

National Health and Morbidity Survey 2019
Technical Report — Volume I

NCDs — Non-Communicable Diseases: Risk Factors and other Health Problems

National Institutes of Health (NIH)
Ministry of Health Malaysia

NATIONAL HEALTH AND MORBIDITY SURVEY 2019: NON-COMMUNICABLE DISEASES, HEALTHCARE DEMAND AND HEALTH LITERACY

Volume I: NCDs – Non-Communicable Diseases: Risk Factors and other Health Problems
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The following persons had contributed in the proposal, planning, logistics, analysis, write-up, discussion, conclusions and/or drawing recommendations for this report.

Core Team Members

Dr Shubash Shander Ganapathy, Dr Hj Tahir Hj Aris, Dr Noor Ani Ahmad, Dr Nor Izzah Hj Ahmad Shauki, Dr Manimaran Krishnan Kaundan, Nazirah Alias, Dr Muhammad Fadhli Mohd Yusoff, Suhana Jawahir, Komathi Perialathan, Dr Mohd Shaiful Azlan Kassim, Wan Shakira Rodzlan Hasani, Dr Fathullah Iqbal Ab Rahim, Dr Halizah Mat Rifin, Dr LeeAnn Tan, Norzawati Yeop, Dr Mohd Azahadi Omar, Norazizah Ibrahim Wong, Ruhaya Salleh, Lim Kuang Kuay, Dr Rajini Sooryanarayana, Hasimah Ismail, Norhafizah Sahril, Chan Ying Ying, Ahmad Ali Zainuddin, Andy Mustaming

Editors

Chan Ying Ying, Norzawati Yeop, Dr Muhammad Solihin Rezali, Dr Jane Ling Miaw Yn, Dr Noor Aliza Lodz, Syafinaz Mohd Sallehuddin, Dr Chong Zhuo Lin, Dr Thamil Arasu Saminathan, Cheong Siew Man, Lalitha Palanivello, Dr Fazila Haryati Ahmad, Dr Tania Gayle Robert Lourdes, Mohd Hatta Abdul Mutalib, Jayvikramjit Singh Manjit Singh

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The National Health and Morbidity Survey 2019: Non-Communicable Diseases, Healthcare Demand and Health Literacy

Institute for Public Health
National Institutes of Health
Ministry of Health
Block B5 & B6, Kompleks NIH
No 1, Jln Setia Murni U13/52
Seksyen U13, Bandar Setia Alam
40170 Shah Alam, Selangor Darul Ehsan

Tel: +603-3362 7800 Fax: +603-3362 7801 / 7802

Any enquiries or comments on this report should be directed to

The Principal Investigator, The National Health and Morbidity Survey 2019

Institute for Public Health,
National Institutes of Health,
Ministry of Health,
Block B5 & B6, Kompleks NIH
No 1, Jln Setia Murni U13/52
Seksyen U13, Bandar Setia Alam
40170 Shah Alam, Selangor Darul Ehsan

Tel: +603-3362 7800 Fax: +603-3362 7801 / 7802

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Disclaimer

The views expressed in this report are those of the authors alone and do not necessarily represent the opinions of other investigators participating in the survey, nor the views or policy of the Ministry of Health.



Message from the Director General of Health Malaysia

The National Health and Morbidity Survey (NHMS) was first carried out by the Ministry of Health Malaysia in 1986 and subsequently in ten-yearly intervals, i.e. in 1996 and 2006, to obtain local data on the nation's population health. However, given the growing importance of 'time-context' data to effectively respond to the healthcare needs in Malaysia, the NHMS is now carried out every year since 2011, with a regular four-yearly interval survey on Non-Communicable Diseases (NCDs).

The significance of the NHMS goes beyond providing up-to-date epidemiological data on the key diseases and NCDs risk factors. An understanding of disease trends and their risk factors will supplement and aid the country in planning for the healthcare needs of the people in Malaysia. Thus, the information gained from the NHMS will unequivocally facilitate the process of benchmarking our progress towards global commitments and strategically prioritise our nation to achieve Universal Health Coverage (UHC) and the Sustainable Developmental Goals (SDG).

The alarming rise of NCDs in Malaysia over the years is of grave concern as we approach an ageing nation status. In 2016, the Ministry of Health developed the National Strategic Plan on Non-Communicable Diseases (NSP-NCD) to tackle the growing burden of NCDs in Malaysia. The analysis obtained from this survey will provide the Ministry of Health the tools towards monitoring and evaluating the formulated health policies and strategies to strengthen healthcare delivery to the nation continuously.

This latest NHMS aimed to provide community-based data to determine the prevalence of NCDs, the prevalence of risk factors of NCDs, and relevant critical areas of concern. The

diseases and risk factors studied in each NHMS is overseen by the NHMS Steering Committee, which consists of Ministry of Health policymakers as well as state representatives and experts from local universities. Each topic studied in the survey is critically evaluated to ensure appropriate and meaningful data collection.

The NHMS 2019 was carried out between July and October 2019, simultaneously across all 13 states and three Federal Territories in Malaysia. A total of 70 research teams of over 300 personnel, consisting of field supervisors, research assistants and nurses were mobilised for data collection. In addition, dozens of experts from the Ministry of Health and local universities from various fields were involved in the analysis and preparation of this report. The success of this nation-wide survey is owed to the gracious support from all the state health departments in carrying out scouting activities, providing nurses, and assisting the research teams. I wish to express my gratitude to all State Health Directors and their team members for their immense contribution.

My commendation also goes to the survey team from the Institute for Public Health, Institute for Health Systems Research, and Institute for Health Behavioural Research for the successful completion of this important survey. Thank you to all the agencies involved for their support and cooperation throughout the process.

Last but not least, I also thank all the respondents who had taken the time to participate in this survey and urge everyone to join hands towards creating a healthy Malaysia. This survey has highlighted several areas of concern that will be addressed by the Ministry of Health as we continue to improve the health status and health delivery in the country.

A handwritten signature in black ink, appearing to read 'Hisham', written over a white background.

Datuk Dr Noor Hisham bin Abdullah
Director General of Health Malaysia
Chairman of NHMS Steering Committee
Ministry of Health Malaysia

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The authors also thank all parties who assisted in the implementation of the survey, from the Central Committee Team, Field Supervisors, Team Leaders, Data Collectors and Drivers, without whom the survey would not have been a success.

Finally, our sincere appreciation is extended to all respondents who had participated in and contributed their valuable time and precious information towards the survey. It is our hope that these findings will help program leaders and policy makers to better run the various health programs and other services available to the people of Malaysia.

Table of Contents

Acknowledgement	004	8.0 Health Screening	132
Executive Summary	010	8.1 Medical Check-Up / Health Screenings	133
1.0 Introduction	014	8.2 Breast Cancer	133
1.1 Background	014	8.3 Cervical Cancer	134
1.2 Objectives	014	8.4 Faecal Occult Blood Test for Colorectal Cancer Screening	134
2.0 Methodology	016	9.0 Alcohol Consumption	146
2.1 Target Population	016	9.1 Alcohol Consumption Among Those Aged 18 Years and Above	147
2.2 Sampling Frame	016	9.2 Alcohol Consumption Among Those Aged 13 Years Old and Above	147
2.3 Sample Size Determination	016	9.3 Binge Drinking Among Those Aged 18 Years and Above	147
2.4 Sampling Design	016	9.4 Heavy Episodic Drinkers Among Those Aged 18 Years and Above	147
2.5 Ethical Considerations	017	9.5 AUDIT Risk Stratification Related to Pattern of Drinking	147
2.6 Questionnaire and Other Survey Material	017	10.0 Substance Abuse	156
2.7 Field Preparation and Logistic Support	018	11.0 Benign Prostatic Hyperplasia (BPH)	162
2.8 Training	019	12.0 Erectile Dysfunction (ED)	168
2.9 Publicity	019	13.0 Anaemia	174
2.10 Data Collection	019	14.0 Nutritional Status of Adults	184
2.11 Data Management and Monitoring During Data Collection	020	15.0 Nutritional Status of Children	206
2.12 Data Analysis	020	15.1 Nutritional Status of Children Below 5 Years Old	206
3.0 General Findings	022	15.2 Nutritional Status Among Children 5 To 17 Years Old	207
3.1 Sample Coverage	022	16.0 Mental Health Problems of Children	226
3.2 Sociodemographic Characteristics	022	17.0 Disability	236
3.3 Sample Representativeness	024	18.0 Child Functioning	248
4.0 Non-Communicable Diseases: Diabetes, Hypertension and Hypercholesterolaemia	026	19.0 Epilepsy	252
4.1 Diabetes	026	20.0 Depression	256
4.2 Hypertension	028	21.0 Health Literacy	260
4.3 Hypercholesterolaemia	029	21.1 Overall Health Literacy	261
5.0 Physical Activity	070	21.2 Health Literacy in Health Care, Disease Prevention and Health Promotion Domains	262
6.0 Tobacco Use	080		
6.1 Smoking	081		
6.2 Exposure to Secondhand Smoke	081		
6.3 Smoking Cessation Behaviour	082		
6.4 Awareness of Anti-Smoking Campaign	082		
6.5 Awareness of Cigarette Advertising and Promotion	082		
7.0 Dietary Practices	104		
7.1 Intake of Commercially Packed Ready to Drink Beverages/ Premixed/ Sugar Added Self-Prepared Drinks and The Consumption of Sugar	104		
7.2 Dietary Practices	107		

List of Tables

Table 2.1: Distribution of Sample by State, NHMS 2019	017	Table 5.4: Prevalence of Exposure to Physical Activity Information Disseminated Through Various Mass Media Channels Among Respondents Aged 16 Years and Above in Malaysia by Socio-Demographic Characteristics	074
Table 2.2: Questionnaire Used for NCD Component, NHMS 2019	018	Table 6.1: Smoking Trend in Malaysia	083
Table 3.1: Response Rate by Living Quarters and Individual by State, NHMS 2019	022	Table 6.2: Prevalence of Smokers Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics	084
Table 3.2: Socio-Demographic Characteristics of Sample, NHMS 2019	023	Table 6.3: Prevalence of Smokeless Tobacco and E-cigarettes / Vape Use Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics	086
Table 4.1: Non-Communicable Diseases Trend in Malaysia	031	Table 6.4: Prevalence of Any Tobacco Product Use Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics	088
Table 4.2: Prevalence of Overall Raised Blood Glucose Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	032	Table 6.5: Cigarettes Smoked Per Day Among Daily Cigarette Smokers Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics	090
Table 4.3: Prevalence of Known Diabetes Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	036	Table 6.6: Prevalence of Exposure to Secondhand Smoke at Home and Work Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics	094
Table 4.4: Prevalence of Raised Blood Glucose Amongst Those Not Known to Have Diabetes Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	040	Table 6.7: Prevalence of Exposure to Secondhand Smoke at Eateries Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics	096
Table 4.5: Prevalence of Overall Raised Blood Pressure Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	044	Table 6.8: Current Smokers Who Made a Quit Attempt in The Past 12 Months Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics	098
Table 4.6: Prevalence of Known Hypertension Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	048	Table 6.9: Prevalence of Noticing Anti-Cigarette Information in Newspapers/Magazines and Television in The Past 30 days Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics	099
Table 4.7: Prevalence of Raised Blood Pressure Amongst Those Not Known to Have Hypertension Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	052	Table 6.10: Prevalence of Noticing Cigarette Advertisement and Promotion Among Respondents Aged 15 Years and Above in Malaysia	101
Table 4.8: Prevalence of Overall Raised Blood Cholesterol Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	056	Table 7.1: Inadequate Fruit and / or Vegetable Intake Trend in Malaysia	109
Table 4.9: Prevalence of Known Hypercholesterolemia Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	060	Table 7.2: Prevalence of at Least Once in A Week Intake of Commercially Packed Ready to Drink (CPRD) Beverages, Proportion of Daily Intake of at Least One Type of CPRD Beverages and The Amount of Sugar Intake Per Day Among the Respondents Consuming CPRD Beverages Daily Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	110
Table 4.10: Prevalence of Raised Total Cholesterol Amongst Those Not Known to Have Hypercholesterolemia Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	064	Table 7.3: Prevalence of at Least Once in A Week Intake of Premixed Drinks, Proportion of Daily Intake of at Least One Type of Premixed Beverages and The Amount of Sugar Intake Per Day Among the Respondents Consuming Premixed Beverages Daily Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	114
Table 5.1: Physical Inactivity Trend in Malaysia	071		
Table 5.2: Prevalence of Physically Inactivity Among Respondents Aged 16 Years and Above in Malaysia by Socio-Demographic Characteristics	072		
Table 5.3: Prevalence of Physical Inactivity in Travel Domain Among Respondents Aged 16 Years and Above in Malaysia by Socio-Demographic Characteristics	073		

Table 7.4: Prevalence of at Least Once in A Week Intake of Sugar Added Self-Prepared Beverages, Proportion of Daily Intake of at Least One Type of Self-Prepared Beverages and The Amount of Sugar Intake Per Day Among the Respondents Consuming Self-Prepared Beverages Daily Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	118
Table 7.5: Prevalence of Inadequate Intake of Fruit, Vegetable and Fruit and / or Vegetable Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	122
Table 7.6: Prevalence of Adequate and Inadequate Plain Water Intake in A Day Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	126
Table 7.7: Prevalence of Awareness of Healthy Plate Concept Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	128
Table 7.8: Prevalence of Adequate Knowledge and Practice of Healthy Plate Concept Among Those with Awareness Among Adults Aged 18 Years and Above in Malaysia	129
<hr/>	
Table 8.1: Prevalence of Undergoing Any Health Screening / Medical Check Up in The Past 12 Months Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	136
Table 8.2: Prevalence of Breast Self-Examination in The Past 12 Months Among Females Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	137
Table 8.3: Prevalence of Mammogram Examination (In The Past 3 Years and Ever Done) Among Females Aged 40 Years and Above in Malaysia by Socio-Demographic Characteristics	138
Table 8.4: Prevalence of Pap Smear Examination in The Last 3 Years and, Awareness and Interest to Use Self-Sampling Screening (HPV Screening) Among Female Aged 20 Years and Above in Malaysia by Socio-Demographic Characteristics	140
Table 8.5: Prevalence of Faecal Occult Blood Test Among Adults Aged 50 Years and Above in Malaysia by Socio-Demographic Characteristics	144
<hr/>	
Table 9.1: Harmful Alcohol Consumption Trend in Malaysia	148
Table 9.2: Prevalence of Current Drinkers Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	149
Table 9.3: Prevalence of Current Drinkers Among Respondents Aged 13 Years and Above in Malaysia by Socio-Demographic Characteristics	150
Table 9.4: Proportion of Binge Drinkers Among Current Drinkers Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	151

Table 9.5: Proportion of Heavy Episodic Drinkers Among Current Drinkers Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	152
Table 9.6: Proportion of AUDIT Risk Stratification Score Among Current Drinkers Aged 18 Years and Above in Malaysia	153
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Table 10.1: Prevalence of Ever and Current Drug Use Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	158
Table 10.2: Prevalence of Drug Use by Types Among Adults Aged 18 Years and Above in Malaysia	159
Table 10.3: Proportion of Age of Initiation and Types of First Started Drug by Respondents with Ever Drug Use Among Adults Aged 18 Years and Above in Malaysia	159
Table 10.4: Proportion of Sources of Obtaining Drugs by Respondents with Current Drug Use Among Adults Aged 18 Years and Above in Malaysia	159
<hr/>	
Table 11.1: Prevalence of Probable Benign Prostatic Hyperplasia (BPH) Among Males Aged 40 Years and Above in Malaysia by Socio-Demographic Characteristics	164
Table 11.2: Association Between BPH Status and Quality of Life (QoL) Due to Urinary Symptom Among Males Aged 40 Years and Above in Malaysia	165
<hr/>	
Table 12.1: Prevalence of Probable Erectile Dysfunction (ED) Among Sexually Active Males Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	170
<hr/>	
Table 13.1: Anaemia Trend in Malaysia	175
Table 13.2: Prevalence of Anaemia Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics	176
Table 13.3: Prevalence of Anaemia Level Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics	177
Table 13.4: Prevalence of Anaemia Among Women of Reproductive Age Group (15-49 years) in Malaysia by Socio-Demographic Characteristics	179
Table 13.5: Prevalence of Anaemia Level Among Women of Reproductive Age Group (15-49 years) in Malaysia by Socio-Demographic Characteristics	180
<hr/>	
Table 14.1: Nutritional Status (Adults) Trend in Malaysia	186
Table 14.2: Prevalence of Underweight Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	187
Table 14.3: Prevalence of Normal BMI Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	188
Table 14.4: Prevalence of Overweight Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	190

Table 14.5: Prevalence of Obesity Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	192	Table 16.4: Prevalence of Conduct Problems Among Children Aged 5 - 15 Years in Malaysia by Socio-Demographic Characteristics	230
Table 14.6: Prevalence of Obesity I to III (WHO 1998) Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	194	Table 16.5: Prevalence of Hyperactivity Problems Among Children Aged 5 -15 years in Malaysia by Socio-Demographic Characteristics	231
Table 14.7: Prevalence of Obesity I to III (CPG 2004) Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	198	Table 16.6: Prevalence of Peer Problems Among Children Aged 5 - 15 Years in Malaysia by Socio-Demographic Characteristics	232
Table 14.8: Prevalence of Abdominal Obesity (WHO 2000) Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	202	Table 16.7: Prevalence of Pro-Social Skills Among Children Aged 5 - 15 Years in Malaysia by Socio-Demographic Characteristics	233
Table 14.9: Mean Weight by BMI Category Among Adults Aged 18 Years and Above in Malaysia	203	Table 17.1: Disability (Adult) Trend in Malaysia	238
Table 15.1: Nutritional Status (Children Under 5 Years of Age) Trend in Malaysia	207	Table 17.2: Prevalence of Overall Difficulty Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	239
Table 15.2: Nutritional Status (Children 5 – 17 Years of Age) Trend in Malaysia	209	Table 17.3: Prevalence of Difficulty by Domains Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	240
Table 15.3: Prevalence of Nutritional Status Among Children Below 5 Years Old in Malaysia	209	Table 17.4: Prevalence of Overall Disability Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	244
Table 15.4: Prevalence of Nutritional Status Among Children Aged 5-17 Years Old in Malaysia	210	Table 17.5: Use of Assistive Device Among Adults with Overall Difficulty Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	245
Table 15.5: Prevalence of Weight-for-Age Among Children Below 5 Years Old in Malaysia by Socio-Demographic Characteristics	210	Table 18.1: Prevalence of Overall Functional Difficulty (At Least One Domain) Among Children Aged 2-17 Years in Malaysia by Socio-Demographic Characteristics	250
Table 15.6: Prevalence of Height-for-Age Among Children Below 5 Years Old in Malaysia by Socio-Demographic Characteristics	212	Table 18.2: Prevalence of Use of Assistive Devices Among Children Aged 2-17 Years in Malaysia	250
Table 15.7: Prevalence of Weight-for-Height Among Children Below 5 Years Old in Malaysia by Socio-Demographic Characteristics	214	Table 19.1: Prevalence of Suspected Epilepsy (Preliminary Results Based on Initial Screening) in Malaysia by Socio-Demographic Characteristics	254
Table 15.8: Prevalence of BMI-for-Age Among Children Below 5 Years Old in Malaysia by Socio-Demographic Characteristics	216	Table 20.1: Prevalence of Depression Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	258
Table 15.9: Prevalence of Weight-for-Age Among Children Aged 5-10 Years Old in Malaysia by Socio-Demographic Characteristics	218	Table 21.1: Prevalence of Total Health Literacy Level Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	264
Table 15.10: Prevalence of Height-for-Age Among Children Aged 5-17 Years Old in Malaysia by Socio-Demographic Characteristics	220	Table 21.2: Prevalence of Health Literacy Level for Healthcare Domain Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	268
Table 15.11: Prevalence of BMI-for-Age Among Children Aged 5-17 Years Old in Malaysia by Socio-Demographic Characteristics	222	Table 21.3: Prevalence of Health Literacy Level for Disease Prevention Domain Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	272
Table 16.1: Mental Health (Children) Trend in Malaysia	227	Table 21.4: Prevalence of Health Literacy Level for Health Promotion Domain Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics	276
Table 16.2: Prevalence of Mental Health Problems Among Children Aged 5 - 15 Years in Malaysia by Socio-Demographic Characteristics	228		
Table 16.3: Prevalence of Emotional Health Problems Among Children Aged 5 - 15 Years in Malaysia by Socio-Demographic Characteristics	229		

List of Figures

Figure 3.1: Population Pyramid Comparing Estimated Population of NHMS 2019 and Projected Population of Malaysia for 2019 by Age and Sex	024
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List of Appendices

APPENDIX 1: Members of Steering Committee, NHMS 2019-2022	282
APPENDIX 2: Members of NHMS 2019 Central Coordinating Team (CCT)	282
APPENDIX 3: List of Research Team Members	282
APPENDIX 4: List of Liaison Officers (Other Research Members)	284
APPENDIX 5: List of Research Assistants in Central Team	285
APPENDIX 6: State Data Collection Teams	285
APPENDIX 7: Questionnaire	290
APPENDIX 8: Code Book	364
APPENDIX 9: Summary of Publicity Activities and Samples of Publicity Materials	381

Executive Summary

The National Health and Morbidity Survey (NHMS) is carried out to provide community based data to the Ministry of Health Malaysia for review of health programs and priorities. The starting of each cycle of NHMS focuses on non-communicable diseases (NCDs), risk factors for NCDs, healthcare demand and other areas of priority as determined by the Ministry of Health. The year 2019 marks the beginning of a new cycle of NHMS, to study these key areas to determine the health status of the people in Malaysia, as well as monitor the trends of diseases and healthcare utilization in Malaysia.

Complex study design, with two stage stratified cluster sampling, was utilized in NHMS 2019. A total of 475 Enumeration Blocks (EBs) were selected across all 13 states and 3 federal territories in Malaysia, with 12 Livings Quarters (LQs) selected from each EB, resulting in almost 5,700 LQs randomly selected to be included in this survey. A trained team, consisting of trained research assistants and nurses carried out face-to-face interviews, self-administered questionnaires, clinical assessment as well as point-of-care blood testing. All those living in the selected LQs were eligible for this survey, with a total of 14,965 individuals agreeing to participate, and resulting in a response rate of 87.2%.

The NHMS 2019 found that the prevalence of known diabetes to be at 9.4%, while the prevalence of raised blood glucose among unknown diabetes to be 8.9%, resulting in the prevalence of overall raised blood glucose in Malaysia in 2019 to be 18.3%. This was an increase compared to findings of 2011 of 11.2% and 2015 of 13.4%. There were no large differences noted between sexes or urban and rural localities. The prevalence of raised blood glucose by each state showed varying rates, from as low as 9.8% to as high as 33.2%. Over 80% of those with raised blood glucose but unknown to have diabetes were aged 60 years and below.

The prevalence of known hypertension was found to be 15.9% in NHMS 2019. Raised blood pressure among unknown hypertension was 14.1%, with an overall prevalence of raised blood pressure in Malaysia to be 30.0%. The trend for raised blood pressure shows a plateau compared to findings of 2011 of 32.6% and 2015 of 30.3%. The prevalence of known hypercholesterolemia was found to be 13.5% with the prevalence of raised blood total cholesterol among unknown hypercholesterolemia to be 24.6%. This is a reduction compared to the 47.7% reported in NHMS 2015.

This survey also found that 50.1% of adults in Malaysia were overweight or obese, with 30.4% being overweight and 19.7% obese. A total of 52.6% of adults were found to have abdominal obesity. The trends of overweight, obesity and abdominal obesity continue to rise compared to findings of 2011 and 2015. Among children 5-17 years of age, a total of 15.0% were overweight, with 14.8% being obese. On the other hand, the number of children under 5 years of age being stunted, showed an increase compared to previous years, from 16.6% in 2011, 17.7% in 2015 to 21.8% in 2019.

In 2019, the prevalence of adults who are physically inactive was 25.1%. This was an improvement, a reduction from 35.7% in 2011 to 33.5% in 2015. However, a staggering 94.9% of adults were found to not consume adequate fruits and/or vegetables daily. The awareness of the Healthy Plate Concept (Suku Suku Separuh), was found to be 20.4% in the population, with only 14.0% of the adults who are aware, admitting to practicing it daily. The survey also found the prevalence of current smokers to 21.3%, with the use of e-cigarettes at 4.9%. The number of current alcohol drinkers were found to be 11.8%, with a reduction seen in harmful alcohol use, with the proportion of binge drinkers reducing from 59.4% in 2015 to 45.8% in 2019 and reducing proportion of heavy episodic drinkers from 10.8% in 2015 to 8.4% in 2019.

A total of 2.3% of the adults in Malaysia were found to have depression. Among children 5 to 15 years of age, 7.9% of children were found to have mental health problems, and a rise was seen compared to findings of 2015, mainly due to poor interaction with their peers. The prevalence of disability among adults was found to be 11.1%, and 4.7% among children 2 to 17 years of age. A total of 21.3% of adults in Malaysia were found to have anaemia, with 29.9% of women in reproductive age (15 to 49 years of age) to be anaemic.

The survey findings also found that 1.5% of the people in Malaysia to have ever used drugs, with 0.5% being current drug users. Marijuana, kratom and amphetamine were found to be the most prevalent substance used. A total of 31.6% of adult men and 36.1% of men over 40 years of age reported having erectile dysfunction. Furthermore 16.3% of men over 40 years of age reported of having lower urinary tract symptoms, suggestive of having benign prostatic hyperplasia. Among women, 49.0% of adult women reported practicing breast self-examination in the past 12 months while 36.6% of women age 20 years and above reported having done a pap smear in the past 12 months. Only 25.0% of women age 40 years and above reported to having ever done a mammogram, while of 21.0% of women had done so in the past 3 years, as recommended by the Ministry of Health Malaysia.

Understanding the status and prevalence of NCDs and its risk factors is essential, as it is one of the major causes of mortality and morbidity in Malaysia. We are hopeful that the findings of this survey will aid policy makers and program managers in carrying out their tasks, improving existing programs as well as plan to future needs of the people in Malaysia. Strengthening the delivery of primary healthcare services and empowerment of the people remains the mainstay towards combating this rising problem in Malaysia. The survey findings of rising prevalence rates of several key NCDs and risk factors highlights the critical need for clinicians, researchers, program managers, policy makers and most importantly each and every individual to join hands in combating NCDs in Malaysia.

LIST OF ABBREVIATIONS

BPH	- Benign Prostatic Hyperplasia
BMI	- Body Mass Index
CI	- Confidence Interval
CPRD	- Commercially Packed Ready to Drink
EB	- Enumeration Block
ED	- Erectile Dysfunction
FBG	- Fasting Blood Glucose
FOBT	- Faecal Occult Blood Tests
GATS	- Global Adult Tobacco Surveillance
HEPA	- Health-Enhancing Physical Activity
HPV	- Human Papilloma Virus
IPAQ	- International Physical Activity Questionnaire
LQ	- Living Quarter
LUTS	- Lower Urinary Tract Symptoms
MDG	- Malaysian Dietary Guidelines
MOH	- Ministry of Health
NADA	- National Anti-Drug Agency
NASPAL	- National Strategic Plan for Active Living
NCD	- Non-Communicable Disease
NGO	- Non-Government Organization
NHMS	- National Health and Morbidity Survey
NSPTC	- National Strategic Plan on Tobacco Control
OSCA	- One Stop Centre for Addiction
POA	- Plan of Action
PHQ	- Patient Health Questionnaire
PWD	- Person with Disabilities
QoL	- Quality of Life
SCS	- Survey Creation System
SDG	- Sustainable Development Goals
SDQ	- Strength and Difficulties Questionnaire
SSB	- Sugar Sweetened Beverage
UNICEF	- United Nations Children's Fund
WC	- Waist Circumference
WG	- The Washington Group on Disability Statistics
WHO	- World Health Organization

Introduction

Introduction



1.1 Background

The National Health and Morbidity Survey (NHMS) is carried out to obtain community-based data on the pattern of health problems and health needs of the people in Malaysia. This data is essential for the Ministry of Health to review its priorities and programs, plan future allocation of resources and evaluate the impact of current strategies.

The first NHMS was carried out in 1986. Subsequent surveys (NHMS II in 1996 and NHMS III in 2006) were conducted in 10-yearly intervals, to review the health status in Malaysia. Since 2011, taking into account the need for updated and recent health data for policy formulation, the NHMS was structured to be carried out every year, in 4 yearly cycles. The start of each cycle focuses on non-communicable diseases (NCDs) and healthcare demand, as well as other areas of priority as determined by the Ministry of Health (MOH). The scopes of study within each survey is determined by the NHMS Steering Committee, chaired by the Director General of Health Malaysia, and consists of members from both the Ministry of Health as well as representatives from local universities. Several rounds of discussions are also held with local stakeholders to determine the topics and best methods of study in NHMS.

NCDs are the leading cause of death worldwide. In Malaysia, NCDs account for 67% of premature mortality, and over 70% of disease burden in 2014. The previous survey in 2015 had reported high and increasing prevalence of NCDs and NCD risk factors in Malaysia. The year 2019 marks the start of a new cycle of NHMS, the 6th cycle, to monitor the changes and trends in NCDs, following the pattern of the previous surveys carried out in 2011 and 2015.

The data obtained from NHMS 2019 is important to assist the Ministry of Health Malaysia to make evidence-based policies, and review the status of non-communicable diseases in Malaysia, as well as determine the utilization and expenditure of health services. The data is also used by multiple agencies, including monitoring of international indicators such as the Sustainable Development Goals (SDG).

1.2 Objectives

General objective

To provide community-based data and evidence to the Ministry of Health Malaysia on non-communicable diseases, risk factors of non-communicable diseases, and healthcare demand for review of national health priorities and programmes.

Specific objectives for the NCD component:

To determine prevalence of;

- Diabetes
- Hypertension
- Hypercholesterolemia
- Nutritional Status
- Dietary Practice
- Physical Activity
- Tobacco Use
- Alcohol Consumption
- Substance Abuse
- Anaemia
- Depression
- Disability
- Men's Health (ED & BPH)
- Women's Health (Cancer Screening)
- Epilepsy
- Health Literacy

NHMS 2019

Methodology



Methodology

2.1 Target Population

The NHMS 2019 covered both urban and rural areas in all 13 states and 3 federal territories in Malaysia. The target population was the residence in the non-institutional living quarters (LQs). Institutional population such as those staying in hotel, hostels, hospitals, etc. were excluded from this survey.

2.2 Sampling Frame

The geographical areas in Malaysia were divided into Enumeration Blocks (EBs). Each EB is defined and classified into either urban or rural areas by Department of Statistics based on the population size of the gazetted area. The definition of urban area is a gazetted area which has a combined population of 10,000 or more. A gazetted area with a combined population of less than 10,000 is classified as rural area.

There were over 75,000 EBs in Malaysia. Each EB usually contains between 80 to 120 LQs with an average population of 500 to 600 people. The sampling frame consists of selected EBs same as that was provided by Department of Statistics Malaysia in NHMS 2015.

2.3 Sample Size Determination

Sample size was calculated using a single proportion formula for estimation of prevalence.

$$n_{SRS} \geq \frac{Z_{\alpha/2}^2 P(1-P)}{e^2}$$

The sample size calculation was based on a few criteria as below:

- i. Variance of proportion of the variable of interest (Based on NHMS 2015 or other literatures)
- ii. Margin of error (e) (Between 0.02 to 0.07)
- iii. Confidence Interval of 95%

To ensure optimum sample size, few adjustments were made:

- i. Adjusted for finite population (Based on 2019 projected population)
- ii. Adjusted for the design effect (deff) (Based on previous survey: NHMS 2015)
 $n(\text{complex}) = n(\text{srs}) * \text{deff}$
- iii. Adjusted the $n(\text{complex})$ taking into account expected non-response rates of 35%
 $n(\text{adj}) = n(\text{complex}) * (1 + \text{non-response rate})$

The sample size was then adjusted according to the need of the analysis, whether the prevalence estimate was at the national, or state level. Based on the core objectives and above mentioned considerations, the optimum sample size required was 5,676 LQs.

The allocation of samples to the states, urban and rural was done proportionally to the population size. Bigger number of samples were allocated to states with bigger population size such as Selangor, Johor and Sabah, and lesser number of samples were allocated to states with smaller population size such as Melaka, Perlis and Labuan.

2.4 Sampling Design

To ensure national representativeness, two stage stratified random sampling was used. The two strata are primary stratum, which made up of states of Malaysia, including Federal Territories, and secondary stratum, which made up of urban and rural strata formed within the primary stratum.

Sampling involved two stages; the Primary Sampling Unit (PSU), which were the EBs and the Secondary Sampling Unit (SSU), which were the LQs within the selected EBs. For NHMS 2019, a total of 5,676 LQs were selected from the selected 475 EBs in Malaysia, where 362 and 113 EBs were selected from urban and rural areas respectively. Twelve LQs were randomly selected from each selected EB. The distribution of selected sample by state is presented in Table 2.1. All individuals with their primary residence and residing for at least 2 weeks prior to data collection, in the selected LQ were eligible to participate in this survey.

- All households within the selected LQs were included in the study.
- All members in the households were also included in the study.

Table 2.1: Distribution of Sample by State, NHMS 2019

No.	State	Enumeration Block			Living Quarters		
		Urban	Rural	Total	Urban	Rural	Total
1.	Johor	29	10	39	348	120	468
2.	Kedah	16	8	24	192	96	288
3.	Kelantan	11	13	24	132	156	288
4.	Melaka	22	2	24	264	24	288
5.	Negeri Sembilan	17	7	24	204	84	288
6.	Pahang	13	11	24	156	132	288
7.	Pulau Pinang	24	2	26	288	24	312
8.	Perak	20	7	27	240	84	324
9.	Perlis	14	10	24	168	120	288
10.	Selangor	59	5	64	708	60	768
11.	Terengganu	15	9	24	180	108	288
12.	Sabah	23	16	39	276	192	468
13.	Sarawak	17	13	30	204	156	360
14.	WP Kuala Lumpur	25	0	25	300	0	300
15.	WP Labuan	23	0	23	276	0	276
16.	WP Putrajaya	32	0	32	384	0	384
TOTAL		362	113	475	4,320	1,356	5,676

2.5 Ethical Considerations

This study had obtained ethical approval from the Medical Research and Ethics Committee of Ministry of Health Malaysia, and was registered in the National Medical Research Registry, bearing registration number NMRR-18-3085-44207. Before data collection was conducted, the relevant local authorities were contacted and informed.

Prior to each interview, the purpose of the survey and methods used during the survey was explained to the respondent and information handed out via the participant's information sheet. Furthermore, before the interview or any assessment was carried out, informed written consent was taken from each participant or guardian, with an additional assent form signed by participants between 7 to 18 years of age.

All participants who were found to require medical attention at the time of the survey were referred using a structured referral letter to the nearest government health clinic for further assessment and management.

2.6 Questionnaire and Other Survey Materials

Structured questionnaires were used to collect data based on the scopes of the survey. There were two types of questionnaire; face-to-face interview and self-administered. For the face-to-face interview, the pre-tested questionnaire was bi-lingual (Bahasa Melayu and English) accompanied with questionnaire manual prepared as a guide to the data collectors. The self-administered questionnaires were in four languages; Bahasa Melayu, English, Mandarin, and Tamil. There were flash cards provided in the form of code book to assist in the interview.

The face-to-face interview questionnaire was programmed into an application and the data collection was done using tablets. Respondents were given the tablet to fill themselves for the self-administered questionnaires. Hardcopies of the self-administered questionnaires were also prepared should the respondent choose to answer in paper. The modules contained in the questionnaire, as well as the questionnaire used and target age group are presented in Table 2.2. The complete questionnaire and code book for NHMS 2019 is attached in the appendix of this report (Appendix 7 and 8).

Table 2.2: Questionnaire Used for NCD Component, NHMS 2019

Module	Questionnaire	Method	Target Age Group
Household Information	-	Face-to-face	All
Sociodemography	-	Face-to-face	All
Diabetes	STEPS	Face-to-face	18 years and above
Hypertension	STEPS	Face-to-face	18 years and above
Hypercholesterolemia	STEPS	Face-to-face	18 years and above
Physical Activity	IPAQ – Short Form	Face-to-face	16 years and above
Smoking	Mini GATS	Face-to-face	15 years and above
Dietary Practice	-	Face-to-face	18 years and above
Health Screening	-	Face-to-face	18 years and above
Alcohol	AUDIT	Self-Administered	13 years and above
Substance Abuse	-	Self-Administered	18 years and above
Disability	WG Short Set	Face-to-face	18 years and above
Child Functioning	WG	Face-to-face	2 - 17 years
Mental Health (Adult)	PHQ	Self-Administered	18 years and above
Mental Health (Children)	SDQ-Mall	Self-Administered	5 - 15 years
Health Literacy	HLS-M-Q18	Self-Administered	18 years and above
Benign Prostatic Hyperplasia	IPSS	Self-Administered	40 years and above
Erectile Dysfunction	IIEF	Self-Administered	18 years and above
Epilepsy	Ottman Epilepsy Screening	Face-to-face	All

Interviews were conducted for respondents aged 13 years and above, while for respondents below 13 years, the parent/guardian responded to the interview on their behalf (by proxy). Similar rules were applied to the self-administered questionnaire.

Clinical Assessment (done by nurses):

- Anthropometry (weight/height/length and waist circumference):
 - » All ages.
- Blood pressure measurement:
 - » Aged 18 years and above.
- Biochemistry tests (Fasting Blood Glucose and Cholesterol):
 - » Aged 18 years and above.
- Haemoglobin test:
 - » Aged 15 years and above

For the assessment of weight, Tanita Personal Scale HD 319 was used for adults, while Tanita Baby Scale 1583 was used for infants. Both tools had been validated and calibrated prior to the survey. For field implementation, a standard weight was supplied for each team for standardisation. For measurement of height, SECA Stadiometer 213 was used for adults, while Measuring Mat SECA 210 was used for infants. Both tools had also been validated and calibrated prior to the survey. All measurements were carried out twice by trained nurses.

Omron Japan Model HEM-907 was used for blood pressure assessment, while CardioChek® PA Analyzer was used to assess fasting blood glucose and cholesterol, both tools which had been validated and calibrated prior to the survey. A validated and calibrated HemoCue® Machine Hb 201+ was used to measure haemoglobin level.

Any participant who was found to be pregnant, post-natal, bed-ridden, or having physical disabilities or deformities were excluded from the anthropometric assessment. All measurements from the clinical assessment were recorded in the clinical assessment form and subsequently keyed into the tablet by the nurse.

2.7 Field Preparation and Logistic Support

Excellent support was provided by the State Health Departments in the preparation for field data collection. A Liaison Officer was appointed in each state to assist in the data collection activities. They assisted in the delivery of information regarding the survey and liaised with the selected communities, relevant District Health Officers and Local Authorities for logistic arrangements. They also assisted in the publicity of the survey through dissemination of relevant information to various stakeholders including the public.

Before the implementation of the data collection, scouts were appointed from the District Health Office of the selected districts. The selected LQs were then identified and tagged by the scouts. The members in the selected LQs, communities and related government agencies were also informed about the survey, through information leaflets.

Field Supervisors for each state were recruited from among the Institute for Public Health, Institute for Health Systems Research, Institute for Health Behavioural Research and other agencies of Ministry of Health Malaysia personnel, to liaise with the Liaison Officers in the arrangement of transportation, accommodation, appointment with respondents and other related logistic issues. Research Assistants were recruited as interviewers to assist in the data collection. A total of 70 teams were established throughout Malaysia, 57 in Peninsular Malaysia and 13 in East Malaysia, comprising Sabah, Sarawak and WP Labuan. Each team was led by a Team Leader and comprised of an additional two Research Assistants, one driver and one Nurse.

2.8 Training

A training course for scouts was conducted in March 2019. The scouts were trained on the technique of reading the EB maps, locating the selected LQs, tagging the identified LQs and informing head of the household on the survey. The scouts were also required to update the data collection teams on the basic information of the household members.

Prior to data collection, a training course was conducted for the field supervisors, team leaders, nurses and interviewers. The training course was conducted separately for data collectors from Peninsular Malaysia and Sarawak, Sabah and Labuan from 8th to 13th of July 2019.

The main objectives of the training were to familiarize the data collection teams with the questionnaire, develop the interpersonal skills and appreciate the need for good teamwork. Briefing on the questionnaire, mock interview in the classroom and individual interviewing practice under supervision were conducted during the training.

The nurses were trained on the techniques of using the equipment used for clinical assessment in NHMS 2019. They were also briefed on the criteria for referral of respondents with health problems. At the end of training a pilot test for data collection was conducted.

2.9 Publicity

A publicity campaign is a vital component in enhancing the response rate of a national level community survey. Its main purpose is to create awareness among the public about the planned survey activities besides obtaining the highest possible participation from the household members of the selected LQs nationwide. The publicity campaign utilised both printed and electronic media and was further emphasized during the listing activities.

A publicity team was formed to coordinate all the activities related to publicity. The publicity team was responsible for designing the template and drafting the content of publicity materials such as pamphlets, posters, buntings, banners, car stickers, participant information sheets, media press releases, news stickers and text (both questions and answers) for radio and television interviews based on input from the Principal Investigator and approval of the NHMS Central Committee.

In order to ensure the message reached various ethnic groups of the community, most of the printed publicity materials such as pamphlets and respondent information sheets were produced in four main languages – Malay, English, Mandarin and Tamil. Pamphlets were distributed by the scouts during their initial visit as well as utilized by the data collection team.

The publicity team liaised closely with their counterparts from the Corporate Communication Unit, MOH especially in making publicity arrangements with the printed media as well as mass media such as television and radio. In addition, the implementation at the state level was strongly supported by the State Health Departments through the State Liaison Officers. Furthermore, the State Liaison Officers or Field Supervisors for each state were also responsible for the arranging of local media interviews and arranging additional publicity strategies when required. The NHMS 2019 also actively utilized the social media, such as Facebook and Instagram, to create awareness of this survey among the public.

A summary of publicity activities and material used are as seen in Appendix 9.

2.10 Data Collection

Data collection was carried out between 14th July 2019 and 2nd October 2019. An appointment with the eligible household was made by the team leader prior to the actual visit. In case any of the eligible household members were not available during the first visit, the team had to make several visits to ensure a good coverage of all the eligible members in the household. At least three visits were attempted before the household was classified as unsuccessful.

Unsuccessful survey at the household level could be due to LQs that refused to participate, that were empty, locked, besides others such as a hostile or dangerous environment. Unsuccessful survey at the individual level could be due to individuals who did not meet the eligibility criteria for the survey, individuals who were not at home during the scheduled visits, those who refused to participate, or language barrier.

2.11 Data Management and Monitoring During Data Collection

Data processing activities were centralised at the Institute for Public Health. This included receiving data from the field (input from mobile tablet devices to the centralised server) up to handing over the cleaned dataset to the data analysis team.

Face-to-face interviews were conducted by the data collection teams using mobile tablet devices based on the questionnaire system application developed. Completed interviews were sent to the Survey Creation System (SCS) server centralised in the Institute for Public Health whenever there was an internet connection. Data in the server were downloaded weekly by the data management team. Datasets were continuously monitored for quality control; especially on accuracy of the respondent ID, outliers or incorrect data.

To ensure the quality of data captured, quality checks were also in-built into the application pertaining to eligibility in answering different modules based on age group or sex. Subsequently, the dataset was sent to the data analysis team.

Throughout the data collection period, the Central Coordinating Team (CCT) conducted weekly meeting to monitor the progress of each team. These meetings were chaired by the Director of Institute for Public Health (IPH) to discuss on the movements of the teams, logistic issues, response rate, and the publicity.

The productivity of each team was monitored by comparing the cumulative targeted LQs with the weekly progress report by the teams and the amount of data received in the server. This information was updated regularly on the monitoring board at the operation centre in IPH together with the status of self-administered questionnaires (SAQ) received. Hardcopy SAQ were sent to the operation centre via courier.

2.12 Data Analysis

Data analysis was done together with the Biostatistics and Data Repository team from the National Institutes of Health, Ministry of Health Malaysia. All analyses were carried out according to objectives of the survey, working definitions and dummy tables. Complex samples analysis procedures were used in the analysis and was carried out at 95% confidence interval.

A weighting factor was applied to each individual to adjust for non-response and for the varying probabilities of selection. The weight used for estimation is given by:

$$W = W1 \times F \times PS$$

Where;

- W1 : the inverse of the probability of selecting the EBs
- F : the non-response adjustment factor
- PS : a post-stratification adjustment factor calculated by age, gender and ethnicity

General Findings

General Findings

3.1 Sample Coverage

From the 5,147 eligible LQs, a total of 4,703 LQs were successfully interviewed, giving a LQ response rate of 91.4%. From these LQs, a total of 15,683 participants were eligible for interview. A total of 14,965 respondents were successfully interviewed, giving an individual response rate of 95.4%. The overall response rate for this community-based survey is therefore 87.2%. The response rate by state is presented in Table 3.1.

3.2 Socio-Demographic Characteristics

A total of 10.9% of the respondents of NHMS 2019 are from the state of Selangor. A total of 61.4% of the respondents are from urban localities and females made up 52.8% of the total respondents. Those of Malay ethnicity were 66.5% of the respondents, with Indian ethnicity, Bumiputera Sabah, Bumiputera Sarawak and others making up between 4% to 7% each. A total of 36.5% of the respondents reported their highest educational level to be up to secondary education, with those of no formal education and tertiary education at 16.2% each. Private employees made up 20.2% of the respondents, meanwhile government employees made up 7.0%, with a further 3.4% of retirees in the sample.

Table 3.1: Response Rate by Living Quarters and Individual by State, NHMS 2019

State	Living Quarters			Individual			Total Response Rate (%)
	Eligible	Interviewed	Response Rate (%)	Eligible	Interviewed	Response Rate (%)	
Johor	428	404	94.4	1,244	1,212	97.4	91.96
Kedah	255	241	94.5	788	760	96.4	91.15
Kelantan	261	250	95.8	801	791	98.8	94.59
Melaka	278	270	97.1	881	859	97.5	94.70
Negeri Sembilan	255	246	96.5	771	730	94.7	91.34
Pahang	272	265	97.4	908	894	98.5	95.92
Pulau Pinang	290	265	91.4	896	829	92.5	84.55
Perak	291	276	94.8	883	801	90.7	86.04
Perlis	260	253	97.3	730	722	98.9	96.24
Selangor	689	573	83.2	1,732	1,626	93.9	78.07
Terengganu	261	255	97.7	1,009	972	96.3	94.12
Sabah	415	374	90.1	1,417	1,344	94.8	85.48
Sarawak	329	296	90.0	1,160	1,067	92.0	82.76
WP Kuala Lumpur	281	238	84.7	688	664	96.5	81.74
WP Labuan	258	250	96.9	792	772	97.5	94.45
WP Putrajaya	324	247	76.2	983	922	93.8	71.50
MALAYSIA	5,147	4,703	91.4	15,683	14,965	95.4	87.19

Based on the self-reported income of each individual, the household income was calculated and categorized based on state-specific cut-off for B40, M40 and T20 category. The cut-off values for each state were obtained from the Departments of Statistics Malaysia. A total of 68.1% of the respondents fell in the B40 category, with only 8% in the T20 category. This, as in most self-reported studies, shows a certain degree of under-reporting present in the income levels. The sociodemographic characteristics of all respondents in NHMS 2019 are presented in Table 3.2.

Table 3.2: Sociodemographic Characteristics of Sample, NHMS 2019

Sociodemographic characteristics	Count	Percentage (%)
MALAYSIA	14,965	100.0
State		
Johor	1,212	8.1
Kedah	760	5.1
Kelantan	791	5.3
Melaka	859	5.7
Negeri Sembilan	730	4.9
Pahang	894	6.0
Pulau Pinang	829	5.5
Perak	801	5.4
Perlis	722	4.8
Selangor	1,626	10.9
Terengganu	972	6.5
Sabah	1,344	9.0
Sarawak	1,067	7.1
WP Kuala Lumpur	664	4.4
WP Labuan	772	5.2
WP Putrajaya	922	6.2
Location		
Urban	9,183	61.4
Rural	5,782	38.6
Sex		
Male	7,064	47.2
Female	7,901	52.8
Age Group (Years)		
0 – 4	1,249	8.3
5 – 9	1,391	9.3
10 – 14	1,214	8.1
15 – 19	977	6.5
20 – 24	938	6.3
25 – 29	973	6.5
30 – 34	1,008	6.7
35 – 39	1,065	7.1
40 – 44	891	6.0
45 – 49	908	6.1

Sociodemographic characteristics	Count	Percentage (%)
50 – 54	957	6.4
55 – 59	941	6.3
60 – 64	838	5.6
65 – 69	645	4.3
70 – 74	455	3.0
75 and above	515	3.4
Citizenship		
Malaysian	14,064	94.0
Permanent Resident	134	0.9
Non-Malaysian	766	5.1
Ethnicity		
Malay ^a	9,955	66.5
Chinese	1,669	11.2
Indian	875	5.8
Bumiputera Sabah	1,039	6.9
Bumiputera Sarawak	608	4.1
Others	819	5.5
Marital Status		
Single	6,667	44.6
Married	7,165	47.9
Widow(er)/Divorcee	1,132	7.6
Education Level		
No Formal Education	2,423	16.2
Primary Education	4,597	30.7
Secondary Education	5,462	36.5
Tertiary Education	2,426	16.2
Occupation		
Government Employee	1,050	7.0
Private Employee	3,027	20.2
Self-Employed	1,900	12.7
Unpaid Worker/Homemaker	2,068	13.8
Retiree	511	3.4
Student	2,878	19.2
Not Working ^b	3,523	23.6
Household Income Quintile		
Quintile 1	2,754	19.6
Quintile 2	2,848	20.3
Quintile 3	2,805	20.0
Quintile 4	2,638	18.8
Quintile 5	2,973	21.2
Household Income Category		
Bottom 40% (B40)	9,551	68.1
Middle 40% (M40)	3,347	23.9
Top 20% (T20)	1,120	8.0

a - Malay includes Orang Asli

b - Not working includes unemployed, and old age

3.3 Sample Representativeness

The estimated population obtained in the NHMS 2019 closely resembles the actual population structure of Malaysia for 2019, as projected by the Department of Statistics Malaysia. The comparison is shown in Figure 3.1.

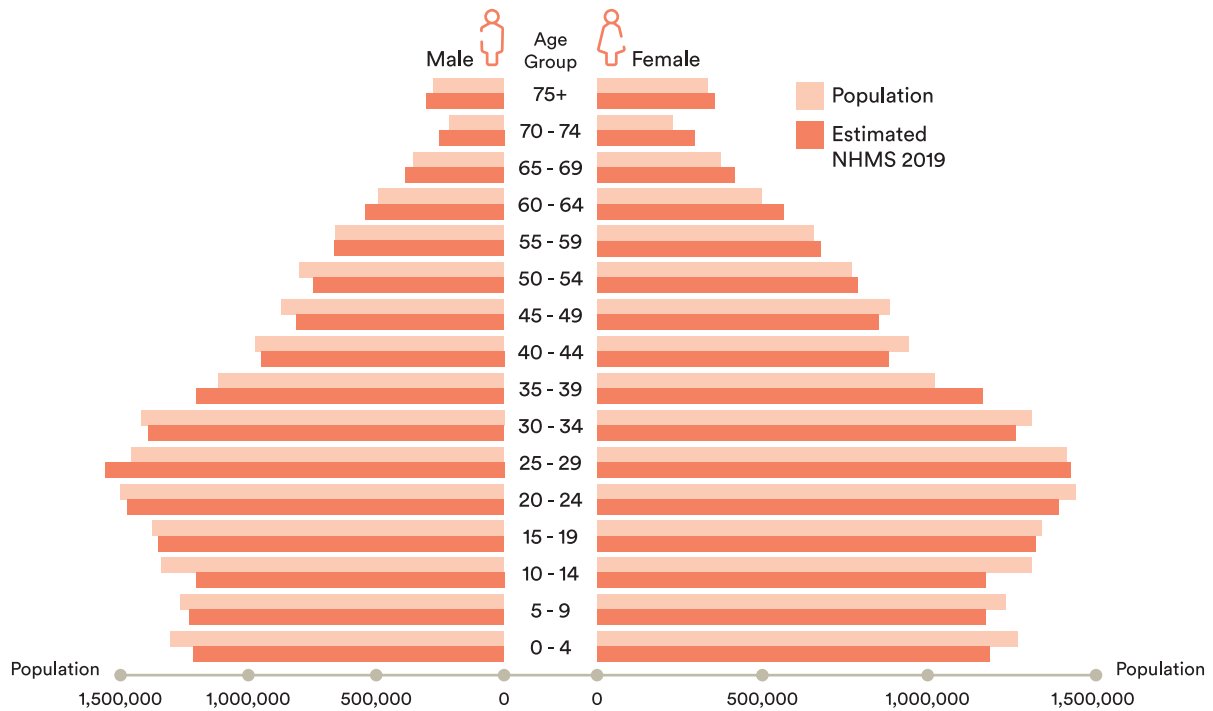


Figure 3.1: Population Pyramid Comparing Estimated Population of NHMS 2019 and Projected Population of Malaysia for 2019 by Age and Sex [1]

Reference:

1. Department of Statistics Malaysia (2016). Population Projection (Revised), Malaysia, 2010-2040

Non-Communi- cable Diseases: Diabetes, Hypertension and Hypercho- lesterolaemia

Non-Communicable Diseases: Diabetes, Hypertension And Hypercholesterolaemia

Introduction

Non-Communicable Diseases (NCDs) are the leading cause of death worldwide. In 2016, NCDs were responsible for 71% of the 57 million deaths globally. An estimated 78% of all NCD deaths and 85% of premature adult NCD deaths occurred in low- and middle-income countries [1].

In Malaysia, NCDs contribute to 71% of premature deaths. According to Malaysian Burden of Disease and Injury Study (2009-2014), cardiovascular and circulatory diseases contributed to 34.8% of deaths [2]. Data from the previous National Health and Morbidity Survey (NHMS) in the year 2011 and 2015 showed an increasing trend for diabetes and hypercholesterolaemia and plateaued trend for hypertension. The prevalence of diabetes was from 11.2% (2011) to 13.4% (2015), hypertension from 32.7% (2011) to 30.3% (2015), and hypercholesterolaemia from 35.1% (2011) to 47.7% (2015) [3] [4].

Malaysia has made enormous gains in the development and delivery of the healthcare system over the past five decades. However, the proportion of Malaysians with risk factors is still high, hence resulting in a substantial economic burden to our country. This report provides a platform for the Ministry of Health to continuously monitor and assess the trends of population health, to strengthen our healthcare system and improve the overall well-being of our population.

4.1 Diabetes

Contributors to this section: Hasimah Ismail, Nabilah Hanis Zainuddin, Nur Liana Ab Majid, Halizah Mat Rifin, Muhammad Fadhli Mohd Yusoff, Feisul Idzwan Mustapha, Arunah Chandran, Masni Mohamad, Fatanah Ismail, Wan Shakira Rodzlan Hasani, Jane Ling Miaw Yn, Tania Gayle Robert Lourdes, Thamil Arasu Saminathan, Ahzairin Ahmad

Objectives

General Objective

To determine the prevalence of diabetes in Malaysia.

Specific Objectives

1. To determine the prevalence of overall raised blood glucose by socio-demographic sub-groups
2. To determine the prevalence of known diabetes by socio-demographic sub-groups
3. To determine the prevalence of raised blood glucose amongst those not known to have diabetes by socio-demographic sub-groups

Methods

The diabetes module was carried out on all respondents aged 18 years old and above. Data was collected through questionnaires and measurement of finger-prick for fasting blood glucose using the CardioChek® portable blood test system.

Variable Definition

1. Overall raised blood glucose was defined as known diabetes and raised blood glucose amongst those not known to have diabetes.
2. Known diabetes was defined as self-reported or being told to have diabetes by a doctor or assistant medical officer.
3. Raised blood glucose amongst those not known to have diabetes was defined as the respondent who was not known to have diabetes and had a fasting capillary blood glucose (FBG) of 7.0 mmol/L or more (or non-fasting blood glucose of more than 11.1 mmol/L) [5].

Findings

A total of 10,464 respondents responded to the diabetes module.

Overall Raised Blood Glucose

The overall prevalence of raised blood glucose among adults aged 18 years and above in this survey was 18.3% (95% CI: 17.08, 19.58).

The prevalence of overall raised blood glucose increased with age, from 5.4% (95% CI: 3.66, 7.91) in the 20-24 years age group, reaching a peak of 43.4% (95% CI: 37.37, 49.65) among the 65-69 years old. The prevalence was reported to be 5.4% (95% CI: 3.66, 7.91) among those aged 20-24 years old and peaked at 65-69 years old [43.4% (95% CI: 37.37, 49.65)]. The prevalence was similar in both urban and rural areas.

There was a large variation between the states, with the highest prevalence of 33.2% (95% CI: 25.06, 42.54) in Negeri Sembilan, followed by Perlis [32.6% (95% CI: 25.97, 40.09)] and Pahang [25.7% (95% CI: 21.11, 30.99)], while the lowest prevalence was reported in Sabah [9.8% (95% CI: 7.40, 12.91)], WP Labuan [12.6% (95% CI: 8.57, 18.19)] and Sarawak [13.1% (95% CI: 10.58, 16.13)].

The prevalence among males and females were 18.2% (95% CI: 16.63, 19.90) and 18.4% (95% CI: 16.99, 19.89) respectively. Indians had the highest prevalence [31.4% (95% CI: 25.85, 37.53)], followed by Malays [21.6% (95% CI: 20.02, 23.17)], Chinese [15.1% (95% CI: 12.52, 18.08)], and Bumiputera Sarawak [12.3% (95% CI: 8.88, 16.68)]. Overall raised blood glucose was more common among widow(er) / divorcee [33.2% (95% CI: 29.27, 37.30)], those with no formal education [28.7% (95% CI: 23.10, 34.94)], retirees [45.8% (95% CI: 40.26, 51.37)] and those from the B40 group [18.5% (95% CI: 17.02, 20.10)].

Known Diabetes

The prevalence of known diabetes was 9.4% (95% CI: 8.66, 10.20).

The prevalence of known diabetes increased with age. The prevalence was reported to be 4.5% (95% CI: 3.04, 6.71) among those aged 35-39 years and peaked at 65-69 years of age 34.3% (95% CI: 28.59, 40.50). The prevalence in the urban areas was 9.7% (95% CI: 8.83, 10.74) compared to rural [8.2% (95% CI: 7.27, 9.19)]. There was a large variation between states; the highest prevalence of 15.2% (95% CI: 12.12, 19.00) in Perak, followed by Melaka [13.7% (95% CI: 10.10, 18.38)] and Perlis [13.5% (95% CI: 10.80, 16.64)]; while the lowest being Sabah [4.1% (95% CI: 2.51, 6.60)] and Sarawak [7.7% (95% CI: 6.15, 9.55)].

The prevalence of known diabetes in males and females were 9.0% (95% CI: 8.01, 10.15) and 9.8% (95% CI: 8.85, 10.84) respectively. In terms of ethnic groups, Indians had the highest prevalence [18.5% (95% CI: 15.12, 22.34)], followed by Malays [11.0% (95% CI: 10.10, 11.95)], Chinese [8.5% (95% CI: 6.69, 10.69)] and Bumiputera Sarawak [7.9% (95% CI: 5.24, 11.89)]. Known diabetes was more common among widow(er) / divorcee [20.9% (95% CI: 17.99, 24.05)], those with no formal education [18.0% (95% CI: 13.84, 23.12)], retiree [32.9% (95% CI: 27.32, 38.98)] and those from the B40 group [9.2% (95% CI: 8.33, 10.17)].

Among those with known diabetes, 25.7% claimed that they were on insulin therapy, 85.6% claimed to be on oral anti-diabetic drugs within the past 2 weeks, 88.0% had received specific diabetes diet advice from healthcare personnel and 75.4% claimed to have been advised by healthcare personnel to lose weight. 23.0% opted for traditional and complementary medication.

Majority of those with known diabetes sought treatment at MOH health clinics 68.2%, followed by MOH hospitals 15.0%, private clinics 12.1% and private hospitals 2.8%. About 0.4% self-medicated by purchasing medications directly from pharmacies and 0.2% sought traditional and complementary medicine practitioners. However, about 2.1% of respondents did not seek any treatment for diabetes.

Among known diabetes, 55.5%, 36.4% and 8.1% reported having had an eye examination within 1 year, 1 to 3 years and more than 3 years ago respectively. Among those who received eye treatment in the last five years, 7.0% received laser treatment, 3.0% received eye injection and other treatments (eye/vitreous surgery) 4.0%.

Raised Blood Glucose Amongst Those Not Known to have Diabetes

The prevalence of raised blood glucose amongst those not known to have diabetes was 8.9% (95% CI: 7.96, 9.93).

The prevalence of raised blood glucose amongst those not known to have diabetes increased with age. The prevalence was reported to be 4.8% (95% CI: 3.15, 7.33) among those aged 20-24 years old and peaked at 45-49 years old [14.2% (95% CI: 11.17, 17.85)]. The prevalence was higher in the rural, 10.2% (95% CI: 8.66, 11.87), compared to the urban areas, 8.5% (95% CI: 7.44, 9.79). There was a large variation between states; the highest prevalence of 20.5% (95% CI: 14.63, 28.05) in Negeri Sembilan, followed by Perlis [19.2% (95% CI: 12.79, 27.78)] and Pahang [16.2% (95% CI: 12.32, 21.06)].

The prevalence of raised blood glucose amongst those not known to have diabetes in males and females were 9.2% (95% CI: 7.92, 10.64) and 8.6% (95% CI: 7.64, 9.65) respectively. Indians had the highest prevalence at 12.9% (95% CI: 7.94, 20.37), followed by Malays [10.6% (95% CI: 9.34, 11.92)], Others [6.7% (95% CI: 4.31, 10.31)], Chinese [6.6% (95% CI: 4.92, 8.83)], Bumiputera Sabah [6.4% (95% CI: 4.66, 8.78)] and Bumiputera Sarawak [4.3% (95% CI: 2.45, 7.46)]. Raised blood glucose amongst those not known to have diabetes was more common among widow(er) / divorcee [12.3% (95% CI: 9.65, 15.56)], those with no formal education [10.6% (95% CI: 7.32, 15.21)], retiree [12.9% (95% CI: 9.68, 16.92)] and those from the B40 group [9.3% (95% CI: 8.18, 10.57)].

4.2 Hypertension

Contributors to this section: Nur Liana Ab Majid, Syarifah Nazeera Syed Anera, Halizah Mat Rifin, Hasimah Ismail, Muhammad Fadhli Mohd Yusoff, Feisul Idzwan Mustapha, Arunah Chandran, Masni Mohamad, Fatanah Ismail, Ahmad Hazri Ilyas, Wan Shakira Rodzlan Hasani, Jane Ling Miaw Yn, Tania Gayle Robert Lourdes, Tamil Arasu Saminathan, Ahzairin Ahmad, Chang Li Cheng, Rizawati Ramli

Objectives

General Objective

To determine the prevalence of hypertension in Malaysia.

Specific Objectives

1. To determine the prevalence of overall raised blood pressure by socio-demographic sub-groups
2. To determine the prevalence of known hypertension by socio-demographic sub-groups
3. To determine the prevalence of raised blood pressure amongst those not known to have hypertension by socio-demographic sub-groups

Methods

The hypertension module was carried out on all respondents aged 18 years old and above. Data was collected through questionnaire and blood pressure was measured using the Omron Digital Automatic Blood Pressure Monitor Model HEM-907. Three readings were taken and an average of the second and third reading was computed for the findings.

Variable Definition

1. Overall raised blood pressure was defined as known hypertension and raised blood pressure amongst those not known to have hypertension.
2. Known hypertension was defined as self-reported of being told to have hypertension by a doctor or assistant medical officer.
3. Raised blood pressure amongst those not known to have hypertension was defined as the respondent who was not known to have hypertension and had systolic blood pressure measurement of ≥ 140 mmHg or diastolic blood pressure of ≥ 90 mmHg [6].

Findings

A total of 10,463 respondents responded to the hypertension module.

Overall Raised Blood Pressure

The overall prevalence of hypertension among adults aged 18 years and above in this survey was 30.0% (95% CI: 28.57, 31.50).

The prevalence of overall raised blood pressure increased with age. The prevalence was reported to be 5.7% (95% CI: 4.09, 7.82) among those aged 20 - 24 years old and the highest prevalence of 81.7% (95% CI: 77.03, 85.55) among those 75 years old and above. The prevalence was higher in the rural areas [32.8% (95% CI: 30.03, 35.63)] compared to urban areas [29.2% (95% CI: 27.57, 30.97)]. There was a large variation between states, with the highest prevalence of 40.5% (95% CI: 35.54, 45.72) in Sarawak, followed by Kelantan [37.1% (95% CI: 33.26, 41.11)] and Perak [35.5% (95% CI: 30.14, 41.23)] while the lowest was Wilayah Persekutuan Putrajaya [24.7% (95% CI: 20.61, 29.36)].

The prevalence in males and females was 30.3% (95% CI: 28.22, 32.50) and 29.7% (95% CI: 27.98, 31.46) respectively. In terms of the main ethnic groups, Bumiputera Sarawak had the highest prevalence at 46.8% (95% CI: 39.65, 54.16), followed by Malays at 32.2% (95% CI: 30.58, 33.92), Bumiputera Sabah at 31.0% (95% CI: 25.19, 37.40), Indians at 30.6% (95% CI: 25.73, 35.91), Chinese at 28.1% (95% CI: 24.51, 31.99) and other ethnicities at 15.2% (95% CI: 11.29, 20.09). The prevalence of overall hypertension was highest among widow(er) / divorcee at 62.5% (95% CI: 57.83, 67.04), those without formal education 48.7% (95% CI: 40.90, 56.58), retirees 66.9% (95% CI: 60.44, 72.79) and those from the B40 group [30.8% (95% CI: 28.97, 32.61)].

Known Hypertension

The prevalence of known hypertension was 15.9% (95% CI: 14.79, 17.05).

The prevalence increased with age, from 1.5% (95% CI: 0.83, 2.51) in the age group 25-29 years old, and the highest prevalence of 65.0% (95% CI: 59.27, 70.23) among the 75 years and above. The prevalence of known hypertension was higher in the rural areas [17.2% (95% CI: 15.37, 19.29)] compared to urban areas [15.5% (95% CI: 14.21, 16.89)]. There was a large variation between states; the highest prevalence 22.7% (95% CI: 16.74, 30.02) in Perak, followed by Negeri Sembilan [19.8% (95% CI: 14.58, 26.31)] and Sarawak [19.6% (95% CI: 16.07, 23.58)], while the lowest being Selangor [12.7% (95% CI: 10.61, 15.16)].

The prevalence among males and females were 14.1% (95% CI: 12.74, 15.58) and 17.8% (95% CI: 16.39, 19.26) respectively. By ethnicity, Bumiputera Sarawak had the highest prevalence [21.3% (95% CI: 16.28, 27.40)] followed by Indians [19.6% (95% CI: 16.16, 23.50)], Chinese [17.8% (95% CI: 14.83, 21.21)], Bumiputera Sabah [17.1% (95% CI: 13.43, 21.50)], Malays [16.6% (95% CI: 15.35, 17.88)] and others [3.6% (95% CI: 2.36, 5.51)]. The prevalence of known hypertension was highest among widow(er) / divorcee [45.3% (95% CI: 41.12, 49.59)], those with no formal education [34.1% (95% CI: 27.83, 40.98)], retiree [48.3% (95% CI: 41.90, 54.85)] and those from the B40 group [16.3% (95% CI: 14.90, 17.85)].

Among those with known hypertension, 89.4% claimed to be on oral anti-hypertensive drugs within the past 2 weeks, 88.1% had received specific diet advice from healthcare personnel, 73.4% claimed to have been advised by healthcare personnel to lose weight and 81.1% had been advised to be more physically active or start exercising. Among the known hypertensives, 15.8% of respondents reported taking herbal and traditional medicine.

With regards to their usual place of treatment, more than half of them sought treatment at MOH health clinics (67.8%), followed by MOH hospitals (15.0%), private clinics (12.6%), and private hospitals (2.1%). About 1.2% self-medicated by purchasing medications directly from pharmacies, 0.2% went to the traditional and complementary medicine practitioners and 1.2% did not seek any treatment.

Raised Blood Pressure Amongst Those Not Known to Have Hypertension

Amongst those not known to have hypertension, the prevalence of raised blood pressure was 14.1% (95% CI: 13.13, 15.19).

There was a general increasing trend in prevalence with age, from 4.6% (95% CI: 3.17, 6.65) in the 20-24 year old age group, reaching a peak of 22.6% (95% CI: 18.48, 27.35) among the 45-49 years old. The prevalence was higher in the rural areas [15.5% (95% CI: 13.85, 17.36)] compared to urban areas [13.7% (95% CI: 12.55, 15.00)]. There was a large variation between states; the highest prevalence of 21.4% (95% CI: 17.22, 26.18) were in Kelantan and Sarawak [21.0 (95% CI: 17.33, 25.16)], followed by Terengganu [18.9% (95% CI: 15.63, 22.75)], while the lowest was Pulau Pinang [9.1% (95% CI: 5.77, 14.01)].

It was higher in males [16.2% (95% CI: 14.59, 17.99)] compared to females [11.9 (95% CI: 10.77, 13.15)]. By ethnicity, Bumiputera Sarawak had the highest prevalence of 25.5% (95% CI: 21.34, 30.22), followed by Malays [15.6% (95% CI: 14.41, 16.98)], Bumiputera Sabah [13.9% (95% CI: 10.65, 17.90)], other ethnicities [11.6% (95% CI: 8.09, 16.24)], Indians [11.0% (95% CI: 7.73, 15.47)], and lastly Chinese [10.3% (95% CI: 8.01, 13.15)]. The prevalence was highest among widow(er) / divorcee [17.2% (95% CI: 14.19, 20.75)], those with primary education [17.5% (95% CI: 15.05, 20.23)], and those from the B40 group [14.4% (95% CI: 13.26, 16.71)].

4.3 Hypercholesterolaemia

Contributors to this section: Halizah Mat Rifin, Masrol Hafizal Ismail, Abdul Muneer Abdul Hamid, Nur Liana Ab Majid, Hasimah Ismail, Muhammad Fadhli Mohd Yusoff, Feisul Idzwan Mustapha, Rizawati Ramli, Chang Li Cheng, Arunah Chandran, Masni Mohamad, Fatanah Ismail, Ahmad Hazri Ilyas, Wan Shakira Rodzlan Hasani, Jane Ling Miaw Yn, Tania Gayle Robert Lourdes, Thamil Arasu Saminathan, Ahzairin Ahmad

Objectives

General Objective

To determine the prevalence of hypercholesterolaemia in Malaysia.

Specific Objectives

1. To determine the prevalence of overall raised blood cholesterol by socio-demographic sub-groups
2. To determine the prevalence of known hypercholesterolaemia by socio-demographic sub-groups
3. To determine the prevalence of raised total cholesterol amongst those not known to have hypercholesterolaemia by socio-demographic sub-groups

Methods

The hypercholesterolemia module was carried out on all respondents aged 18 years old and above. Data was collected through questionnaires and measurement of finger-pricked for total cholesterol using the CardioChek® portable blood test system.

Variable Definition

1. Overall raised blood cholesterol was defined as known hypercholesterolaemia and raised total cholesterol amongst those not known to have hypercholesterolaemia.
2. Known hypercholesterolaemia was defined as self-reported or being told to have hypercholesterolaemia by a doctor or assistant medical officer.
3. Raised total cholesterol amongst those not known to have hypercholesterolaemia was defined as the respondent who was not known to have hypercholesterolaemia and had total cholesterol of 5.2mmol/L or more [7].

Findings

A total of 10,466 respondents responded to the hypercholesterolaemia module.

Overall Raised Blood Cholesterol Prevalence

The prevalence of overall raised blood cholesterol in this survey was 38.1% (95% CI: 36.15, 40.00).

The highest prevalence of overall raised blood cholesterol was among the 70 - 74 years age group [63.4% (95% CI: 56.57, 69.65)]. The highest prevalence of overall raised blood cholesterol was recorded in Kelantan [51.1% (95% CI: 44.58, 57.58)] while the lowest was in Johor [28.9% (95% CI: 23.40, 35.08)]. The prevalence among females was higher [44.5% (95% CI: 42.15, 46.80)] compared to males [32.0% (95% CI: 29.73, 34.36)].

Overall raised blood cholesterol was more common among Malays [43.5% (95% CI: 41.46, 45.57)], widow(er) / divorcee [58.5% (95% CI: 54.26, 62.59)], those with primary education [43.6% (95% CI: 39.64, 47.59)], retirees [62.5% (95% CI: 55.40, 69.02)] and those from the M40 group [40.4% (95% CI: 37.11, 43.84)].

Known Hypercholesterolaemia

The prevalence of known hypercholesterolaemia was 13.5% (95% CI: 12.51, 14.51).

Almost half of the respondents from the 70-74 age group [45.5% (95% CI: 39.02, 52.20)] were aware that they had hypercholesterolaemia. The highest prevalence of known hypercholesterolaemia was recorded in Perak [20.2% (95%

CI: 15.79, 25.53)], while the lowest was in Sabah [8.4% (95% CI: 6.35, 10.95)].

The prevalence of known hypercholesterolaemia among females was higher [15.1% (95% CI: 13.98, 16.35)] compared to males [11.9% (95% CI: 10.61, 13.38)]. Known hypercholesterolaemia was more common among Indians [18.9% (95% CI: 15.18, 23.28)], widow(er)s / divorcees [34.1% (95% CI: 30.23, 38.21)], those with no formal education [21.7% (95% CI: 16.70, 27.77)] and retirees [42.0% (95% CI: 35.56, 48.70)].

Among those with known hypercholesterolaemia, 80.1% claimed to be on oral drugs within the past 2 weeks, 87.7% claimed they had received specific diet advice from healthcare personnel, 73.9% claimed to have been advised by healthcare personnel to lose weight and 82.2% had been advised to be more physically active or to start exercising. 18.1% of respondents reported taking herbal and traditional medicine to treat their condition.

Most respondents sought treatment at Ministry of Health (MOH) clinics (67.1%), MOH hospitals (14.6%), private clinics (12.8%) and private hospitals (3.3%). About 1.0% self-medicated by purchasing medications directly from pharmacies and 0.3% preferred to see traditional, herbal and complementary medicine practitioners. 0.8% did not seek any treatment for their condition.

Raised Total Cholesterol Amongst Those Not Known to Have Hypercholesterolaemia

For this survey, the prevalence of raised total cholesterol amongst those not known to have hypercholesterolaemia was 24.6% (95% CI: 23.03, 26.19).

The highest prevalence of raised total cholesterol amongst those not known to have hypercholesterolaemia was recorded among those in the 50-54 years age group [36.0% (95% CI: 31.93, 40.28)]. The highest prevalence was in Kelantan [40.5% (95% CI: 34.28, 46.98)] while the lowest was in WP Labuan [14.7% (95% CI: 10.92, 19.53)]. The prevalence among females was higher [29.3% (95% CI: 27.35, 31.41)] compared to males [20.1% (95% CI: 18.19, 22.11)].

Raised total cholesterol was more common among Malays [28.8% (95% CI: 26.91, 30.66)], married adults [26.2% (95% CI: 24.34, 28.11)], those with secondary education [25.1% (95% CI: 23.11, 27.14)], unpaid workers / homemakers [30.7% (95% CI: 27.69, 33.90)] and those from the M40 group [27.2% (95% CI: 24.25, 30.41)].

Conclusion

The burden of diabetes has increased substantially over the years. Information from the Global Burden of Disease Study suggests that the biggest contributor amongst the modifiable behavioural risk factors is unhealthy eating. The exposure to unhealthy diet occurs throughout the lifespan of an individual and accumulates over his/her lifetime.

With the increasing prevalence of diabetes and high prevalences of hypertension and hypercholesterolaemia, it is unlikely that Malaysia will be able to achieve target 3.4 of the United Nations Sustainable Development Goals (of reducing premature mortality due to NCDs). At the current trajectory, it is also unlikely for Malaysia to reach the nine voluntary global targets for the prevention and control of NCDs.

In view of the increasing and high burden of NCD risk factors, it is expected that the costs of treating patients with NCDs and their related complications will continue to increase. NCDs will continue to dominate health services provision at all levels of care, particularly at secondary and tertiary levels. This will also add to the increasing need for rehabilitation and palliative care services, which are currently of limited availability and accessibility in Malaysia.

Recommendations

There is an urgent need to reduce the exposure to NCD risk factors amongst Malaysians. Firstly, we must address and acknowledge that NCDs are a development issue. The underlying wider determinants of these NCD risk factors include poverty, income disparity, rapid urbanisation, a rapidly ageing society, food security and low health literacy. There is an urgent need to operationalise the “whole-of-government” approach. The challenge remains that ministries and agencies outside of health, view NCDs as a “health issue” and as such, there is no systematic transfer of responsibility and accountability for policy actions in addressing the wider determinants of NCDs.

Table 4.1: Non-Communicable Diseases Trend in Malaysia

Non-Communicable Diseases	2011	2015	2019
Diabetes			
Overall Raised Blood Glucose	11.2	13.4	18.3
Known Diabetes	7.2	8.3	9.4
Raised Blood Glucose Among Those Not Known to Have Diabetes	4.0	5.1	8.9
Hypertension			
Overall Raised Blood Pressure	32.7	30.3	30.0
Known Hypertension	12.8	13.1	15.9
Raised Blood Pressure Among Those Not Known to Have Hypertension	19.8	17.2	14.1
Hypercholesterolaemia			
Overall Raised Blood Cholesterol	35.1	47.7	38.1
Known Hypercholesterolaemia	8.4	9.1	13.5
Raised Total Cholesterol Among Those Not Known to Have Hypercholesterolaemia	26.6	38.6	24.6

The solutions for those who are at risk and unknown needs to be cost-efficient to drive awareness at a national scale. Whereas for those who are known, NCD care needs to be efficient and effective at a lower cost. Digital health is potentially a powerful enabler to address the growing burden of NCDs and achieve UHC – whether supporting prevention, management and control.

The World Health Organisation (WHO) has published a list of “best buys” and “good buys”, interventions with evidence of cost-effectiveness. MOH has also published “Policy Options to Combat Obesity in Malaysia” in 2017, developed by an expert working group, that lists the potential policy options for interventions. Despite a convincing body of evidence and strong global support, there are still many policy interventions that have been politically difficult for the Malaysian Government to adopt. The Government now must be ready to make these difficult decisions if we are to effectively address this high burden of NCDs.

References

1. World Health Organization, Global Health Observatory (GHO) data, NCD mortality and morbidity, https://www.who.int/gho/ncd/mortality_morbidity/en/ Access Date 18 November 2019
2. Institute of Public Health (IPH) 2017. Malaysian Burden of Disease and Injury Study 2009-2014
3. Institute for Public Health (IPH). National Health and Morbidity Survey 2011 (NHMS 2011). Vol. II: Non-Communicable Diseases. Kuala Lumpur: Ministry of Health Malaysia; 2011. ISBN 978-967-3887-68-2
4. Institute of Public Health (IPH) 2015. National Health and Morbidity Survey 2015 (NHMS 2015). Vol II: Non-Communicable Diseases, Risk Factors & Other Health Problems;2015.
5. Classification of diabetes mellitus. Geneva: World Health Organization; 2019. Licence: CC BY-NC-SA 3.0 IGO
6. Working Group on Hypertension CPG (2018). Clinical Practice Guidelines - Management Of Hypertension, 5TH Edition.
7. National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) final report *Circulation*, 106 (2002)3143–421.

Table 4.2: Prevalence of Overall Raised Blood Glucose Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,464)

Sociodemographic Characteristics	Overall Raised Blood Glucose					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	2,629	3,891,965	18.3	17.08	19.58	1,191	1,991,247	18.2	16.63	19.90
State										
Johor	217	477,575	19.7	15.92	24.16	95	259,559	20.5	15.12	27.28
Kedah	159	319,229	24.9	20.71	29.58	79	163,414	24.9	19.50	31.25
Kelantan	147	219,012	19.5	15.37	24.54	59	94,306	17.1	12.41	23.15
Melaka	151	101,214	17.0	12.48	22.64	67	46,708	16.4	9.96	25.92
Negeri Sembilan	235	234,203	33.2	25.06	42.54	108	124,986	35.1	25.54	46.06
Pahang	196	262,249	25.7	21.11	30.99	95	131,636	24.7	19.03	31.37
Pulau Pinang	178	228,349	18.2	12.48	25.76	84	131,655	20.5	13.33	30.29
Perak	128	272,611	17.6	14.14	21.77	59	163,927	20.8	15.18	27.79
Perlis	221	52,184	32.6	25.97	40.09	84	20,453	26.4	19.36	34.80
Selangor	264	824,168	18.0	14.81	21.67	115	407,918	17.0	13.50	21.19
Terengganu	178	152,036	20.5	16.99	24.60	77	69,322	18.6	13.82	24.52
Sabah	121	252,422	9.8	7.40	12.91	58	131,803	9.7	6.57	14.10
Sarawak	124	242,395	13.1	10.58	16.13	57	124,646	13.2	9.77	17.60
WP Kuala Lumpur	120	233,230	18.0	13.88	22.91	54	110,225	16.9	11.75	23.69
WP Labuan	69	7,992	12.6	8.57	18.19	33	4,147	13.2	8.88	19.11
WP Putrajaya	121	13,095	22.9	18.80	27.54	67	6,544	25.8	19.22	33.77
Location										
Urban	1,519	3,036,491	18.3	16.83	19.84	698	1,572,736	18.5	16.57	20.52
Rural	1,110	855,474	18.3	16.48	20.36	493	418,511	17.3	14.89	20.02
Age Group										
18-19	24	38,232	4.3	2.48	7.42	13	19,181	3.9*	1.85	8.06
20-24	50	155,085	5.4	3.66	7.91	25	97,686	6.5	3.59	11.57
25-29	71	203,573	6.8	4.80	9.53	38	119,216	7.5	4.75	11.70
30-34	132	300,307	11.3	8.55	14.76	61	146,749	10.4	7.21	14.76
35-39	161	288,418	12.2	9.73	15.11	79	168,417	13.8	10.15	18.47
40-44	186	316,161	17.3	14.28	20.69	89	154,943	16.1	12.18	20.86
45-49	248	410,130	24.7	20.81	29.00	100	199,236	24.2	18.54	30.87
50-54	330	467,184	30.4	26.41	34.78	154	235,039	31.0	25.27	37.34
55-59	365	418,253	31.3	26.88	36.04	167	218,454	32.5	26.20	39.46
60-64	359	468,937	42.4	37.18	47.78	143	222,537	40.5	33.16	48.30
65-69	289	349,022	43.4	37.37	49.65	124	182,846	46.5	37.71	55.54
70-74	204	223,736	40.6	34.99	46.57	97	113,076	43.7	35.77	52.01
75 & above	210	252,927	38.4	33.15	44.02	101	113,868	37.0	29.12	45.61
Ethnicity										
Malay ^a	1,868	2,346,041	21.6	20.02	23.17	817	1,120,888	20.7	18.67	22.82
Chinese	276	689,024	15.1	12.52	18.08	154	421,065	17.9	14.22	22.39
Indian	250	389,730	31.4	25.85	37.53	117	196,881	33.1	26.17	40.86
Bumiputera Sabah	90	153,066	11.2	7.90	15.54	38	69,427	10.2	6.26	16.15
Bumiputera Sarawak	70	116,887	12.3	8.88	16.68	30	55,497	11.4	7.37	17.35
Others	75	197,216	8.8	6.21	12.21	35	127,490	9.1	5.53	14.55

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	1,438	1,900,718	18.4	16.99	19.89
State					
Johor	122	218,017	18.8	15.11	23.18
Kedah	80	155,815	24.8	20.33	29.99
Kelantan	88	124,706	21.9	17.08	27.61
Melaka	84	54,506	17.4	12.53	23.76
Negeri Sembilan	127	109,217	31.3	22.88	41.16
Pahang	101	130,613	26.9	20.70	34.18
Pulau Pinang	94	96,695	15.8	9.92	24.09
Perak	69	108,683	14.3	10.12	19.94
Perlis	137	31,732	38.6	29.15	48.92
Selangor	149	416,250	19.1	15.25	23.58
Terengganu	101	82,714	22.5	17.38	28.66
Sabah	63	120,619	9.9	7.32	13.37
Sarawak	67	117,749	13.0	10.26	16.39
WP Kuala Lumpur	66	123,005	19.0	13.63	25.94
WP Labuan	36	3,846	12.1	6.67	20.82
WP Putrajaya	54	6,551	20.5	15.74	26.34
Location					
Urban	821	1,463,755	18.1	16.42	19.91
Rural	617	436,963	19.5	17.34	21.76
Age Group					
18-19	11	19,051	4.8*	2.48	9.18
20-24	25	57,400	4.2	2.57	6.71
25-29	33	84,357	6.0	3.82	9.24
30-34	71	153,558	12.3	8.69	17.14
35-39	82	120,001	10.4	7.78	13.86
40-44	97	161,218	18.6	14.92	22.93
45-49	148	210,893	25.2	20.12	31.01
50-54	176	232,145	29.9	24.59	35.79
55-59	198	199,799	30.1	25.08	35.56
60-64	216	246,399	44.3	37.88	50.84
65-69	165	166,176	40.4	32.99	48.37
70-74	107	110,661	37.9	30.43	46.04
75 & above	109	139,059	39.7	31.82	48.20
Ethnicity					
Malay ^a	817	1,120,888	20.7	18.67	22.82
Chinese	154	421,065	17.9	14.22	22.39
Indian	117	196,881	33.1	26.17	40.86
Bumiputera Sabah	38	69,427	10.2	6.26	16.15
Bumiputera Sarawak	30	55,497	11.4	7.37	17.35
Others	35	127,490	9.1	5.53	14.55

Table 4.2: Prevalence of Overall Raised Blood Glucose Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,464) (cont'd)

Sociodemographic Characteristics	Overall Raised Blood Glucose					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Marital Status										
Single	195	467,040	7.7	6.27	9.53	112	303,274	8.2	6.25	10.68
Married	1,975	2,923,144	21.3	19.74	22.94	1,002	1,592,385	23.0	20.93	25.26
Widow(er)/Divorcee	459	501,781	33.2	29.27	37.30	77	95,588	30.1	22.03	39.57
Education Level										
No Formal Education	231	311,796	28.7	23.10	34.94	54	99,792	24.3	15.47	36.01
Primary Education	795	981,513	23.9	21.14	26.98	347	489,715	21.8	18.15	26.03
Secondary Education	1,196	1,874,850	18.1	16.59	19.77	579	986,825	18.0	15.95	20.27
Tertiary Education	399	710,280	12.7	10.76	14.85	206	411,035	15.1	12.20	18.59
Occupation										
Government Employee	223	271,526	17.4	14.01	21.29	131	171,007	20.2	15.47	25.95
Private Employee	484	1,044,006	12.7	11.06	14.59	320	708,844	13.5	11.45	15.78
Self Employed	459	634,186	17.1	14.84	19.73	296	431,411	16.7	13.92	19.95
Unpaid Worker/Homemaker	580	752,145	21.1	18.83	23.60	28	58,460	35.1*	17.50	57.97
Retiree	232	364,022	45.8	40.26	51.37	167	286,117	49.3	42.38	56.26
Student	22	39,419	5.4	3.06	9.21	12	23,579	7.5*	3.40	15.54
Not Working ^b	627	783,431	29.1	26.46	31.84	235	308,600	26.3	22.56	30.47
Household Income Group										
Less than RM 1,000	344	434,946	25.4	21.80	29.29	114	165,146	24.2	18.46	30.95
RM 1,000 - RM 1,999	552	756,067	18.5	16.16	21.10	231	359,988	16.4	13.39	19.90
RM 2,000 - RM 3,999	747	1,120,606	17.5	15.38	19.95	369	624,868	17.9	15.01	21.20
RM 4,000 - RM 5,999	360	536,658	16.1	13.59	18.99	185	297,858	16.6	13.43	20.29
RM 6,000 - RM 7,999	202	385,450	19.7	16.05	23.83	99	212,968	20.4	15.49	26.45
RM 8,000 - RM 9,999	82	146,052	16.3	11.47	22.55	39	68,602	15.1	9.84	22.36
RM 10,000 and above	136	219,704	13.7	10.44	17.66	76	140,398	15.6	11.53	20.74
Household Income Quintile										
Quintile 1	663	875,284	23.0	20.48	25.83	241	374,777	21.5	17.84	25.65
Quintile 2	485	698,828	17.2	14.73	20.05	230	371,151	16.1	12.76	20.06
Quintile 3	457	657,388	16.5	14.11	19.21	222	353,169	16.6	13.31	20.54
Quintile 4	398	616,776	16.8	14.29	19.57	206	348,763	17.5	14.34	21.26
Quintile 5	420	751,206	16.8	14.37	19.57	214	421,969	17.6	14.37	21.36
Household Income Category										
Bottom 40%	1,729	2,406,324	18.5	17.02	20.10	761	1,185,576	17.4	15.43	19.66
Middle 40%	536	910,352	17.6	15.37	20.17	266	503,301	18.4	15.33	21.87
Top 20%	158	282,806	15.5	12.33	19.27	86	180,952	17.6	13.84	22.01

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli
 b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Marital Status					
Single	83	163,766	7.0	5.16	9.51
Married	973	1,330,758	19.5	17.79	21.42
Widow(er)/Divorcee	382	406,193	34.0	29.71	38.54
Education Level					
No Formal Education	177	212,004	31.3	25.12	38.23
Primary Education	448	491,797	26.5	23.17	30.07
Secondary Education	617	888,024	18.2	16.26	20.43
Tertiary Education	193	299,244	10.3	8.36	12.75
Occupation					
Government Employee	92	100,518	14.0	10.33	18.68
Private Employee	164	335,162	11.4	9.26	13.92
Self Employed	163	202,775	18.1	14.57	22.37
Unpaid Worker/Homemaker	552	693,686	20.4	18.24	22.82
Retiree	65	77,905	36.2	26.92	46.63
Student	10	15,840	3.8*	1.80	7.73
Not Working ^b	392	474,831	31.2	27.56	35.08
Household Income Group					
Less than RM 1,000	230	269,800	26.2	22.22	30.52
RM 1,000 - RM 1,999	321	396,079	21.0	17.81	24.51
RM 2,000 - RM 3,999	378	495,738	17.1	14.79	19.74
RM 4,000 - RM 5,999	175	238,799	15.6	12.52	19.15
RM 6,000 - RM 7,999	103	172,482	18.8	14.27	24.28
RM 8,000 - RM 9,999	43	77,449	17.5	10.38	27.99
RM 10,000 and above	60	79,305	11.2	7.72	15.95
Household Income Quintile					
Quintile 1	422	500,507	24.4	21.32	27.69
Quintile 2	255	327,677	18.7	15.75	22.14
Quintile 3	235	304,219	16.4	13.69	19.46
Quintile 4	192	268,013	15.9	12.99	19.22
Quintile 5	206	329,237	15.9	12.87	19.50
Household Income Category					
Bottom 40%	968	1,220,748	19.7	17.96	21.51
Middle 40%	270	407,050	16.8	14.00	20.08
Top 20%	72	101,855	12.8	8.99	17.92

Table 4.3: Prevalence of Known Diabetes Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,464)

Sociodemographic Characteristics	Known Diabetes					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	1,403	1,999,450	9.4	8.66	10.20	607	986,574	9.0	8.01	10.15
State										
Johor	114	211,468	8.7	7.05	10.77	40	90,575	7.2	5.05	10.09
Kedah	79	165,203	12.9	10.20	16.12	45	89,698	13.7	9.85	18.68
Kelantan	83	108,518	9.7	8.10	11.55	30	36,182	6.6	4.49	9.51
Melaka	107	81,897	13.7	10.10	18.38	46	40,218	14.2	8.26	23.20
Negeri Sembilan	114	89,439	12.7	9.63	16.54	47	41,239	11.6	8.03	16.44
Pahang	78	97,036	9.5	7.05	12.76	38	52,238	9.8	6.28	14.97
Pulau Pinang	66	110,854	8.8	5.37	14.19	31	67,488	10.5	6.13	17.51
Perak	108	235,785	15.2	12.12	19.00	48	141,118	17.9	12.41	25.10
Perlis	107	21,502	13.5	10.80	16.64	35	6,887	8.9	5.83	13.29
Selangor	153	408,113	8.9	6.98	11.29	67	200,838	8.4	6.09	11.40
Terengganu	92	77,506	10.5	8.11	13.41	36	33,424	9.0	5.82	13.55
Sabah	56	105,240	4.1	2.51	6.60	25	53,625	3.9*	2.14	7.16
Sarawak	75	141,915	7.7	6.15	9.55	31	62,251	6.6	4.86	8.88
WP Kuala Lumpur	75	133,647	10.3	7.91	13.29	35	64,600	9.9	6.74	14.32
WP Labuan	43	5,214	8.2	5.25	12.66	23	2,843	9.0	6.22	12.94
WP Putrajaya	53	6,110	10.7	8.20	13.78	30	3,350	13.2	8.95	19.11
Location										
Urban	860	1,617,782	9.7	8.83	10.74	388	822,189	9.7	8.40	11.07
Rural	543	381,668	8.2	7.27	9.19	219	164,385	6.8	5.63	8.18
Age Group										
18-19	0	-	-	-	-	0	-	-	-	-
20-24	6	16,470	0.6*	0.20	1.60	2	4,392	0.3*	0.05	1.89
25-29	10	24,019	0.8*	0.33	1.94	3	7,392	0.5*	0.12	1.86
30-34	29	51,697	1.9	1.13	3.33	10	12,187	0.9*	0.4	2.1
35-39	46	107,435	4.5	3.04	6.71	22	63,887	5.2	2.9	9.3
40-44	71	117,413	6.4	4.74	8.60	31	58,870	6.1	3.87	9.47
45-49	103	174,400	10.5	7.84	13.91	43	89,679	10.9	7.29	15.93
50-54	170	287,593	18.7	15.42	22.56	77	146,659	19.3	14.52	25.27
55-59	223	271,943	20.3	16.96	24.19	102	144,330	21.5	16.64	27.22
60-64	252	325,535	29.4	24.86	34.45	98	154,781	28.2	21.15	36.45
65-69	210	275,763	34.3	28.59	40.50	85	138,756	35.3	26.90	44.70
70-74	138	158,703	28.8	23.65	34.65	63	76,504	29.6	22.17	38.25
75 & above	145	188,480	28.6	23.86	33.97	71	89,137	29.0	21.68	37.50
Ethnicity										
Malay ^a	971	1,196,386	11.0	10.10	11.95	397	547,881	10.1	8.85	11.51
Chinese	163	387,092	8.5	6.69	10.69	93	242,750	10.3	7.66	13.83
Indian	157	229,152	18.5	15.12	22.34	73	113,792	19.1	14.50	24.82
Bumiputera Sabah	46	64,951	4.7	2.46	8.93	21	32,627	4.8	2.02	10.92
Bumiputera Sarawak	42	75,829	7.9	5.24	11.89	18	35,039	7.2	4.30	11.89
Others	24	46,040	2.0	1.19	3.48	5	14,483	1.0	0.39	2.70

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	796	1,012,876	9.8	8.85	10.84
State					
Johor	74	120,893	10.4	8.05	13.42
Kedah	34	75,505	12.0	8.75	16.35
Kelantan	53	72,337	12.7	9.45	16.85
Melaka	61	41,679	13.3	10.05	17.49
Negeri Sembilan	67	48,200	13.8	10.60	17.80
Pahang	40	44,798	9.2	6.84	12.34
Pulau Pinang	35	43,366	7.1*	3.42	14.03
Perak	60	94,667	12.5	8.97	17.13
Perlis	72	14,616	17.8	13.47	23.06
Selangor	86	207,276	9.5	6.92	12.89
Terengganu	56	44,082	12.0	9.02	15.81
Sabah	31	51,616	4.3	2.70	6.64
Sarawak	44	79,664	8.8	6.84	11.28
WP Kuala Lumpur	40	69,047	10.7	7.26	15.46
WP Labuan	20	2,371	7.4*	3.00	17.27
WP Putrajaya	23	2,760	8.7	5.49	13.38
Location					
Urban	472	795,594	9.8	8.69	11.12
Rural	324	217,283	9.7	8.46	11.04
Age Group					
18-19	0	-	-	-	-
20-24	4	12,078	0.9*	0.25	3.00
25-29	7	16,627	1.2*	0.39	3.54
30-34	19	39,510	3.2*	1.64	6.03
35-39	24	43,548	3.8	2.34	6.09
40-44	40	58,543	6.8	4.59	9.83
45-49	60	84,720	10.1	6.51	15.39
50-54	93	140,934	18.1	14.10	23.04
55-59	121	127,613	19.2	15.33	23.78
60-64	154	170,755	30.7	25.44	36.45
65-69	125	137,007	33.3	26.39	41.11
70-74	75	82,199	28.2	21.56	35.89
75 & above	74	99,343	28.4	21.36	36.62
Ethnicity					
Malay ^a	574	648,505	11.9	10.73	13.13
Chinese	70	144,342	6.5	4.52	9.27
Indian	84	115,360	17.8	13.39	23.37
Bumiputera Sabah	25	32,323	4.7	2.76	7.85
Bumiputera Sarawak	24	40,790	8.7	5.29	13.97
Others	19	31,557	3.7	2.10	6.52

Table 4.3: Prevalence of Known Diabetes Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,464) (cont'd)

Sociodemographic Characteristics	Known Diabetes					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Marital Status										
Single	43	93,130	1.5	0.98	2.43	22	49,693	1.3	0.80	2.23
Married	1,071	1,590,721	11.6	10.60	12.66	544	878,346	12.7	11.23	14.33
Widow(er)/Divorcee	289	315,599	20.9	17.99	24.05	41	58,534	18.4	11.91	27.38
Education Level										
No Formal Education	145	196,035	18.0	13.84	23.12	28	53,025	12.9	7.32	21.77
Primary Education	478	571,624	13.9	11.93	16.22	200	268,803	12.0	9.22	15.43
Secondary Education	588	903,413	8.7	7.77	9.80	276	468,380	8.5	7.24	10.07
Tertiary Education	187	315,734	5.6	4.49	7.04	101	193,371	7.1	5.30	9.48
Occupation										
Government Employee	98	128,700	8.2	6.03	11.12	58	81,941	9.7	6.43	14.32
Private Employee	181	364,666	4.4	3.60	5.47	123	245,114	4.7	3.63	5.96
Self Employed	200	280,526	7.6	6.23	9.20	131	193,906	7.5	5.83	9.64
Unpaid Worker/Homemaker	321	418,443	11.7	9.92	13.87	15	43,817	26.3*	10.62	51.76
Retiree	162	261,626	32.9	27.32	38.98	113	198,315	34.2	27.40	41.67
Student	2	6,146	0.8	0.2	3.7	2	6,146	1.9*	0.43	8.26
Not Working ^b	438	537,965	20.0	17.76	22.38	164	215,956	18.4	15.16	22.20
Household Income Group										
Less than RM 1,000	205	268,356	15.6	12.80	18.99	67	109,345	16.0	10.96	22.76
RM 1,000 - RM 1,999	286	377,866	9.2	7.75	11.00	115	166,676	7.6	5.77	9.92
RM 2,000 - RM 3,999	391	543,101	8.5	7.21	10.01	179	283,280	8.1	6.37	10.29
RM 4,000 - RM 5,999	167	233,787	7.0	5.54	8.85	83	123,028	6.8	5.01	9.28
RM 6,000 - RM 7,999	105	200,952	10.2	7.66	13.57	48	111,391	10.7	7.52	14.97
RM 8,000 - RM 9,999	38	69,358	7.7	4.81	12.18	16	41,873	9.2	5.27	15.54
RM 10,000 and above	68	95,925	6.0	3.91	8.98	37	55,294	6.1	3.70	10.03
Household Income Quintile										
Quintile 1	367	482,336	12.7	10.88	14.77	125	198,494	11.4	8.70	14.75
Quintile 2	255	334,124	8.2	6.74	10.02	111	154,607	6.7	4.91	9.07
Quintile 3	239	331,562	8.3	6.74	10.23	113	179,593	8.4	6.13	11.52
Quintile 4	188	275,089	7.5	5.88	9.46	95	149,635	7.5	5.54	10.13
Quintile 5	211	366,235	8.2	6.61	10.12	101	208,557	8.7	6.62	11.35
Household Income Category										
Bottom 40%	915	1,196,718	9.2	8.33	10.17	376	546,212	8.0	6.88	9.36
Middle 40%	266	462,053	9.0	7.31	10.93	134	272,725	10.0	7.70	12.78
Top 20%	79	130,575	7.1	4.99	10.15	35	71,950	7.0	4.54	10.59

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Marital Status					
Single	21	43,437	1.9*	0.84	4.08
Married	527	712,375	10.5	9.27	11.79
Widow(er)/Divorcee	248	257,065	21.5	18.40	24.98
Education Level					
No Formal Education	117	143,010	21.1	16.29	26.91
Primary Education	278	302,821	16.3	13.79	19.17
Secondary Education	312	435,034	8.9	7.60	10.49
Tertiary Education	86	122,363	4.2	3.02	5.89
Occupation					
Government Employee	40	46,758	6.5	4.28	9.78
Private Employee	58	119,552	4.1	2.78	5.90
Self Employed	69	86,620	7.8	5.64	10.57
Unpaid Worker/Homemaker	306	374,626	11.0	9.42	12.88
Retiree	49	63,311	29.4	20.94	39.61
Student	0	-	-	-	-
Not Working ^b	274	322,009	21.2	18.32	24.31
Household Income Group					
Less than RM 1,000	138	159,011	15.4	12.51	18.87
RM 1,000 - RM 1,999	171	211,190	11.2	9.07	13.71
RM 2,000 - RM 3,999	212	259,821	9.0	7.42	10.81
RM 4,000 - RM 5,999	84	110,759	7.2	5.35	9.67
RM 6,000 - RM 7,999	57	89,561	9.7	6.44	14.49
RM 8,000 - RM 9,999	22	27,485	6.2*	2.85	13.01
RM 10,000 and above	31	40,632	5.7	3.52	9.21
Household Income Quintile					
Quintile 1	242	283,843	13.8	11.78	16.14
Quintile 2	144	179,516	10.3	8.06	12.99
Quintile 3	126	151,969	8.2	6.46	10.30
Quintile 4	93	125,453	7.4	5.56	9.85
Quintile 5	110	157,678	7.6	5.66	10.18
Household Income Category					
Bottom 40%	539	650,506	10.5	9.29	11.80
Middle 40%	132	189,328	7.8	6.05	10.05
Top 20%	44	58,625	7.4	4.60	11.61

Table 4.4: Prevalence of Raised Blood Glucose Amongst Those Not Known to Have Diabetes Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,464)

Sociodemographic Characteristics	Raised Blood Glucose Amongst Those Not Known to Have Diabetes					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	1,226	1,892,515	8.9	7.96	9.93	584	1,004,674	9.2	7.92	10.64
State										
Johor	103	266,107	11.0	7.70	15.45	55	168,983	13.4	8.52	20.38
Kedah	80	154,025	12.0	8.03	17.57	34	73,716	11.2*	5.74	20.84
Kelantan	64	110,493	9.9	6.58	14.53	29	58,124	10.6	6.13	17.56
Melaka	44	19,317	3.2*	1.36	7.51	21	6,490	2.3*	0.71	7.08
Negeri Sembilan	121	144,764	20.5	14.63	28.05	61	83,747	23.5	15.38	34.25
Pahang	118	165,213	16.2	12.32	21.06	57	79,398	14.9	10.24	21.16
Pulau Pinang	112	117,495	9.4	5.65	15.13	53	64,166	10.0	5.91	16.47
Perak	20	36,825	2.4*	1.12	5.01	11	22,809	2.9*	0.98	8.25
Perlis	114	30,682	19.2	12.79	27.78	49	13,566	17.5	11.44	25.79
Selangor	111	416,055	9.1	6.80	12.03	48	207,080	8.6	6.04	12.19
Terengganu	86	74,529	10.1	7.75	12.98	41	35,897	9.6	6.49	14.04
Sabah	65	147,182	5.7	4.32	7.54	33	78,178	5.8	3.67	8.92
Sarawak	49	100,480	5.4	3.79	7.74	26	62,395	6.6	3.98	10.78
WP Kuala Lumpur	45	99,583	7.7	4.55	12.64	19	45,625	7.0*	3.11	14.99
WP Labuan	26	2,779	4.4	2.65	7.16	10	1,304	4.1*	1.77	9.41
WP Putrajaya	68	6,986	12.2	8.74	16.78	37	3,194	12.6	7.93	19.47
Location										
Urban	659	1,418,708	8.5	7.44	9.79	310	750,547	8.8	7.32	10.57
Rural	567	473,807	10.2	8.66	11.87	274	254,127	10.5	8.42	13.03
Age Group										
18-19	24	38,232	4.3	2.48	7.42	13	19,181	3.9*	1.85	8.06
20-24	44	138,615	4.8	3.15	7.33	23	93,293	6.2*	3.34	11.34
25-29	61	179,554	6.0	4.11	8.66	35	111,824	7.1	4.37	11.19
30-34	103	248,611	9.3	6.87	12.60	51	134,563	9.5	6.44	13.87
35-39	115	180,983	7.6	5.74	10.09	57	104,529	8.6	5.85	12.37
40-44	115	198,748	10.8	8.53	13.69	58	96,073	10.0	6.97	14.03
45-49	145	235,730	14.2	11.17	17.85	57	109,557	13.3	9.06	19.09
50-54	160	179,591	11.7	9.41	14.45	77	88,380	11.7	8.54	15.69
55-59	142	146,310	10.9	8.65	13.75	65	74,123	11.0	7.82	15.31
60-64	107	143,401	13.0	9.74	17.05	45	67,757	12.3	8.20	18.13
65-69	79	73,260	9.1	6.65	12.37	39	44,091	11.2	7.38	16.68
70-74	66	65,034	11.8	8.31	16.53	34	36,572	14.1	8.57	22.44
75 & above	65	64,446	9.8	7.09	13.39	30	24,730	8.0	4.75	13.26
Ethnicity										
Malay ^a	897	1,149,655	10.6	9.34	11.92	420	573,007	10.6	8.96	12.41
Chinese	113	301,932	6.6	4.92	8.83	61	178,314	7.6	5.22	10.93
Indian	93	160,578	12.9	7.94	20.37	44	83,089	14.0	8.03	23.19
Bumiputera Sabah	44	88,116	6.4	4.66	8.78	17	36,800	5.4	3.25	8.84
Bumiputera Sarawak	28	41,059	4.3	2.45	7.46	12	20,458	4.2	1.76	9.75
Others	51	151,176	6.7	4.31	10.31	30	113,006	8.0	4.57	13.79

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	642	887,841	8.6	7.64	9.65
State					
Johor	48	97,124	8.4	6.13	11.37
Kedah	46	80,309	12.8	9.57	16.94
Kelantan	35	52,369	9.2	6.22	13.38
Melaka	23	12,827	4.1*	1.67	9.73
Negeri Sembilan	60	61,017	17.5	11.92	24.92
Pahang	61	85,815	17.7	12.76	23.98
Pulau Pinang	59	53,329	8.7*	4.68	15.57
Perak	9	14,016	1.8*	0.61	5.50
Perlis	65	17,116	20.8	12.59	32.39
Selangor	63	208,975	9.6	6.97	13.01
Terengganu	45	38,632	10.5	6.58	16.41
Sabah	32	69,004	5.7	4.12	7.80
Sarawak	23	38,085	4.2	2.55	6.88
WP Kuala Lumpur	26	53,958	8.4	5.29	12.94
WP Labuan	16	1,474	4.6	2.84	7.43
WP Putrajaya	31	3,791	11.9	7.59	18.13
Location					
Urban	349	668,161	8.3	7.14	9.54
Rural	293	219,680	9.8	8.30	11.49
Age Group					
18-19	11	19,051	4.8*	2.48	9.18
20-24	21	45,322	3.3	1.97	5.45
25-29	26	67,730	4.8	2.94	7.76
30-34	52	114,048	9.1	6.08	13.51
35-39	58	76,453	6.7	4.57	9.59
40-44	57	102,675	11.8	8.84	15.68
45-49	88	126,173	15.1	11.24	19.89
50-54	83	91,211	11.7	8.41	16.16
55-59	77	72,186	10.9	7.97	14.63
60-64	62	75,644	13.6	9.71	18.70
65-69	40	29,169	7.1	4.61	10.79
70-74	32	28,461	9.8	6.20	15.02
75 & above	35	39,716	11.3	7.45	16.91
Ethnicity					
Malay ^a	477	576,648	10.6	9.22	12.07
Chinese	52	123,618	5.6	3.76	8.17
Indian	49	77,489	12.0	7.10	19.51
Bumiputera Sabah	27	51,316	7.4	5.20	10.52
Bumiputera Sarawak	16	20,601	4.4	2.53	7.53
Others	21	38,169	4.5	2.57	7.76

Table 4.4: Prevalence of Raised Blood Glucose Amongst Those Not Known to Have Diabetes Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,464) (cont'd)

Sociodemographic Characteristics	Raised Blood Glucose Amongst Those Not Known to Have Diabetes					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Marital Status										
Single	152	373,910	6.2	4.89	7.83	90	253,581	6.9	5.03	9.26
Married	904	1,332,423	9.7	8.54	11.02	458	714,039	10.3	8.76	12.13
Widow(er)/Divorcee	170	186,182	12.3	9.65	15.56	36	37,054	11.7	7.43	17.84
Education Level										
No Formal Education	86	115,761	10.6	7.32	15.21	26	46,768	11.4*	5.41	22.41
Primary Education	317	409,888	10.0	8.22	12.11	147	220,912	9.8	7.40	13.00
Secondary Education	608	971,436	9.4	8.11	10.85	303	518,446	9.5	7.72	11.55
Tertiary Education	212	394,546	7.0	5.57	8.84	105	217,665	8.0	5.82	10.93
Occupation										
Government Employee	125	142,826	9.1	6.80	12.15	73	89,066	10.5	7.37	14.82
Private Employee	303	679,340	8.3	6.81	10.02	197	463,731	8.8	7.02	11.00
Self Employed	259	353,661	9.6	7.88	11.56	165	237,505	9.2	7.22	11.66
Unpaid Worker/Homemaker	259	333,702	9.4	7.92	11.05	13	14,643	8.8*	3.88	18.71
Retiree	70	102,396	12.9	9.68	16.92	54	87,802	15.1	10.84	20.73
Student	20	33,273	4.5*	2.46	8.17	10	17,433	5.5*	2.22	13.00
Not Working ^b	189	245,467	9.1	7.54	10.97	71	92,644	7.9	5.67	10.92
Household Income Group										
Less than RM 1,000	139	166,590	9.7	7.37	12.71	47	55,801	8.2	5.21	12.57
RM 1,000 - RM 1,999	266	378,201	9.3	7.58	11.26	116	193,312	8.8	6.45	11.90
RM 2,000 - RM 3,999	356	577,505	9.0	7.41	10.99	190	341,588	9.8	7.59	12.54
RM 4,000 - RM 5,999	193	302,870	9.1	7.29	11.28	102	174,830	9.7	7.40	12.69
RM 6,000 - RM 7,999	97	184,498	9.4	6.70	13.06	51	101,577	9.7	6.13	15.16
RM 8,000 - RM 9,999	44	76,693	8.5	5.40	13.24	23	26,730	5.9*	3.11	10.78
RM 10,000 and above	68	123,779	7.7	5.18	11.27	39	85,105	9.4	5.95	14.69
Household Income Quintile										
Quintile 1	296	392,947	10.3	8.52	12.52	116	176,283	10.1	7.39	13.67
Quintile 2	230	364,704	9.0	7.26	11.08	119	216,544	9.4	7.06	12.36
Quintile 3	218	325,827	8.2	6.51	10.23	109	173,576	8.2	5.95	11.10
Quintile 4	210	341,688	9.3	7.50	11.45	111	199,128	10.0	7.63	13.02
Quintile 5	209	384,970	8.6	6.82	10.83	113	213,412	8.9	6.45	12.14
Household Income Category										
Bottom 40%	814	1,209,606	9.3	8.18	10.57	385	639,364	9.4	7.84	11.24
Middle 40%	270	448,299	8.7	7.08	10.62	132	230,577	8.4	6.30	11.16
Top 20%	79	152,231	8.3	5.88	11.68	51	109,002	10.6	7.24	15.20

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli
 b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Marital Status					
Single	62	120,330	5.2	3.76	7.05
Married	446	618,384	9.1	7.88	10.44
Widow(er)/Divorcee	134	149,128	12.5	9.48	16.25
Education Level					
No Formal Education	60	68,994	10.2	6.99	14.61
Primary Education	170	188,976	10.2	8.34	12.36
Secondary Education	305	452,990	9.3	7.93	10.90
Tertiary Education	107	176,881	6.1	4.66	7.99
Occupation					
Government Employee	52	53,760	7.5	4.81	11.45
Private Employee	106	215,610	7.3	5.66	9.42
Self Employed	94	116,155	10.4	7.80	13.73
Unpaid Worker/Homemaker	246	319,059	9.4	7.90	11.15
Retiree	16	14,594	6.8*	3.24	13.66
Student	10	15,840	3.8*	1.80	7.73
Not Working ^b	118	152,822	10.0	7.82	12.81
Household Income Group					
Less than RM 1,000	92	110,789	10.7	8.00	14.28
RM 1,000 - RM 1,999	150	184,889	9.8	7.83	12.18
RM 2,000 - RM 3,999	166	235,917	8.1	6.57	10.07
RM 4,000 - RM 5,999	91	128,040	8.3	6.05	11.38
RM 6,000 - RM 7,999	46	82,921	9.0	5.83	13.71
RM 8,000 - RM 9,999	21	49,964	11.3	6.19	19.71
RM 10,000 and above	29	38,674	5.5	3.09	9.46
Household Income Quintile					
Quintile 1	180	216,664	10.5	8.50	13.02
Quintile 2	111	148,161	8.5	6.63	10.76
Quintile 3	109	152,251	8.2	6.21	10.74
Quintile 4	99	142,560	8.4	6.27	11.25
Quintile 5	96	171,558	8.3	6.13	11.12
Household Income Category					
Bottom 40%	429	570,242	9.2	8.06	10.46
Middle 40%	138	217,722	9.0	6.92	11.62
Top 20%	28	43,230	5.4	3.21	9.04

Table 4.5: Prevalence of Overall Raised Blood Pressure Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,463)

Sociodemographic Characteristics	Overall Raised Blood Pressure					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	4,056	6,382,865	30.0	28.57	31.50	1,823	3,315,008	30.3	28.22	32.50
State										
Johor	327	662,983	27.4	23.25	31.92	134	335,081	26.5	21.10	32.75
Kedah	196	362,563	28.3	23.52	33.53	95	182,245	27.8	21.90	34.56
Kelantan	274	415,624	37.1	33.26	41.11	108	182,038	33.0	28.55	37.88
Melaka	271	191,255	32.1	28.27	36.09	114	77,174	27.2	20.14	35.53
Negeri Sembilan	229	222,546	31.6	26.65	36.95	91	109,135	30.7	23.79	38.51
Pahang	229	303,347	29.9	25.07	35.13	115	163,133	30.7	24.17	38.19
Pulau Pinang	225	314,504	25.1	19.04	32.24	109	181,098	28.3	19.19	39.52
Perak	276	548,853	35.5	30.14	41.23	112	264,746	33.6	26.11	41.96
Perlis	226	47,794	29.9	25.87	34.26	91	22,290	28.7	24.41	33.47
Selangor	417	1,269,300	27.7	24.11	31.60	197	692,073	28.8	23.15	35.29
Terengganu	257	250,881	33.9	30.31	37.66	111	124,127	33.3	28.60	38.30
Sabah	314	653,566	25.4	20.94	30.46	144	349,453	25.7	19.76	32.73
Sarawak	340	749,251	40.5	35.54	45.72	158	417,259	44.2	38.20	50.34
WP Kuala Lumpur	185	358,004	27.6	23.10	32.54	91	197,963	30.3	23.94	37.60
WP Labuan	170	18,239	28.8	24.20	33.85	89	10,018	31.8	25.58	38.81
WP Putrajaya	120	14,154	24.7	20.61	29.36	64	7,177	28.3	22.71	34.71
Location										
Urban	2,316	4,854,219	29.2	27.57	30.97	1,071	2,582,271	30.3	27.83	32.94
Rural	1,740	1,528,646	32.8	30.03	35.63	752	732,737	30.3	26.87	33.95
Age Group										
18-19	18	60,095	6.8*	3.33	13.35	15	51,211	10.4*	4.65	21.78
20-24	71	162,822	5.7	4.09	7.82	50	129,177	8.7	5.98	12.36
25-29	98	304,754	10.2	7.69	13.34	63	224,104	14.1	10.00	19.60
30-34	163	426,074	16.0	13.02	19.54	92	255,293	18.1	13.60	23.62
35-39	230	523,693	22.1	18.84	25.72	119	312,024	25.6	20.88	30.86
40-44	265	525,172	28.7	24.72	32.96	116	264,141	27.4	21.72	33.84
45-49	383	677,854	40.8	35.84	45.93	158	340,751	41.3	34.06	49.03
50-54	473	717,053	46.7	42.06	51.41	205	333,317	43.9	37.51	50.58
55-59	560	741,478	55.5	50.74	60.06	237	369,010	54.9	48.27	61.28
60-64	567	725,754	65.6	61.36	69.63	234	351,633	64.0	56.70	70.70
65-69	455	558,702	69.5	63.59	74.82	185	239,496	60.9	51.64	69.48
70-74	360	422,048	76.7	70.36	82.00	161	201,365	77.9	69.17	84.65
75 & above	413	537,366	81.7	77.03	85.55	188	243,488	79.1	71.39	85.14
Ethnicity										
Malay ^a	2,655	3,507,041	32.2	30.58	33.92	1,154	1,729,178	31.9	29.82	34.04
Chinese	534	1,282,726	28.1	24.51	31.99	275	709,193	30.2	24.31	36.88
Indian	261	379,677	30.6	25.73	35.91	121	191,639	32.2	25.25	40.10
Bumiputera Sabah	249	424,839	31.0	25.19	37.40	117	225,120	33.0	24.55	42.76
Bumiputera Sarawak	208	446,833	46.8	39.65	54.16	91	249,445	51.4	43.11	59.67
Others	149	341,749	15.2	11.29	20.09	65	210,434	15.0	9.74	22.36

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	2,233	3,067,857	29.7	27.98	31.46
State					
Johor	193	327,903	28.3	23.34	33.85
Kedah	101	180,318	28.8	23.66	34.45
Kelantan	166	233,586	41.0	35.76	46.47
Melaka	157	114,080	36.5	29.87	43.70
Negeri Sembilan	138	113,411	32.5	25.39	40.53
Pahang	114	140,213	28.9	21.99	36.93
Pulau Pinang	116	133,406	21.7	16.18	28.54
Perak	164	284,107	37.5	30.26	45.34
Perlis	135	25,504	31.0	25.48	37.12
Selangor	220	577,228	26.4	22.43	30.88
Terengganu	146	126,755	34.5	29.76	39.60
Sabah	170	304,113	25.1	19.73	31.28
Sarawak	182	331,993	36.7	31.25	42.53
WP Kuala Lumpur	94	160,041	24.8	19.57	30.81
WP Labuan	81	8,221	25.8	20.03	32.51
WP Putrajaya	56	6,978	21.9	16.89	27.83
Location					
Urban	1,245	2,271,948	28.1	26.11	30.16
Rural	988	795,909	35.4	32.28	38.73
Age Group					
18-19	3	8,884	2.3*	0.63	7.67
20-24	21	33,645	2.5	1.38	4.29
25-29	35	80,651	5.7	3.74	8.65
30-34	71	170,781	13.7	9.97	18.49
35-39	111	211,670	18.4	14.67	22.85
40-44	149	261,031	30.1	24.58	36.28
45-49	225	337,103	40.2	35.13	45.58
50-54	268	383,737	49.4	43.30	55.53
55-59	323	372,468	56.0	49.64	62.25
60-64	333	374,121	67.2	61.37	72.54
65-69	270	319,205	77.7	71.36	82.96
70-74	199	220,683	75.6	66.13	83.15
75 & above	225	293,878	83.9	77.48	88.82
Ethnicity					
Malay ^a	1,501	1,777,863	32.6	30.54	34.63
Chinese	259	573,533	25.8	21.60	30.60
Indian	140	188,039	29.1	23.65	35.17
Bumiputera Sabah	132	199,719	28.9	22.16	36.81
Bumiputera Sarawak	117	197,388	42.1	33.16	51.57
Others	84	131,315	15.5	11.41	20.68

Table 4.5: Prevalence of Overall Raised Blood Pressure Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,463) (cont'd)

Sociodemographic Characteristics	Overall Raised Blood Pressure					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Marital Status										
Single	342	814,816	13.5	11.55	15.76	227	619,904	16.8	13.76	20.26
Married	2,950	4,621,633	33.7	31.81	35.59	1,471	2,504,476	36.2	33.56	38.95
Widow(er)/Divorcee	764	946,416	62.5	57.83	67.04	125	190,629	60.0	49.06	69.99
Education Level										
No Formal Education	404	529,950	48.7	40.90	56.58	86	137,060	33.4	23.13	45.47
Primary Education	1,345	1,812,266	44.2	40.15	48.33	564	870,059	38.8	33.37	44.51
Secondary Education	1,752	3,036,298	29.4	27.65	31.12	843	1,621,265	29.6	27.17	32.16
Tertiary Education	540	974,917	17.4	15.08	19.94	321	666,942	24.5	20.62	28.92
Occupation										
Government Employee	308	460,708	29.4	25.35	33.89	188	311,106	36.8	31.06	42.86
Private Employee	702	1,544,023	18.8	16.84	20.96	493	1,162,677	22.1	19.30	25.16
Self Employed	715	1,136,018	30.7	27.48	34.20	452	753,238	29.2	25.01	33.80
Unpaid Worker/Homemaker	922	1,236,244	34.7	31.63	37.93	32	78,884	47.4	27.51	68.10
Retiree	351	532,236	66.9	60.44	72.79	256	392,291	67.6	59.73	74.60
Student	18	37,306	5.1*	2.69	9.34	12	25,456	8.0*	3.58	17.07
Not Working ^b	1,038	1,433,673	53.2	49.48	56.91	388	588,697	50.2	44.80	55.63
Household Income Group										
Less than RM 1,000	595	837,205	48.8	43.82	53.85	218	324,945	47.5	40.59	54.58
RM 1,000 - RM 1,999	882	1,247,594	30.5	27.48	33.77	385	626,545	28.5	24.57	32.83
RM 2,000 - RM 3,999	1,105	1,795,296	28.1	25.76	30.59	532	1,019,507	29.2	25.94	32.70
RM 4,000 - RM 5,999	485	787,573	23.7	20.79	26.78	234	432,875	24.1	20.25	28.48
RM 6,000 - RM 7,999	268	508,634	25.9	22.15	30.11	137	306,700	29.4	23.04	36.72
RM 8,000 - RM 9,999	121	220,230	24.5	18.07	32.38	66	133,100	29.2	20.47	39.82
RM 10,000 and above	221	379,995	23.6	18.11	30.16	124	237,257	26.3	17.54	37.56
Household Income Quintile										
Quintile 1	1,098	1,532,914	40.4	36.82	44.00	433	664,832	38.1	33.65	42.80
Quintile 2	756	1,114,026	27.5	24.38	30.77	342	596,810	25.9	21.88	30.27
Quintile 3	668	1,107,380	27.8	24.90	30.89	329	627,520	29.5	25.29	34.12
Quintile 4	545	913,347	24.8	22.06	27.85	265	514,710	25.9	22.06	30.15
Quintile 5	610	1,108,859	24.8	21.90	27.97	327	677,057	28.2	23.60	33.36
Household Income Category										
Bottom 40%	2,694	3,999,606	30.8	28.97	32.61	1,198	2,034,112	29.9	27.53	32.44
Middle 40%	739	1,361,608	26.4	24.02	28.93	365	801,564	29.3	25.49	33.40
Top 20%	244	415,313	22.7	18.10	28.16	133	245,252	23.8	17.86	30.96

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli
 b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Marital Status					
Single	115	194,912	8.4	6.66	10.45
Married	1,479	2,117,158	31.1	28.99	33.28
Widow(er)/Divorcee	639	755,787	63.2	58.28	67.92
Education Level					
No Formal Education	318	392,891	58.0	49.58	65.98
Primary Education	781	942,208	50.7	46.42	55.02
Secondary Education	909	1,415,033	29.1	26.75	31.52
Tertiary Education	219	307,975	10.7	8.86	12.75
Occupation					
Government Employee	120	149,602	20.8	16.32	26.17
Private Employee	209	381,345	13.0	10.71	15.58
Self Employed	263	382,780	34.3	29.93	38.86
Unpaid Worker/Homemaker	890	1,157,359	34.1	30.98	37.34
Retiree	95	139,946	65.0	55.43	73.55
Student	6	11,850	2.8*	0.98	7.87
Not Working ^b	650	844,975	55.5	50.25	60.67
Household Income Group					
Less than RM 1,000	377	512,260	49.7	43.74	55.62
RM 1,000 - RM 1,999	497	621,049	32.9	29.25	36.73
RM 2,000 - RM 3,999	573	775,789	26.8	23.92	29.88
RM 4,000 - RM 5,999	251	354,697	23.1	19.45	27.21
RM 6,000 - RM 7,999	131	201,934	22.0	18.19	26.29
RM 8,000 - RM 9,999	55	87,130	19.7	13.19	28.37
RM 10,000 and above	97	142,739	20.1	14.89	26.66
Household Income Quintile					
Quintile 1	665	868,082	42.3	38.04	46.60
Quintile 2	414	517,215	29.6	26.10	33.31
Quintile 3	339	479,860	25.8	22.32	29.66
Quintile 4	280	398,637	23.6	20.31	27.22
Quintile 5	283	431,802	20.9	17.63	24.50
Household Income Category					
Bottom 40%	1,496	1,965,494	31.7	29.40	34.04
Middle 40%	374	560,044	23.1	20.19	26.38
Top 20%	111	170,060	21.4	16.16	27.72

Table 4.6: Prevalence of Known Hypertension Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,463)

Sociodemographic Characteristics	Known Hypertension					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	2,394	3,378,796	15.9	14.79	17.05	965	1,541,569	14.1	12.74	15.58
State										
Johor	201	359,725	14.9	11.90	18.38	71	143,978	11.4	8.84	14.58
Kedah	131	238,007	18.6	14.14	23.96	62	108,862	16.6	11.64	23.11
Kelantan	137	176,320	15.7	12.58	19.51	46	60,710	11.0	7.95	15.08
Melaka	173	111,916	18.8	15.63	22.34	72	45,089	15.9	11.00	22.36
Negeri Sembilan	166	139,558	19.8	14.58	26.31	54	50,064	14.1	8.52	22.34
Pahang	123	154,826	15.2	11.88	19.34	56	77,485	14.6	10.10	20.65
Pulau Pinang	143	200,588	16.0	11.20	22.31	59	101,738	15.9	10.50	23.29
Perak	168	351,031	22.7	16.74	30.02	62	151,332	19.2	12.12	29.01
Perlis	149	28,292	17.7	14.43	21.52	47	10,223	13.2	9.05	18.79
Selangor	219	582,509	12.7	10.61	15.16	98	301,635	12.6	9.80	15.99
Terengganu	124	110,687	15.0	11.41	19.35	44	43,990	11.8	7.51	18.03
Sabah	188	345,837	13.4	10.44	17.14	81	173,598	12.8	8.62	18.53
Sarawak	190	361,448	19.6	16.07	23.58	77	165,118	17.5	13.48	22.37
WP Kuala Lumpur	122	199,927	15.4	12.54	18.77	56	98,696	15.1	11.03	20.39
WP Labuan	95	10,290	16.2	12.85	20.32	46	5,269	16.7	12.45	22.14
WP Putrajaya	65	7,836	13.7	10.42	17.78	34	3,782	14.9	10.61	20.60
Location										
Urban	1,358	2,574,453	15.5	14.21	16.89	565	1,210,622	14.2	12.61	16.00
Rural	1,036	804,343	17.2	15.37	19.29	400	330,948	13.7	11.48	16.23
Age Group										
18-19	1	1,317	0.2*	0.02	1.06	0	-	-	-	-
20-24	13	30,704	1.1*	0.50	2.28	9	24,694	1.7*	0.71	3.78
25-29	19	43,315	1.5	0.83	2.51	14	30,363	1.9*	1.02	3.57
30-34	37	77,124	2.9	1.88	4.45	15	34,927	2.5*	1.22	4.93
35-39	72	163,408	6.9	5.01	9.42	35	89,886	7.4	4.65	11.46
40-44	112	206,794	11.3	8.81	14.35	47	106,261	11.0	7.24	16.39
45-49	176	302,126	18.2	14.92	21.97	64	135,179	16.4	11.99	22.03
50-54	263	404,514	26.4	22.70	30.36	100	165,169	21.8	16.86	27.63
55-59	360	468,347	35.0	30.95	39.32	143	221,368	32.9	27.27	39.08
60-64	395	479,014	43.3	38.71	48.02	153	226,422	41.2	33.63	49.23
65-69	357	444,236	55.3	49.37	61.00	137	179,947	45.8	37.95	53.80
70-74	270	330,566	60.1	53.31	66.45	111	142,041	54.9	45.59	63.92
75 & above	319	427,332	65.0	59.27	70.23	137	185,315	60.2	51.59	68.21
Ethnicity										
Malay ^a	1,548	1,804,092	16.6	15.35	17.88	585	758,222	14.0	12.55	15.56
Chinese	359	812,444	17.8	14.83	21.21	180	429,043	18.3	14.45	22.86
Indian	178	242,935	19.6	16.16	23.50	79	117,994	19.8	15.36	25.24
Bumiputera Sabah	142	234,432	17.1	13.43	21.50	60	120,723	17.7	12.34	24.75
Bumiputera Sarawak	115	203,336	21.3	16.28	27.40	45	87,986	18.1	12.43	25.70
Others	52	81,558	3.6	2.36	5.51	16	27,600	1.2*	0.85	4.49

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	1,429	1,837,227	17.8	16.39	19.26
State					
Johor	130	215,747	18.6	14.61	23.43
Kedah	69	129,145	20.6	15.44	26.92
Kelantan	91	115,610	20.3	16.11	25.24
Melaka	101	66,827	21.4	16.85	26.76
Negeri Sembilan	112	89,494	25.6	19.32	33.20
Pahang	67	77,341	15.9	11.18	22.20
Pulau Pinang	84	98,850	16.1	10.88	23.18
Perak	106	199,699	26.4	18.31	36.36
Perlis	102	18,069	22.0	17.22	27.57
Selangor	121	280,874	12.9	10.04	16.34
Terengganu	80	66,697	18.2	14.75	22.15
Sabah	107	172,239	14.2	11.12	17.94
Sarawak	113	196,330	21.7	17.77	26.24
WP Kuala Lumpur	66	101,232	15.7	12.09	20.05
WP Labuan	49	5,021	15.7	10.81	22.36
WP Putrajaya	31	4,054	12.7	9.12	17.44
Location					
Urban	793	1,363,832	16.9	15.22	18.65
Rural	636	473,395	21.1	18.84	23.51
Age Group					
18-19	1	1,317	0.3*	0.05	2.35
20-24	4	6,010	0.4*	0.13	1.43
25-29	5	12,952	0.9*	0.30	2.76
30-34	22	42,197	3.4	1.95	5.80
35-39	37	73,522	6.4	4.28	9.46
40-44	65	100,533	11.6	8.69	15.31
45-49	112	166,947	19.9	15.98	24.57
50-54	163	239,346	30.8	25.94	36.16
55-59	217	246,979	37.2	31.27	43.46
60-64	242	252,592	45.4	39.76	51.10
65-69	220	264,290	64.3	56.98	71.06
70-74	159	188,525	64.6	55.45	72.81
75 & above	182	242,017	69.1	61.65	75.72
Ethnicity					
Malay ^a	963	1,045,870	19.2	17.56	20.84
Chinese	179	383,401	17.3	13.39	22.00
Indian	99	124,941	19.3	15.15	24.31
Bumiputera Sabah	82	113,708	16.5	12.32	21.69
Bumiputera Sarawak	70	115,350	24.6	18.52	31.89
Others	36	53,958	6.4	3.88	10.27

Table 4.6: Prevalence of Known Hypertension Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,463) (cont'd)

Sociodemographic Characteristics	Known Hypertension					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Marital Status										
Single	101	185,321	3.1	2.34	4.03	54	114,529	3.1	2.18	4.38
Married	1,739	2,507,704	18.3	16.77	19.88	835	1,304,062	18.9	16.84	21.05
Widow(er)/Divorcee	554	685,771	45.3	41.12	49.59	76	122,978	38.7	29.02	49.35
Education Level										
No Formal Education	293	371,015	34.1	27.83	40.98	53	77,031	18.8	11.86	28.36
Primary Education	873	1,095,106	26.7	23.72	29.92	339	464,603	20.7	17.22	24.71
Secondary Education	952	1,472,233	14.2	12.93	15.64	409	718,390	13.1	11.34	15.13
Tertiary Education	270	431,592	7.7	6.26	9.42	161	276,766	10.2	7.98	12.91
Occupation										
Government Employee	146	204,366	13.1	10.17	16.62	88	126,212	14.9	10.91	20.06
Private Employee	297	542,916	6.6	5.60	7.80	193	358,396	6.8	5.55	8.33
Self Employed	340	482,914	13.1	11.18	15.21	218	335,845	13.0	10.63	15.87
Unpaid Worker/Homemaker	576	707,317	19.9	17.54	22.40	22	55,527	33.3*	16.05	56.68
Retiree	259	384,603	48.3	41.90	54.85	176	262,653	45.3	38.06	52.67
Student	18	37,306	5.1*	2.69	9.34	12	25,456	8.0*	3.58	17.07
Not Working ^b	1,038	1,433,673	53.2	49.48	56.91	388	588,697	50.2	44.80	55.63
Household Income Group										
Less than RM 1,000	595	837,205	48.8	43.82	53.85	218	324,945	47.5	40.59	54.58
RM 1,000 - RM 1,999	882	1,247,594	30.5	27.48	33.77	385	626,545	28.5	24.57	32.83
RM 2,000 - RM 3,999	1,105	1,795,296	28.1	25.76	30.59	532	1,019,507	29.2	25.94	32.70
RM 4,000 - RM 5,999	485	787,573	23.7	20.79	26.78	234	432,875	24.1	20.25	28.48
RM 6,000 - RM 7,999	268	508,634	25.9	22.15	30.11	137	306,700	29.4	23.04	36.72
RM 8,000 - RM 9,999	121	220,230	24.5	18.07	32.38	66	133,100	29.2	20.47	39.82
RM 10,000 and above	221	379,995	23.6	18.11	30.16	124	237,257	26.3	17.54	37.56
Household Income Quintile										
Quintile 1	1,098	1,532,914	40.4	36.82	44.00	433	664,832	38.1	33.65	42.80
Quintile 2	756	1,114,026	27.5	24.38	30.77	342	596,810	25.9	21.88	30.27
Quintile 3	668	1,107,380	27.8	24.90	30.89	329	627,520	29.5	25.29	34.12
Quintile 4	545	913,347	24.8	22.06	27.85	265	514,710	25.9	22.06	30.15
Quintile 5	610	1,108,859	24.8	21.90	27.97	327	677,057	28.2	23.60	33.36
Household Income Category										
Bottom 40%	2,694	3,999,606	30.8	28.97	32.61	1,198	2,034,112	29.9	27.53	32.44
Middle 40%	739	1,361,608	26.4	24.02	28.93	365	801,564	29.3	25.49	33.40
Top 20%	244	415,313	22.7	18.10	28.16	133	245,252	23.8	17.86	30.96

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Marital Status					
Single	47	70,792	3.0	2.01	4.56
Married	904	1,203,642	17.7	16.02	19.47
Widow(er)/Divorcee	478	562,794	47.1	42.61	51.61
Education Level					
No Formal Education	240	293,983	43.4	36.07	51.04
Primary Education	534	630,503	33.9	30.22	37.89
Secondary Education	543	753,842	15.5	13.77	17.39
Tertiary Education	109	154,826	5.4	4.11	6.95
Occupation					
Government Employee	58	78,154	10.9	7.67	15.21
Private Employee	104	184,521	6.3	4.93	7.93
Self Employed	122	147,070	13.2	10.48	16.40
Unpaid Worker/Homemaker	554	651,790	19.2	16.94	21.68
Retiree	83	121,950	56.7	46.49	66.31
Student	6	11,850	2.8*	0.98	7.87
Not Working ^b	650	844,975	55.5	50.25	60.67
Household Income Group					
Less than RM 1,000	377	512,260	49.7	43.74	55.62
RM 1,000 - RM 1,999	497	621,049	32.9	29.25	36.73
RM 2,000 - RM 3,999	573	775,789	26.8	23.92	29.88
RM 4,000 - RM 5,999	251	354,697	23.1	19.45	27.21
RM 6,000 - RM 7,999	131	201,934	22.0	18.19	26.29
RM 8,000 - RM 9,999	55	87,130	19.7	13.19	28.37
RM 10,000 and above	97	142,739	20.1	14.89	26.66
Household Income Quintile					
Quintile 1	665	868,082	42.3	38.04	46.60
Quintile 2	414	517,215	29.6	26.10	33.31
Quintile 3	339	479,860	25.8	22.32	29.66
Quintile 4	280	398,637	23.6	20.31	27.22
Quintile 5	283	431,802	20.9	17.63	24.50
Household Income Category					
Bottom 40%	1,496	1,965,494	31.7	29.40	34.04
Middle 40%	374	560,044	23.1	20.19	26.38
Top 20%	111	170,060	21.4	16.16	27.72

Table 4.7: Prevalence of Raised Blood Pressure Amongst Those Not Known to Have Hypertension Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,463)

Sociodemographic Characteristics	Raised Blood Pressure Amongst Those Not Known to Have Hypertension					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	1,662	3,004,069	14.1	13.13	15.19	858	1,773,439	16.2	14.59	17.99
State										
Johor	126	303,258	12.5	9.76	15.93	63	191,102	15.1	10.57	21.18
Kedah	65	124,557	9.7	8.02	11.70	33	73,383	11.2	8.71	14.26
Kelantan	137	239,304	21.4	17.22	26.18	62	121,328	22.0	16.68	28.50
Melaka	98	79,339	13.3	10.03	17.43	42	32,085	11.3	6.75	18.28
Negeri Sembilan	63	82,988	11.8	7.95	17.09	37	59,071	16.6	10.65	24.93
Pahang	106	148,521	14.6	11.12	18.99	59	85,648	16.1	11.47	22.24
Pulau Pinang	82	113,916	9.1	5.77	14.01	50	79,361	12.4	6.82	21.45
Perak	108	197,822	12.8	9.24	17.46	50	113,414	14.4	9.15	21.87
Perlis	77	19,502	12.2	9.19	16.02	44	12,067	15.6	10.97	21.58
Selangor	198	686,792	15.0	12.45	17.94	99	390,438	16.3	11.93	21.81
Terengganu	133	140,195	18.9	15.63	22.75	67	80,137	21.5	16.42	27.59
Sabah	126	307,730	12.0	9.36	15.16	63	175,855	12.9	9.33	17.67
Sarawak	150	387,803	21.0	17.33	25.16	81	252,141	26.7	21.02	33.26
WP Kuala Lumpur	63	158,076	12.2	8.96	16.33	35	99,267	15.2	10.61	21.34
WP Labuan	75	7,948	12.5	9.46	16.45	43	4,748	15.1	10.94	20.45
WP Putrajaya	55	6,318	11.0	8.20	14.70	30	3,395	13.4	9.45	18.67
Location										
Urban	958	2,279,766	13.7	12.55	15.00	506	1,371,650	16.1	14.15	18.28
Rural	704	724,303	15.5	13.85	17.36	352	401,790	16.6	14.28	19.24
Age Group										
18-19	17	58,778	6.6*	3.21	13.25	15	51,211	10.4*	4.65	21.78
20-24	58	132,118	4.6	3.17	6.65	41	104,483	7.0	4.55	10.61
25-29	79	261,440	8.7	6.36	11.86	49	193,741	12.2	8.22	17.78
30-34	126	348,950	13.1	10.45	16.34	77	220,366	15.6	11.61	20.65
35-39	158	360,285	15.2	12.57	18.26	84	222,137	18.2	14.28	22.88
40-44	153	318,378	17.4	14.27	20.99	69	157,880	16.4	12.13	21.68
45-49	207	375,728	22.6	18.48	27.35	94	205,572	24.9	18.43	32.83
50-54	210	312,539	20.4	17.23	23.89	105	168,148	22.2	17.43	27.76
55-59	200	273,131	20.4	16.91	24.46	94	147,642	22.0	16.71	28.27
60-64	172	246,740	22.3	18.37	26.81	81	125,211	22.8	17.36	29.31
65-69	98	114,465	14.2	10.80	18.53	48	59,550	15.2	10.13	22.04
70-74	90	91,482	16.6	12.77	21.35	50	59,324	22.9	16.54	30.90
75 & above	94	110,034	16.7	12.42	22.15	51	58,174	18.9	12.93	26.77
Ethnicity										
Malay ^a	1,107	1,702,949	15.6	14.41	16.98	569	970,956	17.9	16.07	19.91
Chinese	175	470,282	10.3	8.01	13.15	95	280,150	11.9	8.01	17.43
Indian	83	136,743	11.0	7.73	15.47	42	73,645	12.4	7.93	18.83
Bumiputera Sabah	107	190,407	13.9	10.65	17.90	57	104,396	15.3	10.63	21.57
Bumiputera Sarawak	93	243,497	25.5	21.34	30.22	46	161,459	33.3	26.45	40.91
Others	97	260,191	11.6	8.09	16.24	49	182,834	13.0	8.08	20.31

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	804	1,230,629	11.9	10.77	13.15
State					
Johor	63	112,156	9.7	6.69	13.80
Kedah	32	51,174	8.2	5.47	12.00
Kelantan	75	117,977	20.7	16.11	26.22
Melaka	56	47,254	15.1	9.93	22.36
Negeri Sembilan	26	23,917	6.9	3.89	11.81
Pahang	47	62,872	13.0	7.98	20.35
Pulau Pinang	32	34,555	5.6	3.43	9.11
Perak	58	84,408	11.1	6.68	18.00
Perlis	33	7,436	9.0	6.28	12.83
Selangor	99	296,354	13.6	10.66	17.14
Terengganu	66	60,058	16.4	12.36	21.33
Sabah	63	131,874	10.9	7.85	14.85
Sarawak	69	135,663	15.0	11.90	18.73
WP Kuala Lumpur	28	58,809	9.1	5.47	14.77
WP Labuan	32	3,200	10.0	5.98	16.37
WP Putrajaya	25	2,923	9.2	6.16	13.42
Location					
Urban	452	908,116	11.2	9.90	12.71
Rural	352	322,513	14.4	12.40	16.57
Age Group					
18-19	2	7,567	1.9*	0.45	7.77
20-24	17	27,635	2.0*	1.06	3.79
25-29	30	67,698	4.8	3.01	7.56
30-34	49	128,584	10.3	6.99	14.94
35-39	74	138,148	12.0	8.99	15.88
40-44	84	160,498	18.5	13.84	24.31
45-49	113	170,156	20.3	16.33	24.98
50-54	105	144,391	18.6	14.75	23.16
55-59	106	125,489	18.9	14.68	23.95
60-64	91	121,529	21.8	16.90	27.71
65-69	50	54,916	13.4	9.14	19.13
70-74	40	32,158	11.0	7.56	15.80
75 & above	43	51,861	14.8	10.07	21.26
Ethnicity					
Malay ^a	538	731,994	13.4	11.86	15.11
Chinese	80	190,132	8.6	6.32	11.52
Indian	41	63,098	9.8	6.40	14.60
Bumiputera Sabah	50	86,011	12.5	8.55	17.82
Bumiputera Sarawak	47	82,037	17.5	12.64	23.71
Others	48	77,357	9.1	6.09	13.45

Table 4.7: Prevalence of Raised Blood Pressure Amongst Those Not Known to Have Hypertension Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,463) (cont'd)

Sociodemographic Characteristics	Raised Blood Pressure Amongst Those Not Known to Have Hypertension					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Marital Status										
Single	241	629,495	10.4	8.66	12.53	173	505,375	13.7	10.88	17.02
Married	1,211	2,113,930	15.4	14.18	16.71	636	1,200,413	17.4	15.50	19.39
Widow(er)/Divorcee	210	260,644	17.2	14.19	20.75	49	67,651	21.3	14.75	29.71
Education Level										
No Formal Education	111	158,936	14.6	10.75	19.55	33	60,028	14.6	9.13	22.59
Primary Education	472	717,160	17.5	15.05	20.23	225	405,456	18.1	14.56	22.23
Secondary Education	800	1,564,065	15.1	13.77	16.58	434	902,875	16.5	14.45	18.75
Tertiary Education	270	543,325	9.7	8.10	11.54	160	390,176	14.4	11.53	17.74
Occupation										
Government Employee	162	256,342	16.4	13.15	20.23	100	184,894	21.8	17.12	27.46
Private Employee	405	1,001,106	12.2	10.51	14.11	300	804,282	15.3	12.80	18.14
Self Employed	375	653,103	17.7	15.33	20.28	234	417,394	16.2	13.27	19.60
Unpaid Worker/Homemaker	346	528,927	14.9	12.83	17.13	10	23,358	14.0*	5.72	30.48
Retiree	92	147,633	18.6	14.15	23.96	80	129,637	22.3	16.76	29.13
Student	13	26,051	3.5*	1.64	7.46	9	17,428	5.5*	2.14	13.44
Not Working ^b	269	390,906	14.5	12.37	16.95	125	196,447	16.8	13.35	20.83
Household Income Group										
Less than RM 1,000	209	299,707	17.5	14.49	20.93	94	136,818	20.0	15.38	25.63
RM 1,000 - RM 1,999	374	605,608	14.8	12.80	17.11	182	335,061	15.3	12.30	18.76
RM 2,000 - RM 3,999	475	915,076	14.3	12.57	16.29	265	575,082	16.5	13.81	19.54
RM 4,000 - RM 5,999	207	390,385	11.7	9.76	14.03	106	229,919	12.8	9.97	16.32
RM 6,000 - RM 7,999	121	248,694	12.7	9.69	16.42	72	176,968	17.0	12.17	23.18
RM 8,000 - RM 9,999	57	124,518	13.9	9.18	20.41	36	73,568	16.1	9.90	25.23
RM 10,000 and above	96	195,497	12.1	7.83	18.38	63	152,685	17.0	9.43	28.59
Household Income Quintile										
Quintile 1	421	631,675	16.6	14.45	19.07	200	310,505	17.8	14.54	21.62
Quintile 2	331	590,692	14.6	12.48	16.91	174	375,513	16.3	13.24	19.82
Quintile 3	276	519,906	13.0	10.90	15.55	150	309,927	14.6	11.39	18.47
Quintile 4	237	468,503	12.7	10.77	15.02	123	280,935	14.1	11.14	17.78
Quintile 5	274	568,709	12.7	10.52	15.32	171	403,220	16.8	12.96	21.53
Household Income Category										
Bottom 40%	1,107	1,877,867	14.4	13.26	15.71	566	1,074,176	15.8	13.93	17.88
Middle 40%	327	712,354	13.8	11.71	16.22	183	465,951	17.0	13.53	21.20
Top 20%	105	189,263	10.4	7.84	13.58	69	139,973	13.6	9.60	18.86

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli
 b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Marital Status					
Single	68	124,120	5.3	4.04	6.99
Married	575	913,516	13.4	11.98	14.99
Widow(er)/Divorcee	161	192,993	16.1	12.92	20.00
Education Level					
No Formal Education	78	98,908	14.6	10.50	19.95
Primary Education	247	311,704	16.8	14.25	19.66
Secondary Education	366	661,190	13.6	11.84	15.55
Tertiary Education	110	153,149	5.3	4.02	6.94
Occupation					
Government Employee	62	71,448	9.9	6.87	14.19
Private Employee	105	196,825	6.7	4.90	9.05
Self Employed	141	235,710	21.1	17.35	25.40
Unpaid Worker/Homemaker	336	505,569	14.9	12.83	17.22
Retiree	12	17,996	8.4*	4.06	16.45
Student	4	8,623	2.0*	0.53	7.64
Not Working ^b	144	194,459	12.8	10.25	15.81
Household Income Group					
Less than RM 1,000	115	162,888	15.8	12.67	19.52
RM 1,000 - RM 1,999	192	270,547	14.3	11.99	17.02
RM 2,000 - RM 3,999	210	339,994	11.7	9.78	14.03
RM 4,000 - RM 5,999	101	160,467	10.5	7.77	13.91
RM 6,000 - RM 7,999	49	71,726	7.8	5.24	11.47
RM 8,000 - RM 9,999	21	50,950	11.5	6.39	19.89
RM 10,000 and above	33	42,812	6.0	3.77	9.55
Household Income Quintile					
Quintile 1	221	321,170	15.6	13.32	18.27
Quintile 2	157	215,179	12.3	10.26	14.69
Quintile 3	126	209,979	11.3	8.78	14.42
Quintile 4	114	187,568	11.1	8.55	14.29
Quintile 5	103	165,489	8.0	6.10	10.42
Household Income Category					
Bottom 40%	541	803,692	13.0	11.58	14.46
Middle 40%	144	246,403	10.2	7.94	12.96
Top 20%	36	49,290	6.2	4.07	9.33

Table 4.8: Prevalence of Overall Raised Blood Cholesterol Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,466)

Sociodemographic Characteristics	Overall Raised Blood Cholesterol					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	4,809	8,097,170	38.1	36.15	40.00	1,860	3,501,615	32.0	29.73	34.36
State										
Johor	307	701,750	28.9	23.40	35.08	100	267,263	21.0	15.87	27.34
Kedah	306	628,508	48.9	40.66	57.22	134	277,568	42.3	33.55	51.60
Kelantan	326	572,470	51.1	44.58	57.58	119	245,482	44.6	34.75	54.83
Melaka	290	237,087	39.7	31.34	48.79	106	106,563	37.5	28.14	47.90
Negeri Sembilan	288	340,342	48.3	41.27	55.37	104	144,036	40.5	30.30	51.52
Pahang	290	410,824	40.3	35.12	45.76	111	169,768	31.8	24.52	40.17
Pulau Pinang	319	525,070	41.8	33.85	50.30	126	231,674	36.2	26.41	47.18
Perak	313	714,671	46.2	39.02	53.58	118	311,085	39.4	30.15	49.58
Perlis	306	75,386	47.2	39.54	54.91	118	34,407	44.3	33.70	55.53
Selangor	482	1,637,703	35.7	30.89	40.90	202	751,336	31.3	25.59	37.67
Terengganu	298	302,973	40.9	35.61	46.46	107	122,341	32.8	27.33	38.76
Sabah	336	768,392	29.9	25.48	34.66	117	295,120	21.7	17.13	27.12
Sarawak	319	664,065	35.9	30.22	42.04	127	314,668	33.3	25.08	42.72
WP Kuala Lumpur	229	473,337	36.4	29.19	44.39	94	212,265	32.5	26.79	38.85
WP Labuan	168	18,738	29.6	25.58	33.91	71	8,008	25.4	20.03	31.75
WP Putrajaya	232	25,855	45.3	39.42	51.22	106	10,030	39.6	33.07	46.50
Location										
Urban	2,870	6,315,713	38.0	35.71	40.39	1,128	2,732,778	32.1	29.32	34.93
Rural	1,939	1,781,457	38.2	35.47	40.95	732	768,837	31.8	28.40	35.38
Age Group										
18-19	43	121,415	13.6	9.25	19.58	15	42,450	8.5*	4.59	15.33
20-24	179	485,017	16.9	13.78	20.54	58	185,129	12.4	8.77	17.18
25-29	227	658,806	22.0	18.45	25.99	99	308,448	19.5	14.90	24.99
30-34	308	742,225	27.9	23.43	32.85	118	299,721	21.2	16.25	27.22
35-39	373	796,221	33.6	29.28	38.18	155	347,941	28.5	23.19	34.46
40-44	391	804,458	43.9	39.03	48.89	152	390,588	40.5	33.99	47.29
45-49	489	829,036	49.9	44.72	55.00	187	368,130	44.7	37.12	52.47
50-54	592	921,120	60.0	55.22	64.59	234	392,994	51.8	45.40	58.15
55-59	633	842,962	63.0	58.36	67.39	245	390,502	58.1	50.58	65.18
60-64	544	694,474	62.8	57.75	67.55	196	295,144	53.7	46.31	60.96
65-69	433	495,042	61.6	54.95	67.79	166	201,437	51.2	42.39	60.01
70-74	301	348,726	63.4	56.57	69.65	118	138,555	53.6	44.69	62.24
75 & above	296	357,669	54.4	47.54	61.02	117	140,575	45.7	36.73	54.88
Ethnicity										
Malay ^a	3,319	4,736,501	43.5	41.46	45.57	1,293	2,062,786	38.0	35.34	40.80
Chinese	584	1,605,094	35.1	30.39	40.14	226	645,486	27.4	22.47	33.01
Indian	302	472,642	38.1	32.85	43.58	116	186,583	31.4	25.48	37.94
Bumiputera Sabah	237	460,149	33.5	29.29	38.07	82	176,990	26.0	20.30	32.55
Bumiputera Sarawak	162	325,250	34.1	26.70	42.36	63	170,699	35.2	24.20	48.02
Others	205	497,534	22.1	17.64	27.30	80	259,071	18.5	13.37	24.91

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	2,949	4,595,556	44.5	42.15	46.80
State					
Johor	207	434,487	37.5	30.68	44.86
Kedah	172	350,940	55.8	46.19	64.96
Kelantan	207	326,987	57.4	52.91	61.78
Melaka	184	130,525	41.8	31.62	52.67
Negeri Sembilan	184	196,305	56.3	47.70	64.47
Pahang	179	241,056	49.7	43.05	56.29
Pulau Pinang	193	293,396	47.8	39.42	56.29
Perak	195	403,586	53.3	45.49	60.88
Perlis	188	40,979	49.8	43.05	56.57
Selangor	280	886,366	40.6	34.41	47.11
Terengganu	191	180,631	49.2	42.29	56.10
Sabah	219	473,272	39.0	32.52	45.90
Sarawak	192	349,397	38.6	32.24	45.45
WP Kuala Lumpur	135	261,073	40.4	30.45	51.22
WP Labuan	97	10,730	33.6	27.02	40.98
WP Putrajaya	126	15,825	49.8	41.94	57.60
Location					
Urban	1,742	3,582,936	44.3	41.51	47.13
Rural	1,207	1,012,620	45.0	41.63	48.52
Age Group					
18-19	28	78,965	20.0	12.71	30.07
20-24	121	299,887	21.8	16.82	27.77
25-29	128	350,357	24.8	20.33	29.98
30-34	190	442,504	35.4	28.84	42.66
35-39	218	448,280	39.0	32.84	45.52
40-44	239	413,870	47.7	41.24	54.31
45-49	302	460,906	55.0	49.21	60.58
50-54	358	528,126	68.0	61.77	73.65
55-59	388	452,459	68.0	62.46	73.02
60-64	348	399,331	71.7	65.07	77.55
65-69	267	293,605	71.5	62.01	79.34
70-74	183	210,171	72.0	62.34	80.03
75 & above	179	217,094	62.0	52.76	70.46
Ethnicity					
Malay ^a	2,026	2,673,714	48.9	46.49	51.40
Chinese	358	959,608	43.2	36.78	49.95
Indian	186	286,059	44.2	37.38	51.30
Bumiputera Sabah	155	283,160	41.0	35.52	46.76
Bumiputera Sarawak	99	154,550	33.0	25.60	41.26
Others	125	238,464	28.1	21.13	36.35

Table 4.8: Prevalence of Overall Raised Blood Cholesterol Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,466) (cont'd)

Sociodemographic Characteristics	Overall Raised Blood Cholesterol					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Marital Status										
Single	564	1,452,287	24.0	21.52	26.78	234	702,098	18.9	15.83	22.47
Married	3,522	5,759,957	42.0	39.60	44.36	1,533	2,666,152	38.5	35.52	41.67
Widow(er)/Divorcee	723	884,927	58.5	54.26	62.59	93	133,365	42.0	31.95	52.68
Education Level										
No Formal Education	352	448,292	41.2	34.02	48.78	65	92,191	22.4	15.03	32.14
Primary Education	1,315	1,787,095	43.6	39.64	47.59	483	751,639	33.5	29.00	38.35
Secondary Education	2,180	3,898,971	37.7	35.51	39.86	912	1,785,581	32.5	29.71	35.52
Tertiary Education	942	1,925,173	34.3	30.65	38.19	389	846,942	31.2	26.73	35.96
Occupation										
Government Employee	470	671,123	42.9	38.16	47.76	241	368,783	43.6	37.13	50.26
Private Employee	1,016	2,416,399	29.4	26.85	32.18	565	1,395,037	26.5	23.48	29.78
Self Employed	861	1,399,471	37.8	34.07	41.76	493	841,699	32.6	28.34	37.20
Unpaid Worker/ Homemaker	1,131	1,685,193	47.3	43.84	50.77	31	87,364	52.5	31.95	72.17
Retiree	328	496,863	62.5	55.40	69.02	222	346,140	59.7	51.70	67.12
Student	51	122,604	16.5	11.67	22.82	11	29,089	9.0*	4.44	17.38
Not Working ^b	947	1,298,273	48.2	44.46	51.93	294	426,857	36.4	30.78	42.44
Household Income Group										
Less than RM 1,000	611	854,186	49.8	45.29	54.28	184	281,482	41.2	34.27	48.45
RM 1,000 - RM 1,999	959	1,464,829	35.8	32.23	39.63	363	616,660	28.1	23.89	32.68
RM 2,000 - RM 3,999	1,348	2,308,805	36.1	33.44	38.88	542	1,095,728	31.3	27.97	34.89
RM 4,000 - RM 5,999	649	1,121,009	33.6	29.86	37.65	286	551,296	30.7	26.07	35.71
RM 6,000 - RM 7,999	390	728,008	37.1	32.03	42.51	176	347,041	33.3	27.10	40.12
RM 8,000 - RM 9,999	176	404,292	45.0	36.93	53.39	75	174,548	38.3	29.00	48.56
RM 10,000 and above	324	616,429	38.3	32.38	44.59	143	286,367	31.8	25.03	39.44
Household Income Quintile										
Quintile 1	1,145	1,644,758	43.3	39.59	47.07	387	619,395	35.5	30.74	40.59
Quintile 2	881	1,429,113	35.2	31.62	38.99	343	643,668	27.9	23.83	32.34
Quintile 3	818	1,420,376	35.6	32.52	38.77	329	675,391	31.7	27.48	36.17
Quintile 4	723	1,254,582	34.1	30.61	37.77	316	606,712	30.5	26.18	35.18
Quintile 5	890	1,748,729	39.1	35.20	43.21	394	807,956	33.7	29.44	38.21
Household Income Category										
Bottom 40%	3,067	4,696,463	36.1	33.82	38.44	1,169	2,035,184	29.9	27.29	32.68
Middle 40%	1,036	2,085,888	40.4	37.11	43.84	448	982,435	35.9	31.83	40.11
Top 20%	354	715,207	39.2	33.72	44.88	152	335,503	32.5	26.26	39.53

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Marital Status					
Single	330	750,189	32.2	27.79	36.94
Married	1,989	3,093,805	45.4	42.88	48.00
Widow(er)/Divorcee	630	751,562	62.9	58.12	67.40
Education Level					
No Formal Education	287	356,101	52.6	43.33	61.64
Primary Education	832	1,035,456	55.7	50.94	60.39
Secondary Education	1,268	2,113,390	43.4	40.51	46.38
Tertiary Education	553	1,078,232	37.3	33.03	41.76
Occupation					
Government Employee	229	302,340	42.1	35.99	48.42
Private Employee	451	1,021,362	34.7	30.39	39.25
Self Employed	368	557,772	49.9	44.24	55.60
Unpaid Worker/ Homemaker	1,100	1,597,829	47.0	43.59	50.52
Retiree	106	150,724	70.0	57.97	79.84
Student	40	93,515	22.3	15.40	31.12
Not Working ^b	653	871,416	57.3	52.43	61.95
Household Income Group					
Less than RM 1,000	427	572,703	55.5	50.39	60.46
RM 1,000 - RM 1,999	596	848,168	44.9	40.40	49.44
RM 2,000 - RM 3,999	806	1,213,077	41.9	38.15	45.74
RM 4,000 - RM 5,999	363	569,713	37.1	32.66	41.79
RM 6,000 - RM 7,999	214	380,968	41.5	34.37	48.92
RM 8,000 - RM 9,999	101	229,743	51.9	39.71	63.93
RM 10,000 and above	181	330,062	46.6	37.88	55.48
Household Income Quintile					
Quintile 1	758	1,025,363	49.9	45.68	54.11
Quintile 2	538	785,445	44.9	40.34	49.52
Quintile 3	489	744,985	40.1	35.64	44.71
Quintile 4	407	647,870	38.3	34.21	42.65
Quintile 5	496	940,773	45.4	39.78	51.24
Household Income Category					
Bottom 40%	1,898	2,661,279	42.9	40.06	45.74
Middle 40%	588	1,103,453	45.6	40.79	50.47
Top 20%	202	379,703	47.7	40.43	55.13

Table 4.9: Prevalence of Known Hypercholesterolaemia Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,466)

Sociodemographic Characteristics	Known Hypercholesterolaemia					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	2,015	2,868,124	13.5	12.51	14.51	806	1,304,685	11.9	10.61	13.38
State										
Johor	142	258,212	10.6	8.62	13.05	48	101,088	8.0	6.20	10.15
Kedah	117	216,000	16.8	13.02	21.43	53	100,867	15.4	9.89	23.12
Kelantan	93	119,012	10.6	9.27	12.15	23	29,187	5.3	3.68	7.58
Melaka	139	91,977	15.4	12.05	19.51	53	35,010	12.3	8.79	17.01
Negeri Sembilan	136	132,201	18.8	13.66	25.20	44	54,893	15.4	8.52	26.30
Pahang	85	114,424	11.2	8.79	14.25	33	43,874	8.2	5.16	12.88
Pulau Pinang	134	231,596	18.5	13.72	24.36	57	107,485	16.8	10.48	25.76
Perak	150	312,701	20.2	15.79	25.53	58	139,686	17.7	11.38	26.52
Perlis	144	28,232	17.7	14.22	21.72	46	10,016	12.9	9.24	17.75
Selangor	203	549,486	12.0	9.54	14.96	93	295,746	12.3	8.88	16.86
Terengganu	114	95,911	13.0	10.47	15.92	40	32,744	8.8	6.16	12.35
Sabah	121	215,148	8.4	6.35	10.95	53	112,179	8.3	5.71	11.79
Sarawak	155	285,551	15.4	12.62	18.77	66	133,426	14.1	10.75	18.36
WP Kuala Lumpur	112	199,910	15.4	12.23	19.19	52	99,639	15.3	11.17	20.53
WP Labuan	93	9,417	14.9	12.08	18.16	39	4,284	13.6	9.77	18.65
WP Putrajaya	77	8,347	14.6	11.29	18.70	48	4,563	18.0	12.52	25.21
Location										
Urban	1,198	2,282,784	13.7	12.59	14.98	495	1,063,948	12.5	10.88	14.28
Rural	817	585,340	12.5	11.04	14.22	311	240,737	10.0	8.16	12.09
Age Group										
18-19	0	-	-	-	-	0	-	-	-	-
20-24	7	40,571	1.4*	0.55	3.59	5	30,190	2.0*	0.63	6.30
25-29	16	31,612	1.1*	0.54	2.04	7	10,335	0.7*	0.20	2.12
30-34	44	74,116	2.8	1.77	4.35	22	42,988	3.0*	1.59	5.75
35-39	66	161,756	6.8	4.80	9.62	23	60,344	4.9*	2.33	10.17
40-44	120	208,568	11.4	9.10	14.14	54	104,640	10.8	7.85	14.79
45-49	163	297,467	17.9	14.55	21.80	63	130,791	15.9	11.13	22.12
50-54	238	368,438	24.0	20.22	28.23	109	183,842	24.2	19.10	30.23
55-59	334	427,510	31.9	27.76	36.44	137	213,558	31.7	26.12	37.97
60-64	330	424,542	38.4	33.88	43.08	118	189,759	34.5	27.19	42.71
65-69	273	318,424	39.6	34.27	45.20	99	131,005	33.3	26.43	41.02
70-74	210	250,607	45.5	39.02	52.20	77	91,438	35.4	27.03	44.68
75 & above	214	264,512	40.2	34.23	46.48	92	115,796	37.6	28.79	47.33
Ethnicity										
Malay ^a	1340	1,606,177	14.8	13.72	15.85	533	725,052	13.4	11.89	15.00
Chinese	288	644,135	14.1	11.54	17.09	118	282,825	12.0	8.87	16.08
Indian	158	234,576	18.9	15.18	23.28	67	105,086	17.7	13.10	23.40
Bumiputera Sabah	100	148,551	10.8	8.17	14.22	40	78,548	11.5	8.08	16.17
Bumiputera Sarawak	85	147,103	15.4	11.42	20.50	35	69,416	14.3	9.45	21.08
Others	44	87,582	3.9	2.32	6.46	13	43,758	3.1*	1.22	7.72

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	1,209	1,563,439	15.1	13.98	16.35
State					
Johor	94	157,124	13.6	10.55	17.26
Kedah	64	115,133	18.3	13.54	24.27
Kelantan	70	89,825	15.8	13.50	18.34
Melaka	86	56,967	18.2	13.30	24.47
Negeri Sembilan	92	77,308	22.2	17.99	26.97
Pahang	52	70,550	14.5	11.16	18.71
Pulau Pinang	77	124,112	20.2	15.81	25.48
Perak	92	173,015	22.8	17.71	28.92
Perlis	98	18,215	22.1	17.10	28.16
Selangor	110	253,741	11.6	8.94	14.98
Terengganu	74	63,167	17.2	13.64	21.46
Sabah	68	102,969	8.5	6.38	11.20
Sarawak	89	152,125	16.8	13.03	21.44
WP Kuala Lumpur	60	100,271	15.5	11.72	20.27
WP Labuan	54	5,134	16.1	11.10	22.76
WP Putrajaya	29	3,784	11.9	8.31	16.76
Location					
Urban	703	1,218,836	15.1	13.71	16.54
Rural	506	344,603	15.3	13.51	17.35
Age Group					
18-19	0	-	-	-	-
20-24	2	10,381	0.8*	0.17	3.28
25-29	9	21,277	1.5*	0.68	3.30
30-34	22	31,128	2.5	1.38	4.47
35-39	43	101,412	8.8	6.28	12.25
40-44	66	103,929	12.0	8.76	16.19
45-49	100	166,676	19.9	15.28	25.44
50-54	129	184,596	23.8	19.29	28.92
55-59	197	213,952	32.1	26.62	38.21
60-64	212	234,783	42.2	36.52	48.04
65-69	174	187,419	45.6	37.85	53.60
70-74	133	159,170	54.6	45.58	63.24
75 & above	122	148,716	42.5	34.44	50.93
Ethnicity					
Malay ^a	807	881,126	16.1	14.82	17.53
Chinese	170	361,310	16.3	12.94	20.29
Indian	91	129,490	20.0	15.67	25.22
Bumiputera Sabah	60	70,003	10.1	7.15	14.20
Bumiputera Sarawak	50	77,687	16.6	11.83	22.71
Others	31	43,823	5.2	3.54	7.49

Table 4.9: Prevalence of Known Hypercholesterolaemia Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,466) (cont'd)

Sociodemographic Characteristics	Known Hypercholesterolaemia					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Marital Status										
Single	85	186,114	3.1	2.20	4.30	32	93,367	2.5	1.53	4.11
Married	1,498	2,165,911	15.8	14.46	17.19	716	1,127,567	16.3	14.45	18.34
Widow(er)/Divorcee	432	516,099	34.1	30.23	38.21	58	83,751	26.4	18.47	36.11
Education Level										
No Formal Education	199	236,420	21.7	16.70	27.77	31	44,090	10.7	6.01	18.45
Primary Education	674	787,547	19.2	16.84	21.80	242	293,880	13.1	10.55	16.17
Secondary Education	842	1,303,211	12.6	11.43	13.85	369	645,642	11.8	10.10	13.67
Tertiary Education	293	532,804	9.5	7.79	11.53	161	317,794	11.7	9.03	15.00
Occupation										
Government Employee	174	250,878	16.0	12.60	20.19	111	155,506	18.4	13.76	24.11
Private Employee	265	545,119	6.6	5.46	8.06	161	338,236	6.4	5.05	8.15
Self Employed	303	446,134	12.1	10.23	14.18	181	276,648	10.7	8.67	13.18
Unpaid Worker/Homemaker	481	590,924	16.6	14.48	18.92	18	56,535	33.9*	16.51	57.18
Retiree	218	334,027	42.0	35.56	48.70	147	235,665	40.6	33.28	48.38
Student	4	18,154	2.4*	0.83	6.96	2	7,773	2.4*	0.50	10.73
Not Working ^b	569	681,509	25.3	22.55	28.25	185	232,942	19.9	16.37	23.91
Household Income Group										
Less than RM 1,000	309	395,875	23.1	20.02	26.43	100	134,866	19.7	15.45	24.84
RM 1,000 - RM 1,999	407	531,225	13.0	11.02	15.27	155	246,569	11.2	8.55	14.60
RM 2,000 - RM 3,999	517	702,236	11.0	9.55	12.60	217	344,599	9.9	8.02	12.05
RM 4,000 - RM 5,999	231	357,108	10.7	8.78	13.01	110	179,749	10.0	7.47	13.27
RM 6,000 - RM 7,999	150	278,423	14.2	11.44	17.48	71	141,278	13.6	10.16	17.85
RM 8,000 - RM 9,999	66	123,285	13.7	9.38	19.65	28	77,391	17.0	9.76	27.92
RM 10,000 and above	128	189,967	11.8	8.53	16.11	65	89,960	10.0	6.65	14.74
Household Income Quintile										
Quintile 1	541	694,218	18.3	16.01	20.78	184	280,416	16.1	12.91	19.85
Quintile 2	351	436,777	10.8	9.05	12.75	141	185,471	8.0	6.10	10.52
Quintile 3	316	459,923	11.5	9.55	13.84	137	238,562	11.2	8.59	14.43
Quintile 4	256	395,525	10.7	8.92	12.90	120	201,334	10.1	7.72	13.15
Quintile 5	344	591,676	13.2	11.18	15.62	164	308,629	12.9	10.23	16.06
Household Income Category										
Bottom 40%	1,291	1,659,905	12.8	11.57	14.05	514	741,452	10.9	9.39	12.62
Middle 40%	381	681,190	13.2	11.47	15.15	171	366,818	13.4	10.97	16.25
Top 20%	136	237,025	13.0	9.78	17.02	61	106,142	10.3	6.92	15.06

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Marital Status					
Single	53	92,748	4.0	2.54	6.18
Married	782	1,038,344	15.2	13.85	16.76
Widow(er)/Divorcee	374	432,348	36.2	31.97	40.60
Education Level					
No Formal Education	168	192,330	28.4	21.81	36.06
Primary Education	432	493,667	26.6	23.47	29.90
Secondary Education	473	657,569	13.5	11.92	15.28
Tertiary Education	132	215,010	7.4	5.91	9.32
Occupation					
Government Employee	63	95,372	13.3	9.41	18.41
Private Employee	104	206,883	7.0	5.38	9.13
Self Employed	122	169,485	15.2	12.31	18.55
Unpaid Worker/Homemaker	463	534,389	15.7	13.84	17.83
Retiree	71	98,362	45.7	34.88	56.95
Student	2	10,381	2.5*	0.55	10.34
Not Working ^b	384	448,567	29.5	25.96	33.25
Household Income Group					
Less than RM 1,000	209	261,010	25.3	21.38	29.63
RM 1,000 - RM 1,999	252	284,656	15.1	12.78	17.67
RM 2,000 - RM 3,999	300	357,637	12.4	10.55	14.41
RM 4,000 - RM 5,999	121	177,359	11.6	9.03	14.67
RM 6,000 - RM 7,999	79	137,146	14.9	11.16	19.68
RM 8,000 - RM 9,999	38	45,894	10.4	6.44	16.30
RM 10,000 and above	63	100,008	14.1	9.94	19.64
Household Income Quintile					
Quintile 1	357	413,802	20.1	17.38	23.21
Quintile 2	210	251,306	14.4	11.96	17.16
Quintile 3	179	221,361	11.9	9.75	14.48
Quintile 4	136	194,191	11.5	9.11	14.40
Quintile 5	180	283,047	13.7	11.09	16.75
Household Income Category					
Bottom 40%	777	918,453	14.8	13.35	16.38
Middle 40%	210	314,372	13.0	10.73	15.64
Top 20%	75	130,883	16.5	12.35	21.59

Table 4.10: Prevalence of Raised Total Cholesterol Amongst Those Not Known to Have Hypercholesterolaemia Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,466)

Sociodemographic Characteristics	Raised Total Cholesterol Amongst Those Not Known to Have Hypercholesterolaemia					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	2,794	5,229,046	24.6	23.03	26.19	1,054	2,196,930	20.1	18.19	22.11
State										
Johor	165	443,538	18.3	13.83	23.72	52	166,176	13.1	8.85	18.92
Kedah	189	412,508	32.1	25.87	39.04	81	176,701	26.9	20.64	34.33
Kelantan	233	453,458	40.5	34.28	46.98	96	216,296	39.3	30.09	49.27
Melaka	151	145,110	24.3	17.22	33.18	53	71,553	25.2	15.27	38.60
Negeri Sembilan	152	208,141	29.5	24.65	34.93	60	89,143	25.0	19.45	31.62
Pahang	205	296,400	29.1	24.70	33.93	78	125,894	23.6	17.98	30.34
Pulau Pinang	185	293,474	23.4	17.10	31.12	69	124,189	19.4	12.73	28.38
Perak	163	401,970	26.0	20.04	32.99	60	171,399	21.7	13.75	32.60
Perlis	162	47,155	29.5	21.26	39.33	72	24,391	31.4	19.77	46.04
Selangor	279	1,088,217	23.7	20.27	27.62	109	455,591	19.0	14.72	24.14
Terengganu	184	207,062	28.0	22.44	34.26	67	89,598	24.0	18.18	31.01
Sabah	215	553,244	21.5	17.73	25.83	64	182,941	13.5	9.87	18.10
Sarawak	164	378,514	20.5	15.22	26.96	61	181,242	19.2	12.31	28.67
WP Kuala Lumpur	117	273,428	21.1	15.82	27.46	42	112,626	17.3	12.40	23.52
WP Labuan	75	9,321	14.7	10.92	19.53	32	3,725	11.8	7.59	17.99
WP Putrajaya	155	17,508	30.6	25.54	36.27	58	5,467	21.6	16.55	27.63
Location										
Urban	1,672	4,032,929	24.3	22.41	26.25	633	1,668,829	19.6	17.30	22.07
Rural	1,122	1,196,117	25.6	23.53	27.85	421	528,101	21.8	19.22	24.70
Age Group										
18-19	43	121,415	13.6	9.25	19.58	15	42,450	8.5*	4.59	15.33
20-24	172	444,446	15.5	12.53	18.96	53	154,939	10.4	7.29	14.51
25-29	211	627,193	20.9	17.46	24.89	92	298,113	18.8	14.31	24.31
30-34	264	668,109	25.1	20.83	29.93	96	256,733	18.2	13.64	23.81
35-39	307	634,465	26.8	22.98	30.91	132	287,597	23.5	18.90	28.94
40-44	271	595,890	32.5	27.98	37.42	98	285,948	29.6	23.39	36.72
45-49	326	531,569	32.0	27.73	36.52	124	237,340	28.8	22.96	35.44
50-54	354	552,682	36.0	31.93	40.28	125	209,152	27.6	22.42	33.39
55-59	299	415,451	31.0	26.81	35.62	108	176,944	26.3	20.55	33.01
60-64	214	269,932	24.4	20.54	28.73	78	105,385	19.2	14.51	24.92
65-69	160	176,618	22.0	17.87	26.71	67	70,431	17.9	13.09	24.03
70-74	91	98,119	17.8	13.63	22.98	41	47,117	18.2	12.62	25.58
75 & above	82	93,157	14.2	10.79	18.37	25	24,779	8.0*	4.24	14.74
Ethnicity										
Malay ^a	1,979	3,130,323	28.8	26.91	30.66	760	1,337,735	24.7	22.35	27.14
Chinese	296	960,959	21.0	17.58	24.92	108	362,660	15.4	11.62	20.15
Indian	144	238,067	19.2	15.05	24.11	49	81,497	13.7	9.31	19.73
Bumiputera Sabah	137	311,598	22.7	18.78	27.19	42	98,442	14.4	10.06	20.30
Bumiputera Sarawak	77	178,147	18.7	12.23	27.46	28	101,284	20.9	11.23	35.51
Others	161	409,953	18.2	14.07	23.23	67	215,312	15.3	10.65	21.59

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	1,740	3,032,116	29.3	27.35	31.41
State					
Johor	113	277,363	23.9	18.23	30.76
Kedah	108	235,807	37.5	28.12	47.89
Kelantan	137	237,163	41.6	36.69	46.76
Melaka	98	73,558	23.5	16.65	32.19
Negeri Sembilan	92	118,997	34.1	25.56	43.82
Pahang	127	170,506	35.1	28.59	42.28
Pulau Pinang	116	169,285	27.6	20.58	35.88
Perak	103	230,571	30.4	23.89	37.87
Perlis	90	22,764	27.7	21.22	35.19
Selangor	170	632,626	29.0	24.09	34.41
Terengganu	117	117,464	32.0	25.72	38.97
Sabah	151	370,303	30.5	24.40	37.41
Sarawak	103	197,272	21.8	16.35	28.48
WP Kuala Lumpur	75	160,802	24.9	17.26	34.47
WP Labuan	43	5,596	17.5	12.12	24.72
WP Putrajaya	97	12,041	37.9	30.43	45.92
Location					
Urban	1,039	2,364,100	29.2	26.83	31.75
Rural	701	668,016	29.7	26.85	32.75
Age Group					
18-19	28	78,965	20.0	12.71	30.07
20-24	119	289,507	21.0	16.14	26.96
25-29	119	329,081	23.3	18.94	28.38
30-34	168	411,376	33.0	26.45	40.18
35-39	175	346,868	30.2	24.41	36.64
40-44	173	309,942	35.7	29.98	41.97
45-49	202	294,229	35.1	30.28	40.21
50-54	229	343,530	44.2	38.71	49.90
55-59	191	238,507	35.8	30.07	42.03
60-64	136	164,547	29.6	24.17	35.58
65-69	93	106,186	25.8	19.67	33.16
70-74	50	51,002	17.5	12.07	24.64
75 & above	57	68,378	19.5	14.29	26.10
Ethnicity					
Malay ^a	1,219	1,792,589	32.8	30.51	35.20
Chinese	188	598,298	27.0	21.56	33.14
Indian	95	156,569	24.2	18.57	30.91
Bumiputera Sabah	95	213,157	30.9	25.24	37.16
Bumiputera Sarawak	49	76,863	16.4	11.28	23.22
Others	94	194,641	23.0	16.72	30.65

Table 4.10: Prevalence of Raised Total Cholesterol Amongst Those Not Known to Have Hypercholesterolaemia Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,466) (cont'd)

Sociodemographic Characteristics	Raised Total Cholesterol Amongst Those Not Known to Have Hypercholesterolaemia					Male				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Marital Status										
Single	479	1,266,172	21.0	18.61	23.54	202	608,731	16.4	13.53	19.77
Married	2,024	3,594,046	26.2	24.34	28.11	817	1,538,584	22.2	19.97	24.71
Widow(er)/Divorcee	291	368,828	24.4	20.99	28.11	35	49,614	15.6	9.13	25.41
Education Level										
No Formal Education	153	211,872	19.5	15.26	24.52	34	48,101	11.7	7.15	18.60
Primary Education	641	999,549	24.4	21.61	27.37	241	457,759	20.4	17.06	24.22
Secondary Education	1,338	2,595,760	25.1	23.11	27.14	543	1,139,939	20.8	18.40	23.38
Tertiary Education	649	1,392,369	24.8	21.91	27.98	228	529,148	19.5	16.19	23.22
Occupation										
Government Employee	296	420,245	26.9	22.78	31.37	130	213,277	25.2	20.19	30.98
Private Employee	751	1,871,280	22.8	20.61	25.15	404	1,056,802	20.1	17.39	23.07
Self Employed	558	953,337	25.8	22.70	29.12	312	565,051	21.9	18.33	25.93
Unpaid Worker/ Homemaker	650	1,094,269	30.7	27.69	33.90	13	30,829	18.5*	6.47	42.74
Retiree	110	162,837	20.5	16.13	25.62	75	110,474	19.0	14.32	24.86
Student	47	104,450	14.1	9.88	19.61	9	21,316	6.6*	2.94	14.12
Not Working ^b	378	616,764	22.9	20.13	25.90	109	193,915	16.5	12.56	21.48
Household Income Group										
Less than RM 1,000	302	458,310	26.7	23.13	30.62	84	146,617	21.4	16.28	27.72
RM 1,000 - RM 1,999	552	933,604	22.8	20.10	25.85	208	370,092	16.8	13.67	20.58
RM 2,000 - RM 3,999	831	1,606,569	25.1	22.57	27.88	325	751,128	21.5	18.28	25.05
RM 4,000 - RM 5,999	418	763,901	22.9	19.88	26.29	176	371,547	20.7	16.82	25.16
RM 6,000 - RM 7,999	240	449,585	22.9	18.96	27.43	105	205,763	19.7	14.78	25.85
RM 8,000 - RM 9,999	110	281,007	31.3	24.85	38.54	47	97,157	21.3	14.64	29.99
RM 10,000 and above	196	426,461	26.5	21.38	32.33	78	196,407	21.8	16.47	28.29
Household Income Quintile										
Quintile 1	604	950,539	25.0	22.07	28.22	203	338,979	19.4	15.70	23.81
Quintile 2	530	992,336	24.5	21.44	27.73	202	458,198	19.8	16.45	23.75
Quintile 3	502	960,452	24.1	21.16	27.22	192	436,829	20.5	16.58	25.03
Quintile 4	467	859,057	23.3	20.49	26.48	196	405,378	20.4	16.74	24.57
Quintile 5	546	1,157,053	25.9	22.72	29.34	230	499,327	20.8	17.40	24.71
Household Income Category										
Bottom 40%	1,776	3,036,558	23.3	21.48	25.31	655	1,293,732	19.0	16.81	21.44
Middle 40%	655	1,404,698	27.2	24.25	30.41	277	615,617	22.5	18.97	26.41
Top 20%	218	478,181	26.2	21.71	31.21	91	229,361	22.3	17.02	28.54

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Female				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Marital Status					
Single	277	657,441	28.2	23.90	32.97
Married	1,207	2,055,462	30.2	28.00	32.46
Widow(er)/Divorcee	256	319,214	26.7	22.80	31.02
Education Level					
No Formal Education	119	163,771	24.2	18.79	30.53
Primary Education	400	541,790	29.2	25.51	33.09
Secondary Education	795	1,455,821	29.9	27.21	32.77
Tertiary Education	421	863,221	29.9	25.98	34.05
Occupation					
Government Employee	166	206,969	28.8	22.93	35.50
Private Employee	347	814,479	27.7	23.87	31.80
Self Employed	246	388,286	34.7	29.76	40.09
Unpaid Worker/ Homemaker	637	1,063,440	31.3	28.20	34.59
Retiree	35	52,362	24.3	16.63	34.14
Student	38	83,134	19.8	13.51	28.09
Not Working ^b	269	422,849	27.8	23.65	32.33
Household Income Group					
Less than RM 1,000	218	311,694	30.2	25.54	35.29
RM 1,000 - RM 1,999	344	563,512	29.8	26.14	33.77
RM 2,000 - RM 3,999	506	855,440	29.5	26.08	33.26
RM 4,000 - RM 5,999	242	392,355	25.6	21.69	29.85
RM 6,000 - RM 7,999	135	243,822	26.5	20.80	33.18
RM 8,000 - RM 9,999	63	183,849	41.6	29.82	54.35
RM 10,000 and above	118	230,054	32.5	23.84	42.46
Household Income Quintile					
Quintile 1	401	611,561	29.8	26.13	33.66
Quintile 2	328	534,139	30.5	26.44	34.95
Quintile 3	310	523,624	28.2	24.20	32.53
Quintile 4	271	453,678	26.8	23.11	30.95
Quintile 5	316	657,726	31.8	26.40	37.68
Household Income Category					
Bottom 40%	1,121	1,742,825	28.1	25.67	30.62
Middle 40%	378	789,082	32.6	27.88	37.71
Top 20%	127	248,820	31.3	24.95	38.38

Physical Activity

Physical Activity

Contributors to this section: Lim Kuang Kuay, Mohd Azahadi Omar, Muhammad Fadhli Mohd Yusoff, Thamil Arasu Saminathan, Chan Ying Ying, Nazirah Alias, Ahzairin Ahmad, Nur Hidayatun Fadillah Mohd Nor, Zanariah Zaini, Mohd Azemir Mustafa, Hazizi Abu Saad

Introduction

Low levels of physical activity had been identified as one of the leading risk factors for global mortality, contributing towards an estimated 6% of deaths globally [1]. In Malaysia, the National Health and Morbidity Survey (NHMS) in 2011 and 2015 revealed the prevalence of physical inactivity among the adult population aged 16 years and above were 35.7% and 33.5%, respectively [2][3]. To further improve the level of physical activity among the population, the government of Malaysia had introduced a new strategic plan known as the “National Strategic Plan for Active Living” (NASPAL) in 2017. One of the strategies in NASPAL is promoting and educating Malaysians to be physically active and to reduce sedentary lifestyle through promotion of active commuting among adults and strengthen the knowledge on physical activity in the community [4].

Objectives

The objectives of this survey are:

1. To determine the prevalence of physical inactivity among adults in Malaysia
2. To determine the prevalence of physical inactivity of travel domain among adults in Malaysia
3. To determine the prevalence of exposure to physical activity information among adults in Malaysia

Methods

Data on physical activity was obtained from adult respondents aged 16 years and above through face-to-face interview using the validated short version of International Physical Activity Questionnaire (IPAQ) [5].

Variable Definition

There are three levels of physical activity which are categorized as:

- i. Inactive (CATEGORY 1)
This is the lowest level of physical activity. Those individuals who do not meet the criteria for Categories 2 or 3 are considered “insufficiently active”.
- ii. Minimally active (CATEGORY 2)
The minimum pattern of activity to be classified as “sufficiently active” is any one of the following 3 criteria:
 - a. 3 or more days of vigorous activity of at least 20 minutes per day
OR
 - b. 5 or more days of moderate-intensity activity or walking of at least 30 minutes per day OR
 - c. 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 600 MET-minutes/week
- iii. HEPA active (CATEGORY 3).
A separate category labelled “HEPA” level, which is a more active category, can be computed for people who exceed the minimum public health physical activity recommendations. The two criteria for classification of “HEPA active” are:
 - a. vigorous-intensity activity on at least 3 days achieving a minimum of at least 1500 MET-minutes/week
OR
 - b. 7 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 3000 MET-minutes/week

However, for the current analysis, the levels of physical activity of minimally active (CATEGORY 2) and HEPA active (CATEGORY 3) will be presented as a single category (active). The data on physical activity of travel domain among adults in Malaysia was obtained using the active travel domain questionnaire adopted from validated long version of International Physical Activity Questionnaire (IPAQ-L) [5]. The exposure to physical activity information among adults in Malaysia questionnaire was developed by investigators and pre-tested before the survey.

Findings

The overall prevalence of physically inactive adults was 25.1% (95% CI: 23.8, 26.6).

Females [28.2% (95% CI: 26.4, 30.2)] were found to be more inactive than males [22.1% (95% CI: 20.4, 24.0)]. The level of physical inactivity gradually increased in adults from the age group of 55-59 years to 75 years and above. The urban population [26.5% (95% CI: 24.9, 28.2)] reported a higher level of physical inactivity compared to the rural population [20.3% (95% CI: 18.0, 22.7)]. The highest prevalence of physical inactivity was observed among Chinese [32.5% (95% CI: 29.0, 36.3)] followed by Malays [25.7% (95% CI: 24.1, 27.4)], and Indians [25.0% (95% CI: 20.5, 30.2)]. Widow(er) / divorcee [31.1% (95% CI: 27.5, 35.1)] or single [29.6% (95% CI: 27.1, 32.2)] adults were more inactive compared to married adults [22.1% (95% CI: 20.5, 23.9)].

With regards to the level of education, adults with no formal education [29.4% (95% CI: 24.2, 35.2)] and tertiary education [28.1% (95% CI: 25.5, 30.9)] were found to be more physically inactive than those with primary and secondary education. Not working adults [43.6% (95% CI: 39.9, 47.3)] and students [38.9% (95% CI: 33.9, 44.1)] had a higher level of physical inactivity compared to those from other occupational categories. The state of Perak [41.6% (95% CI: 36.1, 47.4)] reported the highest prevalence of physical inactivity, followed by Putrajaya [36.8% (95% CI: 31.0, 42.9)] and Melaka [33.2% (95% CI: 28.2, 38.7)].

In terms of active travel domain, the overall prevalence of physical inactivity in travel domain among adults was 83.0% (95% CI: 81.5, 84.5). Females [85.3% (95% CI: 83.6, 86.9)] were more inactive than males [80.9% (95% CI: 78.8, 82.9)]. The level of physical inactivity in this domain was most apparent in the elderly age group from the ages of 65-69 years to 75 years and above. The highest prevalence of physical inactivity was observed among Malays [85.3% (95% CI: 83.8, 86.6)], followed by Chinese [84.4% (95% CI: 80.6, 87.6)], and Indians [81.0% (95% CI: 74.8, 85.9)]. With regards to the level of education, adults with tertiary [85.1% (95% CI: 82.6, 87.3)] and secondary education [83.7% (95% CI: 81.9, 85.3)] were found to be more physically inactive compared to those from other education categories.

Regarding exposure to physical activity information disseminated through various mass media channels, the highest prevalence of adults who noticed the physical activity information was found for television [67.3% (95% CI: 65.3, 69.3)], followed by internet [61.0% (95% CI: 58.9, 63.1)], newspaper/magazine [39.5% (95% CI: 37.6, 41.5)] and radio [36.3% (95% CI: 34.2, 38.4)].

Conclusion

The prevalence of physical inactivity among Malaysian adults was relatively low, with a significant decrease from NHMS 2011 and NHMS 2015. However, the prevalence of physical inactivity in travel domain among Malaysian adults was relatively high. The highest prevalence of adults noticing physical activity information was found for television and on the internet.

Recommendations

In view of the findings which were highlighted above, the recommendations below are suggested.

- i. Programs to promote a better understanding of physical activity that benefits health and functional capacity are recommended, especially among females, student and those from the older population.
- ii. Programs to increase the travel domain are recommended, especially among Malays, females, tertiary education group and those from the older population.
- iii. Promotion of physical activity to be carried out via television and internet channels to increase the awareness of the benefits of physical activity.

Table 5.1: Physical Inactivity Trend in Malaysia

	2011	2015	2019
Physical Inactivity	35.7	33.5	25.1

References

1. World Health Organization. Global Recommendations on Physical Activity for Health. 2010.
2. IPH (Institute for Public Health): The fourth national health and morbidity survey (NHMS IV). Kuala Lumpur: Ministry of Health Malaysia; 2011.
3. IPH (Institute for Public Health): The fifth national health and morbidity survey (NHMS V). Kuala Lumpur: Ministry of Health Malaysia; 2015.
4. Health Education Division. National strategic plan for active living (NASPAL). Kuala Lumpur: Ministry of Health Malaysia; 2018.
5. International Physical Activity Questionnaire Web site [Internet]. Guidelines for data processing and analysis of the International Physical Activity Questionnaire (IPAQ) - Short and long Forms 2005.

Table 5.2: Prevalence of Physical Inactivity Among Respondents Aged 16 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,767)

Sociodemographic Characteristics	Inactive				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	2,820	5,574,818	25.1	23.77	26.56
State					
Johor	194	509,772	20.5	16.21	25.46
Kedah	71	168,405	12.5	9.33	16.61
Kelantan	191	340,438	28.4	23.57	33.75
Melaka	212	197,414	33.2	28.17	38.68
Negeri Sembilan	150	221,486	30.5	23.79	38.18
Pahang	168	265,754	25.0	20.62	29.87
Pulau Pinang	179	341,751	26.7	22.11	31.75
Perak	223	676,269	41.6	36.07	47.43
Perlis	141	40,253	23.8	18.44	30.22
Selangor	282	1,160,563	24.2	21.12	27.59
Terengganu	186	231,224	29.5	25.84	33.48
Sabah	149	439,229	16.0	12.30	20.47
Sarawak	196	517,986	27.4	23.32	31.82
WP Kuala Lumpur	180	426,899	32.1	26.23	38.60
WP Labuan	111	14,847	22.6	17.51	28.58
WP Putrajaya	187	22,527	36.8	31.04	42.91
Location					
Urban	1,843	4,577,603	26.5	24.92	28.21
Rural	977	997,215	20.3	18.00	22.72
Sex					
Male	1,175	2,496,904	22.1	20.41	23.96
Female	1,645	3,077,914	28.2	26.35	30.23
Age Group (Years)					
15-19	272	737,941	36.2	31.47	41.17
20-24	287	767,217	26.8	22.98	31.04
25-29	245	634,458	21.4	17.93	25.25
30-34	223	538,504	20.7	16.84	25.08
35-39	209	518,566	22.3	18.04	27.19
40-44	154	291,567	16.1	12.94	19.83
45-49	175	336,231	20.4	16.92	24.48
50-54	171	283,468	18.6	15.46	22.15
55-59	198	287,625	21.9	17.83	26.70
60-64	207	310,649	28.4	23.68	33.55
65-69	204	284,265	35.8	30.07	42.03
70-74	180	203,733	37.5	31.68	43.80
75 & above	295	380,594	58.9	52.18	65.29
Ethnicity					
Malay ^a	1,910	2,951,439	25.7	24.15	27.41
Chinese	422	1,503,578	32.5	29.02	36.27
Indian	184	328,070	25.0	20.54	30.17
Bumiputera Sabah	122	288,718	20.2	16.25	24.93

Sociodemographic Characteristics	Inactive				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sarawak	99	244,395	24.8	19.60	30.86
Others	83	258,618	10.9	7.57	15.49
Marital Status					
Single	802	2,105,150	29.6	27.11	32.23
Married	1,630	3,004,578	22.1	20.50	23.87
Widow(er)/Divorcee	388	465,090	31.1	27.47	35.06
Education Level					
No Formal Education	235	316,454	29.4	24.21	35.18
Primary Education	656	1,032,864	24.9	21.85	28.26
Secondary Education	1,243	2,624,921	23.3	21.65	25.06
Tertiary Education	668	1,564,012	28.1	25.45	30.89
Occupation					
Government Employee	248	343,433	22.2	17.93	27.16
Private Employee	624	1,696,054	20.8	18.48	23.31
Self Employed	288	593,306	16.3	13.58	19.35
Unpaid Worker/ Homemaker	475	874,021	24.0	20.60	27.70
Retiree	150	233,252	29.8	24.04	36.35
Student	244	656,320	38.9	33.94	44.12
Not Working ^b	790	1,175,015	43.6	39.93	47.27
Household Income Group					
Less than RM 1,000	328	548,803	31.0	26.71	35.56
RM 1,000 - RM 1,999	502	923,956	21.4	18.81	24.31
RM 2,000 - RM 3,999	766	1,520,049	22.8	20.62	25.09
RM 4,000 - RM 5,999	393	887,847	25.4	22.48	28.64
RM 6,000 - RM 7,999	257	528,132	26.5	21.94	31.59
RM 8,000 - RM 9,999	119	241,568	26.2	20.05	33.51
RM 10,000 and above	218	491,758	29.6	23.73	36.12
Household Income Quintile					
Quintile 1	612	1,078,990	27.0	23.99	30.19
Quintile 2	466	810,541	19.2	16.64	22.09
Quintile 3	483	1,026,975	24.6	21.70	27.82
Quintile 4	428	964,149	25.0	22.20	27.97
Quintile 5	594	1,261,459	27.5	24.20	31.17
Household Income Category					
Bottom 40%	1,746	3,200,414	23.6	22.00	25.31
Middle 40%	606	1,369,494	25.3	22.68	28.15
Top 20%	231	572,206	30.7	25.04	36.97

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 5.3: Prevalence of Physical Inactivity in Travel Domain Among Respondents Aged 16 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,886)

Sociodemographic Characteristics	Inactive				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	9,013	18,659,094	83.1	81.53	84.46
State					
Johor	698	1,992,559	78.5	73.21	83.02
Kedah	469	1,130,171	82.6	77.13	86.96
Kelantan	515	1,026,308	85.6	79.48	90.07
Melaka	595	544,838	87.9	84.02	90.94
Negeri Sembilan	506	680,035	92.3	87.70	95.25
Pahang	523	848,076	79.5	73.70	84.31
Pulau Pinang	570	1,176,685	91.3	85.95	94.73
Perak	546	1,441,135	88.5	84.22	91.80
Perlis	471	141,609	83.1	77.72	87.35
Selangor	995	4,169,686	86.5	83.45	89.13
Terengganu	586	675,591	85.9	81.45	89.41
Sabah	678	2,111,653	74.9	67.80	80.92
Sarawak	627	1,577,211	80.6	75.89	84.62
WP Kuala Lumpur	406	1,043,050	77.5	69.92	83.61
WP Labuan	433	55,280	83.8	77.21	88.77
WP Putrajaya	395	45,205	73.8	68.77	78.26
Location					
Urban	5,509	14,587,368	83.5	81.66	85.18
Rural	3,504	4,071,726	81.5	79.06	83.67
Sex					
Male	3,987	9,318,711	80.9	78.76	82.87
Female	5,026	9,340,383	85.3	83.61	86.85
Age Group (Years)					
15-19	641	1,764,371	84.8	80.86	87.99
20-24	799	2,360,798	82.2	76.27	86.91
25-29	836	2,550,077	85.1	81.35	88.23
30-34	825	2,185,708	82.1	78.56	85.24
35-39	861	1,950,877	82.3	78.74	85.35
40-44	691	1,500,815	81.9	78.27	85.04
45-49	754	1,391,202	83.7	80.26	86.58
50-54	768	1,259,559	82.0	78.44	85.16
55-59	769	1,082,172	80.9	76.70	84.43
60-64	687	899,700	81.3	76.79	85.16
65-69	542	679,546	84.5	80.03	88.16
70-74	391	470,974	85.6	79.71	89.95
75 & above	449	563,295	85.6	79.64	90.05
Ethnicity					
Malay ^a	5,976	9,851,457	85.3	83.79	86.65
Chinese	1,108	3,979,145	84.4	80.57	87.58
Indian	559	1,064,258	81.0	74.83	85.94

Sociodemographic Characteristics	Inactive				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sabah	542	1,164,037	79.2	73.13	84.27
Bumiputera Sarawak	354	814,322	80.6	73.54	86.10
Others	474	1,785,875	74.2	67.08	80.21
Marital Status					
Single	2,162	5,999,437	83.1	80.69	85.23
Married	5,888	11,402,957	83.0	81.19	84.72
Widow(er)/Divorcee	963	1,256,701	83.1	79.16	86.35
Education Level					
No Formal Education	521	828,113	75.7	67.94	82.03
Primary Education	1,980	3,392,472	80.7	76.72	84.08
Secondary Education	4,451	9,558,334	83.7	81.92	85.25
Tertiary Education	2,015	4,775,295	85.1	82.60	87.26
Occupation					
Government Employee	843	1,288,417	82.3	78.23	85.81
Private Employee	2,417	6,645,136	80.6	78.03	83.02
Self Employed	1,533	3,045,953	81.3	76.91	85.04
Unpaid Worker/ Homemaker	1,774	3,139,317	85.7	83.02	88.06
Retiree	420	655,215	82.4	77.24	86.54
Student	528	1,454,882	85.0	81.01	88.24
Not Working ^b	1,493	2,419,650	88.4	85.76	90.66
Household Income Group					
Less than RM 1,000	909	1,488,950	82.2	78.06	85.71
RM 1,000 - RM 1,999	1,792	3,601,374	82.7	79.95	85.13
RM 2,000 - RM 3,999	2,658	5,554,971	82.0	78.90	84.75
RM 4,000 - RM 5,999	1,351	2,968,870	83.6	80.16	86.62
RM 6,000 - RM 7,999	774	1,696,736	84.2	80.29	87.41
RM 8,000 - RM 9,999	343	803,423	86.8	80.27	91.45
RM 10,000 and above	603	1,356,330	80.7	74.21	85.88
Household Income Quintile					
Quintile 1	1,853	3,332,529	82.1	79.36	84.52
Quintile 2	1,693	3,452,084	80.5	76.49	83.98
Quintile 3	1,667	3,556,400	84.2	81.03	87.01
Quintile 4	1,497	3,273,153	83.5	80.28	86.30
Quintile 5	1,720	3,856,489	83.4	80.23	86.23
Household Income Category					
Bottom 40%	5,754	11,300,081	82.2	80.3	83.9
Middle 40%	2,005	4,602,839	84.2	81.7	86.4
Top 20%	671	1,567,735	82.9	78.1	86.9

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 5.4: Prevalence of Exposure to Physical Activity Information Disseminated Through Various Mass Media Channels Among Respondents Aged 16 Years and Above in Malaysia by Socio-Demographic Characteristics

Sociodemographic Characteristics	Newspaper or Magazine					Television				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	4,192	8,412,040	39.6	37.64	41.50	7,326	14,752,540	67.3	65.34	69.28
State										
Johor	312	855,146	34.1	28.74	39.94	514	1,415,282	56.8	49.23	64.14
Kedah	205	487,984	40.9	33.71	48.57	429	986,540	74.4	68.16	79.71
Kelantan	256	533,067	45.0	39.91	50.16	406	823,678	69.4	63.18	74.94
Melaka	282	251,206	42.2	33.15	51.86	494	448,699	74.5	64.54	82.37
Negeri Sembilan	317	399,427	57.0	44.22	68.96	415	520,530	72.0	58.84	82.18
Pahang	270	449,420	42.4	37.05	47.96	407	653,312	61.3	55.24	67.01
Pulau Pinang	210	434,758	37.3	29.80	45.56	467	856,195	70.0	62.95	76.29
Perak	235	642,715	44.1	37.67	50.78	438	1,130,282	71.4	65.26	76.78
Perlis	279	94,160	55.8	47.60	63.68	415	126,987	74.9	66.92	81.47
Selangor	452	1,879,674	42.3	37.41	47.42	813	3,143,757	68.8	63.57	73.66
Terengganu	238	275,816	36.2	28.28	45.02	407	481,696	62.0	54.21	69.23
Sabah	235	749,788	28.2	22.84	34.30	593	1,880,383	67.5	61.54	72.90
Sarawak	249	635,876	33.0	28.42	37.91	502	1,238,724	63.8	57.60	69.52
WP Kuala Lumpur	272	678,492	51.1	41.75	60.33	383	970,646	72.5	63.92	79.68
WP Labuan	115	14,254	21.7	15.20	30.11	329	39,529	60.2	51.96	67.83
WP Putrajaya	265	30,256	51.0	45.53	56.39	314	36,301	60.8	55.12	66.18
Location										
Urban	2,660	6,753,109	40.9	38.60	43.25	4,484	11,510,836	67.8	65.39	70.04
Rural	1,532	1,658,930	34.9	31.96	37.89	2,842	3,241,704	65.9	62.21	69.40
Sex										
Male	1,982	4,423,386	40.2	37.62	42.78	3,235	7,216,558	64.5	61.75	67.24
Female	2,210	3,988,653	38.9	36.64	41.20	4,091	7,535,981	70.3	67.94	72.46
Age Group (Years)										
15-19	282	712,947	35.8	31.28	40.68	484	1,308,516	64.9	59.92	69.58
20-24	354	1,034,990	38.7	32.94	44.70	597	1,773,124	63.6	58.13	68.77
25-29	349	1,000,181	35.5	31.18	40.06	603	1,817,139	62.1	57.16	66.80
30-34	413	1,054,236	41.4	35.85	47.24	681	1,801,897	69.6	64.47	74.33
35-39	466	995,936	44.4	39.92	48.98	729	1,608,966	69.1	64.58	73.27
40-44	364	717,041	40.4	35.25	45.76	609	1,249,893	69.5	64.46	74.09
45-49	358	631,750	40.9	36.44	45.45	620	1,088,619	67.8	63.04	72.26
50-54	413	638,988	43.4	38.96	48.02	703	1,106,568	73.2	69.02	76.98
55-59	376	577,476	45.9	41.01	50.96	695	962,372	73.5	68.58	77.87
60-64	320	430,561	40.2	35.10	45.55	592	783,511	71.6	66.48	76.27
65-69	234	296,194	38.9	32.95	45.14	444	529,370	67.3	60.91	73.12
70-74	133	166,795	32.3	26.42	38.74	295	368,313	67.9	60.86	74.30
75 & above	130	154,945	26.0	21.11	31.63	274	354,252	57.7	51.39	63.73
Ethnicity										
Malay ^a	2,906	4,767,006	43.5	41.48	45.58	4,930	8,183,585	72.1	70.07	74.05
Chinese	538	1,887,381	42.0	36.83	47.40	848	2,811,490	62.2	57.69	66.45
Indian	310	547,088	44.2	36.77	51.97	490	884,353	70.1	62.32	76.92

Sociodemographic Characteristics	Radio					Internet				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	3,729	7,755,371	36.3	34.18	38.43	5,878	13,246,766	61.0	58.91	63.07
State										
Johor	250	685,454	27.4	20.39	35.75	394	1,251,932	50.2	40.14	60.18
Kedah	185	448,304	36.5	30.24	43.16	229	689,736	55.1	48.81	61.19
Kelantan	229	466,618	39.4	33.42	45.64	257	623,344	52.8	45.64	59.78
Melaka	294	296,165	50.4	40.35	60.34	379	398,575	65.6	59.24	71.44
Negeri Sembilan	212	250,334	35.0	27.66	43.06	308	483,937	67.0	60.47	73.01
Pahang	196	331,909	31.4	27.88	35.14	339	609,587	57.5	51.50	63.27
Pulau Pinang	216	428,385	37.4	30.84	44.44	329	756,554	60.7	51.80	69.03
Perak	277	713,915	47.0	41.46	52.66	251	798,910	53.6	46.87	60.14
Perlis	233	77,914	46.3	39.49	53.22	254	98,689	58.2	51.88	64.26
Selangor	412	1,692,578	37.8	31.75	44.35	706	3,060,992	65.9	60.80	70.57
Terengganu	207	237,719	30.8	24.79	37.64	342	458,629	59.0	54.60	63.35
Sabah	256	875,521	32.7	27.47	38.48	474	1,767,434	64.9	58.93	70.46
Sarawak	309	753,076	38.9	33.36	44.78	421	1,174,815	60.8	55.33	66.01
WP Kuala Lumpur	178	466,410	36.1	26.98	46.35	342	967,504	75.6	69.03	81.17
WP Labuan	120	13,629	20.9	16.56	25.99	392	52,324	79.7	73.55	84.70
WP Putrajaya	155	17,441	29.7	24.12	35.99	461	53,804	88.4	83.93	91.78
Location										
Urban	2,259	6,105,559	36.8	34.24	39.40	4,021	10,835,094	64.1	61.54	66.49
Rural	1,470	1,649,811	34.5	31.39	37.76	1,857	2,411,672	50.3	46.63	53.92
Sex										
Male	1,718	4,019,673	36.3	33.53	39.07	2,710	6,694,842	59.9	57.20	62.52
Female	2,011	3,735,698	36.3	33.88	38.79	3,168	6,551,925	62.2	59.77	64.59
Age Group (Years)										
15-19	236	618,944	31.0	26.77	35.61	585	1,573,881	77.8	73.57	81.58
20-24	337	999,428	36.9	31.68	42.42	713	2,071,853	73.6	68.18	78.31
25-29	340	990,195	34.7	30.13	39.64	748	2,177,546	74.0	69.18	78.24
30-34	367	962,265	38.2	32.52	44.29	733	1,729,278	67.1	61.54	72.28
35-39	410	970,137	43.2	38.82	47.74	775	1,698,314	73.4	68.89	77.43
40-44	311	675,551	37.9	32.55	43.63	588	1,175,255	65.0	59.90	69.74
45-49	323	573,900	36.2	31.63	41.03	500	935,046	58.2	52.89	63.28
50-54	341	558,790	37.7	33.37	42.26	451	718,953	48.4	43.55	53.24
55-59	325	472,734	36.9	32.33	41.62	355	559,900	43.9	39.13	48.74
60-64	274	369,235	35.0	29.88	40.51	242	351,353	33.0	27.88	38.66
65-69	214	255,481	33.4	27.65	39.67	107	145,625	19.6	15.42	24.62
70-74	130	152,080	29.1	23.11	35.99	46	62,589	12.6	8.38	18.54
75 & above	121	156,630	26.6	21.62	32.25	35	47,175	8.4	5.33	13.13
Ethnicity										
Malay ^a	2,530	4,418,301	40.0	37.77	42.22	3,897	7,060,087	63.1	60.90	65.24
Chinese	414	1,456,140	32.6	27.04	38.64	673	2,659,352	58.8	53.69	63.81
Indian	274	486,094	39.1	31.53	47.21	366	779,697	61.7	54.16	68.72

Table 5.4: Prevalence of Exposure to Physical Activity Information Disseminated Through Various Mass Media Channels Among Respondents Aged 16 Years and Above in Malaysia by Socio-Demographic Characteristics (cont'd)

Sociodemographic Characteristics	Newspaper or Magazine					Television				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sabah	188	436,035	30.8	25.96	36.17	450	996,495	68.6	63.23	73.47
Bumiputera Sarawak	133	331,678	33.3	26.49	40.87	307	717,115	71.1	63.04	77.94
Others	117	442,852	20.4	14.01	28.67	301	1,159,502	50.1	41.90	58.38
Marital Status										
Single	964	2,475,186	36.5	33.52	39.48	1,626	4,385,111	62.8	59.36	66.18
Married	2,914	5,520,060	42.2	39.88	44.65	4,980	9,420,048	70.0	67.71	72.12
Widow(er)/Divorcee	314	416,793	29.6	25.69	33.80	720	947,381	64.7	60.12	69.03
Education Level										
No Formal Education	86	121,182	13.0	9.06	18.24	336	498,695	49.1	42.62	55.58
Primary Education	688	1,122,434	28.5	24.35	33.07	1,519	2,483,630	61.4	57.00	65.71
Secondary Education	2,247	4,533,741	41.6	39.46	43.79	3,776	7,871,836	70.1	67.81	72.36
Tertiary Education	1,162	2,612,623	48.6	45.16	52.02	1,673	3,850,215	70.0	66.69	73.03
Occupation										
Government Employee	569	826,712	54.2	49.56	58.78	762	1,241,318	80.3	76.34	83.68
Private Employee	1,180	2,960,249	38.0	34.84	41.26	1,943	4,961,383	61.8	58.63	64.95
Self Employed	723	1,520,210	42.2	37.13	47.45	1,282	2,534,050	69.3	65.28	72.99
Unpaid Worker/Homemaker	761	1,289,211	37.7	33.92	41.74	1,510	2,711,878	75.3	72.03	78.26
Retiree	235	394,248	50.3	44.34	56.16	367	555,536	71.2	63.65	77.70
Student	252	628,563	38.8	34.01	43.83	421	1,074,214	64.6	59.51	69.44
Not Working ^b	471	791,566	31.4	27.82	35.21	1,038	1,671,685	63.6	59.46	67.53
Household Income Group										
Less than RM 1,000	347	555,099	32.7	28.81	36.80	749	1,224,418	69.8	65.53	73.75
RM 1,000 - RM 1,999	774	1,382,463	33.8	29.67	38.20	1,410	2,692,113	63.5	59.42	67.42
RM 2,000 - RM 3,999	1,219	2,597,004	40.7	37.59	43.83	2,168	4,441,810	67.6	64.57	70.52
RM 4,000 - RM 5,999	667	1,370,694	40.7	36.63	44.88	1,145	2,452,917	70.2	65.78	74.21
RM 6,000 - RM 7,999	418	849,826	44.1	38.12	50.32	632	1,297,232	66.1	59.75	72.00
RM 8,000 - RM 9,999	192	452,546	50.7	41.86	59.57	282	687,237	75.1	68.61	80.67
RM 10,000 and above	346	692,744	42.7	34.85	50.92	504	1,042,495	63.2	53.38	71.99
Household Income Quintile										
Quintile 1	747	1,214,913	32.0	28.91	35.30	1,486	2,594,456	65.9	62.34	69.22
Quintile 2	754	1,526,134	38.1	33.46	42.99	1,370	2,717,400	65.5	61.58	69.32
Quintile 3	765	1,659,711	41.2	37.87	44.58	1,339	2,790,926	67.9	64.00	71.48
Quintile 4	741	1,504,502	40.5	36.69	44.46	1,277	2,708,476	70.2	65.97	74.04
Quintile 5	956	1,995,117	44.9	40.39	49.56	1,418	3,026,964	66.9	61.97	71.44
Household Income Category										
Bottom 40%	2,573	4,841,453	37.3	34.99	39.70	4,677	8,829,078	66.1	63.74	68.38
Middle 40%	1,005	2,257,100	43.5	39.75	47.29	1,654	3,787,306	70.6	67.00	74.00
Top 20%	385	801,824	44.1	37.61	50.86	559	1,221,839	65.5	57.38	72.87

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Radio					Internet				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sabah	204	468,972	32.9	28.25	37.83	419	1,000,008	69.5	65.05	73.63
Bumiputera Sarawak	202	470,808	46.8	39.80	53.86	236	587,061	58.6	49.25	67.34
Others	105	455,056	20.9	14.58	29.01	287	1,160,560	50.5	42.30	58.66
Marital Status										
Single	904	2,440,486	35.6	32.63	38.74	1,895	5,144,297	73.0	69.83	75.93
Married	2,487	4,877,964	37.2	34.64	39.89	3,732	7,693,122	57.9	55.39	60.44
Widow(er)/Divorcee	338	436,922	30.6	26.92	34.65	251	409,348	29.6	25.59	33.85
Education Level										
No Formal Education	141	205,274	21.6	17.19	26.77	54	101,785	10.8	7.55	15.32
Primary Education	703	1,241,639	31.2	27.16	35.50	540	1,260,713	31.9	27.91	36.28
Secondary Education	1,930	4,029,023	36.8	34.43	39.19	3,266	7,238,841	64.9	62.50	67.21
Tertiary Education	945	2,252,586	42.0	38.38	45.63	1,996	4,605,488	83.0	80.23	85.42
Occupation										
Government Employee	424	722,453	47.6	42.16	53.11	886	1,313,535	84.8	81.30	87.71
Private Employee	1,050	2,674,463	34.0	31.03	37.18	2,029	5,338,724	66.4	62.90	69.63
Self Employed	698	1,518,850	42.1	37.18	47.12	893	2,109,764	57.9	53.88	61.86
Unpaid Worker/Homemaker	695	1,238,215	36.0	32.21	39.86	948	1,886,276	53.4	49.39	57.41
Retiree	152	251,958	33.1	27.14	39.58	202	326,074	42.3	35.85	49.12
Student	217	533,919	32.8	28.27	37.66	507	1,334,480	79.3	74.56	83.32
Not Working ^b	492	815,446	32.0	28.54	35.58	412	936,536	37.7	33.48	42.17
Household Income Group										
Less than RM 1,000	356	597,314	35.0	30.91	39.26	303	640,661	38.4	33.65	43.36
RM 1,000 - RM 1,999	704	1,371,814	33.2	28.83	37.81	897	2,093,736	50.0	45.62	54.46
RM 2,000 - RM 3,999	1,138	2,434,278	38.0	34.62	41.50	1,776	4,146,620	63.0	59.97	66.00
RM 4,000 - RM 5,999	559	1,241,267	36.5	32.72	40.50	1,099	2,459,441	70.9	66.78	74.64
RM 6,000 - RM 7,999	334	719,321	37.2	31.48	43.25	675	1,430,662	72.5	66.67	77.59
RM 8,000 - RM 9,999	152	365,832	41.5	32.93	50.52	318	740,059	81.2	74.63	86.39
RM 10,000 and above	287	619,233	37.8	30.51	45.75	581	1,173,475	71.2	60.46	79.92
Household Income Quintile										
Quintile 1	726	1,236,932	32.3	28.90	35.87	735	1,640,200	42.6	38.81	46.56
Quintile 2	695	1,496,168	36.9	32.33	41.76	1,000	2,336,138	56.8	52.53	61.06
Quintile 3	697	1,502,027	37.4	33.52	41.53	1,122	2,654,889	64.5	60.99	67.89
Quintile 4	639	1,409,546	37.6	33.88	41.40	1,218	2,709,231	70.7	67.05	74.16
Quintile 5	773	1,704,386	38.3	34.01	42.71	1,574	3,344,196	73.7	68.95	78.04
Household Income Category										
Bottom 40%	2,342	4,663,980	35.8	33.20	38.39	3,422	7,594,393	57.4	54.75	60.03
Middle 40%	878	1,963,155	37.6	34.12	41.24	1,621	3,718,104	69.5	65.98	72.81
Top 20%	310	721,924	39.3	33.26	45.67	606	1,372,158	73.8	65.16	80.91

Tobacco Use

Tobacco Use

Contributors to this section: Muhammad Fadhli Mohd Yusoff, Jane Ling Miaw Yn, Noraryana Hassan, Mohd Hairul Nizam, Nizam Baharom, Nur Liana Ab. Majid, Tania Gayle Robert Lourdes, Thamil Arasu Saminathan, Halizah Mat Rifin, Hasimah Ismail, Wan Shakira Rodzlan Hasani, Hasmah Mohamed Haris

Introduction

It is estimated that more than 27,200 of Malaysians deaths annually are related to smoking [1]. The adults smoking prevalence in Malaysia has plateaued for more than a decade. Based on the World Health Organization Framework Convention on Tobacco Control (WHO FCTC), the National Strategic Plan on Tobacco Control 2015-2020 (NSPTC) was developed to strengthen the implementation of tobacco control in Malaysia [2]. The NSPTC has a medium-term target to reduce the smoking prevalence to 15% by the year 2025, in line with the WHO Non-Communicable Diseases Global Target; and a long-term target to achieve the ‘Endgame’ of tobacco in Malaysia by 2045.

Objectives

General objective

To determine the prevalence of current smokers by social demographic characteristics among adults aged 15 years and above in Malaysia.

Specific objectives

1. To determine the prevalence of current smokers in Malaysia
2. To determine the prevalence of current cigarette smokers in Malaysia
3. To determine the prevalence of current smokeless tobacco use in Malaysia
4. To determine the prevalence of current e-cigarette/Vape use in Malaysia
5. To determine the prevalence of current any tobacco product use in Malaysia
6. To determine the prevalence of exposure to second-hand smoke in Malaysia
7. To determine the prevalence of quit attempt in the past 12 months among current smokers in Malaysia

Methods

The target population consisted of respondents aged 15 years and above in Malaysia. The study used the short version of Global Adult Tobacco Surveillance questionnaire (GATS), which had been translated, pre-tested and validated among selected respondents in Bangsar, Wilayah Persekutuan Kuala Lumpur. The questionnaire consisted of 31 items which measured the proportion of daily and occasional smokers among participants aged 15 years and above; types and quantities of tobacco products smoked; exposure to secondhand smoke at home, work place and eateries among smokers and non-smokers; smoking cessation behavior among current smokers; awareness of anti-smoking campaign, cigarette advertising and promotion.

Variable Definition

1. Current smoker was defined as currently using any smoked tobacco product (Manufactured cigarettes, hand-rolled cigarettes, kretek, cigars, shisha, bidis or tobacco pipes).
2. Current cigarette smoker was defined as currently using either manufactured cigarettes, hand-rolled cigarettes or kretek.
3. Current smokeless tobacco product user was defined as currently using any smokeless tobacco product (E-cigarettes/vape, chewing tobacco or snuff).
4. Current E-cigarettes/vape user was defined as currently using E-cigarettes/vape.
5. Current any tobacco product user was defined as currently using any tobacco product (Manufactured cigarettes, hand-rolled cigarettes, kretek, cigars, shisha, bidis, tobacco pipes, E-cigarettes/vape, chewing tobacco or snuff).

Findings

A total of 11,097 adults aged 15 years and above responded to this module.

6.1 Smoking

Current Tobacco Smoker

Overall, the prevalence of current smoker was 21.3% (95% CI: 19.86, 22.75). There was a slight reduction compared to the prevalence reported in the National Health and Morbidity Survey (NHMS) 2015 [22.8% (95% CI: 21.9, 23.8)]. It was estimated that 4.8 million Malaysians aged 15 years and above currently smoke. The prevalence was highest in Kedah [27.6% (95% CI: 23.44, 32.24)], followed by Sabah [25.3% (95% CI: 20.02, 31.45)] and Terengganu [23.9% (95% CI: 20.37, 27.82)]; while the lowest prevalence was in WP Putrajaya [12.2% (95% CI: 9.91, 14.97)]. The proportion of current smokers was more than 30 times higher among males compared to females [40.5% (95% CI: 37.90, 43.06) vs 1.2% (95% CI: 0.85, 1.70)]. It was also observed that the prevalence of male smokers had reduced from 43.0% (95% CI: 41.4, 44.6) in 2015 to 40.5% (95% CI: 37.90, 43.06) while the smoking prevalence among females had reduced slightly from 1.4% (95% CI: 1.1, 1.8) in 2015 to 1.2% (95% CI: 0.84, 1.70) in the current survey.

Higher prevalence of tobacco use was observed among respondents in rural areas [25.4% (95% CI: 22.55, 28.54)] as compared to respondents in urban areas [20.1% (95% CI: 18.47, 21.77)]. The prevalence of current smokers for the 15-19 years old age group was 12.3% (95% CI: 9.72, 15.46) and the prevalence peaked in the 30-34 years age group [27.1% (95% CI: 23.01, 31.61)]. The lowest prevalence was reported among those in the 75+ age group with the prevalence of 7.5% (95% CI: 5.20, 10.74).

Respondents with tertiary education had the lowest prevalence [13.0% (95% CI: 11.10, 15.16)] when compared to respondents with primary education [24.3% (95% CI: 20.71, 28.27)] and secondary education attainment [24.6% (95% CI: 22.65, 26.59)]. The highest prevalence of current smokers was among those who were self-employed [33.7% (95% CI: 29.38, 38.31)] followed by private sector employees [30.1% (95% CI: 27.39, 32.99)] which were significantly higher than the prevalence reported by government employees [18.2% (95% CI: 14.68, 22.27)].

Current Cigarette Smoker

Approximately one fifth of the respondents [20.8% (95% CI: 19.43, 22.30)] currently smoked cigarettes. The prevalence was remarkably higher among male current smokers [39.6% (95% CI: 37.08, 42.19)] as compared to female current smokers [1.2% (95% CI: 0.84, 1.69)]. Cigarette use was also higher among those residing in rural areas [24.9% (95% CI: 22.07, 28.00)] compared to those in urban areas [19.6% (95% CI: 18.07, 21.33)]. The respondents with primary education [24.1% (95% CI: 20.57, 28.10)] had the highest prevalence while those with tertiary education attainment reported the lowest prevalence [12.5% (95% CI: 10.62, 14.63)].

Among daily cigarette smokers, the mean number of cigarettes smoked daily was 12.4 sticks per day. About one third [30.5% (95% CI: 26.84, 34.47)] of daily cigarette smokers smoked 15 to 24 sticks of cigarette per day while only 4.2% (95% CI: 3.18, 5.65) smoked 25 or more sticks per day. Majority of male daily cigarette smokers smoked 15 to 24 sticks of cigarette per day [30.9% (95% CI: 27.22, 34.91)] while majority of female smoked less than 5 sticks of cigarette per day [41.5% (95% CI: 25.28, 59.89)].

Smokeless Tobacco Use

The prevalence of smokeless tobacco use among Malaysian population aged 15 years and above was 6.5% (95% CI: 5.63, 7.58) which was lower than the findings in 2015 [10.9% (95% CI: 10.1, 11.7)].

The prevalence was highest in Sabah [9.4% (95% CI: 5.62, 15.26)] and Putrajaya [9.4% (95% CI: 6.62, 13.23)]. The use of smokeless tobacco among male current smokers were almost 17 times higher than females [12.1% (95% CI: 10.41, 14.12) vs 0.7% (95% CI: 0.44, 1.05)].

E-cigarette/Vape Use

The prevalence was highest in Putrajaya [8.2% (95% CI: 5.53, 12.03)] followed by Terengganu [7.3% (95% CI: 5.04, 10.43)] and Sabah [6.9% (95% CI: 3.42, 13.44)]. The use of e-cigarette/vape among male current smokers was almost 31 times higher than females [9.4% (95% CI: 7.80, 11.26) vs 0.3% (95% CI: 0.13, 0.59)]. The prevalence of e-cigarette/vape use was highest among those in the 20 to 24 years age group [14.7% (95% CI: 9.89, 21.33)].

6.2 Exposure To Secondhand Smoke

The prevalence of exposure to secondhand smoke at home by all respondents (smokers and non-smokers) was 31.0% (95% CI: 29.15, 32.82) while exposure at work was 27.2% (95% CI: 24.29, 30.28). At the eateries, the prevalence of exposure differs between air-conditioned and non-air-conditioned eateries [8.5% (95% CI: 7.17, 10.17) vs 48.1% (95% CI: 45.83, 50.32)].

6.3 Smoking Cessation Behavior

Quit Attempt

Less than half [48.9% (95% CI: 45.02, 52.70)] of the current smokers made an attempt to quit smoking in the past 12 months. A comparison across the age groups showed that the percentage of quit attempt was highest among current smokers in 15 to 19 years age group [56.4% (95% CI: 44.02, 67.98)]. The prevalence of quit attempt increases as the education background increases.

Current Smokers Who Visited Healthcare Provider in the Past 12 Months Advised to Quit Smoking by Healthcare Provider

Less than 10% [7.4% (95% CI: 5.99, 9.12)] of current smokers visited a healthcare provider in the past 12 months. More than three quarters [77.3% (95% CI: 64.32, 86.56)] of current smokers who visited healthcare services in the past 12 months had been advised to quit smoking by healthcare providers.

6.4 Awareness of Anti-Smoking Campaign

Noticing Anti-Cigarette Smoking Information During the Last 30 Days in Newspaper or Magazine

Nearly half [48.7% (95% CI: 46.55, 50.91)] of the respondents had noticed anti-smoking information in newspapers or magazines during the last 30 days. There was increasing trend of noticing anti-smoking information with increasing educational background.

Noticing Anti-Cigarette Smoking Information During the Last 30 Days on Television

The prevalence of the respondents noticing anti-smoking information on television during the last one month was 63.7% (95% CI: 61.54, 65.74). Females had higher prevalence of noticing anti-cigarette smoking information during the last 30 days on television than male [67.7% (95% CI: 65.02, 70.20) vs 60.4% (95% CI: 57.44, 63.26)].

6.5 Awareness of Cigarette Advertising and Promotion

Noticing Cigarette Advertising During the Last 30 Days in Stores

A total of 21.2% (95% CI: 19.47, 23.03) of Malaysians aged 15 years and above noticed cigarettes advertising in stores during the last 30 days.

Noticing Cigarette Promotion During the Last 30 Days

Small and insignificant prevalence of noticing cigarette promotion by various approaches were as follows:

- Free sample 1.3% (95% CI: 1.01, 1.79)
- Sales price 1.8% (95% CI: 1.23, 2.64)
- Coupon 0.6% (95% CI: 0.34, 1.00)
- Free gift / discounts on other product 0.5% (95% CI: 0.33, 0.90)
- Clothing / items with brand name or logo 1.1% (95% CI: 0.82, 1.40)
- Promotion on cigarettes through mail 0.4% (95% CI: 0.24, 0.67)

Conclusion

The overall prevalence of current smokers aged 15 years and above had reduced slightly from 22.8% in 2015 to 21.3% in 2019. It was also observed that the prevalence of both male and female current smokers had reduced (43.0% in 2015 to 40.5% in 2019 vs 1.4% in 2015 to 1.2 in 2019) in the current survey. The number of cigarette sticks smoked per day has considerably reduced since 2015. The prevalence of smokeless tobacco product use had reduced from 10.9% in 2015 to 6.5% in 2019. The proportion of current smoker having attempt to quit smoking has dipped slightly from 52.3% in 2015 to 48.9% in 2019. The exposure to secondhand cigarette smoke at non-air-conditioned eateries was high (48.1%).

Recommendations

The implementation of the National Strategic Plan on Tobacco Control 2015-2020 needs to be strengthened in order to achieve its targets. All the elements of the WHO FCTC MPOWER strategies should be enhanced to the best of Malaysia capability. Smoking cessation services such as the 'mQuit' program must be strengthened by enhancing access to smoking cessation services and pharmacotherapy. The tobacco product display ban at point of sale policy would be effective in reducing tobacco products promotion at the store. With the new regulation of smoking ban at all eateries, it is hoped that the public would be further protected from secondhand smoke exposure. With focused tobacco control strategies, the smoking prevalence can be reduced further to achieve the 'Endgame' of tobacco in Malaysia.

Table 6.1: Smoking Trend in Malaysia

	2011	2015	2019
Current Smokers	23.1	22.8	21.3

References

1. Malaysian fact sheet. The Tobacco Atlas, American Cancer Society. 2019. <https://files.tobaccoatlas.org/wp-content/uploads/pdf/malaysia-country-facts-en.pdf>
2. Pelan Strategik Kebangsaan bagi Kawalan Tembakau 2015-2020. Ministry of Health Malaysia. Putrajaya. 2015. http://www.moh.gov.my/moh/resources/Penerbitan/Rujukan/NSP_Tobacco_buku_bind_24oct2015.pdf

Table 6.2: Prevalence of Smokers Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics (n=11,058)

Sociodemographic Characteristics	Current Smokers					Current Cigarette Smokers				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	2,064	4,877,697	21.3	19.86	22.75	2,016	4,776,548	20.8	19.43	22.30
State										
Johor	163	566,904	21.9	17.45	27.19	156	540,042	20.9	16.67	25.87
Kedah	148	391,658	27.6	23.44	32.24	144	376,678	26.6	22.25	31.39
Kelantan	75	185,593	15.1	11.75	19.19	73	182,286	14.8	11.59	18.77
Melaka	99	93,976	14.9	10.63	20.49	93	89,336	14.2	9.74	20.16
Negeri Sembilan	99	150,934	20.2	14.83	26.85	94	144,228	19.3	14.26	25.54
Pahang	152	255,537	23.1	18.45	28.40	150	253,726	22.9	18.24	28.31
Pulau Pinang	127	238,811	18.3	13.09	25.07	127	238,811	18.3	13.09	25.07
Perak	124	398,269	23.8	18.64	29.81	122	391,908	23.4	18.35	29.32
Perlis	109	35,398	20.6	16.83	24.89	106	33,714	19.6	15.94	23.83
Selangor	206	902,041	18.5	15.27	22.22	205	896,337	18.4	15.15	22.11
Terengganu	155	194,709	23.9	20.37	27.82	153	192,583	23.6	20.04	27.65
Sabah	174	729,360	25.3	20.02	31.45	171	725,720	25.2	19.89	31.34
Sarawak	152	444,764	22.2	18.62	26.28	147	424,697	21.2	17.94	24.89
WP Kuala Lumpur	92	268,416	19.8	15.44	24.93	89	265,416	19.5	15.16	24.82
WP Labuan	73	7,677	12.2	9.91	14.97	70	7,417	11.8	9.48	14.60
WP Putrajaya	116	13,650	20.3	15.63	26.06	116	13,650	20.3	15.63	26.06
Location										
Urban	1,172	3,569,016	20.1	18.47	21.77	1,143	3,494,313	19.6	18.07	21.33
Rural	892	1,308,682	25.4	22.55	28.54	873	1,282,235	24.9	22.07	28.00
Sex										
Male	2,007	4,742,418	40.5	37.90	43.06	1,961	4,642,861	39.6	37.08	42.19
Female	57	135,280	1.2	0.85	1.70	55	133,687	1.2	0.84	1.69
Age Group (Years)										
15-19	111	323,110	12.3	9.72	15.46	106	303,831	11.6	9.12	14.58
20-24	202	726,574	25.5	20.12	31.77	195	708,892	24.9	19.49	31.20
25-29	228	737,504	24.7	20.82	29.02	223	721,048	24.1	20.26	28.50
30-34	232	718,979	27.1	23.01	31.61	227	708,883	26.7	22.64	31.22
35-39	254	567,510	24.0	20.63	27.71	252	561,424	23.7	20.43	27.39
40-44	199	470,340	25.7	21.67	30.12	197	467,773	25.5	21.52	29.99
45-49	175	380,829	22.9	19.21	27.12	171	370,447	22.3	18.62	26.48
50-54	206	348,327	22.7	19.24	26.61	203	346,587	22.6	19.12	26.50
55-59	154	232,558	17.6	14.33	21.50	148	228,541	17.3	14.03	21.21
60-64	129	1,649,230	14.9	11.91	18.50	124	158,443	14.3	11.43	17.80
65-69	77	99,319	12.4	9.19	16.58	75	97,236	12.2	8.96	16.30
70-74	51	58,729	10.7	7.46	15.04	49	54,454	9.9	6.82	14.15
75 & above	46	48,989	7.5	5.20	10.74	46	48,989	7.5	5.20	10.74
Ethnicity										
Malay ^a	1,428	2,676,767	22.6	21.23	24.00	1,396	2,622,955	22.1	20.77	23.55
Chinese	161	653,557	13.7	10.62	17.55	155	628,247	13.2	10.20	16.89
Indian	83	155,188	11.5	8.50	15.41	79	151,268	11.2	8.24	15.11

Table 6.2: Prevalence of Smokers Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics (n=11,058) (cont'd)

Sociodemographic Characteristics	Current Smokers					Current Cigarette Smokers				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sabah	139	325,858	21.7	17.24	26.88	136	322,118	21.4	16.95	26.70
Bumiputera Sarawak	85	256,776	24.5	19.64	30.08	83	242,909	23.2	19.35	27.47
Others	168	809,552	33.5	26.96	40.70	167	809,052	33.5	26.94	40.68
Marital Status										
Single	585	1,774,258	22.9	20.37	25.70	568	1,727,603	22.3	19.78	25.08
Married	1,386	2,977,006	21.7	19.97	23.63	1,355	2,922,512	21.3	19.60	3.21
Widow(er)/Divorcee	93	126,433	8.4	6.01	11.63	93	126,433	8.4	6.01	11.63
Education Level										
No Formal Education	72	169,992	15.7	10.99	21.96	71	168,752	15.6	10.87	21.87
Primary Education	455	1,104,878	24.3	20.71	28.27	448	1,097,834	24.1	20.57	28.10
Secondary Education	1,207	2,844,505	24.6	22.65	26.59	1,180	2,779,935	24.0	22.12	26.00
Tertiary Education	317	727,219	13.0	11.10	15.16	304	698,923	12.5	10.62	14.63
Occupation										
Government Employee	185	283,434	18.2	14.68	22.27	182	280,146	18.0	14.49	22.04
Private Employee	874	2,469,707	30.1	27.39	32.99	858	2,432,678	29.7	26.95	32.54
Self Employed	575	1,263,487	33.7	29.38	38.31	558	1,229,649	32.8	28.52	37.38
Unpaid Worker/Homemaker	39	84,767	2.3	1.40	3.82	39	84,768	2.3	1.40	3.82
Retiree	96	142,215	17.9	13.53	23.33	92	135,676	17.1	12.78	22.48
Student	58	179,863	8.0	5.98	10.61	52	159,521	7.1	5.21	9.57
Not Working ^b	234	448,149	16.5	13.87	19.52	232	448,035	16.5	13.87	19.52
Household Income Group										
Less than RM 1,000	172	321,336	17.3	14.25	20.83	170	315,306	17.0	13.93	20.52
RM 1,000 - RM 1,999	508	1,202,476	26.8	23.75	30.18	500	1,185,418	26.5	23.37	29.81
RM 2,000 - RM 3,999	649	1,577,120	22.8	20.32	25.50	633	1,543,258	22.3	19.85	24.98
RM 4,000 - RM 5,999	335	794,897	22.0	18.86	25.59	327	780,872	21.7	18.47	25.22
RM 6,000 - RM 7,999	193	521,632	25.5	20.53	31.11	185	496,757	24.2	19.31	29.98
RM 8,000 - RM 9,999	59	139,802	14.8	9.75	21.70	56	135,545	14.3	9.34	21.28
RM 10,000 and above	102	220,837	12.9	9.33	17.56	101	220,337	12.9	9.30	17.54
Household Income Quintile										
Quintile 1	433	955,640	22.9	20.24	25.71	426	939,104	22.5	19.85	25.32
Quintile 2	455	1,104,348	25.3	21.78	29.15	448	1,086,272	24.9	21.38	28.73
Quintile 3	398	950,099	22.0	19.48	24.69	386	927,763	21.5	18.97	24.17
Quintile 4	378	885,741	22.2	19.20	25.54	370	871,716	21.9	18.84	25.20
Quintile 5	354	882,270	18.7	15.72	22.18	342	852,638	18.1	15.12	21.54
Household Income Category										
Bottom 40%	1,430	3,283,476	23.4	21.61	25.20	1,403	3,228,671	23.0	21.23	24.80
Middle 40%	466	1,180,945	21.2	18.44	24.28	450	1,139,860	20.5	17.74	23.51
Top 20%	122	313,679	16.2	12.36	20.84	119	308,962	15.9	12.13	20.60

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 6.3: Prevalence of Smokeless Tobacco and E-cigarettes / Vape Use Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics

Sociodemographic Characteristics	Smokeless Tobacco Use					E-cigarettes/Vape Use				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	546	1,496,276	6.5	5.63	7.58	401	1,126,073	4.9	4.10	5.92
State										
Johor	40	165,729	6.4	3.82	10.66	30	104,550	4.1	2.56	6.49
Kedah	23	84,314	5.9	3.94	8.88	21	77,456	5.5	3.44	8.59
Kelantan	9	29,971	2.4*	1.00	5.86	9	29,971	2.5*	1.01	5.89
Melaka	32	37,918	6.1	3.56	10.12	24	32,539	5.3*	2.66	10.10
Negeri Sembilan	21	46,514	6.2	4.13	9.35	16	37,110	5.0	3.21	7.69
Pahang	39	76,043	6.8	4.78	9.70	26	51,987	4.7	2.98	7.29
Pulau Pinang	20	47,389	3.6*	1.75	7.39	17	43,551	3.3*	1.48	7.38
Perak	20	87,506	5.2	3.00	8.92	12	53,086	3.2*	1.56	6.31
Perlis	29	12,413	7.2	4.32	11.74	13	6,452	3.8	2.15	6.46
Selangor	71	352,669	7.2	5.18	9.98	56	293,049	6.0	4.07	8.76
Terengganu	35	63,252	7.8	5.20	11.39	32	59,195	7.3	5.04	10.43
Sabah	58	270,848	9.4	5.62	15.26	27	198,624	6.9*	3.42	13.44
Sarawak	48	145,866	7.4	5.35	10.04	29	88,747	4.5	2.77	7.15
WP Kuala Lumpur	24	67,038	5.0	3.30	7.41	17	41,724	3.1	1.91	4.99
WP Labuan	54	5,910	9.4	6.62	13.23	50	5,153	8.2	5.53	12.03
WP Putrajaya	23	2,893	4.3*	2.37	7.70	22	2,877	4.3*	2.35	7.66
Location										
Urban	355	1,192,595	6.7	5.60	8.01	273	898,622	5.1	4.06	6.31
Rural	191	303,681	5.9	4.81	7.29	128	227,450	4.5	3.43	5.76
Sex										
Male	501	1,420,041	12.1	10.41	14.12	386	1,094,971	9.4	7.80	11.26
Female	45	76,235	0.7	0.44	1.05	15	31,102	0.3*	0.13	0.59
Age Group (Years)										
15-19	63	210,316	8.0	5.89	10.79	59	196,087	7.5	5.41	10.26
20-24	112	456,080	16.0	11.16	22.40	102	417,493	14.7	9.89	21.33
25-29	89	255,111	8.6	6.38	11.38	68	181,658	6.1	4.39	8.46
30-34	79	201,662	7.6	5.38	10.64	61	127,286	4.8	3.30	6.94
35-39	54	92,072	3.9	2.67	5.68	39	56,226	2.4	1.48	3.83
40-44	41	102,900	5.6	3.81	8.22	32	77,632	4.2	2.64	6.77
45-49	27	55,780	3.4	1.97	5.68	19	42,804	2.6*	1.36	4.87
50-54	24	41,603	2.7*	1.48	4.90	10	9,278	0.6*	0.23	1.61
55-59	21	36,056	2.7	1.58	4.72	7	11,513	0.9*	0.38	2.00
60-64	13	18,686	1.7*	0.90	3.20	2	2,923	0.3*	0.06	1.13
65-69	13	15,588	2.0*	0.87	4.34	1	2,673	0.3*	0.05	2.35
70-74	5	4,389	0.8*	0.30	2.10	0	-	-	-	-
75 & above	5	6,033	0.9*	0.32	2.64	1	500	0.1*	0.01	0.55
Ethnicity										
Malay ^a	405	845,739	7.1	6.29	8.11	318	679,451	5.8	4.98	6.65
Chinese	32	208,436	4.4	2.55	7.45	23	166,846	3.5*	1.81	6.78
Indian	14	20,167	1.5*	0.72	3.04	9	13,100	1.0*	0.36	2.55

Table 6.3: Prevalence of Smokeless Tobacco and E-cigarettes / Vape Use Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics (cont'd)

Sociodemographic Characteristics	Smokeless Tobacco Use					E-cigarettes/Vape Use				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sabah	56	148,733	9.9	7.46	12.93	26	76,299	5.1	3.00	8.42
Bumiputera Sarawak	21	78,037	7.5	4.52	12.16	14	51,746	5.0*	2.35	10.18
Others	18	195,164	8.1*	3.68	16.81	11	138,630	5.8*	2.11	14.72
Marital Status										
Single	236	791,890	10.2	8.52	12.26	202	666,735	8.7	7.02	10.63
Married	300	686,645	5.0	3.94	6.38	196	452,355	3.3	2.36	4.63
Widow(er)/Divorcee	10	17,740	1.2*	0.54	2.58	3	6,983	0.5*	0.13	1.70
Education Level										
No Formal Education	16	36,873	3.4*	1.07	10.41	1	500	0.1*	0.01	0.33
Primary Education	51	234,110	5.2*	2.82	9.25	19	145,068	3.2*	1.27	7.83
Secondary Education	328	902,023	7.8	6.55	9.24	247	706,422	6.1	4.95	7.55
Tertiary Education	149	317,954	5.7	4.51	7.17	133	270,341	4.8	3.78	6.20
Occupation										
Government Employee	67	114,396	7.3	5.20	10.29	55	81,981	5.3	3.50	7.86
Private Employee	264	765,766	9.3	7.51	11.54	214	596,675	7.3	5.75	9.23
Self Employed	80	283,761	7.6	4.65	12.20	49	210,365	5.7*	2.95	10.57
Unpaid Worker/Homemaker	24	43,237	1.2	0.68	2.05	8	18,110	0.5*	0.19	1.29
Retiree	13	25,044	3.2*	1.49	6.61	3	6,758	0.9*	0.27	2.68
Student	41	135,373	6.0	4.04	8.80	38	128,035	5.7	3.76	8.50
Not Working ^b	57	128,698	4.8	3.39	6.66	34	84,147	3.1	2.04	4.77
Household Income Group										
Less than RM 1,000	34	70,353	3.8	2.34	6.13	14	46,512	2.5*	1.26	5.00
RM 1,000 - RM 1,999	98	307,318	6.9	4.99	9.39	59	196,514	4.4	3.10	6.22
RM 2,000 - RM 3,999	164	508,442	7.4	5.46	9.85	126	387,393	5.6	3.81	8.18
RM 4,000 - RM 5,999	104	237,815	6.6	5.07	8.52	88	193,173	5.4	3.97	7.26
RM 6,000 - RM 7,999	77	236,943	11.6	7.43	17.74	64	199,531	9.8	5.81	16.18
RM 8,000 - RM 9,999	27	42,367	4.5*	2.29	8.48	23	40,316	4.3*	2.14	8.27
RM 10,000 and above	31	59,075	3.5*	1.76	6.67	24	48,700	2.9*	1.31	6.18
Household Income Quintile										
Quintile 1	78	249,103	6.0	4.12	8.59	42	156,610	3.8	2.51	5.61
Quintile 2	99	338,036	7.8	5.04	11.75	63	253,213	5.8	3.32	9.97
Quintile 3	109	278,307	6.4	5.08	8.13	87	215,892	5.0	3.78	6.58
Quintile 4	114	258,483	6.5	5.02	8.32	95	197,878	5.0	3.68	6.72
Quintile 5	135	338,385	7.2	5.09	10.12	111	288,547	6.2	4.11	9.19
Household Income Category										
Bottom 40%	346	953,369	6.8	5.57	8.27	246	695,902	5.0	3.91	6.29
Middle 40%	148	425,443	7.7	5.72	10.16	119	341,010	6.1	4.33	8.66
Top 20%	41	83,502	4.3	2.73	6.73	33	75,228	3.9	2.41	6.28

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 6.4: Prevalence of Any Tobacco Product Use Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics (n=11,034)

Sociodemographic Characteristics	Any Tobacco Product Use				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	2,275	5,335,310	23.3	21.95	24.75
State					
Johor	174	605,688	23.6	19.06	28.81
Kedah	151	399,622	28.2	24.13	32.67
Kelantan	81	204,214	16.7	13.10	20.96
Melaka	108	109,627	17.5	13.12	22.95
Negeri Sembilan	106	163,392	22.0	16.74	28.24
Pahang	160	274,487	24.8	20.34	29.78
Pulau Pinang	140	269,412	20.7	16.10	26.16
Perak	130	426,338	25.4	20.44	31.16
Perlis	119	40,381	23.5	19.33	28.17
Selangor	230	1,003,082	20.6	17.40	24.15
Terengganu	168	214,289	26.3	22.37	30.71
Sabah	208	828,332	28.7	23.64	34.46
Sarawak	168	486,595	24.5	20.90	28.53
WP Kuala Lumpur	98	282,983	21.0	16.43	26.34
WP Labuan	108	11,487	18.3	15.12	21.99
WP Putrajaya	126	15,380	22.9	18.15	28.53
Location					
Urban	1,308	3,924,798	22.1	20.55	23.73
Rural	967	1,410,512	27.5	24.70	30.59
Sex					
Male	2,180	5,150,433	44.1	41.63	46.58
Female	95	184,876	1.7	1.24	2.19
Age Group (Years)					
15-19	135	409,625	15.6	12.72	19.02
20-24	236	833,483	29.3	23.96	35.33
25-29	267	834,408	28.0	23.98	32.38
30-34	259	760,178	28.7	24.49	33.29
35-39	281	597,681	25.4	21.93	29.12
40-44	211	498,702	27.3	23.25	31.68
45-49	188	407,335	24.5	20.64	28.87
50-54	210	353,018	23.0	19.53	26.92
55-59	163	246,066	18.8	15.45	22.68
60-64	137	172,810	15.7	12.65	19.36
65-69	86	108,253	13.6	10.22	17.91
70-74	51	58,729	10.7	7.47	15.05
75 & above	51	55,022	8.5	6.01	11.94
Ethnicity					
Malay ^a	1,577	2,937,009	24.8	23.47	26.28
Chinese	175	724,042	15.3	12.20	18.90
Indian	87	160,646	11.9	8.87	15.83

Table 6.4: Prevalence of Any Tobacco Product Use Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics (n=11,034) (cont'd)

Sociodemographic Characteristics	Any Tobacco Product Use				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sabah	171	399,753	26.6	22.38	31.27
Bumiputera Sarawak	93	280,104	26.9	22.27	32.04
Others	172	833,755	34.5	28.09	41.51
Marital Status					
Single	668	2,039,274	26.4	23.96	29.04
Married	1,509	3,166,229	23.2	21.39	25.06
Widow(er)/Divorcee	98	129,806	8.7	6.24	11.93
Education Level					
No Formal Education	86	182,983	17.0	12.11	23.38
Primary Education	468	1,151,826	25.4	21.78	29.40
Secondary Education	1,321	3,115,446	27.0	25.08	28.92
Tertiary Education	387	853,951	15.3	13.32	17.51
Occupation					
Government Employee	220	327,888	21.1	17.39	25.26
Private Employee	966	2,698,554	32.9	30.30	35.66
Self Employed	596	1,313,607	35.2	30.88	39.82
Unpaid Worker/Homemaker	56	106,475	2.9	1.93	4.41
Retiree	102	150,464	19.0	14.56	24.48
Student	75	232,321	10.3	7.93	13.33
Not Working ^b	257	499,926	18.5	15.66	21.75
Household Income Group					
Less than RM 1,000	188	350,884	19.0	15.82	22.70
RM 1,000 - RM 1,999	536	1,252,425	28.0	24.93	31.35
RM 2,000 - RM 3,999	711	1,745,868	25.3	22.83	27.88
RM 4,000 - RM 5,999	382	889,314	24.7	21.48	28.22
RM 6,000 - RM 7,999	219	570,642	28.0	22.98	33.65
RM 8,000 - RM 9,999	72	163,155	17.2	11.63	24.73
RM 10,000 and above	116	250,851	14.7	11.11	19.18
Household Income Quintile					
Quintile 1	459	1,006,153	24.2	21.52	27.02
Quintile 2	490	1,187,220	27.2	23.71	31.09
Quintile 3	441	1,062,818	24.6	22.17	27.24
Quintile 4	427	982,299	24.7	21.62	27.98
Quintile 5	407	984,648	21.0	17.98	24.34
Household Income Category					
Bottom 40%	1,567	3,573,653	25.5	23.73	27.32
Middle 40%	517	1,300,151	23.4	20.71	26.33
Top 20%	140	349,336	18.0	14.09	22.80

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 6.5: Cigarettes Smoked Per Day Among Daily Cigarette Smokers Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics (n=1,967)

Sociodemographic Characteristics	<5 Cigarettes					5-9 Cigarettes					10-14 Cigarettes				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper				Lower	Upper
MALAYSIA	251	667,266	15.5	12.56	19.01	388	1,012,180	23.5	19.89	27.61	503	1,126,265	26.2	23.19	29.42
State															
Johor	22	86,978	17.7	10.47	28.29	26	74,856	15.2*	7.87	27.39	46	155,259	31.6	22.09	42.86
Kedah	33	92,801	27.2	18.63	37.80	46	116,691	34.2	23.68	46.47	26	62,080	18.2	12.48	25.71
Kelantan	4	9,450	5.6*	1.85	15.57	8	26,061	15.3*	7.00	30.40	35	84,071	49.5	35.91	63.19
Melaka	15	11,968	14.5*	4.93	35.52	13	19,743	23.8*	11.17	43.80	24	23,033	27.8*	11.94	52.26
Negeri Sembilan	9	19,843	15.1	8.31	25.77	16	29,751	22.6	13.18	35.95	20	33,002	25.1*	12.97	42.87
Pahang	15	19,167	8.6	4.76	15.13	21	40,063	18.0	10.00	30.34	38	66,883	30.1	20.19	42.31
Pulau Pinang	12	34,323	16.3*	4.11	47.02	21	27,498	13.1*	5.05	29.89	35	68,270	32.5	18.42	50.61
Perak	10	34,642	9.3*	4.73	17.42	28	79,153	21.2	11.94	34.86	30	83,346	22.3	14.38	33.01
Perlis	20	7,000	23.9	13.83	37.99	20	6,805	23.2	15.51	33.23	29	7,411	25.3	17.03	35.81
Selangor	26	153,648	19.0*	9.86	33.58	55	249,539	30.9	23.04	40.08	42	177,997	22.1	15.20	30.87
Terengganu	15	18,608	11.1*	5.23	22.02	36	40,963	24.4	16.07	35.33	39	51,022	30.4	22.20	40.16
Sabah	17	75,548	12.2*	6.28	22.37	32	204,083	33.0	18.71	51.22	34	114,688	18.5	11.35	28.76
Sarawak	13	39,332	10.4	6.28	16.82	19	66,337	17.6	10.30	28.37	40	120,607	32.0	23.11	42.34
WP Kuala Lumpur	22	61,826	23.8	15.49	34.71	12	26,870	10.3*	5.23	19.40	23	74,075	28.5	18.30	41.50
WP Labuan	5	720	12.7*	5.07	28.27	15	1,544	27.1	17.82	39.03	12	1,174	20.6	11.64	33.93
WP Putrajaya	13	1,412	12.0*	5.83	23.18	20	2,223	18.9	10.89	30.83	30	3,345	28.5	20.90	37.49
Location															
Urban	139	492,929	15.7	12.01	20.35	225	778,553	24.9	20.24	30.12	277	802,127	25.6	22.02	29.55
Rural	156	174,337	14.9	11.33	19.40	163	233,627	20.0	15.60	25.26	226	324,137	27.7	22.67	33.46
Sex															
Male	233	624,973	14.9	11.90	18.46	375	994,888	23.7	19.98	27.86	492	1,097,721	26.1	23.08	29.45
Female	18	42,292	41.5	25.28	59.89	13	17,292	17.0*	6.90	36.11	11	28,544	28.0*	13.58	49.13
Age Group (Years)															
15-19	22	53,287	26.2	16.32	39.23	23	88,004	43.2	28.07	59.80	17	42,754	21.0	11.98	34.20
20-24	33	162,256	24.7*	13.00	41.92	46	204,700	31.2	17.22	49.69	47	164,780	25.1	16.42	36.38
25-29	39	131,517	20.2	12.80	30.27	41	147,087	22.5	15.54	31.52	53	125,722	19.3	13.32	27.04
30-34	29	103,420	15.8	10.24	23.46	45	125,383	19.1	12.91	27.32	52	160,352	24.4	17.45	33.07
35-39	28	57,741	11.1	7.01	17.01	48	112,223	21.5	15.22	29.43	68	143,586	27.5	21.07	34.99
40-44	23	48,109	10.9	6.44	17.85	37	94,582	21.4	13.49	32.29	55	107,263	24.3	17.53	32.65
45-49	14	24,449	6.9*	3.60	12.79	21	40,070	11.3	6.31	19.43	55	161,436	45.5	34.15	57.40
50-54	17	21,337	7.1*	3.89	12.61	35	66,863	22.3	14.90	31.90	52	81,514	27.1	19.30	36.71
55-59	13	29,115	14.0*	7.42	24.95	27	43,540	21.0	12.34	33.37	31	53,806	25.9	17.54	36.56
60-64	12	15,113	11.6*	5.09	24.36	23	31,572	24.3	14.05	38.60	30	42,232	32.5	21.70	45.46
65-69	8	5,373	6.0*	2.58	13.45	17	32,246	36.2	20.62	55.35	19	22,308	25.0	14.03	40.64
70-74	6	5,692	13.0*	4.14	34.26	10	9,823	22.5*	10.43	42.01	17	14,745	33.8	17.95	54.32
75 & above	7	9,855	22.8*	10.04	43.98	15	16,085	37.3	21.55	56.26	7	5,766	13.4*	4.95	31.35
Ethnicity															
Malay ^a	168	340,611	14.4	11.96	17.24	284	554,776	23.5	20.03	27.26	362	652,613	27.6	24.45	30.97
Chinese	21	115,765	20.6*	9.19	39.89	23	106,283	18.9	11.67	29.14	37	164,042	29.2	18.63	42.55
Indian	8	11,025	8.1*	3.42	17.99	16	43,433	31.9*	16.27	53.09	13	20,117	14.8*	6.39	30.61
Bumiputera Sabah	15	31,601	12.5	7.20	20.72	28	77,571	30.6	18.21	46.61	28	57,436	22.7	13.67	35.15
Bumiputera Sarawak	8	18,545	8.2*	3.69	17.35	11	41,145	18.3*	7.98	36.57	26	79,216	35.2	23.15	49.42
Others	31	149,718	19.7	11.15	32.51	26	188,971	24.9*	12.72	43.03	37	152,841	20.1	12.32	31.19
Marital Status															
Single	95	390,614	26.2	19.41	34.40	124	365,496	24.5	19.17	30.83	125	323,854	21.7	17.06	27.29
Married	141	252,559	9.4	7.54	11.63	242	630,041	23.4	18.79	28.78	353	769,875	28.6	24.90	32.65
Widow(er)/ Divorcee	15	24,093	19.9*	10.21	35.25	22	16,643	13.8	7.77	23.20	25	32,536	26.9	17.56	38.87
Education Level															
No Formal Education	13	26,201	16.4*	7.75	31.45	14	27,576	17.3*	8.79	31.12	18	39,605	24.8*	11.78	44.88
Primary Education	60	155,899	15.3	10.03	22.67	74	218,322	21.4	11.99	35.36	109	255,983	25.1	17.94	34.03
Secondary Education	138	383,707	15.4	11.26	20.69	229	602,302	24.2	20.32	28.47	304	687,749	27.6	24.09	31.39
Tertiary Education	38	100,488	16.6	11.35	23.55	71	163,980	27.0	20.59	34.61	69	139,822	23.0	16.28	31.57

Sociodemographic Characteristics	15-24 Cigarettes					≥25 Cigarettes				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	554	1,312,762	30.5	26.84	34.47	92	182,547	4.2	3.18	5.65
State										
Johor	41	155,691	31.7	19.05	47.69	7	19,072	3.9*	1.66	8.80
Kedah	24	61,997	18.2	11.25	27.95	4	8,010	2.3*	0.92	5.86
Kelantan	22	50,209	29.6	17.84	44.81	0	-	-	-	-
Melaka	26	25,106	30.3	16.53	48.88	6	2,964	3.6*	0.81	14.38
Negeri Sembilan	32	43,475	33.0	21.10	47.60	8	5,604	4.3*	1.84	9.54
Pahang	50	85,276	38.4	24.72	54.18	7	10,751	4.8*	2.07	10.89
Pulau Pinang	35	74,862	35.6	21.60	52.63	9	5,226	2.5*	0.80	7.42
Perak	38	161,575	43.3	28.48	59.45	5	14,330	3.8*	1.44	9.87
Perlis	21	7,277	24.8	14.64	38.86	3	824	2.8*	0.87	8.68
Selangor	52	200,951	24.9	17.19	34.62	7	24,971	3.1*	1.38	6.78
Terengganu	44	52,893	31.6	22.24	42.63	3	4,133	2.5*	0.73	7.98
Sabah	47	192,098	31.0	20.57	43.85	6	32,764	5.3*	1.99	13.30
Sarawak	43	114,814	30.4	21.87	40.60	15	36,260	9.6	5.47	16.35
WP Kuala Lumpur	24	80,273	30.9	20.78	43.22	5	16,885	6.5*	2.39	16.45
WP Labuan	21	2,064	36.3	22.84	52.31	2	185	3.2*	0.76	12.78
WP Putrajaya	34	4,200	35.7	30.43	41.45	5	567	4.8*	1.43	15.10
Location										
Urban	319	948,080	30.3	25.78	35.16	184	111,043	3.5	2.49	5.03
Rural	235	364,682	31.2	25.37	37.72	50	71,504	6.1	3.74	9.85
Sex										
Male	549	1,299,093	30.9	27.22	34.91	92	182,547	4.3	3.25	5.79
Female	5	13,669	13.4*	4.27	35.04	0	-	-	-	-
Age Group (Years)										
15-19	8	19,445	9.6*	4.21	20.27	0	-	-	-	-
20-24	43	122,896	18.7	11.12	29.79	2	1,691	0.3*	0.07	0.99
25-29	57	208,127	31.9	22.58	42.93	9	40,015	6.1*	2.43	14.61
30-34	66	237,036	36.1	26.62	46.81	9	30,405	4.6*	2.19	9.54
35-39	81	201,764	38.6	30.75	47.14	6	7,053	1.4*	0.38	4.72
40-44	57	160,669	36.4	27.02	46.95	11	30,765	7.0*	3.69	12.76
45-49	58	105,955	29.9	21.41	40.01	13	22,676	6.4*	2.97	13.22
50-54	64	108,562	36.1	27.24	46.11	14	22,075	7.3*	3.88	13.47
55-59	49	67,535	32.5	23.04	43.74	13	13,504	6.5*	3.20	12.77
60-64	34	36,610	28.1	19.23	39.19	5	4,560	3.5*	1.05	11.10
65-69	19	21,887	24.6	13.15	41.21	6	7,249	8.1*	2.28	25.16
70-74	8	12,391	28.4*	10.79	56.49	2	1,000	2.3*	0.35	13.56
75 & above	10	9,884	22.9*	10.11	43.98	2	1,553	3.6*	0.54	20.36
Ethnicity										
Malay ^a	378	720,152	30.4	26.62	34.57	62	97,182	4.1	2.97	5.66
Chinese	48	162,331	28.9	18.15	42.61	8	13,956	2.5*	0.99	6.08
Indian	26	56,066	41.2	25.50	58.95	2	5,400	4.0*	0.72	18.97
Bumiputera Sabah	30	75,788	29.9	18.37	44.71	5	11,084	4.4*	1.38	12.97
Bumiputera Sarawak	25	69,026	30.6	19.82	44.13	7	17,293	7.7*	2.85	19.08
Others	47	229,399	30.2	19.28	44.03	8	37,632	5.0*	2.00	11.80
Marital Status										
Single	119	383,837	25.8	20.00	32.52	10	25,807	1.7*	0.79	3.75
Married	412	889,874	33.1	28.63	37.84	78	148,109	5.5	3.96	7.60
Widow(er)/ Divorcee	23	39,051	32.3	20.16	47.38	4	8,630	7.1*	2.34	19.77
Education Level										
No Formal Education	19	63,675	39.9	20.71	62.74	2	2,644	1.7*	0.35	7.50
Primary Education	136	339,599	33.4	24.63	43.38	27	48,448	4.8*	2.35	9.38
Secondary Education	326	715,811	28.7	24.77	33.01	53	103,187	4.1	2.97	5.74
Tertiary Education	69	174,912	28.8	21.35	37.68	9	27,422	4.5*	2.04	9.71

Table 6.5: Cigarettes Smoked Per Day Among Daily Cigarette Smokers Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics (n=1,967) (cont'd)

Sociodemographic Characteristics	<5 Cigarettes					5-9 Cigarettes					10-14 Cigarettes				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
			Lower	Upper				Lower	Upper				Lower	Upper	
Occupation															
Government Employee	14	25,678	10.7*	5.66	19.16	38	67,312	27.9	17.90	40.77	44	74,808	31.0	20.65	43.77
Private Employee	111	378,565	16.8	11.97	23.18	153	463,090	20.6	16.52	25.38	231	588,758	26.2	22.12	30.72
Self Employed	58	127,521	11.1	7.62	15.76	107	296,769	25.7	17.39	36.29	154	345,030	29.9	23.54	37.14
Unpaid Worker/ Homemaker	8	14,742	21.1*	8.28	44.13	11	30,819	44.1*	17.79	74.16	7	16,586	23.7*	8.01	52.63
Retiree	10	10,947	9.7*	4.20	20.77	17	29,177	25.8	14.15	42.31	20	30,888	27.3	15.96	42.64
Student	14	35,459	33.9	17.63	55.11	11	43,120	41.2	23.80	61.15	5	19,483	18.6*	7.82	38.18
Not Working ^b	35	70,937	19.5	13.03	28.02	49	79,234	21.7	14.76	30.79	42	50,712	13.9	8.14	22.74
Household Income Group															
Less than RM 1,000	22	39,986	14.9*	7.64	27.07	42	77,227	28.8	18.50	41.90	40	79,403	29.6	19.83	41.71
RM 1,000 - RM 1,999	66	153,672	14.4	10.17	20.07	96	231,924	21.8	16.00	28.93	122	282,194	26.5	21.03	32.81
RM 2,000 - RM 3,999	84	227,463	16.1	11.68	21.76	114	364,070	25.8	18.06	35.32	156	299,713	21.2	16.84	26.34
RM 4,000 - RM 5,999	38	105,620	15.2	9.24	23.95	61	138,070	19.9	13.98	27.43	89	207,440	29.8	23.48	37.08
RM 6,000 - RM 7,999	18	79,397	17.6*	5.27	45.13	35	107,671	23.9	14.00	37.72	51	151,349	33.6	20.76	49.39
RM 8,000 - RM 9,999	5	14,640	11.9*	4.54	27.56	13	36,761	29.8	16.04	48.50	10	28,825	23.4*	11.64	41.35
RM 10,000 and above	10	19,671	10.0*	4.11	22.56	15	27,468	14.0*	7.25	25.40	32	73,706	37.6	24.12	53.40
Household Income Quintile															
Quintile 1	51	103,750	12.4	7.92	18.90	96	215,857	25.8	18.99	34.05	99	192,435	23.0	17.37	29.81
Quintile 2	63	170,298	17.1	12.42	23.20	77	248,577	25.0	15.45	37.90	113	255,703	25.7	19.76	32.81
Quintile 3	52	140,729	16.9	11.26	24.64	67	169,361	20.4	15.00	27.05	102	211,287	25.4	19.64	32.19
Quintile 4	44	111,964	14.3	8.92	22.26	73	177,495	22.7	16.67	30.20	93	209,325	26.8	21.02	33.51
Quintile 5	33	113,708	14.8*	6.22	31.18	63	171,900	22.3	15.35	31.31	93	253,879	33.0	24.13	43.22
Household Income Category															
Bottom 40%	186	470,221	16.1	12.99	19.87	265	682,359	23.4	18.86	28.68	346	743,564	25.5	21.91	29.48
Middle 40%	44	143,881	14.0*	6.88	26.37	91	251,124	24.4	17.99	32.25	121	294,177	28.6	22.32	35.84
Top 20%	13	26,346	9.8*	4.89	18.66	20	49,707	18.5	11.55	28.22	33	84,887	31.5	20.39	45.33

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	15-24 Cigarettes					≥25 Cigarettes				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Occupation										
Government Employee	46	62,032	25.7	17.34	36.40	7	11,208	4.6*	1.82	11.36
Private Employee	246	715,793	31.8	26.47	37.75	35	101,446	4.5	2.92	6.92
Self Employed	170	345,745	30.0	24.07	36.61	31	38,854	3.4	2.06	5.46
Unpaid Worker Homemaker	7	7,716	11.0*	3.02	33.06	1	67	0.1*	0.01	0.74
Retiree	26	39,268	34.7	21.37	51.00	3	2,821	2.5*	0.59	9.91
Student	4	6,559	6.3*	1.94	18.41	0	-	-	-	-
Not Working ^b	55	135,649	37.2	27.55	47.98	15	28,151	7.7*	3.88	14.76
Household Income Group										
Less than RM 1,000	39	62,972	23.5	16.10	32.94	4	8,528	3.2*	1.15	8.46
RM 1,000 - RM 1,999	137	345,448	32.4	24.86	41.07	23	51,680	4.9*	2.52	9.15
RM 2,000 - RM 3,999	187	470,675	33.3	26.83	40.46	35	51,539	3.6	2.21	5.96
RM 4,000 - RM 5,999	84	207,145	29.8	23.15	37.41	14	37,042	5.3*	2.66	10.37
RM 6,000 - RM 7,999	52	100,937	22.4	13.48	34.85	7	11,279	2.5*	1.04	5.91
RM 8,000 - RM 9,999	16	39,746	32.2*	16.60	53.12	2	3,450	2.8*	0.40	17.17
RM 10,000 and above	24	56,885	29.0	17.92	43.43	6	18,096	9.2*	4.14	19.36
Household Income Quintile										
Quintile 1	116	278,112	33.3	24.59	43.22	19	46,224	5.5*	2.66	11.12
Quintile 2	128	291,864	29.4	22.19	37.80	21	26,585	2.7*	1.44	4.91
Quintile 3	105	273,609	32.9	25.48	41.29	19	36,605	4.4*	2.36	8.07
Quintile 4	98	242,655	31.1	24.81	38.13	17	39,375	5.0*	2.62	9.48
Quintile 5	92	197,568	25.7	18.51	34.41	15	32,825	4.3*	2.32	7.72
Household Income Category										
Bottom 40%	391	893,911	30.7	26.29	35.44	67	124,124	4.3	2.93	6.15
Middle 40%	117	301,829	29.3	22.74	36.96	18	37,407	3.6*	1.99	6.56
Top 20%	31	88,067	32.7	22.01	45.62	6	20,082	7.5*	3.46	15.34

Table 6.6: Prevalence of Exposure to Secondhand Smoke at Home and Work Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics

Sociodemographic Characteristics	At Home					At Work				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	3,341	7,067,458	31.0	29.15	32.82	792	1,716,191	27.2	24.29	30.28
State										
Johor	193	604,024	23.5	19.13	28.59	58	195,665	32.4	21.43	45.75
Kedah	238	586,719	41.8	35.99	47.78	26	66,958	19.7	11.34	32.13
Kelantan	191	411,329	33.5	28.59	38.86	18	47,058	32.5	18.46	50.69
Melaka	214	184,153	29.5	19.77	41.58	33	56,398	32.2	17.15	52.20
Negeri Sembilan	131	178,350	23.6	17.62	30.95	45	58,084	34.4	21.48	50.15
Pahang	213	327,782	29.7	25.27	34.45	42	81,721	28.0	21.07	36.12
Pulau Pinang	190	333,190	25.6	20.99	30.80	57	135,712	25.4	18.21	34.19
Perak	205	614,484	36.7	27.32	47.26	29	91,043	21.0	13.28	31.45
Perlis	207	64,083	37.1	31.93	42.69	23	7,689	24.9	14.23	39.84
Selangor	306	1,133,462	23.3	19.36	27.67	87	386,685	22.5	18.11	27.68
Terengganu	269	323,285	39.7	35.04	44.60	31	36,485	23.5	16.36	32.50
Sabah	333	1,231,879	42.8	36.89	48.91	51	272,365	39.6	26.12	54.78
Sarawak	250	646,854	32.8	27.28	38.83	50	146,319	29.1	22.62	36.65
WP Kuala Lumpur	128	393,914	29.5	22.22	37.99	33	109,823	23.5	17.17	31.32
WP Labuan	95	12,562	20.1	14.43	27.35	154	15,817	43.3	37.85	48.95
WP Putrajaya	178	21,390	31.9	25.76	38.63	55	8,370	32.8	22.38	45.31
Location										
Urban	1,799	5,013,383	28.3	26.17	30.48	603	1,484,115	26.6	23.45	30.01
Rural	1,542	2,054,075	40.3	37.21	43.43	189	232,076	31.6	25.69	38.10
Sex										
Male	1,812	4,363,202	37.3	34.78	39.97	483	1,180,556	36.3	31.81	41.04
Female	1,529	2,704,256	24.3	22.40	26.23	309	535,635	17.5	14.60	20.82
Age Group (Years)										
15-19	299	848,242	32.4	27.92	37.25	19	46,765	24.5	11.22	45.48
20-24	339	1,033,878	36.3	31.11	41.75	97	344,150	35.1	24.92	46.77
25-29	349	1,073,524	36.1	31.57	40.92	119	328,225	28.1	22.15	35.03
30-34	342	901,757	34.0	29.34	38.91	125	259,326	25.5	19.64	32.42
35-39	336	725,069	31.0	26.98	35.30	132	230,601	25.0	18.93	32.29
40-44	299	614,810	33.7	29.50	38.22	106	196,621	27.2	20.87	34.70
45-49	269	491,526	29.7	25.15	34.65	69	134,872	24.8	18.65	32.27
50-54	310	443,626	29.1	25.16	33.40	63	93,196	25.6	18.67	33.95
55-59	252	312,750	23.7	19.78	28.17	42	51,428	18.9	12.48	27.69
60-64	201	267,341	24.5	19.86	29.78	12	22,514	27.6	14.86	45.43
65-69	145	153,531	19.4	15.14	24.51	6	7,461	22.6	9.29	45.47
70-74	99	98,214	17.9	13.22	23.79	2	1,031	5.4	1.06	23.17
75 & above	101	103,190	16.1	12.13	20.96	0	-	-	-	-
Ethnicity										
Malay ^a	2,343	3,978,583	33.7	31.88	35.65	546	877,097	28.2	25.07	31.64
Chinese	220	733,329	15.5	11.69	20.18	85	381,528	23.4	18.48	29.18
Indian	114	200,653	15.0	11.20	19.69	49	72,770	17.8	11.20	27.08

Table 6.6: Prevalence of Exposure to Secondhand Smoke at Home and Work Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics (cont'd)

Sociodemographic Characteristics	At Home					At Work				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sabah	264	623,284	41.3	34.89	48.07	51	137,324	35.2	23.29	49.35
Bumiputera Sarawak	159	394,583	37.9	31.21	45.13	23	51,374	25.7	15.29	39.98
Others	241	1,137,025	47.2	40.60	53.92	38	196,098	33.8	18.23	53.98
Marital Status										
Single	938	2,630,408	34.1	31.16	37.10	206	576,970	26.5	21.91	31.64
Married	2,146	4,124,649	30.2	28.14	32.45	559	1,084,604	27.4	23.72	31.51
Widow(er)/Divorcee	257	312,402	21.2	17.67	25.14	27	54,618	29.7	19.12	43.01
Education Level										
No Formal Education	190	306,915	28.7	22.58	35.61	9	17,577	29.8	8.23	66.78
Primary Education	789	1,509,878	33.4	29.50	37.44	73	249,286	42.2	27.03	58.94
Secondary Education	1,801	4,006,840	34.7	32.41	37.15	380	853,637	29.9	25.64	34.51
Tertiary Education	540	1,197,775	21.5	18.87	24.36	328	593,658	21.5	18.26	25.03
Occupation										
Government Employee	230	401,632	25.9	21.70	30.70	224	251,161	23.3	19.29	27.92
Private Employee	1,083	2,864,017	35.0	32.09	38.01	442	1,079,390	25.5	22.43	28.77
Self Employed	663	1,308,996	35.1	30.80	39.66	109	316,421	38.9	27.27	52.02
Unpaid Worker/Homemaker	592	1,008,777	27.7	24.50	31.21	4	11,179	32.6	7.92	73.05
Retiree	95	133,256	17.0	12.82	22.18	1	2,200	47.4	5.70	93.06
Student	213	590,824	26.3	22.00	31.14	4	11,833	21.2	4.82	58.95
Not Working ^b	462	754,630	28.0	24.53	31.75	7	42,628	47.2	22.05	73.87
Household Income Group										
Less than RM 1,000	337	583,750	31.6	26.82	36.86	13	29,969	24.8	11.62	45.29
RM 1,000 - RM 1,999	793	1,670,825	37.5	33.69	41.42	94	233,349	33.4	25.17	42.72
RM 2,000 - RM 3,999	1,074	2,368,892	34.3	30.94	37.83	216	597,098	32.1	25.73	39.24
RM 4,000 - RM 5,999	501	1,123,544	31.1	27.08	35.47	180	344,056	24.5	19.71	30.06
RM 6,000 - RM 7,999	286	624,873	30.8	26.02	36.01	124	202,802	23.2	17.82	29.62
RM 8,000 - RM 9,999	73	134,547	14.3	8.99	22.02	58	109,473	23.5	15.16	34.61
RM 10,000 and above	139	293,628	17.4	12.26	24.13	107	199,444	23.1	16.93	30.64
Household Income Quintile										
Quintile 1	759	1,479,525	35.5	32.02	39.22	58	148,979	34.1	24.29	45.56
Quintile 2	729	1,542,120	35.5	31.28	39.86	105	285,288	32.8	21.49	46.52
Quintile 3	648	1,461,275	33.9	29.90	38.09	142	382,655	30.4	24.52	37.02
Quintile 4	569	1,264,090	31.7	27.84	35.74	198	387,551	25.5	20.86	30.84
Quintile 5	498	1,053,048	22.6	19.47	26.11	289	511,718	23.2	19.54	27.36
Household Income Category										
Bottom 40%	2,293	4,694,122	33.5	31.36	35.74	426	948,584	30.1	25.40	35.36
Middle 40%	731	1,695,083	30.5	26.75	34.62	269	535,003	23.6	19.62	28.18
Top 20%	179	410,854	21.4	16.38	27.49	97	232,605	26.6	20.25	33.99

*Prevalence with high RSE, interpret with caution

a - Bumiputera includes Malays and Orang Asli

b - Not working includes Unemployed, those with Health Problem and Old Age

Table 6.7: Prevalence of Exposure to Secondhand Smoke at Eateries Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics

Sociodemographic Characteristics	At Restaurant (With Air Conditioning)					At Food Stall, Restaurant or Coffee Shop (Without Air Conditioning)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	330	805,838	8.5	7.17	10.17	3,091	6,987,477	48.1	45.83	50.32
State										
Johor	40	150,393	14.7	9.60	21.84	202	648,849	49.0	39.25	58.81
Kedah	12	26,793	5.3*	2.90	9.54	186	500,843	49.8	41.89	57.69
Kelantan	18	37,308	15.3	9.82	23.02	146	361,922	54.5	48.56	60.40
Melaka	6	2,705	1.4*	0.38	4.75	159	184,535	50.7	42.67	58.61
Negeri Sembilan	48	52,594	13.2	7.27	22.78	116	156,832	32.1	23.15	42.68
Pahang	14	21,679	4.8	3.00	7.46	186	314,636	46.7	40.16	53.29
Pulau Pinang	8	13,004	1.9*	0.81	4.46	200	363,958	36.7	28.85	45.40
Perak	14	67,683	12.8*	5.97	25.41	209	590,494	60.0	52.03	67.40
Perlis	15	7,289	12.8*	5.86	25.83	143	49,974	47.0	39.56	54.49
Selangor	63	251,078	8.9	6.36	12.38	382	1,774,828	48.1	43.49	52.69
Terengganu	15	20,295	10.9	6.12	18.80	297	354,519	65.4	58.74	71.59
Sabah	10	37,444	4.2*	1.77	9.59	188	720,090	43.1	35.76	50.68
Sarawak	29	76,748	9.5	5.36	16.29	227	617,331	52.9	45.33	60.43
WP Kuala Lumpur	16	38,575	6.9*	3.29	14.04	114	308,252	40.8	31.06	51.30
WP Labuan	20	2,200	4.8	2.89	7.75	264	31,505	58.3	51.86	64.46
WP Putrajaya	2	50	0.1*	0.03	0.72	72	8,907	17.6	12.50	24.12
Location										
Urban	237	711,102	8.6	7.09	10.47	1,993	5,720,051	48.1	45.48	50.64
Rural	93	94,735	8.0	6.08	10.39	1,098	1,267,426	48.1	43.98	52.34
Sex										
Male	153	469,733	9.6	7.49	12.15	1,685	4,147,437	51.9	49.03	54.83
Female	177	336,105	7.4	5.88	9.37	1,406	2,840,039	43.4	40.34	46.44
Age Group (Years)										
15-19	27	69,915	6.9	4.45	10.60	301	787,560	49.9	43.93	55.95
20-24	38	94,583	7.0	4.64	10.41	340	1,105,548	56.5	50.19	62.69
25-29	26	114,742	8.4	4.93	13.81	345	1,048,032	50.3	44.26	56.25
30-34	35	103,373	7.7	4.84	11.90	349	988,822	52.2	45.64	58.69
35-39	40	119,175	11.1	6.88	17.37	338	689,877	43.6	37.56	49.84
40-44	34	78,650	10.1	5.90	16.68	264	572,189	47.2	41.19	53.21
45-49	32	56,982	8.0	5.30	11.90	248	435,873	41.7	34.97	48.80
50-54	33	58,827	10.3	6.92	15.20	270	462,161	49.8	44.36	55.31
55-59	31	46,645	9.3	6.28	13.61	226	341,847	41.2	35.43	47.19
60-64	17	31,290	10.1*	5.09	18.91	173	225,646	37.3	30.92	44.26
65-69	3	2,564	1.4*	0.37	5.00	106	149,341	38.2	30.56	46.50
70-74	3	9,315	9.0*	3.07	23.77	65	93,882	44.0	32.86	55.87
75 & above	11	19,775	19.5*	9.38	36.28	66	86,699	39.9	30.31	50.36
Ethnicity										
Malay ^a	209	422,974	9.1	7.47	11.01	2,183	3,849,634	50.7	48.10	53.35
Chinese	54	205,131	7.8	5.14	11.70	363	1,530,481	47.5	42.14	52.99
Indian	41	82,769	12.0	8.03	17.63	183	386,488	42.5	36.80	48.37

Table 6.7: Prevalence of Exposure to Secondhand Smoke at Eateries Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics (cont'd)

Sociodemographic Characteristics	At Restaurant (With Air Conditioning)					At Food Stall, Restaurant or Coffee Shop (Without Air Conditioning)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sabah	13	40,330	8.2*	3.91	16.36	149	412,677	44.6	37.36	52.04
Bumiputera Sarawak	6	17,445	5.2*	2.51	10.51	91	247,215	44.0	35.37	53.04
Others	7	37,189	5.9*	1.85	17.22	122	560,980	42.2	31.95	53.17
Marital Status										
Single	92	265,081	7.9	5.97	10.45	919	2,638,930	52.3	48.55	55.97
Married	217	501,926	8.8	7.14	10.79	1,998	4,085,350	46.4	43.89	48.85
Widow(er)/Divorcee	21	38,831	10.3	6.20	16.74	174	263,197	39.0	32.39	46.11
Education Level										
No Formal Education	11	43,231	25.3*	10.31	50.02	81	180,380	47.2	34.96	59.84
Primary Education	36	85,403	7.7	4.53	12.64	500	1,018,104	43.3	37.37	49.49
Secondary Education	170	388,822	8.2	6.66	10.11	1,642	3,799,305	49.4	46.46	52.30
Tertiary Education	113	288,382	8.5	6.32	11.34	857	1,978,782	48.5	44.98	52.06
Occupation										
Government Employee	57	122,020	13.4	9.37	18.79	393	592,566	49.8	43.58	56.07
Private Employee	114	322,856	8.0	6.18	10.33	1,008	2,777,098	47.5	43.88	51.14
Self Employed	45	131,945	9.6	6.15	14.59	609	1,367,309	54.4	49.50	59.20
Unpaid Worker/ Homemaker	56	109,489	9.0	6.03	13.10	402	774,702	40.5	34.93	46.30
Retiree	13	18,501	6.3*	3.17	12.09	123	182,224	39.3	32.53	46.57
Student	21	52,036	5.4	3.10	9.40	260	687,157	49.7	43.21	56.24
Not Working ^b	23	47,859	7.5	4.65	11.91	294	601,873	49.3	42.68	55.92
Household Income Group										
Less than RM 1,000	16	39,168	9.2*	4.85	16.65	185	346,678	39.9	33.82	46.39
RM 1,000 - RM 1,999	45	100,487	7.9	4.58	13.22	577	1,342,928	50.7	45.70	55.78
RM 2,000 - RM 3,999	92	201,333	7.3	5.47	9.63	898	2,119,228	47.1	43.26	51.02
RM 4,000 - RM 5,999	52	125,588	7.6	5.41	10.71	541	1,195,011	49.2	44.41	54.01
RM 6,000 - RM 7,999	42	99,629	9.1	6.18	13.21	345	739,623	50.4	43.38	57.32
RM 8,000 - RM 9,999	20	47,218	8.3	4.85	13.81	145	332,184	47.5	38.30	56.93
RM 10,000 and above	39	118,399	10.2	6.07	16.61	270	559,529	45.1	38.53	51.76
Household Income Quintile										
Quintile 1	38	96,486	8.9	5.32	14.40	479	1,026,621	46.2	40.93	51.54
Quintile 2	43	74,465	5.3	3.42	8.03	561	1,339,267	50.2	45.21	55.23
Quintile 3	67	156,447	8.6	6.24	11.88	562	1,293,186	45.3	40.80	49.87
Quintile 4	57	139,177	7.7	5.59	10.64	599	1,344,771	49.9	45.27	54.50
Quintile 5	101	265,246	9.4	6.94	12.57	760	1,631,336	47.8	43.41	52.32
Household Income Category										
Bottom 40%	166	370,274	7.3	5.63	9.46	1,839	4,047,383	47.3	44.66	49.89
Middle 40%	93	214,815	8.0	6.10	10.53	840	1,923,162	49.3	44.71	53.94
Top 20%	47	146,731	12.2	7.97	18.12	282	664,636	47.9	41.94	53.97

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 6.8: Current Smokers Who Made a Quit Attempt in The Past 12 Months Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics (n=2,015)

Sociodemographic Characteristics	Made A Quit Attempt				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	975	2,309,021	48.9	45.02	52.70
State					
Johor	43	132,299	24.8	16.05	36.20
Kedah	71	181,097	47.1	35.79	58.73
Kelantan	34	67,781	38.4	29.63	48.09
Melaka	44	42,475	47.1	31.98	62.72
Negeri Sembilan	50	90,653	62.2	50.13	72.91
Pahang	86	148,747	59.1	45.41	71.58
Pulau Pinang	49	58,453	24.5*	11.73	44.14
Perak	54	162,319	43.4	30.46	57.36
Perlis	39	13,400	38.4	29.41	48.17
Selangor	112	510,372	58.8	48.02	68.88
Terengganu	97	119,481	62.0	48.42	73.99
Sabah	91	432,046	59.3	47.92	69.77
Sarawak	78	228,776	54.2	44.83	63.24
WP Kuala Lumpur	34	110,171	41.6	30.92	53.20
WP Labuan	34	3,886	51.2	37.32	64.85
WP Putrajaya	59	7,064	52.9	39.81	65.62
Location					
Urban	563	1,730,219	50.2	45.42	54.91
Rural	412	578,802	45.3	39.48	51.31
Sex					
Male	948	2,235,079	48.6	44.69	52.50
Female	27	73,942	58.9	39.85	75.68
Age Group (Years)					
15-19	64	174,809	56.4	44.02	67.98
20-24	100	381,205	54.0	40.42	66.96
25-29	122	367,148	50.3	40.03	60.52
30-34	112	338,430	49.5	40.99	58.05
35-39	114	243,008	44.6	36.27	53.33
40-44	97	31,419	48.5	38.99	58.09
45-49	77	167,441	45.1	34.63	55.96
50-54	89	162,500	47.2	38.20	56.32
55-59	70	105,745	48.2	38.91	57.56
60-64	65	77,171	47.4	35.04	60.02
65-69	31	37,541	38.8	24.47	55.46
70-74	25	22,407	39.0	23.20	57.50
75 & above	9	12,292	26.4*	12.47	47.49
Ethnicity					
Malay ^a	706	1,329,614	51.2	47.24	55.05
Chinese	48	246,418	40.4	26.59	55.87
Indian	37	68,095	46.0	29.39	63.59

Sociodemographic Characteristics	Made A Quit Attempt				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sabah	74	173,893	53.5	43.20	63.60
Bumiputera Sarawak	41	121,283	49.5	35.49	63.51
Others	69	369,718	46.3	33.43	59.70
Marital Status					
Single	293	841,915	49.2	42.98	55.53
Married	638	1,403,182	48.4	43.79	53.10
Widow(er)/Divorcee	44	63,925	53.7	37.39	69.29
Education Level					
No Formal Education	19	37,233	22.8	12.36	38.22
Primary Education	195	468,716	44.2	35.10	53.65
Secondary Education	578	103,736	50.1	45.43	54.78
Tertiary Education	179	412,773	58.3	49.93	66.29
Occupation					
Government Employee	98	145,941	54.4	43.51	64.98
Private Employee	435	1,191,846	49.3	43.62	55.01
Self Employed	252	572,412	47.5	39.67	55.41
Unpaid Worker/ Homemaker	18	51,083	61.3	35.78	81.87
Retiree	39	70,086	49.7	36.42	63.07
Student	35	113,218	66.0	50.79	78.55
Not Working ^b	98	164,435	37.8	29.35	47.16
Household Income Group					
Less than RM 1,000	73	133,512	42.8	33.19	52.89
RM 1,000 - RM 1,999	235	569,870	48.4	41.68	55.15
RM 2,000 - RM 3,999	307	734,888	48.4	41.31	55.46
RM 4,000 - RM 5,999	171	386,368	50.1	40.91	59.20
RM 6,000 - RM 7,999	88	274,797	55.1	41.13	68.24
RM 8,000 - RM 9,999	29	66,253	49.0	28.50	69.84
RM 10,000 and above	51	95,832	45.5	31.13	60.61
Household Income Quintile					
Quintile 1	190	442,858	47.3	39.93	54.88
Quintile 2	208	533,245	49.4	40.65	58.11
Quintile 3	194	418,880	46.4	38.94	53.95
Quintile 4	194	429,655	49.8	41.11	58.51
Quintile 5	168	436,882	51.7	42.05	61.23
Household Income Category					
Bottom 40%	656	1,499,998	46.9	42.25	51.65
Middle 40%	234	615,705	54.7	46.63	62.47
Top 20%	64	145,816	48.0	36.22	60.07

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli
 b - Not working includes Unemployed, and Old Age

Table 6.9: Prevalence of Noticing Anti-Cigarette Information in Newspapers / Magazines and Television in The Past 30 days Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics

Sociodemographic Characteristics	Newspapers/Magazines					Television				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	4,096	8,540,816	48.7	46.55	50.91	5,620	11,056,502	63.7	61.54	65.74
State										
Johor	132	422,833	27.9	21.14	35.92	193	568,194	36.5	25.89	48.55
Kedah	242	613,956	53.7	45.06	62.06	369	943,143	76.3	69.60	81.84
Kelantan	189	401,335	47.8	39.85	55.86	243	496,577	56.8	48.98	64.30
Melaka	334	310,266	57.3	48.47	65.74	405	402,448	73.8	66.68	79.88
Negeri Sembilan	241	308,691	54.7	44.77	64.26	293	384,170	64.0	57.92	69.64
Pahang	318	532,240	51.2	46.08	56.36	397	660,069	63.6	58.20	68.67
Pulau Pinang	253	526,309	54.4	44.68	63.77	385	686,553	68.5	57.41	77.77
Perak	258	695,161	52.2	44.08	60.15	391	1,017,104	68.9	62.45	74.67
Perlis	260	78,915	54.2	44.53	63.64	341	97,034	66.2	56.22	74.99
Selangor	390	1,599,638	48.4	42.87	53.87	576	2,222,963	64.3	59.31	69.09
Terengganu	337	408,025	64.5	56.69	71.65	438	518,198	74.5	68.20	79.98
Sabah	249	919,180	44.2	37.13	51.56	427	1,444,798	67.6	61.39	73.22
Sarawak	244	653,271	48.7	41.99	55.46	338	881,158	63.6	56.42	70.21
WP Kuala Lumpur	228	597,111	54.4	46.70	61.83	259	666,323	60.4	50.95	69.18
WP Labuan	294	34,139	62.4	56.32	68.06	320	37,754	68.6	61.82	74.70
WP Putrajaya	127	15,596	27.7	21.08	35.42	245	30,016	51.8	44.96	58.54
Location										
Urban	2,536	6,457,799	50.0	47.39	52.56	3,393	8,617,497	64.1	61.55	66.49
Rural	1,560	1,658,866	44.4	40.77	48.13	2,227	127,326	62.3	58.40	66.09
Sex										
Male	2,013	4,521,568	48.4	45.60	51.15	2,608	5,761,904	60.4	57.44	63.26
Female	2,083	3,595,098	49.2	46.48	51.89	3,012	5,294,598	67.7	65.02	70.20
Age Group (Years)										
15-19	386	982,212	50.4	45.00	55.76	487	1,311,606	65.5	60.29	70.31
20-24	383	1,141,924	53.3	47.06	59.44	497	1,517,537	67.2	61.92	72.10
25-29	379	1,008,250	46.9	41.50	52.30	506	1,433,761	63.1	57.40	68.40
30-34	408	939,814	48.2	42.13	54.31	518	1,186,919	60.5	54.82	65.92
35-39	445	911,732	52.3	47.05	57.50	576	1,140,365	63.0	57.62	67.99
40-44	374	752,501	54.1	47.85	60.13	477	986,676	69.3	63.36	74.65
45-49	345	601,494	53.7	47.85	59.40	453	747,943	64.3	58.89	69.31
50-54	363	507,670	47.7	42.28	53.25	501	729,668	64.5	59.07	69.53
55-59	354	473,967	51.0	45.52	56.41	431	657,997	64.1	58.26	69.55
60-64	282	362,000	44.3	38.24	50.45	503	544,168	65.6	60.16	70.73
65-69	188	214,761	35.7	29.52	42.44	304	347,186	55.4	47.99	62.54
70-74	108	123,823	32.1	25.68	39.34	196	231,997	56.0	47.49	64.08
75 & above	81	96,518	23.5	18.01	30.11	171	220,680	49.4	42.01	56.76
Ethnicity										
Malay ^a	2,917	4,599,791	51.9	49.62	54.16	3,928	6,315,140	67.4	65.09	69.60
Chinese	421	1,565,947	48.3	42.85	53.77	564	1,941,051	58.9	53.36	64.22
Indian	280	497,912	52.7	45.23	60.11	365	650,701	65.1	58.72	70.94

Table 6.9: Prevalence of Noticing Anti-Cigarette Information in Newspapers / Magazines and Television in The Past 30 days Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics (cont'd)

Sociodemographic Characteristics	Newspapers/Magazines					Television				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sabah	206	516,623	48.5	41.90	55.22	335	762,245	68.0	62.27	73.23
Bumiputera Sarawak	135	354,190	47.4	38.92	55.99	209	525,640	69.3	60.62	76.72
Others	137	582,203	32.4	24.35	41.73	219	861,724	47.4	38.21	56.68
Marital Status										
Single	1,085	2,877,182	49.7	46.16	53.33	1,403	3,835,589	63.3	59.68	66.77
Married	2,730	4,880,832	49.5	46.87	52.05	3,719	6,605,232	64.5	62.03	66.92
Widow(er)/Divorcee	281	358,651	35.7	30.43	41.28	498	615,680	57.6	52.46	62.63
Education Level										
No Formal Education	80	113,755	17.4	12.98	22.99	218	310,539	45.0	37.96	52.18
Primary Education	736	1,380,039	40.6	35.99	45.45	1,168	2,022,089	58.0	53.22	62.71
Secondary Education	2,177	4,291,344	50.3	47.43	53.16	2,907	5,830,951	65.5	62.90	68.05
Tertiary Education	1,089	2,299,973	57.8	53.94	61.53	1,311	2,865,193	68.3	64.50	71.88
Occupation										
Government Employee	516	734,543	60.2	54.67	65.53	605	872,979	70.2	64.36	75.50
Private Employee	1,202	2,976,451	48.6	44.80	52.49	1,549	3,882,264	61.0	57.31	64.65
Self Employed	750	1,491,890	52.9	48.37	57.33	1,002	1,943,576	66.7	62.82	70.44
Unpaid Worker/Homemaker	699	1,102,689	45.9	40.60	51.34	1,058	1,677,843	66.5	61.51	71.08
Retiree	192	265,446	44.0	37.26	51.02	251	354,408	58.2	50.65	65.43
Student	337	859,798	53.1	47.35	58.76	434	1,153,963	68.4	63.13	73.23
Not Working ^b	400	685,850	36.8	32.40	41.41	718	1,168,893	57.8	53.63	61.86
Household Income Group										
Less than RM 1,000	302	540,160	40.1	35.25	45.10	521	865,268	60.4	55.97	64.66
RM 1,000 - RM 1,999	783	1,399,188	42.0	37.86	46.27	1,118	2,086,537	60.8	56.57	64.85
RM 2,000 - RM 3,999	1,254	2,606,648	51.0	47.54	54.52	1,707	3,502,051	66.0	62.65	69.12
RM 4,000 - RM 5,999	670	1,336,724	51.9	46.80	57.04	893	1,877,766	68.0	63.33	72.41
RM 6,000 - RM 7,999	410	834,338	55.8	49.25	62.16	510	1,041,208	66.6	59.70	72.78
RM 8,000 - RM 9,999	185	387,944	58.3	49.80	66.33	224	448,463	64.6	55.46	72.76
RM 10,000 and above	317	647,872	53.6	43.24	63.70	374	737,749	59.1	48.48	68.95
Household Income Quintile										
Quintile 1	707	1,242,901	40.9	36.96	44.88	1,092	1,920,859	60.3	56.60	63.80
Quintile 2	787	1,523,351	47.1	42.34	51.91	1,086	2,088,723	62.9	58.30	67.24
Quintile 3	766	1,636,445	50.4	46.33	54.57	1,062	2,232,196	66.1	61.91	70.01
Quintile 4	749	1,480,024	52.1	47.21	56.96	999	2,089,844	68.6	64.30	72.59
Quintile 5	912	1,870,154	55.5	50.38	60.53	1,108	2,227,420	63.5	57.94	68.75
Household Income Category										
Bottom 40%	2,561	4,751,457	46.1	43.66	48.61	3,602	6,682,789	62.3	59.87	64.74
Middle 40%	1,003	2,253,785	55.6	51.10	59.92	1,318	2,980,512	69.6	65.63	73.28
Top 20%	357	747,633	54.5	45.62	63.15	427	895,741	62.3	52.53	71.18

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 6.10: Prevalence of Noticing Cigarette Advertisement and Promotion Among Respondents Aged 15 Years and Above in Malaysia

Cigarette Advertisement and Promotion	Total			Male			Female								
	Count	Estimated Population	Prevalence (%)	95% CI		Estimated Population	Prevalence (%)	95% CI							
				Lower	Upper			Count	Prevalence (%)	Lower	Upper				
Cigarettes advertising in store	2,004	3,653,288	21.2	19.47	23.03	939	2,080,166	21.8	19.50	24.39	1,065	1,573,122	20.4	18.34	22.60
Free cigarettes sample	156	283,231	1.3	1.01	1.79	85	196,552	1.8	1.31	2.45	71	86,679	0.9	0.49	1.50
Cigarettes at sale price	146	416,162	1.8	1.23	2.64	83	328,376	2.8	1.74	4.41	63	87,786	0.8	0.53	1.14
Coupons for cigarettes	71	123,535	0.6	0.34	1.00	23	73,579	0.7*	0.36	1.26	48	49,957	0.5*	0.22	1.13
Free gift or special discount on other products when buying cigarettes	66	116,014	0.5	0.33	0.90	24	66,857	0.6*	0.30	1.21	42	49,157	0.5*	0.24	0.96
Clothing or other items with a cigarette brand name or logo	128	227,070	1.1	0.82	1.40	65	138,518	1.3	0.88	1.79	63	88,551	0.9	0.56	1.35
Cigarette promotions in the mail	61	85,860	0.4	0.24	0.67	25	46,010	0.4	0.26	0.67	36	39,850	0.4*	0.17	0.90

*Prevalence with high RSE, interpret with caution

NHMS 2019

Dietary Practices

Dietary Practices

7.1 Intake Of Commercially Packed Ready To Drink Beverages / Premixed / Sugar Added Self-Prepared Drinks And The Consumption Of Sugar

Contributors to this section: Cheong Siew Man, Lalitha Palaniveloo, Ruhaya Salleh, Norsyamliana Che Abdul Rahim, Hazizi Abu Saad, Evi Diana Omar, Nazli Suhardi Ibrahim, Fatimah Zurina, Leong Han Yin, Shirly Chai Sook Yi

Introduction

Consumption of sugar sweetened beverages (SSBs) has been linked with adult and childhood obesity, an increasing health burden in Malaysia. SSBs is defined as all types of beverages containing free sugars and these include carbonated or non-carbonated soft drinks, fruit/vegetable juices and drinks, liquid and powder concentrates, flavoured water, energy and sports drinks, ready-to-drink tea, ready-to-drink coffee, and flavoured milk drink [1]. Globally, SSBs intake was highest among younger adults aged between 20-39 years [2]. In a study conducted among undergraduates aged between 19-26 years in Malaysia, the proportion of consuming at least one SSBs in a week was 96.5% while consumption of at least one SSBs in a day was 89.3% [3]. Consumption of SSB is associated with obesity, type 2 diabetes mellitus and cardiovascular risks in adults [4].

Objectives

General objective

To determine the intake of commercially packed ready to drink (CPRD) beverages, premixed beverages and sugar added self-prepared drinks among adults in Malaysia.

Specific objectives

1. To determine prevalence of CPRD beverages intake of at least once in a week among the respondents
2. To determine proportion of daily intake of CPRD beverages among respondents consuming commercially packed ready to drink beverages
3. To determine daily intake of sugar from CPRD beverages among respondents consuming commercially packed ready to drink beverages daily
4. To determine prevalence of premixed drinks intake of at least once in a week among the respondents

5. To determine proportion of daily intake of premixed drinks among respondents consuming premixed drinks
6. To determine daily intake of sugar from premixed drinks among respondents consuming premixed drinks daily
7. To determine prevalence of sugar added self-prepared drinks intake of at least once in a week among the respondents
8. To determine proportion of daily intake of sugar added self-prepared drinks among respondents consuming self-prepared drinks
9. To determine daily intake of sugar from sugar added self-prepared drinks among respondents consuming self-prepared drinks daily

Methods

Data on sugar added beverages was gathered from Malaysian adult respondents aged 18 years and above. Respondents were asked on the quantity of different types of sugar added beverages they consumed in the previous week.

Three questions were designed to determine the intake of commercially packed ready to drink (CPRD) beverages, premixed beverages, and sugar added self-prepared drinks. Respondents were asked whether they consumed each type of the sugar added beverages in the previous week and the quantity of beverages if they reported consuming any sugar added beverage in the previous week. The questions were showed in the appendix.

Variable Definition

1. Commercially packed ready to drink beverages (CPRD beverages)
 - Carbonated and non-carbonated drinks (e.g. Coca-Cola, 100 plus, Sprite, soy milk, chrysanthemum tea, lemon tea, and milo)
2. Premixed drinks
 - Instant drink products containing sugar (e.g. premix coffee, tea, chocolate, soy, and cereal)
3. Sugar added self-prepared drink
 - Coffee, tea, chocolate or malted beverages added with sugar and/or sweetened condensed milk or sweetened creamer

**Based on Operational Definition by Nutrition Division, Ministry of Health Malaysia*

Findings

Intake of Commercially Packed Ready to Drink (CPRD) Beverages and The Amount of Sugar Consumed

The national prevalence of CPRD beverages intake of at least once in a week among the respondents was 38.9% (95% CI: 37.20, 40.60).

Among the 16 states and federal territories in the country, Sarawak recorded the highest prevalence of CPRD beverages intake at least once a week with 55.0% (95% CI: 49.90, 60.00), while Pahang was the lowest with 27.0% (95% CI: 22.10, 32.60). By sex, males recorded higher prevalence at 43.1% (95% CI: 40.80, 45.50) than females [34.4% (95% CI: 32.30, 36.60)]. Respondents in the age group of 18-19 years old had the highest prevalence of CPRD beverages intake at 64.7% (95% CI: 57.50, 71.30) while those aged 75 years and above were the lowest with 13.8% (95% CI: 9.90, 18.80).

Among the ethnic groups, Bumiputera Sarawak had the highest prevalence [52.0% (95% CI: 45.80, 58.20)] while Indians had the lowest [32.7% (95% CI: 27.50, 38.30)]. By marital status, respondents who were single recorded the highest prevalence at 55.6% (95% CI: 52.20, 58.90) while those who were widow(er) / divorced recorded the lowest prevalence at 25.3% (95% CI: 21.30, 29.80).

The overall proportion of daily intake of CPRD beverages was 10.9% (95% CI: 9.40, 12.65) with a median sugar intake of 29.0 grams/day (IQR: 20.69, 43.28). The median daily sugar intake from CPRD beverages among respondents was between 20-44 grams/day. By gender, male respondents recorded higher proportion of daily CPRD beverages' intake with 11.7% (95% CI: 9.73, 13.96) and the median sugar intake was 35.2 grams/day (IQR: 22.26, 49.48). Among the ethnic groups, Bumiputera Sarawak recorded the highest daily proportion of

CPRD beverages' intake with 13.4% (95% CI: 8.90, 19.55) and median sugar intake of 31.7 grams/day (IQR: 20.69, 69.74).

By marital status, respondents who were single recorded the highest proportion of daily CPRD beverages' intake with 13.1% (95% CI: 10.53, 16.26) and median sugar intake was 30.0 grams/day (IQR: 21.17, 43.72). The proportion of daily CPRD beverages' intake by educational level shows that respondents with no formal education recorded the highest with 16.7% (10.35, 25.81) and the median sugar intake was 41.4 grams/day (IQR: 20.69, 62.07).

Respondents from Bottom 40% income group recorded the highest proportion of daily CPRD beverages' intake with 11.9% (95% CI: 10.06, 14.14) and median sugar intake of 27.1 grams/day (IQR: 20.69, 43.72).

Intake of Premixed Drinks and The Amount of Sugar Consumed

The national prevalence of premixed drinks intake of at least once in a week among the respondents was 23.1% (95% CI: 21.50, 24.70). Sarawak recorded the highest prevalence of premixed drinks intake with 38.7% (95% CI: 33.70, 43.90) while Kelantan was the lowest with 14.2% (95% CI: 10.60, 18.80). Respondents in the age group of 45-49 years old had the highest prevalence of premixed drinks intake at 28.5% (95% CI: 24.70, 32.70) while those between the age of 18-19 years old were the lowest with 16.2% (95% CI: 12.00, 21.50). Among the ethnic groups, Bumiputera Sarawak had the highest prevalence [42.1% (95% CI: 36.10, 48.30)] while Indians were the lowest [13.8% (95% CI: 10.50, 17.90)].

Among those who reported to have consumed premixed drinks, the overall proportion of daily intake of premixed drinks was 29.2% (95% CI: 25.69, 32.94) with median sugar intake of 14.3 grams/day (IQR: 14.26, 28.52). The proportion of daily intake of premixed drinks among the 16 states and federal territories in the country was between 16-49%, with Perak recorded the highest proportion with 48.4% (95% CI: 37.91, 59.12) and median sugar intake of 14.3 grams/day (IQR: 14.26, 28.52).

Male respondents recorded a higher proportion of daily intake of premixed drinks [30.7% (95% CI: 25.43, 36.42)] with median sugar intake of 14.3 grams/day (IQR: 14.26, 28.52). The proportion of premixed drinks intake by age groups was between 24-47%, with respondents from the age group of 70-74 years had the highest proportion with 46.9% (95% CI: 31.63, 62.80) and median sugar intake of 14.3 grams/day (IQR: 14.26, 28.52).

Among the ethnic groups, the Bumiputera Sarawak had the highest proportion of premixed drinks intake daily with 42.6% (95% CI: 31.86, 54.04) and the median sugar intake was 14.3 grams/day (IQR: 14.26, 28.52). By marital status, respondents who were widow(er) / divorced recorded the highest proportion of premixed drinks intake with 38.5% (95% CI: 30.23, 47.58) and median sugar intake of 14.3 grams/day (IQR: 14.26, 28.52). The proportion by educational level shows that respondents with primary level education recorded the highest proportion of daily intake of premixed drinks with 39.5% (28.89, 51.11) and median sugar intake of 14.3 grams/day (IQR: 14.26, 28.52).

Intake of Sugar Added Self-Prepared Drinks and The Amount of Sugar Consumed

The national prevalence of sugar added self-prepared drinks intake of at least once in a week among the respondents was 85.6% (95% CI: 84.24, 86.78). Kelantan recorded the highest prevalence of sugar added self-prepared drinks intake with 97.7% (95% CI: 95.73, 98.75) while WP Labuan was the lowest with 72.4% (95% CI: 68.03, 76.36).

Respondents in the age group of 35-39 years old had the highest prevalence of sugar added self-prepared drinks intake at 89.1% (95% CI: 86.30, 91.32) while those aged 75 years and above were the lowest with 80.0% (95% CI: 74.33, 84.61). Among the ethnic groups, Malays had the highest prevalence [91.0% (95% CI: 89.98, 91.94)]. Respondents with tertiary education had the highest prevalence of sugar added self-prepared drinks intake at 86.3% (95% CI: 83.75, 88.56) while those with no formal education were the lowest [79.5% (95% CI: 71.93, 85.42)].

The overall proportion of daily intake of sugar added self-prepared drinks was 62.2% (95% CI: 60.34, 63.96) with median sugar intake of 13.6 grams/day (IQR: 6.80, 25.43). The proportion of daily intake of sugar added self-prepared drinks among the 16 states and federal territories in the country was between 51-76%. Sarawak had the highest proportion with 75.5% (95% CI: 70.04, 80.23) and median sugar intake of 10 grams/day (IQR: 5.00, 20.00). The proportion by educational level shows that respondents with primary education recorded the highest proportion with 67.7% (95% CI: 64.09, 71.18) and the median sugar intake was 13.2 grams/day (IQR: 5.97, 27.20).

Conclusion

In general, sugar added self-prepared drinks were more commonly consumed compared to CPRD beverages and premixed beverages. However, the amount of sugar intake from CPRD beverages is higher compared to sugar intake from sugar added self-prepared drinks. Overall, adults from younger age groups tend to consume more sugar from all the type of beverages. Although consumption of sugar added self-prepared drinks were more common in Sarawak, the amount of sugar intake was higher in Peninsula Malaysia especially among the states from the East Coast; Terengganu, Kelantan and Pahang.

Recommendations

1. Expand the current taxation of Sugar-Sweetened Beverages (SSBs) by imposing tax on sugar added self-prepared and premixed drinks.
2. Strengthen the SSBs tax implementation by imposing higher tax on the SSBs products that is high in sugar.
3. Reduce / restrict the procurement and availability of SSBs at anchor institutions.
4. Engagement with beverage industries to reformulate sugar content in SSBs or resize the packaging.
5. Strengthening the practise of reading nutrition facts labels among consumers to create awareness on sugar content in SSBs, indirectly educating them to reduce the intake of SSBs.

References

1. Guideline: Sugars intake for adults and children. Geneva: World Health Organization; 2015 (http://apps.who.int/iris/bitstream/10665/149782/1/9789241549028_eng.pdf).
2. Singh, G.M., R. Micha, S. Khatibzadeh, P. Shi and S. Lim et al., 2015. Global, regional and national consumption of sugar-sweetened beverages, fruit juices and milk: A systematic assessment of beverage intake in 187 countries. *Plos One*, Vol. 10. 10.1371/journal.pone.0124845
3. Norliza-Ahmad, Muhammad Afiq-Md Zuki, Nur Azilah-Azahar, Boon Han-Khor and Halimatus Sakdiah-Minhat, 2019. Proportion and factors associated with sugar-sweetened beverage intake among undergraduate students in a public university in Malaysia. *Pak. J. Nutr.*, 18: 354-363.
4. Malik, V.S. and F.B. Hu, 2015. Fructose and cardiometabolic health: What the evidence from sugar-sweetened beverages tells us. *J. Am. College Cardiol.*, 66: 1615-1624.

7.2 Dietary Practices

Contributors to this section: Cheong Siew Man, Ruhaya Salleh, Ahmad Ali Zainuddin, Jayvikramjit Singh, Mohamad Hasnan Ahmad, Hazizi Abu Saad, Evi Diana Omar, Leong Han Yin, Shirly Chai Sook Yi, Nazli Suhardi Ibrahim

Introduction

Dietary practices that are incorporated into daily living could contribute significantly to human health. Poor choices in food consumption can increase the risk of certain diseases and conditions, such as diabetes, high blood pressure and obesity. In addition, some nutrients such as Vitamin C, Vitamin E and carotenoids can provide protection against certain health problems. In this study, dietary practices were assessed, including the intake of plain water, fruit and vegetables. In addition, knowledge and practice of the healthy plate concept was assessed.

The World Health Organization (WHO) recommends intake of fruit and/or vegetables of at least 5 servings per day. The findings from the NHMS study (2011) showed that only 7.5% of Malaysians consumed adequate fruit and vegetables. The following NHMS study (2015) showed similar results: 94.0% of Malaysian adults did not consume adequate fruit and/or vegetables daily.

The Malaysian Dietary Guidelines (MDG) 2010 recommends that adults consume 6 to 8 glasses of plain water daily. Findings from the Malaysian Adult Nutrition Survey showed that average intake of plain water among Malaysian was 6 glasses per day [1]. In the Malaysian Adult Nutrition Survey 2014, the results indicated that the mean intake of plain water was 7.1 glasses per day. In the latest NHMS report in 2015, the prevalence of adequate intake of plain water among adult Malaysian was reported to be 72.9%.

To encourage Malaysians to eat healthily, the Malaysian Healthy Plate Guidelines were published in 2016 [2]. The understanding of the Malaysian Healthy Plate (suku-suku separuh) concept among the general public is important to educate people on portion size to consume in order to achieve a balanced and healthy diet.

Objectives

General objective

To determine the dietary practices among adults in Malaysia.

Specific objectives

1. To determine the prevalence of inadequate fruits and/or vegetables intake among adults in Malaysia
2. To determine the prevalence of inadequate and adequate plain water intake among adults in Malaysia
3. To determine the prevalence of awareness of Malaysian Healthy Plate Concept among adults in Malaysia
4. To determine the proportion of adequate knowledge of Malaysian Healthy Plate Concept
5. To determine the proportion of adults who practise Malaysian Healthy Plate Concept

Methods

Data on dietary practices was gathered from respondents aged 18 years and above. Fruit, and vegetable intake, were assessed by 4 questions. Respondents were asked the frequency and quantity of intake of fruits and vegetables in the previous week. They were also requested to report the quantity of plain water intake in a day. Three questions were designed to determine the awareness, knowledge and practice of the Malaysian Healthy Plate Concept. Respondents were asked whether they ever heard of the “Malaysian Healthy Plate”? Among those who are aware of this concept, they were requested to report what are the healthy plate concept and to provide the information whether they practice this concept. The questions were showed in the appendix.

Variable Definition

1. Fruit, vegetable and fruit and vegetable intake
 - Inadequate fruit intake: consume less than 2 servings of fruit per day
 - Inadequate vegetable intake: consume less than 3 servings of vegetable per day
 - Inadequate fruit and/or vegetable intake: consume less than 5 servings of fruit and/or vegetable per day
2. Plain water intake
 - Inadequate plain water intake: drink less than 6 glasses per day
 - Adequate plain water intake: drink 6-8 glasses per day
3. Malaysian Healthy Plate concept
 - With awareness of Malaysian Health Plate Concept: ever heard or know about Malaysian Healthy Plate Concept

- Knowledge among those with awareness: with adequate knowledge was defined as able to elaborate the concepts of Malaysian Healthy Plate correctly:
 - i. Eat a quarter plate of rice / noodles / bread / cereal or grain products / tubers / other carbohydrate sources
 - ii. Eat a quarter plate of fish / chicken / beef / legumes / other protein sources
 - iii. Eat half of the plate with vegetable and fruit
 - » Practice of Malaysian Healthy Plate Concept among those with awareness, whether they practise it every day, sometimes or not at all

Findings

Fruit and vegetable intake

A total of 90.6% (95% CI: 89.36, 91.74) of respondents who did not consume adequate fruit. By state, Melaka recorded the highest prevalence of inadequate fruit intake with 96.0% (95% CI: 92.20, 97.99). In addition, the highest prevalence of inadequate fruit intake was among respondents from urban area [90.7% (95% CI: 89.16, 92.01)], males [90.8% (95% CI: 88.85, 92.40)] and adults aged between 18 -19 years old [95.3% (95% CI: 91.76, 97.36)].

In contrast, 90.0% (95% CI: 88.64, 91.30) of respondents who did not consume adequate vegetable. By state, Kelantan recorded the highest prevalence of inadequate vegetable intake with 98.1% (95% CI: 95.21, 99.27). Respondents from rural area had slightly higher prevalence of inadequate vegetable intake at 92.6% (95% CI: 90.98, 93.96). By sex, the females recorded higher prevalence at 90.7% (95% CI: 89.17, 92.07) than males [89.4% (95% CI: 87.33-91.15)]. By age group, elderly aged 75 years and above [94.0% (95% CI: 90.58, 96.27)] showed the highest prevalence of not taking adequate vegetable intake.

The findings showed that 94.9% (95% CI: 93.82, 95.79) of respondents did not take adequate fruit and/or vegetable as recommended by WHO and MDG. The prevalence of inadequate fruit and/or vegetable intake has increased from 92.5% in 2011 to 94.0% in 2015 among adults in Malaysia.

By state, Kedah recorded the highest prevalence of inadequate fruit and/or vegetable intake with 99.0% (95% CI: 97.47, 99.59) while Sabah was the lowest with 91.0% (95% CI: 81.94, 95.72). Respondents from rural area had slightly higher prevalence of inadequate fruit and/or vegetable intake at 95.9% (95% CI: 94.58, 96.87) compared to 94.6% (95% CI: 93.29, 95.72) among respondents from urban area. There was a higher prevalence of males [95.1% (95% CI: 93.14, 96.50)] with inadequate fruit and/or vegetable compared with females [94.7 (95% CI: 93.44, 95.72)]. By age group, the highest prevalence of inadequate fruit and/or vegetable intake was noted among adults between the age group of 18-19 years old [98.9% (95% CI: 96.54, 99.68)].

Plain water intake

The overall prevalence of adequate plain water intake (6-8 glasses per day) among respondents was 49.4% (95% CI: 47.84, 51.06). Pahang [58.8% (95% CI: 54.95, 62.50)] recorded the highest prevalence of adequate plain water intake followed by Perlis [57.2% (95% CI: 51.62, 62.52)] and Melaka [55.1% (95% CI: 48.79, 61.17)]. The results revealed that there was a high prevalence of respondents from the urban area [50.5% (95% CI: 48.60, 52.40)] and females [51.4% (95% CI: 49.42, 53.41)] who consumed adequate plain water.

In this study, the prevalence of inadequate plain water intake among respondents was 25.8% (95% CI: 24.23, 27.33). The highest prevalence for inadequate plain water intake was in WP Putrajaya [39.9% (95% CI: 33.97, 46.15)]. The prevalence of inadequate plain water intake was higher in the rural area [28.6% (95% CI: 25.91, 31.49)] and among females [27.5% (95% CI: 25.67, 29.48)].

Malaysian Healthy Plate Concept

About 20.4% (95% CI: 18.93, 22.03) or 1 in 5 respondents were aware of the Malaysian Healthy Plate Concept. The awareness was highest in WP Putrajaya [59.1% (95% CI: 53.71, 64.26)] followed by Perlis [31.5% (95% CI: 25.21, 38.54)] and WP Labuan [29.4 (95% CI: 22.83, 37.00)]. Sabah [13.0% (95% CI: 9.79, 17.01)] recorded the lowest prevalence of awareness of Malaysian Healthy Plate Concept. Respondents from the urban area [21.5% (95% CI: 19.64, 23.43)] were more aware of the Malaysian Healthy Plate Concept compared to rural area [16.8% (95% CI: 14.74, 18.98)] and females [28.0% (95% CI: 25.87, 30.15)] were more aware compared to males [13.3% (95% CI: 11.80, 15.02)].

By age group, respondents in the age group of 35 to 39 years old [27.0% (95% CI: 22.88, 31.58)] had the highest prevalence of awareness of Malaysian Healthy Plate Concept and the prevalence decreased as age increased, with the lowest prevalence was among elderly aged 75 years old and above [6.2% (95% CI: 3.75, 10.02)]. By education achievement, respondents with tertiary education level [33.4% (95% CI: 30.45, 36.48)] recorded the highest prevalence of awareness of Malaysian Healthy Plate Concept while respondents achieved secondary education level [19.7% (95% CI: 17.83, 21.66)] and primary education level [9.5% (95% CI: 7.67, 11.67)] recorded the lower prevalence. By occupation status, the government or semi government employees [42.7% (95% CI: 38.08, 47.45)] were more aware of Malaysian Healthy Plate Concept compared to other occupations. Respondents from Top 20% [28.4% (95% CI: 23.20, 34.24)] recorded the highest prevalence with awareness of Malaysian Healthy Plate Concept compared to the group of middle 40% [23.3% (95% CI: 20.43, 26.52)] and bottom 40% [18.3% (95% CI: 16.66, 20.05)].

Among respondents who were aware of Malaysian Healthy Plate Concept, 80.8% (95% CI: 78.01, 83.32) or four in five of them have adequate knowledge for interpreting all of the Malaysian Healthy Plate Concept. About 14.0% (95% CI: 11.73, 16.58) of those with awareness reported that they practiced the Malaysian Healthy Plate Concept in a daily basis and only 50.1% (95% CI: 46.95, 53.30) of them reported that practiced this concept sometimes.

Conclusion

Almost all Malaysian adults did not consume adequate fruit and/or vegetable in a day. Inadequate intake of fruit and vegetable were observed among respondents with lower education achievement and lower household income. This problem may be due to the high cost of fruit and vegetable as well as wide availability of unhealthy foods, such as energy-dense foods in affordable price in the stores [3]. Majority of the respondents drank plain water within the recommended quantity by MDG. Health promotion on drinking adequate plain water was successful and should continue to be implemented especially in rural areas as drinking adequate water is important for hydration and body function.

In conclusion, the overall consumption of fruits and vegetables among Malaysian adults is still low. There is a crucial need for strategies and coordinated efforts by program managers and policy makers at all levels to promote adequate intake of fruits and vegetables among Malaysian adults. A total of 1 in 5 adults or a total of 2,160,915 adults in Malaysia were aware of the Healthy Plate Concept. The awareness is more popular in Putrajaya with 1 in 2 of them aware of this concept. Majority of the adults (80.8%) with this awareness have adequate knowledge for interpreting this concept and 64.1% of them practiced this concept. More efforts are needed to increase the awareness of healthy plate concept.

Recommendations

1. Further studies / researches need to be conducted to determine the factors that cause inadequate intake of fruits & vegetables among Malaysians.
2. Increase the accessibility to affordable fruits & vegetables by expanding the number of Pasar Tani / Pasar Tamu / Pasar Malam / hypermarket / supermarket / equivalent outlets selling fruits & vegetables.
3. Price control / subsidise the local fruits & vegetables in the market in an affordable range.
4. Promote the consumption of plain water to replace the consumption of sugary drinks in various settings.
5. Strengthening the understanding and translation of Malaysian Healthy Plate Concept, the use of that knowledge to practice in main meals intake and make improvements on adequate intake of fruits and vegetables.
6. Strengthening the nutrition advocacy programmes / activities that focus on: Malaysian Healthy Plate Concept, adequate intake of fruits & vegetables and reduce sugar and sugary beverages intake.

Table 7.1: Inadequate Fruit and/or Vegetable Intake Trend in Malaysia

	2011	2015	2019
Inadequate Fruit and/or Vegetable Intake	92.5	94.0	94.9

References

1. Nutrition Section, Family Health Development Division. (2008). Malaysian Adult Nutrition Survey 2003. Ministry of Health Malaysia.
2. National Coordinating Committee on Food and Nutrition. 2010. Malaysian Dietary Guidelines. Ministry of Health Malaysia.
3. Panduan Pinggan Sihat Malaysia #suku-suku separuh. 2016. Cawangan Penyakit Tidak Berjangkit Bahagian Kawalan Penyakit, Kementerian Kesihatan Malaysia. Putrajaya.
4. Institute for Public Health (IPH). 2011. National Health and Morbidity Survey 2011 (NHMS 2011). Vol. II: NonCommunicable Diseases; 2011: 188 pages
5. Institute for Public Health (IPH). 2015. National Health and Morbidity Survey 2015 (NHMS 2015). Vol. II: Non-Communicable Diseases, Risk Factors & Other Health Problems.
6. Kamphuis CB, Giskes K, de Bruijn GJ, Wendel-Vos W, Brug J, van Lenthe FJ. Environmental determinants of fruit and vegetable consumption among adults: a systematic review. *British Journal of Nutrition*. 2006; 96(4):620-35.

Table 7.2: Prevalence of at Least Once in A Week Intake of Commercially Packed Ready to Drink (CPRD) Beverages, Proportion of Daily Intake of at Least One Type of CPRD Beverages and The Amount of Sugar Intake Per Day Among the Respondents Consuming CPRD Beverages Daily Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics

Sociodemographic Characteristics	CPRD Beverages Intake in A Week					CPRD Beverages Intake Daily Among Those Consume at Least Once A Week				
	Count	Estimated Population	Prevalence at Least Once A Week (%)	95% CI		Count	Estimated Population	Proportion of Daily Intake (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	3,643	8,275,614	38.9	37.20	40.60	409	903,567	10.9	9.40	12.65
State										
Johor	268	897,305	37.0	31.70	42.70	40	126,483	14.1	8.87	21.67
Kedah	195	515,820	40.1	32.60	48.20	25	64,726	12.5	8.78	17.62
Kelantan	134	346,208	30.9	25.00	37.50	10	19,160	6.0*	2.52	11.72
Melaka	184	165,317	27.7	19.40	37.90	42	41,824	25.3	15.15	39.12
Negeri Sembilan	156	258,853	36.7	28.80	45.40	12	21,396	8.3	5.01	13.34
Pahang	161	275,316	27.0	22.10	32.60	25	38,389	13.9*	7.52	24.40
Pulau Pinang	228	526,081	41.9	32.80	51.60	22	57,387	10.9*	4.36	24.73
Perak	153	433,046	28.1	23.20	33.50	16	40,923	9.5	5.27	16.36
Perlis	153	57,233	35.8	29.60	42.50	7	3,469	6.1*	2.93	12.11
Selangor	387	1,641,624	35.8	32.70	39.10	28	101,611	6.2	4.00	9.45
Terengganu	254	326,591	44.1	39.00	49.40	20	25,299	7.7	5.13	11.54
Sabah	361	1,320,966	51.4	46.00	56.70	42	156,013	11.8	8.06	16.98
Sarawak	373	1,016,165	55.0	49.90	60.00	50	154,036	15.1	10.74	20.91
WP Kuala Lumpur	159	437,658	33.7	28.00	39.90	17	44,888	10.3*	5.45	18.46
WP Labuan	241	30,772	48.6	41.10	56.10	32	5,060	16.4	10.86	24.13
WP Putrajaya	236	26,657	46.6	40.50	52.70	21	2,903	10.9	7.09	16.38
Location										
Urban	2,303	6,442,126	38.8	36.80	40.80	257	672,270	10.4	8.68	12.49
Rural	1,340	1,833,488	39.3	36.50	42.20	152	231,298	12.6	9.89	15.96
Sex										
Male	1,903	4,716,869	43.1	40.80	45.50	237	551,281	11.7	9.73	13.96
Female	1,740	3,558,745	34.4	32.30	36.60	172	352,286	9.9	7.87	12.37
Age Group (Years)										
18-19	203	572,555	64.7	57.50	71.30	26	72,617	12.7	7.30	21.12
20-24	556	1,660,541	57.9	52.40	63.10	75	194,770	11.7	8.49	15.99
25-29	514	1,608,864	53.7	49.20	58.20	77	211,470	13.1	9.54	17.85
30-34	462	1,155,056	43.4	38.30	48.70	50	126,305	10.9	7.54	15.60
35-39	439	977,200	41.2	37.00	45.60	45	99,877	10.2	7.13	14.44
40-44	307	572,331	31.2	27.10	35.70	25	39,468	6.9	4.15	11.25
45-49	303	494,618	29.7	25.70	34.20	21	23,721	4.8	2.86	7.95
50-54	253	402,522	26.2	22.50	30.40	23	29,960	7.4	4.43	12.25
55-59	222	319,144	23.9	20.40	27.70	23	37,269	11.6	7.09	18.46
60-64	165	202,133	18.3	15.10	22.00	15	18,307	9.1*	4.61	17.02
65-69	98	134,041	16.7	12.80	21.40	9	12,275	9.2*	3.21	23.47
70-74	57	85,968	15.6	11.40	21.00	10	14,983	17.4*	8.60	32.14
75 & above	64	90,640	13.8	9.90	18.80	10	22,546	24.9*	12.48	43.47
Ethnicity										
Malay ^a	2,305	4,015,002	36.9	34.90	38.90	270	463,086	11.5	9.88	13.42
Chinese	359	1,539,984	33.7	29.60	38.20	24	97,871	6.4	3.57	11.05

Sugar Intake From CPRD Beverages Among Those Consume Daily					
Sociodemographic Characteristics	Count	Estimated Population	Median gram of sugar / day	IQR	
				Q1	Q2
MALAYSIA	331	700,184	29.0	20.69	43.28
State					
Johor	34	106,962	22.3	20.69	27.08
Kedah	19	50,042	41.4	20.69	76.08
Kelantan	9	18,310	35.3	18.83	39.85
Melaka	38	40,102	20.7	20.69	41.38
Negeri Sembilan	9	15,836	24.0	20.55	26.46
Pahang	18	29,443	41.0	23.03	42.33
Pulau Pinang	21	40,484	43.7	23.03	62.07
Perak	7	17,738	43.7	18.21	43.72
Perlis	6	3,202	23.0	20.69	103.45
Selangor	24	88,472	37.0	20.69	41.38
Terengganu	17	22,274	25.4	21.17	65.81
Sabah	29	95,594	29.2	25.22	41.38
Sarawak	44	130,675	31.7	20.69	60.21
WP Kuala Lumpur	12	34,350	20.7	18.21	23.50
WP Labuan	26	4,205	25.7	20.69	56.63
WP Putrajaya	18	2,497	20.9	20.69	25.36
Location					
Urban	209	522,371	25.4	20.69	41.38
Rural	122	177,813	30.0	20.69	43.72
Sex					
Male	180	430,127	35.2	22.26	49.48
Female	151	270,056	21.2	20.69	41.38
Age Group (Years)					
18-19	22	66,138	29.2	20.69	79.50
20-24	67	170,180	23.5	20.69	40.98
25-29	60	137,803	35.7	20.69	43.72
30-34	45	107,223	30.5	21.17	41.38
35-39	32	63,769	37.0	20.69	41.38
40-44	21	30,526	59.0	23.03	82.76
45-49	16	19,797	20.7	20.69	62.07
50-54	19	25,222	27.1	23.03	57.73
55-59	18	29,782	20.7	20.69	82.18
60-64	12	13,241	20.7	20.69	57.73
65-69	5	9,208	20.7	20.69	25.36
70-74	8	11,008	20.7	20.69	23.50
75 & above	6	16,286	20.7	20.69	41.38
Ethnicity					
Malay ^a	230	396,004	27.7	20.69	43.72
Chinese	18	78,298	22.3	20.69	34.08

Table 7.2: Prevalence of at Least Once in A Week Intake of Commercially Packed Ready to Drink (CPRD) Beverages, Proportion of Daily Intake of at Least One Type of CPRD Beverages and The Amount of Sugar Intake Per Day Among the Respondents Consuming CPRD Beverages Daily Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (cont'd)

Sociodemographic Characteristics	CPRD Beverages Intake in A Week					CPRD Beverages Intake Daily Among Those Consume at Least Once A Week				
	Count	Estimated Population	Prevalence at Least Once A Week (%)	95% CI		Count	Estimated Population	Proportion of Daily Intake (%)	95% CI	
				Lower	Upper				Lower	Upper
Indian	204	405,353	32.7	27.50	38.30	18	41,006	10.1*	5.52	17.82
Bumiputera Sabah	292	684,354	49.9	44.10	55.70	34	83,630	12.2	7.16	20.09
Bumiputera Sarawak	205	496,112	52.0	45.80	58.20	24	66,237	13.4	8.90	19.55
Others	278	1,134,808	50.4	44.40	56.30	39	151,737	13.4	8.92	19.56
Marital Status										
Single	1,192	3,352,810	55.6	52.20	58.90	161	440,254	13.1	10.53	16.26
Married	2,203	4,540,032	33.1	31.20	35.00	218	415,832	9.2	7.60	11.00
Widow(er)/Divorcee	248	382,772	25.3	21.30	29.80	30	47,481	12.4	7.79	19.17
Education Level										
No Formal Education	133	352,795	32.4	24.80	41.40	19	58,899	16.7	10.35	25.81
Primary Education	591	1,349,900	32.9	28.90	37.20	65	135,845	10.1	7.20	13.90
Secondary Education	1,896	4,139,955	40.0	37.90	42.20	231	508,607	12.3	10.18	14.74
Tertiary Education	1,006	2,384,846	42.5	39.00	46.10	91	192,495	8.1	5.69	11.33
Occupation										
Government Employee	416	623,321	39.8	35.40	44.40	36	58,757	9.4	5.98	14.49
Private Employee	1,358	3,725,459	45.4	42.90	47.90	170	417,829	11.2	9.04	13.83
Self Employed	662	1,504,863	40.7	36.50	45.10	69	147,891	9.8	7.21	13.25
Unpaid Worker/ Homemaker	573	1,064,843	29.9	26.70	33.30	53	109,176	10.3	6.80	15.17
Retiree	84	145,246	18.3	13.70	24.00	12	23,260	16.0*	8.41	28.36
Student	165	425,643	57.8	50.60	64.70	15	23,920	5.6*	2.92	10.56
Not Working ^b	381	781,911	29.0	25.70	32.60	54	122,735	15.7	11.50	21.07
Household Income Group										
Less than RM 1,000	264	500,492	29.2	24.80	34.00	28	52,597	10.5	6.50	16.55
RM 1,000 - RM 1,999	701	1,559,044	38.2	34.90	41.50	88	193,021	12.4	9.46	16.04
RM 2,000 - RM 3,999	1,111	2,523,764	39.5	36.40	42.80	126	266,559	10.6	8.27	13.40
RM 4,000 - RM 5,999	614	1,464,816	44.0	39.80	48.20	66	186,881	12.8	8.51	18.69
RM 6,000 - RM 7,999	352	769,545	39.2	33.90	44.90	48	97,700	12.7	8.12	19.24
RM 8,000 - RM 9,999	162	413,288	46.0	37.50	54.80	15	27,851	6.7*	3.40	12.91
RM 10,000 and above	295	730,478	45.4	39.70	51.20	24	55,451	7.6	4.38	12.84
Household Income Quintile										
Quintile 1	587	1,253,901	33.0	29.60	36.50	67	133,787	10.7	7.64	14.72
Quintile 2	716	1,620,863	39.9	36.00	44.00	95	217,560	13.4	10.50	17.01
Quintile 3	700	1,560,292	39.2	35.60	42.90	72	149,507	9.6	6.88	13.19
Quintile 4	687	1,613,059	43.8	40.00	47.70	74	198,205	12.3	8.30	17.83
Quintile 5	809	1,913,310	42.8	38.80	46.90	87	181,003	9.5	6.81	12.98
Household Income Category										
Bottom 40%	2,287	4,908,586	37.7	35.70	39.80	271	586,566	11.9	10.06	14.14
Middle 40%	910	2,246,938	43.6	40.00	47.20	91	207,774	9.2	6.63	12.74
Top 20%	302	805,901	44.1	38.80	49.60	33	85,722	10.6	6.71	16.46

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Sugar Intake From CPRD Beverages Among Those Consume Daily					
Sociodemographic Characteristics	Count	Estimated Population	Median gram of sugar / day	IQR	
				Q1	Q2
Indian	13	28,059	30.0	18.83	37.04
Bumiputera Sabah	28	68,323	30.5	25.22	43.25
Bumiputera Sarawak	20	53,468	31.7	20.69	69.74
Others	22	76,031	29.2	23.50	43.72
Marital Status					
Single	138	377,550	30.0	21.17	43.72
Married	166	282,936	25.4	20.69	41.38
Widow(er)/Divorcee	27	39,698	20.7	20.69	26.46
Education Level					
No Formal Education	12	32,196	41.4	20.69	62.07
Primary Education	46	91,540	35.3	20.69	50.72
Secondary Education	188	408,937	25.4	20.69	43.72
Tertiary Education	82	159,789	30.5	20.69	41.38
Occupation					
Government Employee	30	45,231	23.0	20.69	41.38
Private Employee	132	321,486	29.2	20.69	41.38
Self Employed	58	126,285	35.2	23.03	48.39
Unpaid Worker/ Homemaker	44	71,505	23.0	20.69	34.08
Retiree	9	13,387	62.1	62.07	82.18
Student	14	21,495	20.7	20.69	41.38
Not Working ^b	44	100,794	21.2	20.69	62.07
Household Income Group					
Less than RM 1,000	24	40,426	24.2	20.69	43.72
RM 1,000 - RM 1,999	66	126,201	35.7	21.09	50.72
RM 2,000 - RM 3,999	102	219,616	28.2	20.69	43.72
RM 4,000 - RM 5,999	58	143,845	25.9	22.26	43.28
RM 6,000 - RM 7,999	36	72,511	30.5	21.17	41.38
RM 8,000 - RM 9,999	14	27,730	20.7	18.21	37.66
RM 10,000 and above	21	51,869	27.7	20.69	41.38
Household Income Quintile					
Quintile 1	53	96,155	30.0	20.69	42.33
Quintile 2	72	151,630	35.3	21.17	50.72
Quintile 3	62	130,701	23.5	20.69	43.72
Quintile 4	63	151,601	25.2	21.17	43.28
Quintile 5	71	152,111	30.5	20.69	41.38
Household Income Category					
Bottom 40%	219	440,207	27.1	20.69	43.72
Middle 40%	74	166,965	34.2	21.17	43.28
Top 20%	28	75,026	30.5	20.69	41.38

Table 7.3: Prevalence of at Least Once in A Week Intake of Premixed Drinks, Proportion of Daily Intake of at Least One Type of Premixed Beverages and The Amount of Sugar Intake Per Day Among The Respondents Consuming Premixed Beverages Daily Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics

Sociodemographic Characteristics	Premixed Drinks Intake In A Week					Premixed Drinks Intake Daily Among Those Consume at Least Once a Week				
	Count	Estimated Population	Prevalence at Least Once A Week (%)	95% CI		Count	Estimated Population	Proportion of Daily Intake (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	2,320	4,902,941	23.1	21.50	24.70	699	1,430,823	29.2	25.69	32.94
State										
Johor	152	491,808	20.3	14.50	27.60	36	83,092	16.9	9.49	28.26
Kedah	94	215,291	16.8	12.70	21.80	29	50,801	23.6	17.08	31.65
Kelantan	72	159,299	14.2	10.60	18.80	3	4,867	3.0*	1.13	8.02
Melaka	133	132,111	22.1	16.50	29.00	48	45,196	34.2	22.58	48.11
Negeri Sembilan	75	111,075	15.8	10.60	22.80	23	33,715	30.4	19.15	44.51
Pahang	114	172,514	16.9	13.80	20.60	25	32,416	18.8	12.00	28.19
Pulau Pinang	162	349,755	27.9	20.90	36.10	31	64,641	18.5	13.07	25.47
Perak	90	250,078	16.2	11.80	21.90	42	121,147	48.4	37.91	59.12
Perlis	115	33,966	21.2	16.30	27.20	31	6,901	20.3	12.75	30.80
Selangor	217	812,901	17.7	14.80	21.10	49	169,941	20.9	14.20	29.68
Terengganu	102	127,492	17.2	14.90	19.80	30	35,233	27.6	14.82	45.61
Sabah	326	978,641	38.0	31.90	44.60	128	388,817	39.7	29.24	51.25
Sarawak	272	714,808	38.7	33.70	43.90	108	274,324	38.4	29.82	47.72
WP Kuala Lumpur	121	320,425	24.7	20.10	29.90	37	109,551	34.2	24.72	45.11
WP Labuan	163	20,345	32.1	26.30	38.60	58	7,985	39.2	29.92	49.43
WP Putrajaya	112	12,433	21.7	16.60	27.90	21	2,196	17.7	11.55	26.04
Location										
Urban	1,471	3,842,682	23.1	21.20	25.20	432	1,095,333	28.5	24.32	33.09
Rural	849	1,060,259	22.7	20.70	24.90	267	335,490	31.6	26.49	37.29
Sex										
Male	1,108	2,662,458	24.4	22.10	26.70	335	816,078	30.7	25.43	36.42
Female	1,212	2,240,484	21.7	20.00	23.50	364	614,745	27.4	24.17	30.97
Age Group (Years)										
18-19	63	143,243	16.2	12.00	21.50	10	27,939	19.5*	9.57	35.69
20-24	225	695,967	24.2	19.40	29.90	33	169,974	24.4*	11.97	43.44
25-29	220	692,326	23.1	19.30	27.40	59	204,979	29.6	21.02	39.92
30-34	248	615,408	23.1	19.50	27.20	75	165,963	27.0	20.27	34.91
35-39	273	631,979	26.7	22.40	31.40	80	154,846	24.5	17.76	32.79
40-44	213	440,006	24.0	20.10	28.40	63	126,965	28.9	21.70	37.25
45-49	233	473,787	28.5	24.70	32.70	73	152,123	32.1	24.48	40.83
50-54	220	328,080	21.4	18.00	25.20	70	113,823	34.7	26.82	43.50
55-59	211	296,637	22.2	18.70	26.10	71	88,961	30.0	22.61	38.57
60-64	149	224,811	20.3	16.50	24.80	54	75,224	33.5	24.46	43.85
65-69	118	141,122	17.6	13.60	22.40	44	47,238	33.5	23.68	44.93
70-74	70	110,964	20.2	14.90	26.70	31	52,058	46.9	31.63	62.80
75 & above	77	108,610	16.5	12.30	21.70	36	50,730	46.7	33.38	60.52
Ethnicity										
Malay ^a	1,326	2,172,387	20.0	18.50	21.50	337	528,073	24.3	21.02	27.93
Chinese	322	1,007,474	22.1	18.20	26.40	109	279,844	27.8	21.23	35.44

Sugar Intake from Premixed Drinks Among Those Consume Daily					
Sociodemographic Characteristics	Count	Estimated Population	Median gram of sugar / day	IQR	
				Q1	Q2
MALAYSIA	695	1,420,857	14.3	14.26	28.52
State					
Johor	36	83,092	14.3	14.26	14.26
Kedah	29	50,801	14.3	14.26	28.52
Kelantan	3	4,867	14.3	14.26	42.78
Melaka	48	45,196	14.3	14.26	14.26
Negeri Sembilan	23	33,715	14.3	14.26	14.26
Pahang	25	32,416	14.3	14.26	28.52
Pulau Pinang	31	64,641	14.3	14.26	14.26
Perak	42	121,147	14.3	14.26	28.52
Perlis	31	6,901	14.3	14.26	28.52
Selangor	48	167,529	14.3	14.26	14.26
Terengganu	30	35,233	14.3	14.26	28.52
Sabah	128	388,817	28.5	14.26	28.52
Sarawak	106	266,791	14.3	14.26	28.52
WP Kuala Lumpur	37	109,551	14.3	14.26	14.26
WP Labuan	57	7,965	14.3	14.26	28.52
WP Putrajaya	21	2,196	14.3	14.26	28.52
Location					
Urban	430	1,085,953	14.3	14.26	28.52
Rural	265	334,903	14.3	14.26	28.52
Sex					
Male	333	809,091	14.3	14.26	28.52
Female	362	611,766	14.3	14.26	14.26
Age Group (Years)					
18-19	10	27,939	14.3	14.26	14.26
20-24	33	169,974	28.5	14.26	28.52
25-29	59	204,979	14.3	14.26	28.52
30-34	75	165,963	14.3	14.26	28.52
35-39	79	147,879	14.3	14.26	14.26
40-44	62	124,553	14.3	14.26	14.26
45-49	73	152,123	14.3	14.26	28.52
50-54	69	113,803	14.3	14.26	28.52
55-59	71	88,961	28.5	14.26	28.52
60-64	53	74,658	14.3	14.26	28.52
65-69	44	47,238	14.3	14.26	14.26
70-74	31	52,058	14.3	14.26	14.26
75 & above	36	50,730	14.3	14.26	14.26
Ethnicity					
Malay ^a	336	528,053	14.3	14.26	28.52
Chinese	108	279,277	14.3	14.26	14.26

Table 7.3: Prevalence of at Least Once in A Week Intake of Premixed Drinks, Proportion of Daily Intake of at Least One Type of Premixed Beverages and The Amount of Sugar Intake Per Day Among The Respondents Consuming Premixed Beverages Daily Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (cont'd)

Sociodemographic Characteristics	Premixed Drinks Intake In A Week					Premixed Drinks Intake Daily Among Those Consume at Least Once a Week				
	Count	Estimated Population	Prevalence at Least Once A Week (%)	95% CI		Count	Estimated Population	Proportion of Daily Intake (%)	95% CI	
				Lower	Upper				Lower	Upper
Indian	91	171,174	13.8	10.50	17.90	29	34,567	20.2	11.40	33.23
Bumiputera Sabah	271	574,422	41.9	35.00	49.00	112	232,495	40.5	33.21	48.18
Bumiputera Sarawak	166	401,528	42.1	36.10	48.30	66	170,950	42.6	31.86	54.04
Others	144	575,956	25.6	18.70	33.90	46	184,893	32.1*	16.01	53.97
Marital Status										
Single	530	1,485,453	24.6	21.80	27.70	120	349,292	23.5	18.89	28.86
Married	1,586	3,100,899	22.6	20.70	24.60	501	959,520	30.9	26.35	35.95
Widow(er)/Divorcee	204	316,588	20.9	17.60	24.80	78	122,010	38.5	30.23	47.58
Education Level										
No Formal Education	127	267,197	24.6	18.50	31.80	57	92,972	34.8	22.90	48.95
Primary Education	464	945,248	23.0	19.40	27.10	179	372,933	39.5	28.89	51.11
Secondary Education	1,128	2,353,405	22.8	21.00	24.60	314	620,187	26.4	22.65	30.42
Tertiary Education	588	1,317,040	23.5	20.60	26.60	147	343,014	26.0	21.01	31.81
Occupation										
Government Employee	270	415,219	26.5	22.20	31.40	65	93,304	22.5	16.23	30.25
Private Employee	786	2,081,801	25.4	22.80	28.10	219	578,167	27.8	23.05	33.04
Self Employed	409	878,220	23.8	20.10	27.80	131	312,562	35.6	25.19	47.55
Unpaid Worker/ Homemaker	410	724,564	20.3	17.70	23.30	130	183,457	25.3	19.63	32.00
Retiree	111	170,928	21.5	17.20	26.50	37	49,856	29.2	19.84	40.66
Student	53	145,686	19.8	13.70	27.70	8	15,458	10.6*	3.78	26.40
Not Working ^b	279	485,326	18.0	15.40	21.00	109	198,018	40.8	32.87	49.25
Household Income Group										
Less than RM 1,000	209	389,892	22.7	18.60	27.50	66	88,797	22.8	15.99	31.36
RM 1,000 - RM 1,999	441	901,502	22.1	18.80	25.80	122	208,452	23.1	17.42	30.01
RM 2,000 - RM 3,999	711	1,556,886	24.4	21.70	27.30	235	557,771	35.8	28.52	43.85
RM 4,000 - RM 5,999	377	784,609	23.5	20.70	26.70	105	216,106	27.5	21.46	34.60
RM 6,000 - RM 7,999	220	485,355	24.7	20.40	29.70	63	148,546	30.6	21.80	41.09
RM 8,000 - RM 9,999	98	221,320	24.6	17.80	33.00	26	55,675	25.2*	13.22	42.58
RM 10,000 and above	150	343,754	21.4	16.50	27.20	46	96,398	28.0	18.93	39.42
Household Income Quintile										
Quintile 1	420	815,554	21.5	18.30	25.00	131	197,155	24.2	18.53	30.89
Quintile 2	440	958,136	23.6	19.80	27.90	130	306,398	32.0	21.20	45.09
Quintile 3	457	961,435	24.1	21.40	27.10	148	328,961	34.2	28.34	40.62
Quintile 4	421	897,764	24.4	21.60	27.40	119	238,613	26.6	21.02	33.00
Quintile 5	468	1,050,430	23.5	20.30	27.10	135	300,618	28.6	22.08	36.20
Household Income Category										
Bottom 40%	1,473	2,981,727	22.9	21.00	25.00	448	878,477	29.5	24.66	34.76
Middle 40%	555	1,275,369	24.7	21.90	27.90	153	338,247	26.5	21.22	32.60
Top 20%	178	426,223	23.3	18.40	29.20	62	155,021	36.4	27.01	46.89

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Sugar Intake from Premixed Drinks Among Those Consume Daily					
Sociodemographic Characteristics	Count	Estimated Population	Median gram of sugar / day	IQR	
				Q1	Q2
Indian	29	34,567	14.3	14.26	14.26
Bumiputera Sabah	112	232,495	14.3	14.26	28.52
Bumiputera Sarawak	65	163,984	14.3	14.26	28.52
Others	45	182,480	28.5	14.26	28.52
Marital Status					
Single	119	349,272	14.3	14.26	28.52
Married	498	949,574	14.3	14.26	28.52
Widow(er)/Divorcee	78	122,010	14.3	14.26	14.26
Education Level					
No Formal Education	56	92,405	14.3	14.26	28.52
Primary Education	177	370,501	14.3	14.26	28.52
Secondary Education	313	613,221	14.3	14.26	28.52
Tertiary Education	147	343,014	14.3	14.26	28.52
Occupation					
Government Employee	64	86,337	14.3	14.26	28.52
Private Employee	218	575,754	14.3	14.26	28.52
Self Employed	130	312,542	14.3	14.26	28.52
Unpaid Worker/ Homemaker	130	183,457	14.3	14.26	28.52
Retiree	37	49,856	14.3	14.26	28.52
Student	8	15,458	14.3	14.26	14.26
Not Working ^b	108	197,452	14.3	14.26	28.52
Household Income Group					
Less than RM 1,000	66	88,797	14.3	14.26	28.52
RM 1,000 - RM 1,999	120	207,865	14.3	14.26	28.52
RM 2,000 - RM 3,999	235	557,771	14.3	14.26	28.52
RM 4,000 - RM 5,999	104	209,140	14.3	14.26	28.52
RM 6,000 - RM 7,999	63	148,546	14.3	14.26	14.26
RM 8,000 - RM 9,999	25	53,262	14.3	14.26	28.52
RM 10,000 and above	46	96,398	14.3	14.26	28.52
Household Income Quintile					
Quintile 1	130	197,135	14.3	14.26	28.52
Quintile 2	129	305,831	14.3	14.26	28.52
Quintile 3	148	328,961	14.3	14.26	28.52
Quintile 4	118	231,646	14.3	14.26	28.52
Quintile 5	134	298,206	14.3	14.26	21.39
Household Income Category					
Bottom 40%	446	877,891	14.3	14.26	28.52
Middle 40%	151	328,867	14.3	14.26	28.52
Top 20%	62	155,021	14.3	14.26	28.52

Table 7.4: Prevalence of at Least Once in A Week Intake of Sugar Added Self-Prepared Beverages, Proportion of Daily Intake of at Least One Type of Self-Prepared Beverages and The Amount of Sugar Intake Per Day Among the Respondents Consuming Self-Prepared Beverages Daily Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics

Sociodemographic Characteristics	Sugar Added Self-Prepared Beverages Intake in A Week					Sugar Added Self-Prepared Beverages Intake Daily Among Those Consume at Least Once A Week				
	Count	Estimated Population	Prevalence at Least Once A Week (%)	95% CI		Count	Estimated Population	Proportion of Daily Intake (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	9,046	18,189,658	85.6	84.24	86.78	5,926	11,307,186	62.2	60.34	63.96
State										
Johor	764	2,156,668	89.0	85.95	91.52	474	1,262,709	58.5	52.29	64.55
Kedah	489	1,164,624	90.6	87.95	92.76	333	724,890	62.2	55.11	68.88
Kelantan	571	1,093,579	97.7	95.73	98.75	299	565,473	51.7	48.36	55.04
Melaka	553	506,975	85.3	80.37	89.09	357	311,092	61.4	47.54	73.57
Negeri Sembilan	471	586,021	83.3	76.30	88.58	318	387,761	66.2	58.57	73.01
Pahang	570	885,594	86.9	80.83	91.31	390	576,223	65.1	58.18	71.37
Pulau Pinang	533	1,007,668	80.3	73.40	85.77	344	606,974	60.2	50.73	69.03
Perak	497	1,301,034	84.3	79.24	88.34	354	845,738	65.0	57.04	72.21
Perlis	512	149,225	93.3	90.42	95.42	354	95,995	64.3	56.84	71.18
Selangor	971	3,970,553	86.6	83.83	89.04	612	2,320,089	58.4	54.06	62.68
Terengganu	607	702,663	94.9	92.40	96.62	443	512,392	72.9	67.92	77.40
Sabah	639	1,943,527	75.6	69.27	80.91	394	1,152,114	59.3	53.34	64.96
Sarawak	645	1,591,715	86.2	82.65	89.12	489	1,201,567	75.5	70.04	80.23
WP Kuala Lumpur	413	1,035,963	79.9	71.50	86.27	272	686,785	66.3	61.05	71.17
WP Labuan	378	45,868	72.4	68.03	76.36	257	31,885	69.5	63.87	74.63
WP Putrajaya	433	47,981	83.8	79.18	87.60	236	25,499	53.1	48.22	58.01
Location										
Urban	5,424	14,046,438	84.6	83.02	86.12	3,465	8,561,257	60.9	58.74	63.11
Rural	3,622	4,143,220	88.8	86.94	90.50	2,461	2,745,929	66.3	63.44	69.00
Sex										
Male	4,308	9,729,604	89.0	87.09	90.71	3,076	6,510,203	66.9	64.18	69.53
Female	4,738	8,460,054	81.9	80.04	83.59	2,850	4,796,984	56.7	54.36	59.01
Age Group (Years)										
18-19	283	758,554	85.7	80.24	89.85	136	362,820	47.8	39.61	56.17
20-24	811	2,376,385	82.8	77.24	87.23	417	1,254,947	52.8	47.62	57.94
25-29	847	2,573,877	86.0	81.71	89.35	475	1,381,467	53.7	49.01	58.27
30-34	865	2,290,761	86.1	81.85	89.48	515	1,284,925	56.1	50.29	61.73
35-39	928	2,111,545	89.1	86.30	91.32	578	1,321,275	62.6	57.58	67.31
40-44	785	1,600,564	87.3	83.73	90.25	533	1,114,053	69.6	64.96	73.88
45-49	790	1,429,722	86.0	82.65	88.76	556	967,604	67.7	62.15	72.75
50-54	831	1,302,486	84.8	80.85	88.12	583	941,969	72.3	67.63	76.57
55-59	804	1,126,605	84.3	80.52	87.43	591	815,864	72.4	67.85	76.56
60-64	725	954,335	86.3	81.82	89.88	553	703,825	73.8	68.32	78.54
65-69	570	694,695	86.8	80.40	91.29	395	458,817	66.0	59.97	71.64
70-74	386	445,303	81.0	74.50	86.17	290	323,452	72.6	65.83	78.53
75 & above	421	524,825	80.0	74.33	84.61	304	376,168	71.7	65.23	77.34
Ethnicity										
Malay ^a	6,088	9,900,777	91.0	89.98	91.94	3,954	6,178,738	62.4	60.39	64.38
Chinese	1,006	3,544,626	77.7	73.94	81.05	657	2,121,086	59.8	54.24	65.20

Sugar Intake From Self-Prepared Beverages Among Those Consume Daily					
Sociodemographic Characteristics	Count	Estimated Population	Median gram of sugar / day	IQR	
				Q1	Q2
MALAYSIA	5,842	11,126,641	13.6	6.80	25.43
State					
Johor	467	1,231,741	8.6	5.00	16.80
Kedah	325	715,257	15.0	7.86	30.00
Kelantan	298	564,156	20	11.46	30.00
Melaka	348	301,720	10.2	6.80	20.40
Negeri Sembilan	318	387,761	10.2	5.71	20.40
Pahang	389	575,023	18.7	10.20	30.00
Pulau Pinang	341	599,860	12.9	6.80	20.40
Perak	349	831,642	15.0	7.50	30.00
Perlis	354	95,995	10.0	6.80	20.00
Selangor	611	2,317,417	15.0	10.00	30.00
Terengganu	441	509,592	30.0	15.00	50.00
Sabah	393	1,144,247	10.0	5.00	21.47
Sarawak	467	1,144,322	10.0	5.00	20.00
WP Kuala Lumpur	258	651,353	9.6	5.00	19.29
WP Labuan	257	31,885	10.0	5.10	20.40
WP Putrajaya	226	24,669	15.0	6.80	30.00
Location					
Urban	3,411	8,425,287	13.6	6.80	25.26
Rural	2,431	2,701,354	15.0	7.50	26.97
Sex					
Male	3,014	6,369,376	15.0	8.40	30.00
Female	2,828	4,757,265	10.2	5.00	20.00
Age Group (Years)					
18-19	134	352,245	19.6	7.93	30.00
20-24	411	1,235,220	14.4	8.74	25.71
25-29	470	1,371,059	13.6	7.14	27.90
30-34	508	1,262,684	15.9	8.40	30.00
35-39	568	1,283,465	13.6	5.71	26.66
40-44	522	1,098,079	13.6	7.50	25.20
45-49	547	949,473	14.5	7.86	27.20
50-54	578	937,136	13.6	6.80	20.00
55-59	585	803,566	11.1	5.00	21.86
60-64	547	697,791	10.0	5.00	20.00
65-69	385	446,833	10.0	5.00	20.00
70-74	285	314,055	10.0	5.00	20.00
75 & above	302	375,035	10.0	5.00	20.00
Ethnicity					
Malay ^a	3,907	6,103,862	15.0	9.14	30.00
Chinese	641	2,077,829	10.0	5.00	15.30

Table 7.4: Prevalence of at Least Once in A Week Intake of Sugar Added Self-Prepared Beverages, Proportion of Daily Intake of at Least One Type of Self-Prepared Beverages and The Amount of Sugar Intake Per Day Among the Respondents Consuming Self-Prepared Beverages Daily Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (cont'd)

Sociodemographic Characteristics	Sugar Added Self-Prepared Beverages Intake in A Week					Sugar Added Self-Prepared Beverages Intake Daily Among Those Consume at Least Once A Week				
	Count	Estimated Population	Prevalence at Least Once A Week (%)	95% CI		Count	Estimated Population	Proportion of Daily Intake (%)	95% CI	
				Lower	Upper				Lower	Upper
Indian	589	1,107,549	89.2	85.73	91.93	424	761,756	68.8	62.30	74.60
Bumiputera Sabah	504	1,094,767	79.8	74.94	83.91	316	641,004	58.6	52.09	64.73
Bumiputera Sarawak	368	844,792	88.6	84.53	91.64	285	665,929	78.8	72.54	83.99
Others	491	1,697,147	75.4	67.66	81.73	290	938,673	55.3	47.99	62.40
Marital Status										
Single	1,875	5,153,668	85.5	83.13	87.60	1,050	2,854,853	55.4	51.81	58.93
Married	6,220	11,784,675	85.9	84.11	87.47	4,227	7,653,355	64.9	62.71	67.11
Widow(er)/Divorcee	951	1,251,316	82.9	79.12	86.14	649	798,979	63.9	59.16	68.29
Education Level										
No Formal Education	520	860,820	79.5	71.93	85.42	376	554,673	64.4	56.32	71.80
Primary Education	2,072	3,469,813	84.6	80.53	87.95	1,461	2,350,250	67.7	64.09	71.18
Secondary Education	4,313	8,913,050	86.2	84.56	87.62	2,817	5,575,420	62.6	59.88	65.16
Tertiary Education	2,093	4,839,891	86.3	83.75	88.56	1,244	2,759,644	57.0	53.37	60.59
Occupation										
Government Employee	922	1,414,797	90.5	87.45	92.90	585	946,759	66.9	61.74	71.71
Private Employee	2,590	6,980,928	85.1	83.10	86.83	1,623	4,170,815	59.7	56.78	62.64
Self Employed	1,681	3,249,956	87.9	83.70	91.19	1,208	2,219,972	68.3	63.97	72.35
Unpaid Worker/ Homemaker	1,749	2,998,692	84.2	80.95	86.90	1,107	1,750,376	58.4	54.77	61.88
Retiree	453	707,349	89.1	84.69	92.35	337	522,433	73.9	67.50	79.35
Student	229	593,604	80.6	72.40	86.86	101	267,285	45.0	36.17	54.21
Not Working ^b	1,417	2,237,807	83.2	79.44	86.35	963	1,424,751	63.7	59.61	67.54
Household Income Group										
Less than RM 1,000	918	1,443,742	84.1	79.64	87.80	615	936,510	64.9	60.18	69.28
RM 1,000 - RM 1,999	1,841	3,575,341	87.5	84.31	90.13	1,241	2,176,556	60.9	56.08	65.48
RM 2,000 - RM 3,999	2,643	5,423,106	85.0	82.16	87.40	1,770	3,409,316	62.9	59.66	65.96
RM 4,000 - RM 5,999	1,355	2,881,491	86.5	83.64	88.90	844	1,785,478	62.0	57.93	65.84
RM 6,000 - RM 7,999	790	1,722,691	87.8	83.79	90.97	499	1,046,196	60.7	54.47	66.66
RM 8,000 - RM 9,999	348	785,631	87.5	81.61	91.67	210	482,861	61.5	53.72	68.66
RM 10,000 and above	614	1,360,235	84.5	78.96	88.82	390	861,967	63.4	56.25	69.95
Household Income Quintile										
Quintile 1	1,874	3,213,697	84.6	81.09	87.54	1,247	1,971,757	61.4	57.44	65.12
Quintile 2	1,731	3,481,887	85.9	81.93	89.04	1,187	2,265,179	65.1	60.39	69.45
Quintile 3	1,644	3,438,918	86.4	83.65	88.67	1,099	2,119,256	61.6	57.43	65.65
Quintile 4	1,508	3,189,179	86.7	84.13	88.90	937	1,951,669	61.2	57.33	64.93
Quintile 5	1,752	3,868,558	86.6	83.63	89.05	1,099	2,391,024	61.8	57.92	65.55
Household Income Category										
Bottom 40%	5,805	11,157,100	85.8	84.03	87.44	3,845	6,975,024	62.5	60.29	64.69
Middle 40%	2,019	4,479,584	86.9	84.70	88.76	1,299	2,761,668	61.7	58.06	65.12
Top 20%	685	1,555,555	85.2	80.02	89.18	425	962,192	61.9	55.37	67.95

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Sugar Intake From Self-Prepared Beverages Among Those Consume Daily					
Sociodemographic Characteristics	Count	Estimated Population	Median gram of sugar / day	IQR	
				Q1	Q2
Indian	418	754,073	10.2	6.46	20.00
Bumiputera Sabah	315	633,137	10.0	5.00	20.40
Bumiputera Sarawak	274	632,758	10.7	5.00	21.43
Others	287	924,981	16.8	9.14	30.00
Marital Status					
Single	1,033	2,797,717	15.0	8.26	30.00
Married	4,162	7,530,962	13.4	6.50	25.20
Widow(er)/Divorcee	647	797,962	11.0	6.43	20.00
Education Level					
No Formal Education	374	552,012	10.2	5.00	20.00
Primary Education	1,441	2,308,320	13.2	5.97	27.20
Secondary Education	2,773	5,484,268	15.0	7.50	26.80
Tertiary Education	1,226	2,714,843	12.0	5.97	22.95
Occupation					
Government Employee	572	931,068	11.5	5.00	23.60
Private Employee	1,600	4,119,599	15.0	8.26	30.00
Self Employed	1,183	2,166,993	15.0	7.50	30.00
Unpaid Worker/ Homemaker	1,101	1,727,732	10.2	5.54	20.00
Retiree	333	514,127	10.0	5.00	22.50
Student	100	263,660	13.6	7.99	30.00
Not Working ^b	951	1,398,667	11.0	5.00	20.40
Household Income Group					
Less than RM 1,000	607	918,005	10.7	5.71	21.43
RM 1,000 - RM 1,999	1,222	2,129,985	15.0	7.99	26.23
RM 2,000 - RM 3,999	1,749	3,369,046	13.6	7.14	28.60
RM 4,000 - RM 5,999	831	1,753,919	13.6	5.49	27.20
RM 6,000 - RM 7,999	492	1,034,820	14.4	7.50	30.00
RM 8,000 - RM 9,999	205	471,461	13.6	7.14	21.94
RM 10,000 and above	383	846,895	11.8	5.97	25.89
Household Income Quintile					
Quintile 1	1,226	1,921,551	13.6	6.80	24.00
Quintile 2	1,175	2,233,896	14.5	6.80	30.00
Quintile 3	1,085	2,098,896	15.0	7.91	26.17
Quintile 4	923	1,916,610	13.1	5.71	27.20
Quintile 5	1,080	2,353,177	13.6	6.80	28.80
Household Income Category					
Bottom 40%	3,793	6,865,160	13.6	6.80	26.17
Middle 40%	1,277	2,715,608	13.6	6.80	26.80
Top 20%	419	943,363	15.0	5.97	30.00

Table 7.5: Prevalence of Inadequate Intake of Fruit, Vegetable and Fruit and/or Vegetable Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics

Sociodemographic Characteristics	Inadequate Intake									
	Fruit					Vegetable				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	8,492	17,042,893	90.6	89.36	91.74	9,151	18,163,065	90.0	88.64	91.30
State										
Johor	700	1,962,232	90.1	85.99	93.13	723	2,066,805	90.1	85.98	93.04
Kedah	428	996,857	91.8	86.34	95.17	505	1,177,118	96.7	94.29	98.14
Kelantan	530	994,118	94	89.93	96.04	559	1,050,136	98.1	95.21	99.27
Melaka	539	494,641	96.0	92.20	97.99	556	484,366	88.4	78.86	93.91
Negeri Sembilan	469	595,445	94.4	90.31	96.79	488	632,848	94.2	89.93	96.70
Pahang	533	844,864	89.3	84.59	92.74	578	919,364	95.6	93.15	97.24
Pulau Pinang	510	971,727	88.1	81.75	92.46	528	1,020,943	84.1	74.09	90.70
Perak	432	1,111,528	87.9	82.07	92.01	483	1,240,240	85.4	81.27	88.75
Perlis	455	126,523	89.4	83.86	93.18	503	142,491	94.5	90.32	96.94
Selangor	939	3,896,923	92.2	90.07	93.97	953	3,871,618	87.3	82.65	90.87
Terengganu	534	605,436	91.4	86.47	94.64	599	679,735	97.1	94.69	98.46
Sabah	604	1,863,421	84.9	77.32	90.26	719	2,202,560	88.3	84.77	91.15
Sarawak	553	1,380,569	92.3	89.60	94.27	603	1,479,505	90.4	84.40	94.30
WP Kuala Lumpur	430	1,100,233	92.2	87.96	94.99	417	1,085,664	89.6	83.69	93.49
WP Labuan	425	51,805	91.2	87.10	94.10	475	57,878	94.9	91.04	97.10
WP Putrajaya	411	46,570	89.8	85.92	92.67	462	51,795	97.2	94.11	98.71
Location										
Urban	5,213	13,436,833	90.7	89.16	92.01	5,552	14,120,634	89.3	87.58	90.87
Rural	3,279	3,606,060	90.4	88.38	92.11	3,599	4,042,431	92.6	90.98	93.96
Sex										
Male	3,801	8,608,289	90.8	88.85	92.40	4,106	9,160,425	89.4	87.33	91.15
Female	4,691	8,434,604	90.5	88.90	91.83	5,045	9,002,639	90.7	89.17	92.07
Age Group (Years)										
18-19	252	654,386	95.3	91.76	97.36	271	712,271	92.7	87.73	95.81
20-24	737	2,221,417	89.1	82.17	93.60	779	2,382,520	89.9	85.89	92.83
25-29	786	2,419,826	90.8	87.23	93.49	853	2,604,249	91.1	87.90	93.58
30-34	792	2,085,160	90.8	87.87	93.15	878	2,228,996	88.2	81.74	92.52
35-39	887	1,920,441	90.4	87.46	92.73	923	1,980,949	87.4	84.16	90.13
40-44	758	1,572,690	93.5	90.87	95.40	801	1,591,687	89.1	84.32	92.54
45-49	737	1,339,369	91.5	88.77	93.61	784	1,402,875	89.3	86.09	91.81
50-54	776	1,243,226	89.1	85.88	91.64	845	1,308,605	88.5	84.98	91.34
55-59	769	1,101,263	90.8	87.42	93.30	851	1,209,379	93.7	91.18	95.51
60-64	675	847,756	88.5	84.01	91.78	738	965,496	91.5	88.41	93.85
65-69	531	649,911	87.3	80.85	91.87	576	714,257	92.8	89.26	95.23
70-74	364	439,400	89.5	84.87	92.81	390	472,431	90.4	85.66	93.73
75 & above	428	548,050	91.8	87.61	94.72	462	589,351	94.0	90.58	96.27
Ethnicity										
Malay ^a	5,592	8,929,725	91.5	90.16	92.72	5,976	9,365,836	91.3	90.00	92.37
Chinese	1,054	3,655,308	90.1	87.37	92.25	1,110	3,771,913	86.7	81.66	90.49
Indian	553	1,028,832	92.5	88.98	95.02	585	1,054,330	88.0	83.87	91.19

Sociodemographic Characteristics	Inadequate Intake				
	Fruit and / or Vegetable			95% CI	
	Count	Estimated Population	Prevalence (%)	Lower	Upper
MALAYSIA	8,655	17,289,917	94.9	93.82	95.79
State					
Johor	707	1,979,710	93.8	90.97	95.78
Kedah	449	1,046,739	99.0	97.47	99.59
Kelantan	542	1,014,365	98	95.10	99.22
Melaka	526	477,550	98.6	96.31	99.50
Negeri Sembilan	468	592,521	97.4	93.66	98.94
Pahang	549	869,184	96.9	94.14	98.33
Pulau Pinang	514	1,009,128	93.4	89.20	96.06
Perak	437	1,124,343	91.1	88.03	93.52
Perlis	480	132,117	95.5	87.37	98.46
Selangor	952	3,968,398	95.5	93.87	96.72
Terengganu	552	615,454	98.0	96.13	98.97
Sabah	642	1,945,376	91.0	81.94	95.72
Sarawak	551	1,351,376	95.3	91.95	97.32
WP Kuala Lumpur	413	1,061,186	93.9	90.07	96.31
WP Labuan	444	54,032	96.4	93.73	97.92
WP Putrajaya	429	48,437	97.4	95.07	98.63
Location					
Urban	5,306	13,618,210	94.6	93.29	95.72
Rural	3,349	3,671,707	95.9	94.58	96.87
Sex					
Male	3,872	8,689,374	95.1	93.14	96.50
Female	4,783	8,600,543	94.7	93.44	95.72
Age Group (Years)					
18-19	238	629,870	98.9	96.54	99.68
20-24	711	2,145,221	91.4	83.51	95.75
25-29	800	2,491,206	96.1	93.66	97.58
30-34	822	2,149,673	96.0	94.12	97.35
35-39	889	1,913,818	92.7	89.89	94.81
40-44	774	1,602,774	96.9	94.93	98.06
45-49	749	1,338,182	94.5	92.12	96.21
50-54	810	1,269,142	93.4	90.29	95.55
55-59	807	1,155,971	97.0	95.12	98.18
60-64	704	896,563	95.5	92.89	97.23
65-69	550	696,068	95.2	92.07	97.15
70-74	371	449,612	94.8	91.00	97.06
75 & above	430	551,817	95.5	91.92	97.58
Ethnicity					
Malay ^a	5,671	8,987,076	95.8	94.86	96.53
Chinese	1,083	3,738,313	93.9	92.14	95.30
Indian	566	1,048,827	96.1	93.51	97.71

Table 7.5: Prevalence of Inadequate Intake of Fruit, Vegetable and Fruit and/or Vegetable Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (cont'd)

Sociodemographic Characteristics	Inadequate Intake									
	Fruit					Vegetable				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
Lower				Upper	Lower				Upper	
Bumiputera Sabah	496	1,062,997	88.4	85.26	90.94	579	1,195,369	89.4	85.91	92.13
Bumiputera Sarawak	323	702,818	92.2	88.23	94.86	354	786,894	91.6	85.76	95.13
Others	474	1,663,214	86.8	77.91	92.48	547	1,988,721	92.0	87.09	95.12
Marital Status										
Single	1,709	4,725,671	91.6	89.47	93.32	1,824	5,006,038	90.8	88.58	92.67
Married	5,856	11,132,752	90.3	88.74	91.72	6,341	11,837,764	89.5	87.69	91.00
Widow(er)/Divorcee	927	1,184,470	89.6	85.05	92.82	986	1,319,263	92.5	89.87	94.49
Education Level										
No Formal Education	502	828,263	91.9	85.86	95.55	562	944,161	93.5	89.47	96.01
Primary Education	1,923	3,188,860	89.9	84.99	93.30	2,101	3,577,135	91.7	89.27	93.56
Secondary Education	4,019	8,223,222	91.0	89.57	92.23	4,331	8,807,365	90.1	88.46	91.61
Tertiary Education	2,008	4,709,413	90.3	88.10	92.08	2,108	4,717,979	87.9	84.46	90.67
Occupation										
Government Employee	880	1,347,681	91.7	88.79	93.89	942	1,333,804	89.3	85.62	92.11
Private Employee	2,429	6,543,957	91.9	90.21	93.40	2,569	6,929,348	89.2	87.25	90.93
Self Employed	1,503	2,890,744	87.7	83.14	91.21	1,655	3,144,167	89.1	84.50	92.45
Unpaid Worker/ Homemaker	1,693	2,892,227	90.6	88.22	92.60	1,852	3,143,750	91.3	88.62	93.37
Retiree	401	612,665	84.8	79.73	88.82	450	709,366	91.0	87.16	93.79
Student	232	626,951	97.0	93.91	98.55	231	619,754	90.6	83.52	94.79
Not Working ^b	1,348	2,121,681	90.0	86.92	92.37	1,446	2,275,889	92.2	89.78	94.12
Household Income Group										
Less than RM 1,000	855	1,355,117	92.8	89.26	95.20	958	1,501,858	91.8	88.81	94.03
RM 1,000 - RM 1,999	1,655	3,190,452	90.4	87.88	92.41	1,833	3,403,907	88.6	83.27	92.43
RM 2,000 - RM 3,999	2,478	5,014,882	89.5	86.41	91.96	2,656	5,494,693	91.1	89.21	92.62
RM 4,000 - RM 5,999	1,282	2,695,061	91.4	89.00	93.36	1,378	2,890,354	91.2	88.65	93.23
RM 6,000 - RM 7,999	749	1,623,753	90.6	87.32	93.11	784	1,661,262	88.2	83.56	91.67
RM 8,000 - RM 9,999	341	788,810	93.4	89.23	96.05	346	778,504	88.6	82.62	92.71
RM 10,000 and above	595	1,344,094	90.7	86.55	93.63	621	1,301,211	86.2	80.79	90.30
Household Income Quintile										
Quintile 1	1,740	3,012,976	91.4	88.97	93.33	1,923	3,266,364	90.6	87.96	92.73
Quintile 2	1,573	3,060,004	89.4	84.69	92.72	1,726	3,386,828	89.4	84.23	93.08
Quintile 3	1,536	3,211,346	90.3	87.61	92.47	1,637	3,432,686	90.9	88.37	92.94
Quintile 4	1,421	2,971,186	91.0	88.72	92.89	1,539	3,204,936	91.2	88.80	93.19
Quintile 5	1,685	3,756,656	91.2	89.05	92.97	1,751	3,740,977	87.6	84.37	90.22
Household Income Category										
Bottom 40%	5,397	10,300,623	90.5	88.72	92.07	5,860	11,089,933	90.0	88.15	91.58
Middle 40%	1,899	4,175,545	91.0	88.82	92.74	2,032	4,435,070	90.7	88.20	92.74
Top 20%	659	1,536,001	90.8	87.11	93.47	684	1,506,788	86.7	81.83	90.35

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Inadequate Intake				
	Fruit and / or Vegetable				
	Count	Estimated Population	Prevalence (%)	95% CI	
Lower				Upper	
Bumiputera Sabah	523	1,119,343	94.9	91.22	97.04
Bumiputera Sarawak	321	690,660	95.4	90.64	97.77
Others	491	1,705,697	91.7	80.84	96.63
Marital Status					
Single	1,683	4,687,295	95.9	94.48	96.97
Married	6,052	11,387,138	94.4	92.93	95.64
Widow(er)/Divorcee	920	1,215,484	95.3	92.79	96.96
Education Level					
No Formal Education	498	821,631	96.7	93.86	98.26
Primary Education	1,965	3,261,697	94.7	89.27	97.44
Secondary Education	4,089	8,353,908	95.3	94.12	96.30
Tertiary Education	2,060	4,749,445	93.9	92.32	95.12
Occupation					
Government Employee	917	1,362,408	95.3	92.59	97.06
Private Employee	2,420	6,571,970	95.5	94.30	96.50
Self Employed	1,567	2,990,343	92.7	87.34	95.94
Unpaid Worker/ Homemaker	1,745	2,957,421	94.6	91.91	96.46
Retiree	431	666,719	93.2	89.11	95.85
Student	220	604,378	98.0	93.91	99.39
Not Working ^b	1,349	2,129,689	95.8	94.04	97.06
Household Income Group					
Less than RM 1,000	864	1,362,960	96.0	93.89	97.44
RM 1,000 - RM 1,999	1,702	3,255,491	95.7	93.18	97.33
RM 2,000 - RM 3,999	2,516	5,143,382	94.6	91.43	96.68
RM 4,000 - RM 5,999	1,304	2,729,511	95.9	94.23	97.06
RM 6,000 - RM 7,999	756	1,611,230	93.3	90.25	95.41
RM 8,000 - RM 9,999	347	788,939	94.7	90.51	97.11
RM 10,000 and above	619	1,332,919	92.6	88.76	95.20
Household Income Quintile					
Quintile 1	1,773	3,033,845	95.1	92.50	96.84
Quintile 2	1,598	3,120,662	94.2	88.63	97.16
Quintile 3	1,561	3,301,838	96.0	94.52	97.09
Quintile 4	1,454	3,034,999	96.0	94.49	97.10
Quintile 5	1,722	3,733,088	93.3	91.35	94.88
Household Income Category					
Bottom 40%	5,490	10,470,920	95.0	93.40	96.25
Middle 40%	1,938	4,229,891	95.4	93.96	96.53
Top 20%	680	1,523,621	92.4	88.96	94.80

Table 7.6: Prevalence of Adequate and Inadequate Plain Water Intake in A Day Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics

Sociodemographic Characteristics	< 6 glasses					6-8 glasses				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	3,003	5,421,810	25.8	24.23	27.33	5,113	10,411,252	49.4	47.84	51.06
State										
Johor	253	676,912	28.5	22.46	35.41	445	1,227,028	51.7	45.36	57.89
Kedah	177	409,765	32.5	27.14	38.35	236	526,489	41.8	35.99	47.75
Kelantan	201	380,048	34	28.82	39.84	266	511,089	45.9	41.07	50.76
Melaka	239	206,098	34.9	27.86	42.68	355	325,044	55.1	48.79	61.17
Negeri Sembilan	161	198,974	28.4	22.53	35.03	273	343,484	49.0	41.41	56.59
Pahang	137	215,197	21.1	16.65	26.43	382	598,715	58.8	54.95	62.50
Pulau Pinang	236	387,738	31.0	25.17	37.58	295	646,091	51.7	42.71	60.61
Perak	178	393,613	25.8	20.15	32.36	264	717,072	47.0	41.21	52.82
Perlis	153	43,845	27.4	22.37	33.14	311	91,374	57.2	51.62	62.52
Selangor	247	913,847	20.0	17.08	23.19	587	2,452,727	53.6	50.23	56.88
Terengganu	212	252,954	34.2	30.04	38.70	282	317,252	42.9	39.34	46.63
Sabah	131	372,113	14.7	11.05	19.36	381	1,199,832	47.5	41.86	53.18
Sarawak	221	587,924	32.5	28.24	37.04	357	850,430	47.0	43.23	50.77
WP Kuala Lumpur	142	345,903	26.9	19.77	35.54	218	550,791	42.9	37.28	48.67
WP Labuan	122	14,197	22.7	18.40	27.64	255	30,911	49.4	45.39	53.42
WP Putrajaya	193	22,684	39.9	33.97	46.15	206	22,924	40.3	35.07	45.82
Location										
Urban	1,756	4,097,631	24.9	23.17	26.81	3,112	8,295,489	50.5	48.60	52.40
Rural	1,247	1,324,179	28.6	25.91	31.49	2,001	2,115,762	45.7	42.95	48.53
Sex										
Male	1,329	2,592,757	24.1	22.12	26.09	2,193	5,128,467	47.6	45.30	49.86
Female	1,674	2,829,053	27.5	25.67	29.48	2,920	5,282,785	51.4	49.42	53.41
Age Group (Years)										
18-19	114	265,935	30.8	24.68	37.76	155	425,106	49.3	41.73	56.89
20-24	309	773,854	27.1	23.35	31.15	440	1,433,617	50.2	44.73	55.58
25-29	250	717,831	24.1	20.32	28.36	477	1,422,971	47.8	43.49	52.12
30-34	237	541,540	20.5	16.66	24.94	492	1,329,679	50.3	44.81	55.83
35-39	250	526,054	22.7	19.16	26.60	509	1,128,156	48.6	44.49	52.76
40-44	211	442,379	24.3	20.52	28.57	411	791,950	43.5	38.54	48.67
45-49	221	352,020	21.3	17.87	25.24	457	866,449	52.5	47.69	57.24
50-54	235	336,201	22.2	18.67	26.13	505	816,539	53.9	49.28	58.38
55-59	257	294,032	22.2	18.60	26.27	495	725,155	54.8	50.06	59.36
60-64	263	352,346	32.0	26.99	37.44	424	549,196	49.9	44.63	55.11
65-69	223	281,032	35.6	29.60	42.00	314	400,848	50.7	44.36	57.05
70-74	165	195,241	36.1	29.94	42.81	226	272,651	50.4	43.81	57.07
75 & above	268	343,346	52.8	46.52	58.98	208	248,935	38.3	32.50	44.40
Ethnicity										
Malay ^a	2,205	3,329,561	30.8	29.00	32.66	3,303	5,280,915	48.8	47.05	50.66
Chinese	328	1,022,461	22.8	19.32	26.61	680	2,285,728	50.9	46.49	55.27
Indian	150	238,782	19.4	14.64	25.15	329	623,229	50.5	45.52	55.52

Table 7.6: Prevalence of Adequate and Inadequate Plain Water Intake in A Day Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (cont'd)

Sociodemographic Characteristics	< 6 glasses					6-8 glasses				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sabah	124	219,533	16.2	12.56	20.75	320	694,195	51.4	46.73	55.94
Bumiputera Sarawak	102	265,615	28.0	22.75	34.00	211	473,111	49.9	44.65	55.22
Others	94	345,858	15.6	11.27	21.17	270	1,054,073	47.5	40.20	54.91
Marital Status										
Single	678	1,699,923	28.4	25.59	31.45	1,017	2,795,958	46.8	43.47	50.08
Married	1,890	3,178,499	23.4	21.74	25.12	3,573	6,921,601	50.9	48.99	52.88
Widow(er)/Divorcee	435	543,388	36.6	32.49	40.88	523	693,692	46.7	42.51	50.94
Education Level										
No Formal Education	243	344,942	32.5	25.82	39.87	294	533,783	50.2	43.51	56.91
Primary Education	747	1,073,661	26.5	23.80	29.38	1,128	1,955,230	48.2	44.15	52.36
Secondary Education	1,364	2,646,737	25.9	23.94	27.87	2,430	4,996,671	48.8	46.75	50.88
Tertiary Education	634	1,332,450	23.9	21.18	26.83	1,232	2,857,194	51.2	48.07	54.39
Occupation										
Government Employee	279	358,539	23.0	19.03	27.41	509	838,477	53.7	48.84	58.44
Private Employee	659	1,659,530	20.4	18.09	22.86	1,480	4,000,826	49.1	46.16	52.06
Self Employed	497	897,343	24.8	21.63	28.29	899	1,802,215	49.8	45.76	53.89
Unpaid Worker/ Homemaker	586	981,739	27.7	24.45	31.15	1,093	1,809,134	51.0	47.43	54.55
Retiree	164	226,388	28.7	23.84	34.10	258	416,217	52.8	46.79	58.65
Student	95	209,976	28.9	22.09	36.90	125	368,841	50.8	41.53	60.06
Not Working ^b	720	1,086,318	40.9	37.59	44.32	747	1,170,993	44.1	40.66	47.60
Household Income Group										
Less than RM 1,000	366	528,159	31.2	27.49	35.26	510	832,381	49.2	44.94	53.55
RM 1,000 - RM 1,999	613	1,050,690	26.0	22.92	29.31	990	1,971,839	48.8	44.98	52.58
RM 2,000 - RM 3,999	826	1,507,678	23.8	21.60	26.24	1,477	3,130,522	49.5	46.50	52.51
RM 4,000 - RM 5,999	450	879,642	26.6	23.42	30.07	774	1,586,114	48.0	44.30	51.69
RM 6,000 - RM 7,999	253	490,983	25.4	20.66	30.72	458	977,028	50.5	44.73	56.20
RM 8,000 - RM 9,999	108	170,296	19.0	13.73	25.79	212	504,715	56.4	48.11	64.41
RM 10,000 and above	186	421,208	26.5	20.40	33.62	350	775,961	48.8	41.87	55.77
Household Income Quintile										
Quintile 1	670	1,036,372	27.7	24.80	30.74	1,053	1,880,016	50.2	47.06	53.33
Quintile 2	561	1,009,347	25.2	22.08	28.52	957	2,043,602	50.9	46.94	54.94
Quintile 3	526	974,314	24.6	21.86	27.62	884	1,828,986	46.2	42.54	49.97
Quintile 4	498	946,136	25.9	22.92	29.18	857	1,768,252	48.5	45.03	51.89
Quintile 5	547	1,082,487	24.5	21.22	28.09	1,020	2,257,704	51.1	47.36	54.78
Household Income Category										
Bottom 40%	1,943	3,268,570	25.4	23.66	27.22	3,239	6,446,728	50.1	48.09	52.11
Middle 40%	663	1,318,831	25.8	22.97	28.89	1,123	2,417,623	47.3	44.00	50.68
Top 20%	196	461,255	25.5	20.57	31.20	409	914,210	50.6	44.86	56.28

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 7.7: Prevalence of Awareness of Healthy Plate Concept Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,462)

Sociodemographic Characteristics	Awareness of Healthy Plate Concept				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	2,346	4,345,817	20.4	18.93	22.03
State					
Johor	144	393,342	16.2	12.63	20.63
Kedah	109	252,902	19.7	15.69	24.39
Kelantan	105	206,536	18.4	15.13	22.27
Melaka	116	106,777	17.9	13.30	23.65
Negeri Sembilan	123	130,704	18.5	12.80	26.09
Pahang	116	211,930	20.8	16.55	25.81
Pulau Pinang	157	312,136	24.9	16.71	35.34
Perak	105	267,780	17.4	12.18	24.12
Perlis	162	50,346	31.5	25.21	38.54
Selangor	302	1,232,475	26.9	22.32	32.02
Terengganu	107	128,389	17.3	13.45	22.06
Sabah	103	333,867	13.0	9.79	17.01
Sarawak	153	407,870	22.1	18.36	26.35
WP Kuala Lumpur	97	258,295	19.9	14.74	26.33
WP Labuan	143	18,644	29.4	22.83	37.00
WP Putrajaya	304	33,824	59.1	53.71	64.26
Location					
Urban	1,588	3,564,319	21.5	19.64	23.43
Rural	758	781,498	16.8	14.74	18.98
Sex					
Male	710	1,456,859	13.3	11.80	15.02
Female	1,636	2,888,957	28.0	25.87	30.15
Age Group (Years)					
18-19	66	140,029	15.9	11.73	21.08
20-24	202	538,457	18.8	14.97	23.26
25-29	260	631,462	21.1	17.77	24.81
30-34	315	665,746	25.0	20.63	29.99
35-39	337	640,456	27.0	22.88	31.58
40-44	251	458,333	25.0	21.05	29.47
45-49	212	356,931	21.5	17.94	25.46
50-54	219	314,459	20.5	16.94	24.54
55-59	190	246,503	18.4	15.00	22.46
60-64	147	171,012	15.5	12.38	19.13
65-69	81	88,039	11.0	8.01	14.85
70-74	36	53,756	9.8	6.20	15.07
75 & above	30	40,635	6.2	3.75	10.02
Ethnicity					
Malay ^a	1,781	2,766,439	25.4	23.63	27.29
Chinese	192	773,230	16.9	13.79	20.66
Indian	138	268,304	21.6	17.44	26.50

Sociodemographic Characteristics	Awareness of Healthy Plate Concept				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sabah	99	204,745	14.9	11.34	19.40
Bumiputera Sarawak	90	195,592	20.5	15.63	26.42
Others	46	137,508	6.1	3.59	10.21
Marital Status					
Single	460	1,100,877	18.3	15.99	20.76
Married	1,721	3,030,548	22.1	20.26	24.02
Widow(er)/Divorcee	165	214,392	14.2	11.59	17.28
Education Level					
No Formal Education	36	43,390	4.0	2.43	6.48
Primary Education	260	388,963	9.5	7.67	11.67
Secondary Education	1,077	2,034,835	19.7	17.83	21.66
Tertiary Education	969	1,872,485	33.4	30.45	36.48
Occupation					
Government Employee	530	668,123	42.7	38.08	47.45
Private Employee	606	1,518,131	18.5	16.35	20.86
Self Employed	322	613,401	16.6	13.94	19.64
Unpaid Worker/ Homemaker	523	898,363	25.2	21.79	28.97
Retiree	104	154,370	19.4	15.00	24.82
Student	74	165,269	22.5	16.73	29.43
Not Working ^b	185	324,279	12.1	9.69	14.89
Household Income Group					
Less than RM 1,000	164	255,432	14.9	11.92	18.43
RM 1,000 - RM 1,999	329	613,864	15.0	12.62	17.79
RM 2,000 - RM 3,999	616	1,208,994	18.9	16.73	21.38
RM 4,000 - RM 5,999	415	767,353	23.0	19.55	26.92
RM 6,000 - RM 7,999	285	501,565	25.6	21.20	30.50
RM 8,000 - RM 9,999	151	278,638	31.0	23.91	39.17
RM 10,000 and above	286	474,591	29.5	23.57	36.24
Household Income Quintile					
Quintile 1	333	546,683	14.4	11.90	17.30
Quintile 2	341	672,000	16.6	14.18	19.24
Quintile 3	395	784,181	19.7	16.93	22.80
Quintile 4	455	842,780	22.9	19.65	26.53
Quintile 5	722	1,254,794	28.1	24.56	31.91
Household Income Category					
Bottom 40%	1,340	2,378,636	18.3	16.66	20.05
Middle 40%	632	1,203,125	23.3	20.43	26.52
Top 20%	274	518,676	28.4	23.20	34.24

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 7.8: Prevalence of Adequate Knowledge and Practice of Healthy Plate Concept Among Those with Awareness Among Adults Aged 18 Years and Above in Malaysia (n=2,346)

Knowledge & Practice	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
With Adequate Knowledge (3 scores)	1,719	3,511,615	80.8	78.01	83.32
Practise Healthy Plate Concept					
Yes, Everyday	329	602,846	14.0	11.73	16.58
Yes, Sometimes	1,156	2,160,914	50.1	46.95	53.30
No	843	1,547,326	35.9	33.02	38.87

Health Screening

Health Screening

Contributors to this section: Tamil Arasu Saminathan, Muhammad Fadhli Mohd Yusoff, Zakiah Mohd Said, Nor Saleha Ibrahim Tamin, Fatanah Ismail, Rajini Sooryanarayana, Shubash Shander Ganapathy, Hasimah Ismail, Norzawati Yoep, Rafidah Ali, Muhammad Faiz Mohd Hisham, Wan Shakira Rodzlan Hasani, Tania Gayle Robert Lourdes, Jane Ling Miaw Yn, Halizah Bt Mat Rifin, Nur Liana Ab Majid, Ahzairin Ahmad, Nor Hanizah Abu Hanit

Introduction

Health screening is widely advocated to be able to save lives or at least reduce morbidity. It is an effective way to detect a specific disease or condition early, even when there have been no symptoms or signs of the disease. Early detection of a condition means getting the right treatment at the right time, and this gives patients better control over their health. Furthermore, making people aware of their health status and risk factors is believed to enable them to exert greater control over their health. Since the 9th Malaysia Plan in 2006, our focus has changed from illness to wellness. Throughout the years, many policies and programs have been introduced and implemented to encourage regular health screening, the notable recent one being the PeKa B40 health screening initiative for the low-income B40 group aged 40-year-old and above. Other than cardiovascular disease risk screenings, Malaysia also has a national cancer screening program for breast cancer, cervical cancer, and colorectal cancer. Such notions should be highly encouraged, but the actual uptake of health screening practices in our nation is still vastly unknown. Accessing this can allow agencies involved to evaluate their current programs and make necessary improvements as required.

- **Breast Cancer**

Breast cancer is the most common cancer among women in Malaysia. Breast self-examination (BSE), clinical breast examination (CBE), and mammogram screening are several methods suggested for early detection of breast lumps. Mammogram screening does exhibit the reduction of breast cancer mortality by approximately 15% for women aged 39-49 years old [1]. The most significant barriers of mammography among Malaysian women in the general population were lack of time, lack of knowledge, unaware of the facilities to run the test, and the fear of knowing the test result [2], which is similar to a finding from a meta-analysis [3].

- **Cervical Cancer**

Cervical cancer is the most common cancer among women worldwide. In Malaysia, cervical cancer was the third most common cancer in women, with an incidence rate of 6.3 per 100,000 [4]. Pap smear screening program was introduced in Malaysia by the Ministry of Health in 1969. Women aged between 30 to 65-year-old and who are, or have been sexually active are recommended to undergo pap smear screening.

- **Colorectal cancer**

According to the Malaysia Cancer Registry Report 2012 - 2016, colorectal cancer (CRC) was the most prevalent cancer among males (14.8%) and second common among females (11.1%) [4]. Evidence exists that reductions in CRC mortality can be achieved through the detection and treatment of early-stage CRCs. In Malaysia, the CRC screening program was implemented using the WHO stepwise approach in 2014. The target group is asymptomatic males and females aged 50 to 75 years old. The screening method is using the immunological Faecal Occult Blood Test (iFOBT), followed by colonoscopy for those who were found to be positive for iFOBT. Colonoscopy is the gold standard for colorectal cancer diagnosis. The objective of the colorectal screening programme in Malaysia is to detect the pre-cancerous lesion and to detect cancer at the earliest stage possible.

Objectives

General objective

To determine the prevalence of medical check-up / health screening uptake in Malaysia.

Specific objectives

1. To determine the prevalence of health screening among adults aged ≥ 18 years old in Malaysia.
2. To determine the prevalence of breast self-examination practice among female adults aged ≥ 18 years old in Malaysia.
3. To determine the prevalence of mammogram screening among female adults aged ≥ 40 years old in Malaysia.
4. To determine the prevalence of pap smear practice among female adults aged ≥ 20 years old in Malaysia.
5. To determine the awareness level on availability of the Human Papilloma Virus (HPV) self-sampling test as a cervical cancer screening tool among female adults aged ≥ 20 years old in Malaysia.
6. To determine the interest level to use the Human Papilloma Virus (HPV) self-sampling test as a cervical cancer screening tool among female adults aged ≥ 20 years old in Malaysia.
7. To determine the prevalence of faecal occult blood tests among adults aged ≥ 50 years old in Malaysia.

Methods

The target population consisted of respondents aged 18 years and above in Malaysia.

Findings

8.1 Medical Check-Up / Health Screenings

In total, 10,472 adults responded to this submodule. The prevalence of health screening/ medical check-up within the past 12 months was 49.0% (95% CI: 47.03, 50.94). The prevalence was higher among older age groups, with 77.3% (95% CI: 74.36, 79.95) among adults aged 60 years and above. Females also reported having a higher prevalence compared to males. Widower(er) / divorcee had higher uptake of medical check-up, as well as among retirees.

8.2 Breast Cancer

Breast Self-Examination

Overall, there were 5,687 females, aged 18 years and above, who responded to this submodule. The prevalence of breast self-examination practice was 49.0% (95% CI: 46.00, 51.00). Those who are married had a higher prevalence of practicing breast self-examination [56.2% (95% CI: 53.56, 58.89)]. Government employees showed a higher prevalence [71.5% (95% CI: 64.88, 77.33)] compared to other occupation categories. Respondents who had no formal education showed the lowest prevalence [25.7% (95% CI: 21.12, 30.97)] compared to other education levels.

Mammogram

There was a total of 3,411 females aged 40 years and above who responded to the survey. The prevalence of women who had done mammogram screening in the past three years was 21.0% (95% CI: 18.00, 23.00). There was a higher prevalence among those between the age of 55 to 59 years-old, Indian ethnicity, married, possessed tertiary educational level, and private employees, compared to the other categories in their respective group. Among all states, Kelantan showed the lowest prevalence [5.3% (95% CI: 2.96, 9.43)]. The prevalence of women who had ever done a mammogram screening was 25.0% (95% CI: 22.61, 27.46). Most of the mammogram screening was done in a public health facility [63.1% (95% CI: 57.08, 68.80)].

8.3 Cervical Cancer

Pap Smear Examination

The total number of respondents was 5,509. The prevalence of pap smear practice in the last three years among women age 20 years and above was 36.6% (95% CI: 34.53, 38.77). The prevalence of ever done a pap smear examination among eligible women was 26% in NHMS II (1996) and 43.7% in NHMS III (2006) [5]. Only 12.8% of eligible women had a pap smear examination done in the past 12 months, according to NHMS 2011 survey.

Perlis recorded the highest prevalence of pap smear examination with 51.3% (95% CI: 43.48, 59.00). The prevalence was highest among women in the age group of 40 to 44 years old, Bumiputera Sarawak, married women, those with at least secondary education, government employee, and in the T20 household income group, compared to the other categories in their respective group.

Awareness of Self-Sampling for Cervical Cancer Screening (HPV Screening)

Awareness of the availability of the Human Papilloma Virus (HPV) self-sampling test as a cervical cancer screening tool in Malaysia was 24.7% (95% CI: 22.58, 26.98). Women in WP Kuala Lumpur had the highest awareness level, with 44.7% (95% CI: 34.09, 55.86). The awareness was highest among women in the age group of 40 to 44-year-old, Bumiputera Sabah ethnicity, married women, those with at least tertiary education, government employee, and in the T20 household income group, compared to the other categories in their respective group.

Interest to Use Self-Sampling Screening for Cervical Cancer (HPV Screening)

Interest to use the Human Papilloma Virus (HPV) self-sampling test as a cervical cancer screening tool was among 41.7% (95% CI: 39.24, 44.13) of women aged 20 years old and above. Women in WP Kuala Lumpur had the most interest level, with 55.4% (95% CI: 43.32, 66.80). The interest was highest among women in the age group of 40 to 44-year-old, Bumiputera Sabah ethnicity, married women, those with at least tertiary education, government employee, and in T20 household income group, compared to the other variables in their respective categories.

8.4 Faecal Occult Blood Test for Colorectal Cancer Screening

In total, 4,351 respondents aged 50 years and above responded to this submodule. The prevalence of colorectal cancer screening using faecal occult blood tests (FOBT) in the last 12 months was 10.8% (95% CI: 9.47, 12.39). The prevalence was highest among adults in the age group of 65 to 69-year-old and retirees.

Conclusion

Though many are aware of health screening or periodic medical check-ups, the uptake in Malaysia is relatively low. Elder age groups utilize the available health screening programs in Malaysia more, compared to the younger eligible age groups. Some respondents imbibe certain healthy lifestyle, thinking that it can be substituted for health screening or routine medical check-up. Efforts are needed to make sure that health screening or periodic medical check-up is continuously encouraged especially among younger adults.

Recommendations

Health screening programmes, such as health screening roadshows or mobile health screenings, are essential in ensuring that the community is being screened enough. Local champions at the community level are crucial to make such programs a success. Many countries have adopted organized screening programs that have been remarkably successful in reducing the incidence and mortality of diseases, especially cancers. Sit-and-screen is bygone; now is the era of search-and-screen.

Colorectal cancer

The prevalence of colorectal cancer screening using the faecal occult blood test is still low. The finding from this survey can be used as a baseline towards strengthening the current program.

Breast cancer

The way forward is to improve access and quality of mammography among women in rural areas. At the same time, women should be empowered to perform breast-self-examination and to seek advice once they find any abnormalities. Coordinated activities with the related agencies are vital in ensuring functional data integration.

Cervical cancer

Not all women have the level of acceptable awareness regarding cervical cancer prevention and early detection, which could influence the rate of screening uptake. Lack of screening registry results in difficulty in tracking the women who went for screening and their subsequent follow-ups. Therefore, implementing the Transformation of Cervical Cancer Prevention Programme that integrates the HPV test as a primary screening tool is the solution to this dilemma. It is also a strategy towards the World Health Organization's global cervical cancer elimination goal.

References

1. Nelson HD, Tyne K, Naik A, Bougatsos C, Chan BK, Humphrey L, et al. Screening for breast cancer: an update for the US Preventive Services Task Force. *Ann Intern Med* 2009; 151(10): 727-37.
2. Al-Naggar RA, Bobryshev YV. Practice and barriers of mammography among Malaysian women in the general population. *Asian Pac J Cancer Prev*. 2012;13(8):3595-600.
3. Saber Azami-Aghdash, Morteza Ghojzadeh, Sepideh Gareh Sheyklo et al. Breast Cancer Screening Barriers from the Womans Perspective: a Meta-synthesis. *Asian Pac J Cancer Prev*, 16 (8), 3463-3471. DOI: <http://dx.doi.org/10.7314/APJCP.2015.16.8>.
4. Azizah AM., Hashimah B., Nirmal K., et al. Malaysia National Cancer Registry Report 2012-2016. National Cancer Institute, Ministry of Health Malaysia.
5. National Health and Morbidity Survey III (Women Health).2006. Institut Kesihatan Umum, Ministry of Health.

Table 8.1: Prevalence of Undergoing Any Health Screening / Medical Check Up in The Past 12 Months Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,472)

Sociodemographic Characteristics	Health Screening / Medical Check Up				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	5,966	10,427,479	49.0	47.03	50.94
State					
Johor	460	1,148,345	47.3	41.39	53.23
Kedah	359	747,878	58.2	51.03	65.04
Kelantan	267	432,390	38.5	35.15	41.98
Melaka	381	321,517	53.9	47.08	60.55
Negeri Sembilan	344	374,996	53.2	44.01	62.17
Pahang	359	526,489	51.7	45.27	58.04
Pulau Pinang	345	630,141	50.2	40.37	60.05
Perak	320	755,654	48.9	42.71	55.06
Perlis	356	90,055	56.2	49.26	62.86
Selangor	632	2,179,173	47.6	42.26	52.89
Terengganu	364	380,779	51.4	45.52	57.30
Sabah	490	1,298,635	50.5	44.11	56.84
Sarawak	375	829,989	44.8	39.04	50.66
WP Kuala Lumpur	287	639,507	49.3	42.92	55.60
WP Labuan	337	39,698	62.7	57.51	67.53
WP Putrajaya	290	32,233	56.3	50.36	62.09
Location					
Urban	3,626	8,141,361	49.0	46.60	51.38
Rural	2,340	2,286,118	49.0	46.28	51.68
Sex					
Male	2,592	5,043,230	46.1	43.44	48.75
Female	3,374	5,384,249	52.1	49.89	54.20
Age Group (Years)					
18-19	76	141,888	15.8	11.52	21.17
20-24	263	786,681	27.4	23.06	32.20
25-29	387	1,109,172	37.0	32.71	41.55
30-34	479	1,146,533	43.1	37.85	48.49
35-39	527	1,121,832	47.3	42.54	52.14
40-44	479	911,157	49.7	45.29	54.16
45-49	546	911,170	54.8	49.96	59.54
50-54	619	960,708	62.6	58.00	66.94
55-59	676	928,457	69.4	64.98	73.44
60-64	633	798,713	72.2	67.20	76.71
65-69	503	628,666	78.2	73.17	82.50
70-74	365	446,737	81.2	75.58	85.72
75 & above	413	535,765	81.4	76.62	85.43
Ethnicity					
Malay ^a	3,790	5,316,594	48.8	46.61	51.03
Chinese	806	2,260,992	49.5	44.57	54.34
Indian	455	775,940	62.5	56.29	68.33

Sociodemographic Characteristics	Health Screening / Medical Check Up				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sabah	382	721,873	52.6	45.18	59.94
Bumiputera Sarawak	228	424,741	44.3	37.29	51.55
Others	305	927,339	41.2	33.81	48.96
Marital Status					
Single	737	1,892,768	31.3	28.13	34.65
Married	4,406	7,488,584	54.6	52.04	57.05
Widow(er)/Divorcee	823	1,046,127	69.1	64.62	73.32
Education Level					
No Formal Education	423	605,003	55.6	47.44	63.47
Primary Education	1,528	2,226,500	54.3	50.25	58.27
Secondary Education	2,655	4,807,537	46.4	43.93	48.89
Tertiary Education	1,334	2,736,529	48.8	45.20	52.38
Occupation					
Government Employee	687	987,832	63.1	57.43	68.48
Private Employee	1,438	3,539,675	43.1	39.83	46.48
Self Employed	944	1,554,259	42.0	37.88	46.27
Unpaid Worker/ Homemaker	1,276	1,947,359	54.7	50.92	58.33
Retiree	408	615,855	77.4	71.61	82.33
Student	81	216,050	28.8	22.65	35.83
Not Working ^b	1,126	1,557,177	57.8	53.88	61.62
Household Income Group					
Less than RM 1,000	670	1,022,683	59.6	54.76	64.26
RM 1,000 - RM 1,999	1,127	1,851,345	45.3	41.11	49.51
RM 2,000 - RM 3,999	1,684	2,918,697	45.6	42.36	48.90
RM 4,000 - RM 5,999	864	1,631,343	49.0	45.09	52.83
RM 6,000 - RM 7,999	491	909,947	46.4	40.93	51.95
RM 8,000 - RM 9,999	239	468,925	52.2	44.33	60.00
RM 10,000 and above	441	839,774	52.2	42.71	61.50
Household Income Quintile					
Quintile 1	1,270	1,952,220	51.4	47.41	55.27
Quintile 2	1,058	1,786,734	44.0	39.77	48.25
Quintile 3	1,054	1,873,534	46.9	43.18	50.72
Quintile 4	963	1,811,580	49.2	45.51	52.97
Quintile 5	1,171	2,218,646	49.7	45.19	54.11
Household Income Category					
Bottom 40%	3,757	6,233,168	47.9	45.50	50.26
Middle 40%	1,271	2,446,179	47.4	43.94	50.90
Top 20%	488	963,367	52.8	45.37	60.01

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 8.2: Prevalence of Breast Self-Examination in The Past 12 Months Among Females Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=5,687)

Sociodemographic Characteristics	Breast self-examination				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	2,971	5,028,665	49.0	46.00	51.00
State					
Johor	206	474,483	41.0	32.80	49.64
Kedah	130	279,184	44.4	37.38	51.61
Kelantan	203	344,383	60.2	54.50	65.65
Melaka	222	192,128	61.5	49.27	72.39
Negeri Sembilan	182	203,749	58.4	45.55	70.19
Pahang	122	190,456	39.2	33.74	45.02
Pulau Pinang	151	241,085	39.3	30.76	48.48
Perak	188	406,898	53.7	45.24	61.95
Perlis	171	49,097	59.7	51.95	66.94
Selangor	318	1,090,027	49.9	43.62	56.20
Terengganu	163	165,819	45.2	37.91	52.60
Sabah	219	614,783	50.7	44.00	57.31
Sarawak	196	420,505	46.3	40.48	52.12
WP Kuala Lumpur	128	313,155	48.5	42.37	54.61
WP Labuan	175	21,106	66.2	58.42	73.16
WP Putrajaya	197	21,807	68.4	60.90	74.97
Location					
Urban	1,830	3,927,760	48.5	45.80	51.25
Rural	1,141	1,100,905	49.0	45.56	52.35
Sex					
Female	2,971	5,028,665	48.6	46.36	50.87
Age Group (Years)					
18-19	43	84,999	21.1	14.49	29.70
20-24	166	431,713	31.4	24.96	38.61
25-29	264	726,260	51.5	44.91	58.01
30-34	353	718,016	57.5	50.31	64.42
35-39	358	704,656	61.3	55.36	66.91
40-44	314	501,929	57.9	51.53	63.99
45-49	327	502,733	60.0	54.41	65.24
50-54	310	420,639	54.2	48.13	60.07
55-59	326	371,289	55.8	49.63	61.75
60-64	208	230,677	41.4	35.31	47.83
65-69	152	162,796	39.6	31.75	48.07
70-74	95	118,543	40.6	32.14	49.72
75 & above	55	54,415	15.5	10.98	21.55
Ethnicity					
Malay ^a	2,047	2,925,641	53.5	50.96	56.06
Chinese	294	898,717	40.5	34.31	47.02
Indian	181	285,532	44.1	38.12	50.36

Sociodemographic Characteristics	Breast self-examination				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sabah	192	370,923	53.7	46.07	61.24
Bumiputera Sarawak	133	231,956	49.0	41.20	56.77
Others	124	315,897	37.2	27.92	47.64
Marital Status					
Single	336	730,262	31.2	27.29	35.46
Married	2,247	3,830,629	56.2	53.56	58.89
Widow(er)/Divorcee	388	467,774	39.1	34.52	43.96
Education Level					
No Formal Education	140	174,325	25.7	21.12	30.97
Primary Education	581	735,935	39.6	35.44	43.92
Secondary Education	1,403	2,473,419	50.7	47.62	53.84
Tertiary Education	840	1,631,865	56.4	52.11	60.67
Occupation					
Government Employee	401	513,821	71.5	64.88	77.33
Private Employee	583	1,395,279	47.4	42.93	51.85
Self Employed	401	614,559	55.0	49.69	60.19
Unpaid Worker/ Homemaker	1,110	1,785,492	52.6	48.83	56.27
Retiree	81	105,158	48.9	38.53	59.29
Student	48	99,907	23.4	16.29	32.42
Not Working ^b	346	513,917	33.8	28.99	38.90
Household Income Group					
Less than RM 1,000	308	459,340	44.5	38.66	50.49
RM 1,000 - RM 1,999	548	913,005	48.3	43.68	52.84
RM 2,000 - RM 3,999	821	1,369,127	47.2	43.40	51.02
RM 4,000 - RM 5,999	463	784,614	51.1	45.71	56.46
RM 6,000 - RM 7,999	272	486,659	53.0	45.87	59.94
RM 8,000 - RM 9,999	122	231,646	52.4	40.74	63.74
RM 10,000 and above	217	367,599	51.9	43.41	60.22
Household Income Quintile					
Quintile 1	599	938,098	45.6	41.40	49.85
Quintile 2	520	821,022	46.8	42.09	51.50
Quintile 3	502	884,651	47.6	43.05	52.20
Quintile 4	519	882,316	52.2	47.07	57.31
Quintile 5	611	1,085,904	52.5	47.17	57.69
Household Income Category					
Bottom 40%	1,846	2,926,001	47.1	44.43	49.74
Middle 40%	670	1,248,556	51.6	46.65	56.49
Top 20%	235	437,433	55.0	48.22	61.57

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 8.3: Prevalence of Mammogram Examination (In The Past 3 Years and Ever Done) Among Females Aged 40 Years and Above in Malaysia by Socio-Demographic Characteristics (n=3,411)

Sociodemographic Characteristics	Mammogram Examination in Past 3 years					Ever Done Mammogram Examination				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	731	979,942	21.0	18.00	23.00	862	1,187,374	25.0	22.61	27.46
State										
Johor	51	93,463	16.5	11.47	23.15	71	131,302	23.2	17.24	30.41
Kedah	51	94,027	28.8	17.79	43.04	56	102,318	31.3	20.40	44.83
Kelantan	12	14,087	5.3	2.96	9.43	16	18,623	7.0	4.60	10.64
Melaka	49	31,431	21.4	15.37	28.89	58	38,888	26.4	20.49	33.36
Negeri Sembilan	65	51,086	28.4	17.78	42.00	75	70,026	38.9	27.59	51.47
Pahang	20	22,174	10.0	6.34	15.31	21	23,702	10.6	7.08	15.72
Pulau Pinang	56	90,288	28.4	18.47	40.92	73	121,835	38.3	25.81	52.52
Perak	40	60,809	14.6	8.50	23.77	46	71,296	17.1	10.09	27.37
Perlis	70	13,660	33.6	23.27	45.71	76	15,180	37.3	27.08	48.80
Selangor	78	192,553	20.6	14.86	27.90	91	242,992	26.0	20.27	32.75
Terengganu	34	26,394	16.2	10.75	23.71	42	30,838	18.9	12.95	26.85
Sabah	40	84,176	20.6	14.83	27.86	43	89,306	21.9	15.45	29.96
Sarawak	58	90,373	20.6	15.70	26.58	69	107,922	24.6	18.54	31.90
WP Kuala Lumpur	61	110,061	35.8	26.71	45.99	65	116,434	37.9	28.70	47.97
WP Labuan	25	2,859	24.5*	12.78	41.78	33	3,585	30.7	18.86	45.78
WP Putrajaya	21	2,503	23.8	15.39	35.00	27	3,128	29.8	21.30	39.96
Location										
Urban	437	795,806	21.4	18.73	24.43	521	971,056	26.2	23.28	29.28
Rural	294	184,136	17.6	15.07	20.45	341	216,318	20.7	17.92	23.72
Age Group (Years)										
40-44	71	116,646	13.5	9.09	19.47	83	143,895	16.6	11.57	23.23
45-49	118	173,387	20.7	16.68	25.33	143	228,000	27.2	22.77	32.11
50-54	133	212,290	27.3	22.07	33.32	154	235,849	30.4	24.75	36.64
55-59	158	209,895	31.5	25.41	38.37	180	246,082	37.0	30.67	43.74
60-64	98	105,916	19.0	14.75	24.18	119	129,644	23.3	18.53	28.84
65-69	79	80,530	19.6	13.87	26.97	97	107,250	26.1	19.38	34.17
70-74	46	54,433	18.7	12.58	26.77	53	64,722	22.2	15.56	30.60
75 & above	28	26,844	7.7	4.43	12.95	33	31,932	9.1	5.56	14.61
Ethnicity										
Malay*	441	452,075	18.4	15.85	21.14	77	93,843	3.8	2.76	5.24
Chinese	129	312,895	24.2	18.82	30.46	35	91,485	7.1	4.40	11.15
Indian	76	104,429	32.0	23.57	41.73	4	4,500	1.4*	0.43	4.30
Bumiputera Sabah	33	48,236	18.3	11.89	27.10	6	4,449	1.7*	0.45	6.14
Bumiputera Sarawak	35	44,319	19.5	13.90	26.74	6	9,905	4.4*	1.82	10.13
Others	17	17,988	9.9	5.73	16.57	3	3,250	1.8*	0.46	6.63
Marital Status										
Single	21	43,382	21.5	12.75	33.80	23	48,738	24.1	14.71	36.89
Married	547	766,496	21.9	19.25	24.68	645	941,653	26.8	23.96	29.92
Widow(er)/Divorcee	163	170,064	16.3	12.65	20.63	194	196,984	18.8	15.05	23.27

Table 8.3: Prevalence of Mammogram Examination (In The Past 3 Years and Ever Done) Among Females Aged 40 Years and Above in Malaysia by Socio-Demographic Characteristics (n=3,411) (cont'd)

Sociodemographic Characteristics	Mammogram Examination in Past 3 years					Ever Done Mammogram Examination				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Education Level										
No Formal Education	58	55,854	10.5	7.51	14.41	68	68,065	12.8	9.19	17.44
Primary Education	203	223,030	16.7	13.81	19.96	241	266,538	19.9	16.89	23.32
Secondary Education	361	525,006	23.4	20.16	26.87	421	642,753	28.6	25.38	32.01
Tertiary Education	108	173,102	27.9	22.35	34.20	129	206,151	33.2	27.17	39.87
Occupation										
Government Employee	49	63,148	23.3	15.94	32.70	58	77,781	28.7	20.89	37.99
Private Employee	121	227,509	27.3	21.67	33.71	137	269,089	32.3	26.01	39.23
Self Employed	78	110,032	17.9	13.31	23.70	97	139,351	22.7	17.72	28.60
Unpaid Worker/ Homemaker	308	349,350	20.0	16.98	23.40	358	418,464	24.0	20.72	27.52
Retiree	39	53,241	24.7	15.90	36.36	49	75,459	35.1	24.91	46.77
Not Working ^b	135	176,595	16.4	12.98	20.58	162	207,164	19.3	15.63	23.54
Household Income Group										
Less than RM 1,000	89	114,205	16.8	12.29	22.50	100	125,442	18.4	13.75	24.26
RM 1,000 - RM 1,999	125	131,069	15.5	12.22	19.33	146	160,842	19.0	15.41	23.09
RM 2,000 - RM 3,999	206	248,214	20.2	16.57	24.27	240	309,877	25.2	21.18	29.59
RM 4,000 - RM 5,999	98	131,881	23.1	17.65	29.63	119	160,672	28.1	22.26	34.89
RM 6,000 - RM 7,999	51	94,271	24.6	17.19	33.79	65	120,807	31.5	23.41	40.82
RM 8,000 - RM 9,999	22	44,615	24.4*	12.59	42.09	28	53,898	29.5	16.80	46.51
RM 10,000 and above	64	100,840	28.9	21.24	37.99	71	114,330	32.8	24.84	41.81
Household Income Quintile										
Quintile 1	157	189,415	16.2	12.93	20.10	181	217,023	18.6	15.10	22.60
Quintile 2	131	151,198	19.5	15.40	24.32	150	180,475	23.2	18.74	28.45
Quintile 3	119	140,616	18.5	13.80	24.39	139	185,655	24.4	19.01	30.83
Quintile 4	111	144,140	23.0	17.77	29.24	135	173,681	27.7	22.10	34.14
Quintile 5	137	239,726	26.2	20.79	32.42	164	289,036	31.6	25.97	37.77
Household Income Category										
Bottom 40%	458	547,978	18.9	16.36	21.63	531	665,679	22.9	20.17	25.89
Middle 40%	138	237,844	24.9	19.71	30.85	170	284,008	29.7	24.33	35.68
Top 20%	59	79,273	20.6	15.56	26.84	68	96,182	25.0	19.30	31.81
Family History of Breast Cancer										
	76	121,531	12.4	9.28	16.39	94	156,128	13.1	10.16	16.85
Mammogram Examination facility										
Public Health Facility	534	617,663	63.1	57.08	68.80	-	-	-	-	-
Private Health Facility	192	356,581	36.4	30.82	42.47	-	-	-	-	-

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 8.4: Prevalence of Pap Smear Examination in The Last 3 Years and, Awareness and Interest to Use Self-Sampling Screening (HPV Screening) Among Female Aged 20 Years and Above in Malaysia by Socio-Demographic Characteristics (n=5,509)

Sociodemographic Characteristics	Pap Smear Examination in The Last 3 Years					Awareness on Self-Sampling Screening (HPV Screening) for Cervical Cancer				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	2,301	3,641,193	36.6	34.53	38.77	1,476	2,456,881	24.7	22.58	26.98
State										
Johor	169	399,873	35.4	28.16	43.39	103	227,882	20.2	13.47	29.09
Kedah	123	231,736	37.6	29.63	46.38	40	92,314	15.0	9.54	22.77
Kelantan	115	184,143	34.7	30.17	39.49	118	200,146	37.7	32.05	43.70
Melaka	170	133,135	44.8	35.82	54.11	126	108,061	36.4	21.69	54.08
Negeri Sembilan	134	128,876	39.5	30.70	48.98	89	95,292	29.2	20.39	39.88
Pahang	100	129,902	28.0	22.17	34.62	109	154,496	33.3	26.72	40.54
Pulau Pinang	121	207,332	35.6	25.66	46.93	38	68,040	11.7*	5.08	24.63
Perak	155	315,303	43.7	37.65	50.01	20	59,714	8.3*	3.52	18.25
Perlis	158	40,555	51.3	43.48	59.00	105	25,402	32.1	23.02	42.80
Selangor	217	675,195	31.7	26.08	37.88	137	474,592	22.3	18.21	26.94
Terengganu	156	148,238	42.5	37.11	47.97	87	80,664	23.1	15.83	32.43
Sabah	144	382,100	32.9	27.81	38.39	127	330,519	28.4	21.65	36.38
Sarawak	203	400,006	46.2	40.64	51.93	117	244,034	28.2	22.00	35.37
WP Kuala Lumpur	112	239,817	38.3	30.60	46.58	116	280,236	44.7	34.09	55.86
WP Labuan	122	14,292	48.0	41.22	54.84	52	6,191	20.8	12.98	31.59
WP Putrajaya	102	10,691	34.4	27.44	41.98	92	9,299	29.9	21.05	40.50
Location										
Urban	1,334	2,781,933	35.7	33.20	38.32	868	1,863,745	23.9	21.43	26.63
Rural	967	859,261	39.9	36.82	43.07	608	593,136	27.5	23.96	31.44
Age Group (Years)										
20-24	33	97,659	7.1	3.91	12.56	68	186,111	13.5	9.10	19.65
25-29	138	373,822	26.5	21.60	32.05	144	435,966	30.9	24.91	37.62
30-34	243	483,305	38.7	31.97	45.93	172	319,291	25.6	20.38	31.58
35-39	286	556,142	48.4	42.68	54.11	172	330,708	28.8	23.64	34.51
40-44	293	464,719	53.6	47.01	60.06	164	277,871	32.0	26.30	38.39
45-49	282	422,747	50.4	44.68	56.13	164	226,616	27.0	22.33	32.30
50-54	276	393,906	50.7	44.66	56.75	157	216,267	27.8	22.68	33.68
55-59	298	352,138	52.9	46.37	59.33	153	177,521	26.7	21.87	32.08
60-64	196	215,188	38.7	32.47	45.22	113	120,403	21.6	16.90	27.24
65-69	135	148,436	36.1	27.87	45.30	88	91,435	22.3	16.82	28.83
70-74	65	75,012	25.7	19.02	33.78	43	41,413	14.2	8.95	21.77
75 & above	56	58,120	16.6	11.57	23.24	38	33,278	9.5	6.33	14.04
Ethnicity										
Malay ^a	1,514	1,974,578	37.8	35.37	40.24	984	1,308,190	25.0	22.51	27.75
Chinese	274	809,049	37.8	31.80	44.19	187	537,134	25.1	20.23	30.68
Indian	169	243,909	38.6	32.61	45.02	97	133,092	21.1	15.42	28.13
Bumiputera Sabah	134	225,365	34.5	28.88	40.67	87	201,333	30.9	23.28	39.62
Bumiputera Sarawak	127	205,745	45.9	39.66	52.30	64	116,524	26.0	17.62	36.60
Others	83	182,547	21.7	15.26	29.86	57	160,608	19.1	11.85	29.26

Sociodemographic Characteristics	Interest to Use Self-Sampling Screening (HPV Screening) for Cervical Cancer				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	2,296	4,142,049	41.7	39.24	44.13
State					
Johor	141	334,363	29.6	21.93	38.64
Kedah	74	178,406	29.0	22.22	36.81
Kelantan	167	280,815	52.9	47.82	57.91
Melaka	170	136,425	45.9	29.53	63.20
Negeri Sembilan	120	120,972	37.1	26.44	49.08
Pahang	92	136,626	29.4	23.16	36.57
Pulau Pinang	73	130,736	22.4	13.96	34.04
Perak	94	223,496	31.0	22.48	41.04
Perlis	161	42,773	54.1	44.59	63.27
Selangor	278	1,014,749	47.6	41.32	54.00
Terengganu	149	162,571	46.6	39.37	53.88
Sabah	241	636,896	54.8	48.60	60.87
Sarawak	172	370,114	42.8	37.43	48.31
WP Kuala Lumpur	143	346,879	55.4	43.32	66.80
WP Labuan	99	13,463	45.2	33.45	57.54
WP Putrajaya	122	12,766	41.0	33.58	48.88
Location					
Urban	1,417	3,242,318	41.6	38.69	44.64
Rural	879	899,731	41.8	38.40	45.24
Age Group (Years)					
20-24	163	461,464	33.6	27.41	40.31
25-29	219	654,933	46.4	40.34	52.62
30-34	294	642,778	51.5	44.40	58.53
35-39	291	570,855	49.7	43.73	55.59
40-44	263	461,370	53.2	46.52	59.78
45-49	264	396,650	47.3	41.32	53.35
50-54	227	329,774	42.5	37.08	48.03
55-59	234	274,331	41.2	35.06	47.65
60-64	145	163,300	29.3	24.10	35.18
65-69	100	93,664	22.8	17.77	28.76
70-74	55	56,097	19.2	13.06	27.39
75 & above	41	36,832	10.5	7.01	15.50
Ethnicity					
Malay ^a	1,500	2,249,018	43.0	40.17	45.92
Chinese	246	780,286	36.5	29.87	43.58
Indian	147	251,672	39.9	33.24	46.87
Bumiputera Sabah	177	368,033	56.4	50.52	62.11
Bumiputera Sarawak	104	182,466	40.7	34.68	47.05
Others	122	310,575	36.9	26.96	48.08

Table 8.4: Prevalence of Pap Smear Examination in The Last 3 Years and, Awareness and Interest to Use Self-Sampling Screening (HPV Screening) Among Female Aged 20 Years and Above in Malaysia by Socio-Demographic Characteristics (n=5,509) (cont'd)

Sociodemographic Characteristics	Pap Smear Examination in The Last 3 Years					Awareness on Self-Sampling Screening (HPV Screening) for Cervical Cancer				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Marital Status										
Single	28	66,989	3.4	2.16	5.39	123	292,092	14.9	11.49	19.16
Married	1,932	3,183,539	46.9	44.01	49.73	1,145	1,929,595	28.4	25.77	31.20
Widow(er)/Divorcee	341	390,665	32.8	28.56	37.39	208	235,194	19.8	16.63	23.32
Education Level										
No Formal Education	116	129,065	19.2	15.50	23.62	84	84,036	12.5	9.55	16.26
Primary Education	529	689,988	37.2	33.44	41.15	283	366,519	19.8	16.83	23.08
Secondary Education	1,162	1,924,824	42.4	39.27	45.61	687	1,158,864	25.5	22.83	28.43
Tertiary Education	490	890,583	31.4	27.79	35.27	420	845,604	29.8	25.88	34.09
Occupation										
Government Employee	260	362,524	50.5	43.41	57.51	201	285,395	39.7	32.87	47.03
Private Employee	397	831,008	29.1	25.43	32.95	287	674,830	23.6	20.17	27.39
Self Employed	312	466,559	42.6	37.36	48.02	185	297,560	27.2	22.55	32.35
Unpaid Worker/ Homemaker	983	1,516,617	45.0	41.25	48.74	588	906,681	26.9	23.69	30.34
Retiree	53	65,983	30.7	21.36	41.85	37	58,879	27.4	18.13	39.04
Student	1	2,130	1.0*	0.14	6.93	4	7,459	3.5*	1.14	10.36
Not Working ^b	294	395,841	27.0	23.40	30.93	173	225,547	15.4	11.93	19.63
Household Income Group										
Less than RM 1,000	241	325,435	32.3	28.05	36.83	147	190,295	18.9	15.54	22.74
RM 1,000 - RM 1,999	460	686,571	37.8	33.84	41.94	292	476,415	26.2	22.21	30.70
RM 2,000 - RM 3,999	656	989,338	36.0	32.52	39.65	386	638,072	23.2	19.91	26.91
RM 4,000 - RM 5,999	318	523,297	35.1	30.73	39.78	230	409,752	27.5	22.27	33.43
RM 6,000 - RM 7,999	190	328,895	37.3	31.00	43.96	143	241,369	27.3	21.59	33.96
RM 8,000 - RM 9,999	79	154,464	36.4	27.30	46.64	50	99,822	23.5	16.33	32.69
RM 10,000 and above	167	293,709	42.3	34.59	50.36	108	194,828	28.0	20.42	37.19
Household Income Quintile										
Quintile 1	484	693,054	34.6	31.07	38.40	320	461,062	23.0	19.80	26.65
Quintile 2	437	634,989	38.1	33.76	42.53	259	397,616	23.8	20.28	27.77
Quintile 3	399	616,326	35.0	30.34	39.94	230	417,815	23.7	19.42	28.62
Quintile 4	355	580,272	35.6	31.45	39.97	246	438,041	26.9	21.87	32.55
Quintile 5	436	777,068	38.8	33.91	43.97	301	536,020	26.8	22.19	31.92
Household Income Category										
Bottom 40%	1,461	2,154,812	36.0	33.66	38.45	925	1,460,864	24.4	21.95	27.07
Middle 40%	473	843,773	36.5	32.53	40.64	316	591,061	25.6	21.33	30.31
Top 20%	177	303,124	39.4	32.90	46.38	115	198,628	25.8	19.48	33.42
Pap Smear Results										
Informed	1,927	3,074,515	84.6	81.82	87.01	-	-	-	-	-
Not Informed	348	543,258	14.9	12.54	17.73	-	-	-	-	-

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli
 b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Interest to Use Self-Sampling Screening (HPV Screening) for Cervical Cancer				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Marital Status					
Single	230	594,102	30.3	25.60	35.54
Married	1,772	3,181,181	46.8	43.94	49.74
Widow(er)/Divorcee	294	366,766	30.8	26.94	34.98
Education Level					
No Formal Education	118	171,006	25.5	17.72	35.20
Primary Education	435	602,263	32.5	28.71	36.49
Secondary Education	1,075	1,933,144	42.6	39.47	45.76
Tertiary Education	663	1,424,484	50.2	45.68	54.79
Occupation					
Government Employee	280	413,870	57.6	51.09	63.90
Private Employee	506	1,261,025	44.1	39.40	48.86
Self Employed	318	512,011	46.8	41.27	52.32
Unpaid Worker/ Homemaker	876	1,459,618	43.3	39.46	47.18
Retiree	43	71,293	33.1	24.37	43.23
Student	20	46,339	21.9	12.86	34.70
Not Working ^b	252	377,362	25.7	21.41	30.61
Household Income Group					
Less than RM 1,000	230	321,799	31.9	27.32	36.91
RM 1,000 - RM 1,999	447	753,893	41.5	37.13	46.04
RM 2,000 - RM 3,999	639	1,108,345	40.3	36.50	44.30
RM 4,000 - RM 5,999	346	664,735	44.6	39.47	49.87
RM 6,000 - RM 7,999	218	441,492	50.0	43.01	57.01
RM 8,000 - RM 9,999	92	180,791	42.6	32.25	53.71
RM 10,000 and above	162	346,302	49.8	41.87	57.83
Household Income Quintile					
Quintile 1	478	752,155	37.6	33.74	41.63
Quintile 2	424	675,747	40.5	35.45	45.74
Quintile 3	382	692,106	39.3	34.47	44.32
Quintile 4	378	728,765	44.7	39.75	49.77
Quintile 5	472	968,586	48.4	43.30	53.51
Household Income Category					
Bottom 40%	1,445	2,411,426	40.3	37.44	43.25
Middle 40%	513	1,043,375	45.1	40.54	49.79
Top 20%	176	362,556	47.2	40.51	53.95
Pap Smear Results					
Informed	-	-	-	-	-
Not Informed	-	-	-	-	-

Table 8.5: Prevalence of Faecal Occult Blood Test Among Adults Aged 50 Years and Above in Malaysia by Socio-Demographic Characteristics (n=4,351)

Sociodemographic Characteristics	Faecal Occult Blood Test				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	514	649,669	10.8	9.47	12.39
State					
Johor	18	36,199	5.1*	2.73	9.47
Kedah	22	33,211	7.8	4.60	12.76
Kelantan	23	28,114	8.5	5.33	13.31
Melaka	52	34,021	18.0	11.99	26.18
Negeri Sembilan	52	41,642	18.2	12.56	25.52
Pahang	30	31,736	10.4	6.28	16.88
Pulau Pinang	28	64,308	16.4	9.32	27.22
Perak	38	107,738	17.6	11.24	26.39
Perlis	40	8,355	15.1	10.30	21.56
Selangor	33	62,286	5.7	3.78	8.47
Terengganu	37	27,028	13.3	9.29	18.70
Sabah	38	67,134	14.5	10.20	20.18
Sarawak	38	66,639	11.4	8.50	15.01
WP Kuala Lumpur	24	36,880	9.9	6.17	15.53
WP Labuan	32	3,204	22.8	13.50	35.86
WP Putrajaya	9	1,174	12.0*	6.02	22.42
Location					
Urban	275	484,245	10.5	8.86	12.48
Rural	239	165,424	11.9	10.07	13.92
Sex					
Male	226	313,047	10.6	8.55	13.19
Female	288	336,622	11.0	9.33	13.00
Age Group (Years)					
50-54	71	96,046	6.3	4.47	8.70
55-59	136	159,481	11.9	9.03	15.56
60-64	107	150,607	13.6	9.93	18.39
65-69	83	132,270	16.5	11.15	23.60
70-74	54	52,017	9.5	6.67	13.22
75 & above	63	59,248	9.0	6.23	12.85
Ethnicity					
Malay ^a	324	293,566	9.7	8.15	11.41
Chinese	86	229,437	12.5	9.35	16.48
Indian	49	45,947	11.9	8.60	16.37
Bumiputera Sabah	26	35,946	11.8	7.42	18.27
Bumiputera Sarawak	21	27,453	9.1	5.98	13.65
Others	8	17,320	14.0*	6.27	28.31
Marital Status					
Single	17	30,733	13.2	7.23	22.89
Married	390	508,657	10.9	9.29	12.77
Widow(er)/Divorcee	107	110,280	10.1	7.61	13.18

Sociodemographic Characteristics	Faecal Occult Blood Test				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Education Level					
No Formal Education	70	65,437	10.2	7.58	13.69
Primary Education	200	252,964	11.8	9.56	14.56
Secondary Education	191	268,433	10.5	8.27	13.23
Tertiary Education	50	59,707	9.3	6.04	14.08
Occupation					
Government Employee	24	16,552	5.4	3.04	9.49
Private Employee	48	80,298	8.8	6.12	12.59
Self Employed	90	107,635	9.6	7.16	12.66
Unpaid Worker/ Homemaker	121	146,992	12.0	8.52	16.61
Retiree	80	124,564	16.0	11.20	22.35
Not Working ^b	151	173,628	10.6	8.24	13.60
Household Income Group					
Less than RM 1,000	80	116,474	12.4	8.45	17.84
RM 1,000 - RM 1,999	118	122,918	10.8	8.22	13.99
RM 2,000 - RM 3,999	138	150,351	10.1	7.42	13.52
RM 4,000 - RM 5,999	52	66,630	9.7	6.80	13.58
RM 6,000 - RM 7,999	27	47,389	10.9	5.94	19.13
RM 8,000 - RM 9,999	9	12,266	6.5*	2.52	15.80
RM 10,000 and above	31	43,793	10.9	6.58	17.52
Household Income Quintile					
Quintile 1	147	185,928	11.8	8.95	15.34
Quintile 2	101	95,360	9.4	7.14	12.26
Quintile 3	77	92,211	10.2	6.54	15.64
Quintile 4	63	82,875	10.8	7.86	14.70
Quintile 5	67	103,449	10.1	6.77	14.78
Household Income Category					
Bottom 40%	332	353,407	9.6	8.01	11.51
Middle 40%	93	165,397	14.4	10.44	19.66
Top 20%	30	41,018	8.8	5.37	13.98

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli
 b - Not working includes Unemployed, and Old Age

Alcohol Consumption

Alcohol Consumption

Contributors to this section: Tania Gayle Robert Lourdes, Muhammad Fadhli Mohd Yusoff, Norli Abdul Jabbar, Rozanim Kamarudin, Mohd Hatta Abdul Mutalip, Wan Shakira Rodzlan Hasani, Nor Azizi Abu Bakar, Nur Liana Ab Majid, Halizah Mat Rifin, Jane Ling Miaw Yn, Tamil Arasu Saminathan, Hasimah Ismail

Introduction

Alcohol is a psychoactive substance with dependence-producing properties that has been widely used in many cultures for centuries. Globally, the harmful use of alcohol causes 3 million deaths every year and this represents 5.3% of all deaths. Drinking alcohol is associated with a risk of developing health problems such as mental and behavioral disorders, including alcohol dependence, major noncommunicable diseases such as liver cirrhosis, some cancers and cardiovascular diseases, as well as injuries resulting from violence, road crashes and collisions [1].

According to a recent study, between the year 1990 and 2017, the global adult per-capita consumption of alcohol increased from 5.9 L to 6.5 L and it is forecasted to reach 7.6 L by 2030. In 2017, 20% of adults were heavy episodic drinkers compared to the year 1990 when it was estimated at 18.5% and this prevalence is expected to increase to 23% in 2030 [2].

In Malaysia, the previous National Health and Morbidity Survey (NHMS) done in the year 2011 and 2015 reported a current drinker prevalence of 12.8% and 8.4% respectively among those aged 18 years and above. [3].

Objective

General Objective

To determine the prevalence of alcohol drinkers in Malaysia.

Specific Objectives

1. To determine the prevalence of current alcohol drinkers in Malaysia by socio-demographic subgroups.
2. To determine the prevalence of ever alcohol drinkers in Malaysia by socio-demographic subgroups.
3. To determine the proportion of binge drinkers among current drinkers (≥ 18 years old) in Malaysia.
4. To determine the proportion of heavy episodic drinkers among current drinkers (≥ 18 years old) in Malaysia.

5. To determine types of drinkers (≥ 18 years old) according to the AUDIT risk stratification score among current drinkers (low risk, risky and probable dependence)

Methods

Data on alcohol drinkers was obtained from respondents aged 13 years and above using a self-administered questionnaire. The questionnaire used comprised the validated Alcohol Use Disorder Identification Test (AUDIT) and 5 additional screening questions for ever drinkers, current drinkers, types of alcoholic beverages consumed and also alcohol consumption in the past 1 month. The AUDIT is a 10-item screening tool developed by the World Health Organization (WHO) to assess alcohol consumption, drinking behaviors and alcohol-related problems. Those who scored 0 to 7 on the Audit are considered to be low risk drinkers, a score of 8 to 19 were risky drinkers and those who scored 20 and above were said to have probable alcohol dependence.

Variable Definition

1. Current drinkers was defined as those who have consumed any alcoholic beverage in the past 12 months.
2. Ever drinkers was defined as those who have consumed any alcoholic beverage in their lifetime.
3. Binge drinking was defined as those who consumed 6 or more standard alcoholic drinks at one sitting.
4. Heavy Episodic Drinking (HED) was defined as those who consumed 6 or more standard alcoholic drinks at one sitting at least weekly.
5. Lifetime abstainers was defined as those who have never consumed alcohol.
6. Abstainers in the past 12 months was defined as those who did not drink any alcohol in the past 12 months.
7. One standard drink of alcohol was defined as calculated based on the percentage of alcohol and also the volume of the beverage (Further details can be referred to Code book NHMS 2019).

Findings

9.1 Alcohol Consumption Among Those Aged 18 Years and Above

Out of 10,472 respondents aged 18 years and above, 93.8% (n=9,818) responded to the Alcohol consumption questionnaire. The prevalence of current drinkers was 11.8% (95% CI: 10.04, 13.81) while the prevalence of abstainers in the past 12 months was 88.2%. Among the current drinkers, the alcohol consumption was significantly higher among males [16.9%, 95% CI: 14.41, 19.82] compared to females [6.4%, 95% CI: 4.95, 8.13]. Current alcohol drinking was common in urban areas [12.1%, 95% CI: 10.03, 14.56], among Bumiputera Sarawak [43.9%, 95% CI: 35.59, 52.59], followed by Chinese [26.4%, 95% CI: 21.98, 31.37], Bumiputera Sabah [22.1%, 95% CI: 13.30, 34.35] and Indians [18.1% (95% CI: 14.05, 23.05)], those with tertiary education [13.7%, 95% CI: 10.81, 17.15], those aged 35 to 39 years old [14.7%, 95% CI: 10.98, 19.35], single adults [15.7%, 95% CI: 12.25, 19.80] and those with a household income of RM10,000 and above [24.0%, 95% CI: 16.45, 33.63]. The prevalence of ever drinkers among adults aged 18 years and above was 14.4% (95% CI: 12.50, 16.48) while the prevalence of lifetime abstainers among those aged 18 and above was 85.6%.

9.2 Alcohol Consumption Among Those Aged 13 Years and Above

Out of 11,530 respondents aged 13 years and above, 94.1% (n=10,846) responded to the Alcohol Consumption questionnaire. The prevalence of current drinkers among those aged 13 years and above was 11.1% (95% CI: 9.46, 13.07). Among the current drinkers, alcohol consumption was significantly higher in males [15.8%, 95% CI: 13.48, 18.54] compared to females [6.2%, 95% CI: 4.79, 7.95]. Current alcohol drinking was common in urban areas [11.4%, 95% CI: 9.44, 13.78], among Bumiputera Sarawak [42.7%, 95% CI: 33.90, 51.90], followed by Chinese [25.3%, 95% CI: 21.03, 30.06], Bumiputera Sabah [21.7%, 95% CI: 13.04, 33.74] and Indians [16.7% (95% CI: 12.99, 21.28)], those with tertiary education [13.7%, 95% CI: 10.80, 17.14], those aged 35 to 39 years old [14.7%, 95% CI: 10.98, 19.35] and with a household income of RM10,000 and above [22.5%, 95% CI: 15.56, 31.32].

The prevalence of ever drinkers among the 13 year olds and above was 13.5% (95% CI: 11.67, 15.46) while the prevalence of lifetime abstainers among them was 86.5%. The prevalence of current drinkers was 11.1% (95% CI: 9.46, 13.07) while the prevalence of abstainers in the past 12 months was 88.9%.

9.3 Binge Drinking Among Those Aged 18 Years and Above

The proportion of binge drinkers among current drinkers was 45.8% (95% CI: 39.15, 52.65). Binge drinking was common among males [49.5%, 95% CI: 41.43, 57.52], rural residents [48.1%, 95% CI: 39.23, 57.02], elders aged 70 to 74 years [59.9, 95% CI: 26.41, 86.11], Bumiputera Sabah [77.8% , 95% CI: 68.23, 85.11], Malays [63.3%, 95% CI: 40.78, 81.17] and Indians [53.6% (95% CI: 38.96, 67.57)], those unemployed [59.0%, 95% CI: 42.57, 73.62] and those with a household income of RM1000- Rm1999 [58.4%, 95% CI: 48.16, 67.90].

The prevalence of binge drinking among the population in Malaysia was 5.4% (95% CI: 4.36, 6.69), with an estimated population of 1,150,861 adults aged 18 years old and above.

9.4 Heavy Episodic Drinkers Among Those Aged 18 Years and Above

The proportion of HED among the current drinkers was 8.4% (95% CI: 5.81, 12.13). HED were more common among urban dwellers [8.7% (95% CI: 5.61,13.18)], males [10.3% (95% CI: 7.15, 14.66)], Bumiputera Sabah [16.7% (95% CI: 8.91, 29.14)] and Indians [12.0% (95% CI: 5.56, 24.06)] widowers/divorcees [21.3% 95% CI: 7.79, 46.54]], those with a household income of RM1000- Rm1999 [11.8% (95% CI: 7.30, 18.55)].

The prevalence of HED among the population was 1.0% (95% CI: 0.7, 1.5), with an estimated population of 212,144 adults aged 18 years and above in Malaysia.

9.5 AUDIT Risk Stratification Related to Pattern of Drinking

In general, most off the current drinkers aged 18 years and above, were categorized as low risk drinkers with a proportion of 81.5% (95% CI: 75.32, 86.36). The proportion of risky drinkers was 17.6% (95% CI: 12.79, 23.71) while the proportion of drinkers with probable alcohol dependence was 0.9% (95% CI: 0.33, 2.64).

Conclusion

This study showed that that males had a significantly higher prevalence (15.8%) of alcohol consumption as compared to females (6.2%). Sarawak, Sabah and Wilayah Persekutuan Kuala Lumpur had the highest prevalence of current drinkers in Malaysia. We also found that there was a reduction in the proportion of binge drinkers and HED compared to NHMS 2015 that is from 59.4% to 45.8% and 10.8% and 8.4% respectively. To conclude, we can say that from this study, we found the target group for intervention in reducing the harmful use of alcohol (binge drinking and HED) to be males, Bumiputera Sabah and those with a household income of RM1000-RM1999. Therefore, specific programs have to be tailored to address this particular group.

Recommendations

1. Health education is the utmost important in advocating healthy living and prevention of the harmful use of alcohol by utilizing various media platforms. The tagline of “Stay Healthy without Alcohol” may be used widely to promote and advocate of healthy lifestyles.
2. Awareness of the adverse health and social outcomes of the harmful use of alcohol should target schools, institutions of higher learning and communities at large including employees in government or private sectors.
3. To further expand and strengthen the current alcohol consumption Screening, Brief Intervention and Referral to Therapy program (SBIRT) services in the primary care.
4. The education on alcohol and the management in primary care and community should be included in the medical school curriculum.

5. Increase excise taxes of alcoholic beverages in order to reduce the accessibility to the drinks. This is among the “best buys” recommended by WHO to reduce the harmful use of alcohol.
6. Campaigns on the harmful use of alcohol during certain festivals have to be upscaled to prevent binge drinking.
7. To reduce the accessibility of alcoholic beverages by limiting points of sale in order to prevent exposure to the younger generation and non-drinkers. However, this needs further supporting evidence for implementation.

Table 9.1: Harmful Alcohol Consumption Trend in Malaysia

	2011	2015	2019
Binge Drinkers	50.2	59.4	45.8
Heavy Episodic Drinkers	18.3	10.8	8.4
Risky Drinkers	21.2	28.4	17.6

References

1. Fact sheet Alcohol WHO; <https://www.who.int/news-room/fact-sheets/detail/alcohol>; 21st September 2018.
2. Manthey J. Et al; Global alcohol exposure between 1990 and 2017 and forecasts until 2030: a modelling study. The Lancet Vol 393; Published June 22, 2019. [http://dx.doi.org/10.1016/S0140-6736\(18\)32744-2](http://dx.doi.org/10.1016/S0140-6736(18)32744-2)
3. Institute for Public Health (2011). National Health and Morbidity Survey 2011 (NHMS 2011). Vol. II: Non-Communicable Diseases; 2011: 188 pages

Table 9.2: Prevalence of Current Drinkers Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,818)

Sociodemographic Characteristics	Current Drinkers (18 Years and Above)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	780	2,511,485	11.8	10.04	13.81
State					
Johor	48	207,793	8.6	5.78	12.49
Kedah	23	59,611	4.6*	2.30	9.15
Kelantan	6	9,248	0.8*	0.21	3.19
Melaka	10	16,542	2.8*	0.84	8.72
Negeri Sembilan	24	31,516	4.5	2.47	7.97
Pahang	22	31,904	3.1*	1.59	6.08
Pulau Pinang	43	175,958	14.0*	6.72	26.97
Perak	37	142,501	9.2	5.22	15.76
Perlis	5	775	0.5*	0.14	1.70
Selangor	72	456,211	10.0	6.02	16.02
Terengganu	3	950	0.1*	0.03	0.62
Sabah	143	517,407	20.1	13.35	29.15
Sarawak	196	601,692	32.5	25.81	39.90
WP Kuala Lumpur	83	251,082	19.3	11.65	30.35
WP Labuan	63	8,060	12.7	8.15	19.32
WP Putrajaya	2	237	0.4*	0.07	2.37
Location					
Urban	522	2,013,021	12.1	10.03	14.56
Rural	258	498,465	10.7	8.09	13.96
Sex					
Male	553	1,854,109	16.9	14.41	19.82
Female	227	657,376	6.4	4.95	8.13
Age Group (Years)					
18-19	25	91,665	10.2	6.03	16.68
20-24	76	395,327	13.8	8.85	20.80
25-29	89	398,940	13.3	10.00	17.51
30-34	94	310,974	11.7	8.70	15.53
35-39	100	348,000	14.7	10.98	19.35
40-44	72	242,089	13.2	9.70	17.75
45-49	81	236,638	14.2	10.47	19.06
50-54	60	128,499	8.4	6.14	11.31
55-59	66	166,243	12.4	9.44	16.18
60-64	55	88,689	8.0	5.79	11.00
65-69	30	53,660	6.7	4.10	10.68
70-74	12	20,646	3.8*	1.83	7.52
75 & above	20	30,114	4.6	2.68	7.70
Ethnicity					
Malay ^a	36	79,151	0.7	0.45	1.18
Chinese	299	1,207,545	26.4	21.98	31.37
Indian	115	224,949	18.1	14.05	23.05
Bumiputera Sabah	133	302,883	22.1	13.30	34.35

Sociodemographic Characteristics	Current Drinkers (18 Years and Above)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sarawak	145	420,982	43.9	35.59	52.59
Others	52	275,975	12.3	7.05	20.46
Marital Status					
Single	229	946,993	15.7	12.25	19.80
Married	512	1,494,696	10.9	9.20	12.84
Widow(er)/Divorcee	39	69,796	4.6	2.79	7.53
Education Level					
No Formal Education	37	69,818	6.4	4.16	9.77
Primary Education	155	512,325	12.5	9.12	16.88
Secondary Education	368	1,159,521	11.2	9.15	13.61
Tertiary Education	217	767,026	13.7	10.81	17.15
Occupation					
Government Employee	50	137,615	8.8	6.30	12.16
Private Employee	353	1,312,918	16.0	13.03	19.48
Self Employed	179	582,563	15.8	11.92	20.53
Unpaid Worker/ Homemaker	80	180,076	5.1	3.58	7.09
Retiree	31	70,541	8.9	5.90	13.13
Student	14	43,967	5.9*	3.05	10.95
Not Working ^b	73	183,806	6.8	5.06	9.13
Household Income Group					
Less than RM 1,000	66	132,850	7.7	5.24	11.29
RM 1,000 - RM 1,999	146	390,694	9.6	7.17	12.62
RM 2,000 - RM 3,999	231	747,109	11.7	9.11	14.85
RM 4,000 - RM 5,999	103	361,470	10.8	7.74	15.00
RM 6,000 - RM 7,999	71	326,983	16.7	11.47	23.60
RM 8,000 - RM 9,999	27	102,000	11.4	6.28	19.68
RM 10,000 and above	106	386,288	24.0	16.45	33.63
Household Income Quintile					
Quintile 1	130	298,871	7.9	5.83	10.51
Quintile 2	156	512,391	12.6	9.22	17.01
Quintile 3	141	422,708	10.6	8.08	13.76
Quintile 4	119	398,153	10.8	7.90	14.65
Quintile 5	204	815,271	18.2	14.03	23.37
Household Income Category					
Bottom 40%	473	1,410,538	10.8	9.10	12.85
Middle 40%	173	711,705	13.8	10.17	18.45
Top 20%	104	325,149	17.8	13.20	23.58

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 9.3: Prevalence of Current Drinkers Among Respondents Aged 13 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,846)

Sociodemographic Characteristics	Current Drinkers (13 Years and Above)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	824	2,662,605	11.1	9.46	13.07
State					
Johor	48	207,793	7.6	5.15	11.03
Kedah	24	62,811	4.3*	2.22	8.24
Kelantan	7	9,748	0.8*	0.20	2.73
Melaka	11	18,975	2.8*	0.98	7.94
Negeri Sembilan	24	31,516	4.0	2.18	7.24
Pahang	22	31,904	2.8*	1.43	5.43
Pulau Pinang	43	175,958	13.1*	6.23	25.41
Perak	39	158,676	9.1	5.03	15.92
Perlis	6	1,276	0.7*	0.27	1.87
Selangor	75	478,392	9.5	5.69	15.36
Terengganu	3	950	0.1*	0.02	0.54
Sabah	157	563,066	18.8	12.51	27.37
Sarawak	210	650,551	31.1	24.40	38.61
WP Kuala Lumpur	87	262,082	18.4	11.12	28.99
WP Labuan	66	8,672	12.4	8.19	18.46
WP Putrajaya	2	237	0.4*	0.06	2.09
Location					
Urban	549	2,120,437	11.4	9.44	13.78
Rural	275	542,168	10.1	7.61	13.37
Sex					
Male	581	1,942,377	15.8	13.48	18.54
Female	243	720,228	6.2	4.79	7.95
Age Group (Years)					
18-19	69	242,785	6.9	4.79	9.88
20-24	76	395,327	13.8	8.85	20.80
25-29	89	398,940	13.3	10.00	17.51
30-34	94	310,974	11.7	8.70	15.53
35-39	100	348,000	14.7	10.98	19.35
40-44	72	242,089	13.2	9.70	17.75
45-49	81	236,638	14.2	10.47	19.06
50-54	60	128,499	8.4	6.14	11.31
55-59	66	166,243	12.4	9.44	16.18
60-64	55	88,689	8.0	5.79	11.00
65-69	30	53,660	6.7	4.10	10.68
70-74	12	20,646	3.8*	1.83	7.52
75 & above	20	30,114	4.6	2.68	7.70
Ethnicity					
Malay ^a	37	81,571	0.7	0.41	1.05
Chinese	314	1,261,311	25.3	21.03	30.06
Indian	117	233,429	16.7	12.99	21.28
Bumiputera Sabah	147	341,752	21.7	13.04	33.74

Sociodemographic Characteristics	Current Drinkers (13 Years and Above)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sarawak	155	461,766	42.7	33.90	51.90
Others	54	282,775	11.5	6.79	18.96
Marital Status					
Single	272	1,095,170	12.7	9.96	16.01
Married	513	1,497,639	10.9	9.21	12.85
Widow(er)/Divorcee	39	69,796	4.6	2.79	7.53
Education Level					
No Formal Education	37	69,818	6.4	4.12	9.71
Primary Education	172	579,685	10.8	8.07	14.27
Secondary Education	395	1,243,281	10.6	8.68	12.98
Tertiary Education	217	767,026	13.7	10.80	17.14
Occupation					
Government Employee	50	137,615	8.8	6.30	12.16
Private Employee	356	1,324,837	16.1	13.12	19.55
Self Employed	181	590,263	15.7	11.92	20.42
Unpaid Worker/ Homemaker	81	184,661	5.0	3.51	7.20
Retiree	31	70,541	8.9	5.90	13.13
Student	51	165,426	5.3	3.47	8.00
Not Working ^b	74	189,263	6.9	5.17	9.17
Household Income Group					
Less than RM 1,000	71	150,704	7.7	4.76	12.10
RM 1,000 - RM 1,999	155	424,576	9.2	6.88	12.12
RM 2,000 - RM 3,999	248	807,400	11.2	8.80	14.11
RM 4,000 - RM 5,999	109	381,222	10.2	7.25	14.05
RM 6,000 - RM 7,999	71	326,983	15.5	10.58	22.07
RM 8,000 - RM 9,999	29	105,051	10.6	5.91	18.36
RM 10,000 and above	110	400,838	22.5	15.56	31.32
Household Income Quintile					
Quintile 1	139	335,524	7.7	5.57	10.57
Quintile 2	166	545,407	11.9	8.89	15.86
Quintile 3	152	464,910	10.3	7.84	13.51
Quintile 4	126	418,061	10.1	7.36	13.65
Quintile 5	210	832,872	17.0	13.12	21.86
Household Income Category					
Bottom 40%	503	1,522,254	10.4	8.76	12.28
Middle 40%	185	743,070	12.8	9.44	17.20
Top 20%	105	331,449	16.5	12.20	21.94

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli
 b - Not working includes Unemployed, and Old Age

Table 9.4: Proportion of Binge Drinkers Among Current Drinkers Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=780)

Sociodemographic Characteristics	Binge Drinkers				
	Count	Estimated Population	Percentage (%)	95% CI	
				Lower	Upper
MALAYSIA	348	2,511,485	45.8	39.15	52.65
State					
Johor	14	64,149	30.9	16.82	49.65
Kedah	7	17,241	28.9*	12.39	53.93
Kelantan	2	4,299	46.5	32.48	61.07
Melaka	1	2,300	13.9*	1.80	58.78
Negeri Sembilan	13	13,400	42.5	23.41	64.16
Pahang	9	16,586	52.0*	21.69	80.90
Pulau Pinang	20	89,958	51.1	31.64	70.28
Perak	21	75,942	53.3	34.20	71.47
Perlis	3	325	41.9*	4.33	92.02
Selangor	30	138,179	30.3	16.78	48.34
Terengganu	0	-	-	-	-
Sabah	99	386,955	74.8	62.57	84.04
Sarawak	70	232,944	38.7	28.12	50.49
WP Kuala Lumpur	30	104,714	41.7	29.83	54.62
WP Labuan	27	3,632	45.1	31.66	59.21
WP Putrajaya	2	237	100.0*	100.00	100.00
Location					
Urban	225	911,282	45.3	37.31	53.48
Rural	123	239,580	48.1	39.23	57.02
Sex					
Male	275	917,070	49.5	41.43	57.52
Female	73	233,792	35.6	27.52	44.52
Age Group (Years)					
18-19	12	41,767	45.6	23.78	69.19
20-24	45	215,406	54.5	31.53	75.68
25-29	43	153,085	38.4	26.71	51.54
30-34	50	182,979	58.8	45.55	70.96
35-39	55	188,729	54.2	42.88	65.17
40-44	34	120,274	49.7	33.68	65.75
45-49	28	79,354	33.5	20.97	48.96
50-54	17	33,354	26.0	15.10	40.87
55-59	26	70,800	42.6	29.36	56.97
60-64	19	31,598	35.6	20.88	53.72
65-69	9	12,857	24.0*	9.24	49.36
70-74	5	12,359	59.9	26.41	86.11
75 & above	5	8,299	27.6*	9.89	56.86
Ethnicity					
Malay ^a	22	50,083	63.3	40.78	81.17
Chinese	94	422,257	35.0	27.02	43.84
Indian	60	120,478	53.6	38.96	67.57

Sociodemographic Characteristics	Binge Drinkers				
	Count	Estimated Population	Percentage (%)	95% CI	
				Lower	Upper
Bumiputera Sabah	91	235,629	77.8	68.23	85.11
Bumiputera Sarawak	56	170,469	40.5	28.19	54.12
Others	25	151,946	55.1	30.07	77.73
Marital Status					
Single	123	428,399	45.2	35.15	55.73
Married	209	691,315	46.3	38.70	53.98
Widow(er)/Divorcee	16	31,148	44.6	26.39	64.43
Education Level					
No Formal Education	16	25,429	36.4	18.49	59.13
Primary Education	62	240,222	46.9	30.35	64.14
Secondary Education	168	534,602	46.1	37.26	55.20
Tertiary Education	101	349,763	45.6	35.43	56.15
Occupation					
Government Employee	19	64,237	46.7	28.59	65.69
Private Employee	175	575,033	43.8	35.40	52.56
Self Employed	80	289,001	49.6	35.49	63.79
Unpaid Worker/ Homemaker	24	66,545	37.0	22.15	54.69
Retiree	14	29,288	41.5	22.68	63.21
Student	6	18,338	41.7*	20.12	67.02
Not Working ^b	30	108,419	59.0	42.57	73.62
Household Income Group					
Less than RM 1,000	30	58,203	43.8	26.83	62.38
RM 1,000 - RM 1,999	77	228,015	58.4	48.16	67.90
RM 2,000 - RM 3,999	101	362,614	48.5	36.03	61.23
RM 4,000 - RM 5,999	44	169,187	46.8	32.08	62.11
RM 6,000 - RM 7,999	25	95,924	29.3	15.74	47.98
RM 8,000 - RM 9,999	12	45,687	44.8	22.32	69.62
RM 10,000 and above	48	164,080	42.5	25.20	61.81
Household Income Quintile					
Quintile 1	62	152,371	51.0	41.52	60.37
Quintile 2	71	293,441	57.3	43.17	70.28
Quintile 3	68	183,994	43.5	31.06	56.87
Quintile 4	51	188,213	47.3	33.57	61.40
Quintile 5	85	305,692	37.5	27.68	48.46
Household Income Category					
Bottom 40%	219	714,058	50.6	42.75	58.46
Middle 40%	68	232,844	32.7	22.95	44.25
Top 20%	50	176,810	54.4	43.02	65.30

*Prevalence with high RSE, interpret with caution
a - Malay includes Orang Asli
b - Not working includes Unemployed, and Old Age

Table 9.5: Proportion of Heavy Episodic Drinkers Among Current Drinkers Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=780)

Sociodemographic Characteristics	Heavy Episodic Drinkers				
	Count	Estimated Population	Percentage (%)	95% CI	
				Lower	Upper
MALAYSIA	62	212,145	8.4	5.81	12.13
State					
Johor	1	2,720	1.3*	0.18	8.91
Kedah	2	6,751	11.3*	3.92	28.54
Kelantan	1	2,100	22.7*	10.70	41.86
Melaka	0	-	-	-	-
Negeri Sembilan	2	2,840	9.0*	2.29	29.48
Pahang	1	1,866	5.9*	0.88	30.39
Pulau Pinang	3	20,119	11.4*	4.07	28.20
Perak	3	16,050	11.3*	2.44	39.20
Perlis	2	300	38.7*	3.89	90.79
Selangor	8	23,950	5.2*	2.19	12.07
Terengganu	0	-	-	-	-
Sabah	18	57,147	11.0*	5.14	22.16
Sarawak	14	64,691	10.8*	4.95	21.81
WP Kuala Lumpur	4	13,120	5.2*	1.83	14.05
WP Labuan	3	490	6.1*	1.94	17.50
WP Putrajaya	0	-	-	-	-
Location					
Urban	44	174,620	8.7	5.61	13.18
Rural	18	37,525	7.5*	3.99	13.76
Sex					
Male	57	191,248	10.3	7.15	14.66
Female	5	20,896	3.2*	0.98	9.86
Age Group (Years)					
18-19	5	16,046	17.5*	6.06	41.10
20-24	9	43,570	11.0*	4.79	23.36
25-29	7	31,575	7.9*	3.69	16.15
30-34	4	19,492	6.3*	1.78	19.77
35-39	5	8,696	2.5*	0.71	8.41
40-44	5	22,239	9.2*	3.36	22.76
45-49	9	31,408	13.3*	5.78	27.64
50-54	3	2,953	2.3*	0.72	7.07
55-59	7	18,136	10.9*	4.36	24.73
60-64	4	11,072	12.5*	4.12	32.11
65-69	2	936	1.7*	0.33	8.62
70-74	1	2,720	13.2*	1.75	56.32
75 & above	1	3,300	11.0*	1.52	49.58
Ethnicity					
Malay ^a	3	5,952	7.5*	2.19	22.83
Chinese	24	94,558	7.8*	4.26	13.97
Indian	9	27,018	12.0*	5.56	24.06

Sociodemographic Characteristics	Heavy Episodic Drinkers				
	Count	Estimated Population	Percentage (%)	95% CI	
				Lower	Upper
Bumiputera Sabah	17	50,597	16.7*	8.91	29.14
Bumiputera Sarawak	7	30,440	7.2*	3.17	15.66
Others	2	3,580	1.3*	0.18	8.69
Marital Status					
Single	21	90,070	9.5	5.45	16.09
Married	35	107,189	7.2	4.53	11.18
Widow(er)/Divorcee	6	14,886	21.3*	7.79	46.54
Education Level					
No Formal Education	2	4,066	5.8*	1.10	25.57
Primary Education	15	44,567	8.7*	4.34	16.66
Secondary Education	35	116,808	10.1	6.42	15.45
Tertiary Education	10	46,704	6.1*	2.93	12.23
Occupation					
Government Employee	3	11,720	8.5*	2.70	23.79
Private Employee	27	94,776	7.2	4.40	11.61
Self Employed	23	71,619	12.3	7.09	20.48
Unpaid Worker/ Homemaker	2	4,944	2.7*	0.57	12.17
Retiree	2	7,080	10.0*	2.61	31.73
Student	1	100	0.2*	0.03	1.81
Not Working ^b	4	21,907	11.9*	4.26	29.17
Household Income Group					
Less than RM 1,000	5	10,314	7.8*	3.46	16.49
RM 1,000 - RM 1,999	16	46,153	11.8	7.30	18.55
RM 2,000 - RM 3,999	20	72,963	9.8*	4.65	19.35
RM 4,000 - RM 5,999	6	25,595	7.1*	1.91	22.98
RM 6,000 - RM 7,999	3	12,483	3.8*	1.17	11.70
RM 8,000 - RM 9,999	3	11,208	11.0*	2.75	34.99
RM 10,000 and above	9	33,429	8.7*	3.89	18.14
Household Income Quintile					
Quintile 1	10	22,813	7.6*	3.90	14.41
Quintile 2	19	61,946	12.1	6.84	20.49
Quintile 3	11	41,342	9.8*	4.21	21.09
Quintile 4	7	28,923	7.3*	2.27	20.87
Quintile 5	15	57,120	7.0	3.90	12.27
Household Income Category					
Bottom 40%	39	125,826	8.9	5.64	13.83
Middle 40%	14	49,370	6.9*	3.07	14.91
Top 20%	9	36,949	11.4*	5.63	21.59

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 9.6: Proportion of AUDIT Risk Stratification Score Among Current Drinkers Aged 18 Years and Above in Malaysia (n=544)

Sociodemographic Characteristics	Unweighted Count	Estimated Population	Percentage (%)	95% CI	
				Lower	Upper
Low Risk Drinkers	440	1,389,637	81.5	75.32	86.36
Risky Drinkers	99	300,089	17.6	12.79	23.71
Drinkers with Probable Alcohol Dependence	5	16,091	0.9*	0.33	2.64

*Prevalence with high RSE, interpret with caution

**Only those who answered all 10 questions in the Audit were included

Substance Abuse

Substance Abuse

Contributors to this section: Wan Shakira Rodzlan Hasani, Muhammad Fadli Mohd Yusoff, Rushidi Ramly, Rusdi Abd Rashid, Musalnizan Mustalkah, Fazila Ahmad, Eida Nurhadzira, Aliza Lodz, Norli Abd Jabbar, Tania Gayle Robert Lourdes, Jane Ling Miaw Yn, Halizah Bt Mat Rifin, Nur Liana Ab Majid, Tamil Arasu Saminathan, Hasimah Ismail, Ahzairin Ahmad, Shubash Shander

Introduction

The World Drug Report 2017 estimated that a quarter of a billion people, or around 5 per cent of the global adult population, used drugs at least once [1]. Additionally, 29.5 million of those drug users, or 0.6% of the global adult population, suffer from drug use disorders.

Marijuana or cannabis remains the world's most widely used drug, with an estimated 192 million users, while Amphetamines remain the second most commonly used drug, with an estimated 34 million past-year users. Opioids continue to cause the most harm, accounting for 76 per cent of deaths where drug use disorders were implicated [2].

Kratom (*Mitragyna speciosa*), an herbal plant native to areas in Southeast Asia which is also colloquially known as herbal speedball, is increasingly been used recently for its stimulant side effects and analgesic property. It is currently classed as a “new psychoactive substance” as it consists of synthetic opioid which is more potent than codeine. Kratom has recently been identified as a substance that may have negative public health consequences in the near future that can be similar to illicit drugs. While cases of addiction, withdrawal and even fatalities have been reported from the use of kratom, especially among polydrug users, this substance, though banned in Thailand, can be acquired legally in Malaysia at the moment. There is concern that the use of this substance is becoming increasingly common among Malaysians.

Objectives

General objective

To determine the prevalence of ever and current drug use among adults in Malaysia.

Methods

The target population consisted of non-institution respondents aged 18 years and above in Malaysia. This study used a self-administered questionnaire.

Findings

The total numbers of adult respondents included in this module were 9,648. Overall, the prevalence of lifetime drug use in Malaysia was 1.5% (95% CI: 1.19, 1.93) while the prevalence of current drug use was 0.5% (95% CI: 0.37, 0.79).

The prevalence of lifetime (ever) drug use in the rural area was 2.2% (95% CI: 1.43, 3.24) while in urban area was 1.3% (95% CI: 0.99, 1.80). The prevalence of male [2.8% (95% CI: 2.16, 3.57)] user was significant higher than female [0.2% (95% CI: 0.10, 0.40)]. The prevalence of those aged 18 to 40 years [1.9% (95% CI: 1.37, 2.51)], those aged 41 to 59 years [1.3% (95% CI: 0.83, 1.95)] and those aged more than 60 years [0.6% (95% CI: 0.32, 0.99)]. Our study also showed that the prevalence of those who were single was 1.8% (95% CI: 1.19, 2.59) and married was 1.5% (95% CI: 1.09, 2.04). Those in secondary education and tertiary education have the prevalence of 1.8% (95% CI: 1.30, 2.36) and 1.1% (95% CI: 0.69, 1.78) respectively. Prevalence of private employee was 1.8% (95% CI: 1.23, 2.60) and unemployed was 1.5% (95% CI: 0.86, 2.52). The prevalence of bottom 40% household income group was 1.6% (95% CI: 1.18, 2.18) and middle 40% household income group was 1.5% (95% CI: 0.93, 2.44).

The prevalence of lifetime opiate, marijuana, amphetamine / methamphetamine and kratom consumption were 0.2% (95% CI: 0.14, 0.39), 0.7% (95% CI: 0.53, 1.01), 0.5% (95% CI: 0.32, 0.80) and 0.6% (95% CI: 0.46, 0.90) respectively. The prevalence of age of initiation at 15-17 years was 23.5% (95% CI: 14.41, 35.89), 18-24 years was 57.6% (95% CI: 45.52, 68.91) and 25 or older was 17.5% (95% CI: 11.50, 25.60).

The prevalence of current drug use was 0.5% (95% CI: 0.33, 0.83) in urban area and 0.6% (95% CI: 0.36, 1.09) in rural area. The prevalence of those aged 18 to 40 years [0.7% (95% CI: 0.42, 1.07)], those aged 41 to 59 years [0.4% (95% CI: 0.22, 0.80)] and those aged more than 60 years [0.2% (95% CI: 0.11, 0.58)]. Our study also showed that the prevalence of those who were single was 0.6% (95% CI: 0.35, 1.14) and married was 0.5% (95% CI: 0.30, 0.81). Those in secondary education and tertiary education have the prevalence of 0.7% (95% CI: 0.45, 1.19) and 0.4% (95% CI: 0.21, 0.85) respectively. The prevalence for B40 was 0.6% (95% CI: 0.38, 0.92).

It was reported that the source of obtaining drug by the current user was 34.4% (95% CI: 18.55, 54.73) bought from someone and 38.3% (95% CI: 18.60, 62.87) obtained from friends.

Conclusion

Drug abuse is a public health problem that is associated with negative clinical and social implications. Although the prevalence of lifetime drug use (1.5%) was lower as compared to global prevalence of drug use of 5% [1], clearly showed that Malaysia not spared from the scourge of drug abuse menace.

The World Drug Report 2018 [2] showed that cannabis (marijuana) is the most commonly used drug across the world similar with finding in this study, followed by kratom and amphetamine. Despite cannabis being the most commonly used drug, opioids such as heroin are causing the biggest problems to users as the number of people classed as dependent on cannabis was lower than for other drugs.

The finding from this survey demonstrated that kratom usage came second to the use of cannabis which is contrary from World Drug Report showed the second use of drug was amphetamine. This different pattern of usage may be attributed to the current trends of drug usage in Malaysia as the use of kratom is becoming increasingly common among Malaysians.

The age of initiation of drug use in Malaysia showed that the onset of drug use occurred at a relatively young adulthood stage, which was similarly commonly reported worldwide. A report among hospitalised drug users in the United States of America showed that age of drug use initiation was younger among rural patients as compared to urban patients [3]. During their younger age, exposure to recreational drugs may be limited due to logistics and accessibility. Their first encounter to drugs may start when these rural youths started to seek social and economic opportunities in urban areas.

Recommendations

Cannabis (marijuana) remains by far the most commonly used drug worldwide similar with finding in this study, followed by kratom and amphetamine. Therefore the service on Medication Assisted Therapy (MAT) must be expanded to ensure that all type of drug user able to be treated accordingly. The existing MAT services that available currently should be expanded as the drug user not confined to opioid base but more on polydrug user. The service must be holistic, comprehensive and integrated that fulfil the requirement of bio-psycho-social and spiritual components in treating the drug addiction. The One Stop Center for Addiction (OSCA) is one of the way forward in providing this holistic treatment and should be implemented in all states in Malaysia. And at the same time, the service must be integrated with other agencies such National Anti-Drug Agency (NADA), religious bodies and NGO's. Nevertheless, prevention, treatment and after-care must be enhanced and concerted effort to ensure the good result and sustainability of the strategy in line with SDG and fulfilling the international community's pledge to leave no one behind.

References

1. World Drug Report 2017: Executive Summary Conclusions and Policy Implications. (ISBN:978-92-1-148291-1, eISBN: 978-92-1-060623-3, United Nations publication, Sales No. E.17.XI.6).
2. United Nations Office on Drugs and Crime, World Drug Report 2018: Executive Summary, Conclusion and Policy Implication. (ISBN: 978-92-1-148304-8, eISBN: 978-92-1-045058-4, United Nations publication, Sales No. E.18.XI.9).
3. The TEDS Report. A Comparison of Rural and Urban Substance Abuse Treatment Admissions. Center for Behavioural Health Statistics and Quality (formerly the Office of Applied Studies), Substance Abuse and Mental Health Services Administration (SAMHSA). 2012

Table 10.1: Prevalence of Ever and Current Drug Use Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,648)

Sociodemographic Characteristics	Ever Drug / Substance Use					Current Drug / Substance Use				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	138	303,086	1.5	1.19	1.93	50	108,430	0.5	0.37	0.79
Location										
Urban	74	210,051	1.3	0.99	1.80	27	81,487	0.5	0.33	0.83
Rural	64	93,035	2.2	1.43	3.24	23	26,943	0.6	0.36	1.09
Sex										
Male	127	283,826	2.8	2.16	3.57	46	101,985	1.0	0.69	1.44
Female	11	19,260	0.2*	0.10	0.40	4	6,445	0.1*	0.02	0.23
Age Group (Years)										
18 – 40	83	215,862	1.9	1.37	2.51	30	78,218	0.7	0.42	1.07
41 – 59	40	72,007	1.3	0.83	1.95	13	23,551	0.4*	0.22	0.80
60 & above	15	15,216	0.6	0.32	0.99	7	6,661	0.2*	0.11	0.58
Marital Status										
Single	44	100,446	1.8	1.19	2.59	14	36,068	0.6*	0.35	1.14
Married	87	193,336	1.5	1.09	2.04	31	64,511	0.5	0.30	0.81
Widow(er)/Divorcee	7	9,304	0.7*	0.29	1.70	5	7,851	0.6*	0.22	1.62
Education Level										
No Formal Education	2	4,792	0.6*	0.12	2.59	1	1,270	0.1*	0.02	1.07
Primary Education	26	61,879	1.7*	0.87	3.26	10	11,081	0.3*	0.14	0.67
Secondary Education	84	173,716	1.8	1.30	2.36	30	72,869	0.7	0.45	1.19
Tertiary Education	25	60,598	1.1	0.69	1.78	9	23,210	0.4*	0.21	0.85
Occupation										
Government Employee	10	19,101	1.3*	0.48	3.27	3	11,305	0.7*	0.17	3.24
Private Employee	60	139,224	1.8	1.23	2.60	18	42,181	0.5*	0.30	0.98
Self Employed	41	99,446	2.9	1.94	4.19	18	36,119	1.0	0.58	1.85
Unpaid Worker/ Homemaker	4	7,481	0.2*	0.08	0.64	1	1,875	0.1*	0.01	0.40
Retiree	1	400	0.1*	0.01	0.38	1	400	0.1*	0.01	0.38
Student	1	2,683	0.4*	0.05	2.62	1	2,683	0.4*	0.05	2.62
Not Working ^a	21	34,752	1.5	0.86	2.52	8	13,866	0.6*	0.24	1.42
Household Income Category										
Bottom 40%	91	194,657	1.6	1.18	2.18	36	71,511	0.6	0.38	0.92
Middle 40%	31	74,521	1.5	0.93	2.44	10	28,065	0.6*	0.25	1.29
Top 20%	10	19,722	1.1*	0.45	2.73	1	1,492	0.1*	0.01	0.60

Drug & substance use: use of controlled psychoactive substance for non-medical and non-scientific purposes such as opioid (heroin, morphine), marijuana, amphetamine/methamphetamine (meth, syabu, ice and yaba pills), inhalant & kratom

Ever Drug: Ever drug use: Self-reported history of taking or using drug at least once in a lifetime

Current drug use: Self-reported history of taking or using drug in the past 30 days.

*Prevalence with high RSE, interpret with caution

a - Not working includes Unemployed, and Old Age

Table 10.2: Prevalence of Drug Use by Types Among Adults Aged 18 Years and Above in Malaysia (n=9,648)

Sociodemographic Characteristics	Ever Use					Current Use				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Opiate (Heroin/morphine)	20	45,623	0.2	0.14	0.39	4	7,993	0.03*	0.01	0.13
Marijuana	63	145,819	0.7	0.53	1.01	10	26,051	0.1*	0.06	0.29
Amphetamine/ Methamphetamine	40	101,906	0.5	0.32	0.80	8	19,401	0.1*	0.04	0.22
Inhalant	7	33,314	0.2*	0.07	0.42	1	229	0.001*	0.00	0.01
Kratom	65	128,035	0.6	0.46	0.90	34	70,537	0.4	0.22	0.56

*Prevalence with high RSE, interpret with caution

Table 10.3: Proportion of Age of Initiation and Types of First Started Drug by Respondents with Ever Drug Use Among Adults Aged 18 Years and Above in Malaysia

Sociodemographic Characteristics	Ever Use Drug & Substance				
	Count	Estimated Population	Percentage (%)	95% CI	
				Lower	Upper
Age of Initiation					
14 years or younger	1	3,780	1.4*	0.19	9.70
15 – 17 years	28	62,972	23.5	14.41	35.89
18 – 24 years	58	154,520	57.6	45.52	68.91
25 years or older	32	46,802	17.5	11.50	25.60
Type of First Started Drug / Substance					
Opiate (Heroin / Morphine)	9	20,931	7.0*	3.32	14.33
Marijuana	51	113,476	38.2	26.61	51.29
Amphetamine / Methamphetamine	28	68,903	23.2	13.20	37.46
Inhalant	2	11,836	4.0*	0.74	18.70
Kratom	44	82,006	27.6	19.80	37.05

*Prevalence with high RSE, interpret with caution

Table 10.4: Proportion of Sources of Obtaining Drugs by Respondents with Current Drug Use Among Adults Aged 18 Years and Above in Malaysia

Sociodemographic Characteristics	Current Drug Use				
	Count	Estimated Population	Percentage (%)	95% CI	
				Lower	Upper
Source of Obtaining Drugs					
Bought from someone	12	24,951	34.4	18.55	54.73
Gave someone else money to buy	2	4,250	5.9*	0.75	33.89
Stole or got it without permission	0	-	-	-	-
Got from friend	14	27,801	38.3	18.60	62.87
Got from family	8	15,503	21.4*	10.34	39.07
Got some other way	0	-	-	-	-

*Prevalence with high RSE, interpret with caution

Benign Prostatic Hyperplasia (BPH)

Benign Prostatic Hyperplasia (BPH)

Contributors to this section: Mohamad Fuad Mohamad Anuar, Chong Zhuo Lin, Mohamed Ashraf Mohamed Daud, Shaiful Bahari Ismail, Zakiah Mohd Said, Noor Ani Ahmad, Mohd Shaiful Azlan Kassim, Azli Baharudin, Ridwan Sanaudi

Introduction

Benign prostatic hyperplasia (BPH) or also known as benign prostatic enlargement (BPE), is one of the most common urological diseases among men [1]. BPH is defined as benign overgrowth of prostatic tissue around the prostatic urethra which ultimately constricts the urethral opening, resulting in lower urinary tract symptoms (LUTS) [1]. BPH usually starts to occur at an early age of 40 and the prevalence of BPH increases with age [2].

Objectives

General Objective

To determine the prevalence of benign prostatic hyperplasia / enlargement (BPH) among adult men age 40 years and above in Malaysia.

Methods

BPH's LUTS was measured using International Prostate Symptom Score (IPSS), a well-established diagnostic screening tool which has been translated into Malay language and also validated for use in Malaysia [3]. The IPSS is based on the seven questions concerning urinary symptoms. Each answer is scored from 0 to 5 for a maximum score of 35 points (asymptomatic to severely symptomatic). The probable severities of BPH can be divided into normal (Score 0), Mild BPH (Score 1-7), Moderate BPH (Score 8-19) and Severe BPH (Score 20-35) [3-5]. One additional question is regarding the perceived quality of life in relation to urination, which is assigned a score if 0 (delighted) to 6 (terrible). The quality of life (QoL) for the urination can be accessed by good (Score 0-1) and poor (Score 2-6) [6].

Findings

The prevalence of probable BPH (moderate to severe symptomatic) was 16.3% (95% CI: 14.14, 18.81). Both urban and rural prevalence of probable BPH was similar to the national prevalence. Prevalence of probable BPH increased from 40-44 years old [10.5% (95% CI: 7.21, 14.95)] until 75 years and above [33.4% (95% CI: 23.04, 45.62)]. Almost a quarter of separated / widowed men reported to have probable BPH. Men who were retiree and not working due to unemployment, health problems or old age showed higher prevalence which was 25.9% (95% CI: 20.04, 32.86) and 22.2% (95% CI: 16.02, 30.01) respectively. Among ethnicity, 1 out of 4 Bumiputera Sabah reported to have probable BPH. Of note, men among M40 income category had higher prevalence reported for probable BPH. Also, 17.6% (95% CI: 15.24, 20.33) among men aged 40 years and above perceived their urination was poor and unsatisfied. By BPH status, 1 in 10 among none BPH status and 3 in 5 men with probable BPH had poor QoL and unsatisfied with their urination experience.

Conclusion

BPH is a common condition among older men resulting in lower urinary tract symptoms (LUTS). The prevalence of BPH in Malaysia was reported lower compared to lifetime global estimates of 26.2% (95% CI: 22.8, 29.6) with worldwide prevalence ranging from 22.4% to 28.8% [1]. Similar findings were found in several countries such as Korea (21.0%) and Ghana (19.9%) based on their latest survey [1][6]. Even so, the prevalence of poor quality of life due to urinary symptoms among men was slightly higher compared to other study findings [1]. Also, the prevalence of self-reported urination quality of life was not high as we expected. Lim 2017 had suggested a decreased risk of BPH in Asian men compared to western men. Moreover, for Asians, there was no clear association found between BPH and ethnicity [7]. BPH is mostly associated with age, comorbidities, and risky lifestyles [8]. Observational studies from Europe, US, and Asia also demonstrated older age to be a risk factor for clinical BPH onset and progression [7]. Our findings also show the increasing prevalence by age and this results is agreeable with other studies [6][8-11]. In summary, BPH should be highlighted as one of the men's health problems that needs to be monitored and controlled, with counter measures being implemented.

Recommendations

These findings indicate an urgent need to address BPH. Thus, the following recommendations are made:

1. To advocate public health policies to support the establishment of age-friendly primary health care especially for men's health clinic.
2. To establish collaboration for comprehensive care, especially among elderly people.
3. Need to encourage healthy lifestyle and create campaign focusing on awareness of signs and symptoms of BPH among the target group.

References

1. Lee SWH, Chan EMC, Lai YK. The global burden of lower urinary tract symptoms suggestive of benign prostatic hyperplasia: A systematic review and meta-analysis. *Scientific Reports* 2006; 7(1):7984-7994. doi: 10.1038/s41598-017-06628-8
2. Teh GC, Sahabudin RM, Lim TC, Chong WL, Woo S, Mohan M, Khairullah A, Abraham PP. Prevalence of Symptomatic BPE among Malaysian Men aged 50 and above attending screening during Prostate Health Awareness Campaign. *Medical Journal of Malaysia* 2001; 56(2): 186-195
3. Quek KF, Low WY, Razack AH, Loh CS. Reliability and validity of the International Prostate Symptom Score in a Malaysian population. *British Journal of Urology International* 2001; 88(1):21-25.
4. Khoo EM, Tan HM, Low WY. Erectile dysfunction and comorbidities in aging men: An urban cross-sectional study in Malaysia. *The journal of sexual medicine* 2008; 5(12):2925-2934
5. Mariappan P, Chong WL. Prevalence and correlations of lower urinary tract symptoms, erectile dysfunction and incontinence in men from a multiethnic Asian population: Results of a regional population-based survey and comparison with industrialized nations. *British Journal of Urology International* 2006; 98(6):1264-1268.
6. Christopher Ho CK, Praveen S, Goh EH, Tan GH, Badrulhisham B, Zulkiffi MZ, Khoo HW, Su XV, Ng JY, Chong LL, Lim DW, Chen ES, Teoh SY. Prevalence and Awareness of Lower Urinary Tract Symptoms among Males in the Outpatient Clinics of Universiti Kebangsaan Malaysia Medical Centre. *Medicine & Health* 2011; 6(2): 98-106.
7. Lim KB. Epidemiology of clinical benign prostatic hyperplasia. *Asian Journal of Urology* 2017; 4 (148-151)
8. Parsons JK. Benign Prostatic Hyperplasia and Male Lower Urinary Tract Symptoms: Epidemiology and Risk Factors. *Current Bladder Dysfunction Reports* 2010 5:212-218.
9. Chukwunonso ECCE, Kingsley CE. Prevalence of Symptoms of Benign Prostatic Hyperplasia in Umudike and its Relationship with Measures of Obesity. *Asian Journal of Clinical Nutrition* 2015; 7 (1): 1-8
10. Vuichoud C & Loughlin KR. Benign Prostatic Hyperplasia: Epidemiology, Economics, and Evaluation. *Canada Journal of Urologist* 2015; 22(Supp 1):1-6
11. Suzuki K. Epidemiology of Prostate Cancer and Benign Prostatic Hyperplasia. *Japan Medical Association Journal* 2009; 52(6): 478-483.

Table 11.1: Prevalence of Probable Benign Prostatic Hyperplasia (BPH) Among Males Aged 40 Years and Above in Malaysia by Socio-Demographic Characteristics (n=2,251)

Sociodemographic Characteristics	None BPH					Probable BPH				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	1,855	3,363,917	83.7	81.19	85.86	396	657,058	16.3	14.14	18.81
Location										
Urban	1,117	2,704,106	83.8	80.82	86.36	242	523,513	16.2	13.64	19.18
Rural	738	659,811	83.2	79.35	86.40	154	133,545	16.8	13.60	20.65
Age Group (Years)										
40-44	307	762,167	89.5	85.05	92.79	40	89,075	10.5	7.21	14.95
45-49	299	677,361	88.6	82.37	92.82	41	87,130	11.4	7.18	17.63
50-54	329	551,792	84.8	78.57	89.40	59	99,201	15.2	10.60	21.43
55-59	281	483,135	82.5	76.74	87.09	58	102,377	17.5	12.91	23.26
60-64	239	343,882	76.5	68.60	82.85	67	105,826	23.5	17.15	31.40
65-69	165	230,152	75.6	65.99	83.19	53	74,278	24.4	16.81	34.01
70-74	127	173,937	86.0	76.76	91.98	26	28,258	14.0	8.02	23.24
75 & above	108	141,492	66.6	54.38	76.96	52	70,912	33.4	23.04	45.62
Ethnicity										
Malay ^a	1,211	1,705,352	83.9	81.23	86.18	250	328,275	16.1	13.82	18.77
Chinese	302	964,133	85.5	79.31	90.05	63	163,700	14.5	9.95	20.69
Indian	114	194,078	84.4	74.01	91.14	21	35,873	15.6	8.86	25.99
Bumiputera Sabah	92	172,681	75.1	64.70	83.28	33	57,144	24.9	16.72	35.30
Bumiputera Sarawak	74	162,587	82.4	66.25	91.82	13	34,646	17.6*	8.18	33.75
Others	62	165,086	81.5	65.34	91.17	16	37,420	18.5*	8.83	34.66
Marital Status										
Single	98	242,596	89.9	81.54	94.67	16	27,399	10.1*	5.33	18.46
Married	1,656	2,979,982	83.6	80.87	85.95	353	586,066	16.4	14.05	19.13
Widow(er)/Divorcee	101	141,339	76.4	63.53	85.78	27	43,593	23.6	14.22	36.47
Education Level										
No Formal Education	58	95,685	89.9	80.10	95.18	11	10,728	10.1*	4.82	19.90
Primary Education	502	817,111	81.1	77.18	84.40	134	191,043	18.9	15.60	22.82
Secondary Education	965	1,823,521	85.5	82.35	88.12	183	309,992	14.5	11.88	17.65
Tertiary Education	326	617,432	81.4	75.31	86.28	66	140,995	18.6	13.72	24.69
Occupation										
Government Employee	218	336,550	87.9	80.98	92.53	46	46,341	12.1	7.47	19.02
Private Employee	547	1,225,881	85.1	80.71	88.68	85	214,129	14.9	11.32	19.29
Self Employed	563	938,959	86.9	82.96	89.96	96	142,142	13.1	10.04	17.04
Unpaid Worker/ Homemaker	32	94,042	91.2	77.05	96.95	7	9,102	8.8*	3.05	22.95
Retiree	238	372,757	74.1	67.14	79.96	83	130,568	25.9	20.04	32.86
Not Working ^b	254	392,260	77.8	69.99	83.98	78	112,176	22.2	16.02	30.01

Table 11.1: Prevalence of Probable Benign Prostatic Hyperplasia (BPH) Among Males Aged 40 Years and Above in Malaysia by Socio-Demographic Characteristics (n=2,251) (cont'd)

Sociodemographic Characteristics	None BPH					Probable BPH				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Household Income Group										
Less than RM 1,000	173	260,357	81.9	72.92	88.32	40	57,696	18.1	11.68	27.08
RM 1,000 - RM 1,999	386	620,462	82.3	77.36	86.40	93	133,208	17.7	13.60	22.64
RM 2,000 - RM 3,999	573	1,061,821	87.6	83.65	90.73	99	150,081	12.4	9.27	16.35
RM 4,000 - RM 5,999	269	541,984	86.4	81.40	90.19	57	85,459	13.6	9.81	18.60
RM 6,000 - RM 7,999	148	276,300	73.5	62.08	82.39	37	99,825	26.5	17.61	37.92
RM 8,000 - RM 9,999	75	151,995	80.4	65.74	89.75	17	37,083	19.6*	10.25	34.26
RM 10,000 and above	147	283,597	85.4	76.62	91.29	25	48,392	14.6	8.71	23.38
Household Income Quintile										
Quintile 1	380	553,772	80.7	74.92	85.45	86	132,235	19.3	14.55	25.08
Quintile 2	366	670,011	85.8	81.23	89.37	80	111,116	14.2	10.63	18.77
Quintile 3	350	645,600	87.6	82.29	91.50	61	91,256	12.4	8.50	17.71
Quintile 4	305	615,240	87.0	82.46	90.52	62	91,838	13.0	9.48	17.54
Quintile 5	370	711,892	79.3	72.83	84.63	79	185,300	20.7	15.37	27.17
Household Income Category										
Bottom 40%	1,219	2,114,427	85.1	82.39	87.42	248	370,824	14.9	12.58	17.61
Middle 40%	398	772,813	80.4	74.10	85.40	94	188,904	19.6	14.60	25.90
Top 20%	154	309,275	85.60	77.22	91.25	26	52,016	14.4	8.75	22.78

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 11.2: Association Between BPH Status and Quality of Life (QoL) Due to Urinary Symptom Among Males Aged 40 Years and Above in Malaysia (n=2,251)

Variables	Good QoL					Poor QoL				
	Unweighted Count	Estimated Population	Prevalence (%)	95% CI		Unweighted Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	1,810	3,311,510	82.4	79.67	84.76	441	709,465	17.6	15.24	20.33
No BPH	1,644	3,027,119	90.0	87.40	92.09	211	336,798	10.0	7.91	12.60
Probable BPH	166	284,391	43.3	36.74	50.07	230	372,667	56.7	49.93	63.26

*p-value=0.0001

Erectile Dysfunction (ED)

Erectile Dysfunction (ED)

Contributors to this section: Mohamad Fuad Mohamad Anuar, Chong Zhuo Lin, Mohamed Ashraf Mohamed Daud, Shaiful Bahari Ismail, Zakiah Mohd Said, Noor Ani Ahmad, Mohd Shaiful Azlan Kassim, Azli Baharudin, Ridwan Sanaudi

Introduction

Erectile dysfunction (ED) is defined as the inability to attain and maintain an erect penis enough to allow for satisfactory sexual intercourse [1]. Prevalence of ED reported in previous studies varied widely, ranging from 1.7% in Brazil to 52.0% in United States [2]. In Malaysia, an unpublished nationwide population study conducted in 1998 among men aged 40 years and above reported the overall prevalence of ED at 60.0%, or more specifically mild ED at 44.0% and moderate to severe ED at 16.0% [3]. In view of the rise in non-communicable diseases (NCD) in Malaysia and their association with ED, an update to the current situation of ED among Malaysian men is urgently needed for more equitable health policy planning [4].

Objective

To determine the prevalence of erectile dysfunction among sexually active adult males aged 18 years and above in Malaysia.

Methods

All sexually active adult men age 18 and above were given a self-administered questionnaire on ED. The questionnaire, a 5-item English and Malay versions of the International Index of Erectile Function (IIEF-5), had been previously validated for use in Malaysia [5-7]. Each item in the IIEF-5 assesses a different domain in erectile function, to which respondents could assign a score from 1 to 5, with higher score indicating better function. Total score can range from 5 to 25 and classified as normal (score 22-25), probable mild ED (score 17-21), probable moderate ED (score 8-16) and probable severe ED (score 5-7) [6]. Both probable moderate and severe ED may be more likely to require clinical treatment and were combined together in this report [5-6].

Findings

The overall national prevalence of probable moderate to severe ED was 31.6% (95% CI: 28.80, 34.56), as compared to mild ED at 47.1% (95% CI: 43.87, 50.44). There was no large difference between urban and rural strata within moderate to severe ED and mild ED.

The prevalence of probable moderate to severe ED appeared to be higher in younger (between 18 to 29 years old) and older age groups (starting at the age of 50 years old), and lower in middle age groups (between 30 to 49 years old). It was also reported to be higher among single people, people with up to primary and secondary education, retiree, students and people who were not working, as well as people in the lowest household income category.

On the other hand, the trend observed in probable moderate to severe ED was generally reversed in probable mild ED. The prevalence of probable mild ED was reported to be higher in middle age (between 30 to 49 years old) groups, married persons, and government employees. However, it was found to be rather comparable within education and income sub-groups.

Conclusion

Our study found that, among sexually active Malaysian men aged 18 and above, 47.1% had probable mild ED and 31.6% had probable moderate to severe ED. The overall prevalence of probable ED was 78.7%. This figure was higher than the 60% reported in 1998 [3]. On top of that, the prevalence of more severe forms of ED also almost doubled. This may be due to the rise in NCD burden over the past two decades.

The high prevalence of probable ED among older age groups was expected, but its presence among younger age groups was not. Psychological factors may have contributed to the rise in the prevalence [8]. Among unmarried younger age groups, low self-esteem coupled with unrealistically high expectation in erectile function might be the reason of lower scores observed among them [8]. Nevertheless, part of this low score might be the result of existing organic conditions such as cardiovascular, metabolic, endocrine and neurological diseases, as well as of other psychiatric, psychological, and relational conditions, that must be identified and treated [9].

In summary, ED is prevalent in Malaysia. Its presence in older age groups must be identified and treated. However, its observation in younger age groups must be interpreted with caution, yet not entirely dismissing its significance.

Recommendations

These finding indicates an urgent need to address the ED problem in Malaysia. Thus, the following recommendations are made:

1. Sexual reproductive health among men especially ED should be prioritized and highlighted.
2. More exploration on the preventive and intervention strategy especially in early stage / age to halt progress of NCD and risky lifestyle related to the issue of ED.
3. Empowerment of paramedical staff and patient's self-care are crucial for the success in dealing with ED.
4. Education and training programs for ED conditions must be introduced early in the medical curriculum for medical officers and paramedical staff.
5. Further research is needed to reveal the factors associated with ED among young people in Malaysia.

References

1. NIH Consensus Conference. Impotence. NIH Consensus Development Panel on Impotence. *Jama*. 1993;270(1):83-90
2. Eardley I. The Incidence, Prevalence, and Natural History of Erectile Dysfunction. *Sexual Medicine Reviews*. 2013;1(1):3-16.
3. Malaysian Urological Association M. Clinical practice guide in erectile dysfunction
4. Colson MH, Cuzin B, Faix A, Grellet L, Huyghes E. Current epidemiology of erectile dysfunction, an update. *Sexologies*. 2018;27(1): e7-e13
5. Lim TO, Das A, Rampal S, Zaki M, Sahabudin RM, Rohan MJ, et al. Cross-cultural adaptation and validation of the English version of the International Index of Erectile Function (IIEF) for use in Malaysia. *Int J Impotence Res*. 2003;15(5):329-36
6. Tang Z, Li D, Zhang X, Yi L, Zhu X, Zeng X, et al. Comparison of the simplified International Index of Erectile Function (IIEF-5) in patients of erectile dysfunction with different pathophysiologies. *BMC Urol*. 2014; 14:52.
7. Rosen RC, Cappelleri JC, Smith MD, Lipsky J, Pena BM. Development and evaluation of an abridged, 5-item version of the International Index of Erectile Function (IIEF-5) as a diagnostic tool for erectile dysfunction. *Int J Impot Res*. 1999;11(6):319-26
8. Rynja S, Bosch R, Kok E, Wouters G, De Kort L. IIEF-15: Unsuitable for Assessing Erectile Function of Young Men? *The Journal of Sexual Medicine*. 2010;7(8):2825-30
9. Rastrelli G, Maggi M. Erectile dysfunction in fit and healthy young men: psychological or pathological? *Transl Androl Urol*. 2017;6(1):79-90.

Table 12.1: Prevalence of Probable Erectile Dysfunction (ED) Among Sexually Active Males Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=2,403)

Sociodemographic Characteristics	Probable Moderate-Severe ED					Probable Mild ED				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	821	1,744,121	31.6	28.80	34.56	1,081	2,600,942	47.1	43.87	50.44
Location										
Urban	484	1,356,839	30.6	27.34	34.16	706	2,098,986	47.4	43.49	51.36
Rural	337	387,282	35.5	31.14	40.18	375	501,956	46.1	41.61	50.56
Age Group (Years)										
18-19	30	104,734	88.0	70.74	95.67	6	10,712	9.0*	2.70	26.08
20-24	61	208,411	44.7	28.99	61.54	40	207,292	44.5	26.99	63.42
25-29	47	144,901	22.1	15.69	30.10	91	292,691	44.6	34.70	54.89
30-34	42	115,893	14.4	9.25	21.85	123	438,065	54.6	43.60	65.16
35-39	69	203,713	25.5	18.62	33.99	152	361,658	45.4	37.59	53.36
40-44	65	169,316	23.8	17.21	31.92	132	355,175	49.9	41.63	58.19
45-49	59	119,220	21.5	15.34	29.25	150	332,625	60.0	52.09	67.33
50-54	96	161,288	34.6	26.86	43.35	149	255,194	54.8	46.60	62.78
55-59	101	172,280	42.3	34.32	50.76	104	177,465	43.6	35.24	52.35
60-64	89	137,718	53.1	42.57	63.29	81	105,651	40.7	31.01	51.17
65-69	87	123,956	83.2	73.92	89.69	28	23,192	15.6	9.35	24.80
70-74	41	51,986	64.3	45.03	79.77	14	24,471	30.2	16.47	48.81
75 & above	34	30,705	64.7	42.39	82.03	11	16,753	35.3*	17.97	57.61
Ethnicity										
Malay ^a	541	914,478	30.9	27.96	33.94	764	1,450,193	48.9	45.92	51.98
Chinese	92	336,753	31.3	23.79	40.01	101	476,819	44.4	34.62	54.56
Indian	54	107,843	34.6	25.43	44.98	59	122,600	39.3	27.56	52.39
Bumiputera Sabah	61	141,530	38.5	30.20	47.43	80	175,122	47.6	39.69	55.59
Bumiputera Sarawak	33	101,808	40.1	30.38	50.67	36	120,177	47.3	32.78	62.37
Others	40	141,709	26.0	15.56	40.00	41	256,031	46.9	30.41	64.09
Marital Status										
Single	135	444,893	54.0	44.97	62.81	69	236,306	28.7	21.61	37.00
Married	665	1,261,247	27.4	24.64	30.36	984	2,316,335	50.3	46.68	53.99
Widow(er)/Divorcee	21	37,981	41.1	26.39	57.69	28	48,301	52.3	36.05	68.13
Education Level										
No Formal Education	22	40,300	38.6*	17.84	64.46	10	31,650	30.3*	11.84	58.42
Primary Education	202	358,173	39.1	30.59	48.41	155	414,413	45.3	35.16	55.82
Secondary Education	446	1,009,628	35.5	31.98	39.26	607	1,302,336	45.8	42.18	49.55
Tertiary Education	145	322,249	19.7	15.41	24.72	308	848,802	51.8	44.60	58.86
Occupation										
Government Employee	66	105,047	16.9	12.20	22.88	199	326,511	52.5	45.02	59.78
Private Employee	281	787,299	29.0	25.06	33.29	462	1,243,614	45.8	41.39	50.31
Self Employed	251	453,211	31.7	25.83	38.18	272	721,695	50.5	42.36	58.53
Unpaid Worker/ Homemaker	9	17,513	28.5*	9.62	59.94	5	36,617	59.7	26.13	86.07
Retiree	103	148,850	51.9	42.06	61.54	72	116,956	40.8	31.23	51.04
Student	13	37,289	71.9	44.71	88.96	7	14,604	28.1*	11.04	55.29
Not Working ^b	98	194,912	55.7	43.49	67.19	64	140,944	40.3	29.08	52.53

Table 12.1: Prevalence of Probable Erectile Dysfunction (ED) Among Sexually Active Males Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=2,403) (cont'd)

Sociodemographic Characteristics	Probable Moderate-Severe ED					Probable Mild ED				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Household Income Group										
Less than RM 1,000	61	105,398	56.3	43.18	68.67	33	59,681	31.9	20.37	46.18
RM 1,000 - RM 1,999	182	369,145	33.6	26.45	41.61	192	561,635	51.1	41.93	60.25
RM 2,000 - RM 3,999	275	569,710	32.3	27.42	37.64	338	792,729	45.0	38.90	51.20
RM 4,000 - RM 5,999	104	259,650	27.2	21.36	33.86	210	416,500	43.6	37.02	50.35
RM 6,000 - RM 7,999	88	197,231	34.4	26.27	43.45	117	296,386	51.6	42.29	60.84
RM 8,000 - RM 9,999	29	64,557	23.3	14.88	34.57	61	137,798	49.8	36.78	62.76
RM 10,000 and above	53	128,941	24.2	17.87	31.79	109	268,915	50.4	42.21	58.52
Household Income Quintile										
Quintile 1	161	305,470	44.9	36.24	53.93	119	285,933	42.1	33.67	50.92
Quintile 2	172	346,920	29.5	22.94	37.00	210	598,890	50.9	40.93	60.80
Quintile 3	173	370,823	34.2	28.37	40.50	210	461,644	42.5	36.87	48.43
Quintile 4	116	280,689	26.4	21.01	32.65	234	484,078	45.6	39.15	52.12
Quintile 5	170	390,730	28.2	23.44	33.53	287	703,099	50.8	45.03	56.49
Household Income Category										
Bottom 40%	546	1,090,600	33.1	29.15	37.26	628	1,548,633	47.0	42.29	51.72
Middle 40%	190	463,661	30.5	25.24	36.27	316	698,838	45.9	39.84	52.15
Top 20%	56	140,372	24.6	18.34	32.12	116	286,173	50.1	42.20	58.04

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Anaemia

Anaemia

Contributors to this section: Nik Adilah Shahein, Muhd. Hafizuddin Taufik Ramli, Noor Ani Ahmad, Sharifah Nazeera Syed Anera, Nor'Ain Ab Wahab, Ruhaya Salleh, Rasidah Jamaluddin, Nur Amalina Muhamad, Nurul Zaiza Zainudin.

Introduction

Anaemia is a common blood disorder affecting the population worldwide and is a public health issue as it can contribute to morbidity and mortality. The health effects are worrying particularly among women of reproductive age, as anaemia is associated with poor birth outcomes such as preterm birth, low birth weight and miscarriage [1].

In the National Health and Morbidity Survey (NHMS) 2015, the overall prevalence of anaemia was 24.6% (95% CI: 23.6, 25.6) [2]. From NHMS 2015, it was also found that the prevalence of anaemia among women of reproductive age was 34.5% (95% CI: 33.09, 36.36) [3]. This figure was higher than the World Health Organization (WHO), which estimated the prevalence to be 29% worldwide [4,5]. A goal in reducing the prevalence of anaemia among women of reproductive age by 50% by the year 2025 was set by the World Health Assembly as part of the global nutrition target [6].

Objectives

General objective

To determine the prevalence of anaemia in Malaysia

Specific Objectives

1. To determine the overall prevalence of anaemia by socio-demographic profile
2. To determine the prevalence of anaemia in women of reproductive age group (15-49 years)
3. To determine the prevalence of anaemia by level of severity (mild, moderate and severe) for overall and for women in reproductive age group.

Methods

The target population for this study was all respondents aged 15 years and above. Haemoglobin level was measured using HemoCue Hb201+ system point of care testing (POCT). The cut off point for the levels of anaemia was based on the 2011 WHO guideline as below [4]:

Haemoglobin levels to diagnose anaemia at sea level (g/l)²

Population	Non-Anaemia	Anaemia		
		Mild	Moderate	Severe
Non-pregnant women (15 years of age and above)	120 or higher	110-119	80-109	Lower than 80
Men (15 years of age and above)	130 or higher	110-129	80-109	Lower than 80

Findings

The overall prevalence of anaemia was 21.3% (95% CI: 19.91, 22.85). Prevalence of mild, moderate and severe anaemia was 13.5% (95% CI: 12.33, 14.84), 6.8% (95% CI: 6.18, 7.58) and 1.0% (95% CI: 0.72, 1.29) respectively. By gender, the prevalence was higher among females at 30.4% (95% CI: 28.44, 32.47) compared to males at 12.6% (95% CI: 10.91, 14.51). The prevalence of anaemia in rural was higher at 22.9% (95% CI: 20.43, 25.51) compared to urban at 20.9% (95% CI: 19.2, 22.69). By ethnicity, Indians had the highest prevalence at 26.7% (95% CI: 21.72, 32.28). The state with the highest prevalence of anaemia was Kelantan at 27.2% (95% CI: 23.24, 31.55) and the lowest was Pahang at 14.4% (95% CI: 10.59, 19.20). The prevalence of anaemia was highest among those with monthly household income of less than RM1000 at 29.6% (95% CI: 25.65, 33.78) and those with no formal education at 28.4% (95% CI: 23.00, 34.55). Retirees and those who were not working had the highest prevalence at 28.5% (95% CI: 22.93, 34.82) and 29.8% (95% CI: 26.49, 33.27) respectively.

Among women of reproductive age group, the prevalence of anaemia was 29.9% (95% CI: 27.53, 32.39). The prevalence of mild anaemia among women of reproductive age group was 15.9% (95% CI: 14.07, 18.03) whilst moderate and severe anaemia was 14.0% (95% CI: 12.40, 15.66). By ethnicity, the highest prevalence was among Indian women at 39.8% (95% CI: 31.41, 48.86).

Conclusion

Anaemia still remains a public health issue especially in women of reproductive age group, younger and older Malaysians, Indian ethnicity, people in the lower income group and those with low education level.

Recommendations

- To develop a national plan of action in managing anaemia which include:
 - Implement the national fortification of wheat flour with folic acid and iron as mandatory regulation.
 - Provision of micronutrient supplementation in settings where iron is known to be deficient in the diet and anaemia is prevalent, particularly among vulnerable groups.
 - Strengthening advocacy on promoting dietary improvement through increasing consumption of vegetables, fruits and animal-source foods high with iron and folic acid.
 - Advocate public the importance of preventing anaemia and knowing their haemoglobin status through smart partnership with relevant agencies and NGO.
 - Develop programs to empower women to be aware of their haemoglobin status by doing screening regularly from young age (Self-Care).
- To conduct qualitative and quantitative research to identify the main barriers and factors that causes anaemia among women at reproductive age.

Table 13.1: Anaemia Trend in Malaysia

	2015	2019
Anaemia	24.6	21.3
Anaemia Among Women in Reproductive Age (15-49)	34.5	29.9

References

- World Health Organization (2008) Worldwide prevalence of anaemia 1993-2005 of WHO global database of anaemia.
- Institute for Public Health (IPH) (2015) National health and morbidity survey 2015: Vol I: Methodology and general findings; 2015. Ministry of Health Malaysia, Malaysia.
- Awaluddin SM, Ahmad NA, Naidu BM, Mohamad MS, Yusof M et al. (2017). A Population-based Anaemia Screening using Point-of-care in Estimating Prevalence of Anaemia in Malaysian Adults: Findings from A Nationwide Survey. *J Community Med Health Educ*; 7: 513. doi:10.4172/2161-0711.1000513
- World Health Organization (2011) Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. *Vitamin and Mineral Nutrition Information System*.
- World Health Organization. The global prevalence of anaemia in 2011. Geneva: World Health Organization; 2015.
- World Health Organization (2014) Global Target Indicators: What is measured gets done. Geneva: World Health Organisation.

Table 13.2: Prevalence of Anaemia Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,590)

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	2,511	4,644,149	21.3	19.91	22.85
State					
Johor	183	472,455	20.7	17.49	24.43
Kedah	115	247,284	17.8	13.83	22.65
Kelantan	183	325,475	27.2	23.24	31.55
Melaka	194	144,934	23.9	18.20	30.72
Negeri Sembilan	126	145,802	20.0	15.81	24.93
Pahang	116	157,499	14.4	10.59	19.20
Pulau Pinang	167	338,636	26.6	22.17	31.45
Perak	185	430,110	26.6	21.22	32.88
Perlis	139	40,885	24.6	18.79	31.48
Selangor	233	834,312	18.0	14.20	22.45
Terengganu	142	159,549	20.1	17.54	22.95
Sabah	220	641,262	23.0	18.01	28.98
Sarawak	199	471,553	23.9	19.59	28.82
WP Kuala Lumpur	100	208,368	19.2	14.59	24.76
WP Labuan	111	14,331	21.6	18.04	25.75
WP Putrajaya	98	11,694	20.1	14.88	26.53
Location					
Urban	1,484	3,501,885	20.9	19.20	22.69
Rural	1,027	1,142,264	22.9	20.43	25.51
Sex					
Male	732	1,396,160	12.6	10.91	14.51
Female	1,779	3,247,989	30.4	28.44	32.47
Age Group (Years)					
15-19	171	507,321	20.5	16.67	24.98
20-24	157	478,202	17.6	13.43	22.81
25-29	163	496,238	17.3	13.95	21.15
30-34	188	423,616	16.7	13.80	20.15
35-39	205	428,240	19.4	16.12	23.27
40-44	199	389,321	22.5	18.73	26.70
45-49	233	361,507	22.8	19.59	26.47
50-54	211	325,387	22.8	19.12	26.93
55-59	217	270,249	21.3	18.10	24.93
60-64	207	272,651	25.8	21.65	30.36
65-69	185	238,870	31.6	25.70	38.73
70-74	158	180,171	34.4	28.62	40.59
75 & above	218	272,376	44.4	38.65	50.22
Ethnicity					
Malay ^a	1,633	2,484,256	21.8	20.43	23.28
Chinese	282	904,863	21.2	16.96	26.07
Indian	204	335,849	26.7	21.72	32.28

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sabah	187	353,101	24.4	19.62	29.96
Bumiputera Sarawak	105	211,044	20.4	16.31	25.21
Others	100	355,037	15.1	9.82	22.44
Marital Status					
Single	458	1,252,948	17.2	14.90	19.69
Married	1,669	2,878,721	22.1	20.59	23.78
Widow(er)/Divorcee	384	512,480	35.1	30.78	39.65
Education Level					
No Formal Education	197	299,561	28.4	23.00	34.55
Primary Education	666	967,498	22.6	19.99	25.49
Secondary Education	1,166	2,335,633	21.1	19.26	23.11
Tertiary Education	473	1,021,473	19.5	17.19	22.00
Occupation					
Government Employee	203	319,338	21.2	17.38	25.62
Private Employee	497	1,261,655	16.4	14.14	18.94
Self Employed	389	679,344	18.9	16.17	21.90
Unpaid Worker/ Homemaker	569	1,000,600	28.3	24.91	31.87
Retiree	135	211,446	28.5	22.93	34.82
Student	159	408,121	19.4	15.91	23.55
Not Working ^b	557	762,200	29.8	26.49	33.27
Household Income Group					
Less than RM 1,000	315	524,914	29.6	25.65	33.78
RM 1,000 - RM 1,999	506	824,638	19.1	16.70	21.81
RM 2,000 - RM 3,999	743	1,376,923	20.7	18.38	23.29
RM 4,000 - RM 5,999	349	724,849	21.2	17.59	25.31
RM 6,000 - RM 7,999	192	433,372	22.4	16.35	29.97
RM 8,000 - RM 9,999	90	208,036	23.1	16.33	31.60
RM 10,000 and above	122	253,808	16.6	12.28	21.99
Household Income Quintile					
Quintile 1	581	953,692	23.9	21.31	26.65
Quintile 2	502	867,776	20.7	17.83	23.84
Quintile 3	443	837,211	20.1	17.43	23.06
Quintile 4	387	792,646	20.9	17.55	24.69
Quintile 5	404	895,216	20.5	16.89	24.68
Household Income Category					
Bottom 40%	1,644	2,864,816	21.4	19.83	23.07
Middle 40%	511	1,120,338	21.0	17.74	24.75
Top 20%	162	361,386	20.00	15.65	25.32

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 13.3: Prevalence of Anaemia Level Among Respondents Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,590)

Sociodemographic Characteristics	Mild Anaemia					Moderate and Severe Anaemia				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	1,569	2,944,744	13.5	12.33	14.84	942	1,699,405	7.8	7.06	8.63
State										
Johor	111	280,044	12.3	10.23	14.72	72	192,412	8.5	4.66	9.38
Kedah	42	94,332	6.8	4.03	11.24	73	152,952	11.0	7.27	12.89
Kelantan	123	219,765	18.4	15.25	21.95	60	105,710	8.8	6.32	11.13
Melaka	110	89,695	14.8	10.25	20.87	84	55,239	9.1	5.38	10.89
Negeri Sembilan	77	78,622	10.8	8.05	14.29	49	67,180	9.2	4.90	14.03
Pahang	76	99,476	9.1	6.47	12.58	40	58,023	5.3	3.38	7.77
Pulau Pinang	110	256,600	20.1	16.87	23.82	57	82,037	6.4	3.51	10.98
Perak	113	278,828	17.3	12.33	23.67	72	151,281	9.4	6.26	12.56
Perlis	105	30,907	18.6	13.83	24.52	34	9,978	6.0	2.34	7.52
Selangor	134	514,321	11.1	7.87	15.36	99	319,991	6.9	4.54	8.08
Terengganu	97	104,747	13.2	11.19	15.51	45	54,802	6.9	4.29	9.74
Sabah	143	439,044	15.8	11.56	21.17	77	202,218	7.3	4.32	7.94
Sarawak	127	302,840	15.4	12.40	18.85	72	168,713	8.6	5.55	9.26
WP Kuala Lumpur	69	140,194	12.9	9.31	17.60	31	68,174	6.3	3.40	8.43
WP Labuan	67	7,429	11.2	8.57	14.56	44	6,902	10.4	7.00	13.91
WP Putrajaya	65	7,902	13.6	10.10	17.99	33	3,792	6.5	3.20	8.81
Location										
Urban	928	2,208,111	13.2	11.73	14.77	556	1,293,774	7.7	6.82	8.72
Rural	641	736,633	14.8	12.95	16.74	386	405,630	8.1	6.98	9.43
Sex										
Male	584	1,166,735	10.5	8.93	12.37	148	229,426	2.1	1.64	2.61
Female	985	1,778,009	16.7	15.04	18.40	794	1,469,979	13.8	12.45	15.20
Age Group										
15-19	105	338,960	13.7	10.38	17.89	66	168,361	6.8	4.72	9.73
20-24	86	287,715	10.6	6.89	16.00	71	190,487	7.0	5.30	9.26
25-29	103	333,303	11.6	8.87	15.00	60	162,934	5.7	4.05	7.86
30-34	118	263,477	10.4	8.23	13.08	70	160,138	6.3	4.47	8.88
35-39	116	260,956	11.9	9.20	15.14	89	167,284	7.6	5.75	9.97
40-44	113	221,994	12.8	10.14	16.06	85	167,326	9.7	7.06	13.08
45-49	136	188,817	11.9	9.52	14.86	97	172,691	10.9	8.61	13.74
50-54	139	223,937	15.7	12.83	19.04	72	101,450	7.1	5.16	9.72
55-59	144	176,684	13.9	11.36	16.99	73	93,564	7.4	5.49	9.85
60-64	136	184,198	17.4	14.03	21.40	71	88,453	8.4	6.16	11.25
65-69	130	171,902	22.8	16.74	30.14	55	66,968	8.9	6.15	12.62
70-74	108	118,244	22.6	17.71	28.25	50	61,927	11.8	7.97	17.15
75 & above	135	174,556	28.4	23.20	34.31	83	97,820	15.9	12.13	20.64
Ethnicity										
Malay ^a	1,017	1,522,941	13.4	12.23	14.61	616	961,315	8.4	7.54	9.44
Chinese	180	627,016	14.7	10.89	19.45	102	277,847	6.5	4.72	8.88
Indian	117	162,501	12.9	9.84	16.76	87	173,347	13.8	10.22	18.30
Bumiputera Sabah	118	221,320	15.3	11.50	20.09	69	131,781	9.1	6.55	12.55

Table 13.3: Prevalence of Anaemia Level Among Adults Aged 15 Years and Above in Malaysia by Socio-Demographic Characteristics (n=10,590) (cont'd)

Sociodemographic Characteristics	Mild Anaemia					Moderate and Severe Anaemia				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sarawak	69	145,260	14.0	10.78	18.09	36	65,784	6.4	4.24	9.44
Others	68	265,707	11.3	7.12	17.42	32	89,331	3.8	2.24	6.36
Marital Status										
Single	275	803,920	11.0	9.03	13.38	183	449,029	6.2	5.04	7.50
Married	1,062	1,829,938	14.1	12.75	15.51	607	1,048,783	8.1	7.21	9.02
Widow(er)/Divorcee	232	310,887	21.3	17.94	25.06	152	201,593	13.8	11.04	17.13
Education Level										
No Formal Education	113	192,209	18.2	13.39	24.34	84	107,352	10.2	7.32	14.00
Primary Education	431	636,065	14.9	12.76	17.26	235	331,433	7.8	6.41	9.34
Secondary Education	715	1,447,640	13.1	11.51	14.86	451	887,993	8.0	7.05	9.14
Tertiary Education	305	657,796	12.5	10.69	14.66	168	363,677	6.9	5.62	8.52
Occupation										
Government Employee	120	192,133	12.8	9.96	16.21	83	127,205	8.5	6.02	11.73
Private Employee	314	823,228	10.7	8.79	12.95	183	438,427	5.7	4.65	6.97
Self Employed	283	488,801	13.6	11.25	16.29	106	190,543	5.3	4.13	6.76
Unpaid Worker/Homemaker	329	573,912	16.2	13.50	19.34	240	426,687	12.1	10.21	14.17
Retiree	97	156,866	21.1	15.80	27.71	38	54,580	7.4	4.75	11.23
Student	90	231,811	11.0	8.67	13.96	69	176,311	8.4	6.08	11.49
Not Working ^b	334	476,548	18.6	15.85	21.73	223	285,652	11.2	9.34	13.28
Household Income Group										
Less than RM 1,000	198	339,004	19.1	15.49	23.29	117	185,911	10.5	8.14	13.36
RM 1,000 - RM 1,999	316	501,062	11.6	9.80	13.73	190	323,576	7.5	6.12	9.17
RM 2,000 - RM 3,999	453	858,245	12.9	10.92	15.22	290	518,678	7.8	6.55	9.28
RM 4,000 - RM 5,999	213	458,173	13.4	10.72	16.63	136	266,676	7.8	5.93	10.20
RM 6,000 - RM 7,999	123	292,117	15.1	9.83	22.56	69	141,254	7.3	4.96	10.65
RM 8,000 - RM 9,999	60	148,754	16.5	10.61	24.79	30	59,283	6.6*	3.53	11.94
RM 10,000 and above	73	149,476	9.8	6.98	13.49	49	104,332	6.8	4.53	10.12
Household Income Quintile										
Quintile 1	354	567,662	14.2	12.07	16.66	227	386,030	9.7	8.06	11.56
Quintile 2	331	580,785	13.8	11.38	16.72	171	286,992	6.8	5.43	8.58
Quintile 3	258	508,653	12.2	10.05	14.76	185	328,558	7.9	6.34	9.76
Quintile 4	237	499,385	13.2	10.66	16.15	150	293,261	7.7	5.97	9.95
Quintile 5	256	590,347	13.5	10.45	17.33	148	304,868	7.0	5.40	8.99
Household Income Category										
Bottom 40%	1,012	1,775,016	13.3	11.94	14.70	632	1,089,800	8.1	7.21	9.18
Middle 40%	328	753,327	14.1	11.37	17.46	183	367,011	6.9	5.36	8.81
Top 20%	96	218,488	12.1	9.06	16.04	66	142,898	7.9	5.68	10.95

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli
 b - Not working includes Unemployed, and Old Age

Table 13.4: Prevalence of Anaemia Among Women of Reproductive Age Group (15-49 years) in Malaysia by Socio-Demographic Characteristics (n=3,648)

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	1,042	2,318,725	29.9	27.53	32.39
State					
Johor	71	220,010	28.8	24.10	33.97
Kedah	46	118,826	25.0	17.21	34.87
Kelantan	55	127,943	29.8	23.97	36.39
Melaka	79	71,072	32.9	23.95	43.19
Negeri Sembilan	52	88,720	37.8	26.41	50.79
Pahang	45	66,645	18.1	13.00	24.56
Pulau Pinang	64	156,705	38.1	27.82	49.49
Perak	59	160,907	33.0	25.49	41.43
Perlis	32	15,979	28.1	17.68	41.47
Selangor	125	480,488	27.5	21.80	34.00
Terengganu	58	72,273	24.5	19.49	30.30
Sabah	111	403,776	36.6	28.64	45.42
Sarawak	82	212,748	30.8	24.28	38.09
WP Kuala Lumpur	40	104,944	25.2	16.89	35.76
WP Labuan	61	9,821	36.5	29.51	44.15
WP Putrajaya	62	7,867	27.8	19.35	38.13
Location					
Urban	671	1,788,805	29.6	26.88	32.47
Rural	371	529,919	31.0	26.35	35.99
Age Group (Years)					
15-19	135	382,489	31.7	25.23	38.89
20-24	128	355,245	27.4	21.82	33.81
25-29	129	367,457	27.0	21.93	32.76
30-34	148	332,289	28.2	22.84	34.20
35-39	158	315,951	28.8	23.65	34.46
40-44	156	271,044	32.9	27.12	39.27
45-49	188	294,249	37.4	31.89	43.18
Ethnicity					
Malay ^a	659	1,251,069	29.6	26.92	32.42
Chinese	84	334,242	26.3	20.56	32.96
Indian	89	183,320	39.8	31.41	48.86
Bumiputera Sabah	101	221,766	37.8	29.84	46.48
Bumiputera Sarawak	47	87,002	24.1	17.19	32.80
Others	62	241,325	28.4	17.88	42.80
Marital Status					
Single	315	833,868	28.4	24.62	32.58
Married	676	1,398,363	30.8	27.77	33.92
Widow(er)/Divorcee	51	86,493	31.4	22.08	42.45

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Education Level					
No Formal Education	18	58,247	31.5*	15.86	52.82
Primary Education	123	233,556	26.8	21.42	32.94
Secondary Education	580	1,310,740	31.4	28.20	34.88
Tertiary Education	315	700,311	28.1	24.34	32.24
Occupation					
Government Employee	122	201,016	33.1	26.38	40.68
Private Employee	282	739,190	29.4	25.30	33.91
Self Employed	131	261,554	33.7	27.67	40.40
Unpaid Worker/ Homemaker	325	697,316	30.7	26.08	35.65
Retiree					
Student	129	312,618	28.1	22.70	34.19
Not Working ^b	53	107,029	22.7	15.44	32.18
Household Income Group					
Less than RM 1,000	81	161,784	30.4	23.50	38.20
RM 1,000 - RM 1,999	195	406,842	28.0	23.30	33.21
RM 2,000 - RM 3,999	328	741,304	31.5	27.09	36.20
RM 4,000 - RM 5,999	179	410,910	31.6	24.51	39.69
RM 6,000 - RM 7,999	97	226,681	31.5	23.99	40.17
RM 8,000 - RM 9,999	44	107,148	28.7	18.51	41.58
RM 10,000 and above	69	153,720	29.0	21.47	38.00
Household Income Quintile					
Quintile 1	180	381,556	29.1	24.26	34.40
Quintile 2	209	439,001	32.6	27.13	38.66
Quintile 3	199	450,737	29.2	24.54	34.44
Quintile 4	195	449,547	31.2	24.50	38.68
Quintile 5	210	487,549	30.1	25.01	35.65
Household Income Category					
Bottom 40%	667	1,403,048	30.4	27.33	33.70
Middle 40%	249	605,855	29.8	24.48	35.71
Top 20%	77	199,487	32.2	24.85	40.64

*Prevalence with high RSE, interpret with caution
a - Malay includes Orang Asli
b - Not working includes Unemployed, and Old Age

Table 13.5: Prevalence of Anaemia Level Among Women of Reproductive Age Group (15-49 years) in Malaysia by Socio-Demographic Characteristics (n=3,648)

Sociodemographic Characteristics	Mild Anaemia					Moderate and Severe Anaemia				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	557	1,236,804	15.9	14.07	18.03	485	975,181	14.0	12.40	15.66
State										
Johor	35	104,063	13.6	10.51	17.46	36	115,946	15.2	10.99	20.56
Kedah	14	34,697	7.3*	2.93	17.04	32	84,129	17.7	12.43	24.60
Kelantan	31	70,042	16.3	12.43	21.13	24	57,901	13.5	9.27	19.22
Melaka	42	39,218	18.1	11.30	27.80	37	31,853	14.7	9.60	21.91
Negeri Sembilan	28	40,651	17.3	12.16	24.12	24	48,068	20.5*	10.50	36.18
Pahang	26	38,479	10.4	6.88	15.50	19	28,167	7.6	4.54	12.56
Pulau Pinang	33	103,958	25.3	16.74	36.21	31	52,747	12.8	7.14	21.92
Perak	25	63,759	13.1	8.01	20.59	34	97,148	19.9	12.99	29.26
Perlis	22	10,232	18.0	11.58	26.82	10	5,747	10.1*	3.96	23.42
Selangor	63	252,204	14.4	10.88	18.89	62	228,284	13.1	9.58	17.55
Terengganu	40	48,231	16.3	11.99	21.90	18	24,042	8.1	4.72	13.71
Sabah	60	238,948	21.7	14.43	31.23	51	164,828	15.0	10.62	20.63
Sarawak	44	122,036	17.6	12.68	24.01	38	90,711	13.1	9.41	17.99
WP Kuala Lumpur	24	60,813	14.6	8.45	24.00	16	44,131	10.6	5.92	18.21
WP Labuan	29	4,135	15.4	9.82	23.26	32	5,685	21.1	14.86	29.16
WP Putrajaya	41	5,336	18.8	12.55	27.29	21	2,531	8.9	5.62	13.91
Location										
Urban	364	951,224	15.7	13.58	18.17	307	837,581	13.9	12.03	15.92
Rural	193	285,579	16.7	13.17	20.92	178	244,340	14.3	11.81	17.16
Age Group										
15-19	73	219,938	18.2	12.62	25.54	62	162,551	13.5	9.25	19.17
20-24	64	176,470	13.6	9.24	19.62	64	178,775	13.8	10.29	18.24
25-29	77	217,144	16.0	11.94	21.01	52	150,312	11.0	7.82	15.37
30-34	85	188,549	16.0	12.23	20.63	63	143,740	12.2	8.52	17.14
35-39	81	178,040	16.2	12.00	21.52	77	137,911	12.6	9.48	16.44
40-44	79	121,166	14.7	11.29	18.95	77	149,878	18.2	13.58	23.96
45-49	98	135,497	17.2	13.37	21.86	90	158,753	20.2	15.83	25.32
Ethnicity										
Malay ^a	358	658,972	15.6	13.55	17.88	301	592,097	14.0	12.00	16.29
Chinese	45	185,274	14.6	10.59	19.72	39	148,968	11.7	7.90	17.04
Indian	41	67,912	14.7	9.61	21.97	48	115,408	25.1	18.28	33.34
Bumiputera Sabah	53	115,843	19.7	13.71	27.59	48	105,923	18.1	12.22	25.86
Bumiputera Sarawak	25	51,832	14.4	9.46	21.28	22	35,170	9.8	5.66	16.33
Others	35	156,971	18.5	10.26	31.06	27	84,354	9.9	6.05	15.90
Marital Status										
Single	170	450,340	15.4	12.24	19.08	145	383,527	13.0	10.48	16.20
Married	361	751,435	16.5	14.10	19.28	315	646,928	14.2	12.38	16.31
Widow(er)/Divorcee	26	35,028	12.7	7.45	20.83	25	51,465	18.7	11.06	29.76

Table 13.5: Prevalence of Anaemia Level Among Women of Reproductive Age Group (15-49 years) in Malaysia by Socio-Demographic Characteristics (n=3,648) (cont'd)

Sociodemographic Characteristics	Mild Anaemia					Moderate and Severe Anaemia				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Education Level										
No Formal Education	11	45,510	24.6*	9.37	50.72	7	12,737	6.9*	2.69	16.50
Primary Education	54	99,824	11.4	8.08	15.97	69	133,732	15.3	10.98	21.01
Secondary Education	302	677,853	16.3	13.83	19.02	278	632,887	15.2	13.11	17.51
Tertiary Education	188	406,696	16.3	13.38	19.79	127	293,615	11.8	9.28	14.87
Occupation										
Government Employee	70	117,077	19.3	14.22	25.66	52	83,940	13.8	8.76	21.19
Private Employee	147	388,685	15.5	12.18	19.45	135	350,505	14.0	11.32	17.08
Self Employed	76	156,396	20.2	15.21	26.26	55	105,158	13.6	9.81	18.45
Unpaid Worker/Homemaker	176	379,780	16.7	12.88	21.37	149	317,536	14.0	11.43	16.94
Retiree	0	-	-	-	-	0	-	-	-	-
Student	63	141,133	12.7	9.43	16.84	66	171,485	15.4	11.08	21.03
Not Working ^b	25	53,732	11.4	6.55	19.15	28	53,297	11.3	6.98	17.86
Household Income Group										
Less than RM 1,000	38	73,438	13.8	9.30	19.93	43	88,346	16.6	10.99	24.23
RM 1,000 - RM 1,999	101	205,229	14.1	10.89	18.12	94	201,613	13.9	10.61	17.93
RM 2,000 - RM 3,999	173	404,888	17.2	13.28	21.95	155	336,416	14.3	11.54	17.55
RM 4,000 - RM 5,999	90	214,743	16.5	11.44	23.27	89	196,168	15.1	11.02	20.32
RM 6,000 - RM 7,999	61	138,177	19.2	14.19	25.50	36	88,503	12.3	7.54	19.45
RM 8,000 - RM 9,999	29	65,827	17.6	10.21	28.68	15	41,322	11.1*	5.64	20.54
RM 10,000 and above	33	66,751	12.6	8.00	19.33	36	86,969	16.4	10.72	24.36
Household Income Quintile										
Quintile 1	81	161,480	12.3	9.48	15.81	99	220,076	16.8	12.94	21.44
Quintile 2	118	253,928	18.9	13.91	25.11	91	185,074	13.8	10.14	18.41
Quintile 3	104	247,274	16.0	12.25	20.73	95	203,463	13.2	10.09	17.09
Quintile 4	99	235,616	16.3	11.56	22.56	96	213,931	14.8	11.03	19.64
Quintile 5	123	270,754	16.7	13.27	20.79	87	216,794	13.4	10.08	17.52
Household Income Category										
Bottom 40%	341	720,841	15.6	13.09	18.55	326	682,207	14.8	12.71	17.15
Middle 40%	146	355,799	17.5	13.59	22.23	103	250,056	12.3	9.24	16.19
Top 20%	38	92,413	14.9	10.34	21.10	39	107,074	17.3	12.13	24.08

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Nutritional Status of Adults

Nutritional Status of Adults

Contributors to this section: Syafinaz Mohd Sallehuddin, Azli Baharudin, Munawara Pardi, Suhaila Abd Ghaffar, Ruhaya Salleh, Nur Shahida Abdul Aziz, Mohamad Hasnan Ahmad, Ahmad Ali Zainuddin, Norlida Zulkafly, Rusidah Selamat, Hamid Jan Jan Mohamed

Introduction

Nutritional status is an essential element of population health. Body Mass Index (BMI) and waist circumference (WC) are important and universally acceptable anthropometric measurements among adults age 18 years old and above. These are non-invasive methods that can assess size, proportion and composition of the human body [1]. The nutritional assessments are not only limited to individuals but also reflect the health status including cardiovascular risk, social and economic circumstances of population groups [2][3].

Anthropometric techniques have become indispensable instruments for the evaluation of the nutritional and health status of children and adults.

Objectives

General objective

To determine the body mass index and waist circumference status among Malaysians aged 18 years old and above.

Specific objectives

1. To determine the prevalence of underweight, normal, overweight and obesity among Malaysian adults by socio-demography groups
2. To determine the prevalence of abdominal obesity among Malaysian adults by socio-demography groups

Methods

Classification of nutritional status was made according to recommendation by World Health Organization (1998) [1] and World Health Organization (2000) [4]. The anthropometric measurements for this survey were done by trained researchers according to the standard protocol.

Body Mass Index (BMI) was calculated as the ratio of weight in kilogram to the square of height in metres (kg/m^2) and classified using two guidelines for this study as following:

- The World Health Organization (1998)
Classified BMI into 6 categories; underweight ($<18.5 \text{ kg}/\text{m}^2$), normal ($18.5\text{-}24.9 \text{ kg}/\text{m}^2$), overweight ($25.0\text{-}29.9 \text{ kg}/\text{m}^2$), obese I ($30.0\text{-}34.9 \text{ kg}/\text{m}^2$), obese II ($35.0\text{-}39.9 \text{ kg}/\text{m}^2$) and obese III ($\geq 40 \text{ kg}/\text{m}^2$).
- The Malaysian Clinical Practice Guidelines of Obesity (2004)
Classified BMI into 6 categories; underweight ($<18.5 \text{ kg}/\text{m}^2$), normal ($18.5\text{-}22.9 \text{ kg}/\text{m}^2$), overweight ($23.0\text{-}27.4 \text{ kg}/\text{m}^2$), obese I ($27.5\text{-}34.9 \text{ kg}/\text{m}^2$), obese II ($35.0\text{-}39.9 \text{ kg}/\text{m}^2$) and obese III ($\geq 40 \text{ kg}/\text{m}^2$).

For assessment on 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-off values of $\geq 90 \text{ cm}$ for men and $\geq 80 \text{ cm}$ for women [4].

Findings

Underweight

The national prevalence of underweight among adults was 6.5% (95% CI: 5.71, 7.45). Among states, Pulau Pinang [9.8% (95% CI: 6.50, 14.56)] had the highest prevalence of underweight. The results revealed that higher prevalence of underweight were observed among those from rural areas [8.5% (95% CI: 6.74, 10.68)], males [7.3% (95% CI: 6.05, 8.70)], aged 15 -19 years old [22.9% (95% CI: 17.38, 29.64)], Bumiputera Sarawak [7.9% (95% CI: 5.54, 11.05)], single [12.7% (95% CI: 10.68, 15.05)], no formal education [10.7% (95% CI: 6.82, 16.51)], and private employees [7.1% (95% CI: 5.80, 8.73)]. The underweight prevalence was higher in students [15.2% (95% CI: 11.04, 20.59)], and from B40 income group [7.0% (95% CI: 6.00, 8.26)]

Normal weight

Prevalence of normal weight was 43.3% (95% CI: 41.39, 45.23). Perak had the highest prevalence of normal weight [48.2% (95% CI: 41.70, 54.80)]. Urban areas [43.7% (95% CI: 41.36, 45.99)], males [46.7% (95% CI: 44.10, 49.33)], those aged 75 years and above [58.4% (95% CI: 50.86, 65.54)], Chinese [52.8% (95% CI: 47.76, 57.84)], single [48.3% (95% CI: 45.10, 51.45)], no formal education [46.0% (95% CI: 39.40, 52.79)], students [49.2% (95% CI: 41.46, 56.91)], and T20 income group [47.7% (95% CI: 41.93, 53.49)] had the highest prevalence of normal weight for their respective groups.

Overweight

The national prevalence of overweight was 30.4% (95% CI: 29.00, 31.90). WP Putrajaya [37.7% (95% CI: 32.40, 43.20)] had the highest prevalence of overweight. In term of locality, urban [30.6% (95% CI: 28.90, 32.43)] had slightly higher as compared to rural. The highest prevalence of overweight was among males [30.8% (95% CI: 28.80, 32.80)], those aged 45-49 years old [39.6% (95% CI: 34.80, 44.60)], Bumiputera Sabah [35.3% (95% CI: 30.83, 40.08)], married [33.9% (95% CI: 32.00, 35.80)], primary education [31.5% (95% CI: 28.30, 34.80)], government employees [39.5% (95% CI: 34.70, 44.50)] and those in the T20 income group [32.0% (95% CI: 27.50, 36.90)].

Obesity

Prevalence of obesity was 19.7% (95% CI: 18.43, 21.13). The highest prevalence of obesity was observed in Perlis 27.5% (95% CI: 24.43, 30.83), from rural areas [19.8% (95% CI: 17.90, 21.79)], females [24.7% (95% CI: 22.86, 26.59)], aged 35-39 years old [25.3% (95% CI: 21.80, 29.23)], Indian [29.3% (95% CI: 23.40, 35.93)], married [21.2% (95% CI: 19.67, 22.82)], secondary education [21.2% (95% CI: 19.54, 22.89)], unpaid / home maker [26.5% (95% CI: 23.69, 29.55)], and those in the M40 income group [21.5% (95% CI: 18.53, 24.79)].

Abdominal obesity

National prevalence of abdominal obesity among adults was 52.6% (95% CI: 50.54, 54.58). Negeri Sembilan has the highest prevalence of abdominal obesity [61.5% (95% CI: 51.58, 70.55)], urban [53.1% (95% CI: 50.65, 55.54)], female [64.8% (95% CI: 62.62, 66.94)], 60-64 years old [71.5% (95% CI: 66.59, 75.96)], Indians [68.3% (95% CI: 60.95, 74.80)], among widow(er) / divorcee [67.8% (95% CI: 62.73, 72.52)], no formal education [59.0% (95% CI: 51.74, 65.89)], unpaid worker / home maker [69.3% (95% CI: 65.90, 72.42)], and those in the M40 income group [53.4% (95% CI: 49.62, 57.14)].

Conclusion

The findings from NHMS 2019 showed that the national prevalence of underweight, normal, overweight and obese among adults aged 18 years and above were 6.5%, 43.3%, 30.4% and 19.7% respectively. The prevalence of abdominal obesity among adults in Malaysia was found to be 52.6%. The current prevalence of underweight, normal, overweight, obese and abdominal obesity shows an increase compared to the previous study in 2015 (6.7%, 45.6%, 30.0%, 17.7% and 48.6%) [5]. Nevertheless, the prevalence of overweight in Malaysia is still lower than the global prevalence of 39% [6].

The alarming trend of obesity epidemic in Malaysia needs immediate action through public health policies to ensure the awareness and practice of a healthier living environment to reduce the risk of obesity and abdominal obesity.

Recommendations

1. Strengthening of the nutrition and public health intervention programmes and activities, aiming at the advocating healthy eating and lifestyle among public sector/ semi government servants.
2. Incorporate and consolidate the concept of Malaysian Healthy Plate (suku-suku separuh) into the existing programmes carried out by various ministries and agencies.
3. Explore funding opportunities among multi-sectoral NGOs and volunteers to support nutrition education programmes.
4. Strengthening various nutrition advocacies throughout social media and networks such as the Facebooks, Twitter, Instagram, Whatsapp, Telegrams to inculcate and empower healthy eating and lifestyle.
5. Engagement / partnerships with multi-disciplinary and multi-stakeholder holistic to support effective nutrition programmes and policies at national and local levels.

Table 14.1: Nutritional Status (Adult) Trend in Malaysia

	2011	2015	2019
Underweight	8.3	6.7	6.5
Overweight	29.4	30.0	30.4
Obesity	15.1	17.7	19.7
Abdominal Obesity	45.4	48.6	52.6

References

1. World Health Organization. (WHO). Obesity: preventing and managing the global epidemic. Geneva;1998
2. Kotseva K, De Bacquer D, De Backer G, Rydén L, Jennings C, Gyberg V, Abreu A, Aguiar C, Conde AC, Davletov K, Dilic M. Lifestyle and risk factor management in people at high risk of cardiovascular disease. A report from the European Society of Cardiology European Action on Secondary and Primary Prevention by Intervention to Reduce Events (EUROASPIRE) IV cross-sectional survey in 14 European regions. *European journal of preventive cardiology*. 2016 Dec;23(18):2007-18.
3. Lam BC, Koh GC, Chen C, Wong MT, Fallows SJ. Comparison of body mass index (BMI), body adiposity index (BAI), waist circumference (WC), waist-to-hip ratio (WHR) and waist-to-height ratio (WHtR) as predictors of cardiovascular disease risk factors in an adult population in Singapore. *PLoS one*. 2015 Apr 16;10(4): e0122985.
4. World Health Organization (WHO). International Association for the Study of Obesity (IASO), International Obesity Task Force (IOTF) (2000). *The Asia-Pacific Perspective: Redefining Obesity and Its Treatment*. Geneva: World Health Organization.
5. Institute for Public Health. National Health and Morbidity Survey 2015 (NHMS 2015).
6. <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>. accessed on 17th April 2020.

Table 14.2: Prevalence of Underweight Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,811)

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	536	1,301,375	6.5	5.71	7.45
State					
Johor	41	130,367	6.0	4.28	8.30
Kedah	20	48,952	4.0	2.56	6.24
Kelantan	35	79,721	7.5	5.34	10.53
Melaka	40	53,014	9.3	5.58	15.18
Negeri Sembilan	22	41,154	6.3	3.81	10.35
Pahang	32	56,479	5.7	3.48	9.20
Pulau Pinang	55	118,970	9.8	6.50	14.56
Perak	22	76,543	5.1*	1.96	12.76
Perlis	19	6,756	4.5	2.74	7.22
Selangor	50	209,569	5.0	3.49	7.15
Terengganu	39	53,128	7.5	5.23	10.51
Sabah	51	208,391	8.6	5.67	12.75
Sarawak	49	145,768	8.3	5.97	11.39
WP Kuala Lumpur	19	67,913	5.6	3.56	8.72
WP Labuan	32	3,386	5.6	3.55	8.76
WP Putrajaya	10	1,263	2.3	1.28	4.09
Location					
Urban	300	926,737	6.0	5.08	7.00
Rural	236	374,638	8.5	6.74	10.68
Sex					
Male	276	757,933	7.3	6.05	8.70
Female	260	543,442	5.7	4.78	6.83
Age Group (Years)					
18-19	75	197,383	22.9	17.38	29.64
20-24	131	380,609	14.1	11.26	17.49
25-29	72	270,157	9.5	7.18	12.53
30-34	32	72,617	2.9	1.77	4.87
35-39	34	78,282	3.5	2.30	5.36
40-44	21	61,313	3.5*	1.62	7.39
45-49	16	32,317	2.0*	0.85	4.71
50-54	20	22,831	1.6*	0.80	3.04
55-59	13	22,905	1.8*	0.82	3.94
60-64	30	35,326	3.4	2.02	5.57
65-69	25	42,385	5.7*	2.40	13.07
70-74	25	34,626	6.9	4.37	10.65
75 & above	42	50,624	10.5	6.62	16.21
Ethnicity					
Malay ^a	362	667,543	6.5	5.63	7.50
Chinese	68	275,004	6.7	4.50	9.78
Indian	19	40,388	3.4*	1.72	6.79
Bumiputera Sabah	36	76,046	5.9	3.27	10.33

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sarawak	24	71,903	7.9	5.54	11.05
Others	27	170,490	7.9	4.77	12.72
Marital Status					
Single	267	743,387	12.7	10.68	15.05
Married	218	466,755	3.7	2.89	4.65
Widow(er)/Divorcee	51	91,233	6.6	4.16	10.46
Education Level					
No Formal Education	51	101,586	10.7	6.82	16.51
Primary Education	93	197,392	5.2	3.55	7.58
Secondary Education	270	661,983	6.7	5.66	7.99
Tertiary Education	119	330,915	6.3	4.86	8.13
Occupation					
Government Employee	28	53,623	3.6	2.18	5.78
Private Employee	168	556,923	7.1	5.80	8.73
Self Employed	85	191,149	5.3	3.80	7.36
Unpaid Worker/ Homemaker	57	95,111	2.9	2.00	4.28
Retiree	18	35,926	4.8*	1.67	12.83
Student	46	108,213	15.2	11.04	20.59
Not Working ^b	134	260,429	11.3	9.01	14.20
Household Income Group					
Less than RM 1,000	60	122,473	7.8	5.24	11.52
RM 1,000 - RM 1,999	121	272,008	7.0	5.35	9.19
RM 2,000 - RM 3,999	165	463,482	7.6	6.01	9.67
RM 4,000 - RM 5,999	77	180,702	5.8	4.20	7.97
RM 6,000 - RM 7,999	43	120,537	6.5	4.25	9.67
RM 8,000 - RM 9,999	18	42,185	4.9*	2.22	10.46
RM 10,000 and above	20	54,323	3.6*	1.91	6.77
Household Income Quintile					
Quintile 1	123	276,887	7.9	6.00	10.33
Quintile 2	102	214,191	5.5	4.21	7.23
Quintile 3	109	342,779	9.0	6.83	11.89
Quintile 4	89	204,807	5.9	4.42	7.93
Quintile 5	81	217,046	5.1	3.69	7.10
Household Income Category					
Bottom 40%	355	858,358	7.0	6.00	8.26
Middle 40%	120	299,324	6.1	4.71	7.80
Top 20%	29	98,028	5.7	3.49	9.04

CPG 2004 (BMI < 18.5 kg/m²) & WHO 1998 (BMI < 18.5 kg/m²)

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 14.3: Prevalence of Normal BMI Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,811)

Sociodemographic Characteristics	Normal BMI (BMI 18.5 - 22.9 kg/m ²)					Normal BMI (BMI 18.5 - 24.9 kg/m ²)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	2,332	5,473,841	27.5	25.75	29.24	3,868	8,631,511	43.3	41.39	45.23
State										
Johor	194	632,326	29.0	25.49	32.85	316	946,657	43.5	39.04	47.99
Kedah	115	309,350	25.4	20.40	31.10	192	482,744	39.6	33.77	45.75
Kelantan	143	287,372	27.2	22.16	32.83	228	440,130	41.6	35.66	47.81
Melaka	120	121,123	21.3	16.61	26.90	214	221,098	38.9	31.20	47.17
Negeri Sembilan	94	129,210	19.9	15.04	25.79	174	235,100	36.2	31.04	41.62
Pahang	158	280,658	28.3	22.92	34.46	269	462,595	46.7	41.74	51.74
Pulau Pinang	146	329,628	27.2	22.78	32.09	224	484,719	40.0	34.03	46.24
Perak	134	423,079	28.3	22.35	35.17	237	720,269	48.2	41.70	54.80
Perlis	120	37,038	24.5	20.62	28.89	192	54,557	36.1	31.79	40.67
Selangor	244	1,249,996	29.9	24.86	35.45	410	1,957,210	46.8	40.77	52.91
Terengganu	153	188,790	26.5	23.20	30.07	251	310,484	43.6	39.51	47.71
Sabah	193	680,991	28.0	22.08	34.79	316	1,054,770	43.4	37.40	49.53
Sarawak	166	435,570	24.8	20.74	29.29	266	671,723	38.2	33.72	42.87
WP Kuala Lumpur	128	341,607	28.2	21.77	35.63	202	545,030	45.0	38.56	51.56
WP Labuan	131	16,291	27.0	22.58	31.96	209	25,427	42.2	35.00	49.68
WP Putrajaya	93	10,811	19.6	15.10	25.11	168	18,998	34.5	28.63	40.85
Location										
Urban	1,420	4,263,539	27.5	25.41	29.59	2,391	6,780,425	43.7	41.36	45.99
Rural	912	1,210,302	27.5	24.72	30.41	1,477	1,851,087	42.0	39.16	44.94
Sex										
Male	1,152	2,988,516	28.6	26.12	31.29	1,951	4,874,309	46.7	44.10	49.33
Female	1,180	2,485,325	26.2	24.23	28.20	1,917	3,757,202	39.6	37.34	41.82
Age Group										
18-19	116	310,657	36.1	29.20	43.63	144	391,902	45.5	38.16	53.13
20-24	328	1,140,657	42.2	36.62	48.05	424	1,476,636	54.7	49.41	59.82
25-29	273	914,478	32.2	28.00	36.80	419	1,289,091	45.4	40.68	50.31
30-34	214	637,974	25.9	20.37	32.31	374	1,044,642	42.4	36.65	48.36
35-39	230	510,661	23.0	19.32	27.05	378	886,043	39.8	35.31	44.54
40-44	164	355,219	20.2	16.52	24.57	289	635,461	36.2	31.57	41.15
45-49	158	329,871	20.6	16.72	25.17	295	622,696	38.9	33.61	44.56
50-54	167	321,611	22.1	18.44	26.26	315	568,053	39.0	34.55	43.71
55-59	162	252,030	19.9	16.58	23.65	297	472,970	37.3	33.34	41.47
60-64	144	209,082	20.0	16.08	24.52	289	395,942	37.8	32.60	43.31
65-69	121	176,481	23.9	18.08	30.86	245	343,554	46.5	39.68	53.45
70-74	111	130,410	25.9	20.45	32.19	189	222,551	44.2	37.55	51.03
75 & above	144	184,709	38.2	31.54	45.43	210	281,969	58.4	50.86	65.54
Ethnicity										
Malay ^a	1,433	2,563,218	25.0	23.41	26.60	2,387	4,086,464	39.8	38.05	41.60
Chinese	370	1,411,368	34.2	29.25	39.60	598	2,178,057	52.8	47.76	57.84
Indian	113	201,586	17.2	12.86	22.58	209	383,542	32.7	26.80	39.19
Bumiputera Sabah	142	294,231	22.7	17.73	28.64	244	508,828	39.3	34.21	44.63

Table 14.3: Prevalence of Normal BMI Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,811) (cont'd)

Sociodemographic Characteristics	Normal BMI (BMI 18.5 - 22.9 kg/m ²)					Normal BMI (BMI 18.5 - 24.9 kg/m ²)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sarawak	89	205,991	22.5	17.67	28.26	145	337,940	37.0	31.79	42.44
Others	185	797,445	36.8	30.24	43.96	285	1,136,680	52.5	45.47	59.45
Marital Status										
Single	683	2,061,113	35.2	32.24	38.34	951	2,823,916	48.3	45.10	51.45
Married	1,412	3,059,138	24.1	21.96	26.30	2,519	5,241,954	41.2	38.97	43.54
Widow(er)/Divorcee	237	353,590	25.8	21.57	30.46	398	565,641	41.2	36.51	46.09
Education Level										
No Formal Education	137	261,386	27.6	21.22	35.09	234	435,224	46.0	39.34	52.79
Primary Education	533	1,102,870	29.1	25.05	33.56	882	1,735,780	45.8	41.98	49.73
Secondary Education	1,093	2,580,737	26.2	24.23	28.36	1,802	4,116,684	41.9	39.63	44.14
Tertiary Education	555	1,493,057	28.4	24.92	32.23	925	2,283,287	43.5	39.63	47.41
Occupation										
Government Employee	200	295,556	19.7	16.09	23.81	373	542,452	36.1	31.30	41.17
Private Employee	777	2,350,939	30.1	27.45	32.84	1,243	3,669,516	46.9	44.07	49.85
Self Employed	424	1,016,366	28.2	23.36	33.58	713	1,557,689	43.2	38.32	48.23
Unpaid Worker/Homemaker	360	703,839	21.7	18.93	24.78	626	1,207,043	37.2	33.74	40.88
Retiree	94	145,171	19.2	15.11	24.19	187	282,142	37.4	31.61	43.57
Student	100	273,544	38.4	31.22	46.22	127	349,826	49.2	41.46	56.91
Not Working ^b	375	685,198	29.9	25.98	34.03	596	1,019,083	44.4	39.97	48.92
Household Income Group										
Less than RM 1,000	257	468,554	29.9	25.47	34.81	422	716,426	45.8	40.85	50.77
RM 1,000 - RM 1,999	464	1,151,980	29.8	25.48	34.44	782	1,729,177	44.7	40.59	48.84
RM 2,000 - RM 3,999	676	1,646,548	27.1	24.14	30.35	1,123	2,567,089	42.3	39.20	45.46
RM 4,000 - RM 5,999	363	810,516	26.0	22.28	30.20	576	1,295,972	41.6	37.05	46.39
RM 6,000 - RM 7,999	205	497,152	26.6	21.52	32.41	333	764,576	40.9	36.15	45.87
RM 8,000 - RM 9,999	84	232,969	27.0	20.36	34.97	140	390,643	45.4	36.68	54.32
RM 10,000 and above	156	414,895	27.7	23.04	32.85	284	727,768	48.5	42.24	54.89
Household Income Quintile										
Quintile 1	495	1,030,949	29.4	26.27	32.77	837	1,582,699	45.2	41.45	48.93
Quintile 2	435	1,143,068	29.5	24.78	34.74	727	1,725,456	44.5	39.98	49.21
Quintile 3	416	990,030	26.1	22.90	29.63	691	1,556,415	41.1	37.60	44.64
Quintile 4	414	913,549	26.5	22.86	30.46	648	1,444,095	41.9	37.48	46.40
Quintile 5	445	1,145,016	27.1	23.81	30.61	757	1,882,987	44.5	41.03	48.08
Household Income Category										
Bottom 40%	1,483	3,398,702	27.9	25.68	30.24	2,471	5,271,455	43.3	40.86	45.72
Middle 40%	552	1,381,293	28.0	24.69	31.61	877	2,093,296	42.5	39.01	45.99
Top 20%	170	442,618	25.5	21.51	29.99	312	826,900	47.7	41.93	53.49

CPG 2004 (BMI 18.5 - 22.9 kg/m²) & WHO 1998 (BMI 18.5 - 24.9 kg/m²)

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 14.4: Prevalence of Overweight Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,811)

Sociodemographic Characteristics	Overweight (BMI 23.0 - 27.5 kg/m ²)					Overweight (BMI 25.0 - 30.0 kg/m ²)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	3,310	6,448,586	32.3	30.95	33.78	3,263	6,066,191	30.4	29.00	31.90
State										
Johor	254	639,974	29.4	25.92	33.10	242	625,158	28.7	24.58	33.21
Kedah	188	420,669	34.5	29.32	40.11	193	418,622	34.3	29.31	39.76
Kelantan	172	305,970	28.9	25.01	33.18	167	301,105	28.5	24.64	32.63
Melaka	187	180,475	31.7	25.36	38.90	200	161,990	28.5	23.04	34.66
Negeri Sembilan	172	235,969	36.3	31.59	41.28	163	224,634	34.6	28.46	41.20
Pahang	228	345,109	34.8	27.57	42.90	206	304,009	30.7	26.95	34.71
Pulau Pinang	186	374,335	30.9	25.98	36.25	187	383,638	31.6	25.74	38.20
Perak	188	487,974	32.7	28.50	37.14	164	376,278	25.2	19.34	32.10
Perlis	172	44,786	29.6	25.58	34.07	174	48,184	31.9	26.40	37.90
Selangor	350	1,355,700	32.4	28.53	36.55	345	1,207,216	28.9	25.10	32.90
Terengganu	208	241,678	33.9	31.66	36.24	201	217,835	30.6	26.30	35.20
Sabah	272	787,926	32.4	27.87	37.27	279	787,525	32.4	28.10	36.90
Sarawak	243	566,269	32.2	28.93	35.65	249	601,398	34.2	30.50	38.10
WP Kuala Lumpur	167	423,374	34.9	29.23	41.10	155	368,195	30.4	25.00	36.30
WP Labuan	165	20,574	34.1	30.14	38.33	159	19,660	32.6	27.60	38.00
WP Putrajaya	158	17,806	32.3	26.95	38.21	179	20,742	37.7	32.40	43.20
Location										
Urban	2,058	5,086,880	32.8	31.07	34.49	2,016	4,757,879	30.6	28.90	32.43
Rural	1,252	1,361,706	30.9	28.84	33.06	1,247	1,308,312	29.7	27.60	31.90
Sex										
Male	1,662	3,665,736	35.1	32.98	37.33	1,558	3,212,349	30.8	28.80	32.80
Female	1,648	2,782,850	29.3	27.54	31.12	1,705	2,853,841	30.0	28.30	31.90
Age Group										
18-19	52	151,292	17.6	12.73	23.77	55	131,984	15.3	10.70	21.40
20-24	198	596,743	22.1	18.46	26.20	197	533,363	19.7	16.30	23.70
25-29	277	802,490	28.3	23.81	33.25	241	700,137	24.7	21.10	28.70
30-34	306	774,327	31.4	26.79	36.47	313	801,564	32.5	27.80	37.70
35-39	331	760,849	34.2	30.26	38.38	328	696,575	31.3	27.30	35.60
40-44	294	615,985	35.1	30.50	40.02	322	630,226	35.9	31.20	40.90
45-49	323	633,915	39.6	34.59	44.93	361	633,036	39.6	34.80	44.60
50-54	341	549,346	37.7	33.82	41.85	353	543,500	37.3	33.30	41.60
55-59	332	487,028	38.4	34.20	42.83	345	493,797	39.0	35.10	42.90
60-64	328	407,759	38.9	34.16	43.92	307	383,492	36.6	32.20	41.30
65-69	232	294,367	39.8	34.25	45.71	208	231,597	31.3	25.90	37.30
70-74	169	197,662	39.2	33.44	45.37	138	164,789	32.7	26.80	39.20
75 & above	127	176,823	36.6	29.81	43.99	95	122,132	25.3	19.30	32.50
Ethnicity										
Malay ^a	2,074	3,219,951	31.4	29.77	33.01	2,100	3,176,561	30.9	29.47	32.46
Chinese	453	1,437,228	34.9	30.96	38.98	383	1,135,236	27.5	23.61	31.85
Indian	220	401,974	34.3	28.43	40.61	226	405,776	34.6	30.18	39.28
Bumiputera Sabah	205	438,130	33.8	28.02	40.19	209	457,265	35.3	30.83	40.08

Table 14.4: Prevalence of Overweight Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,811) (cont'd)

Sociodemographic Characteristics	Overweight (BMI 23.0 - 27.5 kg/m ²)					Overweight (BMI 25.0 - 30.0 kg/m ²)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sarawak	140	305,682	33.4	27.49	39.94	144	314,795	34.4	28.51	40.87
Others	218	645,621	29.8	24.25	36.06	201	576,559	26.6	22.01	31.83
Marital Status										
Single	541	1,505,005	25.7	23.28	28.33	514	1,332,404	22.8	20.50	25.20
Married	2,415	4,496,028	35.4	33.52	37.26	2,402	4,308,261	33.9	32.00	35.80
Widow(er)/Divorcee	354	447,553	32.6	28.43	37.09	347	425,526	31.0	27.40	34.90
Education Level										
No Formal Education	192	318,219	33.6	27.91	39.88	161	245,210	25.9	20.70	31.90
Primary Education	799	1,277,816	33.7	30.27	37.40	787	1,192,029	31.5	28.30	34.80
Secondary Education	1,512	3,108,896	31.6	29.92	33.37	1,541	2,973,190	30.2	28.40	32.10
Tertiary Education	781	1,688,491	32.2	29.27	35.18	757	1,618,914	30.8	28.00	33.80
Occupation										
Government Employee	347	531,456	35.4	31.31	39.63	368	594,097	39.5	34.70	44.50
Private Employee	972	2,591,044	33.1	30.68	35.71	915	2,236,434	28.6	26.50	30.80
Self Employed	665	1,156,760	32.1	28.68	35.70	641	1,093,853	30.3	26.90	34.00
Unpaid Worker/Homemaker	606	1,012,569	31.2	28.04	34.63	680	1,079,569	33.3	30.00	36.80
Retiree	194	293,284	38.9	32.80	45.32	183	285,270	37.8	32.40	43.60
Student	55	155,268	21.8	16.29	28.59	63	156,999	22.1	16.80	28.40
Not Working ^b	468	702,978	30.6	27.32	34.15	410	615,207	26.8	23.60	30.30
Household Income Group										
Less than RM 1,000	321	483,580	30.9	27.31	34.72	278	434,017	27.7	24.10	31.70
RM 1,000 - RM 1,999	708	1,238,972	32.0	28.82	35.38	655	1,166,316	30.1	27.10	33.40
RM 2,000 - RM 3,999	947	1,860,331	30.7	28.20	33.23	971	1,777,931	29.3	26.80	31.90
RM 4,000 - RM 5,999	466	1,005,343	32.3	28.54	36.31	469	904,375	29.1	25.50	32.90
RM 6,000 - RM 7,999	291	606,420	32.5	27.41	37.95	326	623,449	33.4	29.80	37.10
RM 8,000 - RM 9,999	133	302,171	35.1	28.24	42.60	134	257,948	29.9	23.60	37.20
RM 10,000 and above	265	585,041	39.0	34.72	43.50	234	62,388	33.2	28.50	38.20
Household Income Quintile										
Quintile 1	705	1,104,006	31.5	28.72	34.43	611	971,049	27.7	24.80	30.80
Quintile 2	655	1,307,271	33.8	30.06	37.65	661	1,274,113	32.9	29.40	36.60
Quintile 3	573	1,075,275	28.4	25.78	31.13	589	1,044,990	27.6	24.60	30.80
Quintile 4	509	1,101,675	31.9	28.46	35.63	589	992,487	28.8	25.30	32.50
Quintile 5	689	1,493,633	35.3	32.26	38.50	694	1,378,739	32.6	30.10	35.20
Household Income Category										
Bottom 40%	2,124	3,877,550	31.8	29.98	33.75	2,071	3,628,389	29.8	27.90	31.70
Middle 40%	707	1,528,434	31.0	28.42	33.71	730	1,477,585	30.0	27.50	32.60
Top 20%	300	675,876	39.0	34.84	43.27	266	555,404	32.0	27.50	36.90

CPG 2004 (BMI 23.0 - 27.5 kg/m²) & WHO 1998 (BMI 25.0 - 30.0 kg/m²)

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 14.5: Prevalence of Obesity Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,811)

Sociodemographic Characteristics	Obese (BMI ≥ 27.5 kg/m ²)					Obese (BMI ≥ 30.0 kg/m ²)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	3,636	6,711,363	33.7	31.95	35.43	2,147	3,936,088	19.7	18.43	21.13
State										
Johor	288	775,610	35.6	31.81	39.59	178	476,094	21.9	18.26	25.94
Kedah	192	439,902	36.1	30.56	42.02	110	268,555	22.0	17.55	27.28
Kelantan	197	384,695	36.4	30.86	42.26	117	236,802	22.4	18.55	26.76
Melaka	256	213,908	37.6	30.98	44.78	149	132,418	23.3	16.99	31.05
Negeri Sembilan	208	243,797	37.5	31.15	44.31	137	149,242	23.0	17.25	29.87
Pahang	201	308,228	31.1	25.44	37.43	112	167,392	16.9	12.92	21.80
Pulau Pinang	216	389,428	32.1	25.01	40.17	137	225,034	18.6	12.65	26.40
Perak	203	506,109	33.9	26.12	42.63	124	320,614	21.5	15.22	29.39
Perlis	206	62,484	41.4	37.76	45.06	132	41,566	27.5	24.43	30.83
Selangor	389	1,367,580	32.7	27.77	38.03	228	808,850	19.3	16.03	23.15
Terengganu	216	229,054	32.1	29.52	34.88	125	131,203	18.4	15.14	22.21
Sabah	277	755,159	31.0	26.39	36.12	147	381,781	15.7	12.92	18.93
Sarawak	244	611,121	34.7	30.97	38.73	138	339,839	19.3	16.21	22.86
WP Kuala Lumpur	150	379,025	31.3	25.01	38.30	88	230,781	19.0	14.36	24.82
WP Labuan	169	20,053	33.3	27.73	39.28	97	11,831	19.6	15.32	24.77
WP Putrajaya	224	25,210	45.8	39.08	52.60	128	14,087	25.6	20.15	31.87
Location										
Urban	2,211	5,252,981	33.8	31.74	35.97	1,282	3,065,097	19.7	18.14	21.43
Rural	1,425	1,458,382	33.1	30.63	35.68	865	870,991	19.8	17.90	21.79
Sex										
Male	1,454	3,024,308	29.0	26.85	31.20	759	1,591,901	15.3	13.63	17.03
Female	2,182	3,687,055	38.8	36.60	41.08	1,388	2,344,187	24.7	22.86	26.59
Age Group										
18-19	73	201,170	23.4	16.97	31.30	42	139,232	16.2	10.23	24.64
20-24	230	583,219	21.6	18.07	25.58	135	310,620	11.5	9.16	14.34
25-29	297	849,166	29.9	25.38	34.93	187	576,907	20.3	16.57	24.72
30-34	390	978,910	39.7	34.46	45.25	223	545,005	22.1	18.10	26.74
35-39	421	874,617	39.3	34.97	43.84	276	563,509	25.3	21.80	29.23
40-44	378	721,838	41.1	36.63	45.82	225	427,355	24.4	20.63	28.52
45-49	385	602,866	37.7	33.19	42.44	210	310,920	19.4	16.16	23.21
50-54	393	561,484	38.6	34.13	43.23	233	320,889	22.1	18.98	25.46
55-59	391	505,523	39.9	35.90	44.01	243	277,815	21.9	18.75	25.45
60-64	296	395,173	37.7	33.02	42.68	172	232,580	22.2	18.33	26.63
65-69	214	225,621	30.5	25.63	35.93	114	121,319	16.4	12.82	20.78
70-74	105	140,975	28.0	22.38	34.38	58	81,707	16.2	11.57	22.27
75 & above	63	70,799	14.7	10.29	20.46	29	28,230	5.8	3.52	9.56
Ethnicity										
Malay ^a	2,499	3,814,554	37.2	35.37	38.98	1,519	2,334,699	22.7	21.30	24.25
Chinese	313	999,065	24.2	20.06	28.96	155	534,369	13.0	9.89	16.81
Indian	272	529,218	45.1	38.38	52.03	170	343,460	29.3	23.40	35.93
Bumiputera Sabah	231	486,307	37.6	31.99	43.48	125	252,576	19.5	15.43	24.35

Table 14.5: Prevalence of Obesity Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,811) (cont'd)

Sociodemographic Characteristics	Obese (BMI \geq 27.5 kg/m ²)					Obese (BMI \geq 30.0 kg/m ²)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sarawak	151	330,906	36.2	30.01	42.85	91	189,843	20.8	16.35	26.00
Others	170	551,312	25.5	20.31	31.42	87	281,140	13.0	9.40	17.67
Marital Status										
Single	615	1,541,045	26.3	23.64	29.23	374	950,845	16.3	13.92	18.89
Married	2,649	4,690,414	36.9	34.84	39.00	1,555	2,695,363	21.2	19.67	22.82
Widow(er)/Divorcee	372	479,904	35.0	31.21	38.93	218	289,880	21.1	17.77	24.92
Education Level										
No Formal Education	175	265,054	28.0	23.10	33.52	109	164,225	17.4	13.82	21.57
Primary Education	762	1,209,094	31.9	28.73	35.30	425	661,971	17.5	14.86	20.45
Secondary Education	1,840	3,481,652	35.4	33.34	37.53	1,102	2,081,412	21.2	19.54	22.89
Tertiary Education	853	1,738,666	33.1	29.93	36.45	507	1,018,013	19.4	17.05	21.96
Occupation										
Government Employee	439	622,496	41.4	36.96	46.01	245	312,959	20.8	17.81	24.20
Private Employee	980	2,317,314	29.6	27.16	32.27	571	1,353,347	17.3	15.31	19.52
Self Employed	661	1,240,854	34.4	30.69	38.35	396	762,437	21.1	18.34	24.26
Unpaid Worker/Homemaker	899	1,429,557	44.1	40.42	47.86	559	859,353	26.5	23.69	29.55
Retiree	181	279,987	37.1	31.02	43.65	99	151,030	20.0	15.14	25.99
Student	64	174,490	24.5	17.56	33.14	29	96,477	13.6	7.55	23.16
Not Working ^b	411	646,599	28.2	24.43	32.24	248	400,484	17.4	14.44	20.93
Household Income Group										
Less than RM 1,000	324	490,802	31.4	27.05	36.00	202	292,494	18.7	15.39	22.50
RM 1,000 - RM 1,999	681	1,206,980	31.2	28.15	34.40	416	702,439	18.2	15.91	20.63
RM 2,000 - RM 3,999	1,114	2,098,244	34.6	31.54	37.74	643	1,260,103	20.8	18.19	23.59
RM 4,000 - RM 5,999	574	1,115,416	35.8	31.63	40.28	358	730,927	23.5	20.17	27.16
RM 6,000 - RM 7,999	330	644,416	34.5	29.12	40.28	167	359,964	19.3	14.91	24.52
RM 8,000 - RM 9,999	151	283,989	33.0	24.72	42.42	94	170,539	19.8	13.37	28.31
RM 10,000 and above	239	444,981	29.7	25.06	34.75	142	219,807	14.7	11.13	19.07
Household Income Quintile										
Quintile 1	663	1,092,665	31.2	28.04	34.50	415	673,873	19.2	16.87	21.82
Quintile 2	696	1,208,646	31.2	27.68	34.97	398	659,416	17.0	14.76	19.56
Quintile 3	699	1,381,232	36.5	32.63	40.45	408	845,132	22.3	18.99	26.01
Quintile 4	635	1,228,899	35.6	31.73	39.74	398	807,541	23.4	20.24	26.92
Quintile 5	720	1,373,386	32.5	29.20	35.93	403	750,309	17.7	15.08	20.76
Household Income Category										
Bottom 40%	2,315	4,046,437	33.2	31.27	35.23	1,380	2,422,844	19.9	18.41	21.46
Middle 40%	838	1,720,698	34.9	31.47	38.50	490	1,059,544	21.5	18.53	24.79
Top 20%	260	517,692	29.9	25.59	34.50	152	253,883	14.6	11.44	18.55

CPG 2004 (BMI \geq 27.5 kg/m²) & WHO 1998 (BMI \geq 30.0 kg/m²)

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 14.6: Prevalence of Obesity I to III (WHO 1998) Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,811)

Sociodemographic Characteristics	Obese I (BMI 30.0 - 34.9 kg/m ²)					Obese II (BMI 35.0 - 39.9 kg/m ²)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	1,444	2,672,025	13.4	12.32	14.57	466	827,976	4.2	3.63	4.74
State										
Johor	128	354,929	16.3	13.11	20.07	33	78,090	3.6	2.50	5.12
Kedah	77	174,887	14.3	11.18	18.24	25	76,522	6.3	3.61	10.71
Kelantan	80	146,735	13.9	10.84	17.59	24	56,838	5.4	3.59	7.97
Melaka	96	75,877	13.3	9.23	18.91	37	39,376	6.9	4.04	11.62
Negeri Sembilan	87	85,257	13.1	9.49	17.85	32	44,671	6.9	4.52	10.32
Pahang	77	103,794	10.5	8.19	13.31	23	36,253	3.7	2.08	6.37
Pulau Pinang	92	183,208	15.1	9.91	22.36	27	27,354	2.3*	1.24	4.06
Perak	91	250,580	16.8	10.58	25.56	17	28,853	1.9*	0.91	4.03
Perlis	96	29,100	19.3	16.57	22.27	25	8,614	5.7	3.73	8.62
Selangor	148	517,385	12.4	10.21	14.91	51	197,469	4.7	3.39	6.53
Terengganu	87	89,321	12.5	10.00	15.59	25	26,905	3.8	2.55	5.56
Sabah	103	279,076	11.5	9.13	14.32	28	65,821	2.7	1.68	4.34
Sarawak	85	215,137	12.2	9.14	16.18	37	78,379	4.5	2.91	6.76
WP Kuala Lumpur	53	150,013	12.4	8.63	17.44	27	56,377	4.7	3.01	7.12
WP Labuan	64	8,007	13.3	10.45	16.73	22	2,605	4.3	2.39	7.68
WP Putrajaya	80	8,719	15.8	11.67	21.11	33	3,849	7.0	4.39	10.96
Location										
Urban	846	2,078,370	13.4	12.06	14.83	292	655,064	4.2	3.60	4.94
Rural	598	593,655	13.5	12.05	15.04	174	172,912	3.9	3.15	4.88
Sex										
Male	540	1,161,332	11.1	9.76	12.66	146	295,932	2.8	2.21	3.63
Female	904	1,510,693	15.9	14.38	17.56	320	532,045	5.6	4.81	6.51
Age Group										
18-19	26	98,514	11.4*	6.12	20.40	7	21,381	2.5*	1.00	6.02
20-24	76	170,447	6.3	4.62	8.57	34	83,860	3.1	1.98	4.85
25-29	111	367,146	12.9	9.90	16.75	53	157,062	5.5	3.76	8.08
30-34	149	373,879	15.2	11.86	19.21	51	96,919	3.9	2.74	5.61
35-39	168	380,411	17.1	14.01	20.71	73	118,113	5.3	3.96	7.09
40-44	141	267,760	15.3	12.17	18.97	54	103,612	5.9	3.92	8.81
45-49	148	219,126	13.7	11.01	16.93	34	44,413	2.8	1.74	4.41
50-54	164	231,581	15.9	13.18	19.09	46	68,643	4.7	3.36	6.58
55-59	179	215,098	17.0	14.00	20.42	47	48,834	3.9	2.55	5.79
60-64	118	157,855	15.1	11.91	18.90	39	52,206	5.0	3.28	7.51
65-69	87	90,096	12.2	9.26	15.89	20	23,820	3.2	1.80	5.72
70-74	52	76,934	15.3	10.69	21.36	6	4,774	0.9*	0.34	2.59
75 & above	25	23,179	4.8	2.79	8.13	2	4,340	0.9*	0.19	4.11
Ethnicity										
Malay ^a	1,006	1,502,407	14.6	13.44	15.92	331	533,897	5.2	4.49	6.02
Chinese	114	397,297	9.6	6.93	13.24	31	103,683	2.5	1.51	4.15
Indian	118	238,972	20.4	15.39	26.45	37	56,064	4.8	2.99	7.56
Bumiputera Sabah	86	178,211	13.8	11.04	17.03	27	55,052	4.3	2.47	7.23

Sociodemographic Characteristics	Obese III (BMI \geq 40.0 kg/m ²)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	237	436,086	2.2	1.81	2.64
State					
Johor	17	43,075	2.0	1.19	3.27
Kedah	8	17,146	1.4*	0.72	2.72
Kelantan	13	33,229	3.1*	1.61	6.05
Melaka	0	-	-	-	-
Negeri Sembilan	18	19,313	3.0	1.69	5.18
Pahang	12	27,345	2.8*	1.30	5.79
Pulau Pinang	18	14,473	1.2*	0.48	2.92
Perak	16	41,180	2.8*	1.44	5.22
Perlis	11	3,853	2.6*	1.31	4.90
Selangor	29	93,996	2.2	1.30	3.86
Terengganu	13	14,977	2.1*	1.15	3.81
Sabah	16	36,883	1.5	0.88	2.60
Sarawak	16	46,324	2.6	1.66	4.16
WP Kuala Lumpur	8	24,392	2.0*	0.75	5.30
WP Labuan	11	1,219	2.0*	0.97	4.19
WP Putrajaya	15	1,518	2.8	1.60	4.71
Location					
Urban	144	331,663	2.1	1.70	2.68
Rural	93	104,423	2.4	1.74	3.22
Sex					
Male	73	134,637	1.3	0.94	1.78
Female	164	301,449	3.2	2.54	3.96
Age Group					
18-19	9	19,337	2.2*	1.02	4.86
20-24	25	56,313	2.1	1.26	3.43
25-29	23	52,699	1.9	1.10	3.12
30-34	23	74,207	3.0*	1.50	5.94
35-39	35	64,985	2.9	1.82	4.66
40-44	30	55,983	3.2	2.09	4.83
45-49	28	47,381	3.0	1.88	4.64
50-54	23	20,665	1.4	0.79	2.54
55-59	17	13,882	1.1*	0.58	2.07
60-64	15	22,520	2.2	1.22	3.75
65-69	7	7,403	1.0*	0.43	2.33
70-74	0	-	-	-	-
75 & above	2	711	0.1*	0.03	0.80
Ethnicity					
Malay ^a	182	298,396	2.9	2.39	3.53
Chinese	10	33,389	0.8*	0.34	1.94
Indian	15	48,424	4.1*	1.73	9.53
Bumiputera Sabah	12	19,312	1.5*	0.69	3.18

Table 14.6: Prevalence of Obesity I to III (WHO 1998) Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,811) (cont'd)

Sociodemographic Characteristics	Obese I (BMI 30.0 - 34.9 kg/m ²)					Obese II (BMI 35.0 - 39.9 kg/m ²)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sarawak	55	124,563	13.6	9.83	18.57	24	42,029	4.6	2.69	7.75
Others	65	230,576	10.7	7.28	15.32	16	37,252	1.7*	0.85	3.44
Marital Status										
Single	217	583,687	10.0	7.90	12.52	94	217,955	3.7	2.84	4.88
Married	1,076	1,887,672	14.8	13.62	16.16	323	542,001	4.3	3.63	5.00
Widow(er)/Divorcee	151	200,666	14.6	11.79	18.00	49	68,020	5.0	3.50	6.97
Education Level										
No Formal Education	85	129,319	13.7	10.35	17.84	19	24,598	2.6*	1.35	4.95
Primary Education	295	462,387	12.2	10.00	14.83	84	133,307	3.5	2.44	5.06
Secondary Education	732	1,428,051	14.5	13.07	16.11	242	422,945	4.3	3.66	5.04
Tertiary Education	329	643,366	12.3	10.54	14.20	120	245,560	4.7	3.60	6.05
Occupation										
Government Employee	162	213,158	14.2	11.57	17.26	54	57,582	3.8	2.65	5.52
Private Employee	384	934,582	12.0	10.23	13.93	126	294,653	3.8	2.99	4.74
Self Employed	281	531,198	14.7	12.43	17.38	74	144,833	4.0	2.94	5.47
Unpaid Worker/Homemaker	363	577,118	17.8	15.43	20.46	129	176,975	5.5	4.29	6.92
Retiree	76	119,436	15.8	11.67	21.12	18	28,355	3.8	2.16	6.45
Student	18	59,414	8.4*	3.51	18.58	5	17,006	2.4*	0.83	6.69
Not Working ^b	160	237,118	10.3	8.18	12.97	60	108,572	4.7	3.17	7.00
Household Income Group										
Less than RM 1,000	139	204,543	13.1	10.49	16.16	44	68,100	4.4	2.70	6.93
RM 1,000 - RM 1,999	293	500,977	12.9	11.10	15.04	81	130,548	3.4	2.50	4.54
RM 2,000 - RM 3,999	413	817,437	13.5	11.31	15.97	146	306,380	5.0	3.98	6.38
RM 4,000 - RM 5,999	245	517,288	16.6	13.73	19.99	79	134,619	4.3	3.19	5.83
RM 6,000 - RM 7,999	117	268,069	14.3	10.57	19.18	30	49,917	2.7	1.55	4.57
RM 8,000 - RM 9,999	52	75,570	8.8	5.72	13.24	27	47,023	5.5*	2.77	10.50
RM 10,000 and above	96	149,776	10.0	7.24	13.63	31	42,740	2.9	1.60	5.04
Household Income Quintile										
Quintile 1	290	482,558	13.8	11.78	16.04	87	136,230	3.9	2.81	5.35
Quintile 2	273	450,449	11.6	9.74	13.83	79	138,834	3.6	2.66	4.82
Quintile 3	255	530,380	14.0	11.27	17.25	98	216,847	5.7	4.27	7.63
Quintile 4	272	576,857	16.7	13.82	20.11	86	147,737	4.3	3.21	5.69
Quintile 5	265	493,415	11.7	9.55	14.18	88	139,680	3.3	2.36	4.60
Household Income Category										
Bottom 40%	920	1,610,735	13.2	12.07	14.46	306	551,194	4.5	3.83	5.34
Middle 40%	328	750,360	15.2	12.59	18.28	103	183,993	3.7	2.76	5.03
Top 20%	107	172,564	10.0	7.51	13.08	29	44,141	2.5	1.47	4.36

WHO 1998: Obese I (BMI 30.0 - 34.9 kg/m²), Obese II (BMI 35.0 - 39.9 kg/m²) & Obese III (BMI ≥ 40.0 kg/m²)

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Obese III (BMI \geq 40.0 kg/m ²)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sarawak	12	23,252	2.5*	1.18	5.39
Others	6	13,313	0.6*	0.26	1.43
Marital Status					
Single	63	149,203	2.6	1.88	3.44
Married	156	265,691	2.1	1.63	2.68
Widow(er)/Divorcee	18	21,193	1.5*	0.80	2.96
Education Level					
No Formal Education	5	10,307	1.1*	0.40	2.93
Primary Education	46	66,277	1.8	1.18	2.58
Secondary Education	128	230,415	2.3	1.82	3.01
Tertiary Education	58	129,086	2.5	1.74	3.46
Occupation					
Government Employee	29	42,218	2.8	1.72	4.55
Private Employee	61	124,112	1.6	1.10	2.29
Self Employed	41	86,406	2.4	1.63	3.51
Unpaid Worker/Homemaker	67	105,261	3.2	2.35	4.47
Retiree	5	3,239	0.4*	0.14	1.31
Student	6	20,056	2.8*	1.20	6.47
Not Working ^b	28	54,794	2.4	1.40	4.03
Household Income Group					
Less than RM 1,000	19	19,851	1.3*	0.69	2.31
RM 1,000 - RM 1,999	42	70,915	1.8	1.23	2.71
RM 2,000 - RM 3,999	84	136,285	2.2	1.66	3.03
RM 4,000 - RM 5,999	34	79,020	2.5	1.55	4.12
RM 6,000 - RM 7,999	20	41,977	2.2*	1.23	4.06
RM 8,000 - RM 9,999	15	47,945	5.6*	2.77	10.88
RM 10,000 and above	15	27,291	1.8*	0.79	4.12
Household Income Quintile					
Quintile 1	38	55,085	1.6	1.05	2.36
Quintile 2	46	70,134	1.8	1.23	2.67
Quintile 3	55	97,906	2.6	1.77	3.76
Quintile 4	40	82,947	2.4	1.50	3.83
Quintile 5	50	117,213	2.8	1.85	4.14
Household Income Category					
Bottom 40%	154	260,914	2.1	1.70	2.70
Middle 40%	59	125,192	2.5	1.78	3.62
Top 20%	16	37,179	2.1*	1.05	4.31

Table 14.7: Prevalence of Obesity I to III (CPG 2004) Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,811)

Sociodemographic Characteristics	Obese I (BMI 27.5 - 34.9 kg/m ²)					Obese II (BMI 35.0 - 39.9 kg/m ²)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	2,933	5,447,300	27.3	25.80	28.90	466	827,976	4.2	3.63	4.74
State										
Johor	238	654,445	30.0	26.35	34.02	33	78,090	3.6	2.50	5.12
Kedah	159	346,234	28.4	23.86	33.44	25	76,522	6.3	3.61	10.71
Kelantan	160	294,628	27.9	23.07	33.21	24	56,838	5.4	3.59	7.97
Melaka	203	157,367	27.7	23.30	32.54	37	39,376	6.9	4.04	11.62
Negeri Sembilan	158	179,812	27.7	23.48	32.27	32	44,671	6.9	4.52	10.32
Pahang	166	244,631	24.7	20.33	29.66	23	36,253	3.7	2.08	6.37
Pulau Pinang	171	347,602	28.7	22.23	36.11	27	27,354	2.3*	1.24	4.06
Perak	170	436,076	29.2	21.12	38.84	17	28,853	1.9*	0.91	4.03
Perlis	170	50,018	33.1	29.52	36.91	25	8,614	5.7	3.73	8.62
Selangor	309	1,076,116	25.7	21.95	29.90	51	197,469	4.7	3.39	6.53
Terengganu	178	187,172	26.3	23.10	29.69	25	26,905	3.8	2.55	5.56
Sabah	233	652,455	26.8	22.37	31.80	28	65,821	2.7	1.68	4.34
Sarawak	191	486,418	27.7	23.69	32.01	37	78,379	4.5	2.91	6.76
WP Kuala Lumpur	115	298,256	24.6	18.99	31.25	27	56,377	4.7	3.01	7.12
WP Labuan	136	16,228	26.9	21.94	32.54	22	2,605	4.3	2.39	7.68
WP Putrajaya	176	19,842	36.0	30.55	41.87	33	3,849	7.0	4.39	10.96
Location										
Urban	1,775	4,266,254	27.5	25.63	29.39	292	655,064	4.2	3.60	4.94
Rural	1,158	1,181,046	26.8	24.62	29.12	174	172,912	3.9	3.15	4.88
Sex										
Male	1,235	2,593,739	24.9	22.90	26.91	146	295,932	2.8	2.21	3.63
Female	1,698	2,853,561	30.0	28.04	32.12	320	532,045	5.6	4.81	6.51
Age Group										
18-19	57	160,451	18.6	12.58	26.75	7	21,381	2.5*	1.00	6.02
20-24	171	443,046	16.4	13.36	19.98	34	83,860	3.1	1.98	4.85
25-29	221	639,405	22.5	18.66	26.97	53	157,062	5.5	3.76	8.08
30-34	316	807,784	32.8	27.85	38.13	51	96,919	3.9	2.74	5.61
35-39	313	691,519	31.1	27.00	35.50	73	118,113	5.3	3.96	7.09
40-44	294	562,243	32.0	27.75	36.68	54	103,612	5.9	3.92	8.81
45-49	323	511,072	32.0	27.74	36.50	34	44,413	2.8	1.74	4.41
50-54	324	472,177	32.4	28.10	37.11	46	68,643	4.7	3.36	6.58
55-59	327	442,806	34.9	30.93	39.16	47	48,834	3.9	2.55	5.79
60-64	242	320,448	30.6	26.17	35.41	39	52,206	5.0	3.28	7.51
65-69	187	194,399	26.3	22.05	31.07	20	23,820	3.2	1.80	5.72
70-74	99	136,202	27.0	21.54	33.35	6	4,774	0.9*	0.34	2.59
75 & above	59	65,748	13.6	9.43	19.25	2	4,340	0.9*	0.19	4.11
Ethnicity										
Malay ^a	1,986	2,982,262	29.1	27.42	30.74	331	533,897	5.2	4.49	6.02
Chinese	272	861,993	20.9	16.96	25.49	31	103,683	2.5	1.51	4.15
Indian	220	424,730	36.2	30.74	42.05	37	56,064	4.8	2.99	7.56
Bumiputera Sabah	192	411,943	31.8	27.01	37.05	27	55,052	4.3	2.47	7.23

Sociodemographic Characteristics	Obese III (BMI \geq 40.0 kg/m ²)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	237	436,086	2.2	1.81	2.64
State					
Johor	17	43,075	2.0	1.19	3.27
Kedah	8	17,146	1.4*	0.72	2.72
Kelantan	13	33,229	3.1*	1.61	6.05
Melaka	16	17,164	3.0*	1.60	5.63
Negeri Sembilan	18	19,313	3.0	1.69	5.18
Pahang	12	27,345	2.8*	1.30	5.79
Pulau Pinang	18	14,473	1.2*	0.48	2.92
Perak	16	41,180	2.8*	1.44	5.22
Perlis	11	3,853	2.6*	1.31	4.90
Selangor	29	93,996	2.2	1.30	3.86
Terengganu	13	14,977	2.1*	1.15	3.81
Sabah	16	36,883	1.5	0.88	2.60
Sarawak	16	46,324	2.6	1.66	4.16
WP Kuala Lumpur	8	24,392	2.0*	0.75	5.30
WP Labuan	11	1,219	2.0*	0.97	4.19
WP Putrajaya	15	1,518	2.8	1.60	4.71
Location					
Urban	144	331,663	2.1	1.70	2.68
Rural	93	104,423	2.4	1.74	3.22
Sex					
Male	73	134,637	1.3	0.94	1.78
Female	164	301,449	3.2	2.54	3.96
Age Group					
18-19	9	19,337	2.2*	1.02	4.86
20-24	25	56,313	2.1	1.26	3.43
25-29	23	52,699	1.9	1.10	3.12
30-34	23	74,207	3.0*	1.50	5.94
35-39	35	64,985	2.9	1.82	4.66
40-44	30	55,983	3.2	2.09	4.83
45-49	28	47,381	3.0	1.88	4.64
50-54	23	20,665	1.4	0.79	2.54
55-59	17	13,882	1.1*	0.58	2.07
60-64	15	22,520	2.2	1.22	3.75
65-69	7	7,403	1.0*	0.43	2.33
70-74	0	-	-	-	-
75 & above	2	711	0.1*	0.03	0.80
Ethnicity					
Malay ^a	182	298,396	290.7	238.93	3.53
Chinese	10	33,389	0.8*	0.34	1.94
Indian	15	48,424	4.1*	1.73	9.53
Bumiputera Sabah	12	19,312	1.5*	0.69	3.18

Table 14.7: Prevalence of Obesity I to III (CPG 2004) Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,811)

Sociodemographic Characteristics	Obese I (BMI 27.5 - 34.9 kg/m ²)					Obese II (BMI 35.0 - 39.9 kg/m ²)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sarawak	115	265,625	29.0	22.92	36.05	24	42,029	4.6	2.69	7.75
Others	148	500,747	23.1	18.09	29.08	16	37,252	1.7*	0.85	3.44
Marital Status										
Single	458	1,173,887	20.1	17.60	22.78	94	217,955	3.7	2.84	4.88
Married	2,170	3,882,722	30.5	28.69	32.46	323	542,001	4.3	3.63	5.00
Widow(er)/Divorcee	305	390,691	28.5	24.97	32.25	49	68,020	5.0	3.50	6.97
Education Level										
No Formal Education	151	230,148	24.3	19.52	29.87	19	24,598	2.6*	1.35	4.95
Primary Education	632	1,009,510	26.7	23.73	29.80	84	133,307	3.5	2.44	5.06
Secondary Education	1,470	2,828,292	28.8	26.79	30.82	242	422,945	4.3	3.66	5.04
Tertiary Education	675	1,364,020	26.0	23.47	28.65	120	245,560	4.7	3.60	6.05
Occupation										
Government Employee	356	522,695	34.8	30.30	39.53	54	57,582	3.8	2.65	5.52
Private Employee	793	1,898,549	24.3	22.03	26.70	126	294,653	3.8	2.99	4.74
Self Employed	546	1,009,614	28.0	24.67	31.60	74	144,833	4.0	2.94	5.47
Unpaid Worker/Homemaker	703	1,147,321	35.4	31.90	39.06	129	176,975	5.5	4.29	6.92
Retiree	158	248,393	32.9	27.45	38.91	18	28,355	3.8	2.16	6.45
Student	53	137,427	19.3	12.96	27.79	5	17,006	2.4*	0.83	6.69
Not Working ^b	323	483,233	21.1	17.99	24.48	60	108,572	4.7	3.17	7.00
Household Income Group										
Less than RM 1,000	261	402,851	25.7	21.94	29.93	44	68,100	4.4	2.70	6.93
RM 1,000 - RM 1,999	558	1,005,517	26.0	23.28	28.88	81	130,548	3.4	2.50	4.54
RM 2,000 - RM 3,999	884	1,655,578	27.3	24.52	30.23	146	306,380	5.0	3.98	6.38
RM 4,000 - RM 5,999	461	901,777	29.0	25.12	33.16	79	134,619	4.3	3.19	5.83
RM 6,000 - RM 7,999	280	552,521	29.6	24.69	34.97	30	49,917	2.7	1.55	4.57
RM 8,000 - RM 9,999	109	189,021	21.9	16.17	29.07	27	47,023	5.5*	2.77	10.50
RM 10,000 and above	193	374,950	25.0	20.99	29.52	31	42,740	2.9	1.60	5.04
Household Income Quintile										
Quintile 1	538	901,350	25.7	22.84	28.83	87	136,230	3.9	2.81	5.35
Quintile 2	571	999,678	25.8	22.60	29.31	79	138,834	3.6	2.66	4.82
Quintile 3	546	1,066,479	28.1	24.68	31.88	98	216,847	5.7	4.27	7.63
Quintile 4	509	998,215	28.9	25.28	32.90	86	147,737	4.3	3.21	5.69
Quintile 5	582	1,116,492	26.4	23.58	29.43	88	139,680	3.3	2.36	4.60
Household Income Category										
Bottom 40%	1,855	3,234,328	26.6	24.89	28.29	306	551,194	4.5	3.83	5.34
Middle 40%	676	1,411,514	28.6	25.51	31.98	103	183,993	3.7	2.76	5.03
Top 20%	215	436,373	25.2	21.34	29.41	29	44,141	2.5	1.47	4.36

CPG 2004: Obese I (BMI 27.5 - 34.9 kg/m²), Obese II (BMI 35.0 - 39.9 kg/m²) & Obese III (BMI ≥ 40.0 kg/m²)

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Obese III (BMI \geq 40.0 kg/m ²)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sarawak	12	23,252	2.5*	1.18	5.39
Others	6	13,313	0.6*	0.26	1.43
Marital Status					
Single	63	149,203	2.6	1.88	3.44
Married	156	265,691	2.1	1.63	2.68
Widow(er)/Divorcee	18	21,193	1.5*	0.80	2.96
Education Level					
No Formal Education	5	10,307	1.1*	0.40	2.93
Primary Education	46	66,277	1.8	1.18	2.58
Secondary Education	128	230,415	2.3	1.82	3.01
Tertiary Education	58	129,086	2.5	1.74	3.46
Occupation					
Government Employee	29	42,218	2.8*	1.72	4.55
Private Employee	61	124,112	1.6	1.10	2.29
Self Employed	41	86,406	2.4	1.63	3.51
Unpaid Worker/Homemaker	67	105,261	3.2	2.35	4.47
Retiree	5	3,239	0.4*	0.14	1.31
Student	6	20,056	2.8*	1.20	6.47
Not Working ^b	28	54,794	2.4	1.40	4.03
Household Income Group					
Less than RM 1,000	19	19,851	1.3*	0.69	2.31
RM 1,000 - RM 1,999	42	70,915	1.8	1.23	2.71
RM 2,000 - RM 3,999	84	136,285	2.2	1.66	3.03
RM 4,000 - RM 5,999	34	79,020	2.5	1.55	4.12
RM 6,000 - RM 7,999	20	41,977	2.2*	1.23	4.06
RM 8,000 - RM 9,999	15	47,945	5.6*	2.77	10.88
RM 10,000 and above	15	27,291	1.8*	0.79	4.12
Household Income Quintile					
Quintile 1	38	55,085	1.6	1.05	2.36
Quintile 2	46	70,134	1.8	1.23	2.67
Quintile 3	55	97,906	2.6	1.77	3.76
Quintile 4	40	82,947	2.4	1.50	3.83
Quintile 5	50	117,213	2.8	1.85	4.14
Household Income Category					
Bottom 40%	154	260,914	2.1	1.70	2.70
Middle 40%	59	125,192	2.5	1.78	3.62
Top 20%	16	37,179	2.1*	1.05	4.31

Table 14.8: Prevalence of Abdominal Obesity (WHO 2000) Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,755)

Sociodemographic Characteristics	Abdominal Obesity				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	5,756	10,387,112	52.6	50.54	54.58
State					
Johor	465	1,124,490	53.4	47.23	59.40
Kedah	307	671,363	54.5	48.03	60.78
Kelantan	326	583,392	54.9	50.11	59.56
Melaka	339	284,418	50.7	43.33	58.13
Negeri Sembilan	345	402,882	61.5	51.58	70.55
Pahang	341	507,764	51.0	44.46	57.49
Pulau Pinang	390	663,586	55.0	46.21	63.43
Perak	330	792,001	53.4	44.61	61.99
Perlis	308	86,629	57.4	52.38	62.30
Selangor	596	2,045,049	48.7	43.14	54.34
Terengganu	310	320,342	45.1	41.55	48.64
Sabah	425	1,159,499	47.9	41.71	54.07
Sarawak	443	1,047,039	59.7	55.58	63.70
WP Kuala Lumpur	270	634,794	57.4	49.98	64.46
WP Labuan	266	31,637	52.6	47.41	57.83
WP Putrajaya	295	32,226	58.9	51.53	65.82
Location					
Urban	3,502	8,152,975	53.1	50.65	55.54
Rural	2,254	2,234,138	50.7	47.50	53.89
Sex					
Male	2,079	4,269,195	41.4	38.77	44.01
Female	3,677	6,117,917	64.8	62.62	66.94
Age Group (Years)					
18-19	102	286,341	34.0	26.98	41.81
20-24	306	804,010	30.0	25.75	34.65
25-29	396	1,133,755	40.4	35.52	45.53
30-34	519	1,280,873	52.8	47.15	58.35
35-39	600	1,231,061	55.7	51.36	60.03
40-44	529	1,000,740	57.6	52.91	62.24
45-49	600	1,014,531	64.1	59.17	68.68
50-54	624	929,037	64.9	60.51	69.06
55-59	641	853,859	68.2	63.41	72.62
60-64	559	745,119	71.5	66.59	75.96
65-69	408	494,376	66.9	59.39	73.56
70-74	261	319,011	63.6	57.03	69.73
75 & above	211	294,401	57.3	49.58	64.74
Ethnicity					
Malay ^a	3,807	5,622,269	54.8	53.11	56.57
Chinese	646	1,948,953	48.6	43.48	53.69
Indian	444	778,548	68.3	60.95	74.80

Sociodemographic Characteristics	Abdominal Obesity				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sabah	320	672,282	52.3	46.20	58.28
Bumiputera Sarawak	263	568,618	62.5	55.85	68.77
Others	276	796,443	36.9	29.86	44.45
Marital Status					
Single	824	2,075,100	35.9	32.78	39.19
Married	4,204	7,370,611	58.5	56.15	60.85
Widow(er)/Divorcee	728	941,401	67.8	62.73	72.52
Education Level					
No Formal Education	357	568,427	59.0	51.74	65.89
Primary Education	1,375	2,007,568	53.2	48.38	57.93
Secondary Education	2,760	5,232,507	53.6	51.32	55.80
Tertiary Education	1,249	2,544,883	49.6	45.96	53.19
Occupation					
Government Employee	616	849,477	57.2	51.94	62.22
Private Employee	1,422	3,363,535	43.6	40.56	46.77
Self Employed	1,033	1,859,265	52.0	47.28	56.67
Unpaid Worker/ Homemaker	1,435	2,238,829	69.3	65.90	72.42
Retiree	321	515,435	69.1	62.83	74.78
Student	86	243,709	35.0	26.82	44.26
Not Working ^b	840	1,312,917	56.9	52.89	60.91
Household Income Group					
Less than RM 1,000	573	850,943	53.9	48.97	58.66
RM 1,000 - RM 1,999	1,138	1,924,168	49.7	45.55	53.90
RM 2,000 - RM 3,999	1,690	3,083,923	51.2	47.76	54.53
RM 4,000 - RM 5,999	848	1,685,419	54.2	49.89	58.54
RM 6,000 - RM 7,999	512	1,009,867	54.7	49.02	60.25
RM 8,000 - RM 9,999	221	409,059	47.9	38.99	57.04
RM 10,000 and above	379	706,011	50.0	41.88	58.19
Household Income Quintile					
Quintile 1	1,170	1,858,979	52.7	49.03	56.29
Quintile 2	1,102	1,889,721	49.1	44.60	53.57
Quintile 3	1,040	1,926,069	51.3	46.76	55.72
Quintile 4	937	1,869,685	54.2	50.03	58.39
Quintile 5	1,112	2,124,937	51.7	47.37	55.99
Household Income Category					
Bottom 40%	3,666	6,237,654	51.3	49.00	53.69
Middle 40%	1,276	2,602,637	53.4	49.62	57.14
Top 20%	419	829,101	49.5	42.64	56.48

WHO 2000 (Waist circumference for Men ≥90, Women ≥80)

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 14.9: Mean Weight by BMI Category Among Adults Aged 18 Years and Above in Malaysia (n=9,811)

BMI Category	Count	Estimated Population	Mean (kg)	95% CI	
				Lower	Upper
MALAYSIA	9,935	20,173,950	66.7	66.10	67.24
Underweight	543	1,315,829	45.2	44.45	45.97
Normal	3,889	8,664,943	57.6	57.17	58.01
Overweight	3,280	6,103,730	70.8	70.39	71.21
Obesity	2,164	3,973,474	87.5	86.47	88.45

Nutritional Status of Children

Nutritional Status of Children

15.1 Nutritional Status of Children Below 5 Years Old

Contributors to this section: Ruhaya Salleh, Nur Shahida Abdul Aziz, Mohamad Hasnan Ahmad, Nursyamalina Che Abd Rahim, Azli Baharudin, Suhaila Abd. Ghaffar, Junidah Raib, Rusidah Selamat, Hamid Jan Jan Mohamad

Introduction

Nutritional status is an important indicator of an overall health of the population. Thus, poor maternal nutrition may lead to poor birth outcome such as low birth weight which subsequently increased the risk of the children to be malnourished [1]. The global prevalence of stunting, wasting and overweight among the children was 21.9%, 7.3% and 5.9% respectively [2][3]. According to report on other countries such as Thailand, their prevalence of stunting was 10.5%, wasting 5.4% and overweight was 8.2%, while in China 4.4% children was stunted, 3.6% wasting and 2.6% was overweight [3-5]. For children below 5 years, it indicates the food adequacy for fetus starting from the womb. Poor maternal nutrition may lead to poor birth outcome. Inappropriate food intake and environment may further affect the growth of the child after birth.

The detrimental effect of nutrition and environment on child growth can be measured using appropriate anthropometric indicators such as height and weight. This information can be applied to define nutrition status of children such as underweight, overweight, wasted and stunted using a universally reference standard.

Objectives

General objective

To determine the nutritional status of children below 5 years of age in Malaysia.

Specific Objectives

1. To determine the prevalence of underweight among children below 5 years in Malaysia
2. To determine the prevalence of stunting among children below 5 years in Malaysia
3. To determine the prevalence of wasting among children below 5 years in Malaysia
4. To determine the prevalence of overweight and obese among children below 5 years in Malaysia

Methods

Classification of nutritional status was made according to recommendation by World Health Organization (2006). The anthropometric measurements for this survey were done by trained researchers according to the standard protocol.

The nutritional status of under five children was defined using the World Health Organization Growth Standard 2006 (WHO 2006). These four indices were:

- Weight for Age -z-score (for children below 5 years old)
- Height-for-Age z-score (for children below 5 years old)
- Weight for Height z-score (for children below 5 years old)
- BMI-for-Age z-score (for children below 5 years old)

Findings

Underweight

The national prevalence of underweight (Weight for Age < -2SD) was 14.1% (95% CI: 11.39, 17.37). By strata, children from rural areas had higher prevalence of underweight [15.6% (95% CI: 12.12, 19.93)]. Compared by sex, the prevalence of underweight was higher among males [15.5% (95% CI: 11.43, 20.70)] than females [12.6% (95% CI: 9.79, 16.20)]. By household income, the highest prevalence was noted among those from B40 income group [14.1% (95% CI: 11.23, 17.45)].

Stunting

The national prevalence of stunting (Height for Age < -2SD) among children was 21.8% (95% CI: 18.42, 25.63). Children from rural areas showed higher prevalence of stunting [22.2% (95% CI: 18.72, 26.12)] than those from urban areas [21.7% (95% CI: 17.35, 26.72)]. By sex, females showed a higher prevalence of stunting [23.5% (95% CI: 18.90, 28.77)] than males [20.2% (95% CI: 15.52, 25.89)]. Children of Bumiputera Sarawak ethnicity [41.5% (95% CI: 26.09, 58.71)] had higher prevalence of stunting. Based on the household income group, those from B40 income group had the highest prevalence of stunting [22.4% (95% CI: 18.47, 26.84)].

Wasting

The national prevalence of wasting (Weight for Height < -2SD) among children was 9.7% (95% CI: 7.57, 12.25). Children from urban areas showed a higher prevalence of wasting [10.1% (95% CI: 7.47, 13.43)] than children from rural areas [8.5% (95% CI: 5.96, 12.02)]. Males showed a higher prevalence of wasting [11.3% (95% CI: 8.36, 15.21)] than females [7.9% (95% CI: 5.49, 11.16)]. Children of Malay ethnicity [11.7% (95% CI: 9.03, 15.05)] were found to have a higher prevalence of wasting.

Overweight and Obese

The national prevalence of overweight and obese (BMI for Age > +2SD) among children was 5.6% (95% CI: 4.13, 7.55). Children from urban areas showed a higher prevalence of overweight and obese [6.0% (95% CI: 4.19, 8.54)] than children from rural areas [4.4% (95% CI: 2.65, 7.31)]. Males showed a higher prevalence of overweight and obese [6.7% (95% CI: 4.60, 9.70)] than females [4.4% (95% CI: 2.62, 7.35)]. Based on the household income group, those in the B40 income group noted the highest prevalence of overweight and obese [6.0% (95% CI: 4.03, 8.75)].

Conclusion

In conclusion, this survey showed that the prevalence of under nutrition has shown increment with underweight 14.1%, stunting 21.8% and wasting 9.1% as compared with previous survey (NHMS 2015) which found underweight was 12.4%, stunting 17.7% and wasting 8.1%. Prevalence of underweight and stunting were predominantly in rural areas and those in the B40 income group. The prevalence of over nutrition showed decreasing trends compared to the previous survey. These findings should help in future planning of programs for healthy children growth, while taking into consideration the factors that contributed to the problem of malnutrition.

Recommendations

1. Focus on the first 1000 days of life with intensification and strengthening of the maternal nutrition programmed before and during pregnancy.
2. To further strengthen nutrition knowledge and practices of mothers and caregivers and increase capacity of health care personnel on monitoring and management of the nutritional status of children under 5 years of age.

Table 15.1: Nutritional Status (Children Under 5 Years of Age) Trend in Malaysia

	2011	2015	2019
Underweight	11.6	12.4	14.1
Stunting	16.6	17.7	21.8
Wasting	12.4	8.1	9.4

References

1. S.L. Loy, M. Marhazlina & J.M. Hamid Jan (2012). Association between Maternal Food Group Intake and Birth Size., *Sains Malaysiana*. 2012; 42(1):1633-8.
2. de Onis, Mercedes, et al., 'Comparison of the World Health Organization (WHO) Child Growth Standards and the National Center for Health Statistics/WHO International Growth Reference: Implications for child health programmes', *Public Health Nutrition*, vol. 9, no. 7, 2006, pp. 942–947
3. UNICEF, *Progress for Children Beyond Averages: Learning from the MDGs*, New York, 2015
4. UNICEF, Division of Data Research and Policy (2018), *Global UNICEF Global Databases: Infant and Young Child Feeding*, New York, May 2018.
5. de Onis, Mercedes, et al., 'Comparison of the World Health Organization (WHO) Child Growth Standards and the National Center for Health Statistics/WHO International Growth Reference: Implications for child health programmes', *Public Health Nutrition*, vol. 9, no. 7, 2006, pp. 942–947.

15.2 Nutritional Status Among Children 5 To 17 Years Old

Contributors to this section: Nur Shahida Abdul Aziz, Ruhaya Salleh, Syafinaz Mohd Sallehuddin, Munawarah Pardi, Nursyamilina Che Abd Rahim, Azli Baharudin, Mohamad Hasnan Ahmad, Junidah Raib, Norlida Zulkaflly, Rusidah Selamat, Hamid Jan Jan Mohamad

Introduction

The nutritional status of children is a measure of the extent to which the physiological needs of the nutrients are met. It is the balance between the intake of nutrients and the use or need of nutrients in individuals. Report from Global Database on child growth and malnutrition revealed that prevalence of overweight among girls in 2016 was 5.6% while boys 7.8%. However, there was high prevalence of overweight in India, 11.6% and lower in Chinatown Ethiopia, 1.4%, regardless of gender. Monitoring child growth in school should be emphasized to achieve the global target of having zero increment of overweight and obese prevalence among children [1][2].

Nutritional anthropometry as measured by body weight and height can be used to reflect an individual's past and present nutritional status. When considered in combination, anthropometric indices can be used to identify stunting (low stature), wasting (thinness), and underweight and overweight.

Objectives

General objective

To determine the nutritional status of children and adolescents aged 5 to 17 years old in Malaysia.

Specific Objectives

1. To determine the prevalence of underweight, normal weight and overweight among children and adolescent aged (5 - <10 years old) by sociodemographic in Malaysia
2. To determine the prevalence of stunting, normal, tall and very tall among children and adolescents (5 to 17 years old) by sociodemographic in Malaysia
3. To determine the prevalence of thinness, normal, overweight and obese among children and adolescents (5 to 17 years old) by sociodemographic in Malaysia

Methods

Classification of nutritional status was made according to recommendation by World Health Organization (2007). The anthropometric measurements for this survey were done by trained researchers according to the standard protocol.

The nutritional status of adolescents was identified based on the World Health Organization Growth Reference 2007 (WHO 2007). The major indices referred to were:

- Weight for age -z-score (for adolescents between 5 and 10 years old)
- Height-for-Age z-score (for adolescents between 5 and 17 years old)
- BMI-for-Age z-score (for adolescents between 5 and 17 years old)

Findings

Underweight

The national prevalence of underweight (Weight for Age < -2SD) was [15.4% (95% CI: 12.78, 18.52)]. By strata, children from urban areas had higher prevalence of underweight [15.8% (95% CI: 12.58, 19.75)]. Compared to sex, the prevalence of underweight was higher among females [16.1% (95%CI: 12.39, 20.71)] than males [14.8% (95% CI: 11.72, 18.54)]. The lowest prevalence was noted among Chinese ethnicity [6.2% (95% CI: 2.55, 14.16)].

Stunting

The finding of the survey shows that 85.2% (95% CI: 83.15, 87.02) of children age 5 to 17 years old had normal height-for-age status (HAZ: $\geq -2SD$) with 12.7% (95% CI: 10.96, 14.70) stunting among children age 5 to 17 years old in Malaysia. Rural areas had higher prevalence of stunting [17.1% (95% CI: 13.39, 21.48)] compared to urban areas [11.3% (95% CI: 9.36, 13.47)]. Chinese had the lowest prevalence of stunting [6.7% (95% CI: 3.44, 12.78)]. Children from household with income less than RM1,000 had the highest prevalence of stunting at 18.0% (95% CI: 11.82, 26.38).

Overweight and Obese

The findings of this survey showed that 15.0% (95% CI: 13.31, 16.82) of adolescents were overweight and 14.8% (95% CI: 13.06, 16.70) were obese, based on their BMI-for-Age status.

A total of 15.4% (95% CI: 13.34, 17.71) of children were in urban areas and 13.7% (95% CI: 11.40, 16.44) in urban areas were overweight. Males had a higher prevalence [15.7% (95% CI: 13.25, 18.50)] compared to females [14.2% (95% CI: 12.12, 16.65)]. By ethnic groups, Chinese showed the highest prevalence of overweight [18.8% (95% CI: 13.45, 25.54)] and based on household income group, children in B40 was the higher prevalence [15.4% (95% CI: 13.24, 17.76)] compared than other income groups.

Among obese children, 15.3% (95% CI: 13.16, 17.78) children were in urban area and 13.2% (95% CI: 11.11, 15.61) in rural areas. Based on sex, males had a higher prevalence [17.5% (95% CI: 15.03, 20.21)] compared than female [12.0% (95% CI: 10.01, 14.36)]. According to ethnic groups, Indians show the highest prevalence of obese at 16.8% (95% CI: 10.59, 25.48) and based on household income group, children in T20 was the higher prevalence [17.8% (95% CI: 12.42, 24.91)] compared than other income groups.

Conclusion

The NHMS 2019 showed that the national prevalence of under nutrition children, underweight, wasting, stunting and underweight were increased by 1.7%, 4.1% and 1.6% respectively as compared with finding of NHMS 2015. However, prevalence of obesity showed increment trend which 11.9% increased to 14.8%. Prevalence of obesity was predominantly in urban area and among T20 household income group.

Recommendations

1. Strengthen ongoing school-based nutrition programmes, aiming at improved nutritional status of school children by creating an appropriate school's nutrition-friendly environment through nutrition education, nutritional assessment, school meals, as well as physical activity education.
2. Consolidate and incorporate existing teaching / learning materials and curriculum on nutrition component in line with local needs and conditions.
3. Empower parents / caregivers' and teachers' awareness on the importance of regular growth monitoring to ensure normal growth development according to their age and identify children at risk of developing overweight and obesity.
4. Continuous engagement / partnerships with relevant ministries and other agencies to ensure the effectiveness of nutrition programmes and policies at national and local levels.
5. Formulate and support appropriate weight management services or intervention programmes for children and adolescent that already affected by overweight and obese.

Table 15.2: Nutritional Status (Children 5 - 17 Years of Age) Trend in Malaysia

	2011	2015	2019
Obesity	6.1	11.9	14.8

References

1. World Health Organization (WHO) Global Database on Child Growth and Malnutrition. Geneva: WHO, 1997.
2. WHO. 2014. Indicators for the Global Nutrition Monitoring Framework on Maternal, Infant and Young Child Nutrition (24 November 2014).
3. de Onis M, Onyango W A, Borghi E et al. (2007). Development of a WHO growth reference for school-aged children and adolescents. Bulletin of the World Health Organization 85, 660-667.
4. Institute for Public Health Malaysia. National Health & Morbidity Survey (NHMS 2015). Vol. II: Non-Communicable Diseases, Risk Factors & Other Health

Table 15.3: Prevalence of Nutritional Status Among Children Below 5 Years Old in Malaysia

Nutritional Status	Count	Estimated Population	Prevalence	95% CI	
				Lower	Upper
MALAYSIA					
Weight for age (WAZ)					
Underweight (WAZ < -2SD)	160	327,628	14.1	11.39	17.37
Normal (WAZ ≥ -2SD - ≤2SD)	1,007	1,907,273	82.2	78.68	85.22
Overweight (WAZ. >2SD) * growth problem	44	85,867	3.7	2.55	5.34
Height for age (HAZ)					
Stunting (HAZ < -2SD)	234	497,185	21.8	18.42	25.63
Normal (HAZ ≥ -2SD to + ≤2SD)	899	82,685	73.6	69.67	77.19
Tall (HAZ > +2SD to ≤ +3SD) & Very Tall (HAZ > +3SD) * endocrine problem	55	104,614	4.6	3.09	6.77
Weight for Height (WHZ)					
Wasting (WHZ < -2SD)	114	219,550	9.7	7.57	12.25
Normal (WHZ ≥ -2SD to ≤ +2SD)	1,009	1,934,116	85.1	82.17	87.66
Overweight (WHZ > +2SD to ≤ +3SD)	35	53,932	2.4	1.56	3.61
Obese (WHZ > +3SD)	28	64,607	2.8	1.77	4.55
BMI for age(BAZ)					
Wasting (BAZ < -2SD)	104	220,605	9.7	7.31	12.79
Normal (BAZ ≥ -2SD to + ≤2SD)	1,014	1,923,733	84.7	81.43	87.46
Overweight (BAZ > +2SD to ≤ +3SD) & Obese (BAZ > +3SD)	68	127,198	5.6	4.13	7.55

Table 15.4: Prevalence of Nutritional Status Among Children Aged 5-17 Years Old in Malaysia

Nutritional Status	Count	Estimated Population	Prevalence	95% CI	
				Lower	Upper
MALAYSIA					
Weight for age (WAZ)*					
Underweight (WAZ < -2SD)	207	373,743	15.4	12.78	18.52
Normal (WAZ ≥ -2SD - ≤2SD)	1,064	1,829,685	75.6	72.01	78.79
Overweight (WAZ >2SD)*	118	218,089	9.0	7.08	11.39
Height for age (HAZ)					
Stunting (HAZ < -2SD)	396	818,428	12.7	10.96	14.70
Normal (HAZ ≥ -2SD to + ≤2SD)	2,726	5,484,027	85.2	83.15	87.02
Tall (HAZ > +2SD to ≤ +3SD)	57	134,939	2.1	1.48	2.95
BMI for age (BAZ)					
Thinness (BAZ < -2SD)	282	640,364	10.0	8.12	12.25
Normal (BAZ ≥ -2SD to + ≤2SD)	1,965	3,858,005	60.2	57.57	62.84
Overweight (BAZ > +2SD to ≤ +3SD)	456	959,304	15.0	13.31	16.82
Obese (BAZ > +3SD)	464	947,185	14.8	13.06	16.70

*Weight-for-Age among children (5 to 10 years old)

Table 15.5: Prevalence of Weight-for-Age Among Children Below 5 Years Old in Malaysia by Socio-Demographic Characteristics (n=1,211)

Sociodemographic Characteristics	Underweight (WAZ < -2SD)					Normal (WAZ ≥ -2SD - ≤2SD)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	160	327,628	14.1	11.39	17.37	1,007	1,907,273	82.2	78.68	85.22
Location										
Urban	94	234,382	13.6	10.24	17.82	631	1,422,453	82.5	77.94	86.27
Rural	66	93,247	15.6	12.12	19.93	376	484,820	81.3	76.92	84.99
Sex										
Male	84	184,984	15.5	11.43	20.70	513	959,331	80.4	75.15	84.78
Female	76	142,644	12.6	9.79	16.20	494	947,942	84.1	79.90	87.49
Ethnicity										
Malay ^a	123	246,496	15.2	12.20	18.73	743	1,320,043	81.3	77.40	84.63
Chinese	4	12,699	5.8*	1.51	19.65	58	204,582	93.1	80.02	97.83
Indian	2	19,972	25.7*	4.51	71.73	30	48,649	62.6	28.45	87.61
Bumiputera Sabah	12	18,464	9.9*	4.81	19.28	83	165,204	88.5	79.45	93.89
Bumiputera Sarawak	12	24,571	24.5	13.20	40.97	38	73,532	73.4	56.13	85.61
Others	7	5,426	4.8*	2.34	9.69	55	95,264	84.7	71.50	92.41
Household Income Group										
Less than RM 1,000	16	25,977	14.8	8.51	24.60	70	149,154	85.2	75.40	91.49
RM 1,000 - RM 1,999	30	58,553	13.8	8.95	20.62	183	346,608	81.6	74.26	87.16
RM 2,000 - RM 3,999	47	96,941	14.5	10.42	19.76	286	539,667	80.6	74.98	85.17
RM 4,000 - RM 5,999	27	47,831	12.4	6.92	21.18	166	318,223	82.4	73.24	88.87
RM 6,000 - RM 7,999	14	17,934	9.1*	4.36	18.17	111	173,365	88.4	78.06	94.24
RM 8,000 - RM 9,999	7	22,733	24.1*	6.35	59.69	34	71,753	75.9	40.31	93.65
RM 10,000 and above	8	12,416	8.5*	2.50	25.13	86	133,783	91.4	74.89	97.43
Household Income Category										
Bottom 40%	107	186,304	14.1	11.23	17.45	617	1,084,065	81.8	78.06	84.98
Middle 40%	32	74,268	12.3	7.63	19.31	251	505,628	83.9	76.37	89.37
Top 20%	10	21,812	13.2*	4.78	31.71	68	142,861	86.7	68.28	95.19

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

Sociodemographic Characteristics	Overweight (WAZ >2SD)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	44	85,867	3.7	2.55	5.34
Location					
Urban	30	67,476	3.9	2.50	6.07
Rural	14	18,391	3.1*	1.69	5.55
Sex					
Male	25	48,702	4.1	2.48	6.65
Female	19	37,165	3.3	1.88	5.70
Ethnicity					
Malay ^a	27	57,434	3.5	2.27	5.47
Chinese	4	2,533	1.2*	0.30	4.37
Indian	5	9,035	11.6*	3.21	34.30
Bumiputera Sabah	2	2,970	1.6*	0.30	7.95
Bumiputera Sarawak	1	2,083	2.1*	0.28	13.89
Others	5	11,812	10.5*	3.92	25.21
Household Income Group					
Less than RM 1,000	0	-	-	-	-
RM 1,000 - RM 1,999	12	19,758	4.6*	2.33	9.07
RM 2,000 - RM 3,999	15	33,116	4.9	2.79	8.62
RM 4,000 - RM 5,999	9	20,259	5.2*	2.18	12.10
RM 6,000 - RM 7,999	2	4,798	2.4*	0.35	15.07
RM 8,000 - RM 9,999	0	-	-	-	-
RM 10,000 and above	2	173	0.1*	0.03	0.51
Household Income Category					
Bottom 40%	30	55,323	4.2	2.72	6.36
Middle 40%	9	22,707	3.8*	1.61	8.55
Top 20%	1	73	0.0*	0.01	0.33

Table 15.6: Prevalence of Height-for-Age Among Children Below 5 Years Old in Malaysia by Socio-Demographic Characteristics (n=1,188)

Sociodemographic Characteristics	Stunting (HAZ < -2SD)					Normal (HAZ ≥ -2SD to + ≤2SD)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	234	497,185	21.8	18.42	25.63	899	82,685	73.6	69.67	77.19
Location										
Urban	142	366,237	21.7	17.35	26.72	554	1,234,810	73.1	67.90	77.67
Rural	92	130,948	22.2	18.72	26.12	345	443,247	75.1	71.10	78.79
Sex										
Male	113	235,807	20.2	15.52	25.89	462	870,891	74.7	68.88	79.67
Female	121	261,377	23.5	18.90	28.77	437	807,166	72.5	67.09	77.33
Ethnicity										
Malay ^a	170	338,684	21.3	17.63	25.51	665	1,183,191	74.4	70.04	78.38
Chinese	9	33,541	15.3*	5.63	35.42	50	179,497	82.0	62.70	92.46
Indian	3	20,911	26.9*	5.14	71.47	31	41,045	52.9*	24.27	79.68
Bumiputera Sabah	23	49,378	26.5	15.58	41.25	73	137,160	73.5	58.75	84.42
Bumiputera Sarawak	18	40,025	41.5	26.09	58.71	32	56,490	58.5	41.29	73.91
Others	11	14,646	13.2*	6.96	23.76	48	80,674	72.9	58.26	83.89
Household Income Group										
Less than RM 1,000	21	40,321	23.0	14.68	34.22	60	124,888	71.3	58.63	81.37
RM 1,000 - RM 1,999	51	101,419	24.5	18.88	31.14	161	291,904	70.5	63.36	76.78
RM 2,000 - RM 3,999	63	144,104	21.8	15.83	29.26	262	486,573	73.6	66.12	79.99
RM 4,000 - RM 5,999	40	77,979	20.9	13.03	31.70	149	282,658	75.6	65.18	83.73
RM 6,000 - RM 7,999	17	29,180	15.1	8.46	25.43	100	147,487	76.2	61.87	86.33
RM 8,000 - RM 9,999	7	15,851	16.8*	4.90	44.12	32	76,704	81.2	53.35	94.21
RM 10,000 and above	16	13,018	9.1*	4.00	19.30	72	126,779	88.4	77.32	94.48
Household Income Category										
Bottom 40%	153	290,806	22.4	18.47	26.84	551	946,352	72.8	68.17	77.02
Middle 40%	48	103,829	17.5	11.41	25.86	227	461,416	77.7	68.71	84.72
Top 20%	14	27,236	16.8	9.09	29.08	58	129,223	79.9	67.52	88.36

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli

Sociodemographic Characteristics	Tall (HAZ > +2SD to ≤ +3SD) & Very Tall (HAZ > +3SD)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	55	104,614	4.6	3.09	6.77
Location					
Urban	40	88,936	5.3	3.33	8.21
Rural	15	15,678	2.7	1.50	4.66
Sex					
Male	32	59,905	5.1	3.32	7.85
Female	23	44,709	4.0*	2.14	7.42
Ethnicity					
Malay ^a	39	67,649	4.3	2.66	6.74
Chinese	6	5,983	2.7*	0.76	9.30
Indian	3	15,700	20.2*	5.48	52.56
Bumiputera Sabah	0	-	-	-	-
Bumiputera Sarawak	0	-	-	-	-
Others	7	15,281	13.8*	6.16	28.13
Household Income Group					
Less than RM 1,000	5	9,880	5.6*	2.06	14.50
RM 1,000 - RM 1,999	9	20,666	5.0*	2.36	10.23
RM 2,000 - RM 3,999	16	30,131	4.6*	2.49	8.19
RM 4,000 - RM 5,999	8	13,082	3.5*	1.25	9.38
RM 6,000 - RM 7,999	6	16,906	8.7*	2.33	27.75
RM 8,000 - RM 9,999	2	1,931	2.0*	0.26	14.16
RM 10,000 and above	6	3,577	2.5*	0.41	13.59
Household Income Category					
Bottom 40%	35	62,456	4.8	3.13	7.31
Middle 40%	12	28,429	4.8*	1.88	11.65
Top 20%	5	5,289	3.3*	0.81	12.32

Table 15.7: Prevalence of Weight-for-Height Among Children Below 5 Years Old in Malaysia by Socio-Demographic Characteristics (n=1,186)

Sociodemographic Characteristics	Wasting (WHZ < -2SD)					Normal (WHZ ≥ -2SD to ≤ +2SD)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	114	219,550	9.7	7.57	12.25	1,009	1,934,116	85.1	82.17	87.66
Location										
Urban	76	169,681	10.1	7.47	13.43	619	1,427,978	84.7	80.89	87.83
Rural	38	49,869	8.5	5.96	12.02	390	506,138	86.4	82.20	89.73
Sex										
Male	70	133,021	11.3	8.36	15.21	502	971,814	82.9	78.48	86.51
Female	44	86,528	7.9	5.49	11.16	507	962,303	87.5	83.63	90.61
Ethnicity										
Malay ^a	92	184,953	11.7	9.03	15.05	743	1,334,441	84.5	81.00	87.41
Chinese	5	14,665	6.8*	1.94	21.06	53	197,190	91.0	76.68	96.86
Indian	3	2,742	3.5*	0.90	12.50	31	66,926	84.8	64.43	94.53
Bumiputera Sabah	4	3,293	1.7*	0.56	5.24	86	169,900	89.5	79.97	94.84
Bumiputera Sarawak	3	5,201	5.4*	1.86	14.61	41	80,020	82.9	70.23	90.89
Others	7	8,696	7.9*	2.87	19.75	55	85,639	77.4	59.11	89.06
Household Income Group										
Less than RM 1,000	8	14,664	8.3*	3.89	16.67	76	157,359	88.6	79.11	94.12
RM 1,000 - RM 1,999	13	31,632	7.7	78.09	90.35	193	351,599	85.2	78.09	90.35
RM 2,000 - RM 3,999	40	86,313	13.1	9.03	18.64	282	536,871	81.5	76.14	85.93
RM 4,000 - RM 5,999	21	27,874	7.5	4.18	13.12	165	321,009	86.4	78.91	91.54
RM 6,000 - RM 7,999	8	8,361	4.5*	1.48	12.78	108	167,860	89.9	77.10	95.95
RM 8,000 - RM 9,999	4	14,465	15.3*	3.01	51.25	34	74,126	78.5	42.91	94.63
RM 10,000 and above	12	18,782	13.1*	5.54	27.95	77	120,413	84.0	69.83	92.24
Household Income Category										
Bottom 40%	74	136,302	10.5	7.91	13.76	625	1,091,689	84.0	80.21	87.10
Middle 40%	19	39,815	6.8*	3.71	12.26	251	508,298	87.3	80.25	92.06
Top 20%	13	25,974	16.1*	7.02	32.64	59	129,250	79.9	63.78	89.98

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli

Sociodemographic Characteristics	Overweight (WHZ > +2SD to ≤ +3SD)					Obese (WHZ > +3SD)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	35	53,932	2.4	1.56	3.61	28	64,607	2.8	1.77	4.55
Location										
Urban	21	34,625	2.1	1.18	3.56	19	54,076	3.2	1.85	5.49
Rural	14	19,307	3.3*	1.77	6.07	9	10,532	1.8*	0.79	4.02
Sex										
Male	16	27,936	2.4	1.34	4.21	20	40,039	3.4	1.93	5.96
Female	19	25,997	2.4*	1.28	4.32	8	24,568	2.2*	0.95	5.19
Ethnicity										
Malay ^a	22	29,540	1.9	1.09	3.19	14	30,772	1.9*	1.04	3.63
Chinese	2	967	0.4*	0.07	2.71	4	3,933	1.8*	0.37	8.53
Indian	2	2,442	3.1*	0.67	13.07	2	6,780	8.6*	1.66	34.34
Bumiputera Sabah	5	14,698	7.7*	2.97	18.72	2	1,847	1.0*	0.20	4.52
Bumiputera Sarawak	4	6,286	6.5*	2.12	18.31	2	5,008	5.2*	1.17	20.20
Others	0	-	-	-	-	4	16,266	14.7*	5.05	35.87
Household Income Group										
Less than RM 1,000	2	2,223	1.3*	0.19	7.64	1	3,333	1.9*	0.26	12.42
RM 1,000 - RM 1,999	4	6,706	1.6*	0.58	4.49	10	22,531	5.5*	2.31	12.35
RM 2,000 - RM 3,999	12	19,051	2.9*	1.47	5.63	7	16,237	2.5*	1.00	5.96
RM 4,000 - RM 5,999	4	9,276	2.5*	0.80	7.56	6	13,293	3.6*	1.29	9.53
RM 6,000 - RM 7,999	3	3,089	1.7*	0.25	10.13	2	7,338	3.9*	0.94	15.07
RM 8,000 - RM 9,999	2	4,037	4.3*	0.64	23.71	1	1,858	2.0*	0.24	14.49
RM 10,000 and above	5	4,179	2.9*	0.90	9.00	0	-	-	-	-
Household Income Category										
Bottom 40%	21	27,589	2.1	1.21	3.70	20	44,781	3.4	1.93	6.08
Middle 40%	7	16,306	2.8*	1.16	6.58	6	17,951	3.1*	1.20	7.66
Top 20%	4	4,666	2.9*	0.97	8.25	1	1,858	1.1*	0.16	7.80

Table 15.8: Prevalence of BMI-for-Age Among Children Below 5 Years Old in Malaysia by Socio-Demographic Characteristics (n=1,186)

Sociodemographic Characteristics	Wasting (BAZ < -2SD)					Normal (BAZ ≥ -2SD to + ≤2SD)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	104	220,605	9.7	7.31	12.79	1,014	1,923,733	84.7	81.43	87.46
Location										
Urban	69	175,894	10.4	7.41	14.50	619	1,409,177	83.6	79.33	87.07
Rural	35	44,710	7.6	5.19	11.11	395	514,556	87.9	83.96	91.02
Sex										
Male	61	140,212	12.0	8.31	16.92	506	953,748	81.3	76.19	85.58
Female	43	80,392	7.3	4.94	10.70	508	969,985	88.3	84.31	91.33
Ethnicity										
Malay ^a	79	161,727	10.2	7.68	13.55	752	1,348,729	85.5	82.09	88.29
Chinese	5	14,665	6.7*	1.92	20.85	53	197,190	90.0	75.96	96.27
Indian	5	22,972	29.1*	6.53	70.74	28	45,429	57.6	27.18	83.16
Bumiputera Sabah	4	5,097	2.7*	0.71	9.76	87	170,616	90.6	80.61	95.71
Bumiputera Sarawak	4	6,923	7.2*	2.92	16.54	40	78,298	81.1	68.51	89.46
Others	7	9,220	8.3*	3.21	19.96	54	83,470	75.5	58.34	87.11
Household Income Group										
Less than RM 1,000	8	16,035	9.0*	4.42	17.56	75	152,655	86.0	76.09	92.18
RM 1,000 - RM 1,999	12	26,805	6.5*	3.50	11.69	193	354,133	85.6	78.61	90.60
RM 2,000 - RM 3,999	39	84,369	12.8	8.66	18.51	285	543,117	82.4	76.80	86.89
RM 4,000 - RM 5,999	17	27,188	7.3*	3.87	13.23	168	323,462	86.4	78.76	91.65
RM 6,000 - RM 7,999	6	7,059	3.8*	1.12	12.05	109	169,072	90.6	77.87	96.37
RM 8,000 - RM 9,999	3	9,385	10.5*	2.32	36.70	34	74,126	82.9	52.47	95.52
RM 10,000 and above	11	15,932	11.1*	4.12	26.65	78	123,263	86.0	71.38	93.77
Household Income Category										
Bottom 40%	68	132,404	10.2	7.61	13.42	628	1,093,749	83.9	80.16	87.01
Middle 40%	17	36,325	6.2*	3.22	11.72	254	513,978	88.1	81.08	92.79
Top 20%	11	18,045	11.5*	5.30	23.24	60	132,099	84.3	71.87	91.88

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli

Sociodemographic Characteristics	Overweight (BAZ > +2SD to ≤ +3SD) & Obese (BAZ > +3SD)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	68	127,198	5.6	4.13	7.55
Location					
Urban	47	101,275	6.0	4.19	8.54
Rural	21	25,923	4.4	2.65	7.31
Sex					
Male	41	78,705	6.7	4.60	9.70
Female	27	48,493	4.4	2.62	7.35
Ethnicity					
Malay ^a	40	67,709	4.3	2.94	6.23
Chinese	7	7,166	3.3*	0.86	11.68
Indian	5	10,489	13.3*	4.27	34.51
Bumiputera Sabah	5	12,628	6.7*	2.50	16.76
Bumiputera Sarawak	6	11,294	11.7*	4.88	25.52
Others	5	17,911	16.2*	6.22	36.04
Household Income Group					
Less than RM 1,000	4	8,890	5.0*	1.62	14.43
RM 1,000 - RM 1,999	16	32,703	7.9*	4.18	14.46
RM 2,000 - RM 3,999	18	31,585	4.8*	2.66	8.47
RM 4,000 - RM 5,999	11	23,530	6.3*	3.03	12.58
RM 6,000 - RM 7,999	5	10,427	5.6*	1.76	16.36
RM 8,000 - RM 9,999	3	5,895	6.6*	1.35	26.67
RM 10,000 and above	5	4,179	2.9*	0.90	9.00
Household Income Category					
Bottom 40%	45	77,825	6.0	4.03	8.75
Middle 40%	12	32,861	5.6*	2.89	10.69
Top 20%	5	6,524	4.2*	1.58	10.52

Table 15.9: Prevalence of Weight-for-Age Among Children Aged 5-10 Years Old in Malaysia by Socio-Demographic Characteristics (n=1,389)

Sociodemographic Characteristics	Underweight (WAZ < -2SD)					Normal (WAZ ≥ -2SD - ≤2SD)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	207	373,743	15.4	12.78	18.52	1,064	1,829,685	75.6	72.01	78.79
Location										
Urban	136	291,096	15.8	12.58	19.75	671	1,373,134	74.7	70.24	78.74
Rural	71	82,647	14.2	10.73	18.44	393	456,550	78.2	73.57	82.18
Sex										
Male	107	188,003	14.8	11.72	18.54	534	940,350	74.1	69.59	78.12
Female	100	185,740	16.1	12.39	20.71	530	889,334	77.2	71.96	81.69
Ethnicity										
Malay ^a	161	285,835	18.2	14.90	22.08	742	1,145,580	73.0	68.72	76.90
Chinese	8	21,479	6.2*	2.55	14.16	81	287,939	82.6	70.63	90.36
Indian	8	18,083	16.4*	6.68	35.03	50	85,530	77.6	60.32	88.81
Bumiputera Sabah	14	21,545	11.4*	5.63	21.86	96	151,999	80.7	68.36	89.02
Bumiputera Sarawak	3	7,293	6.6*	1.60	23.61	48	87,013	79.1	65.68	88.18
Others	13	19,509	20.5	12.31	32.09	47	71,625	75.2	63.55	84.05
Household Income Group										
Less than RM 1,000	22	44,761	19.9	12.39	30.41	91	161,579	71.9	61.27	80.50
RM 1,000 - RM 1,999	38	83,538	16.4	11.92	22.14	222	386,382	75.9	69.35	81.37
RM 2,000 - RM 3,999	59	105,197	16.6	11.90	22.71	284	475,835	75.1	68.24	80.96
RM 4,000 - RM 5,999	31	52,310	14.4	8.74	22.75	154	275,725	75.8	66.77	82.98
RM 6,000 - RM 7,999	16	11,984	5.7*	2.50	12.48	101	170,614	81.2	69.09	89.25
RM 8,000 - RM 9,999	9	13,280	11.9*	3.54	33.27	54	88,644	79.6	57.80	91.72
RM 10,000 and above	17	29,497	18.3*	5.20	47.91	83	119,345	74.2	49.93	89.25
Household Income Category										
Bottom 40%	130	241,897	16.3	13.20	20.05	674	1,115,687	75.4	71.12	79.18
Middle 40%	45	59,876	11.1	7.22	16.79	237	420,192	78.1	70.65	84.13
Top 20%	17	38,794	19.8*	7.39	43.41	78	142,245	72.7	52.71	86.45

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli

Sociodemographic Characteristics	Overweight (WAZ >2SD)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	118	218,089	9.0	7.08	11.39
Location					
Urban	79	173,342	9.4	7.07	12.47
Rural	39	44,747	7.7	5.28	10.99
Sex					
Male	76	140,974	11.1	8.34	14.64
Female	42	77,115	6.7	4.35	10.16
Ethnicity					
Malay ^a	80	137,739	8.8	6.77	11.31
Chinese	11	39,183	11.2*	5.15	22.81
Indian	5	6,540	5.9*	1.92	16.91
Bumiputera Sabah	10	14,779	7.8*	2.40	22.79
Bumiputera Sarawak	9	15,731	14.3*	6.33	29.16
Others	3	4,116	4.3*	1.23	14.11
Household Income Group					
Less than RM 1,000	10	18,481	8.2*	4.13	15.70
RM 1,000 - RM 1,999	21	39,360	7.7	4.77	12.29
RM 2,000 - RM 3,999	29	52,254	8.3	4.99	13.34
RM 4,000 - RM 5,999	19	35,785	9.8*	5.31	17.50
RM 6,000 - RM 7,999	15	27,628	13.1*	6.27	25.51
RM 8,000 - RM 9,999	5	9,480	8.5*	1.86	31.34
RM 10,000 and above	9	11,989	7.5*	3.01	17.29
Household Income Category					
Bottom 40%	72	122,692	8.3	6.16	11.07
Middle 40%	28	57,736	10.7	6.37	17.52
Top 20%	8	14,548	7.4*	3.33	15.79

Table 15.10: Prevalence of Height-for-Age Among Children Aged 5-17 Years Old in Malaysia by Socio-Demographic Characteristics (n=3,179)

Sociodemographic Characteristics	Stunting (HAZ < -2SD)					Normal (HAZ ≥ -2SD to + ≤2SD)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	396	818,428	12.7	10.96	14.70	2,726	5,484,027	85.2	83.15	87.02
Location										
Urban	218	542,421	11.3	9.36	13.47	1,722	4,175,526	86.6	84.35	88.64
Rural	178	276,006	17.1	13.39	21.48	1,004	1,308,501	80.9	76.38	84.67
Sex										
Male	195	410,784	12.5	10.23	15.20	1,388	2,815,017	85.7	82.80	88.14
Female	201	407,644	12.9	10.73	15.52	1,338	2,669,010	84.7	81.94	87.07
Ethnicity										
Malay ^a	287	527,101	13.3	11.39	15.50	1,896	3,373,937	85.2	82.96	87.20
Chinese	18	65,380	6.7*	3.44	12.78	232	856,608	88.3	82.34	92.40
Indian	15	27,651	8.1*	3.84	16.42	146	297,470	87.5	79.50	92.70
Bumiputera Sabah	34	74,187	14.4	9.51	21.20	242	439,519	85.3	78.49	90.19
Bumiputera Sarawak	21	54,280	16.4	10.01	25.72	105	265,054	80.1	71.56	86.56
Others	21	69,829	21.7*	8.71	44.71	105	251,440	78.3	55.29	91.29
Household Income Group										
Less than RM 1,000	52	111,579	18.0	11.82	26.38	244	504,659	81.3	72.99	87.50
RM 1,000 - RM 1,999	88	176,632	13.3	9.91	17.69	539	1,122,064	84.6	80.17	88.25
RM 2,000 - RM 3,999	121	240,917	13.0	10.54	15.92	794	1,574,174	84.9	81.79	87.55
RM 4,000 - RM 5,999	52	114,453	11.5	7.53	17.22	400	857,711	86.3	80.47	90.57
RM 6,000 - RM 7,999	24	36,930	7.5	4.36	12.55	238	440,200	89.2	82.74	93.43
RM 8,000 - RM 9,999	8	11,328	4.5*	1.28	14.92	124	233,765	93.8	84.24	97.72
RM 10,000 and above	26	56,220	13.1*	7.00	23.16	216	367,946	85.7	76.31	91.74
Household Income Category										
Bottom 40%	268	514,363	12.8	10.69	15.32	1,740	3,418,909	85.3	82.73	87.47
Middle 40%	74	167,553	11.6	8.33	15.81	618	1,248,014	86.0	81.37	89.68
Top 20%	29	66,144	13.1*	7.55	21.67	197	433,597	85.7	77.40	91.24

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli

Sociodemographic Characteristics	Tall (HAZ > +2SD to ≤ +3SD)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	57	134,939	2.1	1.48	2.95
Location					
Urban	33	101,385	2.1	1.37	3.21
Rural	24	33,554	2.1	1.25	3.43
Sex					
Male	26	59,822	1.8	1.04	3.16
Female	31	75,117	2.4	1.54	3.67
Ethnicity					
Malay ^a	30	58,628	1.5	0.95	2.30
Chinese	11	48,346	5.0*	2.56	9.46
Indian	7	14,726	4.3*	1.59	11.24
Bumiputera Sabah	4	1,687	0.3*	0.05	1.96
Bumiputera Sarawak	5	11,552	3.5*	1.34	8.81
Others	0	-	-	-	-
Household Income Group					
Less than RM 1,000	3	4,468	0.7*	0.17	2.96
RM 1,000 - RM 1,999	13	26,975	2.0*	1.04	3.93
RM 2,000 - RM 3,999	14	39,222	2.1*	1.03	4.28
RM 4,000 - RM 5,999	8	21,883	2.2*	0.86	5.53
RM 6,000 - RM 7,999	6	16,373	3.3*	1.15	9.22
RM 8,000 - RM 9,999	3	4,125	1.7*	0.37	7.12
RM 10,000 and above	4	5,288	1.2*	0.30	4.84
Household Income Category					
Bottom 40%	32	76,862	1.9	1.21	3.01
Middle 40%	13	35,034	2.4*	1.15	5.01
Top 20%	6	6,438	1.3*	0.36	4.34

Table 15.11: Prevalence of BMI-for-Age Among Children Aged 5-17 Years Old in Malaysia by Socio-Demographic Characteristics (n=3,167)

Sociodemographic Characteristics	Thinness (BAZ < -2SD)					Normal (BAZ ≥ -2SD to + ≤2SD)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	282	640,364	10.0	8.12	12.25	1,965	3,858,005	60.2	57.57	62.84
Location										
Urban	174	459,297	9.6	7.63	11.98	1,212	2,859,397	59.7	56.55	62.75
Rural	108	181,067	11.2	7.14	17.19	753	998,608	61.9	56.71	66.75
Sex										
Male	153	329,327	10.1	8.02	12.66	944	1,848,222	56.7	53.14	60.25
Female	129	311,037	9.9	7.22	13.40	1,021	2,009,783	63.9	60.08	67.50
Ethnicity										
Malay ^a	210	395,280	10.1	8.32	12.10	1,363	2,353,297	59.9	56.91	62.74
Chinese	14	57,614	5.9*	3.02	11.34	165	618,465	63.7	55.59	71.17
Indian	27	76,988	22.7	12.17	38.23	88	150,695	44.3	34.13	55.06
Bumiputera Sabah	13	26,318	5.1*	2.35	10.81	181	342,916	66.7	59.46	73.28
Bumiputera Sarawak	7	27,829	8.5*	3.31	20.03	80	203,967	62.1	49.88	73.00
Others	11	56,334	17.5*	4.47	49.16	88	188,665	58.7	38.89	76.08
Household Income Group										
Less than RM 1,000	35	84,264	13.5	8.66	20.52	188	382,868	61.5	53.81	68.58
RM 1,000 - RM 1,999	53	144,796	11.0	7.09	16.67	412	797,417	60.6	55.10	65.81
RM 2,000 - RM 3,999	74	146,121	7.9	5.79	10.79	555	1,089,752	59.2	54.48	63.77
RM 4,000 - RM 5,999	43	116,649	11.8*	5.87	22.38	270	546,393	55.4	47.63	62.91
RM 6,000 - RM 7,999	25	39,182	7.9*	4.07	14.88	173	333,189	67.5	57.87	75.78
RM 8,000 - RM 9,999	10	14,243	5.8*	2.45	13.16	83	141,635	57.8	46.52	68.37
RM 10,000 and above	27	52,258	12.2*	5.47	24.91	152	258,256	60.1	49.78	69.66
Household Income Category										
Bottom 40%	179	389,704	9.8*	7.76	12.25	1,255	2,362,113	59.3	56.18	62.27
Middle 40%	59	148,651	10.3	5.80	17.57	443	890,555	61.6	55.01	67.76
Top 20%	29	59,159	11.8	5.58	23.19	135	296,842	59.1	49.44	68.13

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli

Sociodemographic Characteristics	Overweight (BAZ > +2SD to ≤ +3SD)					Obese (BAZ > +3SD)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	456	959,304	15.0	13.31	16.82	464	947,185	14.8	13.06	16.70
Location										
Urban	283	737,707	15.4	13.34	17.71	296	734,149	15.3	13.16	17.78
Rural	173	221,596	13.7	11.40	16.44	168	213,037	13.2	11.11	15.61
Sex										
Male	229	511,437	15.7	13.25	18.50	270	569,129	17.5	15.03	20.21
Female	227	447,866	14.2	12.12	16.65	194	378,057	12.0	10.01	14.36
Ethnicity										
Malay ^a	318	579,913	14.8	12.85	16.88	313	602,738	15.3	13.35	17.54
Chinese	44	181,985	18.8	13.45	25.54	38	112,269	11.6	7.02	18.48
Indian	25	55,237	16.3	8.88	27.87	28	56,926	16.8	10.59	25.48
Bumiputera Sabah	39	67,789	13.2	9.82	17.49	46	76,861	15.0	10.27	21.28
Bumiputera Sarawak	19	43,056	13.1	8.20	20.33	23	53,443	16.3	10.55	24.28
Others	11	31,322	9.7*	3.90	22.33	16	44,947	14.0*	7.03	25.91
Household Income Group										
Less than RM 1,000	36	75,873	12.2	7.88	18.37	41	79,957	12.8	8.80	18.35
RM 1,000 - RM 1,999	89	194,232	14.8	11.55	18.66	81	179,866	13.7	10.30	17.91
RM 2,000 - RM 3,999	143	283,712	15.4	12.23	19.25	150	320,904	17.4	13.90	21.65
RM 4,000 - RM 5,999	75	185,374	18.8	14.40	24.16	70	137,940	14.0	10.15	18.96
RM 6,000 - RM 7,999	35	51,982	10.5	6.40	16.83	37	69,535	14.1	8.97	21.42
RM 8,000 - RM 9,999	20	47,524	19.4	12.24	29.36	21	41,516	17.0*	8.91	29.87
RM 10,000 and above	34	51,056	11.9	7.30	18.79	33	67,884	15.8	10.01	24.07
Household Income Category										
Bottom 40%	296	612,479	15.4	13.24	17.76	299	621,786	15.6	13.38	18.11
Middle 40%	106	220,596	15.3	12.10	19.05	96	186,324	12.9	9.74	16.85
Top 20%	30	56,677	11.3	6.92	17.89	38	89,491	17.8	12.42	24.91

Mental Health Problems of Children

Mental Health Problems of Children

Contributors to this section: Abdul Aziz Harith, Mohd Shaiful Azlan Kassim, Noor Ani Ahmad, Norhafizah Sahril, Sherina Mohd Sidik, Idaya Badilla Idris, Nurashikin Ibrahim, Nur Azna Mahmud, Nor Asiah Muhamad, Rimah Melati Ab. Ghani, Zamtira Seman

Introduction

World Health Organization (WHO) reported 10-20% of children and adults experience mental disorders. More surprising, 50% of mental health illnesses begin by the age of 14 and three-quarters by mid-20s [1]. Consequences of mental health severely influence the child's development, their education, and potential to live fulfilling and productive lives [2]. Children with mental disorders face challenges with stigma, isolation and discrimination [3].

Mental health is defined as a state well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community. The positive dimension of mental health is highlighted in World Health Organization's (WHO) definition of health as contained in its constitution: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease infirmity" [4].

Child mental health is the complete well-being and optimal development of a child in the emotional, behavioral, social and cognitive domains [5]. Children's mental health is often defined as different from adult mental health and more multifaceted because of the unique development milestones that children experience. Characteristics of the child for example, gender and genetics, are important determinants of a child's well-being. However, child mental health also includes those conditions that directly affects or modify mental health, including aspects of a child's family, community and broader society.

The mental health problems in children may be reflected as difficulties in psychological and emotional development, social relationships and behavior. Children with good mental health are able to develop emotionally and cognitively, form effective social relationships with others, and cope with problems [6]. The "Report from the 2016 National Survey of Children's Health (NSCH) in United States among 3 to 17 years old children found that 7.1% had anxiety, 7.4% had current behavioral / conduct problems, and 3.2% had current

depression [7]. The prevalence of each disorder was higher with older age and child with poor health [7].

Findings from the previous Malaysia National Health and Morbidity Survey (NHMS 2015) using the Strength and Difficulties Questionnaire (SDQ) found that the prevalence of mental health among children aged 5 to 15 years old was 12.1% (95% CI: 11.0, 13.4) and it was higher among males [12.4% (95% CI: 10.8, 14.1)] compared to females [11.9% (95% CI: 10.3, 13.6)] [8]. It was also found that children in the younger age (5-9 years old) had higher prevalence mental health problems compared to the older age group (10-15 years old) [8].

Objectives

General objective

To determine the prevalence of mental health problems among children age 5 to 15 years in Malaysia.

Specific Objectives

1. To determine the prevalence of emotional problem among children age 5 to 15 years in Malaysia
2. To determine the prevalence of conduct problem among children age 5 to 15 years in Malaysia
3. To determine the prevalence of hyperactivity problem among children age 5 to 15 years in Malaysia
4. To determine the prevalence of peer problem among children age 5 to 15 years in Malaysia
5. To determine the prevalence of pro-social skills among children age 5 to 15 years in Malaysia

Methods

The Strength and Difficulties Questionnaires (SDQ) is a brief behavioural screening questionnaire. This instrument has been used in 2015 and repeated in 2019. The information on mental health among children age 5 to 15 years were required from their parents or guardian. The SDQ comprises 25 items comprising 5 scales of 5 items which were emotional problems scale, conduct problems scales, hyperactivity problem scales, peer problem scales and pro-social scales. Informants answered the questionnaires using Likert-Scales. It scored the scale up to the pro rata if it completed if at least 3 items. Each problem scores comprises five items with a score range of 0-10.

The SDQ scores for each scale were categorized as follows:

SDQ Scale	Categories	
	Normal	Abnormal
Emotional Problems Scores	0-3	4-10
Conduct Problem Scores	0-2	3-10
Hyperactivity Problem Scores	0-5	6-10
Peer Problem Scores	0-2	3-10
Pro-Social Scores	6-10	0-5

We consider a child to having mental health problems if total difficulties score was 14 or more. Total Difficulties Scores generated by adding the scores from all the scales except the pro-social scale. The resultant score ranged from 0 to 40 and counted as missing if one of the four component scores was missing.

The Total Difficulties Scores for SDQ scores were categorized as follows:

Scale	Categories	
	Normal	Abnormal
Total Difficulties Scores	0-13	14-40

Findings

About 3185 out of a total of 3226 children aged 5 to 15 years old responded in this study (response rate: 98.7%). The overall prevalence of mental health problems among children was 7.9% (95% CI: 6.56, 9.38). The prevalence was highest in Perak [19.0% (95% CI: 11.19, 30.35)], followed by Perlis [14.9% (95% CI: 8.90, 23.93)] and Sarawak [14.1% (95% CI: 9.56, 20.25)]. Children from rural areas had higher prevalence of mental health problems as compared to those from urban areas [8.8% (95% CI: 6.68, 11.54) vs 7.5% (95% CI: 5.96, 9.39)]. By sex, mental health problems were higher among females than males [8.4% (95% CI: 6.65, 10.67) vs 7.3% (95% CI: 5.58, 9.38)].

Older children (10-15 years) showed higher prevalence of mental health problems [9.5% (95% CI: 7.58, 11.77)], as compared to younger children (5-9 years) [5.9% (95% CI: 4.60, 7.47)]. By household income, those with lower income (RM1,000-RM1,999) and (less than RM1,000) showed higher prevalence of mental health problems respectively [11.9% (95% CI: 8.49, 16.35)] and [10.1% (95% CI: 6.55, 15.38)]. Those who at B40 income group showed highest prevalence of mental health problems [8.8% (95% CI: 7.27, 10.70)].

By domains, peer problems had the highest prevalence, which increased from 32.5% in NHMS 2015 to 42.9% in NHMS 2019. Conduct, emotional and hyperactivity problems showed reduction in prevalence from NHMS 2015 to NHMS 2019; from 16.7% to 15.9%, 15.7% to 8.3% and 4.6% to 2.3% respectively.

There is an improvement in the prevalence of pro-social skills from 11.2% in NHMS 2015 to 27.7% in the current survey (NHMS 2019).

Conclusion

This survey found that children who were at risk of mental health problems were those who were in the older age group (10-15 years old), female, and from rural areas. Children with lower household income showed higher prevalence of having mental health problems. However, the findings were only significant for age group. It was noted that the highest type of mental health problems were peer problems followed by conduct problems and emotional problems.

Recommendations

Special programs in managing stress among older children need to be emphasized in the school system. Trained preschool and school teachers need to be empowered and trained for early detection of mental health problems among children. Respective agencies involved with education and welfare of children should acknowledge these problems for subsequent action.

Table 16.1: Mental Health (Children) Trend in Malaysia

	2015	2019
Mental Health	12.1	7.9
Emotional Health	15.7	8.3
Conduct Problem	16.7	15.9
Hyperactivity Problem	4.6	2.3
Peer Problem	32.5	42.9
Pro-Social Skills	11.2	27.7

References

- World Health Organization. Web page on Mental Health; Child and adolescent mental health. https://www.who.int/mental_health/maternal-child/child_adolescent/en/
- Sheehan R. Mental Illness in Children: Childhood Illness and Supporting the Family. *Brain Sci.* 2017; 7(8):97. Published 2017 Aug 8. doi:10.3390/brainsci7080097
- Nich Gould. *Mental Health Social Work in Context: Student social work.* First edition published by Routledge 2010. | ISBN 9781138905672 (hbk).
- WHO: Mental health: a state of wellbeing. Geneva: World Health Organization;2014. www.who.int/features/factfiles/mental_health/en/
- Child Mental Health. Melanie Barwick, Diana Urajnik. <http://www.britannica.com/topic/child-mental-health>.
- Reem M.Ghandour, Stephen J.Blumberg Prevalence and treatment of depression, anxiety and conduct problems in US Children. *The Journal of Pediatrics.* Volume 206, March 2019;256-267. <http://doi.org/10.1016/j.peds.2018.09.021>
- Perou R, Bitsko RH, Blumberg SJ, Pastor P, Ghandour RM, Gfroerer JC, Hedden SL, Crosby AE, Visser SN, Schieve LA, Parks SE, Hall JE, Brody D, Simile CM, Thompson WW, Baio J, Avenevoli S, Kogan MD, Huang LN. Mental health surveillance among children – United States, 2005–2011. *MMWR* 2013;62(Suppl; May 16, 2013):1-35.
- Institute for Public Health. National Health Morbidity Survey 2015 Report. <http://www.moh.gov.my/moh/resources/nhmsreport2015vol2.pdf>
- Idris IB, Barlow J, Dolan A, Surat, S. The reliability and validity of the Malay parent-report version of the strengths and difficulties questionnaire. *Malays J Med Sci.* 2019;26(1):125–137. <https://doi.org/10.21315/mjms2019.26.1.12>

Table 16.2: Prevalence of Mental Health Problems Among Children Aged 5 - 15 Years in Malaysia by Socio-Demographic Characteristics (n=3,185)

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	251	424,017	7.9	6.56	9.38
State					
Johor	10	28,015	4.7*	2.32	9.44
Kedah	10	21,222	5.8*	2.61	12.21
Kelantan	14	23,564	6.1*	3.04	11.78
Melaka	11	8,675	6.6*	3.42	12.29
Negeri Sembilan	12	15,399	5.1*	2.51	10.08
Pahang	11	16,894	5.9*	2.67	12.68
Pulau Pinang	7	8,346	3.5*	0.78	14.46
Perak	23	66,292	19.0	11.19	30.35
Perlis	19	5,929	14.9	8.90	23.93
Selangor	16	41,458	4.1	2.34	6.94
Terengganu	25	25,655	10.1	6.53	15.21
Sabah	35	81,015	11.9	7.73	17.87
Sarawak	25	65,838	14.1	9.56	20.25
WP Kuala Lumpur	6	12,795	5.3*	2.00	13.08
WP Labuan	16	1,686	10.3*	5.61	18.10
WP Putrajaya	11	1,234	5.1*	2.71	9.38
Location					
Urban	146	295,867	7.5	5.96	9.39
Rural	105	128,150	8.8	6.68	11.54
Sex					
Male	123	195,827	7.3	5.58	9.38
Female	128	228,190	8.4	6.65	10.67
Age Group (Years)					
5-9	100	142,691	5.9	4.60	7.47
10-15	151	281,325	9.5	7.58	11.77
Ethnicity					
Malay ^a	178	270,053	7.8	6.30	9.60
Chinese	11	24,851	3.1*	1.30	7.30
Indian	8	19,425	7.3*	3.30	15.30
Bumiputera Sabah	27	45,897	10.7	6.30	17.70
Bumiputera Sarawak	18	39,194	14.3	8.60	22.70
Others	9	24,597	14.3*	5.70	31.40
Household Income Group					
Less than RM 1,000	29	60,709	10.1	6.55	15.38
RM 1,000 - RM 1,999	64	116,482	11.9	8.49	16.35
RM 2,000 - RM 3,999	78	131,035	7.6	5.93	9.74
RM 4,000 - RM 5,999	43	67,199	7.6	5.07	11.22
RM 6,000 - RM 7,999	15	23,348	4.5*	1.69	11.33
RM 8,000 - RM 9,999	10	15,468	5.7*	2.63	12.08
RM 10,000 and above	12	9,776	2.3*	0.81	6.36

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Household Income Quintile					
Quintile 1	55	102,919	9.9	7.19	13.49
Quintile 2	62	117,884	11.7	8.36	16.16
Quintile 3	45	72,337	6.6	4.66	9.16
Quintile 4	52	82,285	7.0	4.88	9.98
Quintile 5	37	48,592	4.5*	2.47	8.06
Household Income Category					
Bottom 40%	178	307,881	8.8	7.27	10.70
Middle 40%	56	97,428	6.6	4.38	9.94
Top 20%	17	18,707	4.2*	1.97	8.59

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli

Table 16.3: Prevalence of Emotional Health Problems Among Children Aged 5 - 15 Years in Malaysia by Socio-Demographic Characteristics (n=3,185)

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	277	448,791	8.3	7.04	9.78
State					
Johor	11	27,205	4.6	2.60	8.02
Kedah	9	20,918	5.7*	2.60	11.96
Kelantan	13	23,044	5.9	3.34	10.33
Melaka	12	9,017	6.8*	3.64	12.49
Negeri Sembilan	11	11,631	3.9*	1.96	7.42
Pahang	9	11,014	3.9*	1.57	9.22
Pulau Pinang	9	10,893	4.6*	1.61	12.49
Perak	21	56,543	16.2	9.65	25.89
Perlis	15	4,639	11.7	6.46	20.20
Selangor	22	58,068	5.7	3.22	9.84
Terengganu	26	25,167	9.9	6.67	14.38
Sabah	45	97,333	14.3	10.11	19.83
Sarawak	30	84,321	18.0	12.53	25.25
WP Kuala Lumpur	3	4,750	2.0*	0.69	5.37
WP Labuan	17	1,705	10.4	6.70	15.80
WP Putrajaya	24	2,542	10.5	6.68	16.13
Location					
Urban	160	310,831	7.9	6.36	9.72
Rural	117	137,960	9.5	7.46	12.00
Sex					
Male	123	201,960	7.5	5.78	9.64
Female	154	246,831	9.1	7.46	11.15
Age Group (Years)					
5-9	112	155,001	6.4	5.02	8.08
10-15	165	293,789	9.9	7.99	12.19
Ethnicity					
Malay ^a	192	270,958	7.8	6.30	9.60
Chinese	12	32,997	4.1*	1.70	9.60
Indian	9	17,936	6.7	3.70	11.90
Bumiputera Sabah	34	54,327	12.7	7.80	20.00
Bumiputera Sarawak	18	40,651	14.8	9.80	21.90
Others	12	31,922	18.5*	9.80	32.30
Household Income Group					
Less than RM 1,000	36	71,104	11.9	7.80	17.67
RM 1,000 - RM 1,999	62	117,733	12.0	8.63	16.45
RM 2,000 - RM 3,999	86	134,740	7.8	6.15	9.93
RM 4,000 - RM 5,999	43	68,681	7.8	4.89	12.10
RM 6,000 - RM 7,999	27	26,155	5.0*	2.08	11.60
RM 8,000 - RM 9,999	12	16,699	6.2*	2.58	14.14
RM 10,000 and above	11	13,678	3.2*	1.40	7.21

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Household Income Quintile					
Quintile 1	64	123,847	11.9	8.69	16.14
Quintile 2	58	105,741	10.5	7.51	14.50
Quintile 3	51	77,265	7.0	5.03	9.67
Quintile 4	55	86,913	7.4	4.99	10.86
Quintile 5	49	55,025	5.1	2.93	8.74
Household Income Category					
Bottom 40%	197	325,757	9.4	7.83	11.14
Middle 40%	65	100,076	6.8	4.56	10.06
Top 20%	15	22,958	5.1*	2.59	9.84

*Prevalence with high RSE, interpret with caution
a - Malay includes Orang Asli

Table 16.4: Prevalence of Conduct Problems Among Children Aged 5 - 15 Years in Malaysia by Socio-Demographic Characteristics (n=3,185)

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	551	859,671	15.9	14.14	17.87
State					
Johor	26	58,119	9.8	5.91	15.90
Kedah	23	45,585	12.4*	6.37	22.65
Kelantan	20	32,529	8.4	5.13	13.40
Melaka	37	19,412	14.7	9.62	21.90
Negeri Sembilan	25	28,596	9.5	5.69	15.35
Pahang	21	39,987	14.0	8.06	23.35
Pulau Pinang	23	24,858	10.5*	5.66	18.68
Perak	45	113,192	32.4	25.68	39.96
Perlis	35	10,494	26.4	18.16	36.71
Selangor	32	110,880	10.9	7.00	16.47
Terengganu	42	43,585	17.1	11.01	25.57
Sabah	73	172,068	25.3	19.73	31.73
Sarawak	53	132,010	28.2	22.39	34.91
WP Kuala Lumpur	11	19,615	8.1*	3.71	16.59
WP Labuan	33	3,208	19.6	13.45	27.56
WP Putrajaya	52	5,533	22.9	17.78	28.87
Location					
Urban	322	620,480	15.7	13.57	18.14
Rural	229	239,190	16.5	13.61	19.76
Sex					
Male	280	456,519	16.9	14.43	19.72
Female	271	403,151	14.9	12.67	17.49
Age Group (Years)					
5-9	253	370,022	15.2	12.79	18.03
10-15	298	489,649	16.5	14.06	19.23
Ethnicity					
Malay ^a	391	492,660	14.2	12.30	16.40
Chinese	32	97,983	12.3	7.10	20.40
Indian	20	44,330	16.7	10.50	25.50
Bumiputera Sabah	57	109,817	25.6	19.20	33.40
Bumiputera Sarawak	36	76,619	28.0	19.90	37.80
Others	15	38,262	22.2*	9.70	43.10
Household Income Group					
Less than RM 1,000	61	124,534	20.8	15.09	27.95
RM 1,000 - RM 1,999	108	170,689	17.4	13.40	22.27
RM 2,000 - RM 3,999	177	253,328	14.7	12.16	17.73
RM 4,000 - RM 5,999	110	165,600	18.7	14.35	24.04
RM 6,000 - RM 7,999	50	81,751	15.7	9.81	24.12
RM 8,000 - RM 9,999	14	19,906	7.4*	3.23	16.02
RM 10,000 and above	31	43,863	10.3*	4.38	22.42

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Household Income Quintile					
Quintile 1	106	191,471	18.4	14.52	23.10
Quintile 2	118	171,305	17.0	13.24	21.61
Quintile 3	104	163,511	14.8	11.40	19.05
Quintile 4	133	204,403	17.4	13.91	21.61
Quintile 5	90	128,981	12.0	7.73	18.04
Household Income Category					
Bottom 40%	378	563,731	16.2	14.26	18.31
Middle 40%	136	244,975	16.7	12.59	21.77
Top 20%	37	50,964	11.4	6.58	18.89

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli

Table 16.5: Prevalence of Hyperactivity Problems Among Children Aged 5 - 15 Years in Malaysia by Socio-Demographic Characteristics (n=3,185)

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	87	124,270	2.3	1.69	3.12
State					
Johor	4	8,387	1.4*	0.50	3.92
Kedah	3	6,247	1.7*	0.53	5.28
Kelantan	3	4,707	1.2*	0.41	3.56
Melaka	9	9,094	6.9*	2.38	18.37
Negeri Sembilan	6	5,904	2.0*	0.85	4.42
Pahang	7	11,440	4.0*	1.37	11.20
Pulau Pinang	2	1,895	0.8*	0.13	4.83
Perak	4	11,954	3.4*	0.88	12.35
Perlis	4	1,157	2.9*	0.96	8.48
Selangor	4	10,319	1.0*	0.33	3.08
Terengganu	9	8,975	3.5	1.96	6.24
Sabah	9	14,018	2.1*	1.05	4.01
Sarawak	4	12,675	2.7*	0.58	11.67
WP Kuala Lumpur	8	16,189	6.6*	2.97	14.23
WP Labuan	4	426	2.6*	1.00	6.55
WP Putrajaya	7	884	3.7*	1.40	9.17
Location					
Urban	49	84,931	2.2	1.44	3.21
Rural	38	39,339	2.7	1.77	4.12
Sex					
Male	53	77,986	2.9	1.92	4.33
Female	34	46,285	1.7	1.10	2.65
Age Group (Years)					
5-9	39	51,037	2.1	1.43	3.07
10-15	48	73,234	2.5	1.60	3.79
Ethnicity					
Malay ^a	66	91,052	2.6	1.80	3.80
Chinese	6	12,239	1.5*	0.60	3.90
Indian	3	3,180	1.2*	0.30	4.30
Bumiputera Sabah	6	4,822	1.1*	0.40	3.30
Bumiputera Sarawak	2	4,306	1.6*	0.40	5.80
Others	4	8,672	5.0*	1.70	14.00
Household Income Group					
Less than RM 1,000	7	11,826	2.0*	0.78	4.88
RM 1,000 - RM 1,999	21	35,038	3.6	2.17	5.83
RM 2,000 - RM 3,999	25	28,171	1.6	0.95	2.82
RM 4,000 - RM 5,999	14	23,907	2.7*	1.39	5.19
RM 6,000 - RM 7,999	8	9,310	1.8*	0.67	4.69
RM 8,000 - RM 9,999	8	14,420	5.4*	2.23	12.30
RM 10,000 and above	4	1,597	0.4*	0.07	1.97

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Household Income Quintile					
Quintile 1	12	17,952	1.7*	0.87	3.40
Quintile 2	22	37,304	3.7	2.23	6.09
Quintile 3	17	17,711	1.6*	0.78	3.26
Quintile 4	18	30,405	2.6	1.46	4.57
Quintile 5	18	20,899	1.9*	0.85	4.37
Household Income Category					
Bottom 40%	62	86,834	2.5	1.79	3.47
Middle 40%	19	31,219	2.1	1.19	3.76
Top 20%	6	6,218	1.4*	0.40	4.66

*Prevalence with high RSE, interpret with caution
a - Malay includes Orang Asli

Table 16.6: Prevalence of Peer Problems Among Children Aged 5 -15 Years in Malaysia by Socio-Demographic Characteristics (n=3,185)

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	1,321	2,317,585	42.9	40.06	45.81
State					
Johor	133	309,631	52.4	44.58	60.03
Kedah	54	106,900	29.0	20.92	38.69
Kelantan	102	175,352	45.2	38.41	52.13
Melaka	92	69,941	53.1	42.89	62.99
Negeri Sembilan	59	110,105	36.5	24.71	50.11
Pahang	55	106,678	37.5	25.88	50.73
Pulau Pinang	50	68,128	28.8	20.64	38.62
Perak	84	208,953	59.8	50.27	68.70
Perlis	92	26,463	66.6	57.05	74.95
Selangor	123	393,359	38.5	31.21	46.38
Terengganu	85	84,978	33.3	25.55	42.14
Sabah	118	280,238	41.1	31.87	51.10
Sarawak	105	277,448	59.3	49.34	68.60
WP Kuala Lumpur	44	86,480	35.5	26.53	45.64
WP Labuan	59	5,923	36.1	24.76	49.27
WP Putrajaya	66	7,008	29.0	22.86	35.92
Location					
Urban	774	1,697,035	43.0	39.37	46.70
Rural	547	620,550	42.7	38.84	46.61
Sex					
Male	664	1,167,541	43.3	39.23	47.37
Female	657	1,150,044	42.6	39.00	46.21
Age Group (Years)					
5-9	631	1,033,370	42.5	38.90	46.23
10-15	690	1,284,215	43.2	39.41	47.12
Ethnicity					
Malay ^a	948	1,405,686	40.6	37.30	43.90
Chinese	100	370,009	46.5	37.50	55.80
Indian	70	133,032	50.0	36.80	63.30
Bumiputera Sabah	99	181,828	42.4	32.20	53.40
Bumiputera Sarawak	71	150,414	54.9	43.40	65.90
Others	33	76,615	44.5	23.80	67.20
Household Income Group					
Less than RM 1,000	134	258,140	43.1	36.47	50.01
RM 1,000 - RM 1,999	286	454,032	46.3	40.13	52.53
RM 2,000 - RM 3,999	439	755,152	43.9	38.35	49.62
RM 4,000 - RM 5,999	214	402,864	45.5	39.72	51.46
RM 6,000 - RM 7,999	111	215,130	41.3	31.94	51.26
RM 8,000 - RM 9,999	60	113,676	42.2	30.28	55.08
RM 10,000 and above	77	118,591	27.9	20.03	37.41

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Household Income Quintile					
Quintile 1	265	466,150	44.9	39.84	49.99
Quintile 2	288	453,209	45.0	38.44	51.79
Quintile 3	272	498,376	45.2	38.11	52.45
Quintile 4	272	508,688	43.4	37.99	48.91
Quintile 5	224	391,162	36.2	31.08	41.76
Household Income Category					
Bottom 40%	905	1,538,075	44.2	40.63	47.74
Middle 40%	313	616,468	42.0	36.99	47.13
Top 20%	103	163,043	36.3	28.27	45.22

a - Malay includes Orang Asli

Table 16.7: Prevalence of Pro-Social Skills Among Children Aged 5 - 15 Years in Malaysia by Socio-Demographic Characteristics (n=3,185)

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	781	1,496,791	27.7	24.65	31.01
State					
Johor	117	236,574	40.0	29.46	51.57
Kedah	11	31,530	8.6*	4.56	15.50
Kelantan	84	140,801	36.3	30.45	42.54
Melaka	43	37,012	28.1	18.39	40.36
Negeri Sembilan	24	31,896	10.6	6.08	17.73
Pahang	36	81,591	28.7	20.92	37.91
Pulau Pinang	31	52,380	22.1*	7.41	50.27
Perak	50	100,670	28.8	15.96	46.34
Perlis	60	15,889	40.0	29.42	51.58
Selangor	100	388,442	38.0	29.37	47.54
Terengganu	40	44,087	17.3	11.35	25.44
Sabah	40	89,735	13.2	9.00	18.89
Sarawak	62	162,813	34.8	28.40	41.84
WP Kuala Lumpur	36	78,515	32.2	23.24	42.79
WP Labuan	33	3,383	20.6	12.75	31.61
WP Putrajaya	14	1,472	6.1	3.54	10.25
Location					
Urban	459	1,136,817	28.8	24.89	33.06
Rural	322	359,974	24.8	21.15	28.76
Sex					
Male	415	797,777	29.6	25.98	33.40
Female	366	699,013	25.9	21.84	30.37
Age Group (Years)					
5-9	410	753,735	31.0	27.33	34.97
10-15	371	743,056	25.0	21.20	29.25
Ethnicity					
Malay ^a	562	901,008	26.0	23.30	28.90
Chinese	81	352,139	44.3	32.70	56.50
Indian	38	62,780	23.6	14.90	35.40
Bumiputera Sabah	48	62,744	14.6	9.90	21.10
Bumiputera Sarawak	40	85,424	31.2	24.80	38.30
Others	12	32,696	19.0*	7.90	38.80
Household Income Group					
Less than RM 1,000	79	117,520	19.6	14.92	25.37
RM 1,000 - RM 1,999	181	290,209	29.6	23.64	36.29
RM 2,000 - RM 3,999	234	420,656	24.5	20.55	28.84
RM 4,000 - RM 5,999	119	247,730	28.0	22.08	34.79
RM 6,000 - RM 7,999	89	184,124	35.3	24.92	47.32
RM 8,000 - RM 9,999	34	67,182	24.9	15.34	37.86
RM 10,000 and above	45	169,369	39.8	20.52	62.95

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Household Income Quintile					
Quintile 1	153	232,293	22.4	18.27	27.05
Quintile 2	180	321,832	32.0	25.24	39.55
Quintile 3	142	249,624	22.6	18.08	27.93
Quintile 4	163	346,409	29.5	23.46	36.43
Quintile 5	143	346,633	32.1	23.06	42.76
Household Income Category					
Bottom 40%	530	934,715	26.8	23.39	30.58
Middle 40%	197	466,395	31.8	25.10	39.25
Top 20%	54	95,680	21.3	13.15	32.65

*Prevalence with high RSE, interpret with caution
a - Malay includes Orang Asli

Disability

Disability

Contributors to this section: Noor Ani Ahmad, Salimah Othman, Yusniza Mohd Yusof, Rajini a/p Sooryanarayana, Chan Ying Ying, Nur Azna Mahmud, Norhafizah Sharil, Rasidah Jamaludin, Nor'Ain Ab Wahab, Norazizah Ibrahim Wong

Introduction

Disability among adults continues to be a major health issue in our country, urging for more reliable data and association factors on disability for development of policies, programs and strategies in Malaysia. Ministry of Health Malaysia (MOH), recognizes disability as a major health issue and has incorporated Plan of Action (POA) for Health Care of Person with Disabilities (PWDs) 2011-2020 and National POA for PWDs 2016-2022. The World Health Organization (WHO) Global Disabilities Action Plan, 2014–2021 aims to strengthen collection of relevant and internationally comparable data on disability and support research on disability [1]. National Health and Morbidity Survey (NHMS) 2019 continues to focus on the prevalence of disability and addition on the usage of assistive devices among persons with disabilities.

Objectives

1. To determine the prevalence of difficulty in six different domains (i.e. seeing, hearing, walking, remembering, self-care and communicating) among adults in Malaysia by socio-demographic characteristics
2. To determine the prevalence of overall difficulty among adults in Malaysia by socio-demographic characteristics
3. To determine the prevalence of overall disability among adults in Malaysia by socio-demographic characteristics
4. To determine the assistive devices usage among adults with overall difficulty in Malaysia by socio-demographic characteristics as part of WHO universal health coverage indicators

Methods

Data on disability was obtained from adult respondents aged 18 years and above via face-to-face interviews by trained research assistants using the Washington Group Questionnaire (short version).

Variable Definition

1. Difficulty was defined as having some difficulty or worst in an individual domain.
2. Overall difficulty was defined as having some difficulty or worst in any domain.
3. Overall disability was defined as having a lot of difficulty in two domains or cannot do at all in one domain.

Findings

Difficulty

By domains, the most common type of difficulty was difficulty in seeing, with a prevalence of 14.9% (95% CI: 13.75, 16.12); of which 13.6% (95% CI: 12.55, 14.73) having some difficulty, 1.2% (95% CI: 0.89, 1.61) having a lot of difficulty, and 0.1% (95% CI: 0.05, 0.19) cannot do at all. Prevalence of difficulty in hearing was 7.6% (95% CI: 6.71, 8.68); with 7.3% (95% CI: 6.37, 8.28) having some difficulty, 0.8% (95% CI: 0.55, 1.04) having a lot of difficulty, and 0.1% (95% CI: 0.05, 0.18) cannot do at all. Prevalence of difficulty in walking was 10.4% (95% CI: 9.51, 11.46); with 8.5% (95% CI: 7.67, 9.40) having some difficulty, 1.5% (95% CI: 1.24, 1.82) having a lot of difficulty, and 0.4% (95% CI: 0.33, 0.60) cannot do at all. Prevalence of difficulty in remembering was 7.0% (95% CI: 6.21, 7.96); with 6.4% (95% CI: 5.68, 7.29) having some difficulty, 0.5% (95% CI: 0.32, 0.66) having a lot of difficulty, and 0.1% (95% CI: 0.08, 0.24) cannot do at all. Prevalence of difficulty in self-care was 2.1% (95% CI: 1.81, 2.54); with 1.6% (95% CI: 1.29, 1.88) having some difficulty, 0.2% (95% CI: 0.16, 0.38) having a lot of difficulty, and 0.3% (95% CI: 0.22, 0.53) cannot do at all. Prevalence of difficulty in communicating was 2.0% (95% CI: 1.65, 2.38); with 1.6% (95% CI: 1.31, 1.98) having some difficulty, 0.2% (95% CI: 0.12, 0.35) having a lot of difficulty, and 0.2% (95% CI: 0.09, 0.30) cannot do at all.

The national prevalence of overall difficulty was 27.3% (95% CI: 25.56, 29.06); with 25.9% (95% CI: 24.28, 27.69) having some difficulty, 3.6% (95% CI: 3.17, 4.19) having a lot of difficulty, and 0.9% (95% CI: 0.67, 1.10) cannot do at all. Negeri Sembilan showed the highest prevalence of overall difficulty [48.5% (95% CI: 43.14, 53.98)], followed by Sarawak [44.8% (95% CI: 36.95, 52.89)] and Wilayah Persekutuan Putrajaya [44.0% (95% CI: 38.02, 50.25)], while the lowest was in Wilayah Persekutuan Kuala Lumpur [10.8% (95% CI: 8.07, 14.37)]. The prevalence was significantly higher in the rural areas [34.4% (95% CI: 31.68, 37.22)] compared to the urban areas [25.0% (95% CI: 22.89, 27.16)].

Females reported a significantly higher prevalence [31.6% (95% CI: 29.56, 33.75)] compared to males [22.9% (95% CI: 20.81, 25.06)]. The prevalence of overall difficulty significantly increased with increasing age, with the highest prevalence among adults aged 80 years and above [91.0% (95% CI: 85.05, 94.67)]. In terms of ethnicity, Bumiputera of Sarawak reported the highest prevalence of overall difficulty [46.6% (95% CI: 38.65, 54.72)], followed by Bumiputera of Sabah [35.3% (95% CI: 27.93, 43.45)] and Indians [29.8% (95% CI: 24.90, 35.15)]. By marital status, those being widow(er) / divorcee showed a significantly higher prevalence [54.6% (95% CI: 50.14, 58.94)] compared to those being single [16.8% (95% CI: 14.44, 19.55)] and married [28.6% (95% CI: 26.74, 30.55)].

By education level, the prevalence was significantly higher among those with no formal education [47.5% (95% CI: 40.24, 54.83)] compared to those with a secondary [23.1% (95% CI: 21.24, 25.13)] or tertiary education level [20.3% (95% CI: 17.90, 22.97)]. Adults who were not working (unemployed, those with health problem & old age) showed a significantly higher prevalence of overall difficulty [51.3% (95% CI: 47.19, 55.31)] compared to their respective counterparts. Respondents with household income of less than RM1,000 also reported a significantly higher prevalence of overall difficulty [45.2% (95% CI: 40.52, 49.93)] compared to those with a higher household income level.

Disability

The national prevalence of overall disability was 11.1% (95% CI: 10.10, 12.21). Negeri Sembilan showed the highest prevalence of overall disability [23.9% (95% CI: 19.64, 28.64)], followed by Sarawak [21.2% (95% CI: 15.57, 28.09)] and Perak [19.2% (95% CI: 14.61, 24.93)], while the lowest was in Wilayah Persekutuan Kuala Lumpur [4.1% (95% CI: 2.91, 5.83)]. The prevalence was significantly higher in the rural areas [16.1% (95% CI: 14.23, 18.15)] compared to the urban areas [9.5% (95% CI: 8.33, 10.81)].

By sex, females showed a significantly higher prevalence of overall disability [13.7% (95% CI: 12.33, 15.29)] compared to males [8.4% (95% CI: 7.33, 9.71)]. The prevalence showed an increasing trend with age, from 3.5% (95% CI: 2.41, 4.95) in 18-29 years age group, reaching a peak of 78.4% (95% CI: 69.05, 85.53) among the 80 years and above. Among ethnic groups, Bumiputera of Sarawak reported the highest prevalence [20.4% (95% CI: 15.14, 26.91)], followed by Indians [14.3% (95% CI: 11.24, 18.02)] and Bumiputera of Sabah [13.4% (95% CI: 9.68, 18.30)]. In terms of marital status, the prevalence was significantly higher among widow(er) / divorcee [32.7% (95% CI: 28.88, 36.81)] compared to those being married [10.8% (95% CI: 9.59, 12.05)] and single [5.9% (95% CI: 4.55, 7.67)].

Regarding education level, the prevalence of overall disability was significantly higher among those with no formal education [35.9% (95% CI: 29.15, 43.28)] compared to their respective higher education counterparts. Respondents who were not working (unemployed, those with health problem & old age) showed a significantly higher prevalence of overall disability [34.9% (95% CI: 31.35, 38.71)] compared to their respective counterparts. Respondents with household income of less than RM1,000 also reported a significantly higher prevalence of overall disability [25.9% (95% CI: 22.39, 29.77)] compared to those with a higher household income level.

Use of Assistive Device Among Adults with Overall Difficulty

Among adults with overall difficulty, 56.6% (95% CI: 53.76, 59.14) use assistive devices. The highest prevalence was in the state of Malacca [74.6% (95% CI: 63.37, 83.32)], while the lowest was in Sabah [35.1% (95% CI: 27.64, 43.29)]. The prevalence was significantly higher in the urban areas [59.2% (95% CI: 55.82, 62.50)] compared to the rural areas [50.3% (95% CI: 45.79, 54.71)]. Females showed a significantly higher prevalence of assistive device usage [60.3% (95% CI: 57.00, 63.47)] compared to males [51.2% (95% CI: 46.97, 55.32)]. The prevalence also increased with increasing age.

Conclusion

Based on the findings of this survey, prevalence of overall disability among adults in Malaysia (11.1%) is comparable with findings from NHMS 2015 (11.8%) [2] and Zambia National Disability Survey 2015 (10.9%) [3]. All surveys used similar methodology, definition and similar cut-off point of Washington Group. No significant differences were found in the prevalence of overall difficulty and disability as compared to NHMS 2015. However, there were three significant changes within the domains; increased in prevalence of difficulty in hearing (5.5% in NHMS 2015 vs 7.6% in NHMS 2019), reduction in prevalence of difficulty in remembering (9.4% in NHMS 2015 vs 7.0% in NHMS 2019) and reduction in prevalence of difficulty in communicating (3.3% in NHMS 2015 vs 2.0% in NHMS 2019).

Recommendations

In view of the findings which were highlighted above, several recommendations are suggested as below:

1. Strengthen promotional activities to create disability awareness, prevention and provision of quality rehabilitation programs must be tailored to targeted groups such as elderly with lower education level, lower income group and the unemployed.
2. Perform regular early identification and screening of disability. Collaboration with multiple agencies and support from the various ministries, the private sectors, non-governmental bodies and community is necessary towards early intervention program (EIP).
3. Provision of early disability intervention including referral to appropriate services or programme, rehabilitation and prescription of assistive devices.
4. Healthcare provider should be adequately trained to detect risk factor and early sign of disability and able to manage appropriately. MOH must ensure adequate resources are allocated for disability health to ensure its success.
5. Design program on empowerment of elderly in Pusat Aktiviti Warga Emas (PAWE) under the Social Welfare Department and elderly health care club in health clinic about health promotion activities on elderly health care and disability health. These to prepare and provide the necessary environments for a healthier aging in the country.
6. Expand and strengthen the outreach services especially to the rural areas.
7. Provide appropriate environmental access to various group of disability such as transport, traffic light alarm, accessible toilet, ramp in line with requirement of universal design.

Table 17.1: Disability (Adult) Trend in Malaysia

	2015	2019
Overall Disability	11.8	11.1

References

1. World Health Organization & World Bank. World Report on Disability 2011. World Health Organization. Available at: <https://apps.who.int/iris/handle/10665/44575>.
2. Noor Ani A, Noraida MK, Nur Azna M, Yusniza MY, Salimah O, Chan YY, et al. Prevalence and Determinants of Disability among Adults in Malaysia: Results from the National Health and Morbidity Survey (NHMS) 2015. BMC Public Health 2017; 17(1):756.
3. Central Statistical Office / Ministry of Community Development & Social Services. Zambia National Disability Survey 2015. December 2018. Available at: <https://www.unicef.org/zambia/sites/unicef.org.zambia/files/2018-12/Zambia%20National%20Disability%20Survey%202015%20WEB%20ONLY.pdf>.

Table 17.2: Prevalence of Overall Difficulty Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=11,674)

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	3,721	5,929,729	27.3	25.56	29.06
Difficulty by Severity					
Some difficulty	3,545	5,641,382	25.9	24.28	27.69
A lot of difficulty	531	792,455	3.6	3.17	4.19
Cannot do at all	149	186,379	0.9	0.67	1.10
State					
Johor	250	522,253	23.1	18.45	28.59
Kedah	216	344,185	25.0	20.98	29.41
Kelantan	230	269,118	24.3	19.67	29.70
Melaka	197	154,928	29.4	23.33	36.30
Negeri Sembilan	292	628,821	48.5	43.14	53.98
Pahang	177	209,055	20.0	15.00	26.11
Pulau Pinang	226	273,325	21.9	15.94	29.27
Perak	254	540,215	34.9	27.20	43.40
Perlis	173	36,704	25.9	20.46	32.22
Selangor	354	982,071	21.3	17.58	25.46
Terengganu	236	210,343	28.1	23.16	33.68
Sabah	330	786,960	29.6	24.21	35.53
Sarawak	341	795,236	44.8	36.95	52.89
WP Kuala Lumpur	80	137,213	10.8	8.07	14.37
WP Labuan	190	24,855	44.0	38.02	50.25
WP Putrajaya	175	14,445	23.9	18.11	30.81
Location					
Urban	2,030	4,098,635	25.0	22.89	27.16
Rural	1,691	1,831,094	34.4	31.68	37.22
Sex					
Male	1,456	2,468,215	22.9	20.81	25.06
Female	2,265	3,461,514	31.6	29.56	33.75
Age Group (Years)					
18–29	379	979,050	14.2	12.07	16.69
30–39	442	839,695	16.4	14.20	18.87
40–49	629	973,468	27.9	24.98	31.05
50–59	840	1,247,170	41.2	37.74	44.77
60–69	768	1,025,720	50.8	46.69	54.97
70–79	470	596,205	65.5	59.19	71.25
80 & above	193	268,422	91.0	85.05	94.67
Ethnicity					
Malay ^a	2,405	3,177,870	28.5	26.50	30.52
Chinese	466	1,148,112	24.7	20.96	28.95
Indian	264	390,129	29.8	24.90	35.15
Bumiputera Sabah	229	476,114	35.3	27.93	43.45
Bumiputera Sarawak	218	425,772	46.6	38.65	54.72
Others	139	311,732	13.2	10.36	16.61

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Marital Status					
Single	474	1,059,708	16.8	14.44	19.55
Married	2,543	3,914,299	28.6	26.74	30.55
Widow(er)/Divorcee	702	951,410	54.6	50.14	58.94
Education Level					
No Formal Education	387	545,607	47.5	40.24	54.83
Primary Education	1,201	1,780,398	41.4	37.49	45.37
Secondary Education	1,476	2,438,824	23.1	21.24	25.13
Tertiary Education	637	1,145,576	20.3	17.90	22.97
Occupation					
Government Employee	330	351,895	23.4	19.74	27.61
Private Employee	644	1,423,859	17.5	15.42	19.83
Self Employed	635	955,389	25.0	22.29	27.91
Unpaid Worker/ Homemaker	856	1,348,849	34.7	31.54	38.00
Retiree	214	323,705	42.2	35.23	49.48
Student	46	96,786	11.7	7.58	17.58
Not Working ^b	991	1,424,888	51.3	47.19	55.31
Household Income Group					
Less than RM 1,000	683	1,059,514	45.2	40.52	49.93
RM 1,000 - RM 1,999	826	1,291,130	29.3	26.16	32.70
RM 2,000 - RM 3,999	1,089	1,792,316	25.5	23.09	28.10
RM 4,000 - RM 5,999	512	835,326	24.4	20.91	28.17
RM 6,000 - RM 7,999	275	501,070	22.9	18.96	27.48
RM 8,000 - RM 9,999	143	203,963	21.7	16.16	28.60
RM 10,000 and above	193	246,411	17.4	13.00	22.83
Household Income Quintile					
Quintile 1	1,052	1,625,596	37.3	33.87	40.85
Quintile 2	795	1,261,600	29.0	25.98	32.15
Quintile 3	633	1,088,874	24.3	21.38	27.53
Quintile 4	675	1,078,309	24.3	21.42	27.43
Quintile 5	566	875,350	21.3	17.97	25.02
Household Income Category					
Bottom 40%	2,704	4,251,969	28.7	26.83	30.63
Middle 40%	770	1,302,622	25.3	22.21	28.74
Top 20%	247	375,137	21.1	16.95	25.84

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Table 17.3: Prevalence of Difficulty by Domains Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=11,674)

Sociodemographic Characteristics	Difficulty in Seeing					Difficulty in Hearing					Difficulty in Walking				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper				Lower	Upper
MALAYSIA	2,051	3,252,045	14.9	13.75	16.12	1,087	1,661,791	7.6	6.71	8.68	1,644	2,287,233	10.4	9.51	11.46
Difficulty by Severity															
Some difficulty	1,869	2,970,799	13.6	12.55	14.73	1,027	1,581,950	7.3	6.37	8.28	1,306	1,861,191	8.5	7.67	9.40
A lot of difficulty	163	261,170	1.2	0.89	1.61	113	164,329	0.8	0.55	1.04	244	328,976	1.5	1.24	1.82
Cannot do at all	19	20,076	0.1*	0.05	0.19	22	21,158	0.1*	0.05	0.18	94	97,066	0.4	0.33	0.60
State															
Johor	142	277,251	12.1	8.55	16.81	87	188,587	8.3	4.88	13.68	83	149,143	6.5	4.89	8.62
Kedah	138	224,210	16.3	13.12	19.98	39	63,545	4.6*	2.41	8.61	102	156,107	11.3	8.53	14.85
Kelantan	173	201,699	18.2	14.59	22.41	72	73,002	6.6	4.70	9.13	86	87,529	7.9	5.47	11.23
Melaka	94	85,854	16.0	10.68	23.27	35	22,480	4.2	2.82	6.24	93	68,326	12.8	8.29	19.23
Negeri Sembilan	193	410,679	31.7	26.81	36.96	56	116,310	9.0	6.68	12.00	148	309,355	23.9	19.13	29.34
Pahang	100	114,267	10.9	8.21	14.29	56	68,188	6.6	4.39	9.66	70	82,216	7.8	5.68	10.69
Pulau Pinang	100	91,241	7.3	4.47	11.67	80	96,748	7.7*	4.14	13.96	117	109,515	8.7	5.88	12.82
Perak	103	209,489	13.5	10.36	17.42	75	180,660	11.6	8.00	16.65	114	226,509	14.6	10.45	20.06
Perlis	74	18,140	12.8	8.55	18.66	62	11,279	8.0	5.88	10.68	103	19,727	13.9	11.54	16.71
Selangor	196	552,190	11.9	9.53	14.84	94	221,790	4.8	3.51	6.52	187	413,047	8.9	6.88	11.49
Terengganu	146	127,154	17.0	12.71	22.25	66	53,884	7.2	5.39	9.52	93	71,550	9.5	7.69	11.70
Sabah	211	450,619	16.9	14.22	19.99	133	287,981	10.8	7.65	15.06	109	184,861	6.9	5.05	9.46
Sarawak	181	426,823	23.9	18.01	31.03	101	244,839	14.1	9.83	19.74	155	308,152	16.6	12.59	21.61
WP Kuala Lumpur	23	44,922	3.5*	1.87	6.51	13	18,927	1.5*	0.79	2.76	54	87,005	6.8	4.70	9.77
WP Labuan	79	10,299	18.0	14.12	22.64	66	8,941	15.8	10.86	22.50	60	8,245	14.4	10.55	19.38
WP Putrajaya	98	7,206	11.9	8.43	16.58	52	4,629	7.7	5.21	11.10	70	5,943	9.8	6.59	14.40
Location															
Urban	1,086	2,193,102	13.3	11.91	14.78	576	1,153,088	7.0	5.87	8.33	857	1,540,355	9.3	8.27	10.47
Rural	965	1,058,943	19.9	18.07	21.86	511	508,703	9.6	8.36	11.02	787	746,878	13.9	11.96	16.15
Sex															
Male	788	1,296,666	11.9	10.56	13.49	449	726,753	6.7	5.66	7.96	551	809,245	7.4	6.46	8.51
Female	1,263	1,955,379	17.8	16.25	19.48	638	935,038	8.5	7.34	9.92	1,093	1,477,988	13.4	12.11	14.89
Age Group (Years)															
18–29	177	425,425	6.1	4.87	7.73	102	264,769	3.8	2.83	5.19	61	142,125	2.0	1.40	2.97
30–39	215	459,938	8.9	7.36	10.84	113	237,365	4.6	3.46	6.16	108	160,932	3.1	2.33	4.17
40–49	386	600,196	17.1	14.75	19.72	107	158,856	4.5	3.35	6.15	210	316,659	9.0	7.43	10.84
50–59	482	706,864	23.3	20.52	26.32	184	282,854	9.3	7.27	11.90	377	529,311	17.4	14.82	20.32
60–69	416	548,018	27.2	23.58	31.04	223	290,386	14.4	11.81	17.49	412	544,682	26.9	23.21	30.89
70–79	247	326,058	35.8	30.41	41.58	236	276,899	30.7	25.03	36.98	321	381,642	41.9	36.58	47.36
80 & above	128	185,544	62.9	53.56	71.32	122	150,662	51.4	41.12	61.55	155	211,882	72.1	62.42	80.15
Ethnicity															
Malay ^a	1,340	1,849,305	16.5	14.99	18.10	698	826,217	7.4	6.24	8.71	1,055	1,248,333	11.1	9.92	12.41
Chinese	228	567,755	12.2	9.76	15.09	149	328,823	7.1	5.26	9.53	223	468,465	10.0	8.04	12.45
Indian	138	204,817	15.6	12.32	19.59	54	97,511	7.5	5.40	10.22	158	223,669	17.1	13.74	21.04
Bumiputera Sabah	142	248,527	18.4	14.78	22.74	87	181,965	13.5	8.69	20.37	75	121,429	9.0	6.83	11.78
Bumiputera Sarawak	117	216,910	23.6	18.83	29.16	55	120,198	13.3	9.12	18.98	94	173,407	18.2	13.80	23.70
Others	86	164,730	6.9	5.10	9.37	44	107,076	4.5	2.84	7.07	39	51,931	2.2*	1.20	3.93
Marital Status															
Single	232	481,662	7.6	6.12	9.41	130	288,378	4.6	3.38	6.14	123	240,324	3.8	2.87	4.96
Married	1,404	2,183,072	15.9	14.51	17.38	658	1,018,381	7.4	6.40	8.63	1,088	1,505,337	10.9	9.78	12.19
Widow(er)/Divorcee	413	582,998	33.5	29.49	37.75	299	355,032	20.5	17.21	24.14	433	541,572	31.0	27.09	35.17
Education Level															
No Formal Education	234	332,563	28.9	23.50	35.00	196	279,166	24.3	19.51	29.75	256	350,564	30.3	24.15	37.30
Primary Education	655	942,479	21.9	19.32	24.65	415	583,929	13.6	11.53	15.94	640	849,850	19.7	16.97	22.66
Secondary Education	823	1,319,910	12.5	11.20	13.87	322	554,317	5.3	4.39	6.28	572	834,148	7.8	6.84	8.98
Tertiary Education	330	650,000	11.4	9.51	13.68	143	233,652	4.1	2.97	5.71	167	243,458	4.3	3.37	5.43

Sociodemographic Characteristics	Difficulty in Remembering					Difficulty in Self-Care					Difficulty in Communicating				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper				Lower	Upper
MALAYSIA	994	1,538,773	7.0	6.21	7.96	349	468,946	2.1	1.81	2.54	291	433,988	2.0	1.65	2.38
Difficulty by Severity															
Some difficulty	896	1,408,222	6.4	5.68	7.29	250	340,788	1.6	1.29	1.88	232	352,324	1.6	1.31	1.98
A lot of difficulty	73	100,582	0.5	0.32	0.66	43	53,340	0.2	0.16	0.38	32	45,553	0.2	0.12	0.35
Cannot do at all	25	29,969	0.1	0.08	0.24	56	74,818	0.3	0.22	0.53	27	36,111	0.2*	0.09	0.30
State															
Johor	55	100,697	4.4	3.02	6.47	39	70,468	3.1	2.09	4.55	19	45,191	2.0	1.25	3.14
Kedah	39	51,391	3.7	2.17	6.36	17	28,039	2.0*	0.96	4.26	12	22,062	1.6*	0.62	4.06
Kelantan	66	70,591	6.4	4.41	9.10	49	47,237	4.3	2.85	6.31	31	34,830	3.1	1.82	5.40
Melaka	48	34,437	6.4	3.73	10.88	22	9,207	1.9*	0.84	3.56	17	10,477	2.0*	0.89	4.27
Negeri Sembilan	60	125,228	9.7	6.10	14.94	23	38,618	3.0	1.73	5.05	20	45,872	3.5*	1.83	6.71
Pahang	25	40,267	3.8	2.28	6.41	16	26,834	2.6*	1.35	4.77	17	23,934	2.3*	1.18	4.39
Pulau Pinang	63	66,598	5.3*	2.59	10.67	21	23,251	1.9	1.05	3.25	14	16,924	1.4*	0.51	3.53
Perak	139	310,572	20.0	14.66	26.73	18	33,517	2.2	1.28	3.63	10	19,109	1.2*	0.59	2.54
Perlis	48	10,475	7.4	5.07	10.70	14	3,799	2.7*	1.25	5.65	15	3,704	2.6*	1.33	5.07
Selangor	82	173,881	3.8	2.57	5.46	30	62,307	1.3	0.84	2.15	27	60,909	1.3	0.77	2.24
Terengganu	59	57,385	7.6	5.23	11.01	23	15,421	2.1	1.17	3.58	19	13,153	1.7	0.98	3.11
Sabah	90	208,793	7.8	5.30	11.45	22	34,110	1.3*	0.60	2.72	35	74,670	2.8	1.78	4.39
Sarawak	96	245,709	13.3	9.90	17.57	17	46,182	2.5*	1.03	5.89	22	50,128	2.7*	1.38	5.24
WP Kuala Lumpur	20	31,398	2.5	1.50	4.02	17	27,858	2.2*	1.15	4.08	8	11,074	0.9*	0.42	1.78
WP Labuan	58	7,820	13.6	9.89	18.51	6	1,092	1.9*	0.85	4.21	13	1,462	2.5*	1.03	6.18
WP Putrajaya	46	3,531	5.8*	3.19	10.45	15	1,006	1.7*	0.56	4.87	12	488	0.8*	0.37	1.74
Location															
Urban	524	1,059,594	6.4	5.46	7.54	177	313,025	1.9	1.52	2.36	132	251,662	1.5	1.18	1.96
Rural	470	479,179	8.9	7.45	10.70	172	155,921	2.9	2.24	3.77	159	182,326	3.4	2.61	4.43
Sex															
Male	331	571,591	5.2	4.30	6.39	152	206,032	1.9	1.50	2.38	129	196,303	1.8	1.37	2.38
Female	663	967,181	8.8	7.72	10.04	197	262,914	2.4	1.93	2.97	162	237,685	2.2	1.71	2.72
Age Group (Years)															
18–29	98	278,321	4.0	2.88	5.55	17	45,626	0.7*	0.34	1.26	29	62,026	0.9	0.52	1.54
30–39	111	203,155	3.9	2.80	5.55	18	33,025	0.6*	0.35	1.19	27	62,136	1.2	0.71	2.04
40–49	119	165,229	4.7	3.41	6.46	24	45,219	1.3*	0.59	2.75	25	39,677	1.1	0.64	1.97
50–59	156	241,775	8.0	6.39	9.88	45	50,004	1.6	1.10	2.45	39	55,512	1.8	1.14	2.91
60–69	219	302,956	15.0	12.10	18.39	77	105,874	5.2	3.96	6.87	54	85,280	4.2	2.85	6.19
70–79	171	192,181	21.0	17.01	25.67	88	91,440	10.1	7.49	13.37	59	60,670	6.6	4.45	9.77
80 & above	120	155,154	52.4	42.60	62.06	80	97,760	33.0	24.57	42.75	58	68,686	23.2	15.61	33.06
Ethnicity															
Malay ^a	634	779,354	6.9	5.97	8.06	243	314,291	2.8	2.29	3.40	186	236,827	2.1	1.68	2.64
Chinese	145	333,125	7.2	5.24	9.69	48	70,457	1.5	1.01	2.25	41	73,635	1.6	1.01	2.46
Indian	70	104,410	8.0	5.42	11.54	31	37,981	2.9	1.90	4.38	20	32,664	2.5*	1.36	4.49
Bumiputera Sabah	65	126,786	9.4	6.41	13.58	14	27,301	2.0*	0.87	4.66	23	45,801	3.4	1.91	5.97
Bumiputera Sarawak	51	114,746	12.1	7.12	19.79	4	12,942	1.4*	0.48	3.79	11	36,893	3.9*	1.63	8.97
Others	29	80,351	3.4	1.97	5.76	9	5,974	0.3*	0.10	0.62	10	8,169	0.3*	0.16	0.75
Marital Status															
Single	149	355,292	5.6	4.26	7.34	45	83,543	1.3	0.86	2.00	64	118,707	1.9	1.30	2.69
Married	573	867,704	6.3	5.44	7.31	171	244,484	1.8	1.39	2.27	135	198,535	1.4	1.07	1.94
Widow(er)/Divorcee	272	315,777	18.0	15.27	21.21	133	140,920	8.0	6.40	10.07	92	116,746	6.7	5.05	8.76
Education Level															
No Formal Education	170	243,763	21.1	16.46	26.72	93	128,197	11.1	8.16	15.02	80	118,853	10.3	7.43	14.08
Primary Education	379	549,005	12.7	10.74	15.01	141	157,608	3.6	2.79	4.75	101	111,419	2.6	1.92	3.44
Secondary Education	307	499,312	4.7	3.83	5.77	86	136,308	1.3	0.92	1.78	89	179,239	1.7	1.25	2.28
Tertiary Education	126	232,023	4.1	3.11	5.34	23	40,759	0.7	0.42	1.22	13	14,682	0.3*	0.12	0.55

Table 17.3: Prevalence of Difficulty by Domains Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=11,674) (cont'd)

Sociodemographic Characteristics	Difficulty in Seeing					Difficulty in Hearing					Difficulty in Walking				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper				Lower	Upper
Occupation															
Government Employee	169	177,621	11.6	9.07	14.84	82	84,991	5.6	3.60	8.68	98	90,099	5.9	4.09	8.41
Private Employee	359	778,465	9.5	8.17	11.12	151	360,965	4.4	3.35	5.84	174	322,687	3.9	3.11	4.99
Self Employed	393	569,703	14.9	12.87	17.08	156	212,971	5.6	4.38	7.06	206	272,340	7.1	5.77	8.63
Unpaid Worker/ Homemaker	468	755,601	19.4	17.07	21.96	208	333,406	8.6	7.07	10.39	402	573,306	14.7	12.36	17.32
Retiree	108	158,834	20.7	15.27	27.37	64	97,285	12.7	8.72	18.23	103	143,153	18.6	14.37	23.72
Student	28	62,076	7.4	4.30	12.49	11	21,930	2.6*	1.18	5.79	6	5,138	0.6*	0.13	2.82
Not Working ^b	522	747,644	26.8	23.71	30.21	412	548,490	19.8	17.05	22.80	651	876,502	31.3	27.85	35.05
Household Income Group															
Less than RM 1,000	371	596,173	25.5	22.27	29.06	253	390,805	16.8	14.03	19.93	382	537,017	22.8	19.27	26.76
RM 1,000 - RM 1,999	479	745,807	16.9	14.75	19.18	253	345,744	7.8	6.34	9.67	396	500,484	11.3	9.54	13.27
RM 2,000 - RM 3,999	623	968,620	13.7	12.01	15.67	292	494,267	7.0	5.67	8.70	457	654,811	9.3	8.03	10.68
RM 4,000 - RM 5,999	271	455,478	13.2	10.55	16.40	147	222,378	6.5	4.81	8.60	184	278,581	8.0	6.21	10.33
RM 6,000 - RM 7,999	137	233,700	10.6	7.95	14.10	67	119,557	5.4	3.71	7.94	101	163,625	7.4	5.40	10.20
RM 8,000 - RM 9,999	74	117,519	12.4	7.90	18.87	31	40,498	4.3	2.68	6.83	55	81,250	8.6	5.30	13.54
RM 10,000 and above	96	134,747	9.5	6.63	13.34	44	48,541	3.4	1.93	6.05	69	71,466	5.0	3.45	7.22
Household Income Quintile															
Quintile 1	586	924,866	21.2	18.88	23.78	358	536,031	12.3	10.54	14.36	564	772,847	17.6	15.27	20.26
Quintile 2	448	661,261	15.1	13.15	17.28	248	380,831	8.7	6.88	11.05	363	469,579	10.7	9.04	12.63
Quintile 3	368	624,145	13.9	11.63	16.51	163	267,421	6.0	4.64	7.66	269	399,555	8.9	7.43	10.58
Quintile 4	365	606,447	13.6	11.32	16.22	188	280,753	6.3	4.89	8.08	244	358,548	8.0	6.46	9.86
Quintile 5	284	435,325	10.5	8.33	13.19	130	196,754	4.8	3.51	6.46	204	286,705	6.9	5.32	8.95
Household Income Category															
Bottom 40%	1,503	2,376,749	16.0	14.72	17.31	830	1,236,832	8.3	7.34	9.46	1,276	1,743,367	11.7	10.57	12.90
Middle 40%	416	662,331	12.8	10.67	15.35	205	347,820	6.7	5.30	8.56	276	416,804	8.0	6.58	9.78
Top 20%	132	212,964	11.9	8.86	15.80	52	77,139	4.3	2.63	7.07	92	127,062	7.1	4.92	10.10

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Difficulty in Remembering					Difficulty in Self-Care					Difficulty in Communicating				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper				Lower	Upper
Occupation															
Government Employee	61	65,029	4.3	2.67	6.71	9	5,177	0.3*	0.11	1.07	8	2,827	0.2*	0.05	0.69
Private Employee	124	273,913	3.4	2.38	4.69	15	29,427	0.4*	0.19	0.68	27	57,198	0.7	0.43	1.14
Self Employed	122	208,606	5.4	4.08	7.17	13	17,625	0.5*	0.23	0.92	35	43,927	1.1	0.73	1.79
Unpaid Worker/ Homemaker	214	339,587	8.7	7.12	10.64	38	72,266	1.9	1.12	3.05	46	86,944	2.2	1.46	3.37
Retiree	45	65,945	8.6	5.19	13.81	19	18,180	2.4*	1.26	4.37	11	16,940	2.2*	0.89	5.34
Student	8	9,414	1.1*	0.36	3.47	1	4,133	0.5*	0.07	3.44	0	-	-	-	-
Not Working ^b	418	575,285	20.6	17.67	23.80	253	321,412	11.5	9.57	13.82	163	225,425	8.1	6.41	10.08
Household Income Group															
Less than RM 1,000	222	359,544	15.3	12.49	18.60	96	113,985	4.9	3.71	6.33	71	112,941	4.8	3.43	6.68
RM 1,000 - RM 1,999	233	365,759	8.3	6.69	10.14	79	105,509	2.4	1.75	3.23	65	87,565	2.0	1.37	2.84
RM 2,000 - RM 3,999	276	399,329	5.7	4.66	6.83	102	141,823	2.0	1.52	2.64	96	155,314	2.2	1.63	2.94
RM 4,000 - RM 5,999	118	185,090	5.3	3.82	7.44	41	63,132	1.8	1.13	2.91	33	38,658	1.1	0.70	1.77
RM 6,000 - RM 7,999	68	138,687	6.3	4.17	9.51	12	26,144	1.2*	0.45	3.12	11	26,313	1.2*	0.45	3.16
RM 8,000 - RM 9,999	35	43,903	4.6	2.98	7.17	10	9,571	1.0*	0.39	2.58	10	12,097	1.3*	0.53	3.08
RM 10,000 and above	42	46,461	3.3*	1.59	6.59	9	8,782	0.6*	0.23	1.62	5	1,100	0.1*	0.01	0.45
Household Income Quintile															
Quintile 1	328	531,355	12.1	10.20	14.41	133	158,882	3.6	2.87	4.59	96	152,599	3.5	2.59	4.69
Quintile 2	224	325,867	7.4	5.92	9.28	81	114,373	2.6	1.88	3.59	73	100,092	2.3	1.49	3.48
Quintile 3	149	226,817	5.0	3.96	6.39	56	77,974	1.7	1.22	2.46	52	85,317	1.9	1.30	2.76
Quintile 4	157	237,683	5.3	4.00	7.03	51	76,882	1.7	1.12	2.61	44	56,469	1.3	0.79	2.00
Quintile 5	136	217,051	5.3	3.78	7.26	28	40,835	1.0*	0.50	1.93	26	39,510	1.0*	0.46	1.96
Household Income Category															
Bottom 40%	755	1,121,715	7.5	6.66	8.50	278	371,001	2.5	2.10	2.95	240	362,779	2.4	1.99	2.96
Middle 40%	183	319,762	6.2	4.63	8.18	56	75,598	1.5	0.94	2.25	41	54,281	1.0	0.67	1.64
Top 20%	56	97,295	5.4	3.64	8.08	15	22,346	1.2*	0.45	3.38	10	16,929	0.9*	0.26	3.39

Table 17.4: Prevalence of Overall Disability Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=11,674)

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	1,628	2,406,400	11.1	10.10	12.21
State					
Johor	106	200,805	9.0	6.86	11.61
Kedah	77	114,560	8.3	6.01	11.39
Kelantan	109	117,066	10.6	7.48	14.78
Melaka	68	51,742	9.9	5.98	16.00
Negeri Sembilan	147	307,496	23.9	19.64	28.64
Pahang	63	73,163	7.1	4.72	10.42
Pulau Pinang	109	95,235	7.6*	4.06	13.88
Perak	136	297,757	19.2	14.61	24.93
Perlis	88	18,677	13.2	10.03	17.23
Selangor	148	305,028	6.6	4.87	8.90
Terengganu	92	71,790	9.6	7.34	12.48
Sabah	152	317,490	11.9	9.35	15.12
Sarawak	161	368,238	21.2	15.57	28.09
WP Kuala Lumpur	36	52,328	4.1	2.91	5.83
WP Labuan	74	10,033	17.8	12.91	24.06
WP Putrajaya	62	4,991	8.3	5.39	12.43
Location					
Urban	828	1,553,938	9.5	8.33	10.81
Rural	800	852,461	16.1	14.23	18.15
Sex					
Male	578	908,268	8.4	7.33	9.71
Female	1,050	1,498,132	13.7	12.33	15.29
Age Group (Years)					
18–29	94	236,765	3.5	2.41	4.95
30–39	128	241,837	4.7	3.54	6.30
40–49	186	297,508	8.6	6.83	10.67
50–59	326	470,812	15.6	13.21	18.27
60–69	388	515,679	25.7	22.43	29.19
70–79	334	414,171	45.7	39.78	51.67
80 & above	172	229,627	78.4	69.05	85.53
Ethnicity					
Malay ^a	1,035	1,273,808	11.4	10.15	12.86
Chinese	225	480,165	10.4	8.22	13.12
Indian	135	186,470	14.3	11.24	18.02
Bumiputera Sabah	96	180,595	13.4	9.68	18.30
Bumiputera Sarawak	88	182,880	20.4	15.14	26.91
Others	49	102,482	4.3	2.80	6.65
Marital Status					
Single	175	370,528	5.9	4.55	7.67
Married	1,011	1,468,295	10.8	9.59	12.05
Widow(er)/Divorcee	442	567,577	32.7	28.88	36.81

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Education Level					
No Formal Education	285	412,311	35.9	29.15	43.28
Primary Education	654	944,367	22.0	19.66	24.59
Secondary Education	518	776,690	7.4	6.36	8.60
Tertiary Education	157	258,573	4.6	3.52	5.99
Occupation					
Government Employee	87	71,258	4.8	3.14	7.20
Private Employee	171	367,145	4.5	3.47	5.89
Self Employed	216	287,546	7.5	6.16	9.20
Unpaid Worker/ Homemaker	367	573,691	14.8	12.62	17.36
Retiree	91	128,862	16.8	12.10	22.94
Student	8	9,386	1.2*	0.38	3.48
Not Working ^b	685	966,760	34.9	31.35	38.71
Household Income Group					
Less than RM 1,000	393	601,862	25.9	22.39	29.77
RM 1,000 - RM 1,999	395	564,261	12.8	10.89	15.08
RM 2,000 - RM 3,999	455	673,608	9.6	8.31	11.09
RM 4,000 - RM 5,999	181	278,762	8.1	5.94	11.07
RM 6,000 - RM 7,999	93	142,905	6.6	4.72	9.08
RM 8,000 - RM 9,999	54	78,252	8.4	5.16	13.45
RM 10,000 and above	57	66,749	4.7	2.79	7.96
Household Income Quintile					
Quintile 1	572	865,393	20.0	17.59	22.61
Quintile 2	371	514,088	11.8	9.98	13.97
Quintile 3	255	391,838	8.8	7.30	10.50
Quintile 4	242	368,151	8.3	6.47	10.62
Quintile 5	188	266,930	6.5	4.93	8.62
Household Income Category					
Bottom 40%	1,273	1,861,843	12.6	11.52	13.77
Middle 40%	274	407,674	8.0	6.23	10.14
Top 20%	81	136,882	7.7	5.24	11.26

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli
 b - Not working includes Unemployed, and Old Age

Table 17.5: Use of Assistive Device Among Adults with Overall Difficulty Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=3,721)

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	2,139	3,318,314	56.5	53.76	59.14
State					
Johor	165	340,428	65.6	57.34	73.06
Kedah	97	169,753	49.7	41.37	57.99
Kelantan	129	149,807	55.8	45.82	65.40
Melaka	139	114,381	74.6	63.37	83.32
Negeri Sembilan	190	407,084	67.1	58.34	74.79
Pahang	106	126,662	60.8	52.16	68.88
Pulau Pinang	137	166,303	61.3	49.06	72.18
Perak	177	375,332	69.5	61.70	76.29
Perlis	77	17,105	48.0	39.38	56.80
Selangor	210	578,846	59.3	52.12	66.17
Terengganu	120	106,331	51.0	43.14	58.87
Sabah	140	274,383	35.1	27.64	43.29
Sarawak	166	374,771	47.4	38.72	56.33
WP Kuala Lumpur	57	91,656	66.8	52.23	78.74
WP Labuan	136	18,130	74.5	67.19	80.70
WP Putrajaya	93	7,343	51.1	41.05	61.05
Location					
Urban	1,235	2,414,937	59.2	55.82	62.50
Rural	904	903,377	50.3	45.79	54.71
Sex					
Male	769	1,256,587	51.2	46.97	55.32
Female	1,370	2,061,728	60.3	57.00	63.47
Age Group (Years)					
18–29	166	421,314	43.4	36.74	50.25
30–39	183	337,196	40.7	33.98	47.70
40–49	320	476,846	49.2	43.27	55.16
50–59	523	778,726	63.4	58.76	67.87
60–69	507	689,396	67.5	62.36	72.32
70–79	310	431,775	73.0	66.18	78.89
80 & above	130	183,062	68.6	57.71	77.77
Ethnicity					
Malay ^a	1,417	1,881,535	60.0	56.57	63.28
Chinese	320	807,637	70.8	64.36	76.42
Indian	159	213,110	54.7	46.83	62.41
Bumiputera Sabah	102	165,453	35.0	26.06	45.15
Bumiputera Sarawak	96	185,645	43.8	34.42	53.61
Others	45	64,934	20.8	13.37	30.96
Marital Status					
Single	222	483,780	46.3	40.06	52.73
Married	1,467	2,216,535	57.1	54.15	59.99
Widow(er)/Divorcee	450	618,000	65.3	58.93	71.22

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Education Level					
No Formal Education	200	294,035	54.5	46.62	62.13
Primary Education	649	918,951	52.0	47.44	56.62
Secondary Education	853	1,345,316	55.8	51.58	59.97
Tertiary Education	422	744,605	65.2	59.36	70.65
Occupation					
Government Employee	218	220,164	63.3	54.36	71.35
Private Employee	316	671,816	47.5	41.77	53.25
Self Employed	308	504,297	53.3	47.02	59.43
Unpaid Worker/ Homemaker	483	718,270	53.5	48.04	58.96
Retiree	157	245,504	76.2	67.15	83.34
Student	30	54,190	56.0	33.07	76.62
Not Working ^b	626	901,816	64.3	59.70	68.69
Household Income Group					
Less than RM 1,000	365	551,563	52.5	46.99	58.04
RM 1,000 - RM 1,999	449	662,008	51.7	46.29	57.07
RM 2,000 - RM 3,999	616	973,421	55.0	50.35	59.62
RM 4,000 - RM 5,999	300	494,876	59.5	51.93	66.74
RM 6,000 - RM 7,999	183	341,998	68.3	58.80	76.43
RM 8,000 - RM 9,999	88	115,174	57.6	42.58	71.36
RM 10,000 and above	138	179,273	73.0	63.15	81.07
Household Income Quintile					
Quintile 1	576	849,286	52.7	48.10	57.16
Quintile 2	422	653,000	52.2	47.13	57.25
Quintile 3	367	594,974	55.5	49.09	61.72
Quintile 4	395	641,025	59.9	53.44	65.99
Quintile 5	379	580,029	66.6	59.71	72.92
Household Income Category					
Bottom 40%	1,509	2,285,561	54.3	51.25	57.34
Middle 40%	465	785,567	60.5	54.35	66.35
Top 20%	165	247,187	66.8	56.35	75.80

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Child Functioning

Child Functioning

Contributors to this section: Chan Ying Ying, Noor Ani Ahmad, Rajini Sooryanarayana, Nor'Ain Ab Wahab, Rasidah Jamaluddin, Norazizah Ibrahim Wong, Noor Safiza Mohamad Nor, Salimah Othman, Yusniza Mohd Yusof

Introduction

Children with disabilities are among some of the most marginalised groups in society. They face institutionalisation, abandonment or neglect. Their disabilities also place them at a higher risk of physical abuse, and often exclude them from receiving proper nutrition or humanitarian assistance during emergencies [1]. The World Health Organization (WHO) estimates that there are 93 million children (or 1 in 20; 5.1%) aged 0 to 14 years living with moderate or severe disabilities worldwide, of which 13 million (0.7%) have severe disabilities [2]. The prevalence of child disabilities in low- and middle-income countries varies from 0.4% to 12.7% depending on the study and assessment tools [3]. Global child disability data are generally non-comparable as it uses different tools, methodologies and disability definitions. In order to address this need, The United Nations Children's Fund (UNICEF) and The Washington Group on Disability Statistics (WG) have developed a new tool to measure child functioning and disability. The tool assesses functional difficulties in different domains including hearing, vision, communication/comprehension, learning, mobility and emotions of children aged 2-17 years based on their parents' / guardians' perception.

In line with the United Nation's Sustainable Development Goals (SDG) and the "Leave no one behind" core principle of the SDG agenda, the UNICEF/WG Child Functioning Module was included in the National Health and Morbidity Survey (NHMS) 2019 to collect information on child functioning and disability in the Malaysian population. As the UNICEF/WG Child Functioning Module was used for the first time in this national survey, the instrument underwent forward-backward translation of the English version into the Malay language and cognitive interview testing among parents / guardians of children aged 2-17 years according to the WG standard guidelines [4,5] prior to the actual survey, in order to make it suitable to be used in NHMS 2019 among the Malaysian population.

Objectives

1. To determine the prevalence of overall functional difficulty (functional difficulty in at least one domain) among children aged 2-17 years in Malaysia by socio-demographic characteristics
2. To determine the prevalence of use of assistive devices among children aged 2-17 years

Methods

Both English and Malay versions of the UNICEF/WG Child Functioning Module were used to measure functional difficulties among children aged 2-17 years. The UNICEF/WG Child Functioning Module comprised of two questionnaires:

- Questionnaire for age 2-4 years (16 questions)
- Questionnaire for age 5-17 years (24 questions)

For the purpose of analysis, data for children aged 2-17 years were analysed as a whole in this survey. "Overall functional difficulty" was reported as the final outcome and was defined as functional difficulty in at least one domain.

The questionnaires were administered to parents / guardians with children aged 2-17 years via face-to-face interviews by trained research assistants.

Variable Definition

Functional difficulty in individual domain is defined as follows:

- for children aged 2-4, the definition includes "a lot of difficulty" or "cannot do at all" for questions in a particular domain, and "a lot more" for the question on controlling behaviour.
- for children age 5-17, it includes "a lot of difficulty" or "cannot do at all" for questions in a particular domain, and "daily" for the questions on anxiety and depression.

Findings

The prevalence of overall functional difficulty (functional difficulty in at least one domain) among children aged 2-17 years in Malaysia was 4.7% (95% CI: 3.91, 5.71). The prevalence was higher in rural areas [5.4% (95% CI: 3.87, 7.42)] compared to urban areas [4.5% (95% CI: 3.57, 5.66)], but the difference was not statistically significant. Children from older age groups (10-17 years) [5.8% (95% CI: 4.54, 7.44)] reported a higher prevalence compared to children from younger age groups (2-9 years) [3.6% (95% CI: 2.71, 4.88)]; however, the difference was not statistically significant. There were also no significant differences across sex, parent's marital status and household income group. The prevalence of overall functional difficulty was found to be higher among children whose mothers who had no formal/ primary education [6.2% (95% CI: 4.41, 8.66)] compared to children whose mothers who had tertiary education [2.7% (95% CI: 1.51, 4.66)], but the difference was not statistically significant. Our findings showed that children from households whose heads of household had no formal / primary education [5.7% (95% CI: 3.98, 8.15)] had a significantly higher prevalence of overall functional difficulty compared to children from households whose heads of households had tertiary education [1.9% (95% CI: 0.91, 3.77)].

Regarding the use of assistive devices among children aged 2-17 years, the prevalence of wearing glasses, using hearing aids, and using equipment or received assistance for walking were 11.3% (95% CI: 9.53, 13.43), 0.8% (95% CI: 0.50, 1.19), and 0.5% (95% CI: 0.29, 0.81) respectively.

Conclusion

The national prevalence of overall functional difficulty among children aged 2-17 years (4.7%) is comparable to the global prevalence of childhood disability (5.1%). For the first time, the use of UNICEF/WG Child Functioning Module in the NHMS 2019 was able to provide reliable baseline data on functional difficulties among children in Malaysia which is internationally comparable. Ultimately this information will be important for the designing of strategies to improve the development and well-being of children in Malaysia.

Recommendations

Functional difficulties occurring in children should be further studied to determine their health needs. Awareness and care for this population should be strengthened and extended to parents or guardians especially those with low education levels.

Healthcare providers should be adequately trained to detect risk factors and early signs of child disability, be able to manage appropriately and have adequate resources to ensure the success of disability health.

References

1. United Nations International Children's Emergency Fund (UNICEF). Children and young people with disabilities fact sheet, 6 (May 2013). Available at: https://www.unicef.org/disabilities/files/Factsheet_A5_Web_NEW.pdf
2. World Health Organization (WHO) & World Bank. World report on disability, 2011. WHO, Geneva. Available at: https://www.who.int/disabilities/world_report/2011/report.pdf
3. Maulik PK, Darmstadt GL. Childhood disability in low- and middle-income countries: Overview of screening, prevention, services, legislation, and epidemiology. *Pediatrics*, 2007; 120: S1-S55.
4. The Washington Group on Disability Statistics. Methodology: Translation of the Washington Group Tools. Available at: <http://www.washingtongroup-disability.com/wp-content/uploads/2016/12/WG-Document-3-Translation-of-the-Washington-Group-Tools.pdf>
5. The Washington Group on Disability Statistics. Methodology: Cognitive testing interview guide. Available at: http://www.washingtongroup-disability.com/wp-content/uploads/2016/01/appendix3_cognitive_test.pdf

Table 18.1: Prevalence of Overall Functional Difficulty (At Least One Domain) Among Children Aged 2-17 Years in Malaysia by Socio-Demographic Characteristics (n=4,576)

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	201	362,601	4.7	3.91	5.71
Location					
Urban	117	253,184	4.5	3.57	5.66
Rural	84	109,416	5.4	3.87	7.42
Sex					
Male	99	186,105	4.9	3.77	6.27
Female	102	176,496	4.6	3.57	5.90
Age Group (Years)					
2–9	90	140,027	3.6	2.71	4.88
10–17	111	222,573	5.8	4.54	7.44
Ethnicity					
Malay ^a	140	237,280	4.8	3.87	6.01
Chinese	9	19,620	1.7*	0.71	4.07
Indian	12	19,190	4.8*	2.48	9.14
Bumiputera Sabah	25	47,244	8.3	4.52	14.63
Bumiputera Sarawak	8	28,317	7.7	3.83	14.75
Others	7	10,950	4.1	1.74	9.25
Parent's Marital Status					
Single / Widow(er) / Divorcee	24	38,622	4.3	2.60	7.14
Married	174	320,869	4.8	3.90	5.89
Mother's Education Level					
No Formal / Primary education	57	117,809	6.2	4.41	8.66
Secondary Education	106	187,618	4.9	3.84	6.29
Tertiary Education	34	49,423	2.7	1.51	4.66

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Head of Household's Education Level					
No Formal / Primary education	53	103,226	5.7	3.98	8.15
Secondary Education	106	193,761	5.5	4.21	7.04
Tertiary Education	25	32,601	1.9	0.91	3.77
Household Income Group					
Less than RM 1,000	24	59,604	6.8	3.99	11.29
RM 1,000 - RM 1,999	47	85,670	6.0	4.23	8.42
RM 2,000 - RM 3,999	77	118,390	5.0	3.66	6.72
RM 4,000 - RM 5,999	25	48,636	3.9	2.24	6.59
RM 6,000 - RM 7,999	14	24,427	3.4	1.56	7.28
RM 8,000 - RM 9,999	8	14,865	4.1	1.93	8.35
RM 10,000 and above	6	11,009	1.7	0.64	4.66
Household Income Quintile					
Quintile 1	42	93,858	6.2	4.20	9.06
Quintile 2	54	85,977	5.7	3.94	8.16
Quintile 3	44	68,736	4.7	3.14	6.92
Quintile 4	33	63,729	3.9	2.45	6.20
Quintile 5	28	50,300	3.3	1.85	5.68
Household Income Category					
Bottom 40%	151	260,995	5.3	4.22	6.57
Middle 40%	40	80,826	3.8	2.44	5.94
Top 20%	10	20,780	3.5	1.89	6.24

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli

Table 18.2: Prevalence of Use of Assistive Devices Among Children Aged 2-17 Years in Malaysia (n=4,576)

Domain of Assistive Devices	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Wear Glasses	403	933,208	11.3	9.53	13.43
Use Hearing Aid	37	63,410	0.8	0.50	1.19
Use Equipment or Receive Assistance for Walking	24	40,200	0.5	0.29	0.81

NHMS 2019

Epilepsy

Epilepsy

Contributors to this section: Fong Si Lei, LeeAnn Tan, Lim Kheng Seang, Nabilah Hanis Zainuddin, Raymond Azman Ali, Santhi Datuk Puvanarajah, Suganthi Chinnasami, Tee Sow Kuan

Introduction

The national prevalence of epilepsy is a strong indicator reflecting the magnitude of epilepsy in the country, which indicates the number of people requiring treatment. Malaysia is one of only two countries in the Southeast Asia region which has no national epilepsy prevalence estimates to-date. Reliable estimates of the prevalence of epilepsy is important to determine the treatment gap of epilepsy in Malaysia in order to guide adequate and appropriate allocation of resources to reduce this gap effectively; they also serve as a useful baseline for future epidemiological studies on epilepsy.

Although the World Health Organization (WHO) estimates that 8 out of 1000 have this disease [1], the prevalence of epilepsy varies among countries and is usually higher in developing countries. The lifetime prevalence of epilepsy in Asia varied from 1.5 to as high as 14.0 per 1000 population in Asian populations [2,3]. A 1993 study in Singapore showed an epilepsy prevalence rate of 3.8 per 1000 population [4] while in 1997, Kun et al reported lifetime prevalence of 4.9 per 1000 population by the age of 18 years old through screening of Singaporean male residents prior to their enlistment for military service [5]. Cambodia, in its first ever door-to door survey in Prey Veng province, revealed a lifetime prevalence of 5.8 per 1000 population [6]. Thailand and Laos have comparable epilepsy prevalence rates of 7.2 and 7.7 per 1000 population respectively [7,8].

Farther afield, the prevalence of epilepsy was found to be much higher in Latin America, with a lifetime prevalence of 17.8 per 1000 population [9]. Similarly, high rates were also observed in sub-Saharan Africa with an age-dependent prevalence, ranging from as low as 3.1 per 1000 population in those older than 60 years to as high as 11.5 per 1000 population among those aged 20 to 29 years [10]. The prevalence of epilepsy in Western countries was estimated to be 6 per 1000 population [2,11].

Objective

The objective of the study is to determine the prevalence of epilepsy in Malaysia.

Methods

N.B. The Epilepsy module used a different sample than the rest of the modules in Volume I of this report. Please refer to Volume II (Healthcare Demand) — General Findings for further details on the sample characteristics applicable to this module.

The screening questionnaire used is a validated screening instrument for the ascertainment of epilepsy adapted from Ottman et al [12], which was translated into Malay and subsequently validated by Fong et al [1]. The questionnaire was administered to eligible respondents of all ages in NHMS 2019. Each question has three categories of response (Yes, No, Possible) that covers the spectrum of possibility of having symptoms suggestive of epilepsy. A “Yes” or “Possible” response is considered a positive response while a “No” response is considered a negative response.

The definition for a positive screen and suspected epilepsy employed in this report is a positive response to either Question 2 (*Other than the seizures you had because of a high fever, have you ever had, or has anyone ever told you that you had, a seizure disorder or epilepsy?*) or Question 3A (*Other than the seizures you had because of a high fever, have you ever had, or has anyone ever told you that you had, a seizure, convulsion, fit or spell under any circumstances?*). This particular definition yielded a sensitivity of 85.8% and a specificity of 96.6% in the aforementioned validation study by Fong et al [1].

Findings

According to the definition employed in this study, the overall prevalence of epilepsy in Malaysia (based on initial screening) is 1.7% (95% CI: 1.35, 2.02). There was a higher prevalence observed among those who were single [2.3% (95% CI: 1.81, 2.99)] compared to those who were married. A higher prevalence was observed among those aged 10-19 years [2.9% (95% CI: 1.90, 4.43)] and those belonging to households in the B40 income group [1.8% (95% CI: 1.46, 2.32)].

Conclusion

The prevalence of epilepsy in Malaysia (based on initial screening) is slightly higher than that reported in the rest of the Asian countries. One of the possible reasons includes the use of the present definition of a positive screen i.e. a positive response to either Question 2 (epilepsy excluding febrile seizure) or Question 3A (a seizure, convulsion, fit or spell under any circumstances excluding febrile seizure), as utilised in this report. With this definition, we may have included additional patients with acute symptomatic seizures who do not fulfil the International League Against Epilepsy (ILAE) 2014 Operational Clinical Definition of Epilepsy. Furthermore, the prevalence is only based on the screening questionnaire, which subsequently will require diagnostic confirmation by a neurologist.

In addition, various international studies on the prevalence of epilepsy used different screening questionnaires which were skewed towards generalised epilepsy rather than ours, which covers a broader symptomatology to include both generalised and focal epilepsy. Otherwise, our prevalence should be comparable to other Asian countries. Last but not least, differences in aetiology of epilepsy for example, increased risk of endemic central nervous system infections: neurocysticercosis, Japanese encephalitis, tuberculosis and human immunodeficiency virus (HIV) infection, can explain the higher prevalence in less developed countries.

Recommendations

1. To raise awareness on epilepsy by introducing it at the school level.
2. To reduce the stigma of epilepsy through public health talks/radio talk shows, delivered by neurologists.
3. To educate the general public on the simple safety measures they can take, when encountering someone who is having a seizure, while waiting for first responders to the scene.
4. To reduce treatment gap via public awareness campaigns on the availability of treatment at hospitals and determining national policies on resource allocations for the various treatment options.
5. To periodically conduct estimations of the national prevalence of epilepsy with the aim of monitoring the impact of such improved policies, to reduce the treatment gap over time.

References

1. Fong S-L, Lim K-S, Tan L, Aris T, Khalid RA, Ali RA, et al. Validation of Malay brief screening instrument for ascertainment of epilepsy. *Epilepsy Behav.* 2019 Aug 1;97:206–11.
2. Mac TL, Tran D-S, Quet F, Odermatt P, Preux P-M, Tan CT. Epidemiology, aetiology, and clinical management of epilepsy in Asia: a systematic review. *Lancet Neurol.* 2007 Jun;6(6):533–43.
3. Trinkka E, Kwan P, Lee B, Dash A. Epilepsy in Asia: Disease burden, management barriers, and challenges. *Epilepsia.* 2019;60(S1):7–21.
4. Puvanendran K. Epidemiology of epilepsy in Singapore. *Ann Acad Med Singapore.* 1993 May;22(3 Suppl):489–92.
5. Kun LN, Ling LW, Wah YW, Lian TT. Epidemiologic study of epilepsy in young Singaporean men. *Epilepsia.* 1999 Oct;40(10):1384–7.
6. Preux P-M, Chea K, Chamroeun H, Bhalla D, Vannareth M, Huc P, et al. First-ever, door-to-door cross-sectional representative study in Prey Veng province (Cambodia). *Epilepsia.* 2011 Aug;52(8):1382–7.
7. Asawavichienjinda T, Sitthi-Amorn C, Tanyanont W. Prevalence of epilepsy in rural Thailand: a population-based study. *J Med Assoc Thai Chotmaihet Thangphaet.* 2002 Oct;85(10):1066–73.
8. Tran D-S, Odermatt P, Singphuangphet S, Druet-Cabanac M, Preux P-M, Strobel M, et al. Epilepsy in Laos: knowledge, attitudes, and practices in the community. *Epilepsy Behav EB.* 2007 Jun;10(4):565–70.
9. Burneo JG, Tellez-Zenteno J, Wiebe S. Understanding the burden of epilepsy in Latin America: a systematic review of its prevalence and incidence. *Epilepsy Res.* 2005 Sep;66(1–3):63–74.
10. Paul A, Adeloje D, George-Carey R, Kol i i, Grant L, Chan KY. An estimate of the prevalence of epilepsy in Sub-Saharan Africa: A systematic analysis. *J Glob Health.* 2012 Dec; 2(2).
11. Yemadje L-P, Houinato D, Quet F, Druet-Cabanac M, Preux P-M. Understanding the differences in prevalence of epilepsy in tropical regions. *Epilepsia.* 2011 Aug;52(8):1376–81.
12. Ottman R, Barker-Cummings C, Leibson CL, Vasoli VM, Hauser WA, Buchhalter JR. Validation of a brief screening instrument for the ascertainment of epilepsy. *Epilepsia.* 2010 Feb;51(2):191–7.
13. Abdul Manan MM, Várhelyi A. Motorcycle fatalities in Malaysia. *IATSS Res.* 2012 Jul 1;36(1):30–9.

Table 19.1: Prevalence of Suspected Epilepsy (Preliminary Results Based on Initial Screening) in Malaysia by Socio-Demographic Characteristics (n=16,681)

Sociodemographic Characteristics	Unweighted Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	245	522,221	1.7	1.35	2.02
Location					
Urban	143	375,650	1.6	1.24	2.04
Rural	102	146,571	1.8	1.34	2.53
Sex					
Male	133	298,422	1.9	1.43	2.50
Female	112	223,800	1.4	1.10	1.81
Age Group (Years)					
0–9	55	90,689	1.8	1.27	2.56
10–19	55	150,497	2.9	1.90	4.43
20–29	33	90,532	1.5	0.88	2.45
30–39	30	79,851	1.5	0.87	2.67
40–49	23	42,593	1.2	0.67	2.08
50–59	20	31,503	1.0*	0.51	2.02
60–69	20	21,406	1.0*	0.54	1.98
70 & above	9	15,150	1.2*	0.44	3.34
Ethnicity					
Malay ^a	178	321,267	1.9	1.52	2.29
Chinese	22	321,267	1.1*	0.51	2.15
Indian	9	321,267	0.7*	0.32	1.54
Bumiputera Sabah	15	321,267	1.5*	0.78	3.00
Bumiputera Sarawak	6	321,267	1.0*	0.32	2.78
Others	15	321,267	2.7*	1.27	5.73
Marital status					
Single	150	363,934	2.3	1.81	2.99
Married	75	136,349	1.0	0.68	1.36
Widow(er) / Divorcee	20	21,939	1.2	0.69	2.21
Household Income Category					
Bottom 40%	180	394,441	1.8	1.46	2.32
Middle 40%	48	102,107	1.3	0.86	1.97
Top 20%	17	25,674	1.1*	0.59	2.16

*Prevalence with high RSE, interpret with caution

a - Malay includes Orang Asli

Depression

Depression

Contributors to this section: Mohd Shaiful Azlan Kassim, Noor Ani Ahmad, Nurashikin Ibrahim, Sherina Mohd Sidik, Idayu Badilla Idris, Hjh Salina Abdul Aziz, Siti Hazrah Selamat Din, Abdul Aziz Harith, Zamtira Seman, Mohd Amierul Fikri Mahmud, Faizul Akmal Abd Rahims, Hazrin Hasim @ Hashim, Muhammad Faiz Mohd Hisham, Karen Sharmani a/p Sandanasamy.

Introduction

Depression is one of the most common mental health disorders in community settings and a major cause of disability. It is projected to be the leading cause of disease burden globally by 2030 [1]. Depression is a state of low mood and aversion to activity. It can affect a person's thoughts, behaviour, motivation, feelings, and sense of well-being. It may feature sadness, difficulty in thinking and concentration and a significant increase or decrease in appetite and time spent sleeping. People experiencing depression may have feelings of dejection, hopelessness and, sometimes, suicidal thoughts [2].

According to the World Health Organization (WHO), more than 300 million people of all ages suffer from depression. Depression can lead to suicide. Close to 800,000 people die due to suicide every year. Suicide is the second leading cause of death in 15-29 years old [3]. The National Health Morbidity Survey (NHMS) found that mental health problems had increased from 10.7% in 1996 to 29.2% in 2015 [4][5]. In the NHMS 2011 report, the prevalence of lifetime depression was 2.4% and current depression was 1.8% [6].

Many scales have been developed to measure depressive symptoms [7]. Worldwide, the nine-item depression module from the Patient Health Questionnaire (PHQ-9) has been used extensively for assessing and detecting depression based on DSM-IV criteria for major depression. The PHQ-9 has been used in about 15 languages, and over 50 validity studies have been published. The Malay version of PHQ-9 reported sensitivity and specificity of 87% and 82% [8].

Objectives

General objective

To determine the prevalence of depression among Malaysian adults aged 18 years and above.

Specific objectives

1. To determine the prevalence of depression among adults aged 18 years and above.
2. To determine the prevalence of depression by socio-demographic profiles.

Methods

The module on depression was targeted to household members aged 18 years and above from the randomly selected living quarters. Self-administered questionnaire, PHQ-9 was distributed to the respondents and were available in 2 choices of languages: Bahasa Malaysia and English. The Malay version of the PHQ-9 had been validated and was found to have good internal reliability with Cronbach's alpha = 0.70 [8]. There were 9 statements related to depression with four responses for each statement, on a Likert scale scored from 0 (not at all) to 3 (nearly every day). The maximum total score was 27. In this study, score of ≥ 10 was defined as having depression [8].

Findings

The prevalence of depression among adults aged 18 years and above in Malaysia was 2.3% (95% CI: 1.87, 2.78). By state, the prevalence was highest in WP Putrajaya [5.4% (95% CI: 3.29, 8.78)], and followed by Perlis [4.3% (95% CI: 2.50, 7.22)].

The prevalence of depression was significantly higher in rural areas at 3.6% (95% CI: 2.48, 5.24) compared to their counterparts from urban areas [(1.9% (95% CI: 1.50, 2.34)]. The prevalence of depression was higher among Bumiputera Sabah [5.2% (95% CI: 2.84, 9.22)]. The prevalence also significantly higher among single [3.2% (95% CI: 2.35, 4.46)] compared to married [1.8% (95% CI: 1.40, 2.31)]. Among occupation categories, not working subpopulation reported to has the highest prevalence of depression [4.5% (95% CI: 3.01, 6.65)]. By household income group, the higher prevalence was observed in income group below RM1,000 [4.9% (95% CI: 3.05, 7.74)] compared to others.

Conclusion

The prevalence of depression among adults aged 18 years and above in Malaysia was 2.3%. The current depression prevalence in other countries range from 2.2% to 10.4% [9]. Our national prevalence is comparable with the other national prevalence such as Japan and Thailand [9][10]. The findings emphasized on risk communication towards vulnerable subpopulation such as rural, single, Bumiputera Sabah, non-working, and very low household income group.

Recommendations

1. Increase promotion and enhance awareness about the importance of mental health issues to the specific target groups for example Bumiputera Sabah, single and non-working subpopulation.
2. The publicity regarding mental health programs i.e. Minda Sihat Programme must be further expanded with a focus on reducing the stigma of mental illness among communities.
3. Multi-agency collaboration to provide intervention for the high-risk population i.e. social support system for single & widower/divorcee, empowerment of peer support and intervention to increase the employment rate.

References

1. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Med* 2006;3: e442.
2. de Zwart, P.L.; et al. (2018). "Empirical evidence for definitions of episode, remission, recovery, relapse and recurrence in depression: a systematic review". *Epidemiology and Psychiatric Sciences*: 1–19. doi:10.1017/S2045796018000227. PMID 29769159.
3. WHO 2019. Available from: <https://www.who.int/news-room/fact-sheets/detail/depression>
4. Institute for Public Health (1996). National Health and Morbidity Survey 1996: Volume 6. Psychiatric Morbidity in Adults. Ministry of Health; 1996.
5. Institute for Public Health. (2015). National Health & Morbidity Survey 2015: Non-communicable diseases, risk factors & other health problems (volume II).
6. Institute for Public Health (2011). National Health and Morbidity Survey 2011. Vol. II. Non-communicable Diseases. Ministry of Health; 2011
7. Mitchell AKC, J.C. Screening for depression in clinical practice. An evidence-based guide. New York: Oxford University Press; 2010.
8. Sherina MS, Arroll B, Goodyear-Smith F. Criterion validity of the PHQ-9 (Malay version) in a primary care clinic in Malaysia. *The Medical journal of Malaysia*. 2012 Jun;67(3):309-15.
9. Kessler, R.C. and Bromet, E.J., 2013. The epidemiology of depression across cultures. *Annual review of public health*, 34, pp.119-138.
10. Kongsuk T. The prevalence of major depressive disorders in Thailand: results from the Epidemiology of Mental Disorders National Survey 2008. Available from: <http://www.dmh.go.th/downloadportal/Morbidity/Depress2551.pdf>.

Table 20.1: Prevalence of Depression Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=11,674)

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	261	472,420	2.3	1.87	2.78
State					
Johor	13	28,766	1.2*	0.58	2.26
Kedah	16	31,147	2.3*	1.06	5.00
Kelantan	6	11,937	1.2*	0.47	2.97
Melaka	17	18,551	3.8	2.17	6.46
Negeri Sembilan	19	50,965	5.0*	2.41	10.03
Pahang	24	32,582	3.6	2.50	5.24
Pulau Pinang	13	24,331	2.1*	0.95	4.39
Perak	11	24,207	1.6*	0.78	3.12
Perlis	23	6,686	4.3	2.50	7.22
Selangor	19	45,840	1.0	0.57	1.79
Terengganu	26	24,617	3.6*	1.76	7.07
Sabah	28	101,109	4.0	2.28	7.07
Sarawak	16	54,217	3.6	2.14	5.86
WP Kuala Lumpur	7	13,959	1.2*	0.45	3.04
WP Labuan	8	551	0.9*	0.38	2.20
WP Putrajaya	15	2,956	5.4	3.29	8.78
Location					
Urban	151	297,699	1.9	1.50	2.34
Rural	110	174,721	3.6	2.48	5.24
Sex					
Male	106	206,593	2.0	1.44	2.73
Female	155	265,827	2.6	2.02	3.30
Age Group (Years)					
15-19	12	19,574	2.1*	1.00	4.37
20-24	35	89,345	3.1	1.94	4.84
25-29	37	118,087	3.9	2.47	6.19
30-34	26	47,340	1.8	1.06	2.99
35-39	25	42,592	1.8	1.12	2.98
40-44	12	17,450	1.0*	0.42	2.13
45-49	25	27,202	1.7	1.00	2.85
50-54	28	32,974	2.2	1.31	3.69
55-59	15	24,021	1.9*	0.89	3.83
60-64	14	31,523	3.1*	1.16	7.86
65-69	8	7,612	1.1*	0.44	2.63
70-74	7	3,410	0.7*	0.15	3.48
75 & above	17	11,292	2.4	1.36	4.35
Ethnicity					
Malay ^a	172	262,592	2.4	1.93	3.10
Chinese	19	42,203	0.9	0.54	1.67
Indian	30	34,192	2.7	1.55	4.72
Bumiputera Sabah	21	66,902	5.2*	2.84	9.22

Sociodemographic Characteristics	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sarawak	9	28,134	3.6*	1.57	7.92
Others	10	38,396	1.8*	0.74	4.10
Marital Status					
Single	79	198,486	3.2	2.35	4.46
Married	146	235,853	1.8	1.40	2.31
Widow(er)/Divorcee	34	29,315	2.0	1.23	3.23
Education Level					
No Formal Education	15	16,800	2.0*	0.80	4.93
Primary Education	53	74,453	2.0	1.34	3.09
Secondary Education	137	275,966	2.6	2.05	3.37
Tertiary Education	56	105,201	1.9	1.27	2.73
Occupation					
Government Employee	19	14,229	0.9*	0.46	1.85
Private Employee	69	142,474	1.8	1.26	2.54
Self Employed	48	78,335	2.2	1.47	3.17
Unpaid Worker/ Homemaker	49	98,686	2.7	1.88	3.88
Retiree	6	8,107	1.2*	0.23	5.70
Student	11	24,243	2.8*	1.29	6.16
Not Working ^b	59	106,346	4.5	3.01	6.65
Household Income Group					
Less than RM 1,000	42	98,778	4.9	3.05	7.74
RM 1,000 - RM 1,999	60	93,050	2.2	1.52	3.24
RM 2,000 - RM 3,999	87	165,069	2.5	1.68	3.57
RM 4,000 - RM 5,999	30	48,413	1.5	0.89	2.44
RM 6,000 - RM 7,999	23	50,144	2.3	1.34	4.02
RM 8,000 - RM 9,999	10	12,083	1.3*	0.44	3.92
RM 10,000 and above	9	4,883	0.3*	0.14	0.82
Household Income Quintile					
Quintile 1	70	144,977	3.7	2.50	5.32
Quintile 2	61	99,437	2.4	1.67	3.44
Quintile 3	50	106,274	2.5	1.60	3.82
Quintile 4	42	64,375	1.5	0.97	2.36
Quintile 5	38	57,357	1.4	0.86	2.32
Household Income Category					
Bottom 40%	200	371,375	2.7	2.11	3.33
Middle 40%	46	80,951	1.6	1.08	2.47
Top 20%	15	20,094	1.1*	0.53	2.46

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli
 b - Not working includes Unemployed, and Old Age

NHMS 2019

Health Literacy

Health Literacy

Contributors to this section: Komathi Perialathan, Norrafizah Jaafar, Teresa Yong Sui Mien, Masitah Ahmad, Nurashma Juatan, Kamarulzaman Salleh, Manimaran Krishnan, Affendi Isa, Haniza Abdul Hanit, Wan Shakira Rodzlan Hasani, Emma Mirza Mohamad, Mohammad Rezal Hamzah, Arina Anis Azlan, Suffian Hadi Ayub.

Introduction

World Health Organization (WHO) defines Health Literacy as the cognitive and social skills which determines the motivation and ability of individuals to gain access, to understand and use information in ways which promote and maintain good health [1].

According to Sorensen and colleagues [2], health literacy encompasses an individual competency in accessing, understanding, appraising and applying health-related information within the three domains as below:

- a. **Healthcare** - refers to the ability to access information on medical or clinical issues, to understand medical information, to interpret and evaluate medical information, and to make informed decisions on medical issues and comply with medical advice.
- b. **Disease Prevention** - refers to the ability to access information on risk factors for health, to understand information on risk factors and derive meaning, to interpret and evaluate information about risk factors, and to make informed decisions to protect against risk factors for health.
- c. **Health Promotion** - refers to the ability to regularly update oneself on determinants of health in the social and physical environment and derive meaning, to interpret and evaluate information on determinants of health in the social and physical environment, and the ability to make informed decisions on health determinants in the social and physical environment.

Health Literacy emphasizes on improving and enabling people's access to health information and building their capacity to use it effectively and build an empowered individual. The first nationwide study on functional health literacy among Malaysian adults was conducted in National Health and Morbidity Survey (NHMS) 2015 using the translated version of Newest Vital Sign. The survey findings reported the overall prevalence of adequate functional health literacy among adults aged 18 years and above was 6.6% with urban population reporting higher significantly adequate health literacy (7.8%) compared to the rural population (2.3%) and with regards to the level of education, adults with tertiary education were found to be more adequate in health literacy (11.0%) than those with primary education (2.4%) [3].

Objectives

General objective

To determine health literacy prevalence among Malaysian adults.

Specific objectives

1. To determine the prevalence of overall health literacy by socio-demographic subgroups
2. To determine the proportions of health literacy levels; limited; sufficient, and excellent for overall Health Literacy and by domain; disease prevention, healthcare and health promotion

Methods

For National Health Morbidity Survey 2019, Health Literacy assessment was conducted using HLS-M-Q18 [4]. This questionnaire is a compressed and adapted version of the European Health Literacy Survey, HLS-EU-Q47 which was based on the conceptualised model of Health Literacy by European Health Literacy Consortium.

The target population for Health Literacy module in this survey were adult respondents aged 18 years and above in Malaysia. Data was obtained through self-administered questionnaires using the HLS-M-Q18. As mentioned before, this questionnaire was adapted from HLS-EU-Q47 and was pretested in Selangor, Kuala Lumpur and Sarawak using ratio-based sampling, which takes into account population characteristics such as population size and race density in a given area. For validation purpose, the face validity process was conducted at three stages among the experts, researchers, stakeholders and the technical team to ensure each item in the questionnaire is a valid measure of the domain being measured. In terms of instrument reliability, all major domains in this questionnaire showed a Cronbach's alpha value greater than 0.7.

The questionnaire contains 18 items covering 9 sub-dimensions (dimensions such as obtaining, understanding or appraising the information and application relevant to healthcare, disease prevention and health promotion). It is a self-reported tool with Likert-type responses ('very easy', 'fairly easy', 'fairly difficult', 'very difficult') and final score will be given when respondents completes all the 18 questions.

All scores were transformed to a unified metric with a minimum score of 0 and a maximum score of 50, whereby 0 represents the 'lowest possible' and 50 represents the 'highest possible' health literacy score. The scores are divided into three levels:

- **Limited Health Literacy Level**
Scoring range from 0 - 33: Very difficult and fairly difficult to access, understand, appraise and apply health related information within the three domains of healthcare, disease prevention and health promotion.
- **Sufficient Health Literacy Level**
Scoring range from >33–42: Fairly easy to access, understand, appraise and apply health related information within the three domains of healthcare, disease prevention and health promotion.
- **Excellent Health Literacy Level**
Scoring range from >42–50: Very easy to access, understand, appraise and apply health related information within the three domains of healthcare, disease prevention and health promotion.

Findings

21.1 Overall Health Literacy

For Health Literacy module, a total 9478 respondents aged 18 years and above participated and completed all the 18 items in HLS-M-Q18. The overall prevalence of health literacy among Malaysian adults aged 18 years and above showed that higher number of Malaysian population, 40.7% (95% CI: 38.89, 42.57) possessed sufficient health literacy level, followed by 35.0% (95% CI: 33.02, 37.11) possessed limited health literacy level and only 24.3% (95% CI: 22.56, 26.02) had excellent health literacy level. Health literacy level by states shows Johor had the highest number of respondents possessing excellent health literacy level at 40.5% (95% CI: 32.83, 48.71). Wilayah Persekutuan Putrajaya had highest number of respondents possessing sufficient health literacy level at 54.9% (95% CI: 49.13, 60.60) and followed closely by Wilayah Persekutuan Labuan at 53.2% (95% CI: 47.19, 59.15), Pulau Pinang [43.8% (95% CI: 35.02, 53.06)] and Sabah [43.2% (95% CI: 37.03, 49.61)] showed the highest prevalence of respondents possessing limited health literacy level.

In terms of socio demographic aspects, the proportion of limited health literacy was found higher among respondents from rural [41.5% (95% CI: 38.29, 44.85)], with non-formal education [64.8% (95% CI: 55.71, 72.93)], those who earned less than RM1,000 [49.5% (95% CI: 44.04, 55.02)], among male [37.2% (95% CI: 34.25, 40.28)] and widower or divorcee [48.1% (95% CI: 43.06, 53.15)] respectively. Among the ethnic groups, Others reported the highest prevalence of possessing limited health literacy level [51.2% (95% CI: 42.44, 59.90)], followed by Bumiputera Sarawak [41.9% (95% CI: 34.59, 49.63)] and Bumiputera Sabah [38.6% (95% CI: 32.81, 44.71)]. The findings also showed limited health literacy increase as the age increases, starting from elderly aged 60 and above and the highest prevalence of limited health literacy is among elderly aged 75 years and above [68.0% (95% CI: 60.90, 74.31)].

In comparison with this, the ratio of sufficient health literacy was higher among respondents from urban [41.1% (95% CI: 38.87, 43.33)], within the age group of 40-44 years old [46.1% (95% CI: 40.76, 51.49)], possessing tertiary education level [44.1% (95% CI: 41.25, 47.05)] and Malays [43.9% (95% CI: 42.14, 45.75)].

For respondents with excellent health literacy level, the sociodemographic characteristics were similar as respondents with sufficient health literacy level, whereby it was higher among urban population [25.7% (95% CI: 23.66, 27.89)], respondents with tertiary education level [31.2%, 95% CI: 28.11, 34.54]), within the age group 30 to 34 years old [30.4% (95% CI: 24.71, 36.68)], by ethnicity, Indians [33.1% (95% CI: 27.76, 38.81)] and highest among the income group of RM 10,000 and above [27.8% (95% CI: 22.20, 34.18)].

Health Literacy level by household income group shows limited health literacy level were higher among respondents from the B40 group at 36.6% (95% CI: 34.04, 39.14). In sufficient health literacy level, the T20 household group had the highest prevalence [42.0% (95% CI: 35.28, 49.06)] whilst highest prevalence for excellent health literacy level were higher among both household income group of M40 [27.3% (95% CI: 24.27, 30.53)] and T20 [27.3% (95% CI: 22.06, 33.13)].

21.2 Health Literacy in Health Care, Disease Prevention and Health Promotion Domains

In the aspect of Health Literacy by domains, generally, majority of respondents had sufficient health literacy level for all the domains, Health Care [49.1% (95% CI: 47.22, 51.05)], Disease Prevention [44.2% (95% CI: 42.42, 46.06)] and Health Promotion [47.5% (95% CI: 45.68, 49.26)].

Among these three domains, Disease Prevention domain had the highest prevalence of limited health literacy level group at 32.3% (95% CI: 30.39, 34.20). Health Care domain had highest prevalence of sufficient health literacy level group at 49.1% (95% CI: 47.22, 51.05) and Health Promotion had the highest prevalence of excellent health literacy level group at 25.9% (95% CI: 24.23, 27.64).

Conclusion

The overall health literacy level in Malaysia records that majority of population were categorised as having sufficient health literacy 40.7% (95% CI: 38.89, 42.57), followed by 35.0% (95% CI: 33.02, 37.11) possessing limited health literacy level and only 24.3% (95% CI: 22.56, 26.02) had excellent health literacy level.

However, when compared to the whole spectrum, the average mean score for Malaysian was 35.5 (out of the total score of 50). This score indicates that although the overall population falls under the sufficient category (33-42), a large number of the population belongs to the lower end of the sufficient category.

It is recommended that to achieve a comfortable sufficient category in the health literacy index score, it should ideally reach a mean of 37. This highlights that health literacy in Malaysia is considerably unsatisfactory, and there are rooms for improvements to increase the score level.

In comparison with other countries using the same instrument, the prevalence of limited health literacy level among populations in Malaysia is relatively within the same level such as Ireland (40%), Germany (46.3%), Taiwan (34.4%), Sri Lanka (32.5%) and Vietnam (32.5%) [5][6][7][8]. A systematic review of 11 papers in Southeast Asian region shows the overall prevalence of limited health literacy in South East Asia varied considerably, 1.6%–99.5% with a mean of 55.3% [9]. This similar pattern indicated challenges faced by countries in improving health literacy in general.

Limited health literacy level was more prominent among respondents in older age group, with lower education level and lower household income, whereas majority of respondents possessing sufficient or excellent health literacy level are among younger age group (below 50 years old), having higher education level and income. These findings are similar with findings from other studies globally that highlighted association of health literacy level with social gradients. Factors such as older age, lower formal educational level, lower income, location, unemployment that reflects social disparities are interrelated with limited health literacy.

Recommendations

1. Health literacy enhancement should focus on vulnerable groups who scored limited in the health literacy index, especially those with no formal or lower education levels, unemployed, elderly and B40 income groups.
2. Intervention programmes to improve health literacy must be tailored to specific groups and focussed on improving the four competencies i.e.: access, understand, appraise and apply health information.
3. Strategic communication planning among various multiple stakeholders are needed in content and message design development that suits various demographic groups.
4. Develop health literacy instrument specific for Malaysian context and develop health literacy index.
5. Strengthen multi-sectoral collaboration to improve health literacy in all aspect.

References

1. Sorensen K, Van S, den Broucke J, Fullam GD, Pelikan J, Slonska Z, Brand H. E Consortium Health Literacy Project: Health literacy and public health: a systematic review and integration of definitions and models. *BMC Public Health*. 2012;12:80. doi:10.1186/1471-2458-12-80.
2. Sorensen, K., Pelikan, J. M., Röthlin, F., Ganahl, K., Slonska, Z., Doyle, G., ... HLS-EU Consortium (2015). Health literacy in Europe: comparative results of the European health literacy survey (HLS-EU). *European journal of public health*, 25(6), 1053–1058. doi:10.1093/eurpub/ckv043
3. Institute for Public Health (IPH) 2015. National Health and Morbidity Survey 2015 (NHMS 2015). Vol. II: Non-Communicable Diseases, Risk Factors & Other Health Problems; 2015.
4. Mohamad, E.M.W., Kaundan, M.K., Hamzah, M.R. et al. Establishing the HLS-M-Q18 short version of the European health literacy survey questionnaire for the Malaysian context. *BMC Public Health* 20, 580 (2020).
5. Denuwara, H., Gunawardena, N.S. Level of health literacy and factors associated with it among school teachers in an education zone in Colombo, Sri Lanka. *BMC Public Health* 17, 631 (2017)]
6. Schaeffer, Doris & Berens, Eva-Maria & Vogt, Dominique. (2017). Health Literacy in the German Population: Results of a Representative Survey. *Deutsches Ärzteblatt International*. 114. 53-60. 10.3238/arztebl.2017.0053.
7. Duong, Tuyen & Pham, Van & Nguyen, Thanh & Pham Minh, Khue & Truong, Quang & Nguyen, Kien & Chang, Peter & Association, Asian. (2015). Health literacy Surveys in Taiwan and Vietnam.
8. Doyle, Gerardine & Cafferkey, Kenneth & Fulham, James. (2012). The European Health Literacy Survey: Results from Ireland.
9. Rajah, R. & Hassali, Mohamed & Murugiah, M.K.. (2019). A systematic review of the prevalence of limited health literacy in Southeast Asian countries. *Public Health*. 167. 8-15. 10.1016/j.puhe.2018.09.028.

Table 21.1: Prevalence of Total Health Literacy Level Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,478)

Sociodemographic Characteristics	Limited Health Literacy Level (Score 0-33)					Sufficient Health Literacy Level (Score >33-42)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	3,382	6,926,178	35.0	33.02	37.11	4,022	8,048,557	40.7	38.89	42.57
State										
Johor	216	536,122	23.1	17.48	29.95	315	842,275	36.4	30.73	42.36
Kedah	204	465,962	38.0	30.34	46.25	182	445,896	36.3	31.40	41.58
Kelantan	174	343,895	36.7	31.24	42.42	176	380,348	40.5	34.29	47.10
Melaka	130	137,179	27.2	19.52	36.52	249	240,450	47.7	41.17	54.25
Negeri Sembilan	104	138,138	26.4	20.67	33.05	182	262,099	50.1	41.71	58.45
Pahang	216	318,886	34.2	29.16	39.63	235	409,713	44.0	38.59	49.45
Pulau Pinang	251	481,371	43.8	35.02	53.06	229	481,120	43.8	35.68	52.30
Perak	218	575,320	39.1	32.75	45.91	185	487,387	33.2	26.75	40.24
Perlis	182	45,612	30.3	23.97	37.45	248	75,666	50.2	44.44	56.04
Selangor	355	1,468,187	33.5	28.06	39.38	487	1,862,761	42.5	37.87	47.23
Terengganu	216	253,693	39.0	35.55	42.53	236	275,585	42.4	38.48	46.32
Sabah	367	1,083,191	43.2	37.03	49.61	322	994,382	39.7	33.04	46.69
Sarawak	306	732,616	40.8	35.88	45.92	257	642,620	35.8	32.09	39.67
WP Kuala Lumpur	139	311,969	27.1	20.65	34.73	205	584,736	50.8	44.84	56.80
WP Labuan	176	19,317	30.6	25.84	35.73	258	33,637	53.2	47.19	59.15
WP Putrajaya	128	14,721	27.1	21.78	33.08	256	29,882	54.9	49.13	60.60
Location										
Urban	1,924	5,118,651	33.2	30.80	35.70	2,511	6,332,478	41.1	38.87	43.33
Rural	1,458	1,807,527	41.5	38.29	44.85	1,511	1,716,079	39.4	36.73	42.20
Sex										
Male	1,550	3,779,948	37.2	34.25	40.28	1,838	3,933,177	38.7	35.99	41.52
Female	1,832	3,146,230	32.7	30.70	34.85	2,184	4,115,380	42.8	40.81	44.87
Age Group (Years)										
18-19	114	344,350	40.1	32.14	48.62	143	336,126	39.2	31.88	46.92
20-24	309	1,022,527	37.3	32.12	42.73	417	1,180,300	43.0	37.61	48.61
25-29	275	912,757	31.7	27.27	36.54	411	1,185,239	41.2	36.62	45.93
30-34	270	796,281	32.0	27.08	37.35	435	936,545	37.6	33.28	42.20
35-39	319	704,037	31.1	26.85	35.77	459	986,742	43.6	38.94	48.44
40-44	245	449,708	25.6	21.44	30.28	389	808,987	46.1	40.76	51.49
45-49	243	459,437	29.7	25.40	34.35	384	674,209	43.6	38.73	48.51
50-54	287	487,414	34.9	30.70	39.37	383	586,304	42.0	37.48	46.64
55-59	314	437,631	35.7	30.98	40.69	338	511,480	41.7	37.43	46.13
60-64	294	395,710	41.2	35.63	47.01	294	373,394	38.9	33.76	44.26
65-69	263	344,280	49.5	42.58	56.43	184	229,327	33.0	26.88	39.70
70-74	205	239,044	51.2	43.72	58.71	105	137,273	29.4	23.60	36.02
75 & above	244	333,002	68.0	60.90	74.31	80	102,631	21.0	15.69	27.40
Ethnicity										
Malay ^a	2,010	3,122,347	30.6	28.70	32.61	2,768	4,479,846	43.9	42.14	45.75
Chinese	468	1,520,679	36.6	31.32	42.23	414	1,493,965	36.0	31.45	40.74
Indian	186	341,632	30.3	24.43	36.86	211	413,609	36.7	31.83	41.79
Bumiputera Sabah	262	512,133	38.6	32.81	44.71	277	548,394	41.3	35.45	47.46

Sociodemographic Characteristics	Excellent Health Literacy Level (Score >42-50)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	2,074	4,792,941	24.3	22.56	26.02
State					
Johor	296	939,034	40.5	32.83	48.71
Kedah	127	315,211	25.7	20.49	31.68
Kelantan	106	214,112	22.8	19.24	26.84
Melaka	149	126,802	25.1	18.96	32.52
Negeri Sembilan	83	123,113	23.5	16.62	32.19
Pahang	114	203,661	21.9	18.80	25.24
Pulau Pinang	72	135,601	12.4	8.63	17.36
Perak	147	407,484	27.7	22.24	33.95
Perlis	91	29,317	19.5	14.74	25.26
Selangor	231	1,053,955	24.0	20.38	28.11
Terengganu	107	121,446	18.7	15.70	22.04
Sabah	119	429,303	17.1	13.42	21.60
Sarawak	159	420,204	23.4	18.61	29.00
WP Kuala Lumpur	99	253,644	22.1	15.78	29.93
WP Labuan	80	10,255	16.2	12.86	20.26
WP Putrajaya	94	9,798	18.0	14.11	22.71
Location					
Urban	1,384	3,964,617	25.7	23.66	27.89
Rural	690	828,324	19.0	16.87	21.40
Sex					
Male	942	2,444,701	24.1	21.76	26.54
Female	1,132	2,348,240	24.4	22.55	26.42
Age Group (Years)					
18-19	63	178,185	20.8	14.87	28.18
20-24	174	540,771	19.7	16.02	24.01
25-29	239	779,378	27.1	22.88	31.75
30-34	248	755,644	30.4	24.71	36.68
35-39	235	570,664	25.2	21.53	29.34
40-44	209	496,976	28.3	23.63	33.51
45-49	208	414,225	26.8	22.44	31.57
50-54	203	322,419	23.1	19.38	27.28
55-59	188	277,048	22.6	18.59	27.18
60-64	135	191,316	19.9	16.15	24.31
65-69	80	121,914	17.5	13.09	23.07
70-74	58	90,166	19.3	13.84	26.32
75 & above	34	54,235	11.1	7.42	16.21
Ethnicity					
Malay ^a	1,388	2,593,795	25.4	23.53	27.44
Chinese	277	1,139,869	27.4	23.07	32.28
Indian	169	372,838	33.1	27.76	38.81
Bumiputera Sabah	93	266,490	20.1	15.62	25.43

Table 21.1: Prevalence of Total Health Literacy Level Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,478) (cont'd)

Sociodemographic Characteristics	Limited Health Literacy Level (Score 0-33)					Sufficient Health Literacy Level (Score >33-42)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sarawak	181	394,835	41.9	34.59	49.63	155	353,043	37.5	31.99	43.32
Others	275	1,034,552	51.2	42.44	59.90	197	759,701	37.6	29.57	46.39
Marital Status										
Single	729	2,194,197	38.6	34.86	42.44	901	2,240,832	39.4	36.11	42.80
Married	2,193	4,115,581	32.2	29.95	34.45	2,802	5,378,627	42.0	39.93	44.15
Widow(er)/Divorcee	460	616,400	48.1	43.06	53.15	319	429,099	33.5	28.95	38.32
Education Level										
No Formal Education	337	569,890	64.8	55.71	72.93	106	230,261	26.2	19.29	34.48
Primary Education	993	1,750,292	50.3	45.79	54.89	673	1,248,430	35.9	31.72	40.32
Secondary Education	1,476	3,181,020	32.4	30.07	34.78	2,082	4,127,003	42.0	39.70	44.34
Tertiary Education	553	1,352,856	24.6	21.83	27.67	1,153	2,423,297	44.1	41.25	47.05
Occupation										
Government Employee	225	321,280	21.1	17.73	24.95	494	652,367	42.9	38.17	47.71
Private Employee	899	2,664,721	34.2	30.71	37.94	1,286	3,201,104	41.1	37.79	44.55
Self Employed	642	1,252,329	36.7	32.85	40.77	713	1,357,276	39.8	35.78	43.95
Unpaid Worker/Homemaker	665	1,074,546	32.7	29.43	36.08	779	1,446,284	44.0	40.65	47.34
Retiree	146	223,983	30.3	23.70	37.80	204	298,117	40.3	34.53	46.37
Student	73	215,817	29.5	21.69	38.81	140	360,519	49.3	40.55	58.17
Not Working ^b	729	1,170,463	51.2	46.45	55.95	405	730,291	32.0	27.96	36.23
Household Income Group										
Less than RM 1,000	472	736,243	49.5	44.04	55.02	302	547,093	36.8	32.01	41.87
RM 1,000 - RM 1,999	757	1,478,633	39.4	35.27	43.66	768	1,482,071	39.5	35.36	43.75
RM 2,000 - RM 3,999	950	2,036,491	34.5	31.35	37.81	1,172	2,373,834	40.2	37.01	43.53
RM 4,000 - RM 5,999	423	922,677	29.0	25.40	32.90	669	1,384,366	43.5	39.62	47.51
RM 6,000 - RM 7,999	267	648,633	33.8	28.35	39.75	393	765,749	39.9	34.93	45.12
RM 8,000 - RM 9,999	98	211,115	24.4	18.20	31.93	195	428,949	49.6	41.78	57.45
RM 10,000 and above	180	483,817	31.4	22.77	41.64	321	627,249	40.8	33.63	48.31
Household Income Quintile										
Quintile 1	884	1,514,641	44.4	40.41	48.46	683	1,327,546	38.9	35.06	42.92
Quintile 2	664	1,394,410	37.7	33.51	42.06	748	1,413,214	38.2	33.90	42.68
Quintile 3	580	1,222,138	33.0	29.18	37.01	735	1,536,710	41.5	37.80	45.22
Quintile 4	474	1,042,856	29.8	26.32	33.42	745	1,509,894	43.1	39.37	46.85
Quintile 5	545	1,343,565	31.1	27.01	35.48	909	1,821,947	42.2	38.56	45.84
Household Income Category										
Bottom 40%	2,287	4,362,590	36.6	34.04	39.14	2,492	4,885,374	40.9	38.55	43.36
Middle 40%	655	1,617,640	32.6	29.27	36.13	986	1,989,362	40.1	37.03	43.25
Top 20%	205	537,379	30.7	22.90	39.86	342	734,574	42.0	35.28	49.06

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Excellent Health Literacy Level (Score >42-50)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sarawak	83	193,926	20.6	14.55	28.30
Others	64	226,023	11.2	7.21	16.96
Marital Status					
Single	412	1,251,879	22.0	19.12	25.20
Married	1,521	3,304,694	25.8	23.72	28.04
Widow(er)/Divorcee	141	236,368	18.4	14.85	22.67
Education Level					
No Formal Education	35	79,327	9.0	4.89	16.06
Primary Education	272	478,224	13.8	11.34	16.58
Secondary Education	1,104	2,516,591	25.6	23.51	27.84
Tertiary Education	659	1,715,215	31.2	28.11	34.54
Occupation					
Government Employee	296	547,971	36.0	31.17	41.16
Private Employee	657	1,917,504	24.6	21.95	27.54
Self Employed	351	800,818	23.5	19.69	27.75
Unpaid Worker/Homemaker	401	768,734	23.4	20.21	26.85
Retiree	115	217,411	29.4	23.74	35.78
Student	58	154,403	21.1	15.54	28.07
Not Working ^b	195	384,820	16.8	13.96	20.17
Household Income Group					
Less than RM 1,000	119	203,279	13.7	10.35	17.85
RM 1,000 - RM 1,999	341	793,522	21.1	16.98	26.00
RM 2,000 - RM 3,999	649	1,490,772	25.3	22.60	28.12
RM 4,000 - RM 5,999	389	873,542	27.5	24.08	31.13
RM 6,000 - RM 7,999	205	503,923	26.3	21.59	31.56
RM 8,000 - RM 9,999	93	224,631	26.0	19.43	33.81
RM 10,000 and above	185	427,623	27.8	22.20	34.18
Household Income Quintile					
Quintile 1	302	569,059	16.7	13.90	19.89
Quintile 2	361	892,091	24.1	19.89	28.90
Quintile 3	408	947,231	25.6	22.41	28.98
Quintile 4	427	952,734	27.2	24.02	30.59
Quintile 5	483	1,156,177	26.8	23.43	30.36
Household Income Category					
Bottom 40%	1,225	2,687,165	22.5	20.41	24.77
Middle 40%	547	1,353,749	27.3	24.27	30.53
Top 20%	209	476,377	27.3	22.06	33.13

Table 21.2: Prevalence of Health Literacy Level for Healthcare Domain Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,478)

Sociodemographic Characteristics	Limited Health Literacy Level (Score 0-33)					Sufficient Health Literacy Level (Score >33-42)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	2,708	5,573,802	27.9	26.01	29.89	4,888	9,813,215	49.1	47.22	51.05
State										
Johor	191	491,302	20.8	15.25	27.70	374	1,001,828	42.4	36.49	48.55
Kedah	153	343,035	27.8	20.32	36.67	207	507,226	41.0	34.09	48.37
Kelantan	105	216,275	23.0	18.30	28.52	249	510,184	54.3	48.36	60.10
Melaka	101	95,502	18.6	13.06	25.80	300	289,954	56.5	51.50	61.32
Negeri Sembilan	107	154,727	28.6	22.71	35.25	188	262,747	48.5	40.51	56.59
Pahang	143	218,922	23.4	19.25	28.13	320	528,819	56.5	51.93	61.01
Pulau Pinang	196	355,527	32.4	25.37	40.26	283	599,970	54.6	48.00	61.10
Perak	185	478,743	32.6	27.70	37.83	239	650,248	44.2	38.98	49.61
Perlis	147	38,068	24.5	20.08	29.64	295	86,459	55.8	51.43	59.98
Selangor	273	1,127,517	25.5	20.43	31.38	592	2,324,467	52.6	47.40	57.78
Terengganu	176	209,234	31.1	28.17	34.26	275	329,781	49.1	45.68	52.46
Sabah	299	880,724	34.8	28.90	41.28	401	1,207,448	47.8	40.85	54.75
Sarawak	278	655,481	36.3	31.40	41.44	307	791,903	43.8	39.33	48.40
WP Kuala Lumpur	120	281,794	23.9	17.99	31.09	241	648,996	55.1	47.63	62.38
WP Labuan	124	13,724	21.7	17.16	27.08	316	39,255	62.1	56.14	67.72
WP Putrajaya	110	13,225	24.2	20.17	28.71	301	33,930	62.1	58.18	65.77
Location										
Urban	1,539	4,132,020	26.5	24.27	28.88	3,062	7,690,252	49.3	47.05	51.63
Rural	1,169	1,441,782	32.9	29.72	36.20	1,826	2,122,963	48.4	45.29	51.56
Sex										
Male	1,148	2,839,405	27.7	24.97	30.67	2,245	4,840,073	47.3	44.42	50.13
Female	1,560	2,734,397	28.1	26.04	30.24	2,643	4,973,142	51.1	49.01	53.19
Age Group (Years)										
18-19	106	293,859	34.1	26.81	42.21	157	402,629	46.7	39.01	54.57
20-24	259	901,960	32.7	27.59	38.14	472	1,249,887	45.2	40.30	50.28
25-29	237	789,533	27.3	22.99	32.02	475	1,387,448	47.9	42.69	53.22
30-34	218	623,408	24.8	20.25	30.01	519	1,186,184	47.2	42.07	52.40
35-39	234	535,914	23.5	20.05	27.31	569	1,252,487	54.9	50.24	59.46
40-44	203	390,011	22.0	18.05	26.59	453	930,359	52.5	47.22	57.81
45-49	193	352,114	22.2	18.47	26.44	464	839,807	53.0	47.96	57.87
50-54	215	331,877	23.4	19.58	27.79	475	751,769	53.1	48.57	57.56
55-59	217	306,288	24.6	20.58	29.11	454	677,508	54.4	49.76	58.98
60-64	229	305,101	31.5	26.62	36.88	354	457,807	47.3	41.54	53.14
65-69	220	278,036	39.7	33.02	46.70	232	305,821	43.6	36.86	50.63
70-74	162	166,102	35.4	28.69	42.78	150	224,594	47.9	40.45	55.44
75 & above	215	299,599	59.6	52.97	65.81	114	146,915	29.2	23.63	35.48
Ethnicity										
Malay ^a	1,575	2,438,038	23.7	21.91	25.53	3,336	5,382,470	52.3	50.29	54.22
Chinese	378	1,173,309	27.9	23.69	32.56	542	2,000,761	47.6	43.13	52.09
Indian	153	279,319	24.5	19.05	30.80	246	484,052	42.4	37.23	47.67
Bumiputera Sabah	208	431,607	32.2	26.25	38.71	336	660,996	49.3	42.23	56.31

Sociodemographic Characteristics	Excellent Health Literacy Level (Score >42-50)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	1,990	4,585,911	23.0	21.25	24.76
State					
Johor	275	869,410	36.8	29.55	44.70
Kedah	159	385,568	31.2	25.36	37.70
Kelantan	103	213,246	22.7	18.36	27.70
Melaka	139	128,006	24.9	18.02	33.41
Negeri Sembilan	82	124,109	22.9	15.45	32.59
Pahang	104	187,818	20.1	16.82	23.78
Pulau Pinang	74	142,708	13.0	8.99	18.43
Perak	126	341,200	23.2	18.00	29.39
Perlis	93	30,570	19.7	15.96	24.08
Selangor	218	965,858	21.9	18.00	26.28
Terengganu	123	133,082	19.8	15.87	24.42
Sabah	114	440,097	17.4	12.69	23.41
Sarawak	143	359,871	19.9	16.13	24.32
WP Kuala Lumpur	93	246,613	21.0	14.99	28.48
WP Labuan	74	10,229	16.2	12.21	21.14
WP Putrajaya	70	7,527	13.8	10.47	17.89
Location					
Urban	1,288	3,765,786	24.2	22.06	26.39
Rural	702	820,125	18.7	16.80	20.77
Sex					
Male	976	2,560,853	25.0	22.57	27.61
Female	1,014	2,025,058	20.8	19.03	22.70
Age Group (Years)					
18-19	59	165,500	19.2	13.87	25.97
20-24	176	610,803	22.1	17.36	27.72
25-29	219	717,736	24.8	20.63	29.49
30-34	228	703,242	28.0	22.39	34.36
35-39	218	493,378	21.6	18.18	25.52
40-44	195	450,243	25.4	20.88	30.59
45-49	197	394,189	24.9	20.98	29.18
50-54	197	332,444	23.5	19.95	27.41
55-59	179	261,408	21.0	17.02	25.61
60-64	145	204,932	21.2	17.19	25.79
65-69	81	117,268	16.7	12.32	22.30
70-74	59	78,212	16.7	12.08	22.58
75 & above	37	56,555	11.2	7.47	16.59
Ethnicity					
Malay ^a	1,332	2,479,548	24.1	22.16	26.10
Chinese	253	1,029,731	24.5	20.13	29.45
Indian	173	379,213	33.2	28.05	38.76
Bumiputera Sabah	93	249,350	18.6	13.75	24.63

Table 21.2: Prevalence of Health Literacy Level for Healthcare Domain Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,478) (cont'd)

Sociodemographic Characteristics	Limited Health Literacy Level (Score 0-33)					Sufficient Health Literacy Level (Score >33-42)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sarawak	164	366,091	38.7	32.19	45.69	183	400,909	42.4	37.34	47.64
Others	230	885,439	43.4	34.54	52.74	245	884,026	43.4	34.73	52.40
Marital Status										
Single	609	1,847,342	32.4	28.65	36.29	1,037	2,653,485	46.5	42.84	50.13
Married	1,709	3,174,934	24.5	22.52	26.66	3,435	6,596,862	51.0	48.78	53.15
Widow(er)/Divorcee	390	551,526	41.8	37.19	46.56	416	562,867	42.7	38.39	47.05
Education Level										
No Formal Education	307	539,840	60.9	52.66	68.59	137	271,024	30.6	24.00	38.07
Primary Education	790	1,414,887	39.9	35.43	44.60	890	1,565,107	44.2	39.74	48.69
Secondary Education	1,129	2,465,036	24.9	22.71	27.12	2,528	5,111,544	51.5	49.15	53.88
Tertiary Education	464	1,090,661	19.7	17.29	22.43	1,322	2,838,220	51.4	48.44	54.26
Occupation										
Government Employee	194	283,994	18.5	15.02	22.50	568	742,357	48.3	43.24	53.34
Private Employee	714	2,155,409	27.5	24.00	31.36	1,514	3,847,386	49.1	45.54	52.74
Self Employed	465	843,188	24.5	21.45	27.83	904	1,745,634	50.7	46.54	54.90
Unpaid Worker/Homemaker	514	886,239	26.5	23.39	29.90	992	1,792,208	53.6	49.90	57.30
Retiree	109	172,759	23.1	17.22	30.21	252	375,864	50.2	43.54	56.91
Student	74	197,124	26.9	19.54	35.84	145	369,536	50.5	42.30	58.60
Not Working ^b	635	1,032,049	44.2	39.95	48.60	511	936,350	40.1	35.87	44.55
Household Income Group										
Less than RM 1,000	373	599,984	40.0	35.14	45.12	405	693,447	46.3	41.53	51.06
RM 1,000 - RM 1,999	610	1,221,492	32.1	28.14	36.42	930	1,768,284	46.5	41.87	51.25
RM 2,000 - RM 3,999	725	1,580,476	26.5	23.40	29.75	1,473	2,975,342	49.8	46.38	53.23
RM 4,000 - RM 5,999	357	718,959	22.5	19.73	25.48	770	1,653,755	51.7	47.95	55.43
RM 6,000 - RM 7,999	218	531,767	27.5	22.21	33.57	460	918,348	47.5	41.88	53.28
RM 8,000 - RM 9,999	79	191,754	22.1	16.48	28.87	229	496,414	57.1	49.62	64.27
RM 10,000 and above	157	399,302	25.6	17.12	36.45	367	761,360	48.8	41.17	56.54
Household Income Quintile										
Quintile 1	694	1,228,714	35.7	32.05	39.58	895	1,652,882	48.1	43.99	52.16
Quintile 2	528	1,127,095	30.0	25.98	34.42	903	1,663,505	44.3	39.96	48.79
Quintile 3	445	947,733	25.2	21.88	28.90	922	1,981,507	52.8	48.84	56.62
Quintile 4	398	817,368	23.2	20.58	26.03	858	1,792,933	50.9	47.35	54.41
Quintile 5	454	1,122,823	25.8	21.57	30.43	1,056	2,176,122	49.9	45.74	54.08
Household Income Category										
Bottom 40%	1,789	3,435,122	28.5	26.13	30.89	3,101	5,996,039	49.7	47.17	52.14
Middle 40%	555	1,314,577	26.4	23.27	29.73	1,142	2,442,058	49.0	45.62	52.38
Top 20%	175	494,036	27.9	20.39	36.85	391	828,852	46.8	40.23	53.44

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Excellent Health Literacy Level (Score >42-50)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sarawak	74	178,370	18.9	15.10	23.32
Others	65	269,700	13.2	7.60	22.03
Marital Status					
Single	409	1,209,449	21.2	18.32	24.35
Married	1,443	3,171,466	24.5	22.43	26.70
Widow(er)/Divorcee	138	204,996	15.5	12.42	19.26
Education Level					
No Formal Education	36	75,372	8.5*	4.58	15.25
Primary Education	293	563,460	15.9	12.26	20.38
Secondary Education	1,059	2,344,570	23.6	21.60	25.79
Tertiary Education	596	1,597,936	28.9	25.68	32.38
Occupation					
Government Employee	264	511,536	33.3	28.33	38.59
Private Employee	639	1,827,656	23.3	20.82	26.07
Self Employed	354	852,734	24.8	20.33	29.83
Unpaid Worker/Homemaker	366	663,791	19.9	17.00	23.07
Retiree	109	199,720	26.7	21.22	32.97
Student	53	165,667	22.6	16.43	30.30
Not Working ^b	205	364,807	15.6	12.95	18.76
Household Income Group					
Less than RM 1,000	126	205,570	13.7	10.72	17.39
RM 1,000 - RM 1,999	348	810,587	21.3	17.21	26.13
RM 2,000 - RM 3,999	611	1,418,224	23.7	20.67	27.10
RM 4,000 - RM 5,999	366	826,042	25.8	22.72	29.19
RM 6,000 - RM 7,999	197	481,420	24.9	20.20	30.33
RM 8,000 - RM 9,999	80	181,172	20.8	14.63	28.80
RM 10,000 and above	168	398,750	25.6	19.98	32.10
Household Income Quintile					
Quintile 1	303	557,394	16.2	13.47	19.38
Quintile 2	364	962,191	25.6	20.92	31.00
Quintile 3	382	827,483	22.0	18.85	25.57
Quintile 4	402	913,354	25.9	23.00	29.07
Quintile 5	445	1,061,342	24.3	21.03	27.98
Household Income Category					
Bottom 40%	1,189	2,644,908	21.9	19.67	24.31
Middle 40%	510	1,227,921	24.6	21.78	27.73
Top 20%	197	448,936	25.3	20.31	31.13

Table 21.3: Prevalence of Health Literacy Level for Disease Prevention Domain Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,478)

Sociodemographic Characteristics	Limited Health Literacy Level (Score 0-33)					Sufficient Health Literacy Level (Score >33-42)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	3,139	6,459,887	32.3	30.39	34.20	4,391	8,857,004	44.2	42.42	46.06
State										
Johor	220	574,598	24.1	18.26	18.26	332	875,562	36.8	31.22	42.70
Kedah	206	469,013	37.5	28.24	28.24	210	503,529	40.2	32.04	48.96
Kelantan	137	277,919	29.5	25.45	25.45	220	465,536	49.4	45.33	53.50
Melaka	104	99,283	19.2	13.27	13.27	293	291,791	56.4	51.36	61.28
Negeri Sembilan	93	123,697	23.0	18.63	18.63	193	269,589	50.0	41.82	58.21
Pahang	225	330,514	35.3	30.56	30.56	236	413,477	44.2	40.05	48.33
Pulau Pinang	239	435,917	39.4	32.61	32.61	239	510,459	46.1	40.28	52.06
Perak	214	567,454	38.6	33.57	33.57	182	479,217	32.6	26.23	39.60
Perlis	169	42,045	27.3	20.97	20.97	270	80,288	52.2	47.11	57.17
Selangor	309	1,268,322	28.6	23.83	23.83	544	2,160,696	48.7	43.64	53.74
Terengganu	227	261,953	39.1	34.20	34.20	243	283,657	42.3	38.39	46.35
Sabah	357	1,083,733	42.9	37.25	37.25	350	1,034,043	40.9	35.34	46.71
Sarawak	257	607,863	33.8	28.76	28.76	313	795,308	44.2	40.39	48.08
WP Kuala Lumpur	124	287,456	24.6	19.12	19.12	228	629,932	54.0	47.94	59.92
WP Labuan	156	18,069	28.6	23.38	23.38	272	34,020	53.8	48.14	59.28
WP Putrajaya	102	12,052	22.0	17.70	17.70	266	29,901	54.7	49.13	60.06
Location										
Urban	1,728	4,690,038	30.0	27.77	32.31	2,786	7,051,190	45.1	42.88	47.31
Rural	1,411	1,769,850	40.4	37.32	43.51	1,605	1,805,813	41.2	38.65	43.80
Sex										
Male	1,460	3,524,300	34.3	31.53	37.15	2,019	4,477,465	43.6	40.88	46.27
Female	1,679	2,935,588	30.1	28.16	32.18	2,372	4,379,538	45.0	42.96	46.95
Age Group (Years)										
18-19	117	340,310	39.1	31.60	47.18	137	334,015	38.4	31.34	45.96
20-24	324	1,080,088	38.9	33.65	44.38	416	1,220,582	43.9	38.40	49.63
25-29	252	874,753	30.1	25.59	35.04	442	1,272,308	43.8	38.90	48.79
30-34	248	756,057	30.0	25.27	35.19	460	1,010,260	40.1	35.52	44.82
35-39	264	569,851	25.0	21.08	29.31	526	1,136,130	49.8	45.18	54.38
40-44	208	400,878	22.6	18.89	26.89	438	903,825	51.1	46.17	55.90
45-49	231	394,542	25.1	21.07	29.56	419	776,185	49.3	43.93	54.76
50-54	270	458,539	32.2	27.94	36.85	428	660,633	46.4	41.82	51.12
55-59	289	397,195	31.9	27.59	36.57	367	560,379	45.0	39.98	50.17
60-64	286	387,308	39.4	34.07	45.03	317	398,664	40.6	35.48	45.89
65-69	235	279,918	39.7	32.65	47.21	212	296,279	42.0	35.13	49.24
70-74	195	224,224	48.0	40.95	55.08	118	141,332	30.2	24.46	36.72
75 & above	220	296,224	59.3	52.32	65.88	111	146,413	29.3	23.80	35.48
Ethnicity										
Malay ^a	1,889	2,952,177	28.6	26.70	30.55	2,970	4,777,794	46.3	44.50	48.05
Chinese	400	1,301,764	30.9	26.31	35.94	494	1,779,342	42.3	37.17	47.52
Indian	171	325,702	28.4	23.07	34.46	233	469,983	41.0	35.28	46.99
Bumiputera Sabah	248	489,857	36.4	29.88	43.50	293	608,030	45.2	39.44	51.10

Sociodemographic Characteristics	Excellent Health Literacy Level (Score >42-50)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	2,069	4,705,860	23.5	21.84	25.25
State					
Johor	294	930,770	39.1	31.58	47.16
Kedah	107	279,677	22.3	17.21	28.47
Kelantan	100	198,743	21.1	17.49	25.21
Melaka	145	126,440	24.4	19.34	30.36
Negeri Sembilan	96	145,722	27.0	20.11	35.29
Pahang	107	192,520	20.6	17.94	23.45
Pulau Pinang	78	160,592	14.5	9.76	21.03
Perak	155	425,280	28.9	23.34	35.16
Perlis	92	31,585	20.5	15.79	26.23
Selangor	233	1,009,802	22.8	19.08	26.89
Terengganu	102	124,678	18.6	15.46	22.21
Sabah	108	410,452	16.2	12.80	20.37
Sarawak	154	396,267	22.0	17.37	27.50
WP Kuala Lumpur	98	249,370	21.4	15.35	28.95
WP Labuan	87	11,199	17.7	13.82	22.38
WP Putrajaya	113	12,764	23.3	18.45	29.03
Location					
Urban	1,388	3,898,378	24.9	22.91	27.06
Rural	681	807,482	18.4	16.22	20.85
Sex					
Male	894	2,277,413	22.2	19.94	24.55
Female	1,175	2,428,447	24.9	23.00	26.95
Age Group (Years)					
18-19	71	195,778	22.5	16.43	30.01
20-24	169	477,518	17.2	14.07	20.83
25-29	240	758,905	26.1	22.12	30.55
30-34	256	754,035	29.9	24.34	36.16
35-39	234	576,351	25.3	21.39	29.55
40-44	202	465,865	26.3	21.99	31.15
45-49	199	402,584	25.6	21.32	30.38
50-54	188	303,539	21.3	17.61	25.60
55-59	197	286,980	23.1	18.66	28.14
60-64	136	196,510	20.0	16.38	24.19
65-69	87	128,814	18.3	13.78	23.81
70-74	58	101,862	21.8	15.39	29.91
75 & above	32	57,120	11.4	7.27	17.52
Ethnicity					
Malay ^a	1,390	2,596,669	25.2	23.35	27.03
Chinese	281	1,129,325	26.8	22.50	31.64
Indian	170	350,412	30.6	25.18	36.56
Bumiputera Sabah	97	247,202	18.4	14.32	23.27

Table 21.3: Prevalence of Health Literacy Level for Disease Prevention Domain Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,478) (cont'd)

Sociodemographic Characteristics	Limited Health Literacy Level (Score 0-33)					Sufficient Health Literacy Level (Score >33-42)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sarawak	162	354,516	37.6	29.91	46.06	183	418,650	44.5	38.26	50.82
Others	269	1,035,872	50.5	42.02	58.88	218	803,206	39.1	31.28	47.59
Marital Status										
Single	709	2,136,628	37.1	33.63	40.68	944	2,444,561	42.4	39.07	45.86
Married	1,996	3,765,250	29.1	27.06	31.20	3,085	5,908,097	45.6	43.55	47.75
Widow(er)/Divorcee	434	558,009	42.4	37.38	47.52	362	504,346	38.3	33.60	43.22
Education Level										
No Formal Education	318	553,556	62.9	54.98	70.22	125	241,254	27.4	21.63	34.08
Primary Education	952	1,653,968	46.4	41.89	50.98	750	1,419,699	39.8	35.67	44.15
Secondary Education	1,408	3,097,920	31.1	28.93	33.43	2,252	4,435,634	44.6	42.31	46.87
Tertiary Education	439	1,083,769	19.6	17.14	22.30	1,252	2,737,304	49.5	46.47	52.49
Occupation										
Government Employee	164	236,148	15.3	12.40	18.78	543	728,159	47.2	42.15	52.40
Private Employee	857	2,553,678	32.5	29.14	36.02	1,359	3,507,976	44.6	41.26	48.04
Self Employed	593	1,087,406	31.4	27.88	35.13	792	1,600,542	46.2	42.06	50.41
Unpaid Worker/Homemaker	637	1,066,841	32.0	28.73	35.38	850	1,490,566	44.7	41.12	48.25
Retiree	124	197,912	26.5	20.17	34.00	234	340,813	45.7	39.29	52.16
Student	75	228,270	31.0	23.43	39.77	139	350,583	47.6	39.61	55.77
Not Working ^b	685	1,083,993	46.5	42.07	51.06	474	838,365	36.0	32.05	40.13
Household Income Group										
Less than RM 1,000	453	717,894	47.8	42.92	52.71	339	598,307	39.8	35.61	44.21
RM 1,000 - RM 1,999	723	1,411,671	37.2	33.48	41.14	839	1,614,390	42.6	38.54	46.71
RM 2,000 - RM 3,999	899	1,973,046	32.8	29.89	35.94	1,276	2,604,687	43.4	40.23	46.53
RM 4,000 - RM 5,999	392	857,313	26.6	23.25	30.32	733	1,532,564	47.6	43.63	51.64
RM 6,000 - RM 7,999	235	562,749	29.3	23.42	35.87	426	867,549	45.1	38.87	51.50
RM 8,000 - RM 9,999	82	157,225	18.0	13.24	23.91	213	488,104	55.8	48.76	62.54
RM 10,000 and above	142	384,165	24.6	16.28	35.42	337	707,004	45.3	37.76	53.06
Household Income Quintile										
Quintile 1	848	1,446,965	42.1	38.46	45.72	751	1,441,784	41.9	38.43	45.44
Quintile 2	645	1,372,873	36.6	32.57	40.78	812	1,523,183	40.6	36.22	45.09
Quintile 3	536	1,169,363	31.0	27.35	34.95	808	1,711,560	45.4	41.56	49.31
Quintile 4	438	970,723	27.3	24.08	30.77	816	1,673,422	47.1	43.34	50.81
Quintile 5	459	1,104,140	25.3	21.16	30.00	976	2,062,657	47.3	43.29	51.37
Household Income Category										
Bottom 40%	2,174	4,169,121	34.4	32.29	36.63	2,711	5,337,583	44.1	41.83	46.33
Middle 40%	582	1,454,277	29.1	25.45	33.12	1,092	2,277,942	45.6	41.96	49.38
Top 20%	170	440,665	24.8	17.31	34.16	360	797,082	44.8	38.32	51.55

a - Malay includes Orang Asli

b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Excellent Health Literacy Level (Score >42-50)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sarawak	74	168,639	17.9	12.59	24.83
Others	57	213,612	10.4	6.50	16.25
Marital Status					
Single	412	1,179,865	20.5	17.71	23.56
Married	1,513	3,271,308	25.3	23.24	27.41
Widow(er)/Divorcee	144	254,687	19.3	15.49	23.87
Education Level					
No Formal Education	36	84,968	9.7	5.32	16.89
Primary Education	277	490,370	13.8	11.29	16.67
Secondary Education	1,059	2,416,952	24.3	22.23	26.47
Tertiary Education	695	1,710,956	30.9	27.81	34.23
Occupation					
Government Employee	320	576,994	37.4	32.52	42.62
Private Employee	649	1,799,305	22.9	20.30	25.70
Self Employed	346	775,986	22.4	18.70	26.59
Unpaid Worker/Homemaker	387	780,415	23.4	20.11	27.01
Retiree	113	207,798	27.8	22.14	34.35
Student	60	157,189	21.4	15.74	28.30
Not Working ^b	193	406,894	17.5	14.38	21.05
Household Income Group					
Less than RM 1,000	110	185,941	12.4	9.53	15.93
RM 1,000 - RM 1,999	333	765,731	20.2	16.02	25.13
RM 2,000 - RM 3,999	639	1,429,854	23.8	21.32	26.47
RM 4,000 - RM 5,999	369	828,650	25.8	22.54	29.24
RM 6,000 - RM 7,999	211	493,078	25.6	21.08	30.79
RM 8,000 - RM 9,999	96	230,044	26.3	19.94	33.78
RM 10,000 and above	214	469,469	30.1	23.87	37.13
Household Income Quintile					
Quintile 1	294	552,559	16.1	13.41	19.11
Quintile 2	347	857,447	22.8	18.60	27.73
Quintile 3	402	888,212	23.6	20.66	26.74
Quintile 4	408	911,959	25.6	22.66	28.88
Quintile 5	521	1,192,591	27.4	24.00	30.99
Household Income Category					
Bottom 40%	1,204	2,604,321	21.5	19.47	23.69
Middle 40%	533	1,258,608	25.2	22.29	28.39
Top 20%	235	539,839	30.4	24.90	36.45

Table 21.4: Prevalence of Health Literacy Level for Health Promotion Domain Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,478)

Sociodemographic Characteristics	Limited Health Literacy Level (Score 0-33)					Sufficient Health Literacy Level (Score >33-42)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
MALAYSIA	2,615	5,337,658	26.6	24.76	28.60	4,698	9,511,083	47.5	45.68	49.26
State										
Johor	182	455,499	19.2	14.65	14.65	341	936,872	39.5	34.22	45.06
Kedah	161	345,213	27.6	20.63	20.63	223	573,286	45.8	40.05	51.73
Kelantan	127	248,033	26.3	21.87	21.87	216	463,143	49.1	43.75	54.44
Melaka	97	91,789	17.7	11.33	11.33	273	280,113	54.0	44.84	62.81
Negeri Sembilan	80	108,848	20.1	14.95	14.95	206	290,159	53.5	46.45	60.44
Pahang	162	241,243	25.8	22.28	22.28	280	470,376	50.3	46.31	54.20
Pulau Pinang	216	430,299	38.9	31.02	31.02	247	464,741	42.0	35.31	48.97
Perak	173	461,469	31.4	25.69	25.69	222	628,945	42.7	36.50	49.20
Perlis	146	33,888	21.8	16.21	16.21	295	87,851	56.5	50.37	62.47
Selangor	280	1,198,764	26.9	21.70	21.70	557	2,154,695	48.4	43.63	53.20
Terengganu	171	199,094	30.1	24.99	24.99	272	307,010	46.4	41.57	51.30
Sabah	252	729,435	28.8	23.29	23.29	417	1,255,758	49.6	43.19	55.95
Sarawak	219	530,099	29.4	24.45	24.45	341	856,438	47.4	42.76	52.11
WP Kuala Lumpur	99	236,207	20.2	13.99	13.99	248	672,536	57.5	52.19	62.66
WP Labuan	149	15,606	24.7	20.08	20.08	284	37,741	59.6	53.30	65.67
WP Putrajaya	101	12,172	22.3	17.23	17.23	276	31,420	57.5	52.87	62.09
Location										
Urban	1,475	3,984,421	25.5	23.23	27.86	2,927	7,428,084	47.5	45.34	49.65
Rural	1,140	1,353,237	30.8	27.83	33.88	1,771	2,083,000	47.4	44.56	50.19
Sex										
Male	1,204	2,921,454	28.4	25.56	31.47	2,166	4,759,280	46.3	43.61	49.01
Female	1,411	2,416,203	24.8	23.03	26.57	2,532	4,751,803	48.7	46.67	50.73
Age Group (Years)										
18-19	78	232,628	26.7	19.72	35.15	153	412,127	38.4	39.56	55.29
20-24	222	763,768	27.4	22.45	32.92	475	1,305,827	43.9	41.48	52.20
25-29	225	741,839	25.5	21.22	30.40	449	1,311,810	43.8	40.65	49.76
30-34	201	579,742	23.1	19.16	27.57	512	1,238,097	40.1	44.05	54.61
35-39	245	513,402	22.4	18.61	26.71	519	1,154,801	49.8	45.70	55.07
40-44	190	377,609	21.3	17.50	25.73	446	906,790	51.1	46.22	56.17
45-49	175	351,525	22.3	18.43	26.81	450	774,930	49.3	44.83	53.68
50-54	231	387,644	27.3	23.21	31.83	429	671,934	46.4	42.65	52.06
55-59	235	324,197	25.8	21.90	30.11	417	641,543	45.0	46.45	55.60
60-64	227	311,083	31.7	26.42	37.55	355	446,814	40.6	40.33	50.91
65-69	203	265,263	37.8	31.58	44.34	238	313,856	42.0	38.40	51.10
70-74	173	204,632	43.7	36.77	50.82	133	171,213	30.2	30.08	43.52
75 & above	210	284,327	57.0	49.67	64.11	122	161,341	29.3	25.76	39.76
Ethnicity										
Malay ^a	1,569	2,352,517	22.8	21.18	24.49	3,124	5,097,883	49.4	47.63	51.15
Chinese	379	1,299,498	30.7	25.74	36.12	525	1,844,084	43.5	39.00	48.19
Indian	138	272,818	23.9	18.53	30.14	258	482,523	42.2	36.73	47.85
Bumiputera Sabah	196	349,689	26.1	21.85	30.80	338	696,045	51.9	47.36	56.43

Sociodemographic Characteristics	Excellent Health Literacy Level (Score >42-50)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
MALAYSIA	2,293	5,189,305	25.9	24.23	27.64
State					
Johor	321	979,077	41.3	34.62	48.29
Kedah	138	332,377	26.6	21.19	32.76
Kelantan	115	232,371	24.6	20.90	28.78
Melaka	175	147,264	28.4	22.03	35.69
Negeri Sembilan	96	143,217	26.4	20.13	33.82
Pahang	126	224,350	24.0	20.90	27.33
Pulau Pinang	92	211,815	19.1	14.98	24.12
Perak	156	381,537	25.9	19.81	33.14
Perlis	95	33,697	21.7	16.75	27.58
Selangor	250	1,098,160	24.7	21.14	28.57
Terengganu	125	155,542	23.5	19.95	27.49
Sabah	148	548,498	21.7	16.71	27.56
Sarawak	168	419,745	23.2	18.57	28.67
WP Kuala Lumpur	103	260,702	22.3	15.75	30.56
WP Labuan	82	9,941	15.7	11.78	20.64
WP Putrajaya	103	11,012	20.2	16.36	24.59
Location					
Urban	1,501	4,228,184	27.0	25.01	29.15
Rural	792	961,121	21.9	19.52	24.38
Sex					
Male	1,015	2,599,212	25.3	22.93	27.79
Female	1,278	2,590,093	26.5	24.56	28.62
Age Group (Years)					
18-19	94	225,498	25.9	19.98	32.88
20-24	216	720,366	25.8	20.84	31.52
25-29	261	850,843	29.3	25.26	33.68
30-34	247	692,227	27.6	22.06	33.87
35-39	261	623,713	27.2	23.26	31.57
40-44	216	486,512	27.5	23.10	32.32
45-49	224	447,026	28.4	24.10	33.15
50-54	226	360,031	25.4	21.74	29.36
55-59	204	291,332	23.2	19.51	27.29
60-64	153	222,553	22.7	18.91	26.99
65-69	91	123,642	17.6	13.34	22.85
70-74	64	92,748	19.8	14.42	26.55
75 & above	36	52,815	10.6	7.25	15.24
Ethnicity					
Malay ^a	1,556	2,871,225	27.8	26.02	29.69
Chinese	277	1,091,537	25.8	21.53	30.53
Indian	178	388,373	34.0	27.80	40.71
Bumiputera Sabah	104	295,030	22.0	17.71	27.00

Table 21.4: Prevalence of Health Literacy Level for Health Promotion Domain Among Adults Aged 18 Years and Above in Malaysia by Socio-Demographic Characteristics (n=9,478) (cont'd)

Sociodemographic Characteristics	Limited Health Literacy Level (Score 0-33)					Sufficient Health Literacy Level (Score >33-42)				
	Count	Estimated Population	Prevalence (%)	95% CI		Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper				Lower	Upper
Bumiputera Sarawak	137	290,834	30.8	23.46	39.17	196	455,704	48.2	40.87	55.62
Others	196	772,301	37.7	28.98	47.19	257	934,845	45.6	37.20	54.20
Marital Status										
Single	547	1,693,562	29.4	25.61	33.38	1,041	2,714,508	47.0	43.50	50.60
Married	1,698	3,166,421	24.4	22.57	26.38	3,249	6,228,182	48.0	45.99	50.10
Widow(er)/Divorcee	370	477,674	36.7	32.42	41.09	408	568,394	43.6	38.96	48.37
Education Level										
No Formal Education	279	465,541	52.4	43.44	61.11	153	294,808	33.2	25.53	41.77
Primary Education	811	1,435,248	40.2	35.73	44.75	849	1,534,270	42.9	38.43	47.55
Secondary Education	1,069	2,335,473	23.5	21.22	25.92	2,419	4,833,599	48.6	46.36	50.88
Tertiary Education	437	1,044,516	18.9	16.34	21.69	1,265	2,812,750	50.8	47.74	53.88
Occupation										
Government Employee	176	231,936	15.1	11.81	18.97	547	816,319	53.0	48.16	57.69
Private Employee	695	2,145,911	27.3	23.89	30.91	1,464	3,730,034	47.4	44.13	50.65
Self Employed	479	948,160	27.4	23.84	31.16	865	1,583,474	45.7	41.44	49.96
Unpaid Worker/Homemaker	491	746,531	22.3	19.71	25.17	929	1,725,957	51.6	48.07	55.14
Retiree	119	190,781	25.5	19.80	32.23	227	325,098	43.5	37.23	49.96
Student	52	150,618	20.5	13.61	29.69	138	366,668	49.9	41.93	57.92
Not Working ^b	600	920,680	39.6	35.51	43.88	527	960,932	41.4	37.57	45.23
Household Income Group										
Less than RM 1,000	360	556,935	37.1	32.02	42.45	405	709,355	47.2	42.38	52.14
RM 1,000 - RM 1,999	602	1,191,477	31.4	27.58	35.43	902	1,724,699	45.4	41.31	49.57
RM 2,000 - RM 3,999	698	1,488,876	24.8	21.93	27.91	1,387	2,806,222	46.7	43.68	49.83
RM 4,000 - RM 5,999	336	731,034	22.7	19.09	26.70	749	1,585,786	49.2	45.18	53.18
RM 6,000 - RM 7,999	201	516,586	26.8	21.63	32.75	442	881,548	45.8	40.73	50.92
RM 8,000 - RM 9,999	83	181,194	20.8	15.06	28.03	219	470,052	54.0	46.15	61.61
RM 10,000 and above	134	342,587	22.0	13.79	33.25	363	794,013	51.0	42.76	59.22
Household Income Quintile										
Quintile 1	698	1,203,495	34.9	31.33	38.64	855	1,591,900	46.2	42.59	49.77
Quintile 2	497	1,033,869	27.6	23.95	31.49	893	1,701,077	45.3	41.07	49.69
Quintile 3	427	902,605	24.0	20.54	27.77	861	1,810,784	48.1	44.56	51.62
Quintile 4	374	828,354	23.3	19.89	26.99	834	1,722,301	48.4	44.52	52.19
Quintile 5	418	1,040,367	23.9	19.83	28.52	1,024	2,145,612	49.3	45.57	53.03
Household Income Category										
Bottom 40%	1,762	3,382,250	27.9	25.67	30.29	2,957	5,736,171	47.4	45.05	49.67
Middle 40%	498	1,226,107	24.6	21.33	28.08	1,121	2,369,930	47.5	44.14	50.79
Top 20%	154	400,333	22.6	15.28	32.04	389	865,573	48.8	42.52	55.15

*Prevalence with high RSE, interpret with caution
 a - Malay includes Orang Asli
 b - Not working includes Unemployed, and Old Age

Sociodemographic Characteristics	Excellent Health Literacy Level (Score >42-50)				
	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Bumiputera Sarawak	88	198,832	21.0	14.98	28.71
Others	90	344,308	16.8	10.92	24.91
Marital Status					
Single	482	1,362,895	23.6	20.87	26.61
Married	1,651	3,568,986	27.5	25.38	29.80
Widow(er)/Divorcee	160	257,424	19.8	16.18	23.88
Education Level					
No Formal Education	48	128,917	14.5	8.92	22.69
Primary Education	325	604,503	16.9	13.36	21.19
Secondary Education	1,233	2,773,688	27.9	25.82	30.07
Tertiary Education	682	1,678,330	30.3	27.30	33.52
Occupation					
Government Employee	302	493,293	32.0	27.72	36.60
Private Employee	717	1,996,593	25.4	22.83	28.08
Self Employed	390	935,434	27.0	22.53	31.95
Unpaid Worker/Homemaker	449	871,569	26.1	22.66	29.78
Retiree	125	231,678	31.0	25.31	37.31
Student	83	217,166	29.6	23.31	36.70
Not Working ^b	226	442,292	19.0	15.94	22.56
Household Income Group					
Less than RM 1,000	137	235,407	15.7	12.24	19.85
RM 1,000 - RM 1,999	389	881,803	23.2	19.18	27.82
RM 2,000 - RM 3,999	731	1,708,686	28.5	25.54	31.57
RM 4,000 - RM 5,999	414	908,072	28.2	24.88	31.68
RM 6,000 - RM 7,999	229	527,540	27.4	22.73	32.61
RM 8,000 - RM 9,999	88	219,563	25.2	18.87	32.83
RM 10,000 and above	197	419,737	27.0	21.27	33.54
Household Income Quintile					
Quintile 1	342	653,074	18.9	16.29	21.90
Quintile 2	407	1,016,595	27.1	22.49	32.26
Quintile 3	463	1,052,486	28.0	24.73	31.42
Quintile 4	459	1,011,814	28.4	25.36	31.65
Quintile 5	514	1,166,839	26.8	23.46	30.44
Household Income Category					
Bottom 40%	1,368	2,995,000	24.7	22.64	26.94
Middle 40%	593	1,398,443	28.0	25.01	31.19
Top 20%	224	507,366	28.6	23.44	34.41

Appendix

Appendix 1

Members of Steering Committee, NHMS 2019-2022

1. Director General of Health
2. Deputy Director General of Health (Research & Technical Support)
3. Deputy Director General of Health (Public Health)
4. Deputy Director General of Health (Medical)
5. Principal Director, Oral Health Programme
6. Principal Director, Pharmaceutical Services Programme
7. Principal Director, Food Safety and Quality Division
8. Director, Medical Development Division
9. Director, Planning Division
10. Director, Health Education Division
11. Director, Disease Control Division
12. Director, Family Health Development Division
13. Director, Nutrition Division
14. Representative of State Directors
15. Director, Institute for Public Health
16. Dean, Faculty of Medicine University of Malaya
17. Dean, Faculty of Medicine National University of Malaysia
18. Principal Investigator of NHMS

Appendix 2

Members of NHMS 2019 Central Coordinating Team (CCT)

1. Dr Noor Ani binti Ahmad (Director: Institute for Public Health)
2. Dr Nor Izzah binti Hj Ahmad Shauki (Director: Institute for Health Systems Research)
3. Dr Manimaran a/I Krishnan Kaundan (Director: Institute for Health Behavioural Research)
4. Dr Hj Tahir bin Hj Aris (Advisor)
5. Dr Shubash Shander Ganapathy (Principal Investigator)
6. Dr Muhammad Fadhli bin Mohd Yusoff (Co-PI: Non-Communicable Disease Module)
7. Suhana binti Jawahir (Co-PI: Healthcare Demand Module)
8. Komathi Perialathan (Co-PI: Health Literacy Module)
9. Nazirah binti Alias (Project Manager)
10. Dr Mohd Shaiful Azlan bin Kassim (Project Manager)
11. Wan Shakira binti Rodzlan Hasani (Data Manager)
12. Dr Fathullah Iqbal bin Ab Rahim (Data Manager)
13. Dr Halizah binti Mat Rifin (System Manager)
14. Dr LeeAnn Tan (Publicity Manager)
15. Norzawati binti Yeop (Logistics Manager)
16. Dr Mohd Azahadi bin Omar (Biostatistics)
17. Norazizah binti Ibrahim Wong (Biostatistics)
18. Ruhaya binti Salleh (Central Field Supervisor of Northern Zone)
19. Lim Kuang Kuay (Central Field Supervisor of Eastern Zone)
20. Dr Rajini Sooryanarayana (Central Field Supervisor of Southern Zone)
21. Hasimah binti Ismail (Central Field Supervisor of Central Zone)
22. Norhafizah binti Sahril (Central Field Supervisor of Central Zone)
23. Chan Ying Ying (Central Field Supervisor of Central Zone)
24. Ahmad Ali bin Zainuddin (Central Field Supervisor of East Malaysia Zone)
25. Andy Mustaming (System Support)

Appendix 3

List of Research Team Members

NON-COMMUNICABLE DISEASES AND HEALTHCARE DEMAND

Module A: Diabetes

- Hasimah binti Ismail
- Dr. Muhammad Fadhli bin Mohd Yusoff
- Dr. Fazila binti Ahmad
- Dr. Nur Liana binti Ab Majid
- Dr. Jane Ling Miaw Yn
- Dr. Tania Gayle Robert Lourdes
- Dr. Thamil Arasu Saminathan
- Dr. Halizah binti Mat Rifin
- Wan Shakira binti Rodzlan Hasani
- Dr. Feisul Idzwan Bin Mustapha
- Dr. Fatanah binti Ismail
- Dr. Rizawati binti Ramli
- Dr. Chang Li Cheng
- Dr. Masni binti Mohamad
- Dr. Nor Fariza binti Ngah
- Dr. Ahmad Hazri Bin Ilyas

Module B: Hypertension

- Dr. Nur Liana binti Ab Majid
- Dr. Muhammad Fadhli Bin Mohd Yusoff
- Dr. Jane Ling Miaw Yn
- Dr. Tania Gayle Robert Lourdes
- Dr. Thamil Arasu Saminathan
- Dr. Halizah binti Mat Rifin
- Hasimah binti Ismail
- Norazizah binti Ibrahim Wong
- Ahzairin Bin Ahmad
- Wan Shakira binti Rodzlan Hasani
- Dr. Feisul Idzwan Bin Mustapha
- Dr. Fatanah binti Ismail
- Dr. Rizawati binti Ramli
- Dr. Chang Li Cheng
- Dr. Masni binti Mohamad

Module C: Hypercholesterolaemia

- Dr. Halizah binti Mat Rifin
- Dr. Muhammad Fadhli bin Mohd Yusoff
- Dr. Nur Liana binti Ab Majid
- Dr. Jane Ling Miaw Yn
- Dr. Tania Gayle Robert Lourdes
- Dr. Thamil Arasu Saminathan
- Hasimah binti Ismail
- Wan Shakira binti Rodzlan Hasani
- Dr. Feisul Idzwan Bin Mustapha
- Dr. Fatanah binti Ismail
- Dr. Rizawati binti Ramli
- Dr. Chang Li Cheng
- Dr. Masni binti Mohamad

Module D: Tobacco Use

- Dr. Jane Ling Miaw Yn
- Dr. Muhammad Fadhli bin Mohd Yusoff
- Dr. Nur Liana binti Ab Majid
- Dr. Tania Gayle Robert Lourdes
- Dr. Thamil Arasu Saminathan
- Dr. Halizah binti Mat Rifin
- Hasimah binti Ismail
- Hasmah binti Mohamed Haris
- Wan Shakira binti Rodzlan Hasani
- Dr. Noraryana binti Hassan
- Dr. Nizam Bin Baharom

Module E: Alcohol Consumption

- Dr. Tania Gayle Robert Lourdes
- Dr. Muhammad Fadhli Bin Mohd Yusoff
- Dr. Nur Liana binti Ab Majid
- Dr. Jane Ling Miaw Yn
- Dr. Thamil Arasu Saminathan
- Dr. Halizah binti Mat Rifin
- Hasimah binti Ismail
- Mohd. Hatta Bin Abdul Mutalip
- Wan Shakira binti Rodzlan Hasani
- Dr. Norli binti Abdul Jabbar
- Dr. Rushidi Bin Ramly
- Dr. Rozanim binti Kamarudin

Module F: Physical Activity

- Lim Kuang Kuay
- Dr. Muhammad Fadhli Bin Mohd Yusoff
- Dr. Mohd Azahadi Bin Omar
- Dr. Thamil Arasu Saminathan
- Chan Ying Ying
- Ahzairin Bin Ahmad
- Nazirah binti Alias
- Ridwan Bin Sanaudi
- Assoc. Prof. Dr. Hazizi Bin Abu Saad
- Dr. Linayanti binti Rosli
- Nur Hidayatun Fadillah binti Mohd Nor
- Zanariah binti Zaini

Module G: Substances Abuse

- Wan Shakira binti Rodzlan Hasani
- Dr. Muhammad Fadhli Bin Mohd Yusoff
- Dr. Fazila binti Ahmad
- Dr. Nur Liana binti Ab Majid
- Dr. Jane Ling Miaw Yn
- Dr. Noor Aliza binti Lodz
- Dr. Thamil Arasu Saminathan
- Dr. Halizah binti Mat Rifin
- Hasimah binti Ismail
- Eida Nurhahadzira binti Mohamad
- Ahzairin Bin Ahmad
- Dr. Rushidi Bin Ramly
- Dr. Norli binti Abdul Jabbar
- Dr. Rusdi Bin Abd Rashid

Module H: Nutritional Status of Adults

- Syafinaz binti Mohd Sallehuddin
- Ruhaya binti Salleh
- Dr. Romzi binti Mohd Ali
- Ahmad Ali Bin Zainuddin
- Azli Bin Baharuddin
- Nur Shahida binti Abdul Aziz
- Suhaila binti Abd Ghaffar
- Mohamad Hasnan Bin Ahmad
- Munawara binti Pardi
- Assoc. Prof. Dr. Hamid Jan Bin Jan Mohamed
- Norlida binti Zulkafly
- Rusidah binti Selamat

Module I: Nutritional Status of Children

- Nur Shahida binti Abdul Aziz
- Ruhaya binti Salleh
- Dr. Romzi binti Mohd Ali
- Ahmad Ali Bin Zainuddin
- Azli Bin Baharuddin
- Syafinaz binti Mohd Sallehuddin
- Mohamad Hasnan Bin Ahmad
- Assoc. Prof. Dr. Hamid Jan Bin Jan Mohamed
- Zaiton binti Daud

- Junaidah binti Raib
- Norlida binti Zulkafly
- Rusidah binti Selamat

Module J: Dietary Practices

- Cheong Siew Man
- Ruhaya binti Salleh
- Dr. Romzi binti Mohd Ali
- Ahmad Ali Bin Zainuddin
- Lalitha Palaniveloo
- Jayvikramjit Singh Manjit Singh
- Nur Shahida binti Abdul Aziz
- Mohamad Hasnan Bin Ahmad
- Assoc. Prof. Dr. Hazizi Bin Abu Saad
- Nazli Suhardi Bin Ibrahim
- Fatimah Zurina binti Mohamad

Module K: Anaemia

- Dr. Nik Adilah binti Shahein
- Dr. Noor Ani binti Ahmad
- Ruhaya binti Salleh
- Rasidah binti Jamaluddin
- Nor'Ain binti Ab Wahab
- Nurul Zaiza binti Zainuddin

Module L: Mental Health Problems of Children

- Dr. Abdul Aziz Bin Harith
- Dr. Noor Ani binti Ahmad
- Dr. Nor Asiah binti Muhamad
- Dr. Rimah Melati binti Ab Ghani
- Dr. Mohd Shaiful Azlan Bin Kassim
- Norhafizah binti Sahril
- Nur Azna binti Mahmud
- Prof. Dr. Sherina binti Mohd Sidik
- Assoc. Prof. Dr. Idayu Badilla binti Idris
- Dr. Nurashikin binti Ibrahim
- Dr. Hjh. Salina binti Abdul Aziz
- Dr. Siti Hazrah binti Selamat Din

Module M: Depression

- Dr. Mohd Shaiful Azlan Bin Kassim
- Dr. Noor Ani binti Ahmad
- Dr. Nor Asiah binti Muhamad
- Dr. Rimah Melati binti Ab Ghani
- Dr. Abdul Aziz Bin Harith
- Nur Azna binti Mahmud
- Faizul Akmal Bin Abd Rahman
- Mohd Amierul Fikri Bin Mahmud
- Mohd. Hazrin Bin Hasim @ Hashim
- Muhammad Faiz Bin Mohd Hisham
- Prof. Dr. Sherina binti Mohd Sidik
- Assoc. Prof. Dr. Idayu Badilla binti Idris
- Dr. Nurashikin binti Ibrahim
- Dr. Hjh. Salina binti Abdul Aziz
- Dr. Siti Hazrah binti Selamat Din

Module N: Child Functioning

- Chan Ying Ying
- Dr. Noor Ani binti Ahmad
- Dr. Rajini Sooryanarayana
- Norazizah binti Ibrahim Wong
- Norhafizah binti Sahril
- Rasidah binti Jamaludin
- Nor'Ain binti Ab Wahab
- Dr. Noor Safiza binti Mohamad Nor
- Dr. Salimah binti Hj. Othman
- Dr. Yusniza binti Mohd Yusof

Module O: Disability

- Dr. Noor Ani binti Ahmad
- Dr. Rajini Sooryanarayana
- Chan Ying Ying
- Norazidah binti Ibrahim Wong
- Norhafizah binti Shahril
- Nur Azna binti Mahmud
- Rasidah binti Jamaludin
- Nor'Ain binti Ab Wahab
- Dr. Noor Safiza binti Mohamad Nor
- Dr. Salimah binti Hj. Othman
- Dr. Yusniza binti Mohd Yusof

Module P: Health Literacy

- Komathi Perialathan
- Dr. Manimaran Krishnan Kaundan
- Teresa Yong Sui Mien
- Norrafizah binti Jaafar
- Masitah binti Ahmad
- Nurashma binti Juatan
- Dr. Emma Mirza Wati binti Mohamad
- Dr. Mohammad Rezal Hamzah
- Dr. Arina Anis binti Azlan
- Suffian Hadi Ayub
- Suraiya binti Syed Mohamed
- Dr. Affendi Bin Isa
- Zanariah binti Zaini
- Ervinna Marie Donny

Module Q: Epilepsy

- Dr. LeeAnn Tan
- Prof. Dato Dr. Raymond Azman Ali
- Prof. Dr. Lim Kheng Seang
- Dr. Fong Si Lei
- Dr. Santhi Datuk Puvanarajah
- Dr. Suganthi Chinnasami
- Dr. Tee Sow Kuan
- Dr. Nabilah Hanis Zainuddin”

Module R: Erectile Dysfunction

- Mohamad Fuad Bin Mohamad Anuar
- Dr. Noor Ani binti Ahmad
- Dr. Mohd Shaiful Azlan Bin Kassim
- Dr. Chong Zhuo Lin
- Azli Bin Baharudin
- Prof. Dr. Shaiful Bahari Ismail
- Dr. Zakiah binti Mohd Said
- Dr. Mohd Ashraf bin Mohd Daud

Module S: Benign Prostatic Hyperplasia

- Mohamad Fuad Bin Mohamad Anuar
- Dr. Noor Ani binti Ahmad
- Dr. Mohd Shaiful Azlan Bin Kassim
- Dr. Chong Zhuo Lin
- Azli Bin Baharudin
- Prof. Dr. Shaiful Bahari Ismail
- Dr. Zakiah binti Mohd Said
- Dr. Mohd Ashraf bin Mohd Daud

Module T: Health Screening

- Dr. Thamil Arasu Saminathan
- Dr. Muhammad Fadhli Bin Mohd Yusoff
- Dr. Rajini Sooryanarayana
- Dr. Shubash Shander Ganapathy
- Hasimah binti Ismail
- Norzawati binti Yoep
- Rafidah binti Ali
- Muhammad Faiz Bin Mohd Hisham
- Wan Shakira binti Rodzlan Hasani
- Dr. Zakiah binti Mohd Said
- Dr. Nor Saleha binti Ibrahim Tamin

Appendix 4

List of Liaison Officers

1. Dr. Linayanti Rosli
Ketua Penolong Pengarah Kanan (Unit NCD)
Bahagian Kesihatan Awam
Jabatan Kesihatan Negeri Johor
2. Dr. Nor Hana binti Ahmad Bahuri
Ketua Penolong Pengarah Kanan (Unit NCD)
Bahagian Kesihatan Awam
Jabatan Kesihatan Negeri Johor
3. Dr. Ahmad Hazri Bin Ilyas
Pegawai Perubatan
Bahagian Kesihatan Awam
Jabatan Kesihatan Negeri Kedah
4. Dr. Noorhashimah binti Abdullah
Ketua Penolong Pengarah (Unit NCD)
Bahagian Kesihatan Awam
Jabatan Kesihatan Negeri Kelantan
5. Dr. Mohd Syis Bin Zulkipli
Pegawai Perubatan
Bahagian Kesihatan Awam
Jabatan Kesihatan Negeri Melaka
6. Datin Seri Dr. Norzakiah binti Mohd Tahir
Ketua Penolong Pengarah Kanan (Unit NCD)
Bahagian Kesihatan Awam
Jabatan Kesihatan Negeri Sembilan
7. Dr. Ami Kalsum binti Subirdan
Ketua Penolong Pengarah (Unit NCD)
Bahagian Kesihatan Awam
Jabatan Kesihatan Negeri Pahang
8. Dr. Farzaana binti Adam
Ketua Penolong Pengarah Kanan (Unit NCD)
Bahagian Kesihatan Awam
Jabatan Kesihatan Negeri Pulau Pinang
9. Dr. Norrina binti Esa
Pegawai Epidemiologi (NCDC)
Bahagian Kesihatan Awam,
Jabatan Kesihatan Negeri Perak
10. Dr. Husna Hakimah binti Tajul Rahim
Ketua Penolong Pengarah (Unit NCD)
Bahagian Kesihatan Awam
Jabatan Kesihatan Negeri Perlis

11. Dr. Bariyah Kadas
Ketua Penolong Pengarah Kanan
Bahagian Kesihatan Awam
Jabatan Kesihatan Negeri Selangor
12. Dr. Wan Nor Hafizah binti Wan Baharuddin
Pegawai Perubatan
Bahagian Kesihatan Awam
Jabatan Kesihatan Negeri Terengganu
13. Dr. Idzhar Azwan Bin Mohd. Idrus
Penolong Pengarah
Bahagian Kesihatan Awam
Jabatan Kesihatan Negeri Sabah
14. Dr. Micheal Pelitini Anak Ugak
Ketua Penolong Pengarah
Seksyen TB/Kusta dan Penyelidikan Kesihatan Awam
Jabatan Kesihatan Negeri Sarawak
15. Mohd Shamsul Zamani Bin Abdul Malek
Penolong Pegawai Perubatan
Bahagian Kesihatan Awam,
Jabatan Kesihatan Wilayah Persekutuan Kuala Lumpur & Putrajaya
16. Dr. Rosnelizaide Bin Ramely
Pegawai Perubatan
Bahagian Kesihatan Awam
Jabatan Kesihatan Wilayah Persekutuan Labuan
17. Dr. Becklyne Mile
Ketua Penolong Pengarah
Bahagian Kesihatan Awam,
Jabatan Kesihatan Negeri Sarawak

Appendix 5

List of Research Assistants in Central Team

1. Nornadiyah binti Zulkifly
2. Nurul Amalina binti Yusof
3. Noraznie binti Nordin
4. Putrizatul Ain binti Mohamad Radzib
5. Noor Nadia Syahira binti Mohd Kamal
6. Fasehah binti Ali
7. Muhamad Mustaqim bin Hussain
8. Amir Jazali bin Zaili
9. Nurul Hafizah Mohd Hazman
10. Mohamad Syafiq bin Mohamad Sallehin
11. Amira Farhana binti Mohamed Iqbal
12. Muhammad Noriduan bin Nor'amilin
13. Nur Izzati binti Norshamsul
14. Izzatitul Afiqah Kamarullail
15. Madhumathi Ananda Dorai
16. Mohamad Azli Che Daud

Appendix 6

State Data Collection Teams

JOHOR

- **Field Supervisors**
Dr. Nur Liana binti Ab Majid
Ahzairin Bin Ahmad
Dr. Nurul Iman binti Jamalul-Lail
- **Nurses**
Norain binti Mohd Idris
Nur Atiqahasrah binti Abdul Rahman
Nursyazwana binti Abu Bakar
Efie Nursyahira binti Su'ut
Nur Fara Nazira binti Ruhaimi
- **Research Assistants**
Amirah binti Ali
Izza Idayu binti Ishak
Nur Khairiyah binti Mohammad
Norhasima binti Shawal
Ros Azura binti Hikmi
Siti Nur Nabila binti Zailan
Nur Shafiq Quratul Aini binti Mustafa
Muhammad Arif Bin Kamson
Lau Cin Pein
Afiqah binti Ali
Ng Chie Ying
Wan Anisa binti Rodzlan Hasani
Muhammad Farouq Bin Abdul Rahman
Nor Fatin Afiqah binti Mohd Noor
Ahmad Faruqi Bin Ahmad Jazuli
Muhamad Farid Bin Saypodin
Mohd Zahiruddin Bin Khairul Arifin
Muhammad Afif Bin Azhari
Muhammad Syafiq Bin Azni
Mohd Akhsah Bin Mansor

MELAKA

- **Field Supervisors**
Suhaila binti Abdul Ghaffar
Faizul Akmal Bin Abd Rahman
Kong Yuke Lin
- **Nurses**
Muhaizon binti Muhamad
Zafirah binti Zainal
Dayang Nor Atikah binti Datu Awang
Zuhaida binti Hussin
- **Research Assistants**
Raja Nor Fatimah binti Raja Omar
Azmarhani binti Abd Rahman
Nurul Wahidah binti Whakiddin
Nor Azila binti Mustopha
Nur Azlin binti Adil
Nurul Syamimi binti Zuber
Normala binti Samsudin
Nurul Nadia binti Abdul Razak
Fatin Syamimi binti Mansor
Mohd. Yusry Bin Mahdi
Muhammad Khairul Faezi Bin Mohd Tamin
Muhammad Haziq Bin Halimi

NEGERI SEMBILAN

- **Field Supervisors**
Cheong Siew Man
Dr. Mohd Shaiful Jefri Bin Mohd Nor Sham
Dr. Nor Azlina binti Hashim
Ahzairin Bin Ahmad
Munawara binti Pardi
- **Nurses**
Nazurah binti Daud
Rohani binti Sipelistah
Nur Aimi binti Jamaluddin
- **Research Assistants**
Norazilah binti Amir Basan
Muhamad Zulhilmi Bin Razali
Anis Nurdiniey binti Ahmad Shapawi
Nazifa Zahidah binti Malik
Muhammad Aiman Bin Rahimin
Ng Sze Lam
Pavithrayani Ramayah
Kalaiwani Gunasekaran
Sim ZhenZhao
Kamarul Ariffin Bin Amat Basari
Muhammad Asyraf Bin Adnan
Muhammad Syahmir Aminuddin Bin Mohd Baharuddin

SELANGOR

- **Field Supervisors**
Nur Shahida binti Abdul Aziz
Dr. Rozmi binti Mohd Ali
Dr. Mohd Shaiful Azlan Bin Kassim
Dr. Rimah Melati binti Ab. Ghani
Pn Normaizira binti Hamidi
Dr. Nurulasmak binti Mohamed
Munawara binti Pardi
- **Nurses**
Farlinda binti Petrus
Norjannah binti Hussain
Norasshikin binti Anoar
Tengku Ahmad Saifuddin bin Tengku Mohd Nadzri
Noraisyah binti Samsikama
Fadzilah binti Mak Mon
Alia Anak Anthony
- **Research Assistants**
Nadirah binti Fuad
Nur Fatihah binti Mohd
Roshafida binti Hussin
Nurul Khairiza binti Kahar
Ade Aliff Bin Jobin @ Juvie
Mohamad Pauzan Bin Razali
Wan Muhammad Asyraf Bin Wan Ramlan
Nabihah binti Mohamad Noh
Chang May Shin
Ong Ceah Ling
Rohana binti Saharudin
Nurul Aini binti Kamaruddin
Nurul Shafika Hanum binti Yusri
Azizah Nurfauziah binti Jafri
Salsadila binti Nordin
Aini binti Ahmad
Khairunnisa' binti Mohd Subri
Esma Amsyar Bin Edy Harejonto
Isa Bin Kamarudin

Nurlis Bin Yunarlis
Mohd Hilman Faiz Bin Muhd Naim
Mohamad Nur Hafiz Bin Khalil
Mohammad Asyraf Bin Rosli
Muhammad Haniful Amin Bin Mohd Rivoan
Ahmad Husaini Bin Abdul Razak
Mohd Taufik Bin Mokhtar
Wan Mohamad Shahariman Bin Ramli
Mohammad Fareez Akmal Bin Abdul Aziz

WP KUALA LUMPUR

- **Field Supervisors**
Dr. Noor Aliza binti Lodz
Masitah binti Hj. Ahmad
- **Nurses**
Siti Fatimah binti Abdul Mumin
Noor Shuhada binti Kamalrudin
Nur Syakira Hazwani binti Mohamad Rudian
Kamaruz Fawwaz bin Kamaruzzaman
- **Research Assistants**
Syahiroh binti Said
Muhammad Ridwan Bin Md Nurhadi
Nurain Nadia binti Azmi
Adeline Lo Li Ching
Nor Syafawati binti Ahmad Sukhari
Wong Sok Peng
Nurul Hidayah binti Zamri
Muhammad Naufal Bin Mohd Najib
Casey Gan Cheo Lih
Syed Muhammad Iqbal Bin Syed Mazlan
Amierul Asyraf Bin Sauti
Hasnul Amri Bin Jamaluddin

WP PUTRAJAYA

- **Field Supervisors**
Syafinaz binti Mohd. Sallehuddin
Dr. Nur Amalina binti Zaimi
Fadly Ehzan Bin Halim
- **Nurses**
Fauziah Suhanawati binti Ismail
Wan Nor Hafizah binti Wan Jaafar
Ruhil Faizah binti Mustafha
Nur Amira binti Mohd Yusuf @ Mokhles
- **Research Assistants**
Nur Amiera binti Azlan
Nurin Iman binti Ahmad Kamal
Siti Noafika binti Anwar
Siti Nuratikah binti Mohd Zain
Azman Nor Azman Bin Ahamad
Muhammad Zulhilmi Bin Muhammad Yusuf
Nabila Najwa binti Mohamad Azami
Akmal Hafiz Bin Abd Rahman
Siti Zulaikha binti Yusof
Muhammad Shafiq Bin Shaffie
Zaihan Bin Misman
Mohamad Azli Bin Che Daud

PERAK

- **Field Supervisors**
Eida Nurhadzira binti Mohamad
Azli Bin Baharudin @ Shahrudin
Noor Hasidah Ab. Rahman
- **Nurses**
Fauziah Suhanawati binti Ismail
Wan Nor Hafizah binti Wan Jaafar
Ruhil Faizah binti Mustafha
Nur Amira binti Mohd Yusuf @ Mokhles
- **Research Assistants**
Muhammad Baihaqi Bin Ahmad Pauzi
Nurul Hidayah binti Mat Yusoff
Rahimah binti Abdul Rahman
Maisarah binti Norhizat
Shalini Ganesan
Karthigan Chitharthan
Ismul Azam Bin Kamaruzaman
Chua Yen Ting
Ng Hao Zheng
Mohd Faizol Bin Mustaffa
Muhammad Fakhrol Hilman Shah Bin Roslan
Muhammad Izzat Bin Mat Yusoff

KEDAH

- **Field Supervisors**
Rasidah binti Jamaluddin
Lalitha Palanivello
Dr. Sarah Nurain binti Mohd Noh
- **Nurses**
Wan Nur Syamimie binti Wan Rosli
Siti Norshilawati binti Abu Bakar
Nur Asma Aida binti Md Radzi
Nora'shikin binti Mat Esa
- **Research Assistants**
Norhasliza binti Mat Noor
Muhammad Luqman Bin Abdullah
Nur Aishah Solihah binti Mohamad Nezan
Fairuz binti Mohd Hashim
Muhammad Noriduan Bin Nor'amilin
Nurul Ashikin binti Nosarodin
Nurul Najua binti Che Omar
Darshini Paramesvaran
Khuzairi Bin Basharuddin
Sadeshwaran Paramesvaran
Sathiswaran Jayaraman
Mohamad Imran Bin Alias

PULAU PINANG

- **Field Supervisors**
Nur Azna binti Mahmud
Dr. Tan Yeung R'ong
Dr. LeeAnn Tan
- **Nurses**
Norasikin binti Nordin
Farah Amnah binti Mohd Rosli
Deepa Chandra Sakeran

- **Research Assistants**
Siti Salbiah binti Mat Desa
Siti Syafiqah binti Ahmad Yusoff
Nor Hazami binti Rozan
Salsabeela binti Mohd Ariff
Ashahqirin binti Aziz
Goh Yu Zhang
Wan Nur Fatin Iezyan binti Wan Ilias
Nadhirah binti Mohd Yunos
Loo Wen Xin
Mohammad Nazrin Bin Nazmuding
Mohd Fitri Bin Mustafa
Ahmad Fadil Bin Ismail

PERLIS

- **Field Supervisors**
Mohd Amierul Fikri Bin Mahmud
Dr. Ainul Nadzihah binti Mohd Hanafiah
Jayvikramjit Singh Manjit Singh
- **Nurses**
Marwidia binti Mustapa
Aime Yustina binti Saad
Yusmaria binti Kamarudin
- **Research Assistants**
Muammar Hasif Bin Shamsuddin
Siti Aisyah binti Ibrahim
Sharifah Solihah binti Syed Hashim
Nurul Farahtul Akmal binti Alias
Ika Shalida binti Tajuddin
Norhayati binti Kamarudin
Nurulfarhana binti Zakaria
Sakinatul Khaulah binti Mohd Naim
Afidah Haziani binti Rodzi
Ahmad Hafizi Bin Ariffin
Muhammad Haniff Bin Samsuddin
Muhammad Faiz Bin Radzi

PAHANG

- **Field Supervisors**
Dr. Thamil Arasu Saminathan
Dr. Fazila Haryati binti Ahmad
Dr. Fiona Chua Chun Yong
- **Nurses**
Zulaida binti Ammary
Esah binti Dolah
Nurul Suzie Yanti binti Mohd Nor
- **Research Assistants**
Shahibul Bariah binti Mat Ghani
Nur Fadzliana binti Mohd Radzi
Muhamad Hazwan Bin Hasman
Nor Khadijah Fatimah binti Abdul Rahman
Siti Normah binti Abdul Manan
Noor Balqis binti Md Desa
Sarah binti Ridzwan
Norashidah binti Rosed
Noor Nazifah binti Mamat
Muhammad Azim Bin Abdul Mutalib
Yusmawi Bin Mamat
Muhammad Bin Abdul Rahman

TERENGGANU

- **Field Supervisors**
Nor` Ain binti Ab Wahab
Mohamad Hasnan Bin Ahmad
Dr. Muhammad Hafiz Bin Mohd Yunos
- **Nurses**
Fatimah binti Tahir
Faizah binti Derani
Tuan Aishah binti Tuan Ahmad Sulong
Mek Yah binti Othman
- **Research Assistants**
Hasmila binti Mat Hassan
Safriyal Bin Ridwan
Nursyafiza binti Zahari
Nurul Aimi binti Shah Bani
Nur Anas Ilyia binti Ishak
Nur Fatin Amira binti Aziz
Muhammad Bin Jamaluddin
Muhammad Syahmi Farhan Bin Ab Majid
Nabihah binti Mustopal Kamar
Muhammad Affiq Ikhwan Bin Abdul Razak
Muhamad Fateh Bin Mustafa
Muhammad Safuan Bin Suhaimi

KELANTAN

- **Field Supervisors**
Dr. Nik Adilah binti Shahein
Mohamad Fuad Bin Mohamad Anuar
Kamarul Zaman bin Salleh
- **Nurses**
Norlizawati binti Syukur
Rosmawati binti Anuar
Nor Fadilah binti Yusoff
- **Research Assistants**
Saiful Amin Bin Ab Rani
Mohamad Afendi Bin Zainurin
Nur Syafawani binti Yusoff
Zulkarnain Bin Zulkipli
Noor Shamsiah binti Enche Hamid
Mohamad Fakhri Bin Ludin
Aziani binti Md Zain
Nik Mohamad Zakwan Bin Nik Mohd Zulkifly
Nur Amalina binti Rashid
Muhammad Faris Bin Hussin
Muhammad Azim Bin Aziz
Mohamad Hafiezi Shairy Bin Awang

SARAWAK

- **Field Supervisors**
Mohd. Hatta Bin Abdul Mutalib
Dr. Mirunaaleni Selvaraju
Nurashma binti Juatan
- **Nurses**
Mahani binti Iring
Diana Sembai Edward
Ani binti Salihie
Jesseca Anak Sawing
Doris Gia Anak Oiu Juan
Ijjut Anak Banta
Nur Aina Faira binti Abdul Ghafar
Sinda Anak Jawa
Norizan binti Adlie
Stacy Lua Sinawat
Nur Aleesha Ngui Abdullah
Jurina binti Japal
Lisa Anak Taeng
Ong Li Ling
Dayang Nirmilia binti Abang Tasbi
Najwa Dayana binti Abdullah
Koo Pei Yu
Emmalynna Matius
Stillea Anak Mambu
Nur Zumantun binti Abdul Rajak
Cecilia Anak Anthony
Lau Lik Loon
Hannie Ting Tiew Sing
Mary Suzie Anak Asit
Jessica Duling Anak Kudang
Hartini binti Ramzi
Catherine Anak Gudop
Lavenda Joecy Aymen Anak Baba
Nur Adila binti Abdullah
Norjuwita binti Jack
Yap Vivina Kenyalang
Limah Anak Migat
Juliana Jenai Anak Ramping
Margerat Anak Minong
- **Research Assistants**
Ling Song Jing
Aelsa Anak Anthony
Nurhaziqah binti Saimin
Tiong Xun Yih
Baron Anak Peter Jerry
Doris Anak Sabat
Ambrose Neli
Zanariah binti Junaidi
Afina Yian Anak Chundi
Melissa binti Ramji
Happilyn Anak Libin
Elizabeth Melintang
Arddy Bin Yius
Mohammed Hefalani Bin Mohd Azman
Luther Vandrass Linchis
Sia Pong Lee

SABAH

- **Field Supervisors**
Mohamad Aznuddin bin Abd Razak
Muhammad Faiz bin Mohd Hisham
Faizah binti Paiwai
- **Nurses**
Lena James Lojuty
Valerie Paul
Rita binti Gamiun
Siti Khadijah binti Manan
Mas Hidayu binti Siantim
- **Research Assistants**
Sunita Samin
Mohd Hafiz Bin Mohd Ali
Mazlan Bin Haji Abdul Halim Chin
Muhammad Nur Bin Mohd Arif
Ahmad Tang Bin Bakri
Ajun Chin
Dg Siti Fazirah binti Madi
Rasyidah Fathin binti Rahban
Noor Azni binti Adzmain
Wan Misly Kindon
Faradillah binti Dahalan
Arnny Yushidayah binti Dahalan
Fyrah James
Siti Ayuni binti Saplie
Mohd Aldy Bin Abdul Razak
Mohd Khairul Bin Samsu Lim
Ianddrian Charles Taimin
Ilham Bin Tamrin
Mohd Jazlan Harith Bin Abdul Razak
Steve Glant Denventure Benjamin

WP LABUAN

- **Field Supervisors**
Hasmah binti Mohamed Haris
Dr. Abdul Aziz Bin Harith
- **Nurses**
Noryati binti Mohammad
Paimi binti Ahkau
Sanha Villiamon
Norasmah binti Pandin
- **Research Assistants**
Nurulaniza binti Abd Ghafar
Heirie Hazuin Bin Salam
Yunus Bin Mohammad
Nurul Farhanah binti Ihwan
Gabriel Jatum
Mawarsari binti Said
Joan Sonny Limbowoi binti Saimin
Nur Azvila binti Kadir
Joanna John
Javiksen James
Jeldy Bin Galoh
Jonathan Bin Sabin

NHMS 2019

Questionnaire

Institut Kesihatan Umum (IKU)
Kementerian Kesihatan Malaysia

TINJAUAN KEBANGSAAN KESIHATAN DAN MORBIDITI 2019
NATIONAL HEALTH AND MORBIDITY SURVEY 2019

BORANG SOAL SELIDIK
QUESTIONNAIRE

INSTITUT KESIHATAN UMUM
INSTITUTE FOR PUBLIC HEALTH

KEMENTERIAN KESIHATAN MALAYSIA
MINISTRY OF HEALTH MALAYSIA

ISI KANDUNGAN / CONTENT		
Bil / No	Kandungan / Contents	Muka Surat / Pages
PENYAKIT TIDAK BERJANGKIT NON-COMMUNICABLE DISEASE		
	Jadual Isirumah Household Roster	7-8
A1	Isirumah Household	9
A2	Sosiodemografi Sociodemography	10-12
CA	Kencing Manis Diabetes	13-14
CB	Tekanan Darah Tinggi Hypertension	15-16
CC	Paras Kolesterol Tinggi Hypercholesterolaemia	17-18
CD	Aktiviti Fizikal Physical Activity	19-22
CE	Merokok Smoking	23-31
CJ	Amalan Pemakanan Dietary Practice	32-36
CT	Saringan Kesihatan Health Screening	37-38
CF	Alkohol Alcohol	39-44
CG	Dadah Drug	45-47
CQ	Literasi Kesihatan Health Literacy	48-50
CR	Hiperplasia Prostat Benigna Benign Prostatic Hyperplasia	51-52
CS	Mati Pucuk Erectile Dysfunction	53-54
CU	Antropometri Anthropometric	55-57
CL	Kesihatan Mental Kanak-Kanak Children's Mental Health	95-98
CM	Kehilangan Upaya Disability	99-101
CN1	Kefungsian Kanak-Kanak (Berumur 2 - 4) Child Functioning (Age 2 - 4)	102-104
CN2	Kefungsian Kanak-Kanak (Berumur 5 - 17) Child Functioning (Age 5 - 17)	105-108
CP	Sawan Epilepsy	109-110
CK	Kesihatan Mental Dewasa Adult Mental Health	111-112

NHMS 2019

Non- Communicable Diseases

NON

A : MAKLUMAT ISIRUMAH / HOUSEHOLD PARTICULARS

[PENEMURAMAH: Maklumat isirumah ini perlu diperolehi dari ketua isirumah atau orang yang paling tahu mengenai isirumah. Tentukan terlebih dahulu orang yang paling tahu mengenai isirumah]

“Saya akan bertanya beberapa soalan mengenai ahli isirumah anda. Ahli isirumah adalah mereka yang tinggal di tempat kediaman ini, berkongsi peralatan dan kemudahan di rumah, makan bersama dan telah tinggal sekurang-kurangnya 2 minggu dari tarikh temuduga.

I would like to ask you a few questions about your household members. Household members are those who live here, share facilities, eat together, and live here at least 2 weeks from the date of interview.”

A001	“Berapakah bilangan ahli isirumah anda? <i>How many persons are there in your household?”</i>	<input type="text"/> Orang
A001 A-D	“Saya perlukan maklumat mengenai nama, jantina, umur dan taraf perkahwinan setiap ahli isirumah ini. <i>I would like to know the name, sex, age and marital status of each household member.”</i>	[PENEMURAMAH : Senaraikan kesemua ahli isirumah ini serta isikan maklumat berkaitan di ruang A-D. Mulakan baris pertama dengan nama orang yang memberi maklumat mengenai isirumah ini]
A001 E	“Siapakah ketua isirumah ini? <i>Who is head of this household?”</i> [PENEMURAMAH : Ketua isirumah adalah orang yang paling berpengaruh dan yang paling banyak buat keputusan untuk isirumah ini]	[PENEMURAMAH : Tandakan “1” pada kolum E bagi ketua isirumah yang telah dikenal pasti].
	“Saya perlukan maklumat mengenai hubungan setiap ahli isirumah dengan ... [bacakan nama ketua isirumah]. <i>I would like to know the relationship of each household member to ...</i> [bacakan nama ketua isirumah].”	[PENEMURAMAH : Rujuk Kod A untuk status hubungan dan tuliskan pada kolum E bagi setiap ahli isirumah]

MODUL A1: ISIRUMAH *HOUSEHOLD*Soalan untuk diisi oleh penemuramah: Pilih **SATU** jawapan sahaja.

A1000	Siapakah yang telah menjawab borang soal selidik ini?	1 Ketua isirumah atau orang yang paling mengetahui perbelanjaan isirumah ... sila ke A1100 2 Ahli isirumah lain ... sila ke A2000
A1100	Jenis rumah <i>House type</i>	1. Rumah sebuah / banglo <i>Single house / bungalow</i> 2. Rumah berkembar <i>Semi-detached house</i> 3. Rumah teres setingkat <i>Single storey terrace house</i> 4. Rumah teres dua tingkat atau lebih <i>Two or more storey terrace house</i> 5. Kondominium / pangsapuri <i>Condominium</i> 6. Rumah pangsa / flat <i>Flats</i> 7. Rumah kampung <i>Village house</i> 8. Rumah kedai <i>Shop house</i> 9. Rumah panjang <i>Long house</i> 10. Rumah bot <i>Boat house</i> 11. Rumah setinggan <i>Squatters</i>

(-7) TT (-9) EJ

MODUL A2: SOSIODEMOGRAFI/ *SOCIODEMOGRAPHY*

Soalan untuk diisi oleh penemuramah: Pilih SATU jawapan sahaja.

A2000	Siapakah yang telah menjawab borang soal selidik ini?	1 Ahli isirumah sendiri 2 Ahli isirumah dibantu oleh penterjemah (boleh jadi sesiapa sahaja) 3 Proksi (bagi pihak ahli isirumah) 4 Proksi dengan bantuan penterjemah																
A2100	Nama ahli isi rumah: <i>Name of household member:</i>																	
A2101	Apakah jantina anda? <i>What is your gender?</i>	1. Lelaki <i>Male</i> 2. Female <i>Female</i>																
		(-7) TT (-9) EJ																
A2102	Apakah hubungan anda dengan... (nama ketua isirumah)? <i>What is your relationship to... (name of head of household)?</i>	1. Ketua isirumah <i>Head of Household</i> 2. Suami atau isteri <i>Spouse</i> 3. Ibubapa <i>Parent</i> 4. Anak <i>Child</i> 5. Datuk/henek atau moyang <i>Grand- or great-grandparent</i> 6. Cucu atau cicit <i>Grand- or great-grandchild</i> 7. Adik-beradik <i>Siblings</i> 8. Mertua <i>Parent-in-law</i> 9. Menantu <i>Son- or Daughter-in-law</i> 10. Ipar-Duai <i>Brother- or Sister-in-law</i> 11. Saudara-mara lain <i>Other relatives</i> 12. Kawan <i>Friend</i> 13. Pekerja (pembantu rumah, tukang kebun, pemandu, lain-lain) <i>Workers (live-in housemaid, gardener, driver, others)</i> 14. Lain-lain, <i>Others</i> , Sila nyatakan: <i>Please specify:</i>																
		(-7) TT (-9) EJ																
A2103	Bila tarikh lahir anda? <i>When is your birth date?</i>	<table style="width: 100%; text-align: center;"> <tr> <td><input type="text"/></td><td><input type="text"/></td> <td><input type="text"/></td><td><input type="text"/></td> <td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td> </tr> <tr> <td>D</td><td>D</td> <td>M</td><td>M</td> <td>Y</td><td>Y</td><td>Y</td><td>Y</td> </tr> </table>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	D	D	M	M	Y	Y	Y	Y
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>											
D	D	M	M	Y	Y	Y	Y											
[PENEMURAMAH: Sekiranya 'TT' tuliskan '01' untuk hari '07' untuk bulan '9999' untuk tahun]																		
A2104	Berapa umur...? <i>How old are...?</i>	<table style="width: 100%; text-align: center;"> <tr> <td><input type="text"/></td><td><input type="text"/></td> <td>Tahun Genap</td> </tr> </table>	<input type="text"/>	<input type="text"/>	Tahun Genap													
<input type="text"/>	<input type="text"/>	Tahun Genap																
		(-7) TT (-9) EJ																
A2105	Apakah nombor kad pengenalan anda? <i>What is your identification number?</i>	No. Kad Pengenalan Baru/MyKid <i>New Identification Card/MyKid</i> No. Passport <i>Passport No.</i> No. Kad Pengenalan lain (Tentera/Polis/Sijil lahir/Lain-lain) <i>Other identification card no. (Army/Police/Birth cert/Others)</i>																
		(-7) TT (-9) EJ																
[PERINGATAN: Pastikan nombor pengenalan BETUL]																		

A2106	Apakah bangsa anda? <i>What is your ethnicity?</i>	<ol style="list-style-type: none"> 1. Melayu <i>Malay</i> 2. Cina <i>Chinese</i> 3. India <i>Indian</i> 4. Orang Asli Semenanjung <i>Aborigines</i> 5. Bumiputera Sabah, <i>Bumiputera of Sabah</i>, Sila nyatakan: <i>Please specify:</i> 6. Bumiputera Sarawak, <i>Bumiputera of Sarawak</i>, Sila nyatakan: <i>Please specify:</i> 7. Lain-lain, <i>Others</i>, Sila nyatakan: <i>Please specify:</i> 	(-7) TT (-9) EJ
A2107	Apakah taraf kewarganegaraan anda? <i>What is your citizenship status?</i>	<ol style="list-style-type: none"> 1. Warganegara Malaysia <i>Malaysian Citizen</i> 2. Permastautin tetap <i>Permanent Resident of Malaysia</i> 3. Bukan warganegara Malaysia <i>Non-Malaysian Citizen</i> 	(-7) TT (-9) EJ
A2108	Apakah taraf perkahwinan anda? <i>What is your marital status?</i>	<ol style="list-style-type: none"> 1. Tidak pernah berkahwin <i>Never married</i> 2. Berkahwin <i>Married</i> 3. Berpisah <i>Separated</i> 4. Janda / Duda <i>Divorcee</i> 5. Balu <i>Widow/Widower</i> 6. Tinggal bersama pasangan <i>Living with partner</i> 	(-7) TT (-9) EJ
A2109	Apakah tahap pendidikan tertinggi anda? <i>What is your highest education level?</i>	<ol style="list-style-type: none"> 1. Tidak pernah bersekolah <i>Never attended school</i> 2. Tidak habis sekolah rendah <i>Did not complete primary school</i> 3. Tamat darjah 6 <i>Completed standard 6</i> 4. Tamat tingkatan 3 <i>Completed form 3</i> 5. Tamat tingkatan 5 <i>Completed form 5</i> 6. Tamat tingkatan 6 / sijil / diploma <i>Completed form 6 / certificate / diploma</i> 7. Tamat pengajian peringkat sarjana muda <i>Completed Bachelors degree</i> 8. Tamat pengajian peringkat sarjana <i>Completed Masters degree</i> 9. Tamat pengajian peringkat kedoktoran (PhD) <i>Completed Doctoral qualification (PhD)</i> 10. Lain-Lain, <i>Others</i>, Sila nyatakan: <i>Please specify:</i> 	(-7) TT (-9) EJ
A2210	Adakah anda bekerja? <i>Are you working?</i>	<ol style="list-style-type: none"> 1. Ya <i>Yes ... sila ke A2221</i> 2. Tidak <i>No ... sila ke A2211</i> 	(-7) TT (-9) EJ ... sila ke A2211 jika TT / EJ
A2211	Adakah anda bekerja dalam tempoh 1 bulan yang lepas, daripada... 2019, hingga hari ini? <i>Were you working in the last 1 month, from.... 2019, till today?</i>	<ol style="list-style-type: none"> 1. Ya, dengan bayaran <i>Yes, with payment ... sila ke A2221</i> 2. Ya, tanpa bayaran <i>Yes, without payment ... sila ke A2221</i> 3. Tidak <i>No ... sila ke A2212</i> 	(-7) TT (-9) EJ ... sila ke A2212 jika TT/ EJ
[PERINGATAN: Tanyakan samada menerima bayaran]			

<p>A2212</p>	<p>Jika tidak, kenapa? <i>If not, why?</i></p> <p>Pilih satu jawapan UTAMA sahaja. <i>Choose only one MAIN answer.</i></p>	<ol style="list-style-type: none"> 1. Masalah kesihatan/kurang upaya <i>Health problems / disabled</i> 2. Menjaga pesakit/orang kurang upaya/orang tua <i>Care for the sick / disabled / elderly</i> 3. Menjaga rumah/anak-anak, cucu, ahli keluarga lain <i>Homemaker/care for children, grandchildren, other family members</i> 4. Mempunyai pekerjaan tapi tidak bekerja <i>Have a job, but not working</i> 5. Menganggur <i>Unemployed</i> 6. Pelajar <i>Student</i> 7. Pesara <i>Pensioner</i> 8. Tua <i>Old age</i> 9. Kanak-kanak tidak bersekolah <i>Child not at school</i> 10. Lain-lain <i>Others</i> <p style="text-align: right;">(-7) TT (-9) EJ</p> <p style="text-align: center;">Terus ke A2230 selepas soalan ini</p>
<p>A2221</p>	<p>Adakah anda... <i>Are you a....</i></p> <p>Pilih satu jawapan UTAMA sahaja. <i>Choose only one MAIN answer.</i></p>	<ol style="list-style-type: none"> 1. Majikan <i>Employer</i> 2. Pekerja kerajaan <i>Government employee</i> 3. Pekerja separa kerajaan <i>Semi-government employee</i> 4. Pekerja swasta <i>Private employee</i> 5. Bekerja sendiri <i>Self-employed</i> 6. Pekerja tanpa gaji <i>Unpaid worker</i> 7. Pekerja keluarga tanpa gaji <i>Unpaid family worker</i> 8. Lain-lain, <i>Others,</i> Sila nyatakan: <i>Please specify:</i> <p style="text-align: right;">(-7) TT (-9) EJ</p>
<p>A2230</p>	<p>Berapakah purata pendapatan kasar bulanan anda, dari segi... <i>What is your average personal gross monthly income, in terms of...</i></p>	
<p>A2231</p>	<p>Pendapatan daripada bekerja (upah/gaji) atau pencen <i>Income from work (wage/salary) or pension</i></p>	<p>RM <input style="width: 100px; height: 20px; border: 1px solid black;" type="text"/> . <input style="width: 30px; height: 20px; border: 1px solid black;" type="text"/></p> <p style="text-align: right;">Sebulan <i>Monthly</i></p> <p>Sekiranya TIADA pendapatan tuliskan '0'</p> <p style="text-align: right;">(-7) TT (-9) EJ</p>
<p>A2232</p>	<p>Wang yang diterima daripada ahli isirumah <i>Money received from household members</i></p>	<p>RM <input style="width: 100px; height: 20px; border: 1px solid black;" type="text"/> . <input style="width: 30px; height: 20px; border: 1px solid black;" type="text"/></p> <p style="text-align: right;">Sebulan <i>Monthly</i></p> <p>Sekiranya TIADA pendapatan tuliskan '0'</p> <p style="text-align: right;">(-7) TT (-9) EJ</p>
<p>A2233</p>	<p>Wang daripada sumber lain, contohnya daripada kutipan sewa aset, wang daripada ahli keluarga bukan isirumah, biasiswa, kebajikan masyarakat/sosial, Baitulmal, dividen dan lain-lain <i>Money from other sources, such as from asset rental collection, non-household family members, scholarship, community/social welfare, Baitulmal, dividend and others</i></p>	<p>RM <input style="width: 100px; height: 20px; border: 1px solid black;" type="text"/> . <input style="width: 30px; height: 20px; border: 1px solid black;" type="text"/></p> <p style="text-align: right;">Sebulan <i>Monthly</i></p> <p>Sekiranya TIADA pendapatan tuliskan '0'</p> <p style="text-align: right;">(-7) TT (-9) EJ</p>

MODUL CA: KENCING MANIS / DIABETES**KRITERIA KELAYAKAN: AHLI ISIRUMAH BERUMUR 18 TAHUN DAN KE ATAS****ELIGIBILITY CRITERIA: MEMBER OF THE HOUSEHOLD AGED 18 YEARS AND ABOVE**Bulatkan jawapan yang bersesuaian / *Please circle the appropriate answer.*

Sekarang saya ingin bertanya mengenai kesihatan anda, terutamanya berkenaan kencing manis.

Now I would like to ask you about your health, particularly in regards to diabetes.

CA01	Dalam tempoh 12 bulan yang lepas, pernahkah anda menjalani pemeriksaan paras gula dalam darah? <i>Have you ever had your blood sugar measured in the past 12 months?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CA02	Pernahkah anda diberitahu oleh doktor ataupun Penolong Pegawai Perubatan (PPP) bahawa anda menghidap penyakit kencing manis atau diabetes? <i>Have you ever been told by a doctor or Assistant Medical Officer that you have diabetes?</i>	1. Ya / <i>Yes</i> ... sila ke CA03 2. Tidak / <i>No</i> ... sila ke CB01 (-7) TT (-9) EJ ... sila ke CB01 jika TT / EJ
CA03	Jika Ya, bilakah anda diberitahu oleh doktor / PPP bahawa anda menghidap penyakit kencing manis atau diabetes? <i>If Yes, when were you told by a doctor or Assistant Medical Officer that you have diabetes?</i>	1. <1 tahun / <i>year</i> ... sila ke CA04 2. ≥1 tahun / <i>year</i> ... sila ke CA03a (-7) TT (-9) EJ ... sila ke CA04 jika TT / EJ
CA03a	Sila nyatakan / <i>Please state</i>	<input type="text"/> Tahun / <i>Years</i> (-7) TT (-9) EJ
CA04	Apakah jenis rawatan atau nasihat yang anda terima daripada doktor (atau anggota kesihatan lain) untuk mengawal penyakit kencing manis? <i>What kind of treatments or advice for control of diabetes did you receive from your doctor or other health workers?</i>	
CA04a	Insulin <i>Insulin</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CA04b	Ubat-ubatan dalam masa 2 minggu lepas. <i>Drug (medication) in the past 2 weeks.</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CA04c	Nasihat diet khusus untuk penyakit kencing manis. <i>Advice on diabetic diet.</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CA04d	Nasihat untuk kurangkan berat badan. <i>Advice to lose weight.</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CA04e	Nasihat untuk mula bersenam atau lebihkan senaman. <i>Advice to start or do more exercise.</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CA05	Adakah anda mengambil apa-apa rawatan herbal / tradisional untuk penyakit kencing manis atau diabetes anda? <i>Are you currently taking any herbal / traditional remedy for your diabetes?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ

CA06	Dimanakah anda selalunya mendapat rawatan untuk penyakit kencing manis? <i>Where do you usually seek treatment for diabetes?</i>	1. Klinik kerajaan / <i>Government clinic</i> 2. Klinik swasta / <i>Private clinic</i> 3. Hospital kerajaan / <i>Government hospital</i> 4. Hospital swasta / <i>Private hospital</i> 5. Farmasi (rawatan sendiri) / <i>Pharmacy (self-medicating)</i> 6. Pengamal rawatan tradisional, herba atau komplementari / <i>Traditional, herbal and complementary medicine</i> 7. Saya tidak mendapatkan sebarang rawatan/ <i>I did not seek any treatment</i> (-7) TT (-9) EJ				
CA07	Adakah mata anda diperiksa oleh doktor dengan menggunakan salah satu alat yang ditunjukkan di gambarajah ini? Sila lihat kad CA1. <i>Have your eyes been checked by a doctor using one of the equipment as shown in the pictures? Please see card CA1.</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ				
CA08	Bilakah kali terakhir pemeriksaan itu dijalankan? <i>When was the last examination done?</i>	<table border="1" style="width: 100%;"> <tr> <td style="width: 60%;"></td> <td style="width: 40%; text-align: center;">Tahun / <i>Years</i></td> </tr> <tr> <td colspan="2" style="text-align: right;">(-7) TT (-9) EJ</td> </tr> </table>		Tahun / <i>Years</i>	(-7) TT (-9) EJ	
	Tahun / <i>Years</i>					
(-7) TT (-9) EJ						
CA09	Pernahkah anda menerima rawatan berikut dalam masa 5 tahun lepas? <i>Have you received the following treatment in the last 5 years?</i> Rawatan Laser <i>Laser Treatment</i> Suntikan mata <i>Eye injection</i> Pembedahan dalam mata/vitreous (bukan Katarak) <i>Eye/vitreous surgery (not Cataract)</i>	Ya / <i>Yes</i> Tidak / <i>No</i> (-7) TT (-9) EJ Ya / <i>Yes</i> Tidak / <i>No</i> (-7) TT (-9) EJ Ya / <i>Yes</i> Tidak / <i>No</i> (-7) TT (-9) EJ				

MODUL CB: TEKANAN DARAH TINGGI / HYPERTENSION**KRITERIA KELAYAKAN: AHLI ISIRUMAH BERUMUR 18 TAHUN DAN KE ATAS****ELIGIBILITY CRITERIA: MEMBER OF THE HOUSEHOLD AGED 18 YEARS AND ABOVE**Bulatkan jawapan yang bersesuaian / *Please circle the appropriate answer.*

Sekarang saya ingin bertanya mengenai kesihatan anda, terutamanya berkenaan tekanan darah tinggi.

Now I would like to ask you about your health, particularly in regards to high blood pressure.

CB01	Dalam tempoh 12 bulan yang lepas, pernahkah anda menjalani pemeriksaan tekanan darah? <i>Have you ever had your blood pressured measured in the past 12 months?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CB02	Pernahkah anda diberitahu oleh doktor ataupun Penolong Pegawai Perubatan (PPP) bahawa tekanan darah anda adalah tinggi atau menghidap tekanan darah tinggi? <i>Have you ever been told by a doctor or Assistant Medical Officer that you have raised blood pressure or hypertension?</i>	1. Ya / <i>Yes</i> ... sila ke CB03 2. Tidak / <i>No</i> ... sila ke CC01 (-7) TT (-9) EJ ... sila ke CC01 jika TT / EJ
CB03	Jika Ya, bilakah anda diberitahu oleh doktor / PPP bahawa tekanan darah anda adalah tinggi atau menghidap tekanan darah tinggi? <i>If Yes, when were you told by a doctor or Assistant Medical Officer that you have raised blood pressure or hypertension?</i>	1. <1 tahun / <i>year</i> ... sila ke CB04 2. ≥1 tahun / <i>year</i> ... sila ke CB03a (-7) TT (-9) EJ ... sila ke CB04 jika TT / EJ
CB03a	Sila nyatakan / <i>Please state</i>	<input type="text"/> Tahun / <i>Years</i> (-7) TT (-9) EJ
CB04	Apakah jenis rawatan atau nasihat yang anda terima daripada doktor (atau anggota kesihatan lain) untuk mengawal tekanan darah tinggi? <i>What kind of treatments or advice for control of high blood pressure or hypertension did you receive from your doctor or other health workers?</i>	
CB04a	Ubat-ubatan sejak 2 minggu lepas <i>Drugs (medication) in the past 2 weeks</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CB04b	Nasihat untuk kurangkan garam dalam makanan. <i>Advice to reduce salt intake.</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CB04c	Nasihat untuk kurangkan berat badan. <i>Advice to lose weight.</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CB04d	Nasihat untuk mula bersenam atau lebihkan senaman. <i>Advice to start or do more exercise.</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CB05	Adakah anda mengambil apa-apa rawatan herbal / tradisional untuk penyakit darah tinggi anda? <i>Are you currently taking any herbal / traditional remedy for your high blood pressure or hypertension?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ

CB06	Dimanakah anda selalunya mendapat rawatan untuk penyakit darah tinggi? <i>Where do you usually seek treatment for high blood pressure or hypertension?</i>	<ol style="list-style-type: none">1. Klinik kerajaan / <i>Government clinic</i>2. Klinik swasta / <i>Private clinic</i>3. Hospital kerajaan / <i>Government hospital</i>4. Hospital swasta / <i>Private hospital</i>5. Farmasi (rawatan sendiri) / <i>Pharmacy (self-medicating)</i>6. Pengamal rawatan tradisional, herba atau komplementari / <i>Traditional, herbal and complementary medicine</i>7. Saya tidak mendapatkan sebarang rawatan / <i>I did not seek any treatment</i> <p style="text-align: right;">(-7) TT (-9) EJ</p>
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MODUL CC: PARAS KOLESTEROL TINGGI / *HYPERCHOLESTEROLAEMIA***KRITERIA KELAYAKAN: AHLI ISIRUMAH BERUMUR 18 TAHUN DAN KE ATAS****ELIGIBILITY CRITERIA: MEMBER OF THE HOUSEHOLD AGED 18 YEARS AND ABOVE**Bulatkan jawapan yang bersesuaian / *Please circle the appropriate answer.*Sekarang saya ingin bertanya mengenai kesihatan anda, terutamanya berkenaan paras kolesterol yang tinggi. *Now I would like to ask you about your health, particularly in regards to high cholesterol.*

CC01	Dalam tempoh 12 bulan yang lepas, pernahkah anda menjalani pemeriksaan kolesterol dalam darah? <i>Have you ever had your blood cholesterol measured in the past 12 months?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CC02	Pernahkah anda diberitahu oleh doktor ataupun Penolong Pegawai Perubatan (PPP) bahawa paras kolesterol darah anda adalah tinggi? <i>Have you ever been told by a doctor or Assistant Medical Officer that you have high cholesterol?</i>	1. Ya / <i>Yes</i> ... sila ke CC03 2. Tidak / <i>No</i> ... sila ke CD01 (-7) TT (-9) EJ ... sila ke CC01 jika TT / EJ
CC03	Jika Ya, bilakah anda diberitahu oleh doktor / PPP bahawa paras kolesterol darah anda adalah tinggi? <i>If Yes, when were you told by a doctor or Assistant Medical Officer that you have high cholesterol?</i>	1. <1 tahun / <i>year</i> ... sila ke CC04 2. ≥1 tahun / <i>year</i> ... sila ke CC03a (-7) TT (-9) EJ ... sila ke CC04 jika TT / EJ
CC03a	Sila nyatakan / <i>Please state</i>	<input type="text"/> Tahun / <i>Years</i> (-7) TT (-9) EJ
CC04	Apakah jenis rawatan atau nasihat yang anda terima daripada doktor (atau anggota kesihatan lain) untuk mengawal paras kolesterol tinggi? <i>What kind of treatments or advice for control of high cholesterol did you receive from your doctor or other health workers?</i>	
CC04a	Ubat-ubatan sejak 2 minggu lepas <i>Drugs (medication) in the past 2 weeks</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CC04b	Nasihat diet khusus seperti rendah lemak atau rendah kolesterol. <i>Advice on special low fat or low cholesterol diet.</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CC04c	Nasihat untuk kurangkan berat badan. <i>Advice to lose weight.</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CC04d	Nasihat untuk mula bersenam atau lebihkan senaman. <i>Advice to start or do more exercise.</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CC05	Adakah anda mengambil apa-apa rawatan herbal / tradisional untuk paras kolesterol tinggi anda? <i>Are you currently taking any herbal / traditional remedy for your high cholesterol?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ

CC06	<p>Dimanakah anda selalunya mendapat rawatan untuk paras kolesterol tinggi anda? <i>Where do you usually seek treatment your high cholesterol?</i></p>	<ol style="list-style-type: none">1. Klinik kerajaan / <i>Government clinic</i>2. Klinik swasta / <i>Private clinic</i>3. Hospital kerajaan / <i>Government hospital</i>4. Hospital swasta / <i>Private hospital</i>5. Farmasi (rawatan sendiri) / <i>Pharmacy (self-medicating) medicating</i>6. Pengamal rawatan tradisional, herba atau komplementari / <i>Traditional, herbal and complementary medicine</i>7. Saya tidak mendapatkan sebarang rawatan/ <i>I did not seek any treatment</i> <p style="text-align: right;">(-7) TT (-9) EJ</p>
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MODUL CD: AKTIVITI FIZIKAL / PHYSICAL ACTIVITY**KRITERIA KELAYAKAN: AHLI ISIRUMAH BERUMUR 18 TAHUN DAN KE ATAS****ELIGIBILITY CRITERIA: MEMBER OF THE HOUSEHOLD AGED 18 YEARS AND ABOVE**Bulatkan jawapan yang bersesuaian / *Please circle the appropriate answer.***FIKIRKAN TENTANG AKTIVITI FIZIKAL LASAK YANG ANDA LAKUKAN.****PLEASE NOTE THE VIGOROUS PHYSICAL ACTIVITY THAT YOU DO.**

CC01	Dalam tempoh 7 hari yang lepas, berapakah hari yang anda telah melakukan aktiviti fizikal lasak (contohnya: mengangkat barang berat, mencangkul, senaman aerobik atau berbasikal laju dan lain-lain) sekurang-kurangnya 10 minit pada suatu masa? <i>In the past 7 days, how many days have you done vigorous physical activity (e.g.: carry heavy weights, till the earth, aerobic exercises or fast cycling and others) for at least 10 minutes per session?</i>	<input type="text"/>	Hari seminggu / Days a week	<input type="text"/>	(-7) TT	(-9) EJ
CD01a	Pada hari anda yang melakukan aktiviti fizikal lasak, berapa lamakah anda melakukannya? <i>On the day you carry out the vigorous physical activity, how long do you do this activity?</i>	<input type="text"/>	Minit / Minutes	<input type="text"/>	(-7) TT	(-9) EJ

FIKIRKAN TENTANG AKTIVITI FIZIKAL SEDERHANA YANG ANDA LAKUKAN.**PLEASE NOTE THE MODERATE PHYSICAL ACTIVITY THAT YOU DO.**

CD02	Dalam tempoh 7 hari yang lepas, berapakah hari yang anda telah melakukan aktiviti fizikal sederhana (contohnya: mengangkat muatan ringan, mengelap lantai, berbasikal pada kelajuan biasa dan lain-lain) sekurang-kurangnya 10 minit pada suatu masa tidak termasuk berjalan kaki? <i>In the past 7 days, how many days have you done moderate physical activity (e.g.: carry light weights, mop the floor, or normal rate of cycling and others) for at least 10 minutes per session? This does not include walking.</i>	<input type="text"/>	Hari seminggu / Days a week	<input type="text"/>	(-7) TT	(-9) EJ
CD02a	Pada hari anda yang melakukan aktiviti fizikal sederhana, berapa lamakah anda melakukannya? <i>On the day you carry out the moderate physical activity, how long do you do this activity?</i>	<input type="text"/>	Minit / Minutes	<input type="text"/>	(-7) TT	(-9) EJ

FIKIRKAN TENTANG AKTIVITI BERJALAN KAKI YANG ANDA LAKUKAN.**PLEASE NOTE THE AMOUNT OF WALKING THAT YOU DO.**

CD03	Dalam tempoh 7 hari yang lepas, berapa hariakah yang anda telah berjalan kaki selama sekurang-kurangnya 10 minit pada suatu masa? <i>In the past 7 days, how many days have you walked () for at least 10 minutes per session?</i>	<input type="text"/>	Hari seminggu / Days a week	<input type="text"/>	(-7) TT	(-9) EJ
CD03a	Pada salah satu daripada hari berkenaan, berapakah masa yang anda gunakan untuk berjalan kaki? <i>On one of these days that you walked, how long do you spend walking?</i>	<input type="text"/>	Minit / Minutes	<input type="text"/>	(-7) TT	(-9) EJ

FIKIRKAN TENTANG AKTIVITI BARING DAN DUDUK YANG ANDA LAKUKAN.**PLEASE NOTE THE SEDENTARY ACTIVITY THAT YOU DO.**

CD04	Biasanya dalam sehari, berapa jamkah yang anda gunakan untuk duduk atau berbaring termasuk di tempat kerja, di rumah, di waktu lapang dan semasa perjalanan, TETAPI TIDAK TERMASUK waktu tidur? <i>Normally in a day, how many hours do you spend on sitting or lying down including the workplace, in the house, in your free time and while travelling, BUT NOT INCLUDING the time spent sleeping?</i>	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 150px;">Jam / Hours</td> </tr> </table> (-7) TT (-9) EJ	Jam / Hours
Jam / Hours			

SOALAN BERIKUT ADALAH BERKAITAN PENDEDAHAN ANDA KEPADA MEDIA DAN IKLAN DALAM TEMPOH 30 HARI YANG LALU.

THE FOLLOWING QUESTIONS ARE RELATED TO YOUR EXPOSURE TO MEDIA AND ADVERTISEMENT IN THE PAST 30 DAYS.

ARAHAN: BACA PENGENALAN DI ATAS KEPADA RESPONDEN DAN PERGI KE SOALAN SETERUSNYA.

INSTRUCTION: PLEASE READ THE INTRODUCTION ABOVE TO RESPONDENT AND GO TO THE NEXT QUESTION.

CD05	Pada 30 hari yang lalu, adakah anda perasan tentang maklumat mengenai aktiviti fizikal/ senaman di tempat-tempat berikut? <i>In the past 30 days, are you aware of any information regarding physical activity/ exercise from this following places?</i> Tandakan (✓) di ruangan yang disediakan. Jawapan boleh lebih dari satu (1) <i>Tick (✓) in the space provided. Multiple answers are accepted.</i>					
	Tempat <i>Places</i>	Ya <i>Yes</i>	No <i>Tidak</i>	Tidak berkaitan <i>Not Applicable</i>	Tidak tahu <i>Do Not Know</i>	Enggan jawab <i>Refuse to answer</i>
	a. Surat khabar atau majalah? <i>Newspaper or magazine?</i>					
	b. Televisyen? <i>Television?</i>					
	c. Radio? <i>Radio?</i>					
	d. Papan iklan? <i>Billboard?</i>					
	e. Poster? <i>Poster?</i>					
	f. Pawagam? <i>Cinema?</i>					
	g. Tingkap kedai/gerai atau dalam kedai/gerai? <i>At stall or shop?</i>					
	h. Internet? <i>Internet?</i>					
	i. Lain-lain tempat? <i>Other places?</i> Sila nyatakan <i>Please state</i>					

SOALAN-SOALAN BERIKUT ADALAH BERKENAAN BAGAIMANA ANDA BERGERAK DARI SATU TEMPAT KE SATU TEMPAT, TERMASUK KE TEMPAT KERJA, KEDAI, WAYANG, DAN SEBAGAINYA.

THESE QUESTIONS ARE ABOUT HOW YOU TRAVELLED FROM PLACE TO PLACE, INCLUDING TO PLACES LIKE WORK, STORES, MOVIES, AND SO ON.

CD06	<p>Dalam tempoh 7 hari yang lepas, berapa harikah anda bergerak menggunakan kenderaan bermotor seperti kereta api, bas, kereta atau kenderaan bermotor yang lain?</p> <p><i>During the last 7 days, on how many days did you travel in a motor vehicle like train, bus, car, or other kind of motor vehicle?</i></p>	<input type="text"/> <p>Hari seminggu / <i>Days a week</i></p>	<input type="text"/> <p>Tidak bergerak menggunakan kenderaan bermotor / <i>No Travelling in a motor vehicle</i> [Terus ke CD07 / <i>Go to CD07</i>]</p>
		(-7) TT (-9) EJ	
CD06a	<p>Berapa banyak masa yang biasa anda gunakan pada salah satu hari berkenaan untuk bergerak menggunakan kereta api, bas, kereta, trem ataupun kenderaan bermotor yang lain?</p> <p><i>How much time did you usually spend on one of those days travelling in a train, bus, car, tram, or other kind of motor vehicle?</i></p>	<input type="text"/> <p>Jam sehari / <i>Hours per day</i></p>	<input type="text"/> <p>Minit sehari / <i>Minutes per day</i></p>
		(-7) TT (-9) EJ	

SEKARANG FIKIRKAN TENTANG AKTIVITI BERBASIKAL DAN BERJALAN KAKI YANG MUNGKIN PERNAH ANDA LAKUKAN UNTUK PERJALANAN PERGI DAN BALIK DARI KERJA, MELAKUKAN KERJA HARIAN ATAU PERGI DARI SATU TEMPAT KE SATU TEMPAT.

NOW THINK ONLY ABOUT THE BICYCLING AND WALKING YOU MIGHT HAVE DONE TO TRAVEL TO AND FROM WORK, TO DO ERRANDS, OR TO GO FROM PLACE TO PLACE.

CD07	<p>Dalam tempoh 7 hari yang lepas, berapa harikah anda telah berbasikal selama sekurang-kurangnya 10 minit pada satu masa untuk pergi dari satu tempat ke satu tempat?</p> <p><i>During the last 7 days, on how many days did you bicycle for at least 10 minutes at a time to go from place to place?</i></p>	<input type="text"/> <p>Hari seminggu / <i>Days a week</i></p>	<input type="text"/> <p>Tidak berbasikal dari satu tempat ke satu tempat / <i>No cycling from place to place</i> [Terus ke CD08 / <i>Go to CD08</i>]</p>
		(-7) TT (-9) EJ	
CD07a	<p>Berapa banyak masa yang biasa anda gunakan pada salah satu hari berkenaan untuk berbasikal dari satu tempat ke satu tempat?</p> <p><i>How much time did you usually spend on one of those days to bicycle from place to place?</i></p>	<input type="text"/> <p>Jam sehari / <i>Hours per day</i></p>	<input type="text"/> <p>Minit sehari / <i>Minutes per day</i></p>
		(-7) TT (-9) EJ	

CD08	Dalam tempoh 7 hari yang lepas, berapa harikah anda telah berjalan kaki selama sekurang-kurangnya 10 minit pada satu masa untuk pergi dari satu tempat ke satu tempat? <i>During the last 7 days, on how many days did you walk for at least 10 minutes at a time to go from place to place?</i>	Hari seminggu / <i>Days a week</i>	
		Tidak berjalan kaki dari satu tempat ke satu tempat / <i>No walking from place to place</i> [Terus ke CE01 / <i>Go to CE01</i>]	(-7) TT (-9) EJ
CD08a	Berapa banyak masa yang biasa anda gunakan pada salah satu hari berkenaan untuk berjalan kaki dari satu tempat ke satu tempat? <i>How much time did you usually spend on one of those days walking from place to place?</i>	Jam sehari / <i>Hours per day</i>	
		Minit sehari / <i>Minutes per day</i>	(-7) TT (-9) EJ

MODUL CE: MEROKOK / SMOKING**KRITERIA KELAYAKAN: AHLI ISIRUMAH BERUMUR BERUMUR 15 TAHUN DAN KE ATAS****ELIGIBILITY REPENDENT: MEMBER OF THE HOUSEHOLD AGED 15 YEARS AND ABOVE**Bulatkan jawapan yang bersesuaian / *Please circle the appropriate answer.*

CE01	<p>Status Merokok Terkini Current Tobacco Smoking Status</p> <p>Pada ketika ini adakah anda menghisap tembakau setiap hari, kurang daripada setiap sehari, atau tidak sama sekali? <i>Do you currently smoke tobacco on a daily basis, less than daily, or not at all?</i></p>	<p>1. Setiap hari / <i>Daily</i>... sila ke CE03 2. Kurang dari setiap hari / <i>Less than daily</i>... sila ke CE02a 3. Tidak sama sekali / <i>Not at all</i> ... sila ke CE02b</p> <p>(-7) TT (-9) EJ ... sila ke CE04 jika TT / EJ</p>
CE02a	<p>Status Merokok Setiap Hari Terdahulu Past Daily Smoking Status</p> <p>Pernahkah anda menghisap tembakau setiap hari pada masa lalu? <i>Have you smoked tobacco daily in the past?</i></p>	<p>1. Ya / <i>Yes</i> ... sila ke CE03 2. Tidak / <i>No</i> ... sila ke CE03</p> <p>(-7) TT (-9) EJ ... sila ke CE03 jika TT / EJ</p>
CE02b	<p>Status Merokok Terdahulu Past Smoking Status</p> <p>Pada masa lalu, pernahkah anda menghisap tembakau setiap hari, kurang daripada setiap sehari, atau tidak sama sekali? <i>In the past, have you smoked tobacco on a daily basis, less than daily, or not at all?</i></p> <p>JIKA RESPONDEN TELAH MENJAWAB KEDUA-DUANYA "SETIAP HARI" DAN "KURANG DARIPADA SETIAP SEHARI" PADA MASA LALU, TANDAKAN "SETIAP HARI"] <i>IF RESPONDENTS HAS DONE BOTH "DAILY" AND "LESS THAN DAILY" IN THE PAST, CHECK "DAILY"</i></p>	<p>1. Setiap hari / <i>Daily</i> ... sila ke CE04 2. Kurang dari setiap hari / <i>Less than daily</i> ... sila ke CE04 3. Tidak sama sekali / <i>Not at all</i> ... sila ke CE04</p> <p>(-7) TT (-9) EJ ... sila ke CE04 jika TT / EJ</p>
CE03	<p>Bilangan Produk Tembakau Yang Dihisap Number of Tobacco Products Smoked</p> <p>Secara purata, berapa banyak di antara produk-produk berikut yang anda biasa menghisap setiap hari? Nyatakan juga jika anda ada menghisap produk tersebut walaupun tidak setiap hari. <i>On average, how many of the following products do you currently smoke each day? Also, let me know if you smoke the product, but not every (day).</i></p>	
[PERINGATAN: Dapatkan Rokok Yang Dihisap Dalam Bilangan Batang Rokok Tidak Sepatutnya Dalam Bentuk Paket]		

Jika Tidak tahu tuliskan TT, Jika Enggan Jawab tuliskan EJ pada ruangan.					
Jika “TIDAK SAMA SEKALI” pilih ‘NA’					
	Per Hari <i>Per Day</i>	Per Minggu <i>Per Week</i>	TT	NA	EJ
a. Pada ketika ini, secara purata, berapa batang rokok (yang dikilang) anda hisap? <i>On average, how many manufactured cigarettes do you currently smoke?</i>					
b. Pada ketika ini, secara purata, berapa batang rokok digulung sendiri anda hisap? <i>On average, how many hand-rolled cigarettes do you currently smoke?</i>					
c. Pada ketika ini, secara purata, berapa batang kretek anda hisap? <i>On average, how many kreteks do you currently smoke?</i>					
d. Pada ketika ini, secara purata, berapa paip mampat dengan tembakau anda hisap? <i>On average, how many pipes full of tobacco do you currently smoke?</i>					
e. Pada ketika ini, secara purata, berapa batang curut atau curut kecil (cigarillos) anda hisap? <i>On average, how many cigars, cheroots, or cigarillos do you currently smoke?</i>					
f. Pada ketika ini, secara purata, berapa batang bidis anda hisap? <i>On average, how many bidis do you currently smoke in?</i>					
g. Pada ketika ini, secara purata, berapa kali anda hisap shisha? <i>On average, how many times do you currently smoke shisha in?</i>					
h1. Pada ketika ini, nyatakan lain-lain jenis tembakau yang anda hisap: _____ <i>Please specify the other type of tobacco you currently smoke:</i> _____					
h2. Pada ketika ini, secara purata berapa banyak _____ anda hisap? <i>On average, how many _____ do you currently smoke in?</i>					
CE04	Status Penggunaan Produk Tembakau Tanpa Asap Terkini <i>Current Smokeless Tobacco Use</i> Pada ketika ini adakah anda menggunakan tembakau tanpa asap setiap hari, kurang daripada setiap sehari, atau tidak sama sekali? <i>Do you currently use smokeless tobacco on a daily basis, less than daily, or not at all?</i>		1. Setiap hari / <i>Daily</i> ... sila ke CE06 2. Kurang dari setiap hari / <i>Less than daily</i> ... sila ke CE05a 3. Tidak sama sekali / <i>Not at all</i> ... sila ke CE05b (-7) TT (-9) EJ ... sila ke CE06 jika TT / EJ		

CE05a	<p>Status Penggunaan Setiap Hari Produk Tembakau Tanpa Asap Terdahulu Past Daily Smokeless Tobacco Use</p> <p>Pernahkah anda menggunakan tembakau tanpa asap setiap hari pada masa lalu? <i>Have you used smokeless tobacco daily in the past?</i></p>	<p>1. Ya / <i>Yes</i> 2. Tidak / <i>No</i></p> <p>(-7) TT (-9) EJ</p> <p>Terus ke CE06 selepas soalan ini</p>
CE05b	<p>Status Penggunaan Produk Tembakau Tanpa Asap Terdahulu Past Smokeless Tobacco Use</p> <p>Pada masa lalu, pernahkah anda menggunakan tembakau tanpa asap setiap hari, kurang daripada setiap sehari, atau tidak sama sekali? <i>In the past, have you used smokeless tobacco on a daily basis, less than daily, or not at all?</i></p> <p>[JIKA RESPONDEN TELAH MENJAWAB KEDUA-DUANYA “SETIAP HARI” DAN “KURANG DARIPADA SETIAP SEHARI” PADA MASA LALU, TANDAKAN “SETIAP HARI”]</p>	<p>1. Setiap hari / <i>Daily</i> 2. Kurang dari setiap hari / <i>Less than daily</i> 3. Tidak sama sekali / <i>Not at all</i></p> <p>(-7) TT (-9) EJ</p>
CE06	<p>Status Penggunaan Rokok Elektronik/ Vape Terkini Current E-cigarette/ Vape Use</p> <p>Pada ketika ini adakah anda mengguna rokok elektronik/vape setiap hari, kurang daripada setiap hari, atau tidak sama sekali? <i>Do you currently use E-cigarette/vape on a daily basis, less than daily, or not at all?</i></p>	<p>1. Setiap hari / <i>Daily</i> ... sila ke CE08 2. Kurang dari setiap hari / <i>Less than daily</i> ... sila ke CE07a 3. Tidak sama sekali / <i>Not at all</i> ... sila ke CE07b</p> <p>(-7) TT (-9) EJ</p> <p>... sila ke CE08 jika TT / EJ</p>
CE07a	<p>Status Penggunaan Setiap Hari Rokok Elektronik/vape Terdahulu / Past Daily E-cigarette/vape Use</p> <p>Pernahkah anda menggunakan rokok elektronik/vape setiap hari pada masa lalu? <i>Have you used E-cigarette/vape daily in the past?</i></p>	<p>1. Ya / <i>Yes</i> 2. Tidak / <i>No</i></p> <p>(-7) TT (-9) EJ</p> <p>Terus ke CE08 selepas soalan ini</p>
CE07b	<p>Status Penggunaan Rokok Elektronik/vape Terdahulu Past E-cigarette/vape Use</p> <p>Pada masa lalu, pernahkah anda menggunakan rokok elektronik/vape setiap hari, kurang daripada setiap sehari, atau tidak sama sekali? <i>In the past, have you used E-cigarette/vape on a daily basis, less than daily, or not at all?</i></p> <p>[JIKA RESPONDEN TELAH MENJAWAB KEDUA-DUANYA “SETIAP HARI” DAN “KURANG DARIPADA SETIAP SEHARI” PADA MASA LALU, TANDAKAN “SETIAP HARI”]</p>	<p>1. Setiap hari / <i>Daily</i> 2. Kurang dari setiap hari / <i>Less than daily</i> 3. Tidak sama sekali / <i>Not at all</i></p> <p>(-7) TT (-9) EJ</p>
CE08	<p>Kekerapan Merokok di Rumah Frequency of Smoking in the House</p> <p>Berapa kerapkah “seseorang” merokok di dalam rumah anda? Adakah setiap hari, setiap minggu, setiap bulan, kurang daripada setiap bulan, tidak pernah? <i>How often does anyone smoke inside your home? Would you say daily, weekly, monthly, less than monthly, or never?</i></p>	<p>1. Setiap hari / <i>Daily</i> 2. Setiap minggu / <i>Weekly</i> 3. Setiap bulan / <i>Monthly</i> 4. Kurang dari setiap bulan / <i>Less than monthly</i> 5. Tidak pernah / <i>Never</i></p> <p>(-7) TT (-9) EJ</p>

CE09	<p>Lokasi Bekerja Current Working Location Adakah anda bekerja di luar rumah anda? <i>Do you currently work outside of your home?</i></p>	<p>1. Ya / <i>Yes</i> ... sila ke CE10 2. Tidak / Tidak bekerja / <i>No / Don't Work</i> ... sila ke CE12 (-7) TT (-9) EJ ... sila ke CE12 jika TT / EJ</p>
CE10	<p>Kerja di Luar atau Dalam Pejabat Currently Working Indoors or Outdoors Adakah anda selalu bekerja di dalam atau diluar bangunan? <i>Do you usually work indoors or outdoors?</i></p>	<p>1. Di Dalam / <i>Indoors</i> ... sila ke CE11 2. Di Luar / <i>Outdoors</i> ... sila ke CE12 3. Kedua-dua / <i>Both</i> ... sila ke CE11 (-7) TT (-9) EJ ... sila ke CE12 jika TT / EJ</p>
CE11	<p>Merokok di Tempat Kerja Smoking at the Workplace Dalam 30 hari lepas, adakah sesiapa yang merokok di dalam bangunan anda bekerja? <i>During the past 30 days, did anyone smoke in indoor areas where you work?</i></p>	<p>1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ</p>
CE12	<p>Melawat Tempat Makan Yang Mempunyai Penghawa Dingin Visit Any Eateries with Air Conditioning Adakah anda melawat mana-mana restoran yang mempunyai penghawa dingin dalam tempoh 30 hari yang lalu? <i>During the past 30 days, did you visit any restaurant (with air conditioning)?</i></p>	<p>1. Ya / <i>Yes</i> ... sila ke CE13 2. Tidak / <i>No</i> ... sila ke CE14 (-7) TT (-9) EJ ... sila ke CE14 jika TT / EJ</p>
CE13	<p>Merokok di Tempat Makan Yang Mempunyai Penghawa Dingin Smoke in Eateries With Air Conditioning Adakah sesiapa merokok di dalam mana-mana restoran yang mempunyai penghawa dingin yang telah anda lawati dalam tempoh 30 hari yang lalu? <i>Did anyone smoke inside of any restaurant (with air conditioning) that you visited in the past 30 days?</i></p>	<p>1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ</p>
CE14	<p>Melawat Tempat Makan Yang Tiada Penghawa Dingin Visit to Eateries Without Air Conditioning Sepanjang 30 hari yang lepas, adakah anda melawat mana-mana gerai makan, restoran atau kedai kopi yang tidak mempunyai penghawa dingin? <i>During the past 30 days, did you visit any food stall, restaurant or coffee shop (without air conditioning)?</i></p>	<p>1. Ya / <i>Yes</i> ... sila ke CE15 2. Tidak / <i>No</i> ... sila ke CE16 (-7) TT (-9) EJ ... sila ke CE16 jika TT / EJ</p>
CE15	<p>Merokok di Tempat Makan Yang Tiada Penghawa Dingin Smoke in Eateries Without Air Conditioning Adakah sesiapa merokok di dalam mana-mana gerai makan, restoran atau kedai kopi yang tidak mempunyai penghawa dingin yang telah anda lawati dalam tempoh 30 hari yang lalu? (Termasuk dalam lingkungan 3 meter dari gerai makan, restoran atau kedai kopi) <i>Did anyone smoke inside of any food stall, restaurant or coffee shop (without air conditioning) that you visited in the past 30 days? (Including a distance of 3 meters from food stall, restaurant or coffee shop)</i></p>	<p>1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ</p>

Soalan CE16 hingga CE20 hanya perlu dijawab oleh responden yang menjawab pilihan merokok setiap hari (pilihan 1) atau kurang dari setiap hari (pilihan 2) pada soalan CE01 ; iaitu (CE01 = 1 atau 2)

CE16	<p>Percubaan Berhenti Merokok <i>Attempting to Quit Smoking</i></p> <p>Dalam 12 bulan yang lepas, pernahkah anda cuba berhenti merokok? <i>During the past 12 months, have you tried to stop smoking?</i></p>	<p>1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> 3. Tidak Berkenaan / <i>Not Applicable</i> (-7) TT (-9) EJ</p>
CE17	<p>Bertemu Doktor <i>Visiting a Doctor</i></p> <p>Pernahkah anda berjumpa doktor atau petugas kesihatan yang lain dalam tempoh 12 bulan yang lalu? <i>Have you visited a doctor or other health care provider in the past 12 months?</i></p>	<p>1. Ya / <i>Yes</i> – ke soalan CE18 2. Tidak / <i>No</i> – ke soalan CE19 (-7) TT (-9) EJ ... sila ke CE19 jika TT / EJ</p>
CE18	<p>Menerima Nasihat Berhenti Merokok dari Doktor <i>Receiving Cessation Advice from Doctor</i></p> <p>Pada setiap kali anda berjumpa doctor atau petugas kesihatan dalam tempoh 12 bulan yang lalu, adakah anda menerima nasihat berhenti merokok? <i>During any visit to a doctor or health care provider in the past 12 months, were you advised to quit smoking tobacco?</i></p>	<p>1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ</p>
CE19	<p>Tanda Amaran pada Kotak Rokok <i>Noticing Health Warnings on Cigarette Packs</i></p> <p>Pada 30 hari yang lalu, adakah anda perasan sebarang maklumat tentang amaran kesihatan pada kotak rokok? <i>In the last 30 days, did you notice any health warnings on cigarette packages?</i></p>	<p>1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> ... sila ke CE21 3. Tidak Melihat Sebarang Kotak Rokok / <i>Did See Any Cigarette Packages</i> ... sila ke CE21 (-7) TT (-9) EJ ... sila ke CE21 jika TT / EJ</p>
CE20	<p>Memikirkan Untuk Berhenti Kerana Tanda Amaran pada Kotak Rokok <i>Thinking About Quitting Because of Health Warnings on Cigarette Packs</i></p> <p>Pada 30 hari yang lalu, adakah amaran pada kotak rokok mendorong anda untuk berfikir untuk berhenti menghisap hasil tembakau? <i>In the last 30 days, have warning labels on cigarette packages led you to think about quitting?</i></p>	<p>1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ</p>
CE21	<p>Informasi Berhenti Merokok di Suratkhbar / Majalah <i>Noticing Anti-Cigarette Information in Newspaper/Magazines</i></p> <p>Pada 30 hari yang lalu, adakah anda perasan tentang “maklumat-maklumat” mengenai bahaya merokok atau galakan untuk berhenti merokok di surat khabar atau majalah? <i>In the last 30 days, have you noticed information about the dangers of smoking cigarettes or that encourages quitting in newspapers or in magazines?</i></p>	<p>1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> 3. Tidak Berkenaan / <i>Not Applicable</i> (-7) TT (-9) EJ</p>
CE22	<p>Informasi Berhenti Merokok di Televisyen <i>Noticing Anti-Cigarette Information on Television</i></p> <p>Pada 30 hari yang lalu, adakah anda perasan tentang “maklumat-maklumat” mengenai bahaya merokok atau galakan untuk berhenti merokok di televisyen? <i>In the last 30 days, have you noticed information about the dangers of smoking cigarettes or that encourages quitting on television?</i></p>	<p>1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> 3. Tidak Berkenaan / <i>Not Applicable</i> (-7) TT (-9) EJ</p>

CE23	<p>Iklan Merokok di Pasaaraya Cigarette Advertising in Stores Pada 30 hari yang lalu, adakah anda perasan sebarang “iklan atau tanda promosi” di kedai rokok dijual? <i>In the last 30 days, have you noticed any advertisements or signs promoting cigarettes in stores where cigarettes are sold?</i></p>	<p>1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> 3. Tidak Berkenaan / <i>Not Applicable</i> (-7) TT (-9) EJ</p>												
CE24	<p>Promosi Merokok / Cigarette Promotions Dalam masa 30 hari yang lepas, pernahkah anda terlihat promosi rokok seperti yang dinyatakan? <i>In the last 30 days, have you noticed any of the following types of cigarette promotions?</i></p> <p>Baca Setiap Item / <i>Read Each Item</i></p> <table border="1"> <tr> <td> Sampel rokok percuma? <i>Free samples of cigarettes?</i> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ </td> <td> Jualan murah/ potongan harga? <i>Cigarettes at sale prices?</i> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ </td> </tr> <tr> <td> Kupon rokok? <i>Coupons for cigarettes?</i> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ </td> <td> Hadiah atau potongan harga barangan lain apabila membeli rokok? <i>Free gifts or special discount offers on other products when buying cigarettes?</i> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ </td> </tr> <tr> <td> Pakaian atau barangan lain yang mempunyai logo atau jenama rokok? <i>Clothing or other items with a cigarette brand name or logo?</i> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ </td> <td> Promosi rokok melalui surat? <i>Cigarette promotions in the mail?</i> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ </td> </tr> </table>		Sampel rokok percuma? <i>Free samples of cigarettes?</i> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ	Jualan murah/ potongan harga? <i>Cigarettes at sale prices?</i> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ	Kupon rokok? <i>Coupons for cigarettes?</i> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ	Hadiah atau potongan harga barangan lain apabila membeli rokok? <i>Free gifts or special discount offers on other products when buying cigarettes?</i> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ	Pakaian atau barangan lain yang mempunyai logo atau jenama rokok? <i>Clothing or other items with a cigarette brand name or logo?</i> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ	Promosi rokok melalui surat? <i>Cigarette promotions in the mail?</i> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ						
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CE25	<p>Soalan CE25 hanya perlu dijawab oleh responden yang menjawab pilihan merokok setiap hari (pilihan 1) atau kurang dari setiap hari (pilihan 2) pada soalan CE01 ; iaitu (CE01 = 1 atau 2) DAN menjawab CE03 <i>Question CE25 is to be answered by respondents who answered daily (choice No.1) or less than daily (choice No.2) for Question CE01 ; i.e.(CE01 = 1 or 2) AND answered CE03</i></p> <p>Rokok terakhir yang dibeli – kuantiti / <i>Last cigarette purchase – quantity</i> Pada kali terakhir anda membeli rokok untuk diri sendiri, berapa banyakkah yang anda beli? <i>The last time you bought cigarettes for yourself, how many cigarettes did you buy?</i></p> <table border="1"> <tr> <td colspan="3">1. Karton / <i>Carton</i></td> </tr> <tr> <td>a. Berapa Bilangan karton yang dibeli? <i>How many cartons were bought?</i></td> <td></td> <td></td> </tr> <tr> <td>b. Berapa Bilangan bungkus dalam setiap karton? <i>How many packets were in each carton?</i></td> <td></td> <td></td> </tr> <tr> <td>c. Berapa Bilangan rokok dalam setiap bungkus? <i>How many cigarettes were in each packet?</i></td> <td></td> <td></td> </tr> </table>		1. Karton / <i>Carton</i>			a. Berapa Bilangan karton yang dibeli? <i>How many cartons were bought?</i>			b. Berapa Bilangan bungkus dalam setiap karton? <i>How many packets were in each carton?</i>			c. Berapa Bilangan rokok dalam setiap bungkus? <i>How many cigarettes were in each packet?</i>		
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	<p>2. Bungkus / <i>Packets</i> (<i>Sekiranya kurang daripada satu karton / If less than one carton</i>)</p> <p>a. Berapa Bilangan bungkus yang dibeli? <i>How many packets were bought?</i></p> <p>b. Berapa Bilangan rokok dalam setiap bungkus? <i>How many cigarettes were in each packet?</i></p>		
	<p>3. Batang Rokok / <i>Cigarettes</i> (<i>Sekiranya kurang daripada satu bungkus / If less than one packet</i>)</p>		
	<p>4. Lain-lain / <i>Other</i></p> <p>a. Nyatakan: _____ <i>Specify: _____</i></p> <p>b. Berapa bilangan [nyatakan] yang dibeli? <i>How many [FILL] were bought?</i></p> <p>c. Berapa batang rokok dalam setiap [nyatakan]? <i>How many cigarettes were in each [FILL]?</i></p>		
	<p>5. Tidak pernah MEMBELI ROKOK – Tamat, ke Modul seterusnya <i>Never BOUGHT CIGARETTES – End, go to the next Modul</i></p>		
CE26	<p>Soalan CE26 hanya perlu dijawab oleh responden yang menjawab pilihan merokok setiap hari (pilihan 1) atau kurang dari setiap hari (pilihan 2) pada soalan CE01 ; iaitu (CE01 = 1 atau 2) DAN menjawab CE03</p> <p><i>Question CE25 is to be answered by respondents who answered daily (choice No.1) or less than daily (choice No.2) for Question CE01 ; i.e.(CE01 = 1 or 2) AND answered CE03</i></p> <p>Jumlah perbelanjaan / <i>Total expenses</i></p> <p>Berapakah jumlah wang yang anda telah belanja pada kali terakhir anda membeli rokok sebelum ini. <i>In Total, how much money did you pay for this purchase.</i></p>	<p>Nyatakan: RM _____ <i>Specify: RM _____</i></p> <p>(-7) TT (-9) EJ</p>	
CE27a	<p>Soalan CE27a hanya perlu dijawab oleh responden yang menjawab pilihan merokok setiap hari (pilihan 1) atau kurang dari setiap hari (pilihan 2) pada soalan CE01 ; iaitu (CE01 = 1 atau 2) DAN menjawab CE03</p> <p><i>Question CE25 is to be answered by respondents who answered daily (choice No.1) or less than daily (choice No.2) for Question CE01 ; i.e.(CE01 = 1 or 2) AND answered CE03</i></p> <p>Berapakah harga sebungkus rokok yang terakhir anda beli? <i>How much is the price of 1 pack of cigarette in your last purchase?</i></p>	<p>a. Nyatakan: RM _____ <i>Specify: RM _____</i> ... sila ke CE27b</p> <p>b. Tidak pernah beli sebungkus rokok – tamat, ke Modul seterusnya <i>Never bought a pack of cigarettes – End, go to the next Module</i></p> <p>(-7) TT (-9) EJ</p> <p>Tamat, Ke Modul Seterusnya / End, Go to Next Modul</p>	

CE27b	<p>Tempat Membeli Rokok Cigarette Purchase Place Di manakah ada beli rokok tersebut? (Pilih satu jawapan sahaja) <i>Where did you buy the pack of cigarette? (Select one answer only)</i></p>	<ol style="list-style-type: none"> 1. Di kedai runcit biasa dan setempat / <i>At grocery store and local store</i> 2. Di kedai dan kiosk 24 jam / <i>At shop and 24-hour kiosk</i> 3. Stesen minyak / <i>Petrol station</i> 4. Gerai surat khabar/ <i>Newsstand</i> 5. Pasaraya / <i>Supermarket</i> 6. Gerai di tepi jalan/ <i>Roadside stall</i> 7. Daripada penjual dari trak atau kereta / <i>Seller from trak or car</i> 8. Kedai tentera / <i>Military store</i> 9. Kedai bebas cukai / <i>Duty free shop</i> 10. Di luar negara / <i>At overseas</i> 11. Beli melalui internet / <i>Buy via the internet</i> 12. Pasar malam / <i>Night market</i> 13. Mesin vending / <i>Vending machine</i> 14. Lain-lain, sila nyatakan _____ <i>Others, please specify _____</i> 15. Tidak ingat / <i>Do not remember</i> 16. Enggan jawab / <i>Refuse to answer</i> 						
CE28	<p>Adakah responden mempunyai kotak rokok sekarang? <i>Does respondent has cigarette pack now?</i></p>	<ol style="list-style-type: none"> 1. Ya/ <i>Yes</i> 2. Tidak/ <i>No</i> - ke Soalan CE31 						
CE29	<p>Soalan CE29 hanya perlu dijawab oleh responden yang menjawab pilihan merokok setiap hari (pilihan 1) atau kurang dari setiap hari (pilihan 2) pada soalan CE01 ; iaitu (CE01 = 1 atau 2) DAN menjawab CE03 <i>Question CE25 is to be answered by respondents who answered daily (choice No.1) or less than daily (choice No.2) for Question CE01 ; i.e.(CE01 = 1 or 2) AND answered CE03</i></p> <p>Adakah kotak rokok ditunjuk oleh responden? <i>Is the cigarette pack showed by the respondent?</i></p>	<ol style="list-style-type: none"> 1. Ya / <i>Yes</i> - Jawab Soalan CE30 dan ke modul yang seterusnya 2. Tidak / <i>No</i> - Jawab Soalan CE31 						
CE30	<p>Penemuramah perlu memeriksa kotak rokok yang ditunjuk oleh responden dan jawab semua soalan di bawah <i>Interviewer is required to check the cigarette pack shown by respondent and answer all the following questions</i></p> <table border="1"> <tr> <td>CE30a</td> <td> Cop rasmi cukai <i>Tax official stamp</i> </td> <td> <ol style="list-style-type: none"> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> </td> </tr> <tr> <td>CE30b</td> <td> Amaran kesihatan bergambar <i>Health warning images</i> </td> <td> <ol style="list-style-type: none"> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> </td> </tr> </table>	CE30a	Cop rasmi cukai <i>Tax official stamp</i>	<ol style="list-style-type: none"> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> 	CE30b	Amaran kesihatan bergambar <i>Health warning images</i>	<ol style="list-style-type: none"> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> 	<p style="text-align: right;">(-7) TT</p> <p style="text-align: right;">(-7) TT</p>
CE30a	Cop rasmi cukai <i>Tax official stamp</i>	<ol style="list-style-type: none"> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> 						
CE30b	Amaran kesihatan bergambar <i>Health warning images</i>	<ol style="list-style-type: none"> 1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> 						

	CE30c	Maklumat mengenai 4000 bahan kimia <i>Information about 4000 chemicals</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i>		(-7) TT
	CE30d	Maklumat tidak boleh jual kepada individu dibawah umur <i>Information regarding prohibition of sale to minor</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i>		(-7) TT
	CE30e	Nama dan alamat pengilang/pembekal <i>Name of manufacturer/supplier</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i>		(-7) TT
CE31	Untuk kotak rokok terakhir anda telah beli, adakah kotak mempamerkan maklumat berikut? Sila jawab semua soalan di bawah <i>For the pack of cigarette in your last purchase, does the cigarette pack contain the following information? Please answer all the questions below.</i>				
	CE31a	Cop rasmi cukai <i>Tax official stamp</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i>		(-7) TT (-9) EJ
	CE31b	Amaran kesihatan bergambar <i>Health warning images</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i>		(-7) TT (-9) EJ
	CE31c	Maklumat mengenai 4000 bahan kimia <i>Information about 4000 chemicals</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i>		(-7) TT (-9) EJ
	CE31d	Maklumat tidak boleh jual kepada individu dibawah umur <i>Information regarding prohibition of sale to minor</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i>		(-7) TT (-9) EJ
	CE31e	Nama dan alamat pengilang/pembekal <i>Name of manufacturer/supplier</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i>		(-7) TT (-9) EJ
Tamat, Ke Modul Seterusnya / End, Go to Next Modul					

MODUL CJ: AMALAN PEMAKANAN / DIETARY PRACTICE

KRITERIA KELAYAKAN: AHLI ISIRUMAH BERUMUR BERUMUR 18 TAHUN DAN KE ATAS

ELIGIBILITY CRITERIA: MEMBER OF THE HOUSEHOLD AGED 18 YEARS AND ABOVE

Bulatkan jawapan yang bersesuaian / *Please circle the appropriate answer.*

Saya ingin bertanya beberapa soalan tentang amalan pemakanan anda dalam **seminggu yang lepas**.

*I would like to ask you a few questions about your dietary practices for **the past one (1) week**.*

CJ01a	<p>Kebiasaannya, dalam seminggu berapa hari anda minum minuman kopi/teh yang ditambah gula atau / dan susu pekat manis atau / dan krimer manis?</p> <p><i>In a typical week, how many days did you drink coffee / tea with added sugar or / and sweetened condensed milk or/and sweetened creamer?</i></p>	<p>1. 0 hari / 0 day (<i>skip CJ01b & CJ01c</i>) 2. 1 hari / 1 day 3. 2 hari / 2 days 4. 3 hari / 3 days 5. 4 hari / 4 days 6. 5 hari / 5 days 7. 6 hari / 6 days 8. 7 hari / 7 days</p> <p style="text-align: right;">(-7) TT (-9) EJ</p>
CJ01b	<p>Biasanya pada hari yang anda minum minuman kopi / teh yang ditambah gula atau / dan susu pekat manis atau / dan krimer manis, berapa cawan anda minum?</p> <p><i>Usually on the day that you drank coffee/tea with added sugar or/and sweetened condensed milk or/and sweetened creamer, how many cups did you take in a day?</i></p>	<p>_____ bil. cawan (200ml) / <i>no. of cup (200ml)</i></p> <p style="text-align: right;">(-7) TT (-9) EJ</p> <p>*sila rujuk kad CJ1 untuk anggaran cawan / <i>please refer to the card CJ1 for cup estimation</i></p>
CJ01c	<p>Biasanya berapa sudu teh gula atau / dan susu pekat manis atau / dan krimer manis atau / dan madu anda tambah ke dalam satu cawan kopi/teh?</p> <p><i>Usually how many teaspoons of sugar or/and sweetened condensed milk or/ and sweetened creamer or/did you add in one cup of coffee/tea?</i></p>	<p>_____ bil. sudu teh gula / <i>no. of teaspoon of sugar</i> atau / dan or / and</p> <p>_____ bil. sudu teh susu pekat manis / krimer manis / <i>sweetened condensed milk/sweetened creamer</i> atau / dan or / and</p> <p>_____ bil. sudu teh madu/ <i>no. of teaspoon of honey</i></p> <p style="text-align: right;">(-7) TT (-9) EJ</p> <p>*sila rujuk kad CJ2, CJ3 & CJ4 untuk anggaran cawan / <i>please refer to the card CJ2, CJ3 & CJ4 for cup estimation</i></p>

CJ02a	<p>Kebiasaannya, dalam seminggu berapa hari anda minum minuman bercoklat/bermalta yang ditambah gula atau/dan susu pekat manis atau/dan krimer manis?</p> <p><i>In a typical week, how many days did you drink chocolate or/and malted beverages with added sugar or/and sweetened condensed milk or/and sweetened creamer?</i></p>	<ol style="list-style-type: none"> 1. 0 hari / 0 day (CJ02b & CJ02c) 2. 1 hari / 1 day 3. 2 hari / 2 days 4. 3 hari / 3 days 5. 4 hari / 4 days 6. 5 hari / 5 days 7. 6 hari / 6 days 8. 7 hari / 7 days <p style="text-align: right;">(-7) TT (-9) EJ</p>
CJ02b	<p>Biasanya pada hari yang anda minum minuman bercoklat/bermalta yang ditambah gula atau/dan susu pekat manis atau/dan krimer manis, berapa cawan anda minum?</p> <p><i>Usually on the day that you drank chocolate/malted beverages with added sugar or/and sweetened condensed milk or/and sweetened creamer, how many cups did you take in a day?</i></p>	<p>_____ bil. cawan (200ml) / no. of cup (200ml)</p> <p style="text-align: right;">(-7) TT (-9) EJ</p> <p>* sila rujuk kad CJ5 untuk anggaran cawan / <i>please refer to the card CJ5 for cup estimation</i></p>
CJ02c	<p>Biasanya berapa sudu teh gula atau/dan susu pekat manis atau/dan krimer manis atau/dan madu anda tambah ke dalam satu cawan minum tersebut?</p> <p><i>Usually how many teaspoons of sugar or/and sweetened condensed milk or/and sweetened creamer or/and honey did you add in one cup of chocolate/malted beverages?</i></p>	<p>_____ bil. sudu teh gula / no. of teaspoon of sugar atau /dan or /and</p> <p>_____ bil. sudu teh susu pekat manis / krimer manis / sweetened condensed milk/sweetened creamer atau /dan or /and</p> <p>_____ bil. sudu teh madu/ no. of teaspoon of honey</p> <p style="text-align: right;">(-7) TT (-9) EJ</p> <p>*sila rujuk kad CJ2, CJ3 & CJ4 untuk anggaran cawan / <i>please refer to the card CJ2, CJ3 & CJ4 for cup estimation</i></p>
CJ03a	<p>Kebiasaannya, dalam seminggu berapa hari anda minum minuman pra campuran (2-in-1, 3-in-1 dan 4-in-1)?</p> <p><i>In a typical week, how many days did you drink pre-mixed drinks (2-in-1, 3-in-1 and 4-in-1)?</i></p>	<ol style="list-style-type: none"> 1. 0 hari / 0 day (skip CJ03b) 2. 1 hari / 1 day 3. 2 hari / 2 days 4. 3 hari / 3 days 5. 4 hari / 4 days 6. 5 hari / 5 days 7. 6 hari / 6 days 8. 7 hari / 7 days <p style="text-align: right;">(-7) TT (-9) EJ</p>
CJ03b	<p>Biasanya pada hari yang anda minum minuman pra campuran (2-in-1, 3-in-1 dan 4-in-1), berapa pekete anda minum?</p> <p><i>Usually on the day that you drank pre-mixed drinks (2-in-1, 3-in-1 and 4-in-1), how many sachets did you take?</i></p>	<p>_____ bil. pekete /no. of sachet</p> <p style="text-align: right;">(-7) TT (-9) EJ</p> <p>* sila rujuk kad CJ6 untuk anggaran cawan / <i>please refer to the card CJ6 for cup estimation</i></p>

CJ04a	<p>Kebiasaannya, dalam seminggu berapa hari anda minum minuman berkarbonat (dalam kotak, tin, atau botol)?</p> <p><i>In a typical week, how many days did you drink carbonated drinks (in pack, can or bottle)?</i></p>	<ol style="list-style-type: none"> 1. 0 hari / 0 day (skip CJ04b) 2. 1 hari / 1 day 3. 2 hari / 2 days 4. 3 hari / 3 days 5. 4 hari / 4 days 6. 5 hari / 5 days 7. 6 hari / 6 days 8. 7 hari / 7 days <p style="text-align: right;">(-7) TT (-9) EJ</p>
CJ04b	<p>Biasanya pada hari yang anda minum minuman berkarbonat, berapa gelas anda minum?</p> <p><i>Usually on the day that you drank carbonated drinks, how many glasses did you take?</i></p>	<p>_____ bil. gelas (250ml) / <i>no. of glass (250ml)</i></p> <p style="text-align: right;">(-7) TT (-9) EJ</p> <p>* sila rujuk kad CJ7 untuk anggaran gelas / <i>please refer to the card CJ7 for glass estimation</i></p>
CJ05a	<p>Kebiasaannya, dalam seminggu berapa hari anda minum minuman manis BUKAN berkarbonat (dalam kotak, tin, atau botol)?</p> <p><i>In a typical week, how many days did you drink non-carbonated drinks (in pack, can or bottle)?</i></p>	<ol style="list-style-type: none"> 1. 0 hari / 0 day (skip CJ03b) 2. 1 hari / 1 day 3. 2 hari / 2 days 4. 3 hari / 3 days 5. 4 hari / 4 days 6. 5 hari / 5 days 7. 6 hari / 6 days 8. 7 hari / 7 days <p style="text-align: right;">(-7) TT (-9) EJ</p>
CJ05b	<p>Biasanya pada hari yang anda minum minuman manis BUKAN berkarbonat (dalam kotak, tin, atau botol), berapa gelas anda minum?</p> <p><i>Usually on the day that you drank non-carbonated drinks, how many glasses did you take?</i></p>	<p>_____ bil. gelas (250ml) / <i>no. of glass (250ml)</i></p> <p style="text-align: right;">(-7) TT (-9) EJ</p> <p>* sila rujuk kad CJ8 untuk anggaran gelas / <i>please refer to the card CJ8 for glass estimation</i></p>
CJ06	<p>Adakah anda pernah mendengar/mengetahui tentang Pinggan Sihat Malaysia/ Suku Suku Separuh?</p> <p><i>Have you ever heard about the 'Malaysian Healthy Plate' / 'Quarter Quarter Half'?</i></p>	<ol style="list-style-type: none"> 1. Ya / Yes 2. Tidak / No (skip CJ07 & CJ08) <p style="text-align: right;">(-7) TT (-9) EJ</p>

CJ07	<p>Sila tunjuk gambar pinggan sihat dalam buku kod kepada responden. <i>Please show the picture of healthy plate to the respondents</i></p> <p>Sila nyatakan apa yang anda faham tentang Pinggan Sihat Malaysia/Suku Suku Separuh? <i>Please explain what do you understand about Malaysian Healthy Plate / 'Quarter Quarter Half'?</i></p> <p><i>Jawapan yang betul /correct answer:</i></p> <p>a. Suku pinggan nasi/ mi/ roti/ bijirin/ produk bijirin/ ubi/ sumber karbohidrat yang lain. <i>A quarter plate of rice/ noodles/ bread/ cereals/ cereal or grain products/ tubers/ other carbohydrate sources.</i></p> <p>b. Suku pinggan ikan/ ayam/ daging/ kekacang/ sumber protein yang lain. <i>A quarter plate of fish/ chicken/ beef/ legumes/ other protein sources</i></p> <p>c. Separuh pinggan sayur-sayuran dan buah-buahan. <i>Half of the plate with vegetables and fruits</i></p>	 <p>* sila rujuk kad CJ9 / <i>please refer to the card CJ9</i></p> <p>1. Jika Betul / <i>if correct</i> 2. Jika Salah / <i>if incorrect</i> (-7) TT (-9) EJ</p> <p>1. Jika Betul / <i>if correct</i> 2. Jika Salah / <i>if incorrect</i> (-7) TT (-9) EJ</p> <p>1. Jika Betul / <i>if correct</i> 2. Jika Salah / <i>if incorrect</i> (-7) TT (-9) EJ</p>
CJ08	<p>Adakah anda mengamalkan konsep Pinggan Sihat Malaysia/ Suku Suku Separuh dalam hidangan utama anda? <i>Do you practise the concept of Malaysian Healthy Plate/ 'Quarter Quarter Half' in your main meals?</i></p>	<p>1. Ya, setiap hari / <i>Yes, everyday</i> 2. Ya, kadang-kadang/ <i>Yes, sometimes</i> 3. Tidak / <i>No</i> (-7) TT (-9) EJ</p>
CJ09	<p>Adakah anda vegetarian (termasuk lacto-ovo, lacto, ovo, dan vegans vegetarian) sejak sebulan yang lepas? <i>Are you a vegetarian (including lacto-ovo, lacto, ovo, dan vegans vegetarian) in the past one month?</i></p>	<p>1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ</p>
CJ10a	<p>Kebiasaannya, dalam seminggu berapa hari anda makan buah? <i>In a typical week, how many days did you consume fruits?</i></p>	<p>1. 0 hari / <i>0 day (skip CJ10b)</i> 2. 1 hari / <i>1 day</i> 3. 2 hari / <i>2 days</i> 4. 3 hari / <i>3 days</i> 5. 4 hari / <i>4 days</i> 6. 5 hari / <i>5 days</i> 7. 6 hari / <i>6 days</i> 8. 7 hari / <i>7 days</i> (-7) TT (-9) EJ</p>
CJ10b	<p>Biasanya pada hari yang anda makan buah (oren, epal, pisang dan sebagainya), berapa sajian yang anda makan? <i>Usually on the day that you eat fruits (e.g. apple, orange, banana and so on), how many servings did you take?</i></p>	<p>____ bil. sajian / <i>no. of serving</i> (-7) TT (-9) EJ * sila rujuk kad CJ10 untuk anggaran sajian/ <i>please refer to the card CJ10 for serving size estimation</i></p>

CJ11a	<p>Kebiasaannya, dalam seminggu berapa hari anda makan sayuran dimasak dan/ atau ulam-ulaman? <i>In a typical week, how many days did you eat cooked and/or raw vegetables?</i></p>	<p>1. 0 hari / 0 day (<i>skip CJ11b</i>) 2. 1 hari / 1 day 3. 2 hari / 2 days 4. 3 hari / 3 days 5. 4 hari / 4 days 6. 5 hari / 5 days 7. 6 hari / 6 days 8. 7 hari / 7 days</p> <p style="text-align: right;">(-7) TT (-9) EJ</p>
CJ11b	<p>Biasanya pada hari yang anda makan sayuran dimasak dan/atau ulam-ulaman, berapa sajian yang anda makan? <i>Usually on the day that you eat cooked and/or raw vegetables, how many servings did you take?</i></p>	<p>____ bil. sajian / <i>no. of serving</i> (-7) TT (-9) EJ</p> <p>* sila rujuk kad CJ11 untuk anggaran hidangan / <i>please refer to the card CJ11 for serving size estimation</i></p>
CJ12	<p>Kebiasaannya, berapa gelas air kosong anda minum dalam sehari? <i>In a typical day, how many glasses of plain water did you drink?</i></p>	<p>____ bil. gelas (250ml) / <i>no. of glass (250ml)</i> (-7) TT (-9) EJ</p> <p>* sila rujuk kad CJ12 untuk anggaran gelas / <i>please refer to the card CJ12 for glass estimation</i></p>

MODUL CT : SARINGAN KESIHATAN/ HEALTH SCREENING

Sekarang, saya ingin bertanya mengenai aktiviti dalam masa 12 bulan yang lepas.

Now, I would like to ask about activity in the last 12 months.

Dalam masa 12 bulan yang lepas, dari ... 2018 hingga hari ini...

In the last 12 months, from ... 2018 till today...

TB7020	Adakah anda pergi untuk pemeriksaan kesihatan termasuk saringan tekanan darah, kolesterol, paras gula dan lain-lain? <i>Did you go for medical check-up such as screening of blood pressure, cholesterol, blood sugar level, etc?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
TB7030	[PERINGATAN: Untuk responden perempuan umur 18 tahun dan ke atas sahaja]. Adakah anda melakukan pemeriksaan sendiri payudara? <i>Do you do breast self-examination?</i>	1. Ya / <i>Yes.. monthly</i> 2. Ya, tetapi tidak setiap bulan / <i>Yes, but not monthly</i> 3. Tidak melakukan / <i>Not at all</i> (-7) TT (-9) EJ
TB7040	[PERINGATAN: Untuk responden lelaki dan perempuan umur 40 tahun dan ke atas sahaja]. Adakah anda pernah melakukan ujian pengesanan darah dalam sampel najis (bagi saringan kanser usus)? <i>Did you have the test performed to check blood in stool (for colon cancer screening)?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ

[PERINGATAN: Untuk responden perempuan umur 20 tahun dan ke atas sahaja].

Sekarang, saya ingin bertanya mengenai aktiviti dalam masa 3 tahun yang lepas.

Now, I would like to ask about activity in the last 3 years.

Dalam masa 3 tahun lepas, dari ... 2016 hingga hari ni, adakah anda pernah melakukan pemeriksaan:

In the past 3 years, from ... 2016 till today, did you do any of these examinations:

TB7050	Ujian pap smear/pangkal rahim? <i>Pap smear examination?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
TB7051	Jika ya, adakah anda telah dimaklumkan keputusannya? <i>If yes, were you informed of the results?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
TB7052	Adakah anda mengetahui terdapat ujian pap smear/pangkal rahim yang boleh dilakukan sendiri bagi mengesan kanser serviks? <i>Are you aware of a self sampling pap smear that can be done by yourself to detect cervical cancer?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
TB7053	Adakah anda berminat untuk melakukan/menggunakannya? <i>Would you be interested to do/ use it?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ

[PERINGATAN: Untuk responden perempuan umur 40 tahun dan ke atas sahaja].

Dalam masa 3 tahun lepas, dari ... 2016 hingga hari ni, adakah anda pernah melakukan pemeriksaan:

In the past 3 years, from ... 2016 till today, did you do any of these examinations:

TB7060	Ujian mammogram (X-ray khas payudara)? <i>Mammogram examination?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
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TB7061	Jika ya, dimana pemeriksaan tersebut dijalankan <i>If yes, where was your mammogram done</i>	1. Pusat Kesihatan Kerajaan <i>Public Health Facility</i> 2. Pusat Kesihatan Swasta <i>Private Health Facility</i> (-7) TT (-9) EJ
TB7062	Pernahkan anda pada bila-bila masa menjalankan ujian mammogram (X-ray khas payudara)? <i>Have ever had a mammogram examination?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
TB7063	Adakah anda mempunyai sejarah keluarga yang menghidap kanser payudara? <i>Do you have any family members who have been previously been diagnosed with breast cancer?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ

Sila tandakan (✓) pada kotak yang bersesuaian. <i>Please tick (✓) in the appropriate box.</i>																			
CF03	<p>Apakah jenis minuman beralkohol/arak/minuman keras yang paling kerap anda minum? <i>What type of alcoholic beverage do you most frequently consume?</i></p>																		
	<p>Sila tandakan (✓) sekali sahaja iaitu pada minuman yang paling kerap diminum. <i>Please tick (✓) once only indicating the alcoholic beverage that is most often consumed.</i></p> <table border="1"> <tbody> <tr> <td style="width: 40px;"></td> <td>Shandy <i>Shandy</i></td> </tr> <tr> <td></td> <td>Bir ATAU Lager ATAU Ale ATAU Stout <i>Bir OR Lager OR Ale OR Stout</i></td> </tr> <tr> <td></td> <td>Wain ATAU Cider ATAU Champagne ATAU Peri ATAU Toddi <i>Wine OR Cider OR Champagne OR Peri OR Toddy</i></td> </tr> <tr> <td></td> <td>Tuak ATAU Tuak Kelapa ATAU Bahar ATAU Lihing ATAU Ijok <i>Tuak OR Tuak Kelapa OR Bahar OR Lihing OR Ijok</i></td> </tr> <tr> <td></td> <td>Brandi ATAU Rum ATAU Wiski ATAU Vodka ATAU Gin ATAU Samsu ATAU Samsu Cheng <i>Brandy OR Rum OR Whisky OR Vodka OR Gin OR Samsu OR Samsu Cheng</i></td> </tr> <tr> <td></td> <td>Montoku ATAU Langkau <i>Montoku OR Langkau</i></td> </tr> <tr> <td></td> <td>Lain-lain <i>Others</i></td> </tr> <tr> <td></td> <td>Tidak Tahu <i>Don't Know</i></td> </tr> <tr> <td></td> <td>Enggan Jawab <i>Refuse to answer</i></td> </tr> </tbody> </table>		Shandy <i>Shandy</i>		Bir ATAU Lager ATAU Ale ATAU Stout <i>Bir OR Lager OR Ale OR Stout</i>		Wain ATAU Cider ATAU Champagne ATAU Peri ATAU Toddi <i>Wine OR Cider OR Champagne OR Peri OR Toddy</i>		Tuak ATAU Tuak Kelapa ATAU Bahar ATAU Lihing ATAU Ijok <i>Tuak OR Tuak Kelapa OR Bahar OR Lihing OR Ijok</i>		Brandi ATAU Rum ATAU Wiski ATAU Vodka ATAU Gin ATAU Samsu ATAU Samsu Cheng <i>Brandy OR Rum OR Whisky OR Vodka OR Gin OR Samsu OR Samsu Cheng</i>		Montoku ATAU Langkau <i>Montoku OR Langkau</i>		Lain-lain <i>Others</i>		Tidak Tahu <i>Don't Know</i>		Enggan Jawab <i>Refuse to answer</i>
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	Tidak Tahu <i>Don't Know</i>																		
	Enggan Jawab <i>Refuse to answer</i>																		

CF04	<p>Dalam tempoh 12 bulan yang lepas, berapa kerapkah anda minum minuman beralkohol/arak/minuman keras?</p> <p><i>In the past 12 months, how often have you had a drink containing alcohol?</i></p>	<p>Tidak Pernah...Tamat modul</p> <p><i>Never...End of module</i></p> <p>Sekali sebulan atau kurang</p> <p><i>Once a month or less</i></p> <p>2-4 kali sebulan</p> <p><i>2-4 times a month</i></p> <p>2-3 kali seminggu</p> <p><i>2-3 times a week</i></p> <p>4 kali atau lebih seminggu</p> <p><i>4 or more times a week</i></p>							
CF05	<p>Kebiasaannya pada hari yang anda minum, berapa banyakkah anda minum minuman beralkohol/arak/minuman keras?</p> <p><i>How many alcoholic beverages do you have on a typical day when you are drinking?</i></p> <p>Jumlah pengambilan minuman beralkohol mestilah mengikut unit minuman beralkohol seperti yang ditunjukkan dalam Kad CF1.</p> <p><i>The total amount of alcohol consumed should be calculated in terms of standard drink consumed per day as shown in Card CF1.</i></p>	<p>Sila rujuk Kad CF1 / <i>Please refer to Card CF1</i></p> <table border="1"> <tr> <td>1 atau 2</td> <td>3 atau 4</td> </tr> <tr> <td>5 atau 6</td> <td>7, 8 atau 9</td> </tr> <tr> <td>10 atau lebih</td> <td>Tidak Tahu</td> </tr> </table> <p>Enggan Jawab</p> <p><i>Refuse to answer</i></p>		1 atau 2	3 atau 4	5 atau 6	7, 8 atau 9	10 atau lebih	Tidak Tahu
1 atau 2	3 atau 4								
5 atau 6	7, 8 atau 9								
10 atau lebih	Tidak Tahu								
CF06	<p>Berapa kerap anda minum enam unit atau lebih minuman beralkohol pada satu masa?</p> <p><i>How often do you have six or more drinks on one occasion?</i></p>	<table border="1"> <tr> <td>Tidak Pernah</td> <td>Kurang dari sekali sebulan</td> </tr> <tr> <td>Sekali sebulan</td> <td>Sekali seminggu</td> </tr> <tr> <td>Setiap hari atau hampir setiap hari</td> <td>Tidak Tahu</td> </tr> </table> <p>Enggan Jawab</p> <p><i>Refuse to answer</i></p>		Tidak Pernah	Kurang dari sekali sebulan	Sekali sebulan	Sekali seminggu	Setiap hari atau hampir setiap hari	Tidak Tahu
Tidak Pernah	Kurang dari sekali sebulan								
Sekali sebulan	Sekali seminggu								
Setiap hari atau hampir setiap hari	Tidak Tahu								
<p>JIKA SOALAN CF05 DIJAWAB SEBAGAI "1 ATAU 2" DAN SOALAN CF06 DIJAWAB SEBAGAI "TIDAK PERNAH" TERUS KE SOALAN CF12.</p> <p><i>IF ANSWERED "1 OR 2" FOR QUESTION CF05 AND "NEVER" TO QUESTIONS CF06, PROCEED TO QUESTION CF12.</i></p>									

CF07	<p>Dalam tempoh 12 bulan yang lepas, berapa kerapkah anda tidak boleh berhenti minum apabila anda mula minum minuman beralkohol / arak / minuman keras? <i>How often during the last 12 months have you found that you were not able to stop drinking one you had started?</i></p>	<p>Tidak Pernah <i>Never</i></p>	<p>Kurang dari sekali sebulan <i>Less than once a month</i></p>
		<p>Sekali sebulan <i>Monthly</i></p>	<p>Sekali seminggu <i>weekly</i></p>
		<p>Setiap hari atau hampir setiap hari <i>Daily or almost daily</i></p>	<p>Tidak Tahu <i>Don't Know</i></p>
		<p>Enggan Jawab <i>Refuse to answer</i></p>	
CF08	<p>Dalam tempoh 12 bulan yang lepas, akibat dari minum minuman beralkohol / arak / minuman keras berapa kerapkah anda tidak boleh melakukan apa yang biasanya anda lakukan? <i>How often during the last 12 months have you failed to do what was normally expected from you because of drinking?</i></p>	<p>Tidak Pernah <i>Never</i></p>	<p>Kurang dari sekali sebulan <i>Less than once a month</i></p>
		<p>Sekali sebulan <i>Monthly</i></p>	<p>Sekali seminggu <i>weekly</i></p>
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		<p>Enggan Jawab <i>Refuse to answer</i></p>	
CF09	<p>Dalam tempoh 12 bulan yang lepas, selepas sesi meminum minuman beralkohol / arak / minuman keras dalam jumlah melebihi dari biasa, berapa kerapkah pada pagi esoknya anda perlu meminum minuman beralkohol/ arak/minuman keras sebelum memulakan hari anda? <i>How often during the last 12 months you needed a first drink in the morning to get yourself going after a heavy drinking session?</i></p>	<p>Tidak Pernah <i>Never</i></p>	<p>Kurang dari sekali sebulan <i>Less than once a month</i></p>
		<p>Sekali sebulan <i>Monthly</i></p>	<p>Sekali seminggu <i>weekly</i></p>
		<p>Setiap hari atau hampir setiap hari <i>Daily or almost daily</i></p>	<p>Tidak Tahu <i>Don't Know</i></p>
		<p>Enggan Jawab <i>Refuse to answer</i></p>	

CF10	<p>Dalam tempoh 12 bulan yang lepas, berapa kerapkah anda rasa bersalah atau menyesal selepas minum minuman beralkohol/arak/minuman keras?</p> <p><i>How often during the last 12 months have you had a feeling of guilt remorse after drinking?</i></p>	Tidak Pernah <i>Never</i>	Kurang dari sekali sebulan <i>Less than once a month</i>	
		Sekali sebulan <i>Monthly</i>	Sekali seminggu <i>weekly</i>	
		Setiap hari atau hampir setiap hari <i>Daily or almost daily</i>	Tidak Tahu <i>Don't Know</i>	
		Enggan Jawab <i>Refuse to answer</i>		
CF11	<p>Dalam tempoh 12 bulan yang lepas, berapa kerapkah anda tidak dapat mengingati apakah yang telah berlaku malam sebelumnya disebabkan anda telah mengambil minuman beralkohol/arak/minuman keras?</p> <p><i>How often during the last 12 months have you been unable to remember what happened the night before because you had been drinking?</i></p>	Tidak Pernah <i>Never</i>	Kurang dari sekali sebulan <i>Less than once a month</i>	
		Sekali sebulan <i>Monthly</i>	Sekali seminggu <i>weekly</i>	
		Setiap hari atau hampir setiap hari <i>Daily or almost daily</i>	Tidak Tahu <i>Don't Know</i>	
		Enggan Jawab <i>Refuse to answer</i>		
CF12	<p>Pernakah anda atau orang lain tercedera disebabkan anda meminum minuman beralkohol / arak/minuman keras?</p> <p><i>Have you or someone else been injured as a result of your drinking?</i></p>	Tidak <i>No</i>	Ya, tetapi bukan dalam tempoh setahun yang lepas <i>Yes, but not in the last year</i>	
		Ya, dalam tempoh setahun yang lepas <i>Yes, during the last year</i>	Tidak Tahu <i>Don't Know</i>	
		Enggan Jawab <i>Refuse to answer</i>		

CF13	<p>Pernahkah saudara atau kawan atau doktor atau anggota kesihatan mengambil berat atau mencadangkan supaya anda mengurangkan pengambilan minuman beralkohol / arak / minuman keras?</p> <p><i>Has relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?</i></p>	<p>Tidak <i>No</i></p>	<p>Ya, tetapi bukan dalam tempoh setahun yang lepas <i>Yes, but not in the last year</i></p>
		<p>Ya, dalam tempoh setahun yang lepas <i>Yes, during the last year</i></p>	<p>Tidak Tahu <i>Don't Know</i></p>
		<p>Enggan Jawab <i>Refuse to answer</i></p>	
CF14	<p>Adakah anda masih mengambil minuman beralkohol / arak / minuman keras dalam masa 1 bulan yang lalu?</p> <p><i>Are you still consuming alcoholic beverages in the last one month?</i></p>	<p>Ya <i>Yes</i></p>	<p>TAMAT MODUL END OF MODULE</p>
		<p>Tidak <i>No</i></p>	
		<p>Tidak Tahu <i>Don't Know</i></p>	
		<p>Enggan Jawab <i>Refuse to answer</i></p>	
CF15	<p>Berapa kerap anda minum enam atau lebih minuman beralkohol pada satu masa dalam masa 1 bulan yang lalu?</p> <p><i>How often do you have six or more drinks on one occasion in the past 1 month?</i></p> <p>Jumlah pengambilan minuman beralkohol mestilah mengikut minuman alkohol seperti yang ditunjukkan dalam Kad CF1.</p> <p><i>The total amount of alcohol consumed should be calculated in terms of standard drink consumed per day as shown in Card CF1.</i></p>	<p>Sila rujuk Kad CF1 / <i>Please refer to Card CF1</i></p>	
		<p>Tidak Pernah <i>Never</i></p>	<p>Kurang dari sekali sebulan <i>Less than once a month</i></p>
		<p>Sekali sebulan <i>Monthly</i></p>	<p>Sekali seminggu <i>weekly</i></p>
		<p>Setiap hari atau hampir setiap hari <i>Daily or almost daily</i></p>	<p>Tidak Tahu <i>Don't Know</i></p>
		<p>Enggan Jawab <i>Refuse to answer</i></p>	

MODUL CG: DADAH / DRUG**KRITERIA KELAYAKAN: AHLI ISIRUMAH BERUMUR 18 TAHUN DAN KE ATAS**

ID	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Negeri (2 Digit)	DP (2 Digit)	&	DB (3 Digit)	BP (4 Digit)	UB (3 Digit)	TK (3 Digit)	Strata (1 Digit)	Isi Rumah & Individu (2 Digit)				

Bulatkan jawapan yang bersesuaian / *Please circle the appropriate answer.*

CG01	<p>Sepanjang hidup anda, adakah anda pernah mengambil sebarang jenis dadah atau bahan terlarang? [Ini termasuk heroin, morfin, ganja, amfetamin / metamfetamin (ecstasy, syabu, ice, pil kuda), gam atau ketom. Ini tidak termasuk ubat-ubatan preskripsi].</p> <p><i>In your lifetime, have you ever taken any drugs or abused any substance? [This include heroin, morphine, marijuana, amphetamine / methamphetamine (ecstasy, syabu, ice, yaba pills), glue or kratom. This does not include prescribed medicine].</i></p>	<p>1. Ya / <i>Yes</i></p> <p>2. Tidak / <i>No</i></p> <p>3. Tidak Tahu / <i>Don't know</i></p> <p>4. Enggan Jawab / <i>Refuse to answer</i></p>	<p>....Ke soalan CG02 / Go to question CG0</p> <p>....Soalan tamat ke modul seterusnya / End of questions go to the next module</p>
CG02	<p>Berapakah umur anda ketika pertama kali anda menggunakan dadah atau bahan terlarang?</p> <p><i>How old were you when you first used drugs or abused any substance?</i></p>	<p><input type="text"/> Tahun / <i>Years Old</i></p> <p>1. Tidak Tahu / <i>Don't know</i></p> <p>2. Enggan jawab / <i>Refuse to answer</i></p>	

Sila tandakan (✓) pada kotak yang bersesuaian. *Please tick (✓) in the appropriate box.*

CG03	<p>Ketika pertama kali anda menggunakan dadah atau bahan terlarang, apakah jenis dadah/bahan yang anda ambil?</p> <p><i>Which type of drugs or substance abuse did you use when you first started using drugs/substance?</i></p>	
a.	Opiod (Heroin atau Morfin) <i>Opiod (Heroin or Morphine)</i>	<input type="checkbox"/>
b.	Ganja <i>Marijuana</i>	<input type="checkbox"/>
c.	Amfetamin atau metamfetamin (meth, syabu, ice, pil yaba/kuda) <i>Amphetamines or methamphetamines (meth, syabu, ice, Yaba pills)</i>	<input type="checkbox"/>
d.	Inhalan (gam, cat, nitrose oxide) <i>Inhalant (glue, paint, nitrose oxide)</i>	<input type="checkbox"/>
e.	Ketum <i>Kratom</i>	<input type="checkbox"/>
f.	Tidak Tahu <i>Don't know</i>	<input type="checkbox"/>
g.	Enggan Jawab <i>Refuse to answer</i>	<input type="checkbox"/>

CG04	Sepanjang hidup anda, adakah anda pernah mengambil dadah atau bahan terlarang jenis berikut? <i>During your life, did you ever use this type of drugs/substance?</i>				
		Ya Yes	Tidak No	Tidak Tahu Don't know	Enggan Jawab Refuse to answer
	a.	Opiod (Heroin atau Morfin) <i>Opiod (Heroin or Morphine)</i>			
	b.	Ganja <i>Marijuana</i>			
	c.	Amfetamin atau metamfetamin (meth, syabu, ice, pil yaba/kuda) <i>Amphetamines or methamphetamines (meth, syabu, ice, Yaba pill)</i>			
	d.	Inhalan (gam, cat, nitrose oxide) <i>Inhalant (glue, paint, nitrose oxide)</i>			
	e.	Ketum <i>Kratom</i>			
(Jika jawapan Ya bagi mana-mana pilihan jenis dadah/substan, sila ke soalan 5. Jika jawapan Tidak, EJ atau TT bagi semua pilihan jenis dadah, sila ke modul seterusnya.) (If Yes to any type of drugs/substance, go to question 5. If No, don't know or refuse to answer for all types of drug/substance, please go to the next module.)					
CG05	Adakah anda masih mengambil dadah atau bahan terlarang jenis berikut dalam tempoh 30 hari yang lepas? <i>During the past 30 days, do you still used this type of drug/substance?</i>				
		Ya Yes	Tidak No	Tidak Tahu Don't know	Enggan Jawab Refuse To answer
	a.	Opiod (Heroin atau Morfin) <i>Opiod (Heroin or Morphine)</i>			
	b.	Ganja <i>Marijuana</i>			
	c.	Amfetamin atau metamfetamin (meth, syabu, ice, chase the dragon, pil Yaba /kuda) <i>Amphetamines or methamphetamines (meth, syabu, ice, yaba pill)</i>			
	d.	Inhalan (gam, cat, nitrose oxide) <i>Inhalant (glue, paint, nitrose oxide)</i>			
	e.	Ketum <i>Kratom</i>			
(Jika jawapan Ya bagi mana-mana pilihan jenis dadah/substan, sila ke soalan 6. Jika jawapan Tidak, EJ atau TT bagi semua pilihan jenis dadah, sila ke modul seterusnya.) (If Yes to any types of drugs/substance, go to question 6. If No, don't know or refuse to answer for all types of drug, please go to the next module.)					

CG06	<p>Dalam tempoh 30 hari yang lepas, bagaimana kebiasaanya anda mendapatkan dadah atau bahan terlarang yang anda gunakan? SILA PILIH SATU JAWAPAN SAHAJA.</p> <p><i>During the past 30 days, how did you usually get/obtain the drugs/substance used? SELECT ONLY ONE RESPONSE</i></p>	
	a.	<p>Saya membeli dari orang lain <i>I bought them from someone</i></p>
	b.	<p>Saya memberi duit kepada orang lain untuk membeli <i>I gave someone else money to buy it for me</i></p>
	c.	<p>Saya mencuri atau mengambil tanpa kebenaran <i>I stole it or got it without permission</i></p>
	d.	<p>Saya mendapatkannya daripada kawan saya <i>I got it from my friend</i></p>
	e.	<p>Saya mendapatkannya daripada keluarga saya <i>I got it from my family</i></p>

CQ15	... menilai bagaimana keadaan tempat tinggal anda (contoh: komuniti, kawasan perumahan) mempengaruhi kesihatan dan kesejahteraan anda?				
CQ16	... menilai bagaimana keadaan rumah anda membantu anda kekal sihat?				
CQ17	... membuat keputusan untuk memperbaiki kesihatan anda?				
CQ18	... menyertai aktiviti yang boleh menambah baik kesihatan dan kesejahteraan dalam komuniti anda?				

MODULE CR: HIPERPLASIA PROSTAT BENIGNA / BENIGN PROSTATIC HYPERPLASIA**KRITERIA KELAYAKAN: AHLI ISIRUMAH BERUMUR 40 TAHUN DAN KE ATAS**

ID	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Negeri (2 Digit)	DP (2 Digit)	&	DB (3 Digit)	BP (4 Digit)	UB (3 Digit)	TK (3 Digit)	Strata (1 Digit)	Isi Rumah & Individu (2 Digit)				

Soal Selidik Permarkahan Simptom Prostat Antarabangsa / International Prostate Symptom Score (IPSS) Questionnaire**SILA BACA DENGAN CERMAT / PLEASE READ THIS CAREFULLY:**

Kami ingin mengetahui pengalaman pembuangan air kecil anda di dalam satu bulan yang lepas. Sila bulatkan jawapan yang paling sesuai dari pandangan anda.

We would like to know your experience of urinary for the last 1 month. Please circle the designated box for which you think most nearly applies to you.

		Langsung tidak pernah <i>Not at all</i>	Kurang dari 1 dalam 5 kali <i>Less than 1 in 5 times</i>	Kurang dari separuh sepanjang sesi pembuangan air kecil <i>Less than half the times</i>	Lebih kurang separuh sepanjang sesi pembuangan air kecil <i>About half the times</i>	Lebih dari separuh sepanjang sesi pembuangan air kecil <i>More than half the times</i>	Hampir selalu sepanjang sesi pembuangan air kecil <i>Almost always</i>
	Dalam tempoh 1 bulan yang lepas <i>In the past 1 month</i>						
CR01	Berapa kerapkah anda merasakan ketidakpuasan untuk mengosongkan / menyahtinjakan sepenuhnya pundi kencing? <i>How often have you had the sensation of not emptying your bladder?</i>	0	1	2	3	4	5
CR02	Berapa kerapkah anda terpaksa membuang air kecil dalam masa kurang setiap 2 jam? <i>How often have you had to urinate less than every two hours?</i>	0	1	2	3	4	5
CR03	Berapa kerapkah anda mengetahui untuk anda berhenti dan mulakan balik beberapa kali apabila anda membuang air kecil? <i>How often have you found you stopped and started again several times when you urinated?</i>	0	1	2	3	4	5
CR04	Berapa kerapkah anda mengetahui yang anda mengalami kesukaran untuk menundakan/menangguhkan pembuangan air kecil? <i>How often have you found it difficult to postpone urination?</i>	0	1	2	3	4	5

Dalam tempoh 1 bulan yang lepas <i>In the past 1 month</i>		Langsung tidak pernah <i>Not at all</i>	Kurang dari 1 dalam 5 kali <i>Less than 1 in 5 times</i>	Kurang dari separuh sepanjang sesi pembuangan air kecil <i>Less than half the times</i>	Lebih kurang separuh sepanjang sesi pembuangan air kecil <i>About half the times</i>	Lebih dari separuh sepanjang sesi pembuangan air kecil <i>More than half the times</i>	Hampir selalu sepanjang sesi pembuangan air kecil <i>Almost always</i>
CR05	Berapa kerapkah anda mengalami aliran pembuangan air kecil yang lemah? <i>How often have you had a weak urinary stream?</i>	0	1	2	3	4	5
CR06	Berapa kerapkah anda terpaksa berikhtiar/menekankan/berusaha untuk memulakan pembuangan air kecil? <i>How often have you had to strain to start urination?</i>	0	1	2	3	4	5

		Tidak pernah <i>None</i>	1 kali <i>1 Time</i>	2 kali <i>2 Times</i>	3 kali <i>3 Times</i>	4 kali <i>4 Times</i>	5 kali <i>5 Times</i>
CR07	Berapa kerapkah anda bangun untuk membuang air kecil di waktu malam? <i>How many times did you typically get up at night to urinate?</i>	0	1	2	3	4	5

Kualiti hidup disebabkan oleh simptom pembuangan air kecil <i>Quality of life due to Urinary Symptoms</i>		Berasa gembira <i>Delighted</i>	Berpuas hati <i>Pleased</i>	Kebanyakan puas hati <i>Mostly Satisfied</i>	Bercampur perasaan <i>Mixed</i>	Kebanyakan tidak puas <i>Mostly Dissatisfied</i>	Tidak gembira <i>Unhappy</i>	Berasa sangat teruk <i>Terrible</i>
CR08	Jika anda melalui kehidupan anda dengan keadaan pembuangan air kecil seperti sekarang, bagaimana perasaan anda terhadap perkara tersebut? <i>If you were to spend the rest of your life with your urinary condition just the way it is now, how would you feel about that?</i>	0	1	2	3	4	5	6

Terima kasih diatas segala kerjasama yang diberikan.
Thank you very much for your co-operation.

MODUL CS: MATI PUCUK / *ERECTILE DYSFUNCTION***KRITERIA KELAYAKAN: AHLI ISIRUMAH BERUMUR 18 TAHUN DAN KE ATAS SAHAJA DAN AKTIF SECARA SEKSUAL.**

ID

Negeri (2 Digit) DP (2 Digit) & DB (3 Digit) BP (4 Digit) UB (3 Digit) TK (3 Digit) Strata (1 Digit) Isi Rumah & Individu (2 Digit) (2 Digit)

Soal Selidik Indeks Keupayaan Ereksi Antarabangsa / *International Index of Erectile Function Questionnaire*

Di sepanjang enam bulan yang lalu,

Over the past 6 months,

Sila tandakan (✓) pada kotak yang bersesuaian.

Please tick (✓) in the appropriate box.

CS01	Pada penilaian anda, sejauh manakah tahap keyakinan anda, yang anda boleh mencapai serta mengekalkan ketegangan zakar (kemaluan atau batang keras)? <i>How did you rate your confidence that you could get & keep an erection?</i>	a. Sangat rendah / <i>Very low</i>	<input type="checkbox"/>
		b. Rendah / <i>Low</i>	<input type="checkbox"/>
		c. Sederhana / <i>Moderate</i>	<input type="checkbox"/>
		d. Tinggi / <i>High</i>	<input type="checkbox"/>
		e. Sangat Tinggi / <i>Very high</i>	<input type="checkbox"/>
CS02	Apabila anda mengalami ketegangan zakar (kemaluan atau batang keras) menerusi rangsangan seks, berapa kerap ketegangan itu cukup keras untuk persetubuhan? <i>When you had erections with sexual stimulation, how often were your erections hard enough for penetration?</i>	a. Tidak pernah atau hampir tidak pernah / <i>Almost never or never</i>	<input type="checkbox"/>
		b. Beberapa kali / <i>A few times</i>	<input type="checkbox"/>
		c. Kadang-kadang / <i>Sometimes</i>	<input type="checkbox"/>
		d. Sering kali / <i>Most times</i>	<input type="checkbox"/>
		e. Setiap kali atau hampir setiap kali / <i>Always</i>	<input type="checkbox"/>
CS03	Sewaktu bersetubuh, berapa kerap anda dapat mengekalkan ketegangan zakar (kemaluan atau batang keras)? <i>During sexual intercourse, how often were you able to maintain your erection after you had penetrated your partner?</i>	a. Tidak pernah atau hampir tidak pernah / <i>Almost never or never</i>	<input type="checkbox"/>
		b. Beberapa kali / <i>A few times</i>	<input type="checkbox"/>
		c. Kadang-kadang / <i>Sometimes</i>	<input type="checkbox"/>
		d. Sering kali / <i>Most times</i>	<input type="checkbox"/>
		e. Setiap kali atau hampir setiap kali / <i>Always</i>	<input type="checkbox"/>
CS04	Sewaktu bersetubuh, berapa sukarkah untuk mengekalkan ketegangan sehingga selesai persetubuhan? <i>During sexual intercourse, how difficult was it to maintain your erection to completion of intercourse?</i>	a. Tersangat sukar / <i>Extremely difficult</i>	<input type="checkbox"/>
		b. Sangat sukar / <i>Very difficult</i>	<input type="checkbox"/>
		c. Sukar / <i>Difficult</i>	<input type="checkbox"/>
		d. Sukar sedikit / <i>Slightly difficult</i>	<input type="checkbox"/>
		e. Tidak sukar / <i>No difficult</i>	<input type="checkbox"/>

CS05	Apabila anda cuba melakukan persetubuhan, berapa kerap anda berasa puas hati? <i>When you attempted sexual intercourse, how often was it satisfactory to you?</i>	a. Tidak pernah atau hampir tidak pernah / <i>Almost never or never</i>	
		b. Beberapa kali / <i>A few times</i>	
		c. Kadang-kadang / <i>Sometimes</i>	
		d. Sering kali / <i>Most times</i>	
		e. Setiap kali atau hampir setiap kali / <i>Always</i>	

MODUL CU1: ANTROPOMETRI / ANTHROPOMETRIC

Keseluruhan Modul ini perlu dijalankan dan diisi oleh Jururawat

ARAHAN: Bagi responden Kanak-kanak < 18 tahun tidak perlu menjawab soalan CU101 & CU102.

Adakah penghuni mempunyai "kriteria pengecualian"?

Does respondent have "exclusion criteria"?

CU101	Wanita mengandung <i>Pregnant women</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i>
CU102	Wanita yang baru melahirkan anak (<60 hari dari tarikh lawatan) <i>Post-natal (less than 60 days at the same time of visit)</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i>
CU103	Terlantar - akibat sakit teruk/berpanjangan, kecederaan/kemalangan <i>Bed ridden - due to chronic /prolonged illness, injury /accident</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i>
CU104	Mengalami ketidakupayaan fizikal yang menghadkan kebolehan untuk berdiri dengan tegak termasuk yang memakai kerusi roda. <i>Having physical disabilities which can affect the normal standing including on wheel chair.</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i>
CU105	Cacat anggota badan seperti tiada tangan atau tiada kaki, spondylosis (bengkok tulang belakang) kecuali buta, bisu dan pekak. <i>Body deformities such as no hand and leg, spondylosis except blind, mute and deaf.</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i>

Jika 'Ya' kepada salah satu Pilihan di atas, terus ke Modul CU2

CU106	Tarikh Pengukuran Antropometri / <i>Anthropometric Measurement Date:</i>	
	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>
	Hari / <i>Day</i>	Tahun / <i>Year</i>
	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
	Bulan / <i>Month</i>	Tahun / <i>Year</i>
	Berat Badan / <i>Body Weight</i>	
CU107	Ukuran 1 / <i>1st Measurement</i>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> kg
CU108	Ukuran 2 / <i>2nd Measurement</i>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> kg
	(-6) Tidak berkaitan / <i>Not applicable</i> (-9) Enggan diukur / <i>Refuse to be measured</i>	
	Tinggi / <i>Height</i>	
	Panjang / <i>Length</i>	
CU109	Ukuran 1 / <i>1st Measurement</i>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> cm
CU110	Ukuran 2 / <i>2nd Measurement</i>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> cm
	(-6) Tidak berkaitan / <i>Not applicable</i> (-9) Enggan diukur / <i>Refuse to be measured</i>	
	JURURAWAT: Ukuran panjang hanya untuk kanak-kanak di bawah umur 2 tahun	
	Bagi responden berumur ≥ 60 tahun ke atas yang tidak boleh berdiri dengan tegak guna kaedah setengah depa lengan.	
	<i>Use Half-arm span method for respondents aged 60 years and above if they cannot stand straight.</i>	

Setengah depa lengan / <i>Half-arm span</i>	
CU111	Ukuran 1 / <i>1st Measurement</i> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> cm
CU112	Ukuran 2 / <i>2nd Measurement</i> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> cm
(-6) Tidak berkaitan / <i>Not applicable</i> (-9) Enggan diukur / <i>Refuse to be measured</i>	
Ukuran lilit pinggang untuk responden berumur 18 tahun dan ke atas. <i>Waist circumference for respondents aged 18 years and above.</i>	
Ukur lilit pinggang / <i>Waist circumference</i>	
CU113	Ukuran 1 / <i>1st Measurement</i> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> cm
CU114	Ukuran 2 / <i>2nd Measurement</i> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> cm
(-6) Tidak berkaitan / <i>Not applicable</i> (-9) Enggan diukur / <i>Refuse to be measured</i>	

MODUL CU2: PEMERIKSAAN TEKANAN DARAH

KRITERIA KELAYAKAN: RESPONDEN BERUMUR 18 TAHUN DAN KE ATAS

ELIGIBILITY CRITERIA: RESPONDENTS AGED 18 YEARS AND ABOVE

Bacaan tekanan darah / *Blood pressure reading*

CU201	Sistolik / <i>Systolic</i>	1 Bacaan pertama / <i>First reading</i>	<input type="text"/> <input type="text"/> <input type="text"/>
CU202	Diastolik / <i>Diastolic</i>	1 Bacaan pertama / <i>First reading</i>	<input type="text"/> <input type="text"/> <input type="text"/>
CU203	Sistolik / <i>Systolic</i>	2 Bacaan kedua / <i>Second reading</i>	<input type="text"/> <input type="text"/> <input type="text"/>
CU204	Diastolik / <i>Diastolic</i>	2 Bacaan kedua / <i>Second reading</i>	<input type="text"/> <input type="text"/> <input type="text"/>
CU205	Sistolik / <i>Systolic</i>	3 Bacaan ketiga / <i>Third reading</i>	<input type="text"/> <input type="text"/> <input type="text"/>
CU206	Diastolik / <i>Diastolic</i>	3 Bacaan ketiga / <i>Third reading</i>	<input type="text"/> <input type="text"/> <input type="text"/>

(-9) Enggan diperiksa / *Refuse to be examined*

**** Bagi Modul berikutnya, jika wanita mengandung hanya perlu lakukan Modul CU4 sahaja.
 Jika tidak mengandung, perlu lakukan Modul CU3 & CU4.**

MODUL CU3: PEMERIKSAAN BOKIMIA / *BIOCHEMISTRY TEST***KRITERIA KELAYAKAN: RESPONDEN BERUMUR 18 TAHUN DAN KE ATAS*****ELIGIBILITY CRITERIA: RESPONDENTS AGED 18 YEARS AND ABOVE***

CU301	Dalam tempoh 8 jam yang lepas, adakah anda makan dan minum selain dari air kosong? <i>During the past 8 hours have you had anything to eat or drink, other than water?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i>
CU302	Paras glukosa kapilari <i>Capillary blood glucose level</i>	<input type="text"/> <input type="text"/> . <input type="text"/> mmol/L (-9) Enggan diperiksa <i>Refuse to be examined</i>
CU303	Bacaan paras kolestrol <i>Blood cholesterol level measurement</i>	<input type="text"/> <input type="text"/> . <input type="text"/> mmol/L (-9) Enggan diperiksa <i>Refuse to be examined</i>

MODUL CU4: ANAEMIA: PEMERIKSAAN HEMOGLOBIN / *HAEMOGLOBIN TEST***KRITERIA KELAYAKAN: RESPONDEN BERUMUR 15 TAHUN DAN KE ATAS*****ELIGIBILITY CRITERIA: RESPONDENTS AGED 15 YEARS AND ABOVE***

CU401	Bacaan Hemoglobin <i>Haemoglobin readings</i>	<input type="text"/> <input type="text"/> . <input type="text"/> g/dl (-9) Enggan diperiksa <i>Refuse to be examined</i>
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Selalu tidak gembira. Susah hati atau menangis.

Biasanya disukai oleh kanak-kanak lain.

Mudah mengalih perhatian, penumpuan melayang-layang.

Gelisah atau lekat dengan orang dalam situasi baru, mudah hilang keyakinan.

Baik kepada kanak-kanak yang lebih muda.

Selalu berbohong atau menipu.

Dibuli oleh kanak-kanak lain.

Menawarkan secara sukarela pertolongan kepada orang lain (ibu bapa, guru, kanak-kanak lain).

Berfikir sebelum bertindak.

Mencuri daripada rumah, sekolah atau lain-lain tempat.

Mudah berbaik-baik dengan orang dewasa daripada kanak-kanak.

Banyak ketakutan, mudah takut.

Membuat tugas dari awal hingga ke akhir, jangka masa perhatian baik.

Often unhappy, down-hearted or tearful.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Generally liked by other children.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Easily distracted, concentration wanders.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nervous or clingy in new situations, easily loses confidence.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
Kind to younger children.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Often lies or cheats.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Picked on bullied by other children.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Often volunteers to help others (parents, teachers, other children).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thanks things out before acting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Steals from home, school or elsewhere.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gets on better with adults than with other children.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Many fears, easily scared.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sees tasks through to the end, good attention span.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			

MODUL CM: KEHILANGAN UPAYA / <i>DISABILITY</i>		
KRITERIA KELAYAKAN: AHLI ISIRUMAH BERUMUR 18 TAHUN DAN KE ATAS		
ELIGIBILITY CRITERIA: MEMBER OF THE HOUSEHOLD AGED 18 YEARS AND ABOVE		
Soalan seterusnya merujuk kepada kesukaran yang anda alami semasa melakukan aktiviti-aktiviti tertentu disebabkan oleh MASALAH KESIHATAN .		
<i>The next questions ask about difficulties you may have doing certain activities because of a HEALTH PROBLEM.</i>		
CM01	Adakah anda memakai kaca mata/kanta lekap? <i>Do you wear glasses/ spectacles / contact lenses?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CM01a	Adakah anda mengalami kesukaran untuk melihat, (walaupun memakai kaca mata/kanta lekap)? Adakah... <i>Do you have difficulty in seeing, (despite wearing glasses/spectacles / contact lenses)? Would you say...</i>	1. Tidak Sukar / <i>No Difficulty</i> 2. Agak Sukar / <i>Some difficulty</i> 3. Sangat Sukar / <i>Lot of difficulty</i> 4. Tidak Berupaya / <i>Cannot do at all</i> (-7) TT (-9) EJ
CM02	Adakah anda menggunakan alat bantu pendengaran? <i>Do you use a hearing aid?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> (-7) TT (-9) EJ
CM02a	Adakah anda mendapati sukar untuk mendengar, (walaupun menggunakan alat bantu pendengaran)? Adakah... <i>Do have difficulty in hearing/listening, (despite using hearing aid)? Would you say...</i>	1. Tidak Sukar / <i>No Difficulty</i> 2. Agak Sukar / <i>Some difficulty</i> 3. Sangat Sukar / <i>Lot of difficulty</i> 4. Tidak Berupaya / <i>Cannot do at all</i> (-7) TT (-9) EJ
CM02b	Adakah anda mempunyai masalah untuk mendengar perbualan dengan seseorang di dalam bilik/tempat yang senyap , walaupun dengan memakai alat bantu pendengaran? Adakah... <i>Do you have difficulty hearing what is said in a conversation with one other person in a quiet room even when using hearing aid? Would you say...</i>	1. Tidak Sukar / <i>No Difficulty</i> 2. Agak Sukar / <i>Some difficulty</i> 3. Sangat Sukar / <i>Lot of difficulty</i> 4. Tidak Berupaya / <i>Cannot do at all</i> (-7) TT (-9) EJ
CM02c	Adakah anda mempunyai masalah untuk mendengar perbualan dengan seseorang di dalam bilik/tempat yang bising , walaupun dengan memakai alat bantu pendengaran? Adakah... <i>Do you have difficulty hearing what is said in a conversation with one other person in a noisier room even when using hearing aid? Would you say...</i>	1. Tidak Sukar / <i>No Difficulty</i> 2. Agak Sukar / <i>Some difficulty</i> 3. Sangat Sukar / <i>Lot of difficulty</i> 4. Tidak Berupaya / <i>Cannot do at all</i> (-7) TT (-9) EJ
CM03	Adakah anda mendapati sukar untuk berjalan atau naik/turun tangga? Adakah... <i>Do have difficulty in walking or going up and down stairs? Would you say...</i>	1. Tidak Sukar / <i>No Difficulty</i> 2. Agak Sukar / <i>Some difficulty</i> 3. Sangat Sukar / <i>Lot of difficulty</i> 4. Tidak Berupaya / <i>Cannot do at all</i> (-7) TT (-9) EJ

	<p>CM03a</p>	<p>Adakah anda menggunakan sebarang alat bantuan untuk membantu anda bergerak atau menjaga diri sendiri? Adakah anda menggunakan... <i>Do you use any assistive devices to help you get around or for selfcare? Do you use...</i></p> <p>(Boleh pilih lebih dari satu / <i>Allow multiple responses</i>)</p>	<ol style="list-style-type: none"> 1. Kasut ortopedik /<i>Orthopedic footwear</i> 2. Anggota palsu (tangan/kaki) /<i>Artificial limb (leg/foot)</i> 3. Tongkat/<i>A cane or walking stick</i> 4. Topang/<i>Crutches</i> 5. Kerusi roda /<i>A wheelchair</i> 6. Alat bantuan berjalan atau skuter /<i>A walker or a scooter</i> 7. Pendakap/<i>Braces</i> 8. Kenderaan yang diubahsuai /<i>An adapted motor vehicle</i> 9. Alatan untuk mudah capai/<i>Extenders or grasping tools</i> 10. Alat bantuan berjalan lain/<i>Another aid</i> 11. Tidak menggunakan sebarang alat bantuan / <i>Do not use any assistive device</i>
<p>CM04</p>		<p>Adakah anda mendapati sukar untuk mengingat atau menumpukan perhatian pada aktiviti harian? Adakah... <i>Do you have any difficulty in remembering or paying attention/ concentrating in your daily activity? Would you say...</i></p>	<ol style="list-style-type: none"> 1. Tidak Sukar / <i>No Difficulty</i> 2. Agak Sukar / <i>Some difficulty</i> 3. Sangat Sukar / <i>Lot of difficulty</i> 4. Tidak Berupaya / <i>Cannot do at all</i> (-7) TT (-9) EJ
	<p>CM04a</p>	<p>Adakah anda menggunakan sebarang alat bantuan untuk membantu anda mengingat atau menumpukan perhatian pada aktiviti harian? Adakah anda menggunakan... <i>Do you use any assistive devices to help you in remembering or paying attention/ concentrating in your daily activity? Do you use...</i></p> <p>(Boleh pilih lebih dari satu / <i>Allow multiple responses</i>)</p>	<ol style="list-style-type: none"> 1. Produk pengurusan masa / <i>Time management product</i> 2. Alat perakam / <i>Recorder</i> 3. Pembantu digital peribadi / <i>Personal Digital Assistant (PDA)</i> 4. Tidak menggunakan sebarang alat bantuan / <i>Do not use any assistive device</i> (-7) TT (-9) EJ
<p>CM05</p>		<p>Adakah anda mendapati sukar untuk menjaga diri sendiri (seperti membersihkan diri atau memakai pakaian)? Adakah... <i>Do you have any difficulty in caring for yourself (such as cleaning yourself or wearing clothes)? Would you say...</i></p>	<ol style="list-style-type: none"> 1. Tidak Sukar / <i>No Difficulty</i> 2. Agak Sukar / <i>Some difficulty</i> 3. Sangat Sukar / <i>Lot of difficulty</i> 4. Tidak Berupaya / <i>Cannot do at all</i> (-7) TT (-9) EJ
	<p>CM05a</p>	<p>Adakah anda menggunakan sebarang alat bantuan untuk menjaga diri sendiri (seperti membersihkan diri atau memakai pakaian)? Adakah anda menggunakan... <i>Do you use any assistive devices to help you in caring for yourself (such as cleaning yourself or wearing clothes)? Do you use...</i></p> <p>(Boleh pilih lebih dari satu / <i>Allow multiple responses</i>)</p>	<ol style="list-style-type: none"> 1. Kerusi untuk mandi/ tandas /<i>Chairs for shower or bath/ toilet</i> 2. Produk untuk masalah kawalan kencing/berak (contohnya lampin pakaibuang dewasa) / <i>Incontinent products/absorbant (eg.adult pampers)</i> 3. Tidak menggunakan sebarang alat bantuan / <i>Do not use any assistive device</i> (-7) TT (-9) EJ

<p>CM06</p>	<p>Adakah anda mendapati sukar untuk berkomunikasi (contohnya memahami atau difahami oleh orang lain) disebabkan keadaan kesihatan fizikal, mental atau emosi? Adakah...</p> <p><i>Do you have any difficulty in communicating, (such as understanding or being understood by others) due to issues with physical, mental or emotional health? Would you say...</i></p>	<ol style="list-style-type: none"> 1. Tidak Sukar / <i>No Difficulty</i> 2. Agak Sukar / <i>Some difficulty</i> 3. Sangat Sukar / <i>Lot of difficulty</i> 4. Tidak Berupaya / <i>Cannot do at all</i> <p>(-7) TT (-9) EJ</p>
<p>CM06a</p>	<p>Adakah anda menggunakan sebarang alat bantuan untuk berkomunikasi (contohnya memahami atau difahami oleh orang lain)? Adakah anda menggunakan...</p> <p><i>Do you use any assistive devices to help you in communicating, (such as understanding or being understood by others)? Do you use...</i></p> <p>(Boleh pilih lebih dari satu / <i>Allow multiple responses</i>)</p>	<ol style="list-style-type: none"> 1. Papan komunikasi/buku/kad <i>Communication boards/books/ cards</i> 2. Perisian komunikasi/ <i>Communication software</i> 3. Alat komunikasi untuk pekak / buta /<i>Deaf /blind communicators</i> 4. Permainan audio/<i>Audioplayers with DAISY capability</i> 5. Paparan Braille/ <i>Braille displays (note taker)</i> 6. Teknologi isyarat ke suara / <i>Gesture to voice technology</i> 7. Tidak menggunakan sebarang alat bantuan / <i>Do no use any assistive device</i> <p>(-7) TT (-9) EJ</p>

MODUL CN1: KEFUNGSIAN KANAK-KANAK (BERUMUR 2 - 4)**CHILD FUNCTIONING (AGE 2 - 4)****KRITERIA KELAYAKAN: IBUBAPA ATAU PENJAGA YANG MEMPUNYAI ANAK BERUMUR 2 - 4 TAHUN****ELIGIBILITY CRITERIA: PARENTS OR GUARDIANS WHO HAVE CHILDREN AGED 2 - 4 YEARS OLD**Bulatkan jawapan yang bersesuaian / *Please circle the appropriate answer.*

Soalan seterusnya merujuk kepada kesukaran yang mungkin ada pada anak anda.

The next question asks about difficulties your child may have.

CN101	Adakah (nama) memakai cermin mata? <i>Does (name) wear glasses?</i>	1. Ya / <i>Yes ... ke soalan CN102</i> 2. Tidak / <i>No ... ke soalan CN103</i> (-7) TT (-9) EJ
CN102	Apabila dia memakai cermin mata, adakah (nama) mengalami kesukaran untuk melihat? <i>When wearing his/ her glasses, does (name) have difficulty seeing?</i>	1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> (-7) TT (-9) EJ Ke soalan CN104
CN103	Adakah (nama) mengalami kesukaran untuk melihat? <i>Does (name) have difficulty seeing?</i>	1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> (-7) TT (-9) EJ
CN104	Adakah (nama) menggunakan alat bantu pendengaran? <i>Does (name) use a hearing aid?</i> [Sila tunjuk kad imbasan/ <i>Please show flashcard</i>]	1. Ya / <i>Yes ... ke soalan CN105</i> 2. Tidak / <i>No ... ke soalan CN106</i> (-7) TT (-9) EJ
CN105	Apabila dia menggunakan alat bantu pendengaran, adakah (nama) mengalami kesukaran mendengar bunyi seperti suara orang atau muzik? <i>When using his/her hearing aid, does (name) have difficulty hearing sounds like peoples' voices or music?</i>	1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> (-7) TT (-9) EJ
CN106	Adakah (nama) mengalami kesukaran mendengar bunyi seperti suara orang atau muzik? <i>Does (name) have difficulty hearing sounds like peoples' voices or music?</i>	1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> (-7) TT (-9) EJ

CN107	Adakah (nama) menggunakan sebarang peralatan atau menerima bantuan untuk berjalan? <i>Does (name) use any equipment or receive assistance for walking?</i>	1. Ya / Yes ... ke soalan CN108 2. Tidak / No ... ke soalan CN110 (-7) TT (-9) EJ
CN108	Tanpa peralatannya atau bantuan, adakah (nama) mengalami kesukaran untuk berjalan? <i>Without his/her equipment or assistance, does (name) have difficulty walking?</i>	1. Sedikit kesukaran / <i>Some difficulty</i> 2. Banyak kesukaran / <i>A lot of difficulty</i> 3. Tidak mampu sama sekali / <i>Cannot do at all</i> (-7) TT (-9) EJ
CN109	Dengan peralatannya atau bantuan, adakah (nama) mengalami kesukaran untuk berjalan? <i>With his/her equipment or assistance, does (name) have difficulty walking?</i>	1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> (-7) TT (-9) EJ Ke soalan CN111
CN110	Berbanding dengan kanak-kanak yang sama umur, adakah (nama) mengalami kesukaran untuk berjalan? <i>Compared with children of the same age, does (name) have difficulty walking?</i>	1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> (-7) TT (-9) EJ
CN111	Berbanding dengan kanak-kanak yang sama umur, adakah (nama) mengalami kesukaran mengutip objek kecil dengan tangan? <i>Compared with children of the same age, does (name) have difficulty picking up small objects with his/her hand?</i> [Sila tunjuk kad imbasan/ <i>Please show flashcard</i>]	1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> (-7) TT (-9) EJ
CN112	Adakah (nama) mengalami kesukaran untuk memahami anda? <i>Does (name) have difficulty understanding you?</i>	1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> (-7) TT (-9) EJ
CN113	Apabila (nama) bercakap, adakah anda mengalami kesukaran untuk memahaminya? <i>When (name) speaks, do you have difficulty understanding him/her?</i>	1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> (-7) TT (-9) EJ

CN114	<p>Berbanding dengan kanak-kanak yang sama umur, adakah (nama) mengalami kesukaran untuk mempelajari sesuatu?</p> <p><i>Compared with children of the same age, does (name) have difficulty learning things?</i></p>	<ol style="list-style-type: none"> 1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> <p style="text-align: right;">(-7) TT (-9) EJ</p>
CN115	<p>Berbanding dengan kanak-kanak yang sama umur, adakah (nama) mengalami kesukaran untuk bermain?</p> <p><i>Compared with children of the same age, does (name) have difficulty playing?</i></p>	<ol style="list-style-type: none"> 1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> <p style="text-align: right;">(-7) TT (-9) EJ</p>
CN116	<p>Berbanding dengan kanak-kanak yang sama umur, berapa banyak (nama) menendang, menggigit atau memukul kanak-kanak atau orang dewasa yang lain?</p> <p><i>Compared with children of the same age, how much does (name) kick, bite or hit other children or adults?</i></p>	<ol style="list-style-type: none"> 1. Tidak sama sekali / <i>Not at all</i> 2. Sama atau kurang / <i>The same or less</i> 3. Lebih / <i>More</i> 4. Lebih banyak / <i>A lot more</i> <p style="text-align: right;">(-7) TT (-9) EJ</p>

MODUL CN2: KEFUNGSIAN KANAK-KANAK (BERUMUR 5 - 17) / CHILD FUNCTIONING (AGE 5 - 17)		
KRITERIA KELAYAKAN: IBUBAPA ATAU PENJAGA YANG MEMPUNYAI ANAK BERUMUR 5 - 17 TAHUN ELIGIBILITY CRITERIA: PARENTS OR GUARDIANS WHO HAVE CHILDREN AGED 5 - 17 YEARS OLD		
Bulatkan jawapan yang bersesuaian / <i>Please circle the appropriate answer.</i>		
Soalan seterusnya merujuk kepada kesukaran yang mungkin ada pada anak anda. <i>The next question asks about difficulties your child may have.</i>		
CN201	Adakah (nama) memakai cermin mata atau kanta lekap? <i>Does (name) wear glasses or contact lenses?</i>	1. Ya / <i>Yes ... ke soalan CN202</i> 2. Tidak / <i>No ... ke soalan CN203</i> (-7) TT (-9) EJ
CN202	Apabila memakai cermin mata atau kanta lekap, adakah (nama) mengalami kesukaran untuk melihat? <i>When wearing his/ her glasses or contact lenses, does (name) have difficulty seeing?</i>	1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> (-7) TT (-9) EJ <div style="float: right; border-left: 1px solid black; padding-left: 5px;">Ke soalan CN204</div>
CN203	Adakah (nama) mengalami kesukaran untuk melihat? <i>Does (name) have difficulty seeing?</i>	1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> (-7) TT (-9) EJ
CN204	Adakah (nama) menggunakan alat bantu pendengaran? <i>Does (name) use a hearing aid?</i> [Sila tunjuk kad imbasan/ <i>Please show flashcard</i>]	1. Ya / <i>Yes ... ke soalan CN205</i> 2. Tidak / <i>No ... ke soalan CN206</i> (-7) TT (-9) EJ
CN205	Apabila dia menggunakan alat bantuan pendengaran, adakah (nama) mengalami kesukaran mendengar bunyi seperti suara orang atau muzik? <i>When using his/her hearing aid, does (name) have difficulty hearing sounds like peoples' voices or music?</i>	1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> (-7) TT (-9) EJ <div style="float: right; border-left: 1px solid black; padding-left: 5px;">Ke soalan CN207</div>
CN206	Adakah (nama) mengalami kesukaran mendengar bunyi seperti suara orang atau muzik? <i>Does (name) have difficulty hearing sounds like peoples' voices or music?</i>	1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> (-7) TT (-9) EJ

CN207	Adakah (nama) menggunakan sebarang peralatan atau menerima bantuan untuk berjalan? <i>Does (name) use any equipment or receive assistance for walking?</i>	1. Ya / Yes ... ke soalan CN208 2. Tidak / No ... ke soalan CN212 (-7) TT (-9) EJ
CN208	Tanpa peralatannya atau bantuan, adakah (nama) mengalami kesukaran untuk berjalan 100 ela/meter di tanah rata? Itu adalah lebih kurang panjang sebuah padang bola sepak. <i>Without his/her equipment or assistance, does (name) have difficulty walking 100 yards/meters on level ground? That would be about the length of 1 football field.</i>	1. Sedikit kesukaran / Some difficulty 2. Banyak kesukaran / A lot of difficulty 3. Tidak mampu sama sekali / Cannot do at all (-7) TT (-9) EJ Ke soalan CN210
CN209	Tanpa peralatannya atau bantuan, adakah (nama) mengalami kesukaran untuk berjalan 500 ela/meter di tanah rata? Itu adalah lebih kurang panjang 5 buah padang bola sepak. <i>Without his/her equipment or assistance, does (name) have difficulty walking 500 yards/meters on level ground? That would be about the length of 5 football field.</i>	1. Sedikit kesukaran / Some difficulty 2. Banyak kesukaran / A lot of difficulty 3. Tidak mampu sama sekali / Cannot do at all (-7) TT (-9) EJ
CN210	Dengan peralatannya atau bantuan, adakah (nama) mengalami kesukaran untuk berjalan 100 ela/meter di tanah rata? Itu adalah lebih kurang panjang sebuah padang bola sepak. <i>With his/her equipment or assistance, does (name) have difficulty walking 100 yards/meters on level ground? That would be about the length of 1 football field.</i>	1. Tiada kesukaran / No difficulty 2. Sedikit kesukaran / Some difficulty 3. Banyak kesukaran / A lot of difficulty 4. Tidak mampu sama sekali / Cannot do at all (-7) TT (-9) EJ Ke soalan CN214
CN211	Dengan peralatannya atau bantuan, adakah (nama) mengalami kesukaran untuk berjalan 500 ela/meter di tanah rata? Itu adalah lebih kurang panjang 5 buah padang bola sepak. <i>With his/her equipment or assistance, does (name) have difficulty walking 500 yards/meters on level ground? That would be about the length of 5 football field.</i>	1. Tiada kesukaran / No difficulty ke soalan CN214 2. Sedikit kesukaran / Some difficulty 3. Banyak kesukaran / A lot of difficulty 4. Tidak mampu sama sekali / Cannot do at all (-7) TT (-9) EJ
CN212	Berbanding dengan kanak-kanak yang sama umur, adakah (nama) mengalami kesukaran untuk berjalan 100 ela/meter di tanah rata? Itu adalah lebih kurang panjang sebuah padang bola sepak. <i>Compared with children of the same age, does (name) have difficulty walking 100 yards/meters on level ground? That would be about the length of 1 football field.</i>	1. Tiada kesukaran / No difficulty 2. Sedikit kesukaran / Some difficulty 3. Banyak kesukaran / A lot of difficulty 4. Tidak mampu sama sekali / Cannot do at all (-7) TT (-9) EJ Ke soalan CN214
CN213	Berbanding dengan kanak-kanak yang sama umur, adakah (nama) mempunyai masalah untuk berjalan 500 ela/meter di tanah rata? Itu adalah lebih kurang panjang 5 buah padang bola sepak. <i>Compared with children of the same age, does (name) have difficulty walking 500 yards/meters on level ground? That would be about the length of 5 football field.</i>	1. Tiada kesukaran / No difficulty 2. Sedikit kesukaran / Some difficulty 3. Banyak kesukaran / A lot of difficulty 4. Tidak mampu sama sekali / Cannot do at all (-7) TT (-9) EJ

CN214	Adakah (nama) mengalami kesukaran dengan jagaan diri seperti menyuap makanan atau memakai sendiri pakaian dan sebagainya? <i>Does (name) have difficulty with self-care such as feeding or dressing him/herself?</i>	<ol style="list-style-type: none"> 1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> <p style="text-align: right;">(-7) TT (-9) EJ</p>
CN215	Apabila (nama) bercakap, adakah dia mengalami kesukaran untuk difahami oleh orang yang tinggal bersama di rumahnya? <i>When (name) speaks, does he/she have difficulty being understood by people inside of this household?</i>	<ol style="list-style-type: none"> 1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> <p style="text-align: right;">(-7) TT (-9) EJ</p>
CN216	Apabila (nama) bercakap, adakah dia mengalami kesukaran untuk difahami oleh orang yang tidak tinggal bersama di rumahnya? <i>When (name) speaks, does he/she have difficulty being understood by people outside of this household?</i>	<ol style="list-style-type: none"> 1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> <p style="text-align: right;">(-7) TT (-9) EJ</p>
CN217	Berbanding dengan kanak-kanak yang sama umur, adakah (nama) mengalami kesukaran untuk mempelajari sesuatu? <i>Compared with children of the same age, does (name) have difficulty learning things?</i>	<ol style="list-style-type: none"> 1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> <p style="text-align: right;">(-7) TT (-9) EJ</p>
CN218	Berbanding dengan kanak-kanak yang sama umur, adakah (nama) mengalami kesukaran untuk mengingati sesuatu? <i>Compared with children of the same age, does (name) have difficulty remembering things?</i>	<ol style="list-style-type: none"> 1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> <p style="text-align: right;">(-7) TT (-9) EJ</p>
CN219	Adakah (nama) mengalami kesukaran menumpukan perhatian pada satu aktiviti yang dia seronok lakukan? <i>Does (name) have difficulty concentrating on an activity that he/she enjoys doing?</i>	<ol style="list-style-type: none"> 1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> <p style="text-align: right;">(-7) TT (-9) EJ</p>

CN220	Adakah (nama) mengalami kesukaran untuk menerima perubahan dalam rutinnya (aktiviti kebiasaannya)? <i>Does (name) have difficulty accepting changes in his/her routine?</i>	1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> (-7) TT (-9) EJ
CN221	Berbanding dengan kanak-kanak yang sama umur, adakah (nama) mengalami kesukaran untuk mengawal tingkah lakunya? <i>Compared with children of the same age, does (name) have difficulty controlling his/her behavior?</i>	1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> (-7) TT (-9) EJ
CN222	Adakah (nama) mengalami kesukaran untuk berkawan? <i>Does (name) have difficulty making friends?</i>	1. Tiada kesukaran / <i>No difficulty</i> 2. Sedikit kesukaran / <i>Some difficulty</i> 3. Banyak kesukaran / <i>A lot of difficulty</i> 4. Tidak mampu sama sekali / <i>Cannot do at all</i> (-7) TT (-9) EJ
CN223	Berapa kerapkah (nama) kelihatan sangat cemas, gementar atau bimbang? <i>How often does (name) seem very anxious, nervous or worried?</i>	1. Setiap hari / <i>Daily</i> 2. Setiap minggu / <i>Weekly</i> 3. Setiap bulan / <i>Monthly</i> 4. Beberapa kali dalam setahun / <i>A few times a year</i> 5. Tidak pernah / <i>Never</i> (-7) TT (-9) EJ
CN224	Berapa kerapkah (nama) kelihatan sangat sedih atau murung? <i>How often does (name) seem very sad or depressed?</i>	1. Setiap hari / <i>Daily</i> 2. Setiap minggu / <i>Weekly</i> 3. Setiap bulan / <i>Monthly</i> 4. Beberapa kali dalam setahun / <i>A few times a year</i> 5. Tidak pernah / <i>Never</i> (-7) TT (-9) EJ

MODUL CP: SAWAN / EPILEPSY		
KRITERIA KELAYAKAN: SEMUA AHLI ISIRUMAH		
ELIGIBILITY CRITERIA: ALL MEMBERS OF THE HOUSEHOLD		
Bulatkan jawapan yang bersesuaian / <i>Please circle the appropriate answer.</i>		
Sekarang saya ingin bertanya beberapa soalan mengenai sawan. <i>Now I would like to ask you a few questions about seizures.</i>		
CP01	Pernakah anda diberitahu bahawa anda pernah mengalami sawan atau kekejangan yang disebabkan oleh demam panas sewaktu kanak-kanak? <i>Did anyone ever tell you that you had a seizure or convulsion caused by a high fever when you were a child?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> 3. Mungkin / <i>Possible</i> (-7) TT (-9) EJ
CP02	[Selain daripada sawan yang anda alami disebabkan oleh demam panas]* Pernakah anda alami, atau sesiapa memberitahu bahawa anda mengalami penyakit sawan atau epilepsi? <i>[Other than the seizure[s] you had because of a high fever]* Have you ever had, or has anyone ever told you that you had, a seizure disorder or epilepsy?</i>	1. Ya / <i>Yes ... sila ke CP04</i> 2. Tidak / <i>No ... sila ke CP03</i> 3. Mungkin / <i>Possible ... sila ke CP03</i> (-7) TT (-9) EJ ... sila ke CP03 jika TT/EJ
CP03	[Selain daripada sawan yang anda alami disebabkan oleh demam panas]* Pernakah anda alami, atau sesiapa memberitahu bahawa anda alami, mana-mana yang berikut... <i>[Other than the seizure[s] you had because of a high fever]* Have you ever had, or has anyone ever told you that you had, any of the following...</i>	
CP03a	Sawan dalam mana-mana keadaan? <i>A seizure, convulsion, fit or spell under any circumstances?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> 3. Mungkin / <i>Possible</i> (-7) TT (-9) EJ
CP03b	Pergerakan yang tidak terkawal pada mana-mana anggota atau seluruh badan anda seperti menggerenyet, tersentak-sentak, terketar-ketar atau menjadi lembik? <i>Uncontrolled movements of part or all of your body such as twitching, jerking, shaking or going limp?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> 3. Mungkin / <i>Possible</i> (-7) TT (-9) EJ
CP03c	Perubahan keadaan mental atau tahap kesedaran yang tidak dapat dijelaskan; atau episod melamun yang tidak mampu dikawal oleh anda? <i>An unexplained change in your mental state or level of awareness; or an episode of "spacing out" that you could not control?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> 3. Mungkin / <i>Possible</i> (-7) TT (-9) EJ
CP03d	Sewaktu di zaman kanak-kanak, pernahkah anda diberitahu bahawa anda berangan atau termenung lebih kerap daripada kanak-kanak lain? <i>Did anyone ever tell you that when you were a small child, you would daydream or stare into space more than other children?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> 3. Mungkin / <i>Possible</i> (-7) TT (-9) EJ
CP03e	Pernakah anda alami pergerakan badan atau perasaan yang luar biasa apabila terdedah kepada kelipan lampu, permainan video atau silauan matahari? <i>Have you ever noticed any unusual body movements or feelings when exposed to strobe lights, video games, flickering lights, or sun glare?</i>	1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> 3. Mungkin / <i>Possible</i> (-7) TT (-9) EJ

CP03f	<p>Sejurus selepas bangun tidur, sama ada pada waktu pagi atau selepas lelap sebentar, pernahkah anda mengalami sentakan atau pergerakan kurang cermat yang tidak dapat dikawal, seperti barang terlepas atau terpelanting dari genggaman anda?</p> <p><i>Shortly after waking up, either in the morning or after a nap, have you ever noticed uncontrollable jerking or clumsiness, such as dropping things or things suddenly "flying" from your hands?</i></p>	<p>1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> 3. Mungkin / <i>Possible</i></p> <p style="text-align: right;">(-7) TT (-9) EJ</p>
CP03g	<p>Pernahkah anda mengalami sebarang kejadian luar biasa dan berulang yang lain?</p> <p><i>Have you ever had any other type of repeated unusual spells?</i></p>	<p>1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> 3. Mungkin / <i>Possible</i></p> <p style="text-align: right;">(-7) TT (-9) EJ</p>
CP04	<p>Pernahkah anda mengambil ubat untuk sawan?</p> <p><i>Have you ever taken medications for seizures?</i></p>	<p>1. Ya / <i>Yes</i> 2. Tidak / <i>No</i> 3. Mungkin / <i>Possible</i></p> <p style="text-align: right;">(-7) TT (-9) EJ</p>
CP05	<p>Tanya soalan berikut hanya jika responden menjawab "Ya" atau "Mungkin" kepada mana-mana soalan di dalam Modul ini (CP01-CP04).</p> <p>Oleh sebab anda telah menjawab "Ya" atau "Mungkin" kepada sekurang-kurangnya satu soalan di dalam Modul ini, pasukan penyelidik ingin menghubungi anda melalui telefon untuk bertanya beberapa soalan lanjut untuk saringan epilepsi. Adakah anda bersetuju untuk dihubungi?</p> <p><i>As you have answered "Yes" or "Possible" to at least one question in this Module, the research team would like to contact you by telephone to ask some further questions to screen for epilepsy. Do you agree to be contacted?</i></p>	<p>1. Ya, saya bersetuju untuk dihubungi di nombor berikut: <i>Yes, I agree to be contacted at the following number:</i></p> <div style="border: 1px solid black; height: 20px; width: 100%;"></div> <p>[Sekiranya ruangan ini diisi, sila pastikan responden menandatangani <i>Borang Persetujuan Saringan Epilepsi</i>]. Adakah ini nombor telefon responden sendiri? <i>Is this the respondent's own telephone number?</i></p> <ul style="list-style-type: none"> • Ya / <i>Yes</i> • Tidak – sila nyatakan hubungan pemilik nombor telefon kepada respondent: <i>No – please state phone number owner's relationship to respondent:</i> <div style="border: 1px solid black; height: 20px; width: 100%;"></div> <p>2. Maaf, saya tidak mahu dihubungi. <i>Sorry, I do not wish to be contacted.</i></p>

* Frasa [Selain daripada sawan yang anda mengalami disebabkan oleh demam panas] hanya disertakan sekiranya responden menjawab "Ya" atau "Mungkin" bagi soalan CP01.

* *Phrase "Other than the seizure[s] you had because of a high fever" added only if subject responded "Yes" or "Possible" to CP01.*

NHMS 2019

Code Book

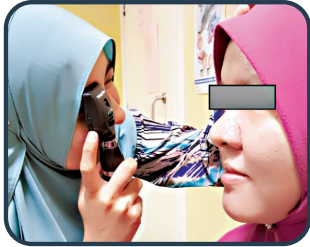


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Kementerian Kesihatan Malaysia

NHMS 2019

Non- Communicable Diseases

NCD

Gambar Modul CA – Rawatan Mata

		
<p>Fundus Examination using Direct Ophthalmoscope</p>	<p>Fundus Examination using Slit Lamp</p>	<p>Fundus Examination using Non-Mydriatic Fundus Camera</p>

Gambar Modul CE -Rokok





		
<p>Cop rasmi cukai</p>	<p>Amaran</p>	<p>Maklumat mengenai 4000 bahan kimia</p>
		
<p>Maklumat tidak boleh jual kepada individu dibawah umur</p>	<p>Nama dan alamat pengilang/pembekal</p>	







Jenis – jenis produk tembakau tanpa asap		
		
Rokok elektronik	Mengunyah Tembakau	Menghidu Tembakau

Gambar Modul CJ – Amalan Pemakanan

CJ1 Kopi atau Teh

			
1 cawan = 200 ml	1 gelas kecil (300 ml) = 1.5 cawan	1 gelas kecil (195 ml) = 1 cawan	1 gelas besar teh tarik (400 ml) = 1.5 cawan

CJ2 Sukatan Gula

			
1 sudu teh = 5g	1 paket gula = 5g = 1 sudu teh gula	1 kiub gula = 5g = 1 sudu teh gula	1 sudu makan = 15g = 3 sudu teh gula

4 BUKU KOD
 Tinjauan Kebangsaan Kesihatan Dan Morbiditi 2019

Institut Kesihatan Umum
 Kementerian Kesihatan Malaysia

CJ3 Sukatan Susu Pekat Manis



1 sudu makan = 9g
= 3 sudu teh

CJ4 Sukatan Krimer



1 paket krimer = 5g
= 1 sudu teh

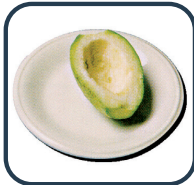





CJ5 Minuman Bercoklat / Bermalta		
		
1 gelas standard (250ml) = 1.25 cawan	200 ml = 1 cawan	190ml = 1 cawan
		
225 ml = 1.1 cawan	240 ml = 1.2 cawan	
CJ6 Minuman Pra Campur		
		
1 paket = 20-30g		











CJ7 Minuman Berkarbonat				
				
a = 200 ml = 0.8 gelas	b = 325 ml = 1.3 gelas	c = 390 ml = 1.6 gelas	d = 500 ml = 2 gelas	400 ml = 1.6 gelas
CJ8 Minuman BUKAN Berkarbonat				
				
250 ml = 1 gelas	355 ml = 1.4 gelas	330 ml = 1.3 gelas	250 ml = 1 gelas	
				
300 ml = 1.2 gelas	500 ml = 2 gelas	200 ml = 0.8 gelas		

CJ9 Pinggan sihat Malaysia / Suku Suku Separuh



CJ10 Buah-buahan
Sukatan 1 Hidangan Buah

			
0.5 biji buah jambu batu = 1 hidangan	0.5 biji buah naga = 1 hidangan	1 biji epal = 1 hidangan	1 biji oren = 1 hidangan
			
2 biji pisang = 1 hidangan	2 biji ciku = 1 hidangan	2 biji belimbing = 1 hidangan	1 potong betik = 1 hidangan

			
1 potong tembikai = 1 hidangan	3 ulas durian = 1 hidangan	4 ulas cempedak = 1 hidangan	7 biji rambutan = 1 hidangan
			
8 biji longan = 1 hidangan		8 biji anggur = 1 hidangan	
CJ11 Sayur – Sayuran Sukatn 1 hidangan sayur dimasak			
			
0.5 cawan teh sayur dimasak = 1 hidangan		4 sudu makan sayur dimasak = 1 hidangan	1 senduk sayur dimasak = 1 hidangan

Sukatan 1 hidangan sayur tidak dimasak



1 cawan ulam / salad / sayur mentah
 = 1 hidangan

CJ12 Sukatan air kosong



1 gelas
 = 250ml



A: 1 botol besar (1500ml) = 6 gelas
 B: 1 botol kecil (500ml) = 2 gelas
 C: 1 cawan plastik (325ml) = 1.3 gelas










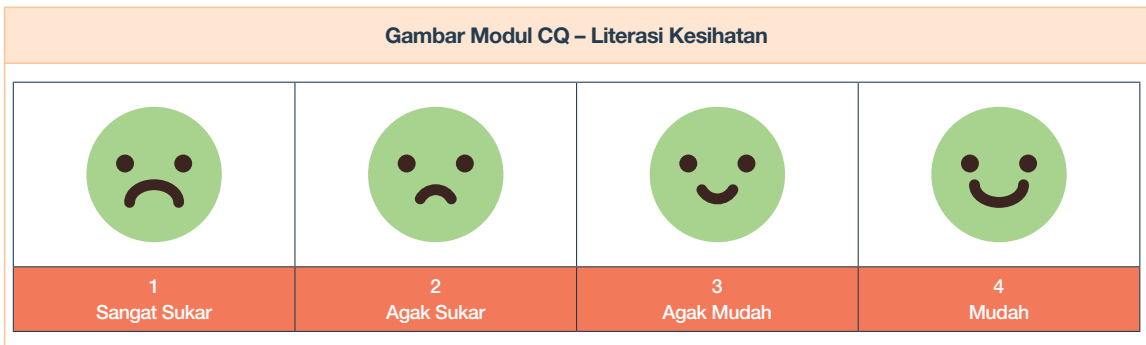
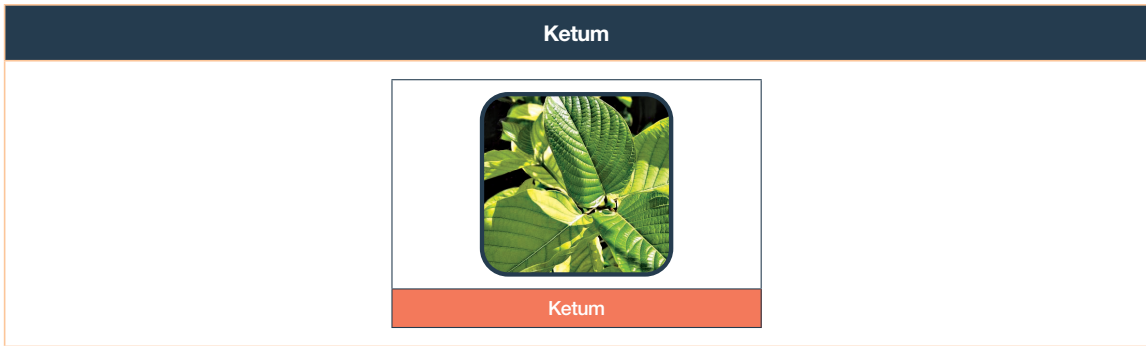
A/B/C: 250ml = 1 gelas
 D: 300ml = 1.2 gelas
 E: 400ml = 1.6 gelas



A/E/F: 200ml = 0.8 gelas
 B/D: 300ml = 1.2 gelas
 C: 350ml = 1.4 gelas

Gambar Modul CF – Alkohol		
CF1		
		
320 ml (1inci) bir Kandungan alcohol >2% dan <10%	140 ml wain merah Kandungan alcohol 7% hingga 15%	150 ml wain kelapa / bahar Kandungan alcohol 7% hingga 15%
		
100 ml wain kelapa / lihing Kandungan alcohol 7% hingga 15%	30 ml Montoku Kandungan alcohol > 30%	30 ml Langkau / Wain beras/ Brendi Wiski Kandungan alcohol > 30%
Gambar Modul CG – Literasi Kesihatan		
Opiod		
		
Heroin	Morfin	

Ganja			
			
Ganja			
Amfetamin /Metamfetamin			
			
Kristal Meth / Ice	Pil kuda /Yaba	Syabu	Ectacy
Inhalan			
			
Pelarut mudah meruap	Aerosol		



Gambar Modul CM – Kehilangan Upaya



Alat bantuan pendengaran

Alat bantuan untuk membantu bergerak atau menjaga diri sendiri



Kasut Ortopedik



Anggota palsu (tangan / kaki)



Topang



Kerusi Roda



Tongkat



Alat bantuan berjalan



Skuter



Pendakap



Alat bantuan untuk membantu mengingat atau menumpukan perhatian aktiviti harian



Alat bantuan untuk berkomunikasi		
		
Papan Komunikasi	Perisian komunikasi	Pemain audio dengan pensintesis suara
		
Alat komunikasi untuk pekak/buta	Paparan Braille	Teknologi isyarat ke suara

Appendix 9

Summary of Publicity Activities and Samples of Publicity Materials

Summary of Publicity Activities

Date/Time Period	Activity Description
April 2019 – September 2019	Regular updates posted throughout the survey period on our Instagram (instagram.com/nhms.iku) and Facebook (www.facebook.com/nhms.iku) pages.
May 2019	A subdomain for NHMS was launched on the IKU website (http://iku.gov.my/nhms), along with a dedicated portal for respondents to verify the identities of the interviewers calling at their door by checking their photos and information on http://iku.gov.my/verify . This has helped to convince some respondents that the interviewer teams are not scammers in disguise as health workers or other government officials—a common concern in many urban communities these days.
30 May 2019	Press statement released by the Director-General of Health, Datuk Dr. Noor Hisham bin Abdullah announcing the upcoming NHMS 2019 through his official website ‘From the Desk of the Director-General of Health Malaysia’ and social media channels.
25 June 2019	Dr. Shubash Shander Ganapathy and Ahmad Ali Bin Zainuddin were interviewed live on BFM89.9 for their programme “The Bigger Picture”. Listen to the interview at https://bit.ly/2JyvZFj
27 June 2019	Live radio interview on AiFM with Dr. Tan Ee Hong and Cheong Siew Man representing the NHMS 2019 team. Listen to the interview at https://bit.ly/2JyrWJO
3 July 2019	Dr. Shubash Shander Ganapathy and Logeswary Krisnan made a guest appearance on the television programme ‘Vizhuthugal’ (Astro Vaanavil and Astro Vinmeen HD) to answer questions about NHMS 2019.
4 July 2019	Dr. Shubash Shander Ganapathy and Dr. Ainul Nadziha Binti Mohd Hanafiah were interviewed live on ‘Selamat Pagi Malaysia’, RTM TV1. Watch the interview here: https://bit.ly/2Nkqvim
17 July 2019	An animated, easy-to-understand explainer video is released to further promote the survey. Respondents whom we successfully interviewed were encouraged to circulate the video in their local community or residents’ WhatsApp groups to encourage participation in the survey.
4 August 2019	Dr. Tan Ee Hong and Cheong Siew Man made a guest appearance on the television programme ‘What Say You’, RTM TV2 to answer questions about NHMS 2019.
23 August 2019	NHMS 2019 is featured on the front page of The Star Metro (Klang Valley edition)
26 August 2019	NHMS 2019 is featured in The Star Metro, Southern Region (Johor, Melaka and Negeri Sembilan).
8 September 2019	Our diligent Principal Investigator, Dr. Shubash Shander Ganapathy once again appears on television as a guest on ‘Vasantham’, TV2 discussing the topic of “Ageing Society” and promoting NHMS 2019.

Samples of Publicity Materials

Information pamphlet

Siapakah yang menjalankan tinjauan ini dan apakah tujuannya?

Tinjauan ini dikendalikan oleh Institut Kesihatan Umum (IKU). Maklumat daripada tinjauan ini akan membantu Kementerian Kesihatan Malaysia merancang perkhidmatan kesihatan yang lebih berkesan.

Kami mengharapkan kerjasama anda untuk menjayakan tinjauan ini. Sertailah tinjauan ini dan bantu kami tingkatkan lagi taraf kesihatan rakyat Malaysia.

Terima kasih.

Who is carrying out the survey and why?

Institut Kesihatan Umum (IKU), or the Institute of Public Health, is carrying out this survey. The information collected will help the Ministry of Health Malaysia plan more effective health services for the future.

We rely on the goodwill and co-operation of people like you to make the study a success. Please take part and help us to make a difference to the health of the people in Malaysia.

Thank you.

Isi rumah anda telah terpilih secara rawak untuk tinjauan ini.

Apakah perkara selanjutnya?

Pasukan penemuramah terlatih dari IKU akan melawat rumah anda antara bulan Julai - September 2019. Untuk makluman lanjut sila layari laman web berikut:

iku.gov.my/nhms

What's next?

A team of trained interviewers from IKU will visit at your address sometime in July - September 2019. Meanwhile, you can learn more about the survey at our website:

PENGANTARAN RINGKAS

Tinjauan Kebangsaan Kesihatan dan Morbiditi 2019

A BRIEF INTRODUCTION TO THE

National Health and Morbidity Survey (NHMS) 2019

Kami menemuramah lebih kurang 30,000 orang di seluruh negara setiap 4 tahun.

Penyertaan anda dalam tinjauan ini adalah secara sukarela dan segala maklumat peribadi anda yang diperolehi dalam tinjauan ini akan disimpan dan dikendalikan secara sulit.

We interview around 30,000 people all over the country every 4 years.

Everything is done with voluntary co-operation and with full respect for your privacy.

Berdasarkan tinjauan yang lepas* kami menganggarkan bahawa di Malaysia...

Based on the previous survey* we estimated that in Malaysia, around...

1 dalam 6 dewasa menghidap penyakit kencing manis.

1 in 6 adults have diabetes.

Hanya 1 dalam 17 dewasa makan buah-buahan dan sayur-sayuran seperti yang disarankan.

Only 1 in 17 adults eat the recommended daily intake of fruit and vegetables.

1 dalam 3 dewasa menghidap tekanan darah tinggi.

1 in 3 adults have high blood pressure.

1 dalam 13 dewasa minum minuman beralkohol.

1 in 13 adults are current alcohol drinkers.

1 dalam 4 dewasa merokok.

1 in 4 adults are current smokers.

1 dalam 2 dewasa mempunyai tahap kolesterol yang tinggi.

1 in 2 adults have high cholesterol.

Hampir 1 dalam 3 dewasa berumur 16 tahun dan ke atas

Almost 1 in 3 adults aged 16 years and above

dan 1 dalam 8 kanak-kanak dari 5 hingga bawah-16 thn

and 1 in 8 children from age 5 to below-16

1 dalam 3 dewasa tidak mencukupi aktiviti fizikal yang disarankan.

1 in 3 adults do not meet the recommended levels of physical activity.

disyaki mengalami masalah kesihatan mental

were suspected to have mental health problems

* National Health and Morbidity Survey (NHMS), 2015

Survey poster


Ministry of Health Malaysia


INSTITUTE FOR PUBLIC HEALTH

Tinjauan Kebangsaan Kesihatan dan Morbiditi 2019

National Health and Morbidity Survey (NHMS) 2019

April - September

iku.gov.my/nhms

  @nhms.iku

Institut Kesihatan Umum (IKU)
Kompleks Institut Kesihatan Negara (NIH)
No.1, Jalan Setia Murni U13/52
Seksyen U13, Setia Alam
40170 Shah Alam, Selangor

NHMS Hotline: 03-33628793
Email: nhms.iku@moh.gov.my

Tri-lingual promotional banner



The banner features a light beige background with a white box containing the text 'NHMS 2019'. Above the box are the logos of the Ministry of Health Malaysia and the Institute for Public Health (iku). Below the box, the survey title is written in three languages: Malay, Chinese, and Tamil. The dates 'Julai - September 2019' are displayed in orange, followed by the website 'iku.gov.my/nhms' in a white box. Social media icons for Facebook, Instagram, and Twitter are shown next to the hotline number '03-3362 8793' and the handle '@nhms.iku'.

Sertailah tinjauan NHMS dan bersama tingkatkan taraf kesihatan Malaysia.

参加 NHMS 调查，共同改善国家的健康状况。

NHMS கணக்கெடுப்பில் சேரவும் மற்றும் தேசிய சுகாதாரத்தை மேம்படுத்தவும்.

NHMS 2019

**TINJAUAN KEBANGSAAN KESIHATAN DAN MORBIDITI 2019:
PENYAKIT TIDAK BERJANGKIT DAN PERMINTAAN JAGAAN KESIHATAN**

**NATIONAL HEALTH AND MORBIDITY SURVEY 2019:
NON-COMMUNICABLE DISEASES AND HEALTHCARE DEMAND**

Julai - September 2019

iku.gov.my/nhms

Hotline: 03-3362 8793    @nhms.iku

Sticker for team vehicles



The sticker features a light beige background with a white box containing the text 'NHMS 2019'. Above the box are the logos of the Ministry of Health Malaysia and the Institute for Public Health (iku). Below the box, the survey title is written in three languages: Malay, Chinese, and Tamil. The dates 'Julai - September 2019' are displayed in dark blue. The website 'iku.gov.my/nhms' is in a white box, followed by social media icons for Facebook, Instagram, and Twitter, and the handle '@nhms.iku'. The bottom section contains the full address of the Institut Kesihatan Umum (IKU) and contact information for the NHMS hotline and email.

NHMS 2019

**TINJAUAN KEBANGSAAN KESIHATAN DAN MORBIDITI 2019:
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No.1, Jalan Setia Murni U13/S2
Seksyen U13, Setia Alam, 40170 Shah Alam, Selangor

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Star Metro feature, discussing NHMS 2018 findings and capturing the NHMS 2019 team in action

StarMetro GREATER KLANG VALLEY

THE STAR, FRIDAY 23 AUGUST 2019 (03) 7967 1388 ext 1706/1323/1496 (Editorial) metro@thestar.com.my (03) 7966 8388 (Advertising) (03) 7966 8200 (Classified)

NEWS
Two massage parlours sealed by MPSJ in raid >4

EVENTS
Hainan association holds competition for Chinese orchestras >12

SPORTS
UTP rugby teams making an impact in Super 10s >24

No shine in golden years

A survey among senior citizens has collected invaluable data, including the fact that over 30% of them say they lack social support. The information will help government and other relevant bodies draft better policies to ensure quality life for the elderly. >2&3

Detailed look: National Health and Morbidity Survey interviewer Syahiroh Said (right) and nurse Nur Syakira Hazwani Mohamad Rudian explaining to a respondent details of the survey being carried out. ONG SOON HIN/The Star

2 News
EMERGENCY 22 AUGUST 2019
NEWS 3

Stannetro Watch

ROAD CLOSURES
 Road closures will be in place for the National Health and Morbidity Survey (NHMS) 2019. The survey is a nationwide survey of the health and well-being of the Malaysian population. The survey is being conducted by the National Health and Morbidity Survey (NHMS) 2019. The survey is being conducted by the National Health and Morbidity Survey (NHMS) 2019. The survey is being conducted by the National Health and Morbidity Survey (NHMS) 2019.

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Looking after our elderly

Annual survey examines their health to enable formulation of better policies

By SHEILA DE FEYTA

As the population ages, it is important to ensure that the elderly are healthy and active. The National Health and Morbidity Survey (NHMS) 2019 is a nationwide survey of the health and well-being of the Malaysian population. The survey is being conducted by the National Health and Morbidity Survey (NHMS) 2019. The survey is being conducted by the National Health and Morbidity Survey (NHMS) 2019.

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Photo left: Nur Hafizah Ahmad Sabhan, Suzainah Saif, Casey Gan, Syed Muhammad Ridwan and Nur Nabila are among the trained data collectors from the Health Ministry conducting the National Health and Morbidity Survey at the Sri Sri Nageswara Temple in Bandar Baru Banting.

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Ministry of Health Malaysia



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