The Twin Faces of Malnutrition in Malaysia

Tee E Siong

Abstract

Various health indicators such as life expectancy at birth, and infant, toddler and maternal mortality rates have been improving steadily over the years, since the country gained independence. Recent studies in various parts of the country have shown that the nutritional status of Malaysians have been improving over the years. Due to the tremendous socio-economic development and parallel improved health care, serious malnutrition has largely been eradicated, although mild to moderate undernutrition exists in various rural and urban underprivileged communities. On the other hand, this rapid development has brought about changes in food consumption patterns and life styles, and a resultant different nutritional problems, namely those associated with overnutrition. Significant proportions of the affluent segments of the population are now known to be afflicted with various risk factors of coronary heart disease. Nutrition activities in the country would therefore have to be directed to both faces of malnutrition. Tackling the undernutrition problems remains as priorities for the nation, while particular attention is also been given to overnutrition and chronic diseases.

Introduction

Nutritionists have a role to play in informing Governments of the potential nutritional implications of their policies and actions, particularly those which can impinge on food supply and health. They should take part in making nutritional impact assessments of proposed governmental actions and submit findings to appropriate bodies for consideration. Although nutritionists can do little to affect food or money availability directly, they can contribute significantly to improve nutritional status at the family level, for example by improving knowledge on food and nutrition, overcoming deficiencies in intrafamilial distribution of food, and improving nutrient utilization (Pellett, 1987). Last but not least, in the context of this paper, nutritionists have a role to play in keeping the government informed of the nutrition situation.

Monitoring the nutritional status of communities has always been given emphasis by health and nutrition workers in this country. Health related indicators

Division of Human Nutrition,
Institute for Medical Research,
Kuala Lumpur, Malaysia

such as life expectancy at birth, birth-weight data, and infant, toddler and maternal mortality rates have been constantly monitored as indirect indicators of nutritional status of Malaysians. At the same time, various communities in different parts of the country have been studied by direct assessment. The implementation of the National Nutrition Surveillance System provided a national nutritional profile of the different communities in the country. All these data have provided valuable input for the implementation of intervention programmes and the subsequent impact assessment of these programmes.

This paper provides an overview of the nutritional situation in the country. Data are presented to illustrate the nutrition situation of Malaysians, the undernutrition problems afflicting the disadvantaged, as well as some insight into the problems affecting the affluent segments of the population. The data are far from being comprehensive and serve only to give a gross picture of the malnutrition problems.

Health and nutritional indicators

Several mortality rates have been used as indirect indicators of the nutrition situation in the country. Some of these are discussed below to indicate an improving nutrition situation.

Infant, toddler, and maternal mortality rates in Peninsular Malaysia, compiled from various sources, are given in **Figure 1**, and **Table 1** to illustrate the health and nutritional status of these vulnerable groups of the population. It can be seen that there had been a dramatic decline in these rates since the country gained independence in 1957. Infant mortality rates declined from 76 in 1957 to around 19 in 1982. Over the same period, toddler mortality rates dropped from 10.7 to 1.7, while maternal mortality recorded a decline from 3.20 to 0.50.

There was considerable variation in the health status of communities in different parts of the country. As can be seen from **Figures 2 – 4,** highest mortality rates were found in the states of Terengganu, Kelantan, Kedah, Perak and Pahang. Those states with better health status, as reflected by low mortality rates, were the Federal Territory, Selangor and Penang. These differences between the various states appeared to have remained essentially the same since a decade ago, as seen from data in the figures.

Within each state, there were again wide variations in mortality rates in the different districts. For example, in Kelantan and Kedah, there were a few districts with infant mortality rates about twice that of the national average. At the same time, several districts in these states recorded death rates of infants at about the level of the national average (Department of Statistics, 1984a, 1984b).

Table 1
Maternal mortality rates in Peninsular Malaysia, 1957 – 1982

Year	Maternal mortality rates (per 1,000 live births)
1957	3.20*
1965	1.68*
1972	1.07
1974	0.96
1976	0.78
1977	0.79*
1978	0.84
1979	0.69
1980	0.63
1981	0.59
1982	0.50

Source: *From Hamid *et al.* (1984); others from Department of Statistics (1974, 1976, 1978, 1980, 1981, 1984a)

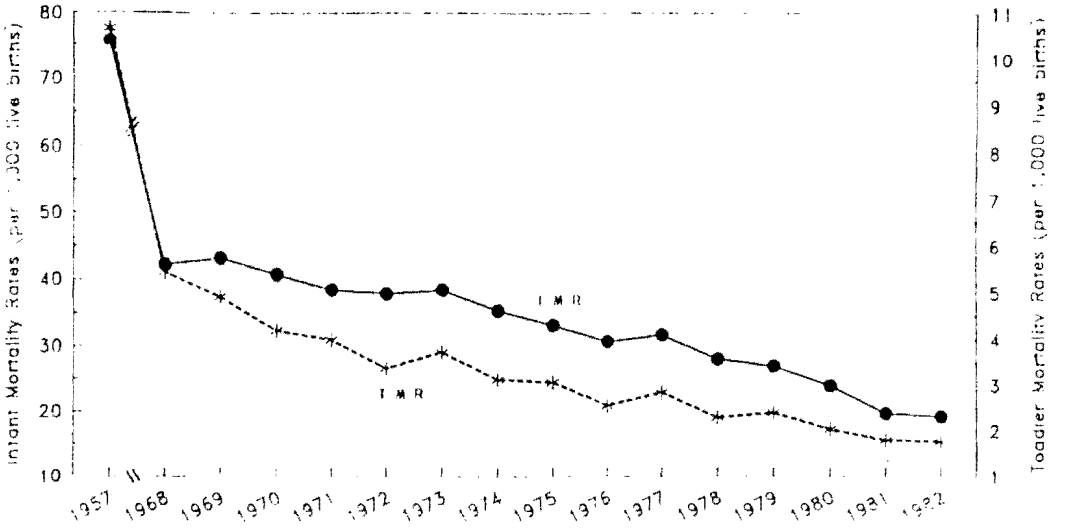

Figure 1
Infant and toddler mortality rates in Peninsular Malaysia, 1957 to 1982.

Source: Plotted using data from reports by Department of Statistics (1974, 1976, 1978, 1980, 1981, 1984a)

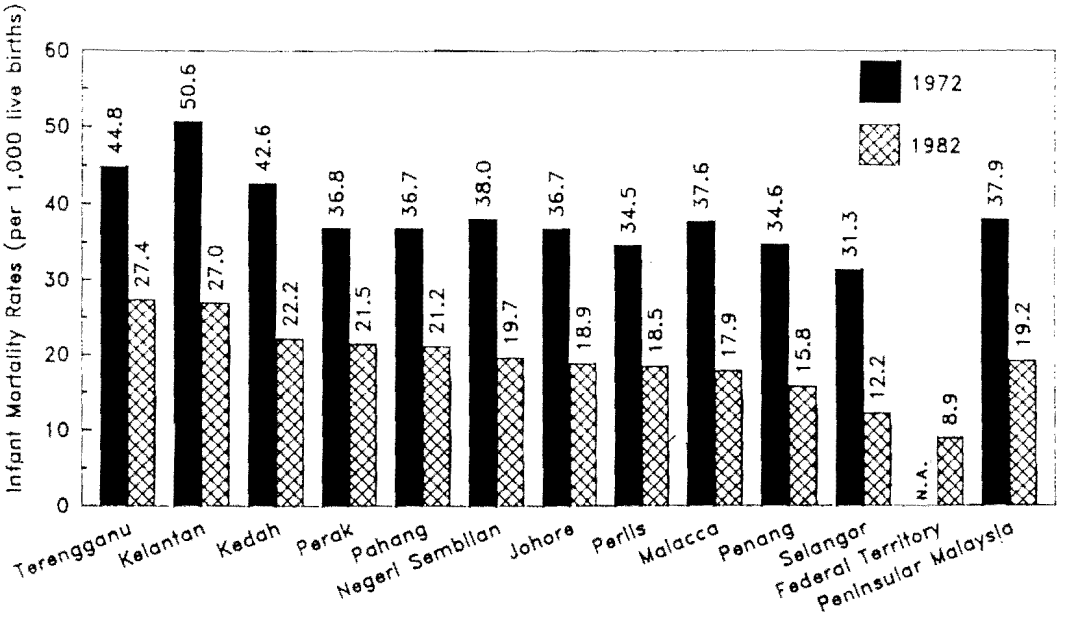

Figure 2
Infant mortality rates of various states in Peninsular Malaysia, 1972 and 1982.

Source: Plotted using data from reports by Department of Statistics (1974, 1984a, 1984b)

N.A. = data not available

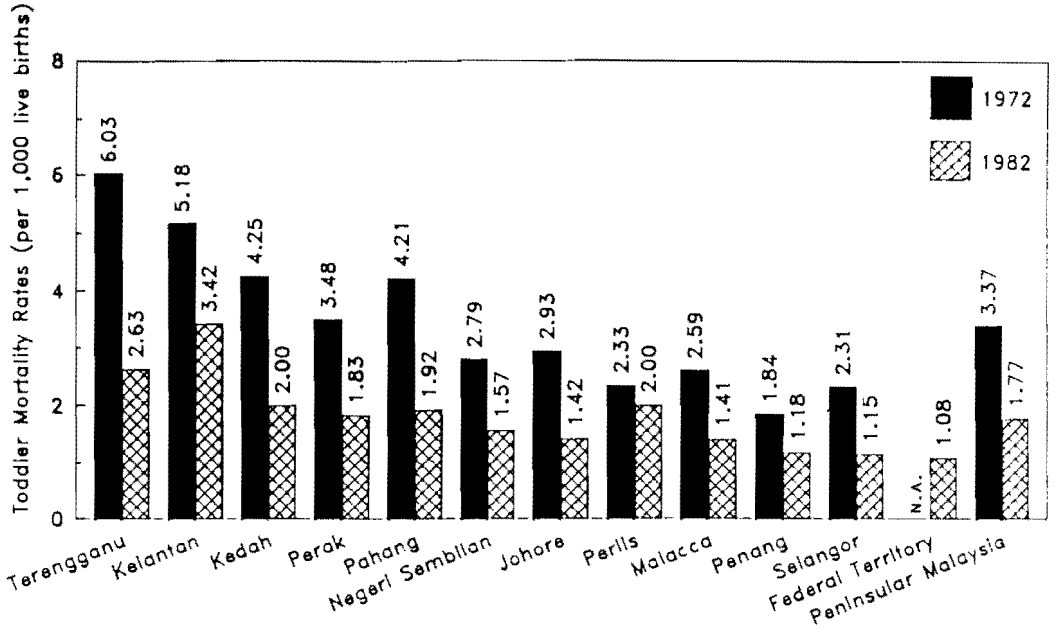

Figure 3

Toddler mortality rates of various states in Peninsular Malaysia, 1972 and 1982.

Source: Plotted using data from reports Department of Statistics (1974, 1984a, 1984b)

N.A. = data not available

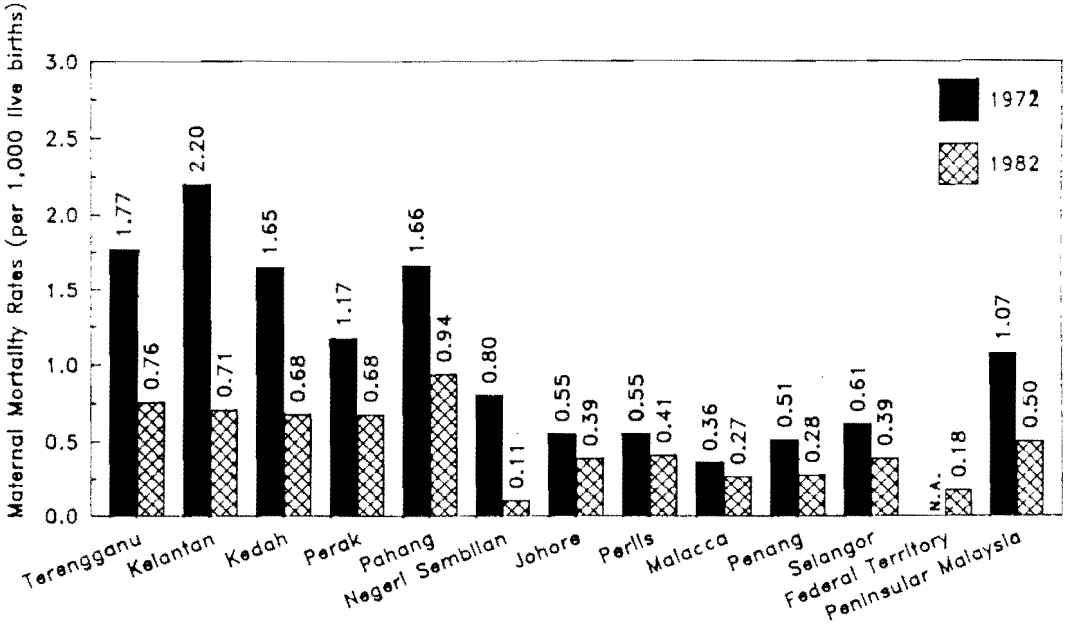

Figure 4

Maternal mortality rates of various states in Peninsular Malaysia, 1972 and 1982.

Source: Plotted using data from reports by Department of Statistics (1974, 1984a, 1984b)

N.A. = data not available

A similar picture was seen with regards to birth-weight data, although statistics in this area was less comprehensive. As shown in **Figure 5,** prevalence of infants born with < 2.5 kg had declined in most of the states, and there was considerable variation in this prevalence rate in different parts of the country.

Food availability and consumption data

Food balance sheet provides information on nutrient availability and pattern of supply of food items in a country. Although such data do not represent the actual consumption of communities, they do provide information on the food situation in a country.

Table 2 gives some data extracted from food balance sheets for Malaysia, taken from reports of the Food and Agriculture Organization (FAO, 1980; 1984; 1987). Over the years, from 1961, there was a trend of increasing per capita availability of calorie, fat and protein. Percentage of protein from animal sources was also seen to be on the increase.

Data on per capita food availability may only be used as a rough indicator of the food and nutrition situation of a country. Bearing in mind the problem of inequity of food distribution, these data also do not give insight on the nutritional status of communities at the local levels. More exact consumption data would have to be obtained through direct assessment studies.

Several studies have been undertaken to quantitate food consumption of com-

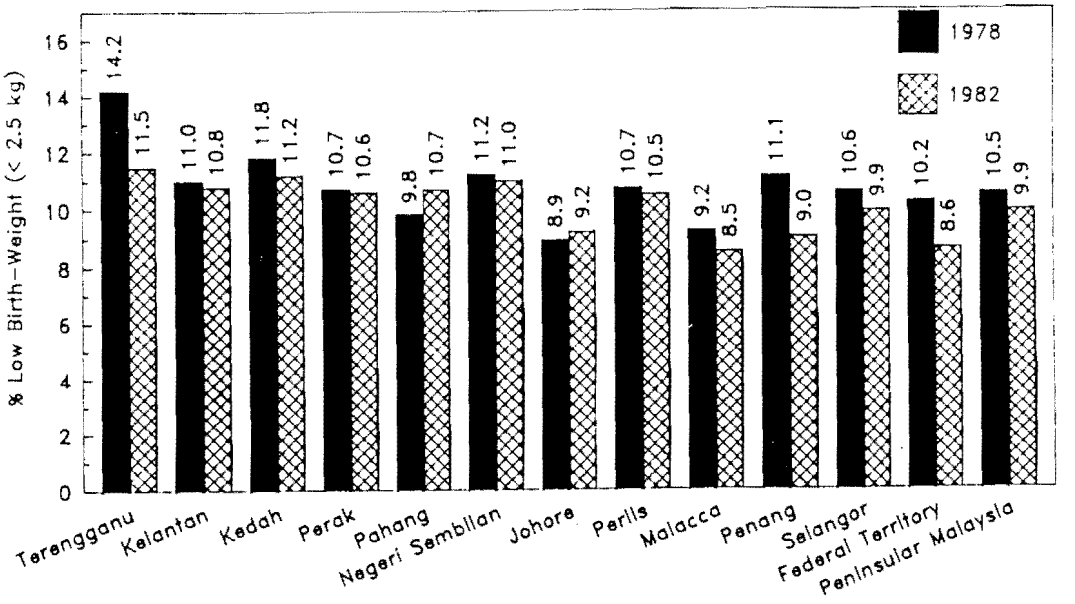

Figure 5
Prevalence of low birth-weight in various states of Peninsular Malaysia. 1978 and 1982.

Source: Plotted using data from reports by Department of Statistics (1980, 1984a)

Table 2
Protein and calorie availability in Malaysia.

	1961 – 65	1967 – 71	1972 – 74	1975 – 77	1979 – 81	1982 – 84
daily per caput supply of:						
calories	2,352	2,474	2,523	2,596	2,518	2,549
protein	48.2	51.2	51.4	55.8	56.0	58.0
fat	41.2	42.4	44.1	45.9	51.6	56.8
% animal proteins	30.3	32.6	32.4	36.6	44.5	43.1

Source: 1961 – 77 data from FAO (1980)
1979 – 81 data from FAO (1984)
1982 – 84 data from FAO (1987)

munities. Examples of recent large scale studies include the household food consumption of 14 rural villages in Peninsular Malaysia (Chong *et al.*, 1984) and studies on five communities reported that 66% of the households were not able to meet their requirement for calorie and 34% of households their requirement for protein. Similarly for the Sabah study, there was a wide range of nutrient consumption, and for 3 of the communities, some 75% of the households had a median calorie intake that were below their requirements. In the case of protein, it was found that 10 – 30% of the households did not meet requirement.

Several recent studies on food consumption by individual household members have been reviewed by Tee and Khor (1986). In general, protein intake by adolescents and preschool children appeared to be adequate. As has been found for household food consumption data, adequacy for calorie had been observed to be a greater problem than protein.

Nutritional deficiencies

While mortality data do give an indication of the overall nutritional status of the country or state, they do not show the problems existing at the micro level. Thus, while the overall nutrition situation in the country has improved over the years, recent studies have indicated that pockets of malnutrition exist in various parts of the country.

Growth retardation

Some recent data (Chen, 1983; Chong *et al.*, 1984; Khor, 1985) on growth performance of preschool children are shown in **Figure 6.** These weight-for-age data were plotted alongside some data collected in the 1970's (Mckay *et al.*, 1971; Chong *et al.*, 1972), and the NCHS median (WHO, 1983). A general trend in growth performance of these children may be seen and some of the highlights include:

* upper income children had better weight-for-age achievement than those from rural areas;
* an apparent gain in weight-for-age among the preschoolers of poor rural communities over a decade period;
* there seemed to be less gain in weight-for-age for the upper income group (for which relatively less data are available) after more than a decade;
* the group of aborigine children studied in the mid-1980's appeared to be worse off than the rural poor Malay children.

The height-for-age data of these groups of children were similarly plotted and shown in **Figure 7.** It can be seen that :

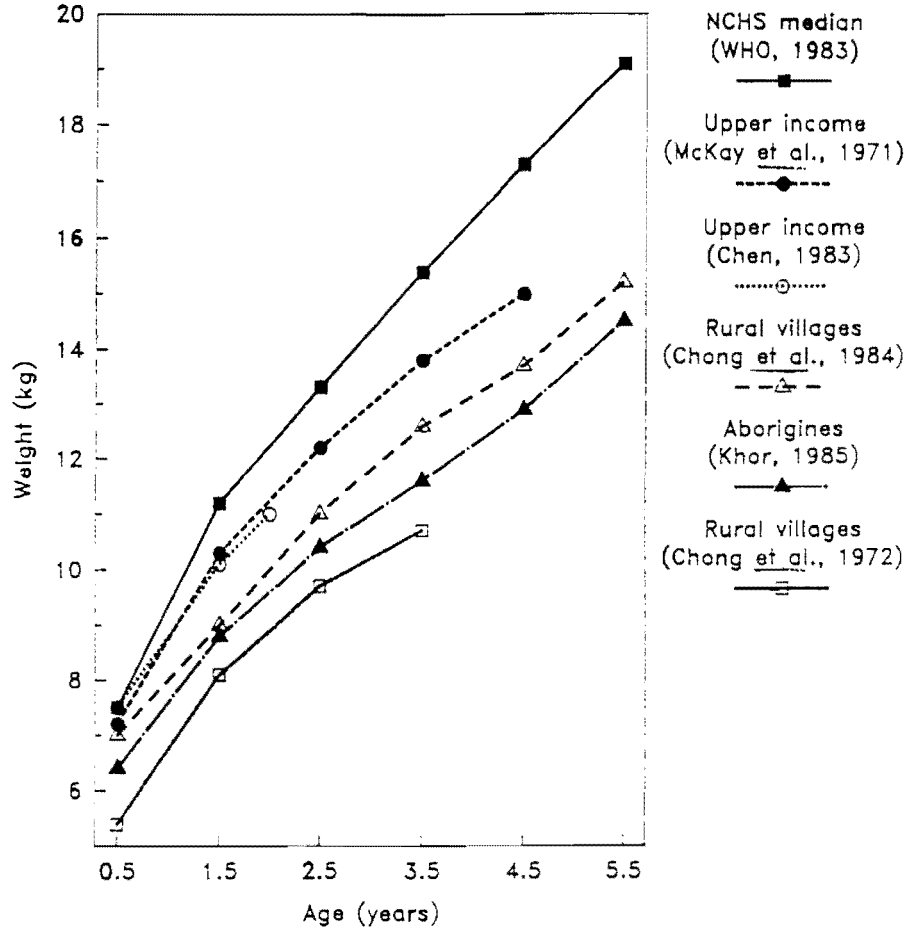

Figure 6
Weight-for-age of Malay preschool children, Peninsular Malaysia (sexes combined).

Source: Tee & Khor (1986)

* height-for-age achievement of the upper income children, which seemed to approximate the NCHS median, was clearly better off than that of the rural children;

* there was a similar improvement in height-for-age over the last decade among the rural preschool children;

When expressed in terms of weight-for-height **(Figure 8)** :

* the rural preschoolers showed achievements of 92 – 98% of the NCHS

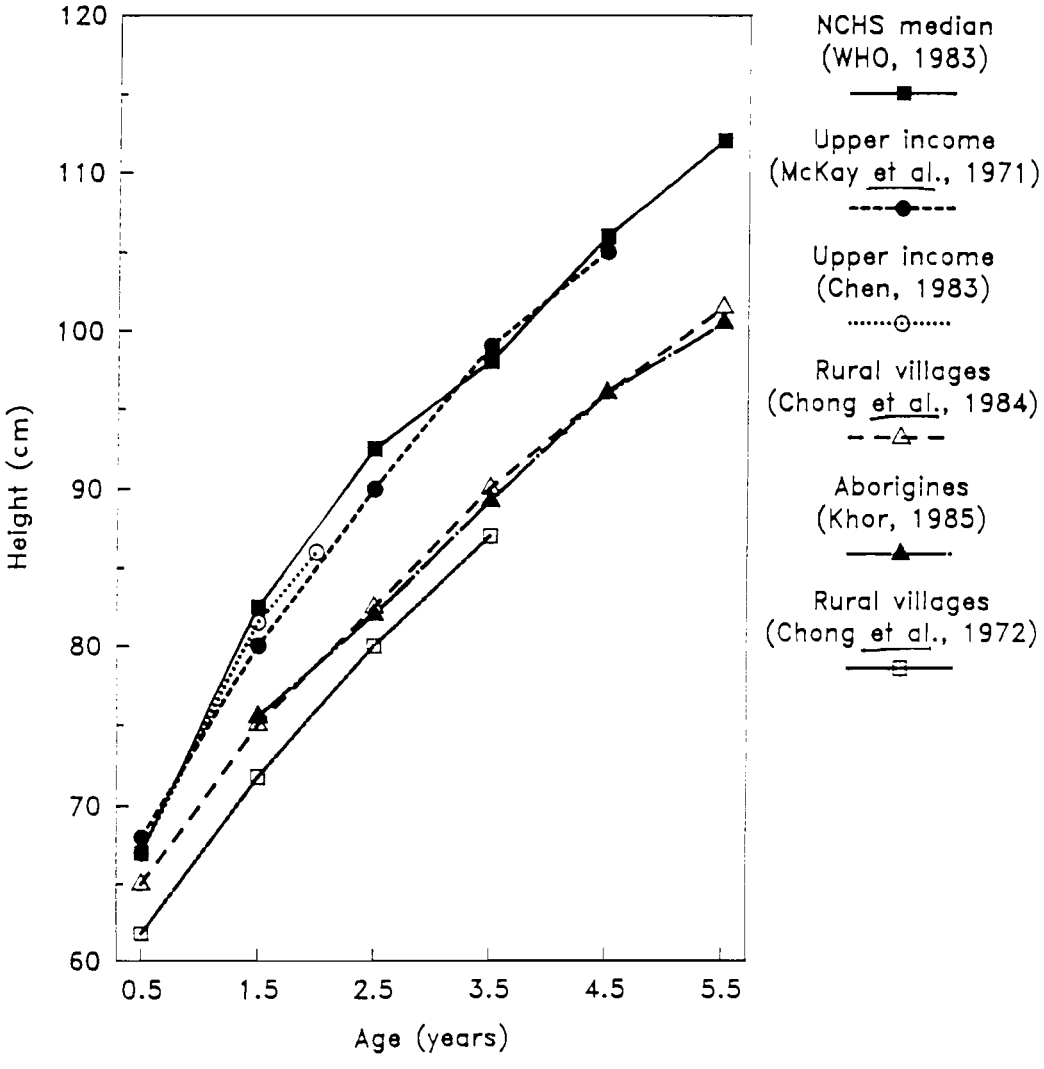

Figure 7
Height-for-age of Malay preschool children, Peninsular Malaysia (sexes combined).

Source: Tee & Khor (1986)

reference, compared to 83 – 89% a decade ago;

* there was a clear trend for the upper income children; they possessed weight-for-height achievements that range between 87 – 95% of the NCHS reference.

Growth performance of primary school children have also been given considerable attention by investigators. Some recent data from rural children in Peninsular Malaysia (Chong *et al.*, 1984) are given in **Figure 9.** The prevalence of acute malnutrition (wasted) and severe chronic undernutrition (wasted and stunted) were minimal, but considerable amount of chronic undernutrition (stunted) and underweight were seen. Compared to their urban counterparts, the median weight and height curves of these children were clearly inferior to their urban counterparts in Kuala Lumpur and Petalin Jaya **(Figure 10).** Such differences in growth achievement of rural and urban school children have also been reported earlier (Rampal, 1977).

Anaemia

Besides poor growth achievement, another major nutritional problem in the country is iron deficiency anaemia, which has been investigated for some years in the country (Tee, 1985). Some selected data (reviewed by Tee and Khor, 1986) amongst children of various population groups studied in the late 1970's and early 80's showed that the problem was of a considerable magnitude, with prevalence rates ranging from 16 to 45%.

The anaemia problem amongst pregnant women has also received particular attention. Like the growing children,

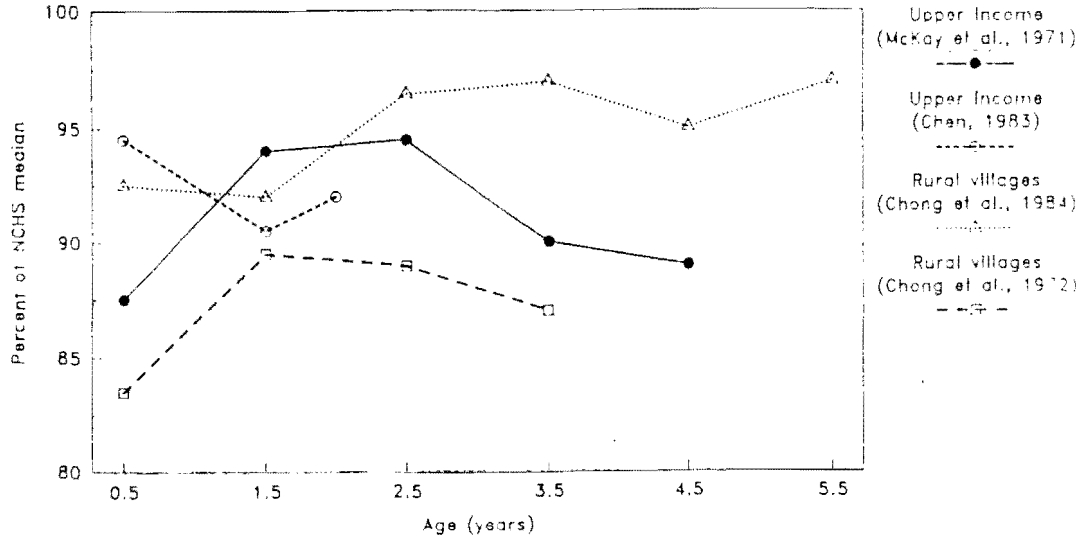

Figure 8
Weight-for-height of Malay preschool children, Peninsular Malaysia (sexes combined).

Source: Tee & Khor (1986)

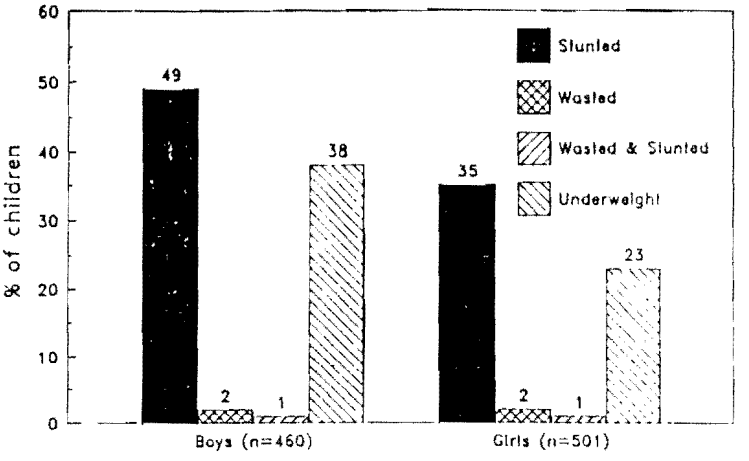

Figure 9
Prevalence of growth retardation in primary school children of rural villages.

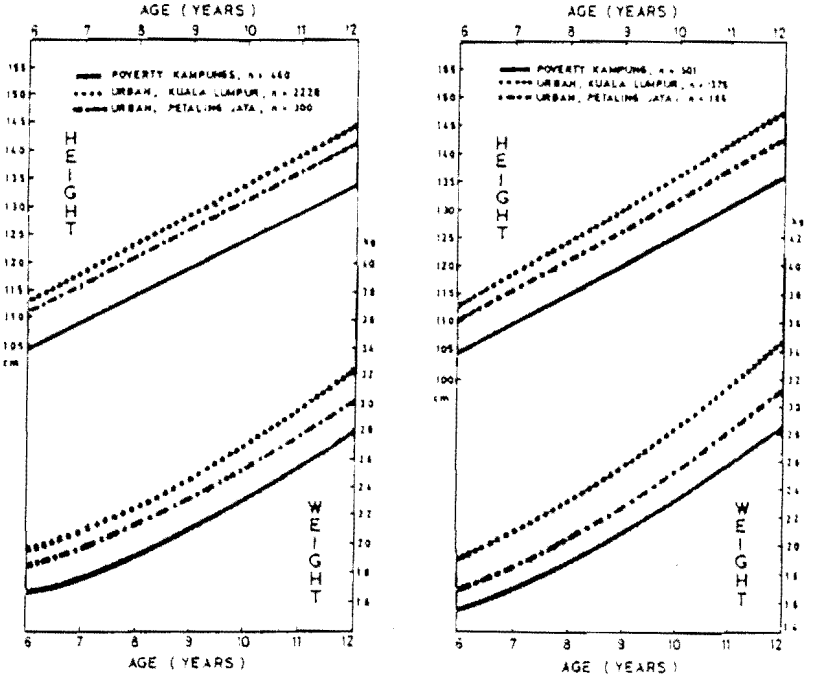

Figure 10 Comparative Growth Achievement of (a) Primary School Boys, and (b) Primary School Girls in Selected Rural Villages and Urban Areas (Shaded areas represent weight and height achievements between median and median – 2SD of the NCHS reference).

Source: Chong *et al.*, 1984

these women are at particular risk to the development of anaemia due to increased requirements. In a recent study concluded at the Maternity Hospital, Kuala Lumpur, a moderately high prevalence of anaemia amongst a group of pregnant women of lower socio-economic status was reported (Tee *et al.*, 1984). Anaemia in the study population was said to be related mostly to iron and, to a lesser extent, folate deficiency.

Other nutritional deficiencies

Other nutrient deficiencies documented include vitamin A and iodine deficiency goitre. Studies reported have indicated that vitamin A deficiency does not appear to pose a serious problem in the country (Tee and Khor, 1986). Endemic goitre too does not appear to be a major nutritional problem in Peninsular Malaysia, except for a few studies which have indicated high prevalence rates in isolated parts of the Peninsula. The problem is however, much more extensive in Sarawak. A recent review (Tan, 1982) indicated that 12 of the State's 25 districts have been identified as goitrous, with varying rates of prevalence and occurring mainly in the inland areas. It has been estimated that there were at least 20,000 cases of endemic goitre in Sarawak, representing about 1.5% of its total population. The problem is said to be caused primarily by iodine deficiency in the diet.

Overnutrition

As a result of the rapid pace in socio-economic development and increased affluence of the country, the population is now faced with the other facet of the malnutrition problem. Chronic diseases associated with dietary excesses and imbalances, such as hypertension, coronary heart disease and cancers have now emerged as the country's major killers.

Studies in these areas are relatively recent undertakings in the country. Studies into the relationship between diet and coronary heart disease (CHD) were carried out from the 1960's. Several studies on serum lipid levels of Malaysians have shown that hyperlipidemia was also a problem amongst the more affluent segments of the population (e.g. Chong, 1961; Lau *et al.*, 1962; Chong *et al.*, 1971). In his reviews of serum cholesterol level and prevalence of hypercholesterolemia among various population groups in the country, Chong (1986) has shown that urban Malaysians were faced with greater risk to CHD **(Table 3).**

Comparative studies of various coronary risk factors among aborigines in the deep jungle and those in the periurban and jungle-fringe revealed low levels of serum lipids and absence of CHD in the former group, while the latter tended to have higher serum cholesterol and blood pressure values (Burns-Cox *et al.*, 1972). A more recent study of these risk factors was reported for 406 male executives in two urban areas, Kuala Lumpur and Petaling Jaya (Teo, 1988). Mean values of selected risk factors of the subjects are shown in **Figures 11** and **12**. Mean total cholesterol, triglycerides and fasting glucose levels were found to increase with the older age groups. The prevalence of these risk factors **(Figures 13a** and **13b)** was also reported to show a rising trend with age, with the exception of uric acid and cholesterol. Even in the younger age group (25 – 34 years), there was an appreciable prevalence of most of the risk factors studied. Examining the prevalence of the three major risk factors: hypertension, hypercholesterolemia and smoking **(Figure**

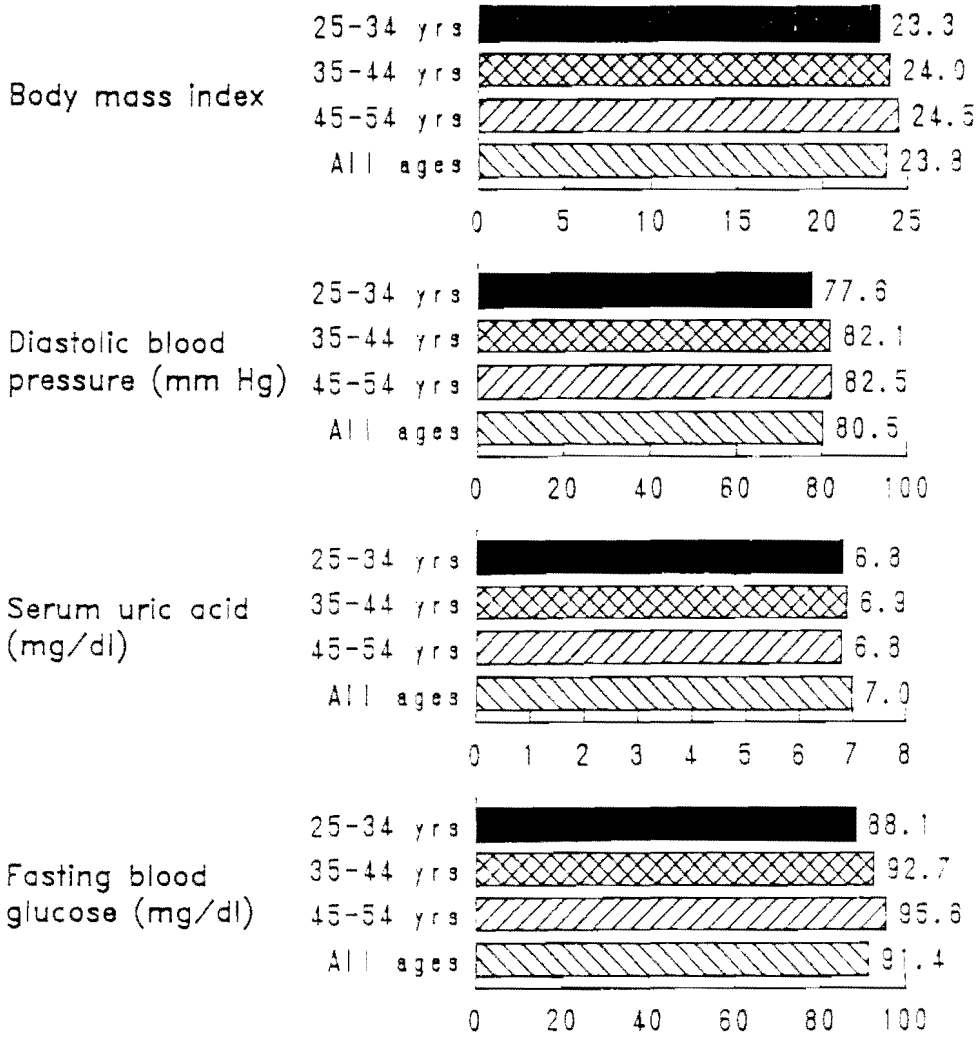

Figure 11
Mean values of selected coronary risk factors among Malaysia male executives.

Source: Teo *et al.* (1988)

25 – 34 yrs, n = 146; 35 – 44 yrs, n = 209
45 – 54 yrs, n = 51; all ages, n = 406

Table 3
Serum cholesterol levels and prevalence of hypercholesterolemia among various population groups in Malaysia.

	No. of Subjects	Serum cholesterol mg/dl (mean ± SD)	Hyper-cholesterolemia*
Urban executives	251	231 ± 45	24
Soldiers	158	199 ± 39	6
Rural dwellers and farmers	195	180 ± 38	3
Aborigines	89	146 ± 30	0

* Serum cholesterol in excess of 260 mg/dl.
Source: Chong (1986)

14), the investigators reported that 1.5% of the subjects had all three risk factors. Slightly more than half (51.5%) of the subjects had one or more of these three risk factors. The investigators noted that several of the risk factors studied were comparable with those reported for other more industrialized countries.

Conclusions

Available data show that nutritional status of Malaysians has been improving over the years Frank nutritional deficiencies are rarely encountered. Nevertheless, mild to moderate malnutrition exists amongst various population groups, especially the vulnerable groups in socio-economically disadvantaged communities. Growth retardation and anaemia are the major problems encountered, while vitamin A deficiency and iodine deficiency goitre are prevalent among selected population groups.

In contrast, it has become evident that the other extreme of the malnutrition problem, that of dietary excesses, is afflicting the affluent segments of the population. Associated with changes in food consumption pattern and life – style, coronary heart disease has emerged as a major cause of death in the country. Studies into risk factors of the disease have shown that these are prevalent among the urban Malaysians.

Nutrition activities in the country have been geared towards ameliorating both faces of the malnutrition problem. There has been a definite change in the trend in nutrition research. Proper characterization of the nutritional problems provided input for the implementation of suitable intervention strategies. Tackling the undernutrition problems remain as priorities for the nation as larger proportions of the population are afflicted by or at risk to nutritional deficiencies. Socio-economic development and poverty eradication has been given emphasis at all times. Development of health services infrastructure continues, and specific intervention programmes have been implementation for needy communities. On the other hand, emphasis has also been given to tackling problems of nutritional excesses and imbalances. The importance of nutritional balance and fitness have been given particular attention in recent years.

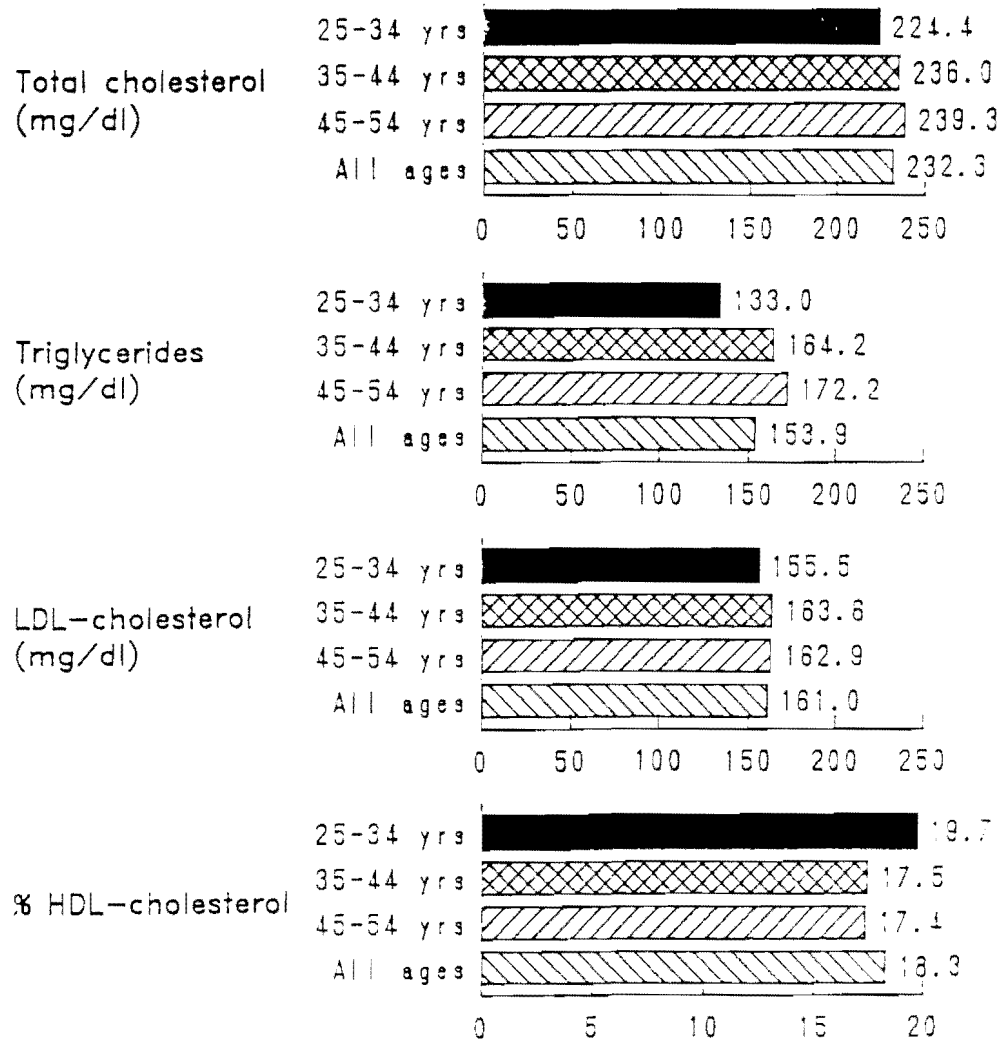

Figure 12
Mean serum lipid levels of Malaysian male executives.

Source: Teo *et al.* (1988)
25 – 34 yrs, n = 146; 35 – 144 yrs, n = 209
45 – 54 yrs, n = 51; all ages, n = 406

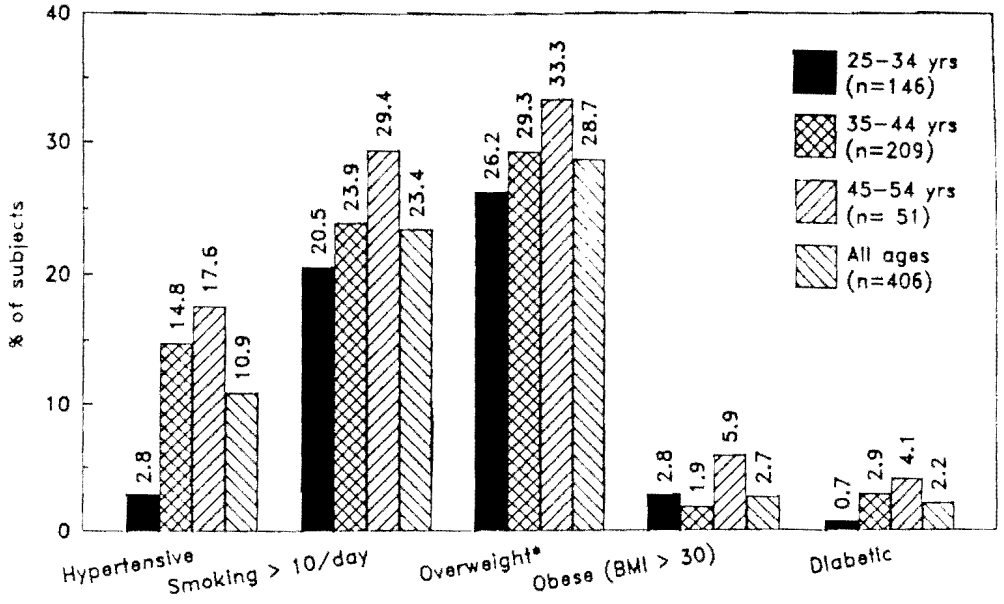

Figure 13a
Prevalence of coronary risk factors among Malaysian male executives.

Source: Teo et al (1988)

* BMI = 25–30

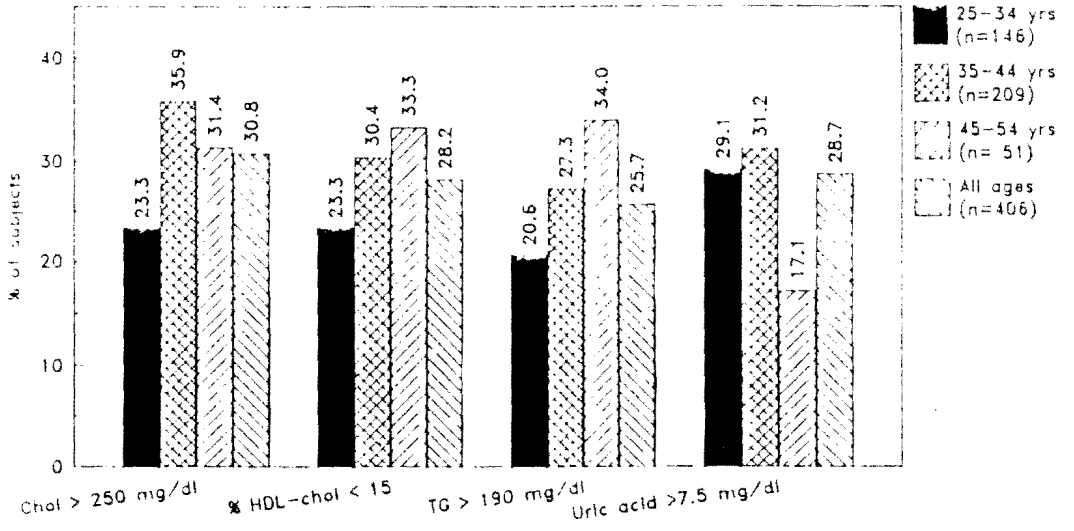

Figure 13b
Prevalence of coronary risk factors among Malaysian male executives.
(continued)

Source: Teo et al. (1988)

Chol = cholesterol
TG = triglycerides

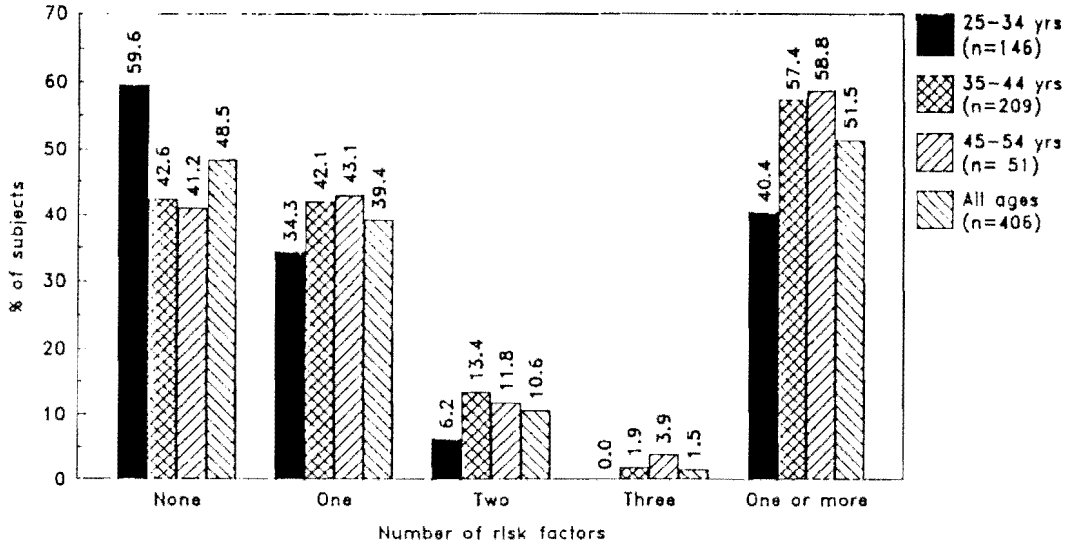

Figure 14
Prevalence of the three major coronary risk factors* among malaysian male executives

Source: Teo et al, (1988)

* Hypertension, cholesterol > 250 mg/dl, and smoking > 10 cigarettes/day

A national programme for the control and prevention of CHD has also been planned. It is hoped that both facets of the malnutrition problem shall be adequately contained, for the betterment of the quality of life of Malaysians.

References

1. Burns-Cox CJ, Chong YH, Gillman, R. Risk factors and the absence of coronary heart disease in aborigines in West Malaysia. *Br Heart J* 1972; 34:953 – 8.
2. Chen PCY, Chan MKC, Teoh ST, *et al.* A nutrition study of the Interior, West coast and Kudat Divisions of Sabah. Department of Social and Preventive Medicine, Faculty of Medicine, University of Malaya, Kuala Lumpur, and Office of the Director of Medical Services, Sabah, Kota Kinabalu, 1981.
3. Chen ST. The assessment of physical growth and development from birth to 2 years of age in a selected group of Malay children from higher income families. M.D. Thesis, Kuala Lumpur University of Malaya, 1983.
4. Chong YH. Serum lipids and lipoproteins in healthy Malayans. *Med J Malaya* 1961;16:136 – 43.
5. Chong YH. Diet and coronary heart disease: Current issues. Proceedings of the 1st Scientific Conference, Kuala Lumpur. Nutrition Society of Malaysia, 1986; pp. 31 – 7.
6. Chong YH, Soh CC, Ho GS, Rajaratnam R, Nonis P. Serum low density lipoproteins, triglycerides and cholesterol levels in Malaysia. *Clin Chim Acta* 1971;34:85 – 92.
7. Chong YH, McKay DA, Lim RKH. Some results of recent nutrition surveys in West Malaysia (with emphasis on

nutritional anthropometry and biochemistry). *Bull Publ Hlth Soc* 1972; 6:55 – 61.

8. Chong YH, Tee ES, Ng TKW, Kandiah M, Rozia Hanis H, Teo PH, Siti Mizura S. Status of community nutrition in poverty kampungs. Bulletin no. 22, Kuala Lumpur. Institute for Medical Research, 1984.
9. Department of Statistics Malaysia. Vital statistics Peninsular Malaysia, 1972. Kuala Lumpur. Department of Statistics, 1974.
10. Department of Statistics Malaysia. Vital statistics Peninsular Malaysia, 1974. Kuala Lumpur. Department of Statistics, 1976.
11. Department of Statistics Malaysia. Vital statistics Peninsular Malaysia, 1976. Kuala Lumpur. Department of Statistics, 1978.
12. Department of Statistics Malaysia. Vital statistics Peninsular Malaysia, 1978. Kuala Lumpur. Department of Statistics, 1980.
13. Department of Statistics Malaysia. Vital statistics Peninsular Malaysia, 1979. Kuala Lumpur. Department of Statistics, 1981.
14. Department of Statistics Malaysia. Vital statistics Peninsular Malaysia, 1982. Volume 1. Kuala Lumpur. Department of Statistics, 1984a.
15. Department of Statistics Malaysia. Vital statistics Peninsular Malaysia, 1982. Volume 2. Kuala Lumpur. Department of Statistics, 1984b.
16. Food and Agriculture Organization. Food Balance Sheets: 1975 – 77 Average and Percaput Food Supplies, 1961 – 65 Average, 1967 – 77. Rome: FAO, 1980; pp. 588 – 93.
17. Food and Agriculture Organization. Food Balance Sheets: 1979 – 81 Average. Rome: FAO, 1984; pp. 145 – 6.
18. Food and Agriculture Organization. Food Balance Sheets: 1982 – 84 Average. Rome: FAO, 1987; unpublished.
19. Hamid A, Kader HA, Jaffar A, Noor Laily AB. The national family planning program: its impact on perinatal mortality. *Malaysian J Reprod Health* 1984;2:83 – 95.
20. Khor GL. A study on the nutritional status of the Semai. Ph.D. Thesis, Kuala Lumpur University of Malaya, 1985.
21. Lau KS, Lopez CG, Gan OM. Serum cholesterol levels in Malaya, Indians and Chinese in Malaya. *Med J Malaya* 1962, 16:184 – 92.
22. McKay DA, Lim RKH, Notaney KH, Dugdale AE. Nutritional assessment by comparative growth achievement in Malay children below school age. *Bull WHO* 1971; 45:233 – 42.
23. Pellett PL. The determinants of nutritional status. *Fd Nutr* 1987;13:2 – 14.
24. Rampal L. Nutritional status of primary school children: a comparative rural and urban study. *Med J Malaysia* 1977;32:6 – 16.
25. Tan YK. Endemic goitre in the State of Sarawak, Malaysia. *In* : Delange F, Ahluwalia R, eds. Proceedings of the workshop on cassava toxicity and thyroid : Research and public health issues, 31 May – 2 June, 1982, Ottawa, Canada 1982;64 – 8.
26. Tee ES. Nutritional anaemias: spectrum and perspectives with relevance to Malaysia. Kuala Lumpur. National Population and Family Development Board, 1985.
27. Tee ES, Kandiah M, Jaafar A, Kandiah V, Mohd Rusli Z, Kuladevan R, Zulkafli H. Nutritional anaemia in pregnancy: A study at the Maternity Hospital, Kuala Lumpur. *Malaysian J Reprod Hlth* 1984;2:32 – 50.

28. Tee ES, Khor GL. Overview of country nutritional status. Proceedings of the 1st Scientific Conference, Kuala Lumpur: Nutrition Society of Malaysia, 1986; pp. 7 – 24.
29. Teo PH. Coronary risk factors among Malaysian male executives in two urban areas. *Proc Nutr Soc Mal* 1988; 3:24 – 31.
30. World Health Organization. Measuring change in nutritional status. Geneva: WHO, 1983.

Proceeding of SEAMEO–TROPMED
Second Seminar on Nutrition
Jakarta, Indonesia, March 20–21,
1989.

The organizing committee wishes to thank the following organizations and companies for their contributions to the congress: Unilever, Otsuka, Roche, Pfizer, Squibb, Bayer, Vitanova, Mack, Sanmaru.

HUMAN NUTRITION
Better Nutrition in Nation Building

Edited by
Praneet Pongpaew
Soemilah Sastroamidjojo
Benjaluck Prayurahong
Panata Migasena
Asri Rasad

1990
Siriyod Printing Company Ltd.
Bangkok, Thailand.
Tel. 2334387, 2358874

ISBN 974-586-900-7

Published by:
Siriyod Printing Company Ltd.
Bangkok, Thailand. Tel. 2334387, 2358874