

# The nutrition and health transition in Malaysia

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## Abstract

The accelerated phase of industrialisation and urbanisation in recent decades has inevitably brought about changes in the lifestyle of Malaysians. Changes in dietary habits and sedentary lifestyles are known to be associated with changes in health and increased prevalence of chronic diseases in the population. The objective of this paper is to provide a better understanding of the link between demographic variables and food consumption patterns related to the nutrition transition in Malaysia. This review uses various reports and publications from several ministries and selected local studies. The statistics compiled over the last two decades have shown that as the population achieves affluence, intakes of calories, fats and sugars increase, which may account for the substantial increase in food importation bills over the same period. Similarly, the rapid growth of the fast food industry during the last decade has added another dimension to the change in food consumption patterns of Malaysians. With the exception of a study on adolescents, the prevalences of overweight and obesity in children and adults are not strictly comparable due to the difference in body mass index (BMI) cut-off points in children and the study protocol in adults, and hence should not be misinterpreted as trends. The recent recommendation to lower the BMI cut-off points for Asians would only increase the magnitude of the existing prevalence among adults. The need to promote healthy nutrition for the population must be pursued vigorously, as the escalation of nutrition-related chronic degenerative diseases – once an urban phenomenon – has now spread to the rural population at an alarming rate. This paper indicates that the problem is real and needs urgent attention because it may be just the tip of the iceberg.

**Keywords**  
Demographic trends  
Food consumption trends  
Body mass index  
Obesity  
Non-communicable diseases

Malaysia has often been recognised as a role model for developing economies. While poverty is being addressed, albeit with varying degrees of success, a good proportion of the population has also achieved affluence. A rapid transition has generated marked changes in lifestyles, occupational patterns and dietary habits amongst Malaysians. These changes are increasingly reflected in the morbidity and mortality patterns of the population. The double burden disease theory is very apparent: i.e. while great efforts are being made to combat communicable diseases and pockets of malnutrition, the past decade has seen degenerative diseases (e.g. coronary heart disease, hypertension, diabetes and obesity) become prominent.

The epidemiological transition involving concurrent shifts in diet, physical activity and body composition appears to be accelerating and affecting the morbidity and mortality patterns in many regions of the world<sup>1</sup>.

The enormous cost of the high technology and tertiary health care needed for the diagnosis, treatment and management of these diseases will impose a huge, undesirable burden on the human and economic resources of Malaysia. It is in Malaysia's interest to intervene strategically before the typical dietary patterns associated with Western affluence become widespread and established within the population<sup>2</sup>. This paper attempts to provide a better understanding of the link

between demographic variables and food consumption patterns related to the nutrition and health transition in Malaysia.

## Sociodemographic indicators

As a result of sustained economic growth and political stability over the last three decades, Malaysia is ranked 'high' according to the rating by the United Nations Development Programme (UNDP)<sup>3</sup>. This rating is based on a composite 'Human Development Index', derived from data on life expectancy, educational attainment and income. From 1980 to 2000<sup>4</sup>, the population has doubled from 11.4 million to 23.3 million and the life expectancy has increased for males and females from 66.4 years and 70.5 years in 1980 to 70.2 years and 75.0 years in 2000, respectively. The gross national product (GNP) rose fourfold from US\$ 20.6 million (US\$ 1.00 = Malaysian Ringgits (RM) 2.50 in 1980–95) in 1980 to US\$ 81.8 million in 2000 (US\$ 1.00 = RM 3.80 in 2000), while the per capita GNP increased from US\$ 1494 to US\$ 5344 during the same period with the exception of 1985, when there was a virtual collapse of private investment, both domestic and foreign. The gross domestic product (GDP) growth rate averaged 8% per annum during these years (Table 1)<sup>4</sup>.

**Table 1** Selected sociodemographic statistics, Malaysia (1980–2000)<sup>4</sup>

	Year				
	1980	1985	1990	1995	2000
Population ('000)	11 442	12 981	14 620	20 689	23 263
Infant mortality rate (per 1000)	23.9	16.5	13.1	10.3	7.9
Crude birth rate (per 1000)	30.9	31.9	28.4	26.1	24.5
Crude death rate (per 1000)	5.3	5.0	4.7	4.6	4.4
Life expectancy (years)					
Males	66.4	67.4	68.9	69.4	70.2
Females	70.5	72.4	73.5	74.2	75.0
GNP (US\$ '000)	20 556	28 735	43 046	83 238	124 326
Per capita GNP (US\$)	1494	1832	2417	4023	5344
Annual GDP growth rate (%)	+7.4	-1.4	+8.3	+9.5	+8.5

Note: US\$ 1.00 = RM 2.50 (1980–1995), RM 3.80 (2000).

The rate of urbanisation has increased from about 25% in 1960 to 41% in 1990 and is expected to exceed 60% by 2020<sup>5</sup>. Based on a poverty line income of US\$ 170 per month for a household of 4.6, the incidence of poverty decreased from 18.4% in 1985 to 5.5% in 2000 while the incidence of hard-core poverty (half of the poverty line income) decreased from 6.3% to 0.5%<sup>6</sup>. The mean monthly gross household income has increased from US\$ 468 in 1989 to US\$ 808 in 1995 with an average annual growth rate of 9.5%<sup>7</sup>.

### Trends in food consumption

Income and population growth, coupled with changes in lifestyle to one of urbanisation, have increased the demand for food and induced changes in food habits, food purchasing and consumption patterns. Food balance sheet<sup>8</sup> data are useful to indicate trends of food intake patterns rather than consumption *per se* in the absence of nation-wide food consumption surveys. The intake pattern of calories increased from 2430 kcal person<sup>-1</sup> day<sup>-1</sup> in 1961 to 2990 kcal person<sup>-1</sup> day<sup>-1</sup> in 1997, protein from 49 g person<sup>-1</sup> day<sup>-1</sup> to 61 g person<sup>-1</sup> day<sup>-1</sup>, and fat from 49 g person<sup>-1</sup> day<sup>-1</sup> to 87 g person<sup>-1</sup> day<sup>-1</sup>, respectively. The food balance sheet<sup>8</sup> also revealed that, from 1961 to 1997, the amount of calories obtained from cereals decreased from 61% to 41%; meanwhile, calories

from meat, eggs and fish increased from 6.2% to 14.3%, sweeteners from 9.5% to 18%, and oils and fats from 11.4% to 14.8% (Table 2)<sup>8</sup>, respectively.

The Ministry of Agriculture<sup>9</sup> reported the per capita consumption of major food commodities between the years 1985 and 2000 as shown in Table 3. The trend observed, where there is a shift towards an affluent diet that is high in energy-dense foods and rich in fats at the expense of complex carbohydrate foods, is consistent with the increased national wealth. The report also revealed a twofold increase in imported food from US\$ 909 million in 1985 to US\$ 2 billion in 1995.

The 'Westernisation' of global eating habits, made possible through food imports, fast foods and rising consumption of sugars and animal fats, is sometimes blamed for the rising epidemic of obesity and associated chronic diseases<sup>10</sup>. The fast food industry in Malaysia had a sizzling growth throughout most of the 1990s. The estimated total sales were RM 1 billion (US\$ 263 million) in 1997 increasing to RM 1.3 billion (US\$ 340 million) in 2000<sup>11</sup>. Some of the major fast food companies in Malaysia and their estimated sales for the year 2000 are shown in Table 4.

### Food intake studies

In the absence of nation-wide food consumption surveys, this report can only highlight some selected studies

**Table 2** Changes in sources of calories in Malaysia, 1961–1997<sup>8</sup>

	Year				
	1961–63	1970–72	1979–81	1988–90	1997
Cereals	61	57	48.6	40.0	41.0
Starchy roots	1.9	1.9	1.9	2.9	1.9
Vegetables & fruits	4.2	3.8	3.8	3.8	3.8
Pulses	1.0	1.0	1.0	1.0	1.0
Meat, fish, eggs	6.2	6.7	9.5	12.4	14.3
Milk, excluding butter	2.9	2.9	3.8	3.8	3.8
Sweeteners	9.5	12.4	12.4	13.2	18.0
Oils & fats	11.4	12.4	17.1	21.0	14.8
Miscellaneous	1.9	1.9	1.9	1.9	1.4

**Table 3** Per capita consumption (kg year<sup>-1</sup>) of major food commodities, 1985–2000<sup>9</sup>

Item	Year			
	1985	1990	1995	2000
Crops				
Rice	102.2	89.8	86.9	85.7
Vegetables	42.4	45.5	48.5	52.0
Fruits	39.7	44.3	49.9	53.5
Livestock				
Beef	2.4	3.2	4.3	5.3
Mutton	0.4	0.4	0.6	0.6
Poultry	14.6	19.0	30.0	35.3
Pork	10.1	12.0	13.2	8.1
Eggs	11.4	15.7	16.4	16.8
Milk*	37.2	37.7	51.5	53.0
Food fish	33.4	34.8	39.1	49.0
Food imports (US\$ million)	909	1205	2017	NA

\* Milk per capita consumption in litres per year.

NA – not available.

conducted in the last several decades. A household food consumption survey in poverty villages<sup>12</sup> reported a mean energy intake of 1874 kcal, of which 12% of the total energy was derived from protein, 18% from fats and 70% from carbohydrates. A recent study by Chee *et al.*<sup>13</sup> in poor villages, using a 3-day food record, reported a similar mean energy intake of 1871 kcal with a slight difference in the constituents; i.e. 13% of the total energy from protein, 20% from fats and 67% from carbohydrates. Their study also revealed a significant difference in mean energy intake between urban (2275 kcal) and rural men (2024 kcal), with fat contributing 30% and 19% of the total calories, respectively. Although the mean energy intakes of urban (1718 kcal) and rural women (1711 kcal) were similar, fat contributed 30% of the total calories in the urban subjects compared with 20% in the rural counterparts. An examination of the fat composition of the Malaysian urban population's diet by chemical analysis, using a 7-day rotation menu, revealed that – on an average – the diet provided 2300 kcal derived from 66 g of total fat (51 g of vegetable fats and 15 g of animal fats), 36 g of protein and 360 g of carbohydrates<sup>14</sup>.

**Table 4** Fast food companies in Malaysia – a selected list<sup>11</sup>

Brand (origin)	Year established	Number of outlets	Market share (%)	Sales (US\$ million)†
KFC (USA)	1973	294	45	152.3
McDonald's (USA)	1982	141	30	92.0
Pizza Hut (USA)	1984	85	8	31.6
A & W (USA)	1961	44	4	19.1
Marrybrown (local)	1981	88	4	NA
Sugar Bun (local)	1981	45	*	9.5
Kenny Roger (USA)	1994	25	*	9.5
Domino's Pizza (USA)	1997	17	*	NA

\* All others combined = 9%.

† US\$ 1.00 = RM 3.80.

NA – not available.

**Table 5** Prevalence of obesity (%) among children and adolescents in urban areas

	Year				
	1993–94 <sup>16</sup>	1998 <sup>18</sup>	1998 <sup>19</sup>	1990 <sup>21</sup>	1997 <sup>21</sup>
Male		9.5	12.5	0.7	5.7
Female		5.2	5.0		
Combine sexes	9.8				

### Prevalence of obesity

At the total population level, a high prevalence of obesity results from a complex interaction between an inherited metabolic predisposition to fatness and changes in the population's lifestyle (i.e. higher energy and fat consumption and reduced physical activity) that tend to accompany economic development<sup>15</sup>. The prevalence of obesity among urban children and adolescents from four secondary schools is shown in Table 5<sup>16,18–21</sup>. An earlier study<sup>16</sup> (1993–94), using +2SD WHO reference<sup>17</sup>, reported a 9.8% obesity level (sexes combined); Tee *et al.*<sup>18</sup> reported 9.5% in males and 5.2% in females (95th percentiles) while Ismail and Tan<sup>19</sup> reported 12.5% and 5% in males and females (85th percentiles), respectively. Both of the later studies used World Health Organization (WHO)<sup>20</sup> criteria. Ismail and Tan<sup>19</sup> reported an increasing prevalence of obesity with age: 6.6% among 7-year-olds, rising to 13.8% in 10-year-olds. In male adolescents, a study carried out in the four same schools in 1990 and again 1997 using the WHO<sup>20</sup> criteria revealed an increase in the prevalence of obesity from 1% to 6%<sup>21</sup>. In adults, a study (Table 6)<sup>23</sup> conducted in 1993–94, using the WHO<sup>22</sup> criteria, reported that the overall prevalence of overweight and obesity in men was 24.0% and 4.7% while in women it was 18.1% and 7.7%, respectively. Rural to urban differences (Malay only, since not many Chinese or Indian live in rural areas) are also evident; 5.6% of urban men were obese as compared with 1.8% for rural men and 8.8% of urban women were obese as compared with 2.6% of their rural counterparts<sup>23</sup>.

A National Health Morbidity Survey<sup>24</sup> conducted in 1996 reported that males were 15.1% overweight and 2.9% obese, while females were 17.9% overweight and 5.7% obese. There is little difference in overweight and obesity

**Table 6** Prevalence of overweight and obesity (%) among adults according to sex and area

	Year			
	1993–94 <sup>23</sup>		1996–97 <sup>24</sup>	
	Overweight	Obese	Overweight	Obese
Male	24.0	4.7	15.1	2.9
Female	18.1	7.9	17.9	5.7
Rural	15.2	2.2	15.5	4.3
Urban	21.8	7.2	17.4	4.5

**Table 7** Basal metabolic rate (BMR, MJ day<sup>-1</sup>), total daily energy expenditure (TDEE, MJ day<sup>-1</sup>) and physical activity level (PAL)

Subjects	Age (years)	Males			Females		
		BMR	TDEE	PAL	BMR	TDEE	PAL
Adolescents <sup>25</sup>	12–14	5.08	7.89	1.55	4.80	7.09	1.48
Adolescents <sup>26</sup>	16–18	5.76	8.64	1.50	5.02	7.64	1.52
Young adults <sup>27</sup>	18–30	5.85	9.40	1.61	4.77	7.58	1.59
Adults <sup>27</sup>	30–60	5.66	9.53	1.68	4.79	8.17	1.70
Elderly <sup>28</sup>	>60	4.92	7.35	1.50	4.37	6.74	1.54
Armed forces <sup>29</sup>	20–30	5.74	12.08	2.10	NA	NA	NA
Elite athletes <sup>30</sup>	20–30	6.84	14.91	2.18	5.39	10.67	1.98

NA – not available.

prevalence between rural and urban populations (Table 6)<sup>23,24</sup>.

Obesity can result from a minor energy imbalance leading to a gradual, but persistent, weight gain over a considerable period. It is not uncommon to find energy intake inadequate to meet the recommended allowances for a given population with the inherent limitation of collecting dietary intake data in a free-living population. Physical inactivity has a major role to play in energy imbalance leading to obesity. Results of several studies<sup>25–30</sup> on the physical activity level (PAL) of selected population groups are shown in Table 7. The results reveal a disturbing pattern of PAL amongst adolescents for both sexes. Sedentary lifestyles, coupled with increased intake of energy-dense and refined carbohydrate foods, are a recipe for disaster for this age group. The adult PAL could be classed as moderate, based on the small segment of the population studies. The extents of motor vehicle and television ownership may be used as indirect indicators of influences on the activity patterns of adults and children. The number of motor vehicles increased threefold from 2.3 million in 1980 to 7.6 million in 1997 while ownership of TVs increased from 1.1 million to 2.4 million during the same period<sup>7</sup>.

### Diet-related chronic non-communicable diseases

There is a definite change in disease patterns in Malaysia

from the more traditional public health concerns, including undernutrition and infectious diseases, to other chronic and non-communicable diseases such as coronary heart disease, diabetes mellitus, hypertension and certain types of cancer. The magnitude of these diseases is often assessed from government hospital data<sup>31</sup> due to the lack of comprehensive disease surveillance mechanisms (Table 8).

Cardiovascular diseases (CVD) constitute a major component of diseases of the circulatory system, which increased in prevalence from 7.5% in 1965 to 27.8% in 1997. Mortality rates of CVD doubled between 1970 and 1996, from 24.1 to 54.8 per 100 000 inhabitants<sup>32</sup>. Similarly, an alarming increase in the rate of CVD admissions into government hospitals was recorded, from 278 per 100 000 inhabitants in 1985 to 493 per 100 000 in 1996. Several epidemiological studies on CVD risk factors have shown that hypercholesterolaemia is more prevalent among the urban affluent. Urban Malaysians have the highest serum cholesterol levels (210–230 mg dl<sup>-1</sup>), rural communities have intermediate levels (between 180 and 200 mg dl<sup>-1</sup>) while aborigines have the lowest (about 150 mg dl<sup>-1</sup>)<sup>33</sup>.

The hospital admissions rate for hypertension increased from 20 509 cases in 1985 to 28 226 cases in 1994; cancer cases doubled from 15 257 in 1985 to 37 294 in 1996; and diabetes mellitus increased from 14 767 in 1985 to 23 589 in 1996. Death due to other diseases during this period was fairly constant in terms of absolute numbers with the exception of CVD and cancer (Table 8). These trends indicate that patients are seeking medical advice and treatment much earlier for their conditions, thus prolonging their life spans.

### Conclusion

The developed countries are making great efforts to correct the dietary excesses and errors to which their populations succumbed in their early years of affluence. Unfortunately, the current nutrition and health scenario reveals that Malaysians have not benefited from Western experiences. The escalation of nutrition-related chronic

**Table 8** Number of hospital admissions and mortality rates due to chronic non-communicable diseases<sup>31</sup>

	Year							
	1985	1990	1991	1992	1993	1994	1995	1996
<b>Admissions</b>								
CVD	58 961	78 800	80 377	82 010	83 858	89 824	95 454	101 985
Hypertension	20 509	26 876	27 415	28 904	29 252	28 226	NA	NA
Cancer	15 257	26 845	26 054	27 570	29 295	31 049	35 409	37 294
Diabetes	14 767	19 503	19 375	19 629	19 959	20 549	21 872	23 589
<b>Deaths</b>								
CVD	6205	6574	6475	6535	6352	6688	6876	4395
Hypertension	336	201	191	192	224	166	NA	NA
Cancer	2224	2186	2341	2234	2314	2367	2512	1034
Diabetes	261	231	254	290	272	311	300	336

NA – not available.

degenerative diseases, once an urban phenomenon, has now spread to the rural population at an alarming rate. As Malaysia proceeds rapidly towards a developed economy status, the population's lifestyle will continue to change. Malaysia may have to re-examine its present policies and strategies, determine their limitations, and formulate sustainable, comprehensive and multifaceted preventive actions to promote a healthy nutritional environment for its population.

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