

## **Appraising the current food and nutrition situation with policy implications**

Khor Geok Lin<sup>1</sup>, Mohd Nasir Mohd Taib<sup>1</sup>, Mirnalini Kandiah<sup>1</sup>, Normah Hashim<sup>1</sup>, Jamal Khair Hashim<sup>2</sup>, Samsuni Mohd Nor<sup>3</sup>, Rokiah Don<sup>4</sup>

<sup>1</sup>Department of Nutrition & Health Sciences, Faculty of Medicine & Health Sciences, Universiti Putra Malaysia, Serdang

<sup>2</sup>Food Quality Control Division, Ministry of Health Malaysia

<sup>3</sup>Commodity Development Division, Ministry of Agriculture Malaysia

<sup>4</sup>Family Health Development Division, Ministry of Health Malaysia

### **INTRODUCTION**

As Malaysia enters the next millenium, it is timely to appraise the current food and nutrition situation in the country. Marked socio-economic development have been attained since the country's independence in 1957. Rapid pace of industrialization and urbanization that have occurred, especially in recent decades, have brought about in its wake changes in the lifestyles of Malaysians. These changes include dietary habits and food preferences which, in turn, have bearings on food production, food imports, food quality and safety from production to ready-to-eat stage. Changes in dietary practices are known to be associated with changes in the health and disease patterns of the population. Like other rapidly developing countries, Malaysia is said to be in a nutrition transition having shed off "old" problems of gross protein-energy malnutrition for a new array of challenges characterized by increasing intake of total calories, animal products and simple carbohydrates.

The appraisal of the current food and nutrition situation covers a wide spectrum of related topics, including food production,

food quality and safety, food consumption, diet-related chronic non-communicable diseases, and nutritional status of various population groups. Nutrition policy implications are discussed for each topic.

This review draws on various reports and publications including the Report of the Second National Health and Morbidity Survey Conference (Public Health Institute, 1997), Country Paper for the FAO/WHO International Conference on Nutrition (ICN) (eds. Tee & Cavalli-Sforza, 1993), the New Agriculture Policy, Annual Reports of the Ministry of Health Malaysia, and the country's Vital Statistics and Food Balance Sheets for various years.

### **DIET-RELATED CHRONIC NON-COMMUNICABLE DISEASES**

The epidemiologic relationship between diet and chronic non-communicable diseases has been extensively researched especially in Western countries following the Framingham Study which began in the 1940s. Chronic non-communicable diseases that are leading causes of morbidity and mortality in Malaysia will be addressed here are cardiovascular

diseases, diabetes mellitus, hypertension and certain types of cancer that have dietary implications.

### **Cardiovascular Disease**

Cardiovascular disease (CVD) is the major cause of death in most developing countries and an important source of illness and disability. Its causes and progress are commonly traced to interacting genetic and behavioral factors. In the first half of the twentieth century, CVD could reasonably be described as a “disease of affluence”. Its increased incidence was associated with increased prosperity in Western societies, where it reached epidemic proportions and tended to strike the more affluent members of those countries. But in more recent years this pattern has completely changed and the present picture of the disease worldwide is much more complex (Marmot, 1992):

- The age-standardized death rate from CVD has fallen dramatically, and continues to fall, in the wealthy countries of Europe, North America, and Australasia. It is even falling in Japan, where it has always been very low.
- Within the affluent countries the decline has occurred more rapidly among the higher status members of the community. Thus rates of CVD in these countries are now in general higher among those with lower income, social status, or position in the work hierarchy.
- On the other hand, CVD is emerging as a major cause of death in some developing countries (including Malaysia), and CVD

rates are rising in the former communist countries of Central and Eastern Europe.

The extent and magnitude of CVD in Malaysia are often assessed from government hospital-based data and the Statistics Department yearly reports because of a lack of comprehensive disease surveillance mechanism, notification and registration, and an inadequate coverage of community-based studies. Certified deaths account for only approximately 41% of all deaths in Malaysia.

Since the 1970s, diseases of the circulatory system, of which cardiovascular diseases (CVD) constitute a major component, have been the leading cause of deaths in Malaysia. In 1996, CVD accounted for 18.9% of all medically-certified deaths (Department of Statistics Malaysia, 1997). In terms of mortality rates, the figure has more than doubled between 1970 and 1996, from 24.1 to 54.8 per 100,000 population for diseases of the circulatory system (SEAMIC Health Statistics, 1998). As for CVD itself, the mortality rate in 1996 was 38.3 per 100,000, being higher for male (47.0) than female (29.3). As expected the CVD mortality rate shows a predominance in the middle age and older groups for both gender. For example, in 1996, the mortality rate for CVD for men aged 45 years and above was 242.9 per 100,000 men in that age category compared with 7.8 per 100,000 men below 45 years. The corresponding figures for women are 153.0 and 3.1 respectively.

Admission and mortality data

from government hospitals showed a similar trend. In terms of absolute numbers, 58,961 patients in 1985 and 101,985 in 1996 were admitted to government hospitals suffering from CVD. These showed an alarming trend in the rates of admissions from 278.5 per 100,000 population in 1985 to 492.9 per 100,000 population in 1996, almost double the rate within a period of 17 years.

However, deaths due to CVD in government hospitals in the same period showed the maintenance of a more constant trend in terms of absolute numbers. For example, in 1985, there were 6205 deaths and in 1996, 7249 deaths due to CVD. In fact, when the numbers of deaths were converted to percentages of admissions due to CVD, a decreasing trend is clearly seen indicating, probably, patients are coming in earlier for treatment and that treatment has been effective in prolonging the lives and sudden deaths of these patients.

### **Hypertension**

Data on hypertension is drawn from the Second Health and Morbidity Survey (NHMSII) (PHI, 1997), which was a cross-sectional survey of 17,995 living quarters. Only household members aged 30 years and above were eligible for the study on the prevalence of hypertension. The survey which used the WHO Guidelines (1993) for diagnosing mild hypertension and also the United States 5<sup>th</sup> Joint National Committee criteria for hypertension, classified any respondent with a systolic blood pressure of 140 mm Hg and above or a diastolic blood pressure of 90 mm Hg and above as having elevated blood pressure.

The NHMSII estimated an overall prevalence of possible hypertension among adults aged 30 years and above to be 29.9%, with self-reported hypertension at 14%, with self reported hypertension at 14.0% and possible undiagnosed hypertension to be 15.9%. The survey found no significant differences among the ethnic groups of Malaysia even after adjusting for age and gender. Wide geographical variations among the states was also reported for the prevalence of hypertension.

Comparatively, prevalence of possible hypertension was found higher in the rural population, females, 50 years and above, lower socio-economic status, diabetes, previous smokers, those who are hypercholesterolemic, overweight and obese.

### **Diabetes Mellitus**

Data on diabetes mellitus was also obtained from adult respondents 30 years and above in the NHMSII. Respondents with blood glucose level of 11.1 mmol/l or more were classified and undiagnosed diabetics whereas those with blood glucose level between 7.8 to < 11.1 mmol/l were categorized as having impaired glucose tolerance (IGT). A third group were the known diabetics comprising of respondents who admitted to being diabetic and had been diagnosed by a medical personnel previously.

The national prevalence of known diabetes was found to be 5.7% and the prevalence of undiagnosed

diabetes was 2.5%. Hence the prevalence of diabetes mellitus in Malaysia was 8.2%. The First Health and Morbidity Survey (NHMSI) (1986) reported the prevalence of diabetes mellitus in Peninsular Malaysia to be 6.3%. In 1995, the Cardiovascular Unit of the Department of Public Health, Ministry of Health Malaysia reported the national prevalence of diabetes mellitus to be 7.7%. Thus, the prevalence seemed to be on the rise.

By ethnicity, the NHMSII found Indians showing the highest prevalence of known diabetes (11.5%). The survey also revealed the association of cardiovascular risk factors with diabetes at notable levels namely, 22.8% showed high cholesterolemia, 18.8% were overweight and 10.9% had hypertension. The majority (71%) of the known diabetics reported that they were on diet control and medication, whilst 8.5% were on diet control only.

There were also geographical variations in the observed prevalence of diabetes mellitus by states. The highest observed prevalence of known diabetes were recorded in Penang (7.3%) and Selangor (7.3%) whereas the highest prevalence of undiagnosed diabetes were observed in Negeri Sembilan (4.1%), Penang (3.5%), and Melaka (3.1%). Similarly, the more urbanized states, like Melaka (6.6%), Wilayah Persekutuan (5.3%) and Johor (5.4%) recorded the highest prevalence of IGT. For all the three categories of diabetes mellitus, urban areas recorded significantly higher prevalence compared to the rural areas.

Overall, CVD, hypertension, and diabetes mellitus are on the rise in Malaysia as major causes disability and death. CVD (hypertensive disease included) remains as the number one cause of deaths in government hospitals. However there is an indication that CVD deaths as percentages of admissions in government hospitals are declining. A more comprehensive disease surveillance mechanism, notification and registration is needed at the national level in order that the extent and magnitude of these diseases can be assessed.

### **Diet and Cancer**

Cancer is a major health problem in Malaysia today. The upward trend in cancer prevalence in Malaysia is expected to continue partly in tandem with the increase in the aged proportion of the population. The true incidence of cancer is not known precisely as the country lacks a national cancer registry. Hospital admissions showed that cancer cases increased from 31,049 in 1994 to 35,409 cases in 1995. Lung cancer (11.2%) is the most common cancer followed by breast cancer (9.6%) (Ministry of Health, 1995; 1996). The approximate cancer incidence in 1996 was about 150 per 100,000 population. It is estimated that 27,000 new cases occur each year. Norhanom & Yadav (1995) in their analysis of all cancer cases seen in 1985 in east and west Malaysia determined the crude prevalence rate to be 24.4 per 100,000.

The Penang Cancer Registry has the most well-kept incidence and mortality data of cancers reported for the state. Between 1987 and 1990,

male cancer incidence was 41.2 per 100,000 men per year, while female cancer incidence rate was 45.7 per 100,000 women per year. The major types of cancer recorded among men for Penang state are cancers of the lung, nasopharynx, larynx, bladder, rectum and esophagus, while cancers of the breast, cervix, rectum and mouth predominate for women (Chan *et al.*, 1994). In a study based on hospital cancer admissions in Penang, Hooi & Devaraj (1998) reported the 5 leading types of cancer were lung, breast, colon & rectum, cervix and stomach.

A study in Sabah based on histologically proven malignant neoplasms showed that the most common cancers in men are nasopharyngeal and stomach cancers, while among women are cancers of the breast and cervix (Ganeson, Pillai & Gudum, 1991).

Dietary factors are known to be implicated in the etiology of certain cancers. The high incidence of cancers of the nasopharynx and stomach among Chinese and Kadazan men in Sabah have been attributed to the high intake of a traditionally prepared salted fish. High consumption of the alcoholic drink "tapai", prepared from fermented rice and the formation of other substances with possible contamination of aflatoxins, have been associated with the high prevalence of liver carcinoma among the Kadazans. Parasitic diseases are also believed to play a contributory role in liver cancers.

In a preliminary study on the implications of dietary factors and cancer among breast and colorectal patients seen in

Hospital Kuala Lumpur and Hospital Universiti Kebangsaan Malaysia, Kandiah *et al* (1998) and Chong *et al* (1999) observed increased risks for cancer with decreased intake of dietary fibre, increased fat intake and rise in body mass index.

### **Nutrition Policy Implications**

As the level of affluence rises in Malaysia, there is a tendency towards dietary changes towards one with increase on total calories, calories from animal products and simple carbohydrates. Such dietary practices coupled with other unhealthy lifestyles such as physical inactivity, smoking and increase in body weight place Malaysians at risk of the chronic non-communicable disease describe above.

## **FOOD PRODUCTION**

### **Background**

The agricultural sector grew at an average rate of 4.2% per annum during 1985-95 period, owed largely to expansion in the livestock, fisheries, fruit and vegetable industries. However, as Malaysia is not self-sufficient in many food products, the country has to depend on imports to meet the growing demand for such food items as cereal products (wheat, maize, rice), sugar, dairy products, fish, meat products, fruits and vegetables. This has led to a substantial leap in food imports from RM3.5 billion in 1985 to RM10 billion in 1997. The recent economic crisis underscores the need for attaining food security, especially for essential food items such as cereals, meat, dairy and fish products.

### **The Third National Agricultural Policy (1998-2010)**

The Third National Agricultural Policy (NAP3) sets the strategic directions for agricultural and forestry development to the year 2010 (Ministry of Agriculture, 1998). The overriding goal of NAP3 is to maximize agriculture's contribution to national income including maximizing income of producers. Specifically, the objectives of nAP3 are:

- 1) to enhance food security
- 2) to increase productivity and competitiveness of the sector
- 3) to deepen linkages with other sectors
- 4) to create new sources of growth for the sector; and
- 5) to conserve and utilize resources on a sustainable basis

In the past, measures were taken to enhance the food security position with respect to rice mainly as it is the country's staple food (Malaysia Country Paper, 1992). The position of rice is again accorded importance in the NAP3, which stated that efforts will be undertaken to realize a minimum self-sufficiency level for rice of 65%. Productivity will also be improved by increasing rice yield from 4.0 tonnes per hectare in 1995 to 5.5 tonnes per hectare in 2010. Besides rice, the NAP3 also identified production of livestock (fresh beef, mutton, milk), fishery products, fruits and vegetables for expansion to meet increased consumer demand.

#### **Nutrition Policy Implications**

Prices of food in general have been on an upward trend. In 1997, increased prices of food accounted for 52% of the increase in

Consumer Price Index, compared to 38% in 1991 (NAP3). Continued increase in food prices imposes a heavy burden on consumers especially those from the lower socio-economic strata. Adjustments made by these population groups in coping with high food prices may lead to compromises in purchases of nutritious and safe food. Prices of basic food such as rice, chicken, eggs, fish, and vegetables that are produced in Malaysia should be maintained at price levels affordable by the lower income groups. There is a need for increased capability and productivity in the agriculture sector, not only to meet the increased demand for food, but also to be able to provide enough varieties that are affordable to the various socio-economic strata.

Increasing per capita income has brought about a high demand for food including imported food. In meeting this demand, the country's food import bill soared to RM10 billion in 1997, thereby placing a strain on the Malaysia's foreign exchange reserves. The onset of the recent financial crisis showed the vulnerability of the country's food supply. Instability and insecurity in the food supply can bring about serious socio-economic consequences.

### **FOOD QUALITY AND SAFETY**

#### **Regulatory Activities**

The rapid expansion of the vast food industry in Malaysia imposes a critical need for an efficient and effective food quality and safety

programme. The Food Quality Control (FQC) Division in the Ministry of Health is the central agency-in charge of overseeing food safety in the country. Premise inspections constitute the main activity of the FQC Programme. Premises inspected include food factories, restaurants, school canteens, markets and food stalls. Samples from these premises are checked for microbiological hazards, industrial and environmental pollutants, pesticide residue, food additives and other food problems. In 1996, out of a total of 23,716 samples analyzed, 60% had problems related to microbiological hazards while 38% were related to chemical contaminants.

The problem of pesticide residues in vegetables comes under the control of the Ministry of Health and the Ministry of Agriculture. Samples are taken at different levels of the food chain including farms, collection centers and retail outlets. Food imports are controlled at entry points and the major imports include cereal and cereal products, sugar and sugar preparations, dairy products, vegetables and fruits.

The Food Act 1983 and the Food Regulations 1985 with amendments made in 1987-1998 provide the main food legislation currently. Several code of practices and guidelines pertaining to food quality and safety have been drawn up under the FQC Programme, including the Guidelines for School Canteens (1989) and the Code of Practice for Hawkers/Street Food (1995).

The FQC Division is the country Contact Point for the Codex Alimentarius Commission, which implements the joint

FAO/WHO Food Standards Programme. The purpose of the Food Standards Programme is "to protect the health of consumers and to ensure fair practices in the food trade". The FQC division participates in the various Codex Alimentarius committees on food additives and contaminants, pesticide residues, nutrition and food for special dietary uses, food analysis and sampling.

### **Food Poisoning Outbreaks**

Water and food-borne diseases constitute a major public health problem in Malaysia. Diseases like cholera, typhoid, paratyphoid fevers and dysentery do occur sporadically, such as the serious outbreak of cholera in Penang in 1996 with 1,339 cases (i.e. 74.5 cases per 100,000 population). Otherwise, the incidence rate of cholera nation-wide has remains low, ranging from 1.8 to 11.5 cases per 100,000 population over the past decade, and appears to be on a downward trend. In the case of typhoid, the nation-wide incidence rate was 4.28 per 100,000 population in 1996, but the figure is much higher in some states like Kelantan (20.3-67.7 in 1994-96) and Terengganu (10.0 in 1996).

In contrast, food poisoning cases is on the rise as evident by the incidence rate of 31.1 cases per 100,000 population in 1997 which is a two-fold increase from the previous year. Food poisoning cases occur mainly in school canteens hostel kitchens and food prepared under the Supplementary Food Programme for schools. These three sources

accounted for 78% of all outbreaks. The contributing factors in these outbreaks of food poisoning are improper storage or holding temperature and poor personal hygiene. The causative agents identified in the contaminated foods are *Staphylococcus aureus* (27%), *Vibrio parahaemolyticus* (16%) *Bacillus cereus* (10%) and *Escherichia coli* (8%) (Ministry of Health, 1997). Food handlers play a significant role in the outbreak of food poisoning due to *Staphylococcus aureus*.

Changes in lifestyles including higher income and with both parents working, is expected to accentuate further the present demand for hawker/street food particularly in urban areas. Consumers are drawn to food stalls as the foods sold are affordable and cater to consumers' choices and tastes. These outlets together with school canteens, hostel kitchens and other food premises need to be continually inspected to reduce food poisoning outbreaks.

Besides microbial pathogens, the danger posed by other hazards in the food chain such as environmental contaminants, hormone residues, pesticide residues and food additives also need to be constantly placed under surveillance by the authorities.

### **Nutrition Policy Implications**

Changing lifestyles and consumer demand have led to increases in food production, food import and the number of food outlets in the country. All these underline the importance of ensuring that food are produced, processed, stored and handled in a sanitary manner. Awareness on

food quality and safety need to be strengthened at all levels from good agricultural practices to food hygiene habits of handlers and consumers.

### **FOOD CONSUMPTION**

Data on food consumption in Malaysia presented here is derived from food balance sheets and cross-sectional nutritional studies in the absence of such data at the national level. Although the food balance sheet only provides a gross estimation of the net food supplies that go into human consumption, it does give an indication of the general pattern of food available for consumption.

#### **Data From Food Balance Sheet**

Based on data from published food balance sheets that spanned three decades, namely between 1967 and 1997, several major changes in the dietary pattern may be deduced:

- Availability of total calories in 1997 was 2,977 per capita per day compared to 2,407 in 1967, an increase of 23.6% over the past three decades
- The proportion of calories from cereals has declined from 57.1% to 41.1%
- Availability of rice has decreased from 119.2kg per capita per year to 94.9kg
- The amount of available sugar (raw & refined) has doubled from 28.0kg per capita per year to 53.2kg
- The proportion of calories from animal products increased from 11.2% to 19.2%
- Poultry meat availability rose six-

fold from 5.7kg per capita per year to 34.8kg

- Availability of milk (cow) has doubled from 28.9kg per capita per year to 59.6kg
- Availability of eggs (hen) has gone up nearly three times from 5.0kg per capita per year to 14.0kg
- The amount of fish and other sea food available almost doubled from 29.5kg per capita per year to 52.5kg
- Palm oil has replaced copra oil as the principal type of cooking oil

The dietary changes depicted above indicate a veering towards a diet that derives increasingly more calories from animal products with the corresponding decline in calories from cereals.

#### **Data From Food Consumption Surveys**

The use of 24-hour dietary recall and food frequency questionnaire have long served as the usual assessment methods to estimate food intake. In recent years, the use of other methods such as the 3-day food record and semi-quantitative food frequency questionnaire have emerged increasingly. In the absence of consumption data at the national level, these studies albeit involving relatively small sample sizes, do provide a window into the overall pattern of food consumption at the household level and for specific age groups in Malaysia. Nonetheless, there is still a need to exercise caution in the interpretation of survey data in light of known shortcomings associated with the use of dietary methods and food composition tables particularly for micro-nutrients.

In general, surveys of the lower socio-economic status tend to be dependent on a few sources of calories namely, rice and wheat products followed by cooking oil and sugar. Chong *et al.* (1984)'s study on poverty villages reported that rice provided 51% of the dietary calories followed by sugar (14%). Likewise Chen *et al.* (1981)'s study of rural communities in Sabah found that cereals, particularly rice, constituted their main source of calories as well as protein. Another study of villages, estates and new villages also reported a high dependence on rice and wheat products as the mainstay of calories, both of which contributed to half of their total calorie intake (Tee *et al.*, 1985).

In contrast, among higher income groups as shown by some studies on urban population groups, the major sources of calories tend to be more diverse including meat, fish and seafood besides cereals, cooking oil and sugar (Zanariah *et al.*, 1986; Khor, Hsu-Hage & Wahlqvist, 1998). The latter study also revealed another facet of urbanized lifestyle namely, eating out and eating take away food. Among the Chinese respondents, more than one-quarter of them reported eating out more than once a week, while another 21% do so at least once a week.

In terms of dietary adequacy of specific groups, in the case of pregnant mothers, they were found to consume total calories that were considerably lower than those recommended by FAO/WHO/UNU (Zawiah & Ismail, 1994). However, the authors found that birth weight was apparently not affected by the low maternal energy intake.

Similarly, lower than recommended levels for energy, iron, calcium, retinol and vitamins were recorded for preschool children (Ng, 1991; Soon & Khor, 1995), adolescents (Poh *et al.*, 1996), adults (Chee *et al.*, 1997), older adults (Suria *et al.*, 1996). Inadequacy intake has also been reported for under-served communities such as urban squatters (Chee, 1997), and among Orang Asli (Baer, 1999; Ismail, Wong & Zawiah, 1988).

### **Breast Feeding**

In the 1950s, the prevalence of breast feeding among rural Malay women was reported to be almost universal, while in urban areas, 80% of low income Malay mothers were breast feeding at three months (King & Ashworth, 1987). Between 1950s and early 1970s, the duration of breast feeding had declined substantially in urban areas but more modestly in rural communities, although initiation remained high in both areas (Pathmanathan, 1978). Nonetheless, the Malaysian Family Life Survey carried out in 1976-77 showed a reversal of the trend in that the percentage of infants breast fed in Peninsula Malaysia, at least initially, increased from 75% in 1970-74 to 79% in 1975-76 (Haaga, 1986). This upward trend appears to continue into the 1980s with the Malaysian Life Survey II (MFLSII), undertaken in 1988-89, reporting 85% for prevalence of ever breast fed. The NHMSII (PHI, 1997) reported a further increase, albeit a small rise, for the overall prevalence of ever breast fed namely, 88.6%. However, the median duration of breast feeding seems to have decreased that is, from 6 months found in the MFLSII in 1988 to 4.5 months reported in NHMSII in 1997.

Other highlights in the NHMSII are as follows (based on WHO definitions):

- Prevalence of exclusive breast feeding was 29.0%
- 10.0% were predominantly breast fed
- Complementary breast feeding was found in 47.0%
- Only 11.7% continued to breast feed up to 2 years

These findings indicate that sub-optimal breast feeding was common in Malaysia.

### **Nutrition Policy Implications**

In general, the usual finding is that, with the exception of protein, the mean intake for energy and micro-nutrients tend to fall below the recommended levels. Although the intake for total protein appears to meet the recommended level, the major proportion of the protein consumed is from plant sources and not from animal food. Low intake of animal products puts the person at risk of inadequate consumption of heme iron, which is needed to protect against iron deficiency anaemia.

There is an urgent need for a national consumption survey to be carried out in Malaysia in order to identify, not only levels of actual intake among Malaysians, but more importantly, population groups that are at risk of inadequate intake of macro or micro nutrients.

While the overall prevalence of ever breast fed remains high among Malaysian mothers, the importance of exclusive breast feeding and

sustained breast feeding need to be further emphasized in both urban and rural clinics. Baby friendly Hospital Initiative should be extended to private hospitals.

## NUTRITIONAL STATUS

Studies on nutritional status including nutrient deficiencies in Malaysia go back to the nineteenth century. These studies provide an insight into the nature and prevalence of the nutritional problems that affect various age groups from different socio-economic and ethnic communities.

### Protein-Energy Malnutrition

A recent review of the nutritional status of children in rural communities, estates, communities in Sarawak and Sabah, and among Orang Asli highlighted the persistence of "old" problems of deficiency including mild to moderate protein-energy malnutrition in the form of underweight and stunting, and anaemia that is attributed to worm infestation and low intake of iron-rich foods (Khor, 1997). In the 1980s, underweight and stunting among preschool children from poor rural communities were found at 37% and 43% respectively (Chong *et al.*, 1984). In the 1990s, pre-school children from almost similar communities were assessed and underweight was reported in 33-36% and stunting in about 29% (Khor & Tee, 1997). This study had also reported an overall finding of 25-30% underweight and 27-31% stunting in children aged 18 years and below. It is patent that underweight and stunting remain as a matter of public health concern, especially in light

of the target of the NPANM For Child Survival to reduce moderate malnutrition from 24.5% in 1990 to 12.2% by the year 2000 (NPANM, 1996).

The NHMSII identified underweight in adults as a noteworthy problem. The overall prevalence of underweight (BMI  $\leq$  18.5 kg/m<sup>2</sup>) was 25.2%, which was higher than that reported by Ismail *et al* (1995). The latter had found the prevalence of underweight for males and females were 7% and 11% in urban and 11% and 14% in rural areas respectively.

As for the elderly (> 60 years), among the nutritional problems faced by this age group is chronic energy deficiency especially in the lower socio-economic groups. A prevalence of 22% and 25% CED was reported in male and female elderly respectively from rural communities (Khor *et al.*, 1999). Dietary assessment of the elderly seem to indicate inadequate intake of energy and most nutrients, particularly calcium, vitamin A and the B vitamins (Suria *et al.*, 1996). There is a need to validate current methodological methods being used presently with regards to their appropriateness for use with older subjects.

### Anaemia

Anaemia remains a widespread problem of childhood and adolescence. The Country Paper for the ICN (1993) reported the prevalence of anaemia amongst pre-school children from rural areas ranging from 10% to over 30% in Peninsular Malaysia, 7% to above

50% in Sarawak, while in Sabah, the levels recorded were between 25-45%. Anaemia is often reported as more serious in female than male subjects. Among female adolescents, the prevalence of anaemia has been reported to vary quite widely ranging from about 10% to over 40% (Tee, 1999). A study conducted on adolescent schoolgirls in Sarawak recommended weekly iron-folate supplementation for improving both haemoglobin and ferritin levels (Tee *et al.*, 1999).

Nutritional anaemia is widespread among pregnant mothers. As assessed by haemoglobin level (<11 gm/dl), anaemia was reported in 67% pregnant mothers in the rural areas of Kuala Selangor as compared to 26% in Kuala Lumpur (Hanafiah *et al.*, 1992). Similarly high prevalence of anaemia (47.5%) was found in Kelantan (Zulkifli *et al.*, 1997). Serious anaemia (Hb < 9 gm/dl) in pregnant mothers is reported to be on the decline from 5.4% in 1990 to 3.9% in 1995 (Ministry of Health, 1995).

More studies should be undertaken on the status of serum iron and ferritin to ascertain the extent of iron deficiency anaemia during pregnancy. In light of the importance of folic acid in the development of the fetus, more data on the status of folic acid among Malaysian pregnant mothers is also needed.

### **Other Micro-nutrient Deficiencies**

The other micro nutrient problems that have been studied to some extent in Malaysia are iodine deficiency disorders (IDD) and vitamin A deficiency. IDD has been the subject of numerous studies and

control programme especially in Sarawak. Previous reports that relied mainly on physical examination had reported very high prevalence of IDD. However, in the 1990s with more sophisticated methods becoming available (e.g. based on thyroid stimulating hormone levels in umbilicus cord blood), the findings are believed to show a more representative picture of the problem (Kiyu, Zainab & Yahya, 1998).

Low to moderate prevalence of vitamin A deficiency based on serum vitamin A levels had been reported among children (Ng & Chong, 1977; Chong *et al.*, 1984). Currently, vitamin A status is assessed primarily by dietary methods and the results showed intake below the recommended level for households (Chen *et al.*, 1981) and in adolescents (Poh *et al.*, 1996). More biochemical determinations should be undertaken to verify whether vitamin A deficiency exists only at the sub-clinical level.

### **Overweight and Obesity**

Overweight in adults in both urban and rural areas in Malaysia is emerging as a matter of public health concern as reviewed recently (Ismail, 1998). According to the NHMSII, the overall prevalence of overweight (BMI =25.0 - <30.0kg/m<sup>2</sup>) in subjects above 18 years of age was 16.6% while that for obesity (BMI =>30.0kg/m<sup>2</sup>) was 4.4%. By ethnicity, obesity was found to higher among Malays (5.1%) and Indians (5.0%) than in Chinese (3.5%). Prevalence of overweight and obesity was significantly higher in females (5.7% and 17.9% respectively). Overweight increases with age up to

about 50 years and starts to decrease after the age of 60 years.

Overweight and its related risks of chronic non-communicable diseases has become more widespread in rural subjects. A significant proportion of rural women was found to be at risk of cardiovascular disease, being overweight (28%) (body mass index  $>25.0 \text{ kg/m}^2$ ), hypercholesterolemic (24%) (total cholesterol  $>240 \text{ mg/dl}$ ) and hypertensive (46%) (systolic blood pressure  $\geq 140 \text{ mm Hg}$ ) (Khor *et al.*, 1999).

The prevalence of overweight children in rural areas remains small at about 1%. In contrast, the prevalence of overweight children in urban areas has been reported in areas with higher income (Osman, Suhardi & Khalid, 1993). The proportion of obese children in urban primary schools was found to range between 3-15% (Bong & Safurah, 1996).

### **Nutrition Policy Implication**

Overall, the nutritional status of Malaysians has improved when compared with that prior to the country's attainment of independence when frank symptoms of nutrient deficiencies were often reported in field surveys. Nonetheless, "old" problems such as protein-energy malnutrition and anaemia persist especially among those from the lower socio-economic strata. Nutritionally vulnerable groups include young children, females and the elderly. Health and nutrition problems affecting the elderly should be accorded attention since its proportion in the population has increased from 5% in 1970 to 6.2% in 1997 and is projected to exceed 18% by the year 2020.

Based on limited consumption studies, inadequate intake of energy, retinol and the B vitamins appear to be a common finding for various age groups especially from the lower-socio-economic categories. More food consumption data is needed, particularly at the national level, in order that findings reported by small scale studies can be verified and more representative data on the nutritional situation in Malaysia be made available.

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