, Siti Zuraidah Mahmud, Nur Akmar Abd Razak, Mohd Fadhli, Mohd Yusof.

6.1 Findings

From a total of 6408 children who were in the five to 15 year age group, 5768 responded, resulting in a response rate of 90%. The overall prevalence of mental health problems using the Reporting Questionnaire for Children, RQC, was 20.0% (95% Confidence Interval, CI: 18.8 - 21.3). The age group of 15 to less than 16 years had the highest prevalence; 22.2 % (95% CI: 17.6 - 27.6) followed by the 10-14 years group; 20.6%, (95% CI: 18.8 - 22.5) and the 5-9 years group; 19.1%, (95% CI: 17.3 - 21.0).

Males had significantly more mental health problems; 21.8% (95% CI: 20.1 - 23.7) as compared to females; 18.1% (95% CI: 16.4 - 20.0). Among the ethnic groups, the prevalence of childhood mental health problems from highest to lowest is as follows: "Others" (35.3%, 95% CI: 25.8 - 46.1), "Other Bumiputeras" (28.0%, 95% CI: 23.8 - 32.6), "Indians" (27.2%, 95% CI: 22.1 - 32.9), "Malays" (18.3%, 95% CI: 16.9 - 19.8) and "Chinese" (14.5%, 95% CI: 11.9 - 17.6). There seems to be a higher prevalence of mental health problems in rural localities; 21.7% (95% CI: 19.8 - 23.8) than in urban areas; 19.2% (95% CI: 17.6 - 20.9). The top three psychological symptoms reported were: 'appears backward or slow' (5.6%), 'suffer frequent headaches' (5.0%) and 'sleep badly and never play with other children' (3.5%). The responses to the two questions relating to inattention and hyperactivity were, 6.4% for unable to concentrate and 13.6% for child extremely active which were lower compared to the percentages in NHMS 2006, which were 8.3% and 25.0% respectively.

6.2 Implications

In comparison to NHMS III, there appears no increment (19.4% in 2006) in the overall prevalence of mental health problems among children five to 15 years. Nevertheless the prevalence is still worrying and highlights an ongoing need for the continued strengthening and upgrading of Child and Adolescent Mental Health Service in Malaysia. Improved detection and recognition of early difficulties as well as more comprehensive early intervention programs, particularly among at-risk population groups, are clearly needed.

6.3 Conclusion

This survey has highlighted the extent of general mental health issues currently existing in the community, reflecting the unmet needs of the population nation-wide. This public health problem needs to be urgently addressed. At-risk population groups include those who are males, age group five to nine years and those who are ethnically in the 'Others', 'Other Bumiputeras' and 'Indians' categories.

6.4 Recommendations

To strengthen the Child and Adolescent Mental Health Service at all levels of care through a structured, integrated and comprehensive approach.

1. Immediate needs:
 - 1.1. To incorporate Child and Adolescent Mental Health Service as a permanent agenda of the State and District level Technical Committee on Mental Health Services
 - 1.2. To establish Multidisciplinary Teams at the district levels to facilitate the assessment and management of children and adolescents with mental health needs.
 - 1.3. To strengthen the role of school counselors in early detection and management.
2. Long term needs:
 - 2.1 To increase the number of qualified Allied Health Professionals in the field of Child and Adolescent Psychiatry (i.e. Speech Therapists, Clinical Psychologists, Occupational Therapists and Rehabilitation Specialists, Child Mental Health nurses) employed by the Ministry of Health particularly in rural Malaysia.
 - 2.2 To intensify training of Family Medicine Specialists on the skills and techniques needed to deal with children and adolescents with mental health problems.
 - 2.3 To facilitate the pathway for training of Child and Adolescent Psychiatrists.
 - 2.4 Monitoring and evaluation of the strategies above in order to achieve continuous improvement.
3. To make a recommendation to the Ministry of Education to provide specific classes which would cater to the differing educational needs of the various children with special needs and to have a much bigger pool of teachers who are specially trained in dealing with children with special needs.
4. Promote inter-agency collaboration among related government and non-government agencies in promotion and interventional activities, early detection and referral to the appropriate authority.
5. To improve detection and early referral of children and adolescents with mental health problems in those who present to other health professionals eg. GPs, Pediatricians, Physicians.
6. To educate parents and the community on child and adolescent mental health issues especially in the population groups at risk.

This may be achieved by:

- 6.1 Holding mass media campaigns
 - 6.2 Organizing health promotion activities at the primary health care level and at hospitals
 - 6.3 To enable and empower the community to access appropriate support systems/tools such as the health portal, help-line etc.
7. Further research is needed using recognized research instruments, for example, the Strength and Difficulty Questionnaire (SDQ), to identify the probable diagnosis of mental health problems and to enhance and improve service development particularly in the identified areas.

Definition of variables: Mental Health Problems among Children

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
Mental Health Problems (Children)	psy_morbid	weight4	<p>Any positive response for either one on the 10 listed items:</p> <ol style="list-style-type: none"> 1. Is the child's speech in any way abnormal? 2. Does the child sleep badly? 3. Does the child ever have a fit or fall to the ground for no reason? 4. Does the child suffer from frequent headaches? 5. Does the child run away from home frequently? 6. Does the child steal things from home? 7. Does the child get scared or nervous for no good reason? 8. Does the child in any way appear backward or slow to learn as compared with other children of the same age? 9. Does the child nearly never play with other children? 10. Does the child wet or soil himself /herself? 	<p>IF (bil_yes >= 1) psy_morbid = 1. EXECUTE. IF (bil_yes = 0 & miss = 0) psy_morbid = 2. EXECUTE. VALUE LABELS psy_morbid '1' Yes '2' No.</p>

Table 6.1 Prevalence of mental health problems among children 5-16 years old by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	1,196	1,038,658	20.0	18.8	21.3
Location					
Urban	634	668,828	19.2	17.6	20.9
Rural	562	369,829	21.7	19.8	23.8
Sex					
Male	673	585,954	21.8	20.1	23.7
Female	523	452,704	18.1	16.4	20.0
Age Group					
5-9	521	461,362	19.1	17.3	21.0
10-14	591	484,418	20.6	18.8	22.5
15-16	84	92,878	22.2	17.6	27.6
Ethnicity					
Malay	706	547,484	18.3	16.9	19.8
Chinese	125	141,699	14.5	11.9	17.6
Indians	109	90,418	27.2	22.1	32.9
Other Bumiputras	182	204,688	28	23.8	32.6
Others	74	54,369	35.3	25.8	46.1
Marital Status					
Single	317	286,257	23.2	20.5	26.1
Married	4	4,587	70.9	30.1	93.2
Education Level					
No formal education	48	45,199	34	24.1	45.4
Primary education	760	576,257	20.6	19.1	22.3
Secondary education	54	55,955	26.3	19.6	34.3
Tertiary education	1	1,502	67.9	11.7	97.1
Unclassified education	155	147,706	15.3	12.8	18.1
Occupation					
Private employee	5	5,819	26.6	7.6	61.6
Self employed	9	11,677	71.3	41.5	89.7
Home maker	1	226	5.7	0.7	34.5

Table 6.2: Positive responses of each RQC items

	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
Does the child sleep badly?	210	204,100	3.5	3.0	4.1
Is the child's speech in any way abnormal?	206	157,355	3.0	2.5	3.7
Does the child ever have a fit or fall to the ground for no reason?	124	106,100	1.8	1.4	2.2
Does the child suffer from frequent headaches?	329	290,700	5.0	4.3	5.6
Does the child run away from home frequently?	47	36,570	0.6	0.4	0.9
Does the child steal things from home?	44	42,010	0.7	0.5	1.0
Does the child get scared or nervous for no good reason?	212	175,800	3.0	2.5	3.5
Does the child in any way appear backward or slow to learn as compared with other children of the same age?	380	329,500	5.6	4.9	6.4
Does the child nearly never play with other children?	234	204,200	3.5	3.0	4.1
Does the child wet or soil him /herself?	154	129,200	2.2	1.8	2.7

Table 6.3 Positive responses for concentration / hyperactivity items

	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
Is the child unable to concentrate?	366	331,400	5.6	5.0	6.4
Is the child extremely active?	782	707,300	12.0	11.1	13.0

TOPIC 7

HOME INJURY AMONG CHILDREN AND ELDERLY IN MALAYSIA

7. PREVALENCE OF HOME INJURY AMONG CHILDREN AND ELDERLY IN MALAYSIA

Contributors to this section: Mohamed Ismail Lasa, Muhammad Fadhli Yusoff, Hj Rosnani Ab. Hamid, Ridhuan Mhd Dan, Balkish Mahadir, Nurhafizah Sahril, Rahama Samad, Norhaniff Yahya, Mohd Yusoff Adon, Roslinah Ali, Rosnah Ramly

7.1 Findings

This survey captured information on home injury among children (aged less than 7 years old) and elderly (aged 60 years old and above). Out of an estimated 116,600 population of children under 7 years old, 8.2% (95% Confidence Interval, CI: 6.4 - 10.4) reported at least one injury in the past one year period, whereas elderly aged 60 years and above reported 5.3% (95% CI: 4.3 - 6.5) out of an estimated 107,035 population. Prevalences of home injuries were higher in the urban area, 9.2% (95% CI: 6.8 - 12.3) among children and 5.3% (95% CI: 4.0 - 6.9) among elderly. According to gender, female showed higher prevalence than male with ratios of 1.4:1.0 for children and 1.8:1.0 for elderly. Children aged less than 5 years old and elderly above 80 years old reported highest prevalence of 9.8% (95% CI: 7.6 - 12.7) and 9.1% (95% CI: 5.8 - 14.1). Among children, Indian recorded the highest prevalence of home injuries at 14.6% (95% CI: 6.5 - 29.5) whereas for the elderly, other Bumiputras reported the highest prevalence at 6.6% (95% CI: 3.3 - 12.6). Widow/widower/divorcee had the highest prevalence at 7.8% (95% CI: 5.8 - 10.4). Elderly with no formal education experienced the highest prevalence at 7.1% (95% CI: 5.1 - 9.9) and by occupation, the retiree recorded the highest prevalence at 6.2% (95% CI: 4.7 - 8.0). Family with household income above RM5000 reported the highest prevalence at 12.2% (95% CI: 7.6 - 19.1) among children while for elderly, the highest prevalence of 8.1% (95% CI: 4.0 - 15.8) was reported among those family with household income of RM4000 to RM4999.

7.2 Implications

Even though the prevalence of home injury among children and elderly is small, but the impact affects not only the victims, but also the family, the society and the nation. The affected children and elderly required specific care and long term management which might incurred additional cost. Furthermore, these children may require special education where as the elderly might require special support facilities. Families need to fulfil their responsibility in the expense of their productivity time and the scenario will be worst if the victim is the sole family breadwinner. Home injury could be the beginning of subsequent disabilities, illnesses and decline quality of life. Young victim of injury could be trained to contribute in national development and not being a burden to the family and the nation.

7.3 Conclusion

This study showed the prevalence of home injury among children and elderly was higher in urban compared to rural residents and those families with household income more than RM4000. Home injury still need to be addressed even though the prevalence was low. Injury victim suffered prevailing health outcome and the worst is permanent disability and death. Home injury is still a health problem which should not be taken lightly.

7.4 *Recommendations*

In order to minimize the prevalence of home injury, stakeholders need to work collectively in concerted effort. The Ministry of Health should play a leading role by developing a strong policy in preventing home injury. Injury prevention programme should be integral activities within existing health services programme at the districts and hospitals. Home safety awareness programme should be inculcated within the education system starting from pre-school. Other professional stakeholders such as architects, engineers, etc. should collectively produce comprehensive guidelines and practices to ensure safe home design and construction are implemented. NGOs should expand their horizon of services with active involvement and participation in empowering the public on safety at home.

Definition of variable: Home Injury among Children and Elderly

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
Experienced any injury at home in the past 1 year	h 010	weight4	Injury(s) which prevent respondent from doing normal daily activities such as playing or engaging in outdoor activities for one (1) day or more ; or injury/injuries which require(s) treatment by a doctor or other medical staff.	h 010 (1=YES, 2=NO)

Table 7.1 Prevalence of home injury among children (<7 years old) by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	108	116,600	8.2	6.4	10.4
Location					
Urban	70	88,598	9.2	6.8	12.3
Rural	38	28,001	6	4.1	8.9
Sex					
Male	47	50,323	6.8	4.8	9.4
Female	61	66,277	9.6	6.9	13.4
Age Group					
<5	90	98,585	9.8	7.6	12.7
5-6	18	18,014	4.2	2.6	6.8
Ethnicity					
Malay	56	56,678	6.9	5	9.3
Chinese	15	20,323	9.6	4.5	19.4
Indians	12	13,924	14.6	6.5	29.5
Other Bumiputras	13	17,236	8	3.9	15.8
Others	12	8,439	10.3	4	23.9
Income Group					
Less than RM 400	11	7,929	7.4	3.6	14.6
RM 400 - RM 699	4	5,993	7.4	1.6	27.6
RM 700 - RM 999	1	1,283	1.5	0.2	9.3
RM 1000 - RM 1999	16	15,285	5.3	2.8	9.9
RM 2000 - RM 2999	20	19,960	7.3	4.2	12.5
RM 3000 - RM 3999	18	19,305	10.1	5.7	17.3
RM 4000 - RM 4999	11	13,223	10.3	5.5	18.5
RM 5000 & above	27	33,623	12.2	7.6	19.1

Table 7.2 Prevalence of home injury among elderly (≥ 60 years old) by socio-demographic characteristics

Sociodemographic characteristics	Count	Estimated Population	% (Prevalence)	95% CI	
				Lower	Upper
MALAYSIA	139	107,035	5.3	4.3	6.5
Location					
Urban	66	69,806	5.3	4	6.9
Rural	73	37,950	5.4	4.1	7.1
Sex					
Male	46	36,948	3.8	2.7	5.3
Female	93	70,088	6.7	5.2	8.7
Age Group					
60-64	30	25,427	3.4	2.3	5.1
65-69	27	21,844	4.5	2.8	7.3
70-74	35	23,623	6.4	4.3	9.6
75-79	21	19,067	8.2	4.6	14.1
80+	26	17,074	9.1	5.8	14.1
Ethnicity					
Malay	74	57,397	5.8	4.4	7.6
Chinese	39	33,532	4.5	3	6.5
Indians	14	5,732	5	2.5	9.6
Other Bumiputras	12	10,374	6.6	3.3	12.6
Marital Status					
Single	2	1,631	4.3	0.3	6.6
Married	71	57,899	4.2	3.2	5.5
Widow/widower/divorcee	66	47,505	7.8	5.8	10.4
Education Level					
No formal education	53	37,132	7.1	5.1	9.9
Primary education	66	53,143	5.3	3.9	7.2
Secondary education	14	11,958	3.3	1.8	6.1
Tertiary education	3	2,603	2.4	0.7	8
Unclassified education	1	540	4.1	0.6	24.5
Occupation					
Private employee	2	2,732	2.1	0.4	10.1
Self employed	14	9,249	2.8	1.6	4.9
Home maker	20	20,488	6.1	3.7	10
Retiree	86	62,411	6.2	4.7	8
Income Group					
Less than RM 400	23	19,173	4.8	2.7	8.4
RM 400 - RM 699	12	6,680	4.2	2.3	7.6
RM 700 - RM 999	8	4,007	2	0.9	4.6
RM 1000 - RM 1999	32	23,116	6.3	4.2	9.4
RM 2000 - RM 2999	24	21,858	7.6	4.7	12
RM 3000 - RM 3999	9	6,675	3.3	1.4	7.3
RM 4000 - RM 4999	11	10,800	8.1	4	15.8
RM 5000 & above	20	14,728	5.4	3.3	8.8



• nhms.iku@iku.gov.my •

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