

Less  
Salt!!

**POPULATION-BASED SALT INTAKE SURVEY  
TO SUPPORT THE NATIONAL SALT  
REDUCTION PROGRAMME FOR MALAYSIA**

**(MALAYSIAN COMMUNITY SALT SURVEY – MyCoSS)**

**PROJECT NO: NMRR-17-423-34969**

**Institute for Public Health  
MINISTRY OF HEALTH MALAYSIA  
2019**



**RESEARCH TECHNICAL REPORT**

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## **INTRODUCTION**

The Non-Communicable Disease Global Monitoring Framework has included daily intake of salt (sodium chloride) among adult population aged 18 years and above as one of the indicators. Monitoring of the population salt intake has to be done and reported every five years to the United Nations General Assembly in New York, starting from 2015 [1]. The Ministry of Health Malaysia started a salt reduction initiative since 2010, which intended to educate, encourage and collaborate with the relevant stakeholders towards reducing salt consumption among the Malaysian adults targeting 30% of the population intake by year 2015, in line with WHO recommendation.

There are few studies on determination of sodium intake been conducted in Malaysia, i.e. among health workers (in 2012 and 2015) and others using small samples. It cannot be generalised to the wider population [2,3]. Hence, the Malaysian Community Salt Survey (MyCoSS) was conducted to determine the level of sodium intake, main sources of sodium in the diet, and knowledge, attitude and practice (KAP) nationwide. Our research will provide key data which are urgently needed for the development and effective implementation of a national salt reduction programme in Malaysia.

MyCoSS was a cross-sectional population-based household survey. Participants aged more than 18 years old and residing in non-institutional living residences were included in the survey. Pregnant mothers, patients recently began diuretic therapy (<4 weeks), having menses during urine collection, those diagnosed to have chronic diseases (such as kidney disease, heart failure or liver disease), and having difficulty in collecting urine, were excluded from the study. To represent the Malaysian population, this survey conducted a stratified cluster sampling method. Sampling design covered both urban and rural areas for every state. Living quarters were randomly selected by the Department of Statistics Malaysia (DOSM). Only one participant was selected from a living quarter. If there were more than one eligible participant, selection was made using a modified Kish Table [4].

Data collection started from October 2017 and completed in March 2018. Data collections via face-to-face interviews were carried out at the participant's home using mobile tablets. Questionnaires consisted of personal information, medical and health history, physical activity, KAP and food frequency questionnaire (FFQ).

**a) Food frequency questionnaire (FFQ)**

Participants were interviewed using an adapted FFQ from a previous study among health staff in 2015. It listed 11 food groups with 104 food items which were frequently consumed or with high salt content ( $\geq 0.25\text{g}$  salt/serving or  $\geq 0.1\text{g}$  sodium/serving) [3]. Responses were recorded on daily or weekly or monthly frequency, as well as portions consumed.

**b) Knowledge, attitude and practice (KAP)**

The KAP questionnaire was adapted from the World Health Organization/Pan American Health Organization protocol for population level sodium determination [5]. Participants were assessed on knowledge (health problems related to high salt intake ('Yes' or 'No' responses), attitude (importance of salt consumption ('very important', 'important', 'not important' responses), amount of salt consumed ('little', 'right amount' or 'too much' responses), and practice in reducing sodium intake ('Yes' or 'No' responses).

**c) Anthropometry and blood pressure measurements**

Body weight was measured using a digital weighing scale (TANITA HD-319), and height was taken using SECA 213 stadiometer. Waist circumference was measured using SECA measuring tape (SECA, Germany). Body mass index (BMI) was categorized based on the WHO 1998 guideline [6]. Blood pressure was measured with a digital blood pressure monitor (Omron HBP-1300) and compared to the Malaysian Ministry of Health Guideline [7]

**d) 24-hour urine collection and analysis**

Participants were given both oral and printed instructions on how to accurately collect 24-hour urine, and provided with a 5-litre screw-capped plastic collection bottle, a urine collection jug, plastic carrier bags, a safety pin for attaching to underclothes and a poster (as a reminder for urine collection). The participants discarded the first urine of the day in the morning and collected all urine for the following 24 hours. The last collection was the first urination on the second day of collection. They recorded the beginning and end of 24-hour urine collection, and were instructed to notify any missed collection to the data collectors. Sodium and creatinine were analysed in a private laboratory. Incomplete 24-hour urine sample volume was determined as urinary creatinine  $< 4$  mmol/day for women or  $< 6$  mmol/day for men, 24-hour urine volume of  $< 500$  ml for either sex, and extreme

outliers for urinary creatinine (i.e. >3SDs from the mean) [8]. Sodium intake was then compared to the Malaysian dietary sodium of 2000 mg/day.

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## CHAPTER 1

# Sodium Intake Estimated from 24- Hour Urine Assessment

## **GENERAL OBJECTIVE**

To estimate dietary sodium intake assessed from 24-hour urine sodium among Malaysian adult population.

## **SPECIFIC OBJECTIVES**

1. To identify sodium intake by socio-demography factors
2. To identify sodium intake by urban and rural localities
3. To identify sodium intake by study characteristics

## **METHODOLOGY AND SAMPLING DESIGN**

### **Study design**

A cross sectional study, household survey.

### **Sample size**

Sample size was calculated using a formula for estimating population prevalence. The sample size calculation for determination of sodium intake was referred to the findings from the previous salt study among the health workers in Malaysia (MySalt 2015) [1]. Based on the mean sodium of 142 mmol, RSE of 0.05 and design effect 1.50, the estimated sample size for both stratum was 816 (including 50% of non-response).

### **Study population**

Malaysian citizen aged 18 years and above.

### **Study setting**

Urban and rural living quarters in all Malaysian states.

### **Study period**

October 2017 to March 2018.

### **Sampling design**

To ensure national representativeness, this cross-sectional study applied a stratified cluster sampling method. Sampling was designed to cover both urban and rural areas for every state in Malaysia. Sample size for each state was calculated proportionally to the state's population size (Table 1). Malaysia's geographical areas were separated into about 80,000 Enumeration Blocks (EB), consisting about 80 to 120 living quarters and 500 to 600 residents per EB. Each EB was

categorized based on the size of the population, i.e. urban (total population of >10,000 residents) or rural areas (population of <10,000 residents) [2].

The process of selecting a person started from a primary sampling unit (PSU), which was the cluster of the EBs to living quarters (LQs) to eligible persons and finally to sample the individual. The first stage sampling units (PSU) were selection of EBs, which was done by the DOSM. The second stage was the selection of LQs from all LQs in the selected EBs using random probability sampling. Twenty LQs were selected by DOSM from each selected EB considering the optimal cluster size with respect to cost, response rate and level of precision. Final stage was the random selection of the eligible LQ member from a roster of eligible LQ members by gender and aged 18 years and above. When there was more than one eligible adult living in the same LQ, only one will be selected using a modified Kish Table [3].

### **Inclusion criteria**

1. Malaysia citizen
2. Adults aged 18 years and above
3. Agree to participate in this study

### **Exclusion criteria**

1. Pregnant women
2. On recent diuretic therapy treatment (< 4 weeks)
3. Fasting on the day of urine collection
4. Having menses on the data collection day
5. Having difficulty to collect 24-hr urine

### **Study instruments**

1. Face to face interviews were carried out using mobile tablets based on the system developed for this study. Structured questionnaires were built in with responses of multiple-choice options, free text, numeric or alphanumeric answers.
2. Data were stored, backed-up in a secured digital card, sent to the institute's server and saved in the dataset folders according to the downloaded completion time.
3. Anthropometry measurements were done using validated and calibrated instruments. Body weight was measured using a digital weighing scale (TANITA HD-319) with an accuracy of 0.1 kg, and height was taken using SECA 213 stadiometer to the nearest 0.1

cm [4]. Waist circumference was measured using SECA measuring tape (SECA, Germany) to the nearest 0.1 cm. Measurements were done twice and the average was recorded as the final reading. Body mass index (BMI) was calculated as the ratio of weight in kilogram to the square of height in meter ( $\text{kg/m}^2$ ) and categorized based on the WHO 1998 guideline [5].

4. Blood pressure was measured with a digital blood pressure monitor (Omron HBP-1300). Measurements were done three times with one to two minutes interval between each measurement. The average of the last two readings was used in the analysis. Those who was previously diagnosed by a physician to have a persistent elevation of SBP  $\geq 140$  mmHg and/or DBP  $\geq 90$  mmHg was classified as hypertensive [6].
5. A single 24-hour urine sample was collected using urine collection kit comprising of a 5 litres screw-capped plastic bottle, an identification label, a urine collection jug, plastic carrier bag (for transporting the equipment away from home), a safety pin for attaching to underclothes and a poster (as a reminder for urine collection). Cool packs and cooler / polystyrene boxes were used to store the urine bottles before delivering it to the nearest ISO certified private laboratory. The report of samples were delivered online and assessed using a password restricted entrance.

## Data collection

1. The data collection for this study was conducted in two phases at the participant's home i.e. 1) Pre-data collection (scouting activity) and 2) Data collection (two visits).
2. Pre-data collection included scouting activities to obtain preliminary information about residential units that had been selected by the DOSM. Scouts were appointed among health staff working in the district health offices and scouting activities were done at least two weeks before the planned data collection date. The scouts located the LQs based on the list and EB maps provided by the DOSM. They approached the LQ members and informed about the survey (objectives of the study and procedures involved), distributed study pamphlets and screened the participants in the LQ based on the study criteria. All eligible participants' name, gender and age were listed in the scouting form (Appendix 1). The scouts tagged the LQ using a coloured scouting card to assist the data collection team in identifying the LQ (Appendix 2). A banner that highlighted the information of the study was placed at a strategic place in the selected EBs to publicise the study. Community leaders and related government agency (e.g., local police department) were informed about the commencement of the study.



3. The data collection (October 2017 to March 2018) involved four teams in Peninsular Malaysia and two teams in East Malaysia. Each team consisted of one team leader with nutrition or dietetic background, a research assistant and a driver. The researchers from Institute for Public Health were responsible to supervise the data collection activities.
4. There were two visits at each selected LQ during data collection. In the first visit, the study team approached the LQ members and introduce themselves. Details of the study procedure were explained. Consent form was documented if the selected LQ member agreed to participate in the study. Face to face interview on socio-demography status, medical status, anthropometry and blood pressure measurements were carried out in the first visit.
5. During the first visit, the study team members explained the detail procedure on 24-hr urine collection (Appendix 5). The participant decided the most suitable day to start collecting 24-hr urine collection. The 24-hr urine collection was completed as the participants collected their first urine on the second day visit.
6. The team members collected the 24-hr urine samples from the participants and labelled them (information on participant's name, identity code and time of urine collections) to send for analysis in the laboratory at the same day. The urine bottle was placed in a secured cooler / polystyrene box for transportation to the laboratory. Cool packs were placed in the cooler box to maintain the temperature at 4°C or less. Temperature of the cooler box was checked using a thermometer. Overall data collection process flowchart was inserted in Figure 1.1
7. The urine test for sodium was measured using the indirect ion-electrode method, whilst urinary creatinine was measured using Kinetic Jaffe method (alkaline picrate with Lloyd's reagent) using Architect C machine. Incomplete 24-hour urine sample was determined as urinary creatinine <4 mmol/day for women or <6 mmol/ day for men, 24-hour urine volume of <500 ml for both sexes, and extreme outliers for urinary creatinine (i.e. >3SDs from the mean) [7]. Conversion from mmol to grams was made by dividing by a factor of 17 and the conversion from sodium (Na) to salt (NaCl) by multiplying a factor of 2.542. The 24-hour urinary sodium excretion was then inflated 10% to account for losses in sweat and faeces. Sodium intake was then compared to the Malaysian dietary sodium of 2000 mg/day (or 5 gm salt or 1 tsp of salt).

## **Statistical analysis**

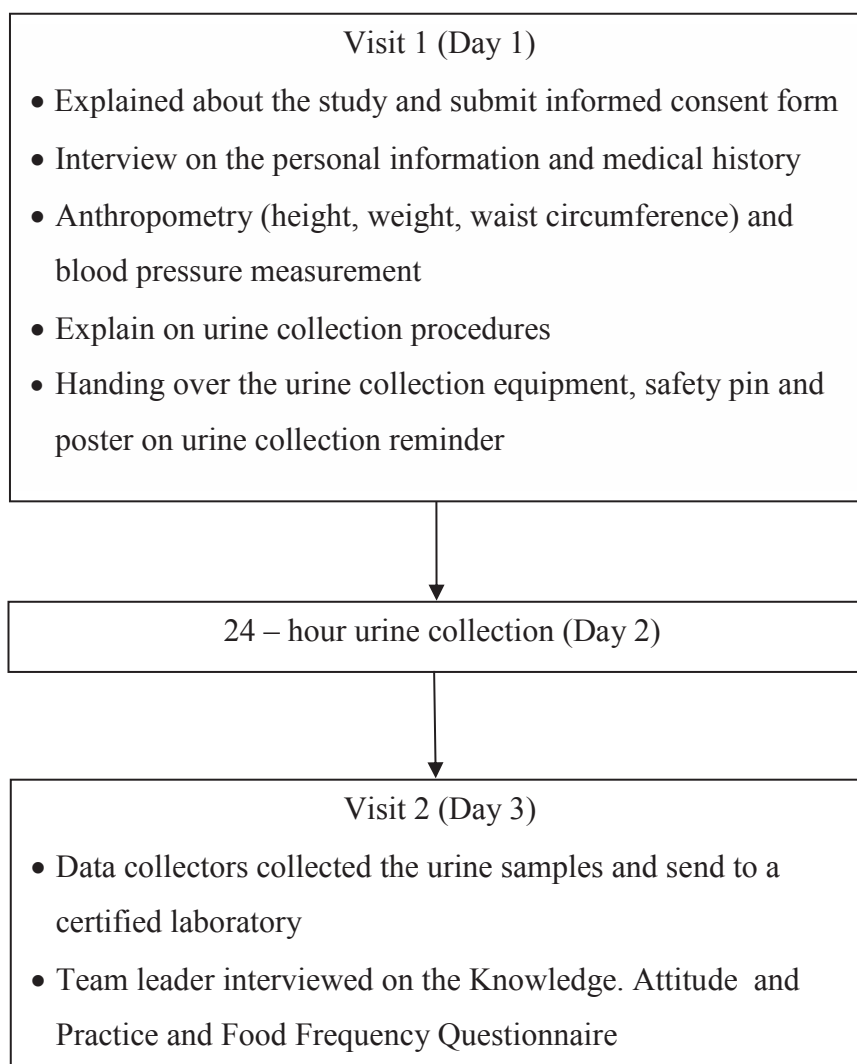
Data were analysed using IBM SPSS version 20. Sample weight was calculated by determining the base or design weight, and adjusted for study non-responses. The final weight used in the analysis was the post-stratification weight based on the Malaysian population of the study reference year. Since this study applied a complex sampling design, analysis was conducted accordingly with 95% confidence interval. Analysis was done according to the objectives of the study. For the determination of sodium intake, data were presented as mean mmol/day with 95% confidence intervals. Descriptive analysis was used to determine the level of sodium, creatinine, socio-demography status and anthropometry measurements. The intake of sodium by socio demography, localities and anthropometry measurement was done using cross tab analysis.

## **Ethics and dissemination**

Research team members explained on the background of the study and provided with an information sheet. Participants who agreed to participate in this study signed the consent form which included allowing the institute to keep their urine sample for future research. Participants were given a token in cash as an incentive for their effort and time spent for this study. A participant dummy identification was used for anonymity and confidentially.

## **Results**

Based on the biggest sample size calculated (KAP of 1300 samples), a total of 1047 participants were interviewed, but only 960 provided urine samples. A total of 798 from 960 participants had completed urine samples and fulfilled the creatinine assessment. The participants aged between 18 to 85 years old with a mean age of 49 years (95% CI: 47, 51). The mean weight was 67.8 kg (95% CI: 66.4, 69.3), with mean BMI of 26.6 kg/m<sup>2</sup> (95% CI: 26.0, 27.1). Mean waist circumference for male was 91.1 cm (95% CI: 89.4, 92.9) and female 88.6 cm (95% CI: 86.6, 90.5). Mean blood pressure was 135/80 mmHg (95% CI: 133/79, 137/81) (Table 1). Table 2 presents the mean 24-hour sodium intake level (mmol/day) by study characteristics of the participants (as corresponds by the 24-hour urinary excretion). The mean 24-hour urinary sodium intake was 3167 mg/day (95% CI: 2987, 3346), which corresponds to 138 mmol/day or 7.9 gram of salt or 1.6 teaspoon of salt. About 79% of Malaysian adult population consumed high sodium diet (Figure 1.2).



**Figure 1.1 Data collection flow chart**

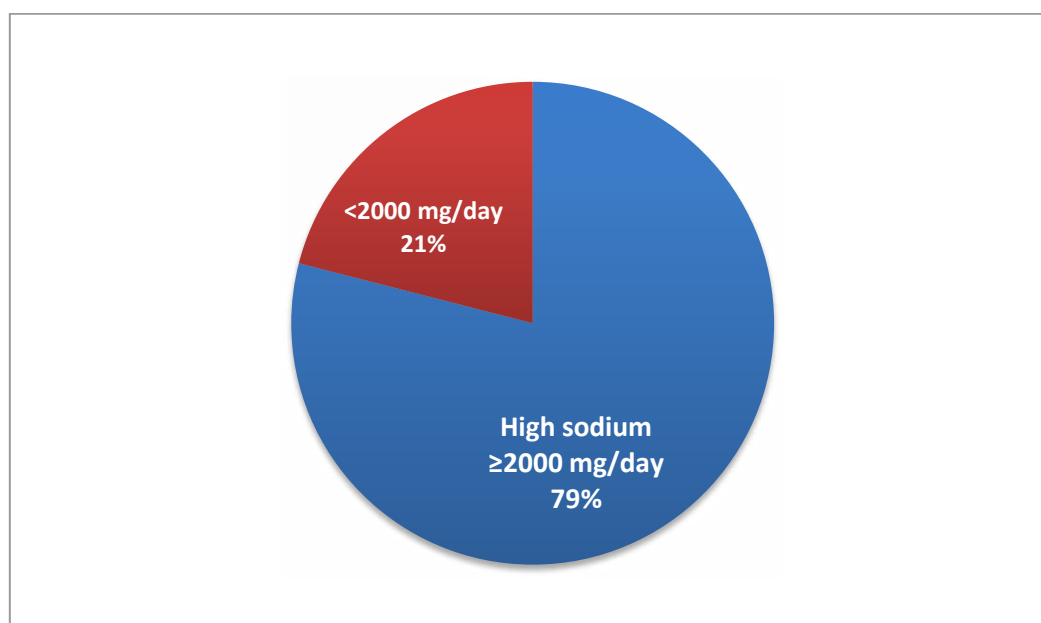
**Table 1.1 Participants characteristics (24-hour urinary collection)**

Study characteristics (n=798)	Mean	95% Confidence Interval	
		Lower	Upper
Age (years)	49	47	51
BMI (kg/m <sup>2</sup> )	26.6	26.0	27.1
Household Income (RM)	3479	2940	4018
Waist circumference-male (cm)	91.1	89.4	92.9
Waist circumference-female (cm)	88.6	86.6	90.5
Blood pressure (mmHg)	135/80	133/79	137/81

**Table 1.2 Mean 24-hour urinary sodium intake (mmol/day) by study characteristics**

Characteristics	Unweighted Count	Population Size	Mean	95% Confidence Interval	
				Lower	Upper
Malaysia	798	14243927	3167	2987	3346
Gender					
Male	340	7365184	3519	3209	3828
Female	458	6887075	2790	2650	2931
Age group (years)					
18-24	53	955086	3266	2748	3783
25-34	117	1983140	3556	3099	4013
35-44	130	2447950	3531	3083	3980
45-54	175	3160650	2955	2751	3159
55-64	190	3232280	3047	2790	3305
65+	133	2473153	2882	2507	3257
Location					
Urban	319	10809259	3254	3024	3483
Rural	479	3443000	2894	2746	3041
Ethnicity					
Malay	501	9480360	3214	2992	3436
Chinese	87	1681915	2926	2575	3278
Indian	44	1205438	3408	2399	4417
Bumiputera Sabah	89	1352484	2879	2489	3270
Bumiputera Sarawak	64	342464	2992	2740	3244
Others	13	189599	3772	2928	4616
Marital status					
Never married	93	1644183	3407	3060	3754
Married	594	11056754	3224	3018	3430
Separated	24	351593	2374	1812	2937
Widow/widower	86	1183117	2528	2223	2833
Household Income (RM)					
<1000	239	3357918	2943	2749	3137
1000-1999	153	2516305	3262	2901	3623
2000-2999	131	2284080	3162	2700	3624
3000-3999	90	1707701	2963	2487	3439
>4000	185	4386255	3365	3049	3682
Academic level					
None	64	731726	2729	2112	3346
Primary education	167	2587785	3051	2667	3436
Secondary education	383	7286332	3232	2987	3476
Tertiary education	184	3646416	3207	2956	3457
Occupation group					
Public sector	117	1988275	3326	2872	3780
Private sector	126	2451061	3338	2990	3686
Self-employed	179	3278506	3469	3038	3900
Housewives	214	3364461	2905	2722	3088
Unemployed	113	1943337	2887	2537	3237
Student	15	280201	2919	2183	3655

Others	34	946419	2919	2426	3411
Body Mass Index (kg/m <sup>2</sup> )					
Underweight	35	640115	2029	1698	2361
Normal	285	5009039	2877	2671	3082
Pre-obese	287	5350422	3285	3007	3562
Obese	191	3252684	3643	3216	4070
Blood Pressure (mmHg)					
<140/90	489	8986647	3180	2952	3408
≥140/90	309	5265613	3144	2927	3360
Waist Circumference (Male) (cm)					
<90	410	6945737	2811	2639	2982
≥90	387	7311322	3506	3233	3777
Waist Circumference (Female) (cm)					
<80	180	2866271	2675	2427	2923
≥80	620	11396476	3291	3098	3483



**Figure 1.2 Proportion of sodium consumption among the Malaysian adult population**

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## CHAPTER 2

# Knowledge, Attitude and Practice Towards Salt Intake

## **GENERAL OBJECTIVE**

To determine the knowledge, attitude and practice towards salt intake in the Malaysian population.

## **SPECIFIC OBJECTIVES**

1. To determine the knowledge on high salt diet and the associated health problem
2. To determine the attitude and perceived behavior towards dietary salt intake
3. To determine the practice on dietary salt intake during cooking and eating

## **METHODOLOGY AND SAMPLING DESIGN**

### **Study design**

A cross sectional study, household survey

### **Sample size**

Sample size was calculated using a formula for estimating population prevalence. Calculations were done on all objectives as listed, and the biggest sample size was derived from the objective of knowledge on the effect of high salt on health. The sample size calculation for knowledge, attitude and practice was referred to the findings from the previous salt study among the health workers in Malaysia (MySalt 2015) [1]. Based on the mean sodium of 142 mmol, RSE of 0.05 and design effect 1.50, the estimated sample size for both stratum was 816 (including 50% of non-response). Sample size was calculated based on prevalence of knowledge on high salt diet and effects on health of 60%; standard deviation of 94%, estimated design effect of 1.5 and non-response rate of 20%. The calculation gives a total of 650 of each stratum. Therefore, the total estimated sample size for this objective was 1300.

### **Study population**

Malaysian population aged 18 years and above.

### **Study setting**

Urban and rural living quarters in all Malaysian states

### **Study period**

October 2017 to March 2018

### **Sampling design**

To ensure national representativeness, this cross-sectional study applied a stratified cluster sampling method. Sampling was designed to cover both urban and rural areas for every state in



Malaysia. Sample size for each state was calculated proportionally to the state's population size (Table 1). Malaysia's geographical areas were separated into about 80,000 Enumeration Blocks (EB), consisting about 80 to 120 living quarters and 500 to 600 residents per EB. Each EB was categorized based on the size of the population, i.e. urban (total population of >10,000 residents) or rural areas (population of <10,000 residents) [2].

The process of selecting a person started from a primary sampling unit (PSU), which was the cluster of the EBs to living quarters (LQs) to eligible persons and finally to sample the individual. The first stage sampling units (PSU) were selection of EBs, which was done by the Department of Statistics Malaysia (DOSM). The second stage was the selection of LQs from all LQs in the selected EBs using random probability sampling. Twenty LQs were selected by DOSM from each selected EB considering the optimal cluster size with respect to cost, response rate and level of precision. Final stage was the random selection of the eligible LQ member from a roster of eligible LQ members by gender and aged 18 years and above. When there was more than one eligible adult living in the same LQ, only one will be selected using a modified Kish Table [3].

### **Inclusion and exclusion criteria**

As Chapter 1.

### **Study instruments**

1. The Knowledge, Attitude and Practice (KAP) questionnaire was adapted from the World Health Organization / Pan American Health Organization protocol for population level sodium status [4]. The English version of the questionnaire was translated into the Malaysian-Malay language by two independent translators and validated using back translation. The initial translation was then independently back-translated to English version to ensure the accuracy of the translation. Discrepancies were resolved, and content validity of the questions was checked with expert panel consensus, and then pre-tested among adults. The final version of the revised KAP questions was used in this study.
2. The knowledge component of the item was asked on health problems related to high salt intake with 'Yes' or 'No' responses. Attitude component was asked on importance of salt consumption with 'very important', 'important', 'not important' responses and amount of

salt consumed with 'little', 'right amount' or 'too much' responses. Practice component e was asked on whether they reduced sodium intake with a 'Yes' or 'No' response.

### **Data collection**

Research team members interviewed the participants using a system developed in mobile tablets on the second day of visit during data collection. Visual aids were used to assist the interview session.

### **Data analysis**

Data were analysed using SPSS version 22 (SPSS IBM, New York, U.S.A.). The complex sample design and weights factors were taken into account in all statistical analyses (as explained in Chapter 1). Descriptive statistic was used to determine KAP related to sodium intake.

### **Results**

Out of 1300 sample size calculated, a total of 1047 participants completed the KAP questionnaire (80.5% response). About 86.2% of the participants were aware that high salt diet could cause serious health problems. Heart diseases (87.9%) was the most known health risk caused by high salt diet, followed by kidney disease (35.6%), high blood pressure (30.7%), stomach cancer (23.3%), stroke (13.6%) and osteoporosis (9.2%). Only a few participants (4.7%) responded correctly that all diseases listed were contributed by high salt consumption (Figure 2.1).

Most of the participants (94.1%) thought salt reduction in diet is important. About 61.8% of them felt they had consumed the right amount of salt, followed with too little (22.2%), too much (14.7%) and don't know (1.2%).

In terms of dietary salt intake practices, 72.9% participants reported that they always add salt during cooking. About 47.7% of participants added salt / sauces / condiments to food at the table, and 55.4% of participants controlled their salt intake regularly. For those who controlled their salt intake regularly, the type of practices implemented were to avoid processed food (60.8%), no added salt at the table (60.5%), using low salt alternative (35.6%), avoid eating out (20.2%), read food label (13.0%), uses spices (2.4%) and no added salt during cooking (1.2%).

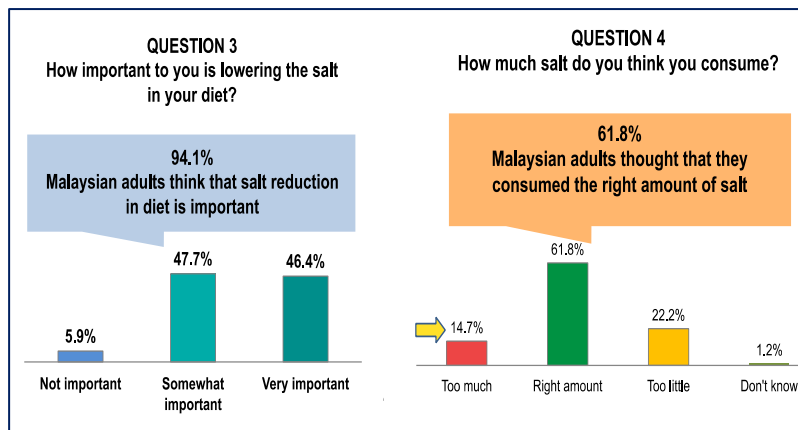
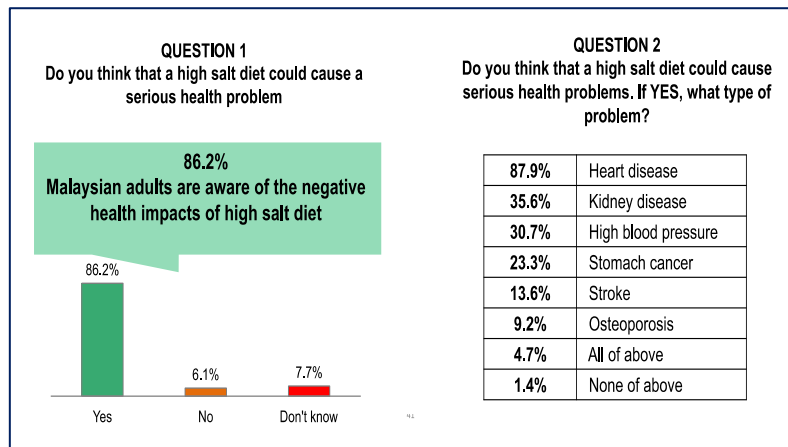


Figure 2.1 Knowledge and attitude towards dietary sodium intake

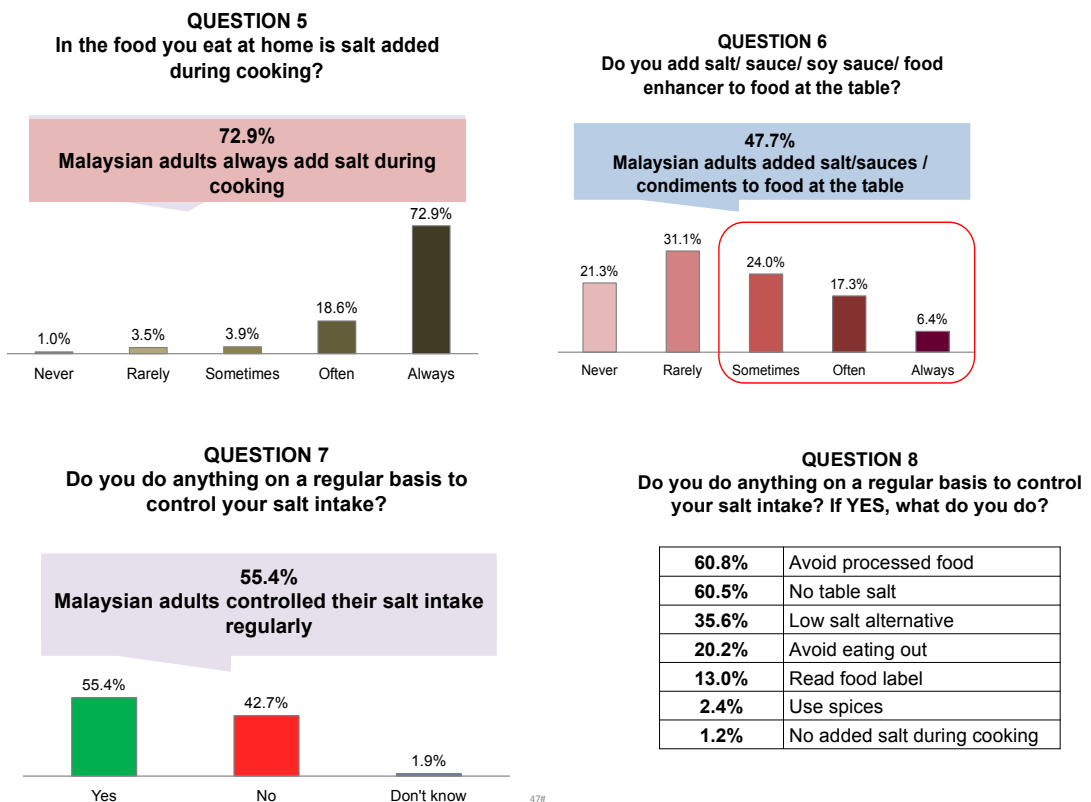


Figure 2.2 Practice on dietary sodium intake

**References:**

1. Institute for Public Health. National Institutes of Health, Ministry of Health Malaysia. Determination of Dietary Sodium Intake among the Ministry of Health Staff (MySalt 2015). MOH; Kuala Lumpur.
2. Department of Statistics Malaysia. Population Distribution and Basic Demographic Characteristics Malaysia. Department of Statistics 2011.
3. Kish L. Survey Sampling, Wiley and Sons, New York, 1965
4. WHO/PAHO Regional Expert Group for Cardiovascular Disease Prevention through Population wide Dietary Salt Reduction: Protocol for population level sodium determination in 24 hour urine samples. Geneva, Switzerland: World Health Organization, 2010.

## CHAPTER 3

# Determination of salt sources in food

## **GENERAL OBJECTIVE**

To determine the main sources of salt in the Malaysian diet

## **SPECIFIC OBJECTIVES**

1. To identify high salt food item that most frequently consumed by Malaysian adults.
2. To assess the intake of foods with highest sodium content per serving

## **METHODOLOGY AND SAMPLING DESIGN**

### **Study design**

Cross sectional study, household survey

### **Sample size**

Sample size was calculated based on prevalence on soy sauce consumption reported from Malaysia Adult Nutrition Survey, MANS 2014 [1], 23%; standard deviation, 77%; estimated design effect, 1.5; confidence level = 95% and non-response rate, 20%. The calculation gives a total of 583 of each stratum.

### **Study population**

Malaysian population aged 18 years and above

### **Study setting**

Urban and rural living quarters in all Malaysian states

### **Study period**

October 2017 to March 2018

### **Sampling design**

To ensure national representativeness, this cross-sectional study applied a stratified cluster sampling method. Sampling was designed to cover both urban and rural areas for every state in Malaysia. Sample size for each state was calculated proportionally to the state's population size (Table 1). Malaysia's geographical areas were separated into about 80,000 Enumeration Blocks (EB), consisting about 80 to 120 living quarters and 500 to 600 residents per EB. Each EB was categorized based on the size of the population, i.e. urban (total population of >10,000 residents) or rural areas (population of <10,000 residents) [2].

The process of selecting a person started from a primary sampling unit (PSU), which was the cluster of the EBs to living quarters (LQs) to eligible persons and finally to sample the individual. The first stage sampling units (PSU) were selection of EBs, which was done by the Department of Statistics Malaysia (DOSM). The second stage was the selection of LQs from all LQs in the selected EBs using random probability sampling. Twenty LQs were selected by DOSM from each selected EB considering the optimal cluster size with respect to cost, response rate and level of precision. Final stage was the random selection of the eligible LQ member from a roster of eligible LQ members by gender and aged 18 years and above. When there was more than one eligible adult living in the same LQ, only one will be selected using a modified Kish Table [3].

### **Inclusion and exclusion criteria**

As Chapter 1.

### **Study instrument**

Trained research team member interviewed the participants using a pre-tested and validated FFQ of 104 food items which were frequently consumed and with high salt content ( $\geq 0.25\text{g}$  salt/serving or  $\geq 0.1\text{g}$  sodium/serving). The FFQ was a bi-language version questionnaire (English and Malay language version) and adapted from a previous salt study in Malaysia [4]. Interviews were conducted on the usual pattern of food consumption of 11 food groups (meat and products, fish / seafood and products, eggs, spreads, local delicacies / breads, snacks, seasonings / flavourings / sauces, fast foods, cooked foods, other cooked foods and canned foods). Responses were recorded on daily or weekly or monthly frequency, as well as portions consumed. A food album was developed to assist participants in identifying food types in the FFQ. Household measurement utensils (cups, plates, spoons, etc.) were used to estimate portion sizes. Sodium intake was calculated using the formula:

$$(\text{Frequency of food item intake /day}) \times (\text{portion size in gram}) \times (\text{sodium content}/100 \text{ g})/100$$

### **Data collection**

Face to face FFQ interviews were done on second visit of the study using mobile tablets developed for this study. Visual aids featuring food images based on the food lists in the FFQ were used to assist the participants to recall the food they took for the past one-month.

## Data analyses

Data were analysed using SPSS version 22 (SPSS IBM, New York, U.S.A.). The complex sample design and weights factors were taken into account in all statistical analyses (as explained in Chapter 1). Descriptive statistic was used to determine the food item consumed.

## Results

Out of 1166 sample size calculated, a total of 1032 participants completed the FFQ questionnaire (88.5% response). This study found that top 10 high sodium most consumed food by Malaysian adults were fried vegetables, white/whole meal bread, omelets, fried chicken with spice, fried rice, nasi lemak, roti canai, fried meehoon, fried noodle and chicken curry (Table 3.1). The top 10 food items that contributed to highest sodium proportion intake were Mee kolok / Kampua, light soy sauce, curry noodle, vegetable with salted fish, fried vegetables, roti canai and fried rice (Table 3.2).

**Table 3.1 Top 5 high sodium food most consumed by Malaysian adults (N = 1032)**

No	Food items	Unweighted count	Estimated population	Population consumed %(95%CI)	mg sodium (per day) median(IQR)
1	Fried vegetable	870	16775456	86.4 (83.2, 89.0)	101.8 (44.1, 264.3)
2	White/ Whole meal bread	823	16674062	85.9 (83.1, 88.2)	59.3 (29.6, 118.6)
3	Omelette	796	15586616	80.3 (76.5, 83.5)	71.8 (35.9, 215.3)
4	Fried chicken with spices	713	14034531	72.3 (67.9, 76.2)	62.5 (29.2, 125.0)
5	Fried rice	683	13609154	70.1 (65.8, 74.0)	95.4 (44.5, 190.8)



**Table 3.2 Top 5 food sources (food item) with the highest sodium consumption among**

Malaysian adult (N=1032)

No	Food items	Unweighted count	Estimated population	Population consumed, % (95%CI)	mg sodium (per day), median(IQR)
1	Kolok mee/ Kampua mee	118	1749135	9.0 (6.2,13.0)	256.5 (171.0, 366.4)
2	Light soy sauce	351	6443736	33.2 (29.0,37.7)	248.1 (88.6, 630.4)
3	Curry noodle	155	3584403	18.5 (14.4,23.3)	164.2 (82.1, 246.4)
4	Vegetable with soy sauce/ oyster sauce	260	5234602	27.0 (23.3,30.9)	154.9 (51.6, 387.3)
5	Fried instant noodle	186	3754633	19.3 (15.6,23.8)	122.3 (61.2, 244.6)

**References:**

1. Institutes for Public Health (IPH) 2014. National Health and Morbidity Survey 2014: Malaysian Adult Nutrition Survey. Vol. 3: Food Consumption Statistics of Malaysia.
2. Department of Statistics Malaysia. Population Distribution and Basic Demographic Characteristics Malaysia. Department of Statistics 2011.
3. Kish L. Survey Sampling, Wiley and Sons, New York, 19654. Reliability, technical error of measurement and validity of height measurement using portable stadiometer. Baharudin A, Ahmad MH, Mahadir Naidu B, Hamzah NR, Mohd Zaki NA, Zainuddin AA, Mohd Nor NS. *Pertanika J Sc Tech.* 2017;25:675-686
4. Institute for Public Health. National Institutes of Health, Ministry of Health Malaysia. Determination of Dietary Sodium Intake among the Ministry of Health Staff (MySalt 2015). MOH; Kuala Lumpur



## Key Findings and Conclusion

## KEY FINDINGS

### 1. Salt intake among Malaysian

- Average salt intake among Malaysian adults was about 7.9 gram or 1.6 teaspoon per day.
- Every 4 of 5 Malaysia adults consumed higher salt intake than the WHO recommendation.

### 2. Knowledge, Attitude and Practice

- About 9 of 10 Malaysian adults were aware of the negative health impacts of high salt diet
- About 9 of 10 Malaysian adults thought that reducing salt in diet is important
- Every 3 of 5 Malaysian adults though that they consumed the right amount of salt in the diet.
- Every 7 of 10 Malaysian adults always add salt during cooking
- About half of Malaysian adults added salt/sauces/condiments to food at the table
- About half of Malaysian adults controlled their salt intake regularly

### 3. Determination of salt sources in food

- 4 of 5 most frequently consumed high sodium Malaysian food was a coked based dish.
- Top 5 food sources (food items) with the highest sodium consumption among Malaysian adults were kolok mee / kampua mee, light soy source, curry noodle, vegetable with soy sauce /oyster sauce and fried instant noodle.

## CONCLUSIONS

1. Salt intake among Malaysian adults was higher than WHO recommendation.
2. Malaysian's knowledge on negative impacts of high salt diet was good.
2. Dietary practices on salt control among Malaysian adults were low.
3. Major sodium contributor in the Malaysian diet was from cooked food.

# Appendix



## Appendix 5

### 24-HOUR URINE COLLECTION PROCEDURE

Please read the instructions carefully, make sure that you are prepared and follow each of the steps to ensure proper collection. This is important because the test result will be based on the total amount of tested substance excreted by your body over the 24 hour period. An incomplete sample may give misleading results.

#### A. PRE-COLLECTION

1. Respondents have to ensure all urine collection equipments are in a good condition as below:
  1. Two urine container 2.5 litres
  2. A spot urine collection bottle of 500 mls
  3. Plastic cups 300 ml (3 units)
  4. Nylon carrier bag (1 unit)
  5. Sticker label (2 pieces)
2. Respondents can collect the urine at any convenient day, whether it is at home / working day / off days
3. Should respondents have health problems that make it difficult for urine collection (such as fever, diarrhea etc), please inform the data collectors. The urine collection will be conducted on another day.
4. Respondent is forbidden to fast on the day of urine collection, as this will affect the amount of urine production.
5. Women should not collect urine on menses days.

#### B. COLLECTION DAY

- The data collector will contact you earlier to remind on the urine collection. A sticker will be given to attach to your inner garment. This is to remind you to collect urine.
- When you get up in the morning (Day 1), pass the first urine into the toilet. **DO NOT PUT YOUR FIRST URINE OF THE DAY INTO THE COLLECTION CONTAINER.**  
Urine collection should be started just after the time you have discard the first urine.  
Example: If you awaken at 6.00 am, urinate and discard the first urine. Collection begins at 6:05 a.m. **Record the time (e.g. 6:05 am) on the Collection Sheet – this is start time.**
- From then on please collect all of your urine for the next 24 hours including the day and night until THE FIRST URINE OF THE NEXT MORNING (Day 2).**  
Urinate directly into the plastic cup that you are given for this collection. For every urine collected, pour into the urine container and screw the cap tightly. Record the date and time on the label of the urine container.  
If you forgot to collect or spilled you urine, please record the date and time on the label.  
You should collect every drop of urine during the 24-hour period. It does not matter how much or little urine is passed each time, as long as every drop is collected.
- REMEMBER: There will be ONE SPOT URINE to be collected between 3.00 pm to 7.00 pm (Day 1).**

**REMEMBER: There will be ONE SPOT URINE to be collected between 3.00 pm to 7.00 pm (Day 1).**

Urinate directly into the plastic cup, and pour into the **SPOT URINE COLLECTION BOTTLE, NOT 24-HOUR URINE CONTAINER.**

Screw the cap tightly. Record the date and time on the label of the urine bottle.

Continue to collect your urine until the first urine the next day (Day 2). Pour the urine into the 24-hour collection container. This completes the 24-hour collection.

Please note both the date and time on the collection container and bottle (spot urine) AND at the bottom of the form where it says 'start day and time'.

If you need to open your bowels, always **remember to pass urine first** before you pass a stool. Try not to include feces with the urine collection. If feces does get mixed in, do not try to remove the feces from the urine collection bottle.

Make sure there are no polluting materials such as tissue in the urine sample.

Please note the exact time of the **final collection**, even if it is not the same time as when collection began on Day 1.

### Appendix 6: Urine collection tool kit



Urine Bottle (5 Litres)



Urine Collection Jug



Cooler / Polystyrene Box



Cooler Packs



Arrangement of urine samples in the Cooler / Polystyrene Box





## Appendix 7

### MODUL MAKLUMAT PERIBADI / PERSONAL INFORMATION LAWATAN 1

Neg\$	Neg\$	daer\$	daer\$	bp\$	bp\$	bp\$	strata\$	tk\$	tk\$	tk\$
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<p>A1 Tarikh temuduga / <i>Date</i></p> <p><input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p> <p style="text-align: center;">date month year</p> <p>A2 Nama / <i>Name</i></p> <p>A3 Alamat / <i>Address</i></p> <p>A4 No telefon / <i>Phone no</i> (12 maksimum)</p> <p><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"/></p> <p>A5 No Kad Pengenalan / <i>Identity card number</i></p> <p><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"/></p> <p>A6 Jantina / <i>Gender</i></p> <p><input type="checkbox"/> Lelaki / <i>Male</i> <input type="checkbox"/> Perempuan / <i>Female</i></p> <p>A7 Umur / <i>Age</i></p> <p><input type="text"/> <input type="text"/> <input type="text"/> Tahun / <i>Year</i></p> <p>Minimum : 18 years Maximum : 120</p> <p>A8 Pekerjaan / <i>Occupation</i></p> <p><input type="checkbox"/> Kakitangan Kerajaan / <i>Public sector</i></p> <p><input type="checkbox"/> Kakitangan Swasta / <i>Private sector</i></p> <p><input type="checkbox"/> Bekerja sendiri / <i>Self-employed</i></p> <p><input type="checkbox"/> Surirumah / <i>Housewife</i></p> <p><input type="checkbox"/> Tidak bekerja / <i>Unemployed</i></p> <p><input type="checkbox"/> Pelajar / <i>Student</i></p> <p><input type="checkbox"/> Lain-lain / <i>Others</i></p> <p>A9 Bangsa / <i>Ethnicity</i></p> <p><input type="checkbox"/> Melayu / <i>Malay</i></p> <p><input type="checkbox"/> China / <i>Chinese</i></p> <p><input type="checkbox"/> India / <i>Indian</i></p> <p><input type="checkbox"/> Bumiputera Sabah</p> <p><input type="checkbox"/> Bumiputera Sarawak</p> <p><input type="checkbox"/> Orang Asal</p> <p><input type="checkbox"/> Lain-lain / <i>others</i></p> <p>A10 Taraf perkahwinan / <i>Marital status</i></p> <p><input type="checkbox"/> Tidak berkahwin / <i>Never married</i></p> <p><input type="checkbox"/> Berkahwin / <i>Married</i></p> <p><input type="checkbox"/> Berpisah / <i>Separated</i></p> <p><input type="checkbox"/> Berceraai / <i>Divorcee</i></p> <p><input type="checkbox"/> Balu / Janda / <i>Widow/er</i></p> <p><input type="checkbox"/> Tinggal bersama / <i>Cohabiting</i></p> <p><input type="checkbox"/> Enggan jawab / <i>Refuse to answer</i></p> <p>A11 Tahap akademik tertinggi / <i>Highest academic qualification</i></p> <p><input type="checkbox"/> Tidak bersekolah</p> <p><input type="checkbox"/> Tahun 6 / <i>Year 6</i></p> <p><input type="checkbox"/> Tingkatan 3 / <i>Form 3</i></p> <p><input type="checkbox"/> Tingkatan 5 / <i>Form 5</i></p> <p><input type="checkbox"/> Tingkatan 6/Sijil/Diploma/ <i>Form 6/ Certificate/ Diploma</i></p> <p><input type="checkbox"/> Ijazah / <i>Degree</i></p> <p><input type="checkbox"/> Sarjana / <i>Master</i></p> <p><input type="checkbox"/> Doktor Falsafah / <i>PhD</i></p> <p><input type="checkbox"/> Lain-lain / <i>Others</i></p>	<p>A11 Tahap akademik tertinggi / <i>Highest academic qualification</i></p> <p><input type="checkbox"/> Tidak bersekolah</p> <p><input type="checkbox"/> Tahun 6 / <i>Year 6</i></p> <p><input type="checkbox"/> Tingkatan 3 / <i>Form 3</i></p> <p><input type="checkbox"/> Tingkatan 5 / <i>Form 5</i></p> <p><input type="checkbox"/> Tingkatan 6/Sijil/Diploma/ <i>Form 6/ Certificate/ Diploma</i></p> <p><input type="checkbox"/> Ijazah / <i>Degree</i></p> <p><input type="checkbox"/> Sarjana / <i>Master</i></p> <p><input type="checkbox"/> Doktor Falsafah / <i>PhD</i></p> <p><input type="checkbox"/> Lain-lain / <i>Others</i></p> <p>A12 Pendapatan individu sebulan</p> <p>Monthly <i>Individual income</i></p> <p>RM</p> <p><input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p> <p>(max limit : 999,999)</p> <p><input type="checkbox"/> Tidak tahu / <i>Do not know</i></p> <p><input type="checkbox"/> Enggan Jawab / <i>Refuse to answer</i></p> <p>A13 Pendapatan isirumah sebulan</p> <p>Monthly <i>Individual income</i></p> <p>RM</p> <p><input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p> <p>(max limit : 999,999)</p> <p><input type="checkbox"/> Tidak tahu / <i>Do not know</i></p> <p><input type="checkbox"/> Enggan Jawab / <i>Refuse to answer</i></p> <p>B1 Berat badan / <i>Body weight</i></p> <p>Min weight: 20 kg</p> <p>Max weight: 150 kg</p> <p><input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> kg <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> kg</p> <p>B2 Tinggi / <i>Height</i></p> <p>Max ht: 2.5 m</p> <p>Min ht: 0.80 m</p> <p><input type="text"/> . <input type="text"/> <input type="text"/> m <input type="text"/> . <input type="text"/> <input type="text"/> m</p> <p>B3 Ukurlilit pinggang / <i>Waist circumference</i></p> <p>Min Wc : 30 cm</p> <p>Max Wc : 180 cm</p> <p><input type="text"/> cm <input type="text"/> cm</p> <p>B4 Tekanan darah / <i>Blood pressure</i></p> <p>- Sistolik / <i>Systolic</i></p> <p>- Diastolic / <i>Diastolic</i></p> <p>Min systolic : 40</p> <p>Max systolic : 300</p> <p>Min Diastolic : 10</p> <p>Max Diastolic : 300</p> <p><input type="text"/> mmHg <input type="text"/> mmHg <input type="text"/> mmHg</p> <p><input type="text"/> mmHg <input type="text"/> mmHg <input type="text"/> mmHg</p>
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**MODUL C : SEJARAH PERUBATAN / MEDICAL HISTORY**

<p>C1. Pernahkah anda diberitahu oleh doktor/ penolong pegawai perubatan yang anda ada sakit jantung? <i>Have you ever been told by a doctor/ medical assistant that you have heart disease?</i></p>	<p>1 Ya/ <i>Yes</i> 2 Tidak/ <i>No</i> 77 TT/ <i>Do not know</i> 99 EJ</p>	<p>C9. Dalam 6 bulan lepas, dari... hingga hari ini, adakah anda mengambil herba/ ubat tradisional seperti ubat makjun, ubat ginseng, Tongkat Ali, Kacip Fatimah dll? <i>In the last 6 months, from... till today, have you taken any herbs/ traditional medicine such as 'Ubat Makjun', ginseng, 'Tongkat Ali', 'Kacip Fatimah' etc?.</i></p>	<p>1 Ya/ <i>Yes</i> Nama, tempoh ambil, bila terakhir ambil 2 Tidak/ <i>No</i> 77 TT/ <i>Do not know</i> 99 EJ</p>
<p>C2. Pernahkah anda diberitahu oleh doktor/ penolong pegawai perubatan yang anda ada angin ahmar/ strok? <i>Have you ever been told by a doctor/ medical assistant that you have stroke?</i></p>	<p>1 Ya/ <i>Yes</i> 2 Tidak/ <i>No</i> 77 TT/ <i>Do not know</i> 99 EJ</p>	<p>C10. Berapa kerap anda mengambil herba/ ubat tradisional tersebut? <i>How frequent do you take those herbs/ traditional medicine?</i></p> <p>1 Sekurang-kurangnya sekali sehari/ <i>At least once a day</i> 2 Sekurang-kurangnya sekali seminggu/ <i>At least one a week</i> 3 Sekurang-kurangnya sekali sebulan/ <i>At least once a month</i> 4 Kurang dari sebulan/ <i>Less than once a month</i> 77 TT/ <i>Do not know</i> 99 EJ</p>	
<p>C3. Pernahkah anda diberitahu oleh doktor ataupun penolong pegawai perubatan bahawa anda menghidap penyakit kencing manis atau diabetes? <i>Have you ever been told by a doctor/ Medical Assistant that you have diabetes?</i></p>	<p>1 Ya/ <i>Yes</i> 2 Tidak/ <i>No</i> 77 TT/ <i>Do not know</i> 99 EJ</p>	<p>C11. Dalam tempoh 2 minggu lepas, dari hari ini, adakah anda mengambil sebarang ubat diuretik seperti Lasix / Frusemide atau lain-lain ? <i>In the last 2 weeks, from... till today, have you taken any diuretic medicine such as Lasix / Frusemide or others?.</i></p>	
<p>C4. Pernahkah anda diberitahu oleh doktor ataupun penolong pegawai perubatan bahawa tekanan darah anda adalah tinggi? <i>Have you ever been told by a doctor or Assistant Medical Officer that you have raised blood pressure or hypertension?</i></p>	<p>1 Ya/ <i>Yes</i> 2 Tidak/ <i>No</i> 77 TT/ <i>Do not know</i> 99 EJ</p>	<p>C7. Adakah salah seorang daripada ahli keluarga (ibu bapa, adik beradik, datuk, nenek, sepupu, ibu bapa saudara) anda menghidap penyakit buah pinggang? <i>Have any of your family members (parents, siblings, grandparents, cousins, aunts, uncles) been diagnosed to have kidney disease?</i></p>	
<p>C5. Pernahkah anda diberitahu oleh doktor ataupun penolong pegawai perubatan bahawa paras kolesterol dalam darah anda adalah tinggi? <i>Have you ever been told by a doctor or Assistant Medical Officer that you have high cholesterol?</i></p>	<p>1 Ya/ <i>Yes</i> 2 Tidak/ <i>No</i> 77 TT/ <i>Do not know</i> 99 EJ</p>	<p>C12. Adakah anda mengamalkan sebarang diet khas seperti diet kencing manis, rendah kalori atau rendah garam ? <i>Do you practice any special diet such as diabetic diet, low calorie or low salt diet?</i></p>	
<p>C6. Pernahkah anda diberitahu oleh doktor/ pembantu perubatan yang anda ada penyakit buah pinggang? <i>Have you ever been told by a doctor/ medical assistant that you have kidney disease?</i></p>	<p>1 Ya/ <i>Yes</i> 2 Tidak/ <i>No</i> 77 TT/ <i>Do not know</i> 99 EJ</p>	<p>C8. Berapa kerap anda mengambil ubat tahan sakit? <i>How frequent do you take those painkillers?</i></p> <p>1 Sekurang-kurangnya sekali sehari/ <i>At least once a day</i> 2 Sekurang-kurangnya sekali seminggu/ <i>At least one a week</i> 3 Sekurang-kurangnya sekali sebulan/ <i>At least once a month</i> 4 Kurang dari sebulan/ <i>Less than once a month</i> 77 TT/ <i>Do not know</i> 99 EJ</p>	

**MODULE D– FAKTOR RISIKO INDIVIDU / PERSONAL RISK FACTORS**

Merokok/ <i>Smoking</i>	
D1. Pernahkah anda menghisap hookah/ shisha, rokok, cerut, paip, rokok daun, dll?  <i>Have you ever smoked shisha, cigarettes, cigars, pipes, etc. ( If no go to E1)</i>	1 Ya/ <i>Yes</i> 2 Tidak/ <i>No</i> 77 TT/ <i>Don't know</i>  99 EJ
D2. Adakah anda masih merokok?  <i>Do you currently smoke?</i>	1 Ya/ <i>Yes</i> 2 Tidak/ <i>No</i> 77 TT/ <i>Don't know</i>  99 EJ

**MODUL E - AKTIVITI FIZIKAL/ PHYSICAL ACTIVITY**

FIKIRKAN TENTANG AKTIVITI LASAK YANG ANDA LAKUKAN. <b>PLEASE NOTE THE VIGOROUS PHYSICAL ACTIVITY THAT YOU DO.</b>										
E1. Dalam tempoh 7 hari yang lepas, berapa hari/ah anda telah melakukan aktiviti fizikal lasak (contohnya mengangkat barang berat, mencangkul, senaman aerobic 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 (eg : carry heavy weights, till the earth, aerobic exercise or fast cycling and others) for at least 10 minutes per session?</i>	E2. 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>									
<table border="1"> <tr> <td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>EJ</td> </tr> </table> <p>hari seminggu/ <i>days in a week</i> If 0, EJ, jump to E3. Others E2</p>	0	1	2	3	4	5	6	7	EJ	<p>Minit/ <i>minute</i></p> <p>-7 TT/ <i>Do not know</i></p> <p><b>Min min : 0 minit</b> <b>Max mini : 1440</b></p>
0	1	2	3	4	5	6	7	EJ		

FIKIRKAN TENTANG AKTIVITI FIZIKAL SEDERHANA YANG ANDA LAKUKAN <b>PLEASE NOTE THE MODERATE PHYSICAL ACTIVITY THAT YOU DO.</b>										
E3. Dalam tempoh 7 hari yang lepas, berapa hari/ah 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 (eg : carry light weights, mop the floor, or normal rate of cycling and others) for at least 10 minutes per session? This does not including walking.</i>	E4. Pada hari anda 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>									
<table border="1"> <tr> <td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>EJ</td> </tr> </table> <p>hari seminggu/ <i>days in a week</i> If 0, EJ, jump to E5. Others E4</p>	0	1	2	3	4	5	6	7	EJ	<p>minit/ <i>minute</i></p> <p>-7 TT/ <i>Do not know</i> -9 EJ</p> <p><b>Min min : 0 minit</b> <b>Max mini : 1440</b></p>
0	1	2	3	4	5	6	7	EJ		

FIKIRKAN TENTANG AKTIVITI BERJALAN KAKI YANG ANDA LAKUKAN. <b>PLEASE NOTE THE WALKING THAT YOU DID.</b>										
E5. Dalam tempoh 7 hari yang lepas, berapa hari/ah anda telah sekurang-kurangnya berjalan kaki sekurang-kurangnya 10 minit pada suatu masa?  <i>In the past 7 days, how many days did you walk for at least 10 minutes at a time?</i>	E6. Pada salah satu daripada hari berkenaan. Berapakah masa yang anda gunakan untuk berjalan kaki?  <i>On one of those days, how much time did you spend walking?</i>									
<table border="1"> <tr> <td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>EJ</td> </tr> </table> <p>Hari seminggu/ <i>days in a week</i> <b>If 0, EJ, jump to E7. Others E6</b></p>	0	1	2	3	4	5	6	7	EJ	<p>Minit/ <i>minute</i></p> <p>-7 TT/ <i>Do not know</i> -9 EJ</p> <p><b>Min min : 0 minit</b> <b>Max mini : 1440</b></p>
0	1	2	3	4	5	6	7	EJ		

FIKIRKAN TENTANG MASA DUDUK ATAU BARING YANG ANDA LAKUKAN. <b>PLEASE NOTE THE SITTING AND LYING DOWN THAT YOU DID.</b>	
E7. Biasanya dalam sehari, berapa jam/ah anda gunakan untuk duduk atau berbaring termasuk di tempat kerja, di rumah, di waktu lapang dan semasa perjalanan. TETAPI TIDAK 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 time spent for sleeping?</i>	
<p>jam / <i>hour</i></p> <p>-7 TT/ <i>Do not know</i> -9 EJ</p> <p><b>Range : 0 – 24 hours</b></p>	

**MODULE F – PENGETAHUAN, SIKAP & AMALAN / KNOWLEDGE, ATTITUDE & PRACTICE**

F1. Adakah anda menambah garam/ sos/ kicap/ perisa makanan dalam makanan yang dihidang di atas meja?  
/ *Do you add salt / sauce / soy sauce / food enhancer to food at the table?*

Tidak pernah / <i>Never</i>
Jarang / <i>Rarely</i>
Kadang-kadang / <i>Sometimes</i>
Selalu / <i>Often</i>
Sentiasa / <i>Always</i>

F5. Jika anda jawab Ya pada soalan 4 di atas, apakah masalah kesihatan tersebut?  
/ *If Yes in 4 above, what sort of problem?*

Tekanan darah tinggi / <i>High blood pressure</i>
Angin ahmar / <i>Stroke</i>
Penyakit jantung / <i>Heart disease</i>
Osteoporosis
Kanser perut / <i>Stomach cancer</i>
Batu karang / <i>Kidney stones</i>
Tiada di atas / <i>None of the above</i>
Semua di atas / <i>All of the above</i>
Tidak tahu / <i>Don't know</i>
EJ / <i>Refused to answer</i>

F2. Dalam makanan yang anda makan di rumah, adakah garam ditambah semasa memasak?  
/ *In the food you eat at home salt is added in cooking*

Tidak pernah / <i>Never</i>
Jarang / <i>Rarely</i>
Kadang-kadang / <i>Sometimes</i>
Selalu / <i>Often</i>
Sentiasa / <i>Always</i>

F3. Berapa banyak garam yang anda rasa anda telah makan?  
/ *How much salt do you think you consume?*

Terlalu banyak / <i>Far too much</i>
Banyak / <i>Too much</i>
Dalam jumlah yang berpatutan / <i>Just the right amount</i>
Sedikit / <i>Too little</i>
Terlalu sedikit / <i>Far too little</i>
Tidak tahu / <i>Don't know</i>
EJ / <i>Refused to answer</i>

F6. Bagaimana pentingnya bagi anda untuk mengurangkan garam/ sodium dalam pemakanan anda?  
/ *How important to you is lowering the salt/sodium in your diet?*

Tidak penting sama sekali / <i>Not at all important</i>
Agak penting / <i>Somewhat important</i>
Sangat penting / <i>Very important</i>

F4. Adakah anda terfikir bahawa pemakanan yang tinggi garam boleh menyebabkan masalah kesihatan yang serius?  
/ *Do you think that a high salt diet could cause a serious health*

Ya / <i>Yes</i>
Tidak / <i>No</i>
Tidak tahu / <i>Don't know</i>
EJ / <i>Refused to answer</i>

F7. Adakah anda melakukan apa-apa tindakan secara rutin untuk mengawal pengambilan garam anda?  
/ *Do you do anything on a regular basis to control your salt or sodium intake?*

Ya (Sambung ke Soalan 8) / <i>Yes (Proceed to Question 8)</i>
Tidak (sambung ke soalan 9) / <i>No Proceed to Question 9</i>
Tidak tahu / <i>Don't know</i>
EJ / <i>Refused to answer</i>

F8. Jika anda jawab Ya pada soalan 7, apakah yang anda lakukan? Pilihan jawapan boleh lebih daripada satu / *If answer is Yes in 7 above, what do you do? Answer can be more than one*

Elak atau kurangkan pengambilan makanan berproses / <i>Avoid or minimize consumption of processed foods</i>
Baca label garam atau sodium pada pembungkus makanan / <i>Look at the salt or sodium labels on food</i>
Tidak menambah garam di meja makan / <i>Do not add salt at the table</i>
Beli pilihan makanan yang rendah garam / <i>Buy low salt alternatives</i>
Tidak menggunakan garam semasa memasak / <i>Do not add salt when cooking</i>
Menggunakan rempah bagi menggantikan garam semasa memasak / <i>Use spices other than salt when cooking</i>
Elak makan luar / <i>Avoid eating out</i>
Lain-lain / <i>Others (specify)</i>

F12. Kebiasaannya, di mana anda mendapat makanan tersebut? / *Where do you normally get the food from?*

Disediakan di rumah / <i>Home prepared</i>
Beli di restoran / <i>Buy from restaurant</i>
Beli di warung / <i>Buy from stall</i>
Beli di outlet makanan segera / <i>Buy from fast food outlet</i>
Beli di kiosk/trak makanan / <i>Buy from food kiosk/ food truck</i>
Beli di kafeteria atau kantin di tempat kerja / <i>Buy from cafeteria or canteen at workplace</i>
Lain-lain / <i>others</i>

F9. Kebiasaannya, dalam seminggu, berapa hari anda mengambil sarapan pagi? / *In a typical week, how many days do you take breakfast?*

1"	2"	3"	4"	5"	6"	7"
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F13. Kebiasaannya, dalam seminggu, berapa hari anda mengambil makan malam? / *In a typical week, how many days do you take dinner?*

1"	2"	3"	4"	5"	6"	7"
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F10. Kebiasaannya, di mana anda mendapat makanan tersebut? / *Where do you normally get the food from?*

Disediakan di rumah / <i>Home prepared</i>
Beli di restoran / <i>Buy from restaurant</i>
Beli di warung / <i>Buy from stall</i>
Beli di outlet makanan segera / <i>Buy from fast food outlet</i>
Beli di kiosk/trak makanan / <i>Buy from food kiosk/ food truck</i>
Beli di kafeteria atau kantin di tempat kerja / <i>Buy from cafeteria or canteen at workplace</i>
Lain-lain / <i>others</i>

F14. Kebiasaannya, di mana anda mendapat makanan tersebut? / *Where do you normally get the food from?*

Disediakan di rumah / <i>Home prepared</i>
Beli di restoran / <i>Buy from restaurant</i>
Beli di warung / <i>Buy from stall</i>
Beli di outlet makanan segera / <i>Buy from fast food outlet</i>
Beli di kiosk/trak makanan / <i>Buy from food kiosk/ food truck</i>
Beli di kafeteria atau kantin di tempat kerja / <i>Buy from cafeteria or canteen at workplace</i>
Lain-lain / <i>others</i>

F11. Kebiasaannya, dalam seminggu, berapa hari anda mengambil makan tengahari? / *In a typical week, how many days do you take lunch?*

1"	2"	3"	4"	5"	6"	7"
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**MODULE G – FOOD FREQUENCY QUESTIONNAIRE**

Bil	Type of Food	Frequency of Intake (Fill in one column only)			Quantity consumed	Serving Size
		Daily	Week	Month		
1	<b>Daging &amp; produk / Meat &amp; Products</b>					
101	Ayam panggang/ bakar / <i>Roasted/grilled chicken</i>					1 ketul sederhana / <i>1 medium piece</i>
102	Ayam goreng berempah / <i>Fried chicken with spices</i>					1 ketul sederhana / <i>1 medium piece!</i>
103	Ayam kari / <i>Chicken curry</i>					1 ketul sederhana / <i>1 medium piece!</i>
104	Ayam masak kicap / <i>Chicken cooked with soy sauce</i>					1 ketul sederhana / <i>1 medium piece!</i>
105	Ayam masak sambal / <i>Chicken cooked with chili sauce</i>					1 ketul sederhana / <i>1 medium piece</i>
106	Ayam rendang / <i>Spiced chicken rendang</i>					1 ketul sederhana / <i>1 medium piece</i>
107	Ayam sup / <i>Chicken soup</i>					1 mangkuk (B) / <i>1 bowl (B)</i>
108	Daging kari/ gulai <i>Meat curry/gulai</i>					1 ketul sederhana / <i>1 medium piece</i>
109	Daging masak kicap / <i>Meat cooked with soy sauce</i>					1 ketul sederhana / <i>1 medium piece</i>
110	Daging sup / <i>Beef soup</i>					1 mangkuk (B) / <i>1 bowl (B)</i>

Bil	Type of Food	Frequency of Intake (Fill in one column only)			Quantity consumed	Serving Size
		Daily	Week	Month		
1	<b>Daging &amp; produk / Meat &amp; Products</b>					
111	Daging rendang / <i>Meat rendang</i>					1 ketul sederhana / <i>1 medium piece</i>
112	Organ dalaman goreng / <i>Fried internal organ</i>					1 ketul sederhana / <i>1 medium piece!</i>
113	Sate ayam/ daging <i>Chicken/ meat satay</i>					1 cucuk / <i>1stick!</i>
114	Kepingan daging dimasinkan / <i>Ham, Luncheon etc</i>					1 keping sederhana / <i>1 medium piece!</i>
115	Tomyam / <i>Tomyam</i>					1 mangkuk (B) / <i>1 bowl (B)</i>
2	<b>Ikan/ makanan laut &amp; produk / Fish/ seafood and products</b>					
201	Bebola atau kek ikan, udang, sotong, ketam goreng/ <i>Fried fish, prawn, squid, crab ball / cake</i>					1 ketul/ bola  <i>/ 1 piece / ball</i>
202	Ikan sambal / <i>Fish cooked with sambal</i>					1 ketul sederhana / <i>1 medium piece</i>
203	Ikan bilis goreng / <i>Fried anchovies</i>					1 sudu makan / <i>1 dessert spoon</i>
204	Ikan bilis sambal tumis / <i>Fish anchovies (sambal)</i>					1 sudu makan / <i>1 dessert spoon</i>
205	Ikan masak kicap / <i>Fish cooked with soy sauce</i>					1 ekor atau ketul sederhana / <i>1 fish or medium piece</i>
206	Ikan masak masam manis / <i>Sweet and sour fish</i>					1 ekor atau ketul sederhana / <i>1 fish or medium piece</i>

Bil	Type of Food	Frequency of Intake (Fill in one column only)			Quantity consumed	Serving Size
		Daily	Week	Month		
207	Ikan masin / <i>Salted fish</i>					1 ketul kecil / <i>1 small piece</i>
208	Ikan bakar atau panggang / <i>Roasted or grilled fish</i>					1 ekor atau ketul sederhana / <i>1 fish or medium piece!</i>
209	Sup ikan / <i>Fish soup</i>					1 mangkuk (B) / <i>1 bowl (B)!</i>
210	Sotong atau udang goreng / <i>Fried squid/ prawn</i>					1 ketul sederhana / <i>1 medium piece!</i>
211	Sotong atau udang masak sambal / <i>Squid/ prawn cooked with sambal</i>					1 ketul sederhana / <i>1 medium piece</i>
212	Sotong kering masak sambal / <i>Dried squid with sambal</i>					1 ketul sederhana / <i>1 medium piece</i>
213	Tofu masak pes kacang hitam / <i>Tofu cooked with black bean paste</i>					1 ketul / <i>1 piece</i>
<b>3</b>	<b>Telur / <i>Egg</i></b>					
301	Telur dadar / <i>Omelette</i>					1 sederhana / <i>1 medium piece</i>
302	Telur masak lemak / <i>Egg cooked with coconut milk</i>					1 biji sederhana / <i>1 medium egg</i>
303	Telur masin / <i>Salted egg</i>					1 biji sederhana / <i>1 medium egg</i>

Bil	Type of Food	Frequency of Intake (Fill in one column only)			Quantity consumed	Serving Size
		Daily	Week	Month		
<b>4</b>	<b>Sapuan / <i>Spread</i></b>					
401	Keju / <i>Cheese</i>					1 keping / <i>1 slice!</i>
402	Majerin / <i>Margarine</i>					1 sudu teh / <i>1 teaspoon!</i>
403	Mentega kacang / <i>Peanut butter</i>					1 sudu teh / <i>1 teaspoon!</i>
<b>5</b>	<b>Kuih muih</b>					
501	Roti putih / Roti berserat <i>White bread / Whole meal bread</i>					2 keping / <i>2 slices</i>
502	Murtabak					1 keping / <i>1 piece</i>
503	Roti canai / roti telur					1 set / <i>1 set</i>
504	Cucur Udang <i>Prawn fritter</i>					1 ketul / <i>1 piece</i>
505	Sandwich sardin / <i>Sardine sandwich</i>					1 set / <i>1 set</i>
506	Pulut panggang / <i>Grilled glutinous rice in banana leaf</i>					1 ketul / <i>1 piece</i>
<b>6</b>	<b>Snek / <i>Snack</i></b>					
601	Jeruk / <i>Pickles</i>					4 ketul / <i>4 pieces</i>
602	Kacang masin / <i>Salted nuts</i>					1 paket kecil / <i>1 small packet</i>
603	Keropok ikan / udang / <i>Fish / Prawn crisps</i>					1 paket kecil / <i>1 small packet</i>
604	Keropok Bawang / <i>Onion chips</i>					1 paket kecil / <i>1 small packet</i>
605	Kerepek ubi kentang / <i>Potato chips</i>					1 paket kecil / <i>1 small packet</i>





Bil	Type of Food	Frequency of Intake (Fill in one column only)			Quantity consumed	Serving Size
		Daily	Week	Month		
9	<b>Makanan bermasak / Cooked Food</b>					
901	Kueh teow goreng / <i>Fried kueh teow</i>					1 pinggan / 1 plate!
902	Mee sizzling / <i>Sizzling noodle</i>					1 mangkuk (B) / 1 bowl (B)!
903	Mee kolok / Mee kempua / <i>Kolok mee / Kempua mee</i>					1 mangkuk (B) / 1 bowl (B)!
904	Laksa Penang / <i>Penang laksa</i>					1 mangkuk (B) / 1 bowl (B)
905	Laksam					1 mangkuk (B) / 1 bowl (B)
906	Mee goreng / <i>Fried noodle</i>					1 pinggan / 1 plate
907	Mee jawa / <i>Jawa noodle</i>					1 mangkuk (B) / 1 bowl (B)
908	Mee kari / <i>Curry noodle</i>					1 mangkuk (B) / 1 bowl (B)
909	Mee segera / <i>Instant noodle</i>					1 keping (celur) / 1 piece (boiled)
910	Mee segera goreng / <i>Fried instant noodle</i>					1 pinggan / 1 plate
911	Mee sup / <i>Noodle soup</i>					1 mangkuk (B) / 1 bowl (B)
912	Mee Udang / Mee Udang Penang / <i>Prawn Noodle / Penang Prawn Noodle</i>					1 mangkuk (B) / 1 bowl (B)
913	Mihun goreng / <i>Fried meehoon</i>					1 pinggan / 1 plate
914	Nasi ayam (set) / <i>Chicken rice</i>					1 pinggan / 1 plate
915	Nasi briyani (set) / <i>Briyani rice</i>					1 pinggan / 1 plate
916	Nasi Dagang (set)					1 pinggan / 1 plate

Bil	Type of Food	Frequency of Intake (Fill in one column only)			Quantity consumed	Serving Size
		Daily	Week	Month		
917	Nasi goreng / <i>Fried rice</i>					1 pinggan / 1 plate
918	Nasi Kerabu (set)					1 pinggan / 1 plate!
919	Nasi kukus (set) / <i>Steamed Rice</i>					1 pinggan / 1 plate!
920	Nasi Lemak (set)					1 pinggan / 1 plate!
921	Nasi berperisa (set) / <i>Flavoured rice</i>					1 pinggan / 1 plate
10	<b>Makanan bermasak lain / Other cooked food</b>					
1001	Salted fried chilli (Mor Milagai)					1 keping / 1 piece
1002	Acar sayur/ jeruk bambangan/ acar buah Indian (Urukkai)					1 sudu makan / 1 dessert spoon
1003	Kerabu mangga / <i>Mango salad</i>					1 mangkuk (A) / 1 bowl (A)
1004	Kuah kacang / <i>Peanut gravy</i>					1 sudu makan / 1 dessert spoon
1005	Sayur goreng / <i>Fried vegetable</i>					1 cawan / 1 cup
1006	Sayur masak dengan ikan masin / <i>Vegetable cooked with salted fish</i>					1 sudu makan / 1 dessert spoon
1007	Sayur masak sos tiram / <i>Vegetable with soy sauce/ oyster sauce</i>					1 sudu makan / 1 dessert spoon
1008	Sayur masak lemak / <i>Vegetable cooked with coconut milk</i>					1 cawan / 1 cup
1009	Sayur atau lobak masin / <i>Salted vegetable</i>					1 sudu makan / 1 dessert spoon

Bil	Type of Food	Frequency of Intake (Fill in one column only)			Quantity consumed	Serving Size
		Daily	Week	Month		
11	<b>Makanan dalam tin / <i>Canned food</i></b>					
1101	Kacang panggang / <i>Roasted nuts</i>					1 sudu makan / <i>1 dessert spoon!</i>
1102	Sardin dalam tin / <i>Canned sardine</i>					1 ketul / <i>1 piece!</i>
1103	Sup berkrım cendawan atau ayam / <i>Creamy soup / mushroom/ chicken</i>					1 mangkuk (B) / <i>1 bowl (B)!</i>
1104	Tuna dalam tin / <i>Canned Tuna</i>					1 ketul / <i>1 piece</i>

## Appendix 9

### PARTICIPANT INFORMATION SHEET

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(1) NEG

(2) DB

(3) BP

(4) S

(5) TK

RESPONDENT'S NAME: \_\_\_\_\_

**1. Research Title**

Population-Based Salt Intake Survey to Support the National Salt Reduction Programme in Malaysia

**2. Name of Principle Investigators and Institutions**

**Principal Investigator of MyCoSS Survey**

Rashidah Binti Ambak (Principle Investigator Malaysia)  
 Institute for Public Health  
 Ministry of Health Malaysia

Dr Feng J He (Principle Investigator United Kingdom)  
 Wolfson Institute of Preventive Medicine  
 Queen Mary University of London  
 United Kingdom

**Principal Investigator of Spot Urine Survey**

Fatimah binti Othman  
 Institute for Public Health  
 Ministry of Health Malaysia

**Principal Investigator of Chronic Kidney Disease Survey in Malaysia**

Dr Thamil Arasu Saminathan  
 Institute for Public Health  
 Ministry of Health Malaysia

**3. Name of funder**

- a. Academy of Sciences Malaysia
- b. Medical Research Council (MRC), United Kingdom
- c. Ministry of Health Malaysia

**4. Introduction**

- This Population-Based Salt Intake Survey to Support the National Salt Reduction Programme in Malaysia is conducted to get information about the level of salt consumption, to identify the source of salt in food and also to determine the amount of knowledge, attitude and behaviour towards salt intake among Malaysians.
- This survey is a collaboration between the Institute for Public Health, Ministry of Health Malaysia, Queen Mary University of London (UK), Disease Control Division and Nutrition Division, Ministry of Health Malaysia.
- This survey has been approved by the Medical Research and Ethics Committee, Ministry of Health Malaysia, and Queen Mary Research Ethics Committee, United Kingdom.

- A total of 1400 participants who were randomly chosen from the whole of Malaysia will be involved in this study.
- This survey will take 6 months to complete, however your participation would be only 3 days in total.
- The detailed procedures of this study are described in this document and it is important that you understand the aim of this survey and what will it involve.
- Therefore you are advised to read through and consider this information before deciding to participate and understand the procedure, risks and benefits related to this study.
- Your participation in this study is voluntary and you do not have to participate in this study if you do not wish to and you may withdraw from it at any time.
- You have the right not to answer any question that you do not wish to answer.
- If you decide to withdraw during the survey, information that had been obtained prior to withdrawal would still be used in this survey.
- Your refusal or withdrawal to participate in this survey will not affect any medical or health benefits which you are otherwise entitled to.
- If you are fully satisfied and understand the study, and wish to participate, you must sign the informed consent form.
- If you have queries or require additional information regarding this survey, kindly get in touch with any of the officers involved in this survey.
- These findings will be used to develop policies and programmes on sodium intake and also CKD among the Malaysian population with the long term goal of preventing chronic disease by the Disease Control Division and Nutrition Division, Ministry of Health Malaysia.

## 6. What will happen to my urine and blood samples?

Your blood and urine samples will be sent to the laboratory for the following tests:

Sample	Laboratory tests	Purpose
24 hour urine	<ul style="list-style-type: none"> <li>• Sodium</li> <li>• Albumin</li> <li>• Potassium</li> <li>• Creatinine</li> </ul>	<ul style="list-style-type: none"> <li>• To estimate salt consumption</li> <li>• To verify Chronic Kidney Disease (CKD)</li> </ul>
Spot urine	<ul style="list-style-type: none"> <li>• Sodium</li> <li>• Potassium</li> <li>• Creatinine</li> </ul>	<ul style="list-style-type: none"> <li>• For the formation and verification of a sodium and potassium formula to estimate salt consumption</li> </ul>
Blood	<ul style="list-style-type: none"> <li>• Creatinine</li> <li>• Random Blood Sugar</li> </ul>	<ul style="list-style-type: none"> <li>• To verify Chronic Kidney Disease (CKD)</li> </ul>

- a. Part of your urine sample will be kept up to 10 years in the Institute for Medical Research.
- b. This spare sample will be used in the future for health-related studies, such as to investigate the association between sodium intake with urinary calcium excretion and bone health), iodine (assessment of iodine status in the population), aldosterone (to study association between aldosterone hormone and hypertension) and other studies to be determined by the Ministry of Health.
- c. The spare sample will be labelled with a unique study number, not revealing your identity. Only your study team will be able to link the code with you. The study team may share those urine samples with other researchers in future studies determined by the Ministry of Health Malaysia
- d. A separate optional consent will be obtained from you for the storage and use of those urine samples.

- e. If you do not give consent for your spare urine to be stored, the urine will only be used to analyse parameters as stated in this Information Sheet, and the spare urine will be destroyed.
- f. Blood samples taken will be fully utilized for this study purpose only and will not be kept for futures studies

**7. What is the procedure for this survey?**

If you are eligible and agree to participate in this study and have signed the Participant Informed Consent Sheet, you will have to go through 3 sections to complete this survey.

**a) Interview using tablets by the data collector which consists of 8 modules:**

Module A - Personal information

Module B - Anthropometry measurement (weight, height and waist circumference) and blood pressure measurement

Module C - Medical history

Module D - Individual risk factors

Module E - Physical activity

Module F - Knowledge, attitude and practice

Module G - Food Frequency Questionnaire

Module H - 24 hour diet recall

**b) Collection of 24 hour urine and spot urine**

- You will provided with a urine collection jug, 24 hour urine container (5L), spot urine container (1L) and a bag for storage of the container.
- **The 24 hour urine collection will start with the 2<sup>nd</sup> urine after awaking from sleep until the 1<sup>st</sup> urine after awaking from sleep the next day.**
- **The spot urine collection will be the 2<sup>nd</sup> urine after the completion of the 24 hour urine collection.**

**c) Blood taking**

- A venous blood sample of 6ml will be taken by trained healthcare staff on the 2<sup>nd</sup> visit.
- You are not required to fast for the blood taking.

**8. What will happen if I take part?**

The data collector team will interview you using a Questionnaire which is uploaded into a tablet. It will take about 1 hour to complete the interview. The data collector team will make **2 visits** to your house.

**a) First Visit (Day 1)**

Explanation regarding study (information sheet), filling up the Informed Consent Sheet, interview on the personal information, health screening, measurements of weight, height, waist circumference and blood pressure, explanation on the urine collection procedure (a urine collection guideline will be provided), and handing over of urine collection instruments.

**b) Second visit (Day 3)**

The data collectors will collect the 24 hour urine sample and spot urine, while the medical personnel will draw the required blood. Both the urine and blood samples will be transported to the laboratory for analysis. The data collector team will interview you on the knowledge, attitude and practice towards sodium intake, and food frequency questionnaire.

**9. What are my responsibilities when taking part in this study?**

- a) It is important that every participant follows the instruction which has been given by the data collector team before urine collection and blood taking.
- b) Participants are reminded to maintain their usual food consumption and must not fast during urine collection as it can affect urine excretion.
- c) Participants are also reminded to answer the questions honestly and completely.
- d) If there are any circumstances that urine collection cannot be done on the appointed date due to sickness or any difficulties, participants must inform the data collector team to arrange a new appointment.

**10. What are the benefits of taking part in this survey?**

- a) This survey enables you to get information on how much salt (sodium) you consume and the source of salt in your diet.
- b) This survey also enables you to get information on your health status in relation to CKD risk factors.
- c) This survey enables you to have a basic physical examination such as blood pressure, body weight and height without any incurred cost.
- d) Health care staff will contact you for further examination or referral if there is any abnormality in your screening parameters or results of your blood and urine samples
- e) Information obtained from this study will help the policy making and planning towards improving public health in the whole country.

**11. What are the potential risks and side effects?**

There are no risks or side effects from the research procedures such as having blood pressure measured or collecting urine. However, the risks of taking

- a) Blood taking may cause discomfort however not everyone would experience it.
- b) You would probably feel pain, get a bruise, redness or swelling at the site where the blood is taken, or a rare risk of fainting.
- c) Ongoing bleeding may occur for people with bleeding disorders or those on blood thinning medication eg. Aspirin, warfarin (Coumadin) etc.
- d) If you have bleeding or clotting problems, or if you are take blood-thinning medication, make sure to inform the medical staff before your blood sample is taken.
- e) Participants are advised to report any problems faced relating to this study during the data collection period to the data collectors.

**12. What if I am injured in during the survey?**

- a) The risks or side effects from blood taking are as stated above. However, if you are injured or ill directly from the blood taking procedure, you should inform the data collector team immediately.
- b) We will pay for reasonable and necessary treatment related to injuries that occur during this survey.
- c) However, the study team and the funders will not be responsible for medical expenses due to pre-existing medical conditions, any underlying diseases, any ongoing treatment process, and your negligence or wilful misconduct.
- d) You will not lose your right lawfully to obtain compensation even though you have signed this form.

**13. Who is funding this study?**

- a) This study is jointly funded by the Malaysian Science Academy, the United Kingdom Medical Research Council and Ministry of Health Malaysia, who will pay for all the survey resources and laboratory tests.
- b) As a sign of appreciation, a token of RM70.00 will be given to each participant who takes part in this survey.

**15. Will my information be kept private?**

- a) All your information obtained in this study will be kept and handled in a confidential manner, in accordance with applicable laws and/or regulations.
- b) Your identity as a participant in the study is strictly confidential. All information available in the study records will always be kept confidential and used only for research purposes.
- c) When publishing or presenting the study results, your identity will not be revealed without your expressed consent. Individuals involved in this study and in your medical care, qualified monitors and auditors, the sponsor or its affiliates and governmental or regulatory authorities may inspect and copy your medical records, where appropriate and necessary.
- d) Only you and the study team involved will gain the result of the urine test and it will be distributed in a confidential manner. We will give your urine test results to you after the study is completed.
- e) Some of your urine samples may be stored by the sponsor for future testing. Your urine samples will be coded and information that can identify you will be removed. Only your study doctor and study staff will be able to link the code with you.
- f) The sponsor may share those urine samples with other researchers. A separate optional consent will be obtained from you for the storage and use of those urine samples.

**Whom do I need to contact if I have any questions regarding this survey?**

**Researchers' contact information**

16. If you have any question about this study, please contact:

**a) Pricipal Investigator of MyCoSS Survey**

Rashidah Binti Ambak (Principle Investigator Malaysia)  
Institute for Public Health  
Ministry of Health Malaysia  
Jalan Bangsar  
50590 Kuala Lumpur  
Tel: 03- 2297 9400 samb. 572

**b) Pricipal Investigator of Spot Urine Survey**

Fatimah binti Othman  
Institute for Public Health  
Ministry of Health Malaysia  
Jalan Bangsar  
50590 Kuala Lumpur  
Tel: 03- 2297 9400 samb. 446

**c) Pricipal Investigator of Chronic Kidney Disease Survey in Malaysia**

Dr Thamil Arasu Saminathan  
Institute for Public Health  
Ministry of Health Malaysia  
Jalan Bangsar  
50590 Kuala Lumpur  
Tel: 03- 2297 9400 samb. 473

**d) Bilik Operasi Tinjauan MyCoSS / 'Spot Urine' / Tinjauan Penyakit Buah Pinggang Kronik di Malaysia**

Institut Kesihatan Umum  
Kementerian Kesihatan Malaysia  
Jalan Bangsar  
50590 Kuala Lumpur  
Tel: 03- 2297 9400 samb. 470

If you have any question about your rights as a participant in this study, please contact secretariat of Medical Research Ethic Committee (MREC), Ministry of Health at 03-22874032.



**PARTICIPANT'S CONSENT FORM**

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(1) NEG

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(2) DB

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(3) BP

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(4) S

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(5) TK

RESPONDENT'S NAME: \_\_\_\_\_

- 1. Population-Based Salt Intake Survey to Support the National Salt Reduction Programme for Malaysia (MyCoSS)**
- 2. Development and Validation of Spot Urine Equation to Determine Sodium and Potassium Intake among Malaysian Population**
- 3. Population-based Study of Prevalence of Chronic Kidney Disease among Adults in Malaysia**

By signing below I confirm the following:

- I have been given oral and written information for the above study and have read and understood the information given.
- I have had sufficient time to consider participation in the study and have had the opportunity to ask questions and all my questions have been answered satisfactorily.
- I understand that my participation is voluntary and I can at any time freely withdraw from the study without giving a reason and this will in no way affect my future treatment. I am not taking part in any other research study at this time. I understand the risks and benefits, and I freely give my informed consent to participate under the conditions stated. I understand that I must follow the study doctor's (investigator's) instructions related to my participation in the study.
- I understand that study staff, qualified monitors and auditors, the sponsor or its affiliates, and governmental or regulatory authorities, have direct access to my study information in order to make sure that the study is conducted correctly and the data are recorded correctly. All personal details will be treated as STRICTLY CONFIDENTIAL
- I will receive a copy of this subject information/informed consent form signed and dated to bring home.
- I agree/disagree\* for my family doctor to be informed of my participation in this study. (*\*delete which is not applicable*)

**PARTICIPANT’S CONSENT FORM**

	Please tick <input type="checkbox"/> in the box provided
1. I have been give information regarding this survey verbally and written and I have read and understood all information that has been stated in this document.	<input type="checkbox"/>
2. I was given sufficient time to consider my participation in this survey dan was given a chance to ask questions dan all my questions have been answered satisfactorily.	<input type="checkbox"/>
3. I understand that my participation is voluntary and I am able to withdraw from this survey at any time without giving a reason.	<input type="checkbox"/>
4. I understand the risks and benefits from this survey and give my full consent voluntarily to take part in this survey. I understand that I am obliged to follow the instructions that is relevant to my participation in this survey.	<input type="checkbox"/>
5. I will receive a copy of this document and a signed and dated informed consent form.	<input type="checkbox"/>

**RESPONDENT:**

Signature/ Left thumb print:.....

IC Number:.....

Name: .....

Date:.....

**RESEARCHER:**

Signature :.....

IC Number:.....

Name: .....

Date:.....

**IMPARTIAL WITNESS:** *(Required if subject is illiterate and contents of participant information sheet is orally communicated to subject)*

Signature : .....

IC Number:.....

Name : .....

Date :.....

**CONSENT TO PARTICIPATE IN FUTURE STUDIES**

Some of my urine samples will be stored by the study team for future health-related studies that will be determined by the Ministry of Health Malaysia.

**By signing below I confirm the following:**

Please tick ✓ the appropriate box (either A or B)

A	I give consent for my spare urine sample to be kept and used for future studies to be determined by the Ministry of Health Malaysia.	
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**OR**

B	I do not give consent for my spare urine to be stored and used for any future studies. The urine will only be used to analyse parameters as stated in this Information Sheet. The spare urine will be destroyed.	
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**RESPONDENT:**

Signature/ Left thumb print:..... IC Number:.....  
 Name: ..... Date:.....

**RESEARCHER:**

Signature :..... IC Number:.....  
 Name: ..... Date:.....

**IMPARTIAL WITNESS:** *(Required if subject is illiterate and contents of participant information sheet is orally communicated to subject)*

Signature : ..... IC Number:.....  
 Name : ..... Date :.....

		-				-				-			
(1) NEG	(2) DB	(3) BP	(4) S	(5) TK									

**RESPONDENT'S NAME:** \_\_\_\_\_

**PARTICIPANT'S CONSENT FORM**

	Please tick <input type="checkbox"/> in the box provided
1. I have been give information regarding this survey verbally and written and I have read and understood all information that has been stated in this document.	<input type="checkbox"/>
2. I was given sufficient time to consider my participation in this survey dan was given a chance to ask questions dan all my questions have been answered satisfactorily.	<input type="checkbox"/>
3. I understand that my participation is voluntary and I am able to withdraw from this survey at any time without giving a reason.	<input type="checkbox"/>
4. I understand the risks and benefits from this survey and give my full consent voluntarily to take part in this survey. I understand that I am obliged to follow the instructions that is relevant to my participation in this survey.	<input type="checkbox"/>
5. I will receive a copy of this document and a signed and dated informed consent form.	<input type="checkbox"/>

**RESPONDENT:**

Signature/ Left thumb print:.....

IC Number:.....

Name: .....

Date:.....

**RESEARCHER:**

Signature :.....

IC Number:.....

Name: .....

Date:.....

**IMPARTIAL WITNESS:** (Required if subject is illiterate and contents of participant information sheet is orally communicated to subject)

Signature : .....

IC Number:.....

Name : .....

Date : .....

**CONSENT TO PARTICIPATE IN FUTURE STUDIES**

Some of my urine samples will be stored by the study team for future health-related studies that will be determined by the Ministry of Health Malaysia.

**By signing below I confirm the following:**

Please tick ✓ the appropriate box (either A or B)

A	I give consent for my spare urine sample to be kept and used for future studies to be determined by the Ministry of Health Malaysia.	
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**OR**

B	I do not give consent for my spare urine to be stored and used for any future studies. The urine will only be used to analyse parameters as stated in this Information Sheet. The spare urine will be destroyed.	
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**RESPONDENT:**

Signature/ Left thumb print:..... IC Number:.....  
 Name: ..... Date:.....

**RESEARCHER:**

Signature :..... IC Number:.....  
 Name: ..... Date:.....

**IMPARTIAL WITNESS:** *(Required if subject is illiterate and contents of participant information sheet is orally communicated to subject)*

Signature : ..... IC Number:.....  
 Name : ..... Date :.....

**PREFERRED METHOD FOR RECEIVING URINE AND BLOOD RESULTS**

Please tick ✓ in ONLY ONE of the boxes

Mobile phone : \_\_\_\_\_

House phone : \_\_\_\_\_

Office phone : \_\_\_\_\_

E-mail : \_\_\_\_\_

Post to address : \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_





Kementerian Kesihatan Malaysia

INSTITUTE FOR PUBLIC HEALTH  
MINISTRY OF HEALTH MALAYSIA

2019