

# THE PREVALENCE OF CHILDHOOD MALNUTRITION: ITS MEASUREMENT, WHAT IT MEANS AND ITS USES

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The prevalence of childhood malnutrition in a population or a community as with other diseases, is measured in terms of mortality and morbidity.

## MORTALITY

The death rate of children 1 to 4 years is widely accepted as a rough indicator of malnutrition. For Peninsular Malaysia, this rate has declined from 10.65 in 1957 to 2.56 in 1976. According to the Statistics Department, 68% of our population reside in the rural areas. The percentage breakdown of the rural population in terms of ethnic groups is: Malay 51%, Chinese 38% and Indians 11%. As is well known, disparities in toddler mortality rates exist between our three major racial groups being highest amongst the Malays, suggesting that malnutrition is more prevalent in the rural areas (Table 1).

Table II shows those districts that recorded toddler mortality rates in excess of 5.0 for 1976. It is evident that in these rural districts where the population is predominantly Malay, toddler mortality rates were about 2-2½ times the national rate of 2.56. In contrast certain districts in Selangor and Penang had rates of less than 1.0.

If however one examines the % annual rates of reduction in toddler mortality over two separate periods, namely 1957-1967 and 1967-1976, one finds that while the average % annual decrease in toddler mortality was higher for the predominantly urban

Chinese population during the first decade after Merdeka, this is now reversed in favour of the predominantly rural Malay (Table III). Figures 1 and 2 show the cumulative % annual decrease in toddler mortality for the three racial groups and serve to illustrate this point further.

## MORBIDITY

Morbidity with reference to malnutrition is usually monitored by growth retardation. This is reflected either by a loss in weight or a slowing of linear growth, i.e. height.

TABLE I  
TODDLER MORTALITY RATE  
(Peninsular Malaysia)

Year	All races	Malay	Chinese	Indians
1957	10.65	14.11	6.59	9.00
1970	4.20	5.61	2.09	3.82
1971	4.00	5.25	1.90	4.30
1972	3.37	4.33	1.76	3.54
1973	3.73	4.75	1.99	4.09
1974	3.13	3.97	1.61	3.70
1975	3.07	4.00	1.44	3.35
1976	2.56	3.26	1.18	3.07

Source: Vital statistics, Peninsular Malaysia, Department of Statistics, 1970, 1974 & 1976.

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**TABLE II**  
**DISTRICTS WITH TODDLER MORTALITY**  
**RATES GREATER THAN 5.00**  
**1976**

Peninsular Malaysia	2.56
Kelantan	
Pasir Mas	6.12
Tanah Merah	5.27
Ulu Kelantan	6.19
Kedah	
Baling	5.18
Perak	
Selama	5.32
Trengganu	
Kuala Trengganu	5.44

Source: Vital Statistics, Peninsular Malaysia, 1976  
 Department of Statistics.

In most developing countries, the rates of gain in weight and height begin to fall off simultaneously after 3–6 months. But by 2 to 3 years, a child may regain normal weight but “catch-up” height (compensatory growth) takes place more slowly so that some degree of linear growth retardation or stunting occurs after this age (Waterlow, 1979).

**TABLE III**  
**MEAN % ANNUAL RATE OF DECREASE IN**  
**TODDLER MORTALITY**  
**(Peninsular Malaysia)**

Period	All races	Malay	Chinese	Indian
1957 – 1967	5.3	6.2	8.9	4.9
1967 – 1976	7.7	8.3	7.6	5.3

Source: Vital statistics, Peninsular Malaysia. 1970,  
 1974 & 1976 Department of Statistics.

There are now three widely used indicators of growth for monitoring childhood malnutrition. These are:

- Weight-for-age
- Weight-for-height
- Height-for-age

**TABLE IV**  
**PREVALENCE OF PEM (Moderate To Severe)**  
**OF RURAL MALAY CHILDREN (Below 5 Years, Sexes Combined)**

	Ulu Trengganu (1969)	Kuala Trengganu (1972)	Kuala Langat (1969)
Total No. of Children	207	271	474
Wasting			
Severe	1%	1%	1%
Moderate	13%	14%	6%
Stunting			
Severe	8%	3%	2%
Moderate	50%	28%	27%
Total Prevalence (Wasting & Stunting)	72%	46%	36%

Source: Nutrition Division, I.M.R.

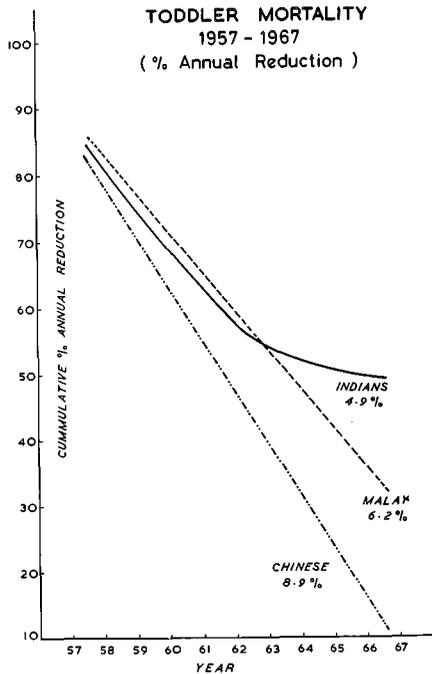


Fig. 1

Source: Vital Statistics, Peninsular Malaysia 1957-1967 Department of Statistics

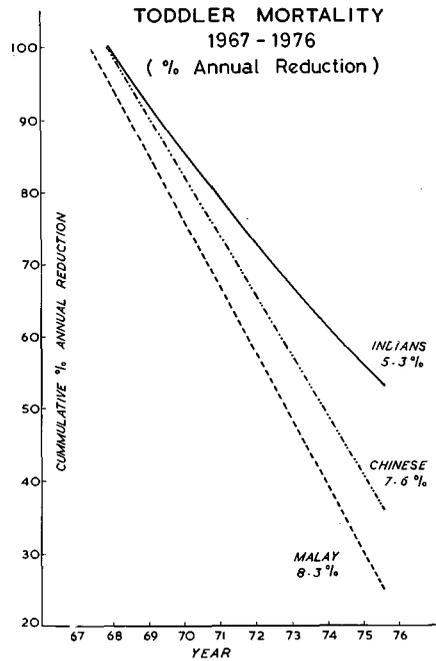


Fig. 2

Source: Vital Statistics, Peninsular Malaysia, 1967-1976 Department of Statistics

Weight-for-age has been used since time immemorial but it does not differentiate between a deficit in weight-for-height (wasting) or a deficit in height-for-age (stunting).

A low weight-for-height indicates the existence of current malnutrition while a low height-for-age suggests a previous history of malnutrition. Both are results of malnutrition and severely malnourished children may present a combination of the two processes. However including both indicators give the proportion of children who have gone through a period of malnutrition and indicate those who are likely to benefit from intervention actions (Waterlow, 1976 and 1979)

#### Nutritional Status of Rural Pre-School Malay Children.

Table IV shows the prevalence of protein-energy malnutrition (PEM) including wasting and stunting in the rural areas originating from previous IMR studies. The criteria used for defining wasting and stunting are those recommended by Waterlow (1976).

The following features of the above Table are worthy of note: malnutrition was more severe in

inland rural areas than coastal areas; during the same time zone, malnutrition was more severe in the East Coast than the West Coast; and stunting was more prevalent than wasting.

#### Current Status Of Rural and Urban Nutrition

Table V shows the current status of nutrition of rural and urban children from the scanty data that are available. The urban children were drawn from the lower socio-economic background while the rural children originate from a recent study on 2 fishing communities near Kota Bharu.

The above table shows little difference between the rates of prevalence of malnutrition between urban children of Malay and Chinese origin belonging to the lower socio-economic groups. However the current generation of rural Malay children in Kota Bharu seems 2½ times more likely to be malnourished than their urban counterpart. Further evidence to support this picture is found in the data of Rampal (1976) who reported a higher prevalence of malnutrition in children from rural schools than children from urban schools. This feature was common to all three racial groups, although Indian school children

**TABLE V**  
**CURRENT NUTRITIONAL STATUS OF**  
**URBAN AND RURAL CHILDREN**  
 (Sexes Combined; Up to 12 Years)

	Urban		Rural
	Malay (1978)	Chinese & Indians (1978)	Kota Bharu Malay (1979)
Total No.	223	421	241
Wasting			
Severe	2%	1%	0%
Moderate	3%	5%	2%
Stunting			
Severe	2%	3%	2%
Moderate	12%	10%	45%
Total Prevalence (Wasting & Stunting)	19%	19%	49%

Source: Nutrition Division, I.M.R.

from both rural and urban areas seemed to have the highest prevalence rates for malnutrition (Table VI).

#### Has Nutritional Status Improved?

It has been shown that there is a trend towards increased heights for all age groups with time (secular trend) and that such a trend is related to the nutritional situation in the country (Tanner, 1976). Can such a trend be demonstrated for Malaysia?

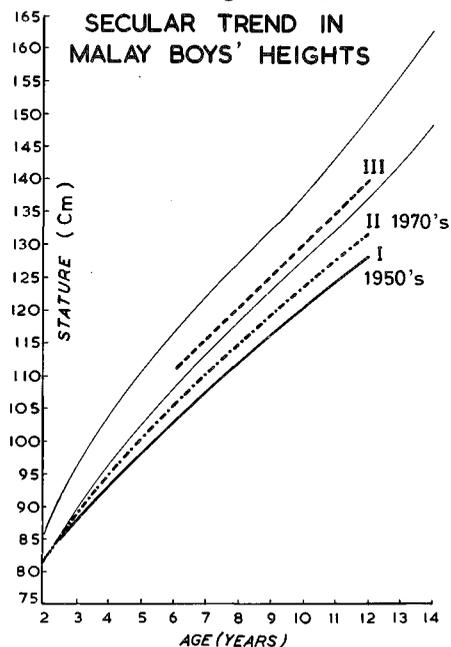
To answer this question fully, repeated growth data must be available from the same sub-population and locality over intervals of time. With the exception of a 10 year-follow-up study of Ulu Trengganu by Dr. McKay of the Hooper Foundation, University of California, at I.M.R. which is yet to be published, no similar studies are available.

I have therefore gone back to records of heights of rural Malay pre-school and school children (boys only) drawn from closely similar socio-economic background reported by various authors and plotted these on the new \*NCHS growth charts for American boys of current generation (Fig. 3).

Curve I is drawn from the data of rural Malay boys from the studies of Burgess and Laidin in Malacca (1950) and Oomen in Perak (1959).

Fig. 3

N.B. The uppermost line and the middle unbroken line represent respectively the 50th and 5th percentile found in the NCHS growth charts.



Curve II is derived from the combined unpublished material on rural Malay boys from nutrition surveys conducted in Kuala Langat (1969–1972), Kuala Trengganu (1972) by the Nutrition Division IMR and those of Klang by Rampai (1976).

Curve III is derived from the data of Rampai (1976) and Chen (1976) but refer to Malay school boys in an urban area.

The noteworthy features indicated by Fig. 3 are as follows:—

The growth of rural Malay boys of 1970's (curve II) seemed to have improved over those of 1950's (curve I) suggesting a secular trend that may be associated with a changing nutritional status. Both curves I and II fall below the 5th percentile height curve of the current generation of American boys found in the NCHS growth charts. Curve III derived from Malay boys in Kuala Lumpur approximate the 10th percentile line of American boys, but because it originated from the urban group, it cannot therefore be used to extend the argument of a secular trend of growth.

Despite this objection, it would seem that curve III may be used as a target for height achievement of rural Malay boys and it would certainly be interesting to see whether rural Malay boys can reach this level now attained by their urban counterpart.

The above indication of a secular trend in growth of rural Malay children and my earlier evidence showing a greater % reduction in the annual rate of toddler mortality for our Malay population strongly suggest a changing nutritional situation in the rural areas. This is gratifying as it reflects to a large extent the success of our Governmental policy of eradicating poverty and improving the living conditions of rural dwellers.

#### WHAT ARE THE USES OF PREVALENCE STUDIES?

It has been said that prevalence studies are of little value unless they can stimulate action. Although nutritionists and other public health scientists are morally obliged to take the lead in drawing the attention of governments to the prevalence of mal-

nutrition, they are acutely aware that nutrition intervention programmes can only result from a political decision. As Field and Levinson (1976) put it "with it, much can be done, without it nutrition activities are likely to be just symbolic gestures".

While many developing nations find it difficult to allocate resources for nutrition programmes, Malaysia, thanks to its strong and buoyant economy, has under the Third Malaysia Plan, allocated \$10 million for applied food and nutrition programmes and another \$18.5 million for operating expenses, the bulk of which goes to school supplementary feeding (Ishak Che Long, 1980).

In economic terms, it may be difficult to justify the cost-effectiveness of such spending but it must be remembered that such investment should be regarded as an investment on human capital. A better nourished child has a better chance of survival against infections; he is in a better position to take advantage of educational opportunities and be an asset to society. Furthermore, nutrition may be an important determinant of family planning since it is well known that high child mortality adversely effects family planning programmes (Field and Levinson, 1976).

#### SUMMARY AND CONCLUSION

In Malaysia, as in elsewhere, the macro-environment and the outreach of socio-economic development are major determinants of malnutrition.

Toddler mortality rates are higher in the rural districts and the rates of prevalence for moderate to severe PEM are similarly greater in the rural compared to the urban areas.

However toddler mortality in Peninsular Malaysia has been declining rapidly and recent % annual rates of decrease in toddler mortality are now greater for the rural rather than the urban population. This and the fact that there are suggestions of a secular trend in growth for rural Malay children indicate that the nutritional situation of our rural population is changing for the better. This is certainly cause for optimism for these changes reflect greatly on the success of the Government's developmental and economic policies.

Nutritionists in Malaysia have a continued role to play in defining and drawing attention to the country's nutritional problems and in monitoring the trends of nutritional status in the wake of the

\* National Centre for Health Statistics Growth Curves for children, birth – 18 years, U.S.A.

**TABLE VI**  
**PREVALENCE OF MALNUTRITION IN**  
**URBAN AND RURAL SCHOOL CHILDREN**  
**(7 – 12 Years, Sexes Combined)**

	Urban Schools		
	Malay	Chinese	Indians
Wasting (Moderate & Severe)	2.2%	1.8%	5%
Stunting (Severe only)	2.3%	2%	5.5%
*Total Prevalence (Moderate & Severe)	4.5%	3.8%	10.5%
<b>Rural Schools</b>			
Wasting (Moderate & Severe)	6%	6%	8.5%
Stunting (Severe only)	11%	5%	12.5%
*Total Prevalence (Moderate & Severe)	17%	11%	21%

\*Total Prevalence figures are underestimates as prevalence of moderate stunting was not available for inclusion.

Source: Rampal (1976)

country's rapidly changing economy and programmes for eradicating rural poverty.

#### ACKNOWLEDGEMENTS

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#### REFERENCES

- Burgess, R.C. and Laidin bin A. Musa (1950) A Report on the State of Health, Diet and the Economic conditions of Groups of People in the Lower Income Levels of Malaya *Report I.M.R. No. 13.*
- Chen, S.T. (1976) Comparative Growth of Malay, Chinese & Indian School children in Malaysia *S.E.Asia J. Trop. Med. & Pub. Hlth.*, 7: 443-451
- Field, J.O. and Levinson, F.J. (1976) Nutrition and Development: The Dynamics of Commitment in *Nutrition and Agricultural Development* Ed. by N.S. Scrimshaw and M. Behar, Plenum Press, N.Y. and London. p 99-111
- Ishak Che Long (1980) Kemajuan Pelaksanaan Rancangan

- Amalan Makanan dan Pemakanan – Dalam Seminar Rancangan Makanan Tambahan Di Malaysia 16-17 Jan. 1980. (mimeographed).
- Oomen, H.A.P.C. (1960) WHO, WPRO Report (Malaya 12) An Assessment of Toddler Malnutrition in Malay Communities (mimeographed).
- Rampal, L. (1977) Nutritional Status of Primary School Children – A Comparative Rural and Urban Study. *Med. J. Mal.* 32 : 6-16.
- Tanner, J.M. (1976) Growth as a Monitor of Nutritional Status. *Proc. Nutr. Soc.* 35 : 315.
- Waterlow, J.C. (1976) Classification and Definition of Protein-Energy Malnutrition in *Nutrition and Preventive Medicine* WHO Monograph series, No. 62. Ed by Beaton, G.H. and Bengoa, J.M., No. 62. Geneva, 1976.
- Waterlow, J.C. (1979) Childhood Malnutrition – the global problem. *Proc. Nutr. Soc.* 38 : 1-9.