

Stunting among Asian Children and Considerations for Intervention

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Resume

Dr E – Siong Tee, PhD, is the Head of the Division of Human Nutrition of the Institute for Medical Research (IMR) in Kuala Lumpur, Malaysia. He joined the IMR in 1972 as a Nutrition Officer and was promoted to the present position of Head of the Division in 1984. Dr Tee' s main areas of interest and research are in community nutrition, nutritional value of foods and food standards. He has published some 130 scientific articles and papers and made 130 presentations on various aspects of food and nutrition in seminars and conferences within and outside the country.

Dr Tee serves on various technical and expert committees in the country. He is Chairman of the following committees: (a) Technical Working Group on Research of the National Coordinating Committee on Food and Nutrition; (b) National Codex Sub – committee on Nutrition and Foods for Special Dietary Uses; and (c) Ministry of Health Task Force on Nutrition Labelling, Claims and Advertising. He is a member of the following committees: (a) National Coordinating Committee on Food and Nutrition; (b) Malaysian Food Regulations Technical Committee; (c) National Codex Committee; and (d) National Codex Sub – Committee on Food Labelling. He is also a member of the Scientific Board of Directors to the International Life Sciences Institute (Southeast Asia Branch).

Dr Tee is also currently the President of the Nutrition Society of Malaysia.

Abstract

There has been dramatic improvement in the socio – economic situation in the region for the last 3 decades. Food and therefore nutrient availability in all countries has steadily increased bringing about improved food and nutrition situation. Nutritional deficiencies in

many of these countries are slowly being decreased in magnitude. On the other hand, significant proportions of the population are now faced with the other facet of the malnutrition problem, namely diet – related chronic diseases such as hypertension, coronary heart disease, diabetes mellitus and certain types of cancers. However, because of the different stages of socio – economic development, the extent of each of these extremes of the malnutrition problems varies considerably between the different countries in the region. The problem of undernutrition, including stunting, remains a significant problem in many communities. This presentation highlights the problem of stunting amongst children in selected Asian countries to illustrate the variations in the extent of the problem.

The WHO global database on child growth and malnutrition is a useful source of data for such a review although several shortcomings of the database should be recognized. Reports from individual Asian countries were also referred to, whenever available. In 1980, the global prevalence of stunting was estimated at 47. 1%, declining to 32. 5% in 2000, affecting some 182 million preschool children. More than two – thirds (70%) of these children are in Asia while some 24% live in Sub – Sahara Africa. There has been a steady decline in prevalence of stunting in Asia for the past 2 decades, from 52% in 1980 to 34% in 2000. The prevalence is clearly higher in South Central Asia. The number of children affected is still huge; 128 million of them in 2000 and 61% of this total are in South Central Asia. Asian countries with prevalence of stunting higher than or close to the Asian average probably include Bangladesh, Bhutan, India, Indonesia, Lao PDR, Myanmar and Vietnam.

Various intervention programmes have been formulated by governments to overcome the undernutrition problem, with a great deal of focus on children. Almost all the countries in the Asia – Pacific region have formulated these strategies and programmes within the framework of the National Plans of Action for Nutrition (NPANs). It is vital for all countries to have periodic reviews and updates of their Plans. It would be necessary to review appropriateness of intervention programmes for children, in the light of current developments.

Countries in the region will continue to progress, accompanied by continued changes in lifestyle of communities. It is therefore of utmost importance to continue to monitor the nutritional status of communities. For countries not yet afflicted with diet – related chronic diseases, it is important to avoid or reduce the onslaught of these disorders. Various efforts in sharing of experiences and collaboration amongst countries in the region should continue to be given emphasis.

Introduction

There has been dramatic improvement in the socio – economic situation in the region for the last 3 decades. Food and therefore nutrient availability in all countries has steadily in-

creased bringing about improved food and nutrition situation. Nutritional deficiencies in many of these countries are slowly being decreased in magnitude. On the other hand, significant proportions of the population are now faced with the other facet of the malnutrition problem, namely diet – related chronic diseases such as hypertension, coronary heart disease, diabetes mellitus and certain types of cancers. However, because of the different stages of socio – economic development, the extent of each of these extremes of the malnutrition problems varies considerably between the different countries in the region. The problem of undernutrition, including underweight and stunting, remains a significant problem in many communities. Micronutrient deficiencies, especially iron deficiency anemia, iodine deficiency disorders and vitamin A deficiency afflict large population groups, especially young children.

This presentation highlights the problem of stunting amongst children in the Asian region using global and regional estimates. Data from selected Asian countries are also presented to illustrate the variations in the extent of the problem. Considerations for intervention programs are also briefly discussed. Emphasis is also given to continuous monitoring and surveillance of the nutritional status of children.

Global prevalence of stunting

The WHO global database on child growth and malnutrition (WHO, 2000a) was a useful source of data for such a review although several shortcomings of the database should be recognized. These include outdated data (more than 15 years old), limitations in data (eg data for selected population groups only) and even non – available data. Few countries in the region have periodically conducted national nutrition surveys. For Malaysia, for instance, as no national nutrition surveys have been conducted, data presented in this report were for sub – national surveys conducted on selected population groups. There are also problems of non – standardized methodologies, especially in anthropometric reference and cut – offs in the different collection and treatment of survey data.

The publication of de Onis, Frongillo and Blossner (2000) is particularly useful for understanding trends in child nutritional status. Recognising the lack of comparability between survey data of countries as a major obstacle in monitoring trends in child nutritional status, the authors carefully screened through available data and analysed in a standard way to produce comparable results. Multilevel modelling was applied to estimate regional and global trends from 1980 to 2005. Reports from individual Asian countries were also referred to, whenever available, in the preparation of this paper. The ACC/SCN (2000) report of the world nutrition situation is also a useful reference for global and regional pictures of the child nutrition situation.

The term undernutrition or inadequate nutrition is often used to refer to stunting, underweight and wasting. These conditions are based on less than minus 2 standard deviations of the median value of the NCHS for the three anthropometric indices height for age, weight

for age and weight for height respectively. Severe undernutrition (stunting, underweight and wasting) is often based on less than minus 3 SD of the three indices. This presentation focuses mainly on the problem of stunting. This definition and classification for undernutrition has been adopted by the country reports referred to in this paper. This facilitates making intercountry comparisons. However, it is important to note that Thailand uses the Thai reference for children in the 1995 national nutrition survey report (Ministry of Public Health, 1996), and a modified Gomez classification was used (footnote of Table 8).

In 1980, the global prevalence of stunting amongst preschool children (under five years old) in all developing countries was estimated at 47.1%, affecting some 221 million children. Twenty years later, this prevalence was estimated to decline to 32.5% in 2000, affecting some 182 million children. The rate of decline in prevalence of stunting was therefore 0.73% per year or 1.95 million children per year. In the year 2005, The global prevalence has been extrapolated to decline to 29%, afflicting 165 million preschool children. The decline in the extent of the problem is real, but the size of the problem is still huge, the numbers mind boggling (Tables 1 and 2; Figures 1 and 2) (Onis, Frongillo and Blossner, 2000).

Asia has a greater share of the malnutrition problem. More than three-quarters (78.3%) of the stunted children in all developing countries were in Asia in 1980. This declined steadily to around two-thirds (70%) in 2000 (Figure 3). The corresponding proportions in Africa, the second most affected region, are 15.7% and 26% in 1980 and 2000 respectively. The numbers of affected children in the region had also increased in the last 2 decades. The highest level of stunting in 2000 has been estimated to be in Eastern Africa where the average prevalence is 48.1%. In addition, some 35% of children in Eastern Africa have been estimated to be underweight.

Stunting in Asian children

There has been a steady decline in prevalence of stunting in Asia for the past 2 decades, from 52% in 1980 to 34% in 2000. The number of stunted children was 174 million in 1980 and declined to 128 million in 2000 (Tables 1 and 2; Figures 1 and 2). The rate of decline was therefore 0.9% or 2.3 million per year. This rate of decline was higher than that for the developing countries as a whole. However, the problem is still large and will remain large 5 years from now. In the year 2005, Asia is expected to remain as the second highest prevalence of stunting among young children, with a prevalence rate of 29.9%. There will be an estimated number of 110 million stunted children or about 66.9% of the total number of stunted children in developing countries in 2005 (Figure 3).

Within Asia, South Central Asia has been having the greater share of the burden. Prevalence rate was 60.8% in 1980 and declined to 43.7% in 2000 and has been higher than South-East Asia for the past 2 decades. In terms of numbers, more than half of the

stunted children in Asia were from the South Central Asia region for the past 20 years. In the year 2000, 61% of these children were from that region, whilst 14.8% of the total were in South – east Asia. Countries in South Central Asia include Afghanistan, Bangladesh, India and Pakistan, all with high levels of child undernutrition. Some Central Asian countries, formerly part of the Soviet Union are also said to be included in this sub – region, eg Kyrgyzstan and Uzbekistan (ACC/SCN, 2000).

Half (52.4%) of the preschool children in Southeast Asian countries were said to be stunted in 1980. This prevalence declined to about one – third (32.8%) in 2000. Prevalence of stunting has been steadily declining in the region, at an estimated rate of 0.98 percentage points per year. This decline is greater than that for the South Central Asia region. The number of children affected, however, is still large, totally about 19 million. The rapid decline in child malnutrition in Asia can perhaps be attributed to the marked socio – economic developments in the last 20 years, although many of these countries were hit with a severe economic downturn about 3 years ago. A few of these countries have yet to recover from the economic crisis and nutrition of children in these countries are in serious peril.

Stunting in selected Asian countries

Current data from surveys conducted in selected Asian countries are presented to illustrate the extent of the problem of stunting amongst children and the variation that exists in the region. The tables also present data on prevalence of underweight and wasting. Some of these data are not from national nutrition surveys.

In Lao PDR, the 1993 data showed a national prevalence of 48% but the midland areas showed a much higher prevalence of 61% (Table 3). Unfortunately the reference is a few years older than the other reports cited below. The prevalence is expected to be lower now. In Vietnam, the prevalence of stunting among children below 5 years declined from 59.7% during 1981 – 85 to 46.9% in 1994. In 1999, the prevalence ranged from 27.7 to 53.2%, with a mean national average of 38.7% (Table 4).

Two large data sets for China are presented, one from the 1992 national nutrition survey and the other from the 1998 surveillance (Tables 5 and 6). These reports are also very well documented and presented. The early survey showed a national prevalence of 32.8% of stunting amongst children under 5 years, but the rural areas showed a prevalence almost twice that of the urban (Table 5). The problem was reduced to 17.5% in the 1998 survey; the urban prevalence was much reduced to 4%, whereas the rural prevalence remained moderately high at almost 22%. One curious point is the prevalence of overweight, which appeared as higher in the 1992 dataset than the later data. The rural population in both data also recorded fairly high prevalence of overweight.

Data from a series of studies conducted from 1992 – 1995 on a number of rural occupational groups in Peninsular Malaysia showed varying prevalences of stunting, ranging from

15 to 34% (Khor and Tee, 1997). The combined prevalence was 28.4% (Table 7). These are extracts of results from a larger study on the nutritional status of various age groups in these occupational groups. The data are however not nationally representative and data on urban malnutrition is lacking. Prevalence of stunting among urban preschool children is probably around 5%. The national prevalence is probably around 15%.

The problem of stunting in Thailand, as seen from the 1995 national survey, is lower than the other countries mentioned above. The national prevalence was 15.6%, but with prevalence ranging from 9.9 to 16.3% (Table 8). However, as mentioned earlier in this paper, the reference used was not the same as the other studies cited and the cut-offs used were also different. Comparison with data from other countries is therefore difficult. The data for the 1997 study in Brunei Darussalam also showed a low prevalence of stunting of 12.9% (Table 9).

Intervention programs and National Plans of Action for Nutrition

The importance of malnutrition in young children has been given attention by governments, especially because of the potential impact on child survival and mental and cognitive development. Future generations depend on the wellbeing of children. And the numbers affected are simply so huge. Various intervention programmes have been formulated by governments to overcome the undernutrition problem amongst children. The intervention programmes must have met with varying success. Since the causes of malnutrition are so complex and the various factors exert different influences on communities, the intervention programmes must necessarily be community specific. This necessitates the understanding of the causes of undernutrition specific to the community. This in turn requires the availability of comprehensive data for the formulation of effective intervention programmes. But, as we are fully aware, such data are not available in many developing countries. Are we, in many instances, making a lot of trials and errors in implementing intervention programmes? Are some countries or communities merely importing programmes from other countries or communities without determining if such programmes are indeed suitable?

Other papers in this conference will deal in greater depth intervention programmes. It is however important to have a blue print of these programmes and activities. This could be in the form of a national plan of action for nutrition, such as recommended in the International Conference on Nutrition jointly organised by the FAO/WHO in 1992. Government representatives adopted the world declaration on nutrition and pledged to revise or prepare and implement national plans of action for nutrition (NPANs) to effectively tackle undernutrition and overnutrition problems. In a workshop to review progress of NPANs in the Western – Pacific Region, it was found that most countries have NPANs, either approved and implemented or awaiting official endorsement. NPANs were recognized as more than a framework or a descriptive document. Rather it is a tool for action with identified projects and activities and

with details of implementation eg what, how and when. It designates responsibilities and accountability for monitoring and evaluation. It was observed that successful NPANs are usually multisectoral, involving several government ministries, NGOs and international agencies. It was also recognized vital that all countries should have periodic reviews and updates of their Plans (WHO, 2000b). Child nutrition intervention programmes should be part of the NPAN.

An innovative programme, involving partnership among 3 different sectors, to reach out to toddlers and preschool children is to take off very soon in Malaysia. It was initiated by a professional body in the country, namely the Nutrition Society of Malaysia, sponsored by the private sector and implemented with the help of a communications specialist company. Called Bright Start Nutrition, it is targeted at kindergarden and child care operators, teachers and parents. Nutrition guidelines, including a child food pyramid, has been formulated to suit local conditions and needs. A variety of other educational materials are being prepared. To enhance the understanding and use of these educational materials, by the target population, the programme also aims to reach out to the kindergartens and child – care centres through road-shows, seminars, and workshops. Growth monitoring, also an important component of the programme, shall make vital data on nutritional status of these children become available. It is hoped that the programme will be able to augment government programmes and activities.

Concluding remarks

Countries in the region will continue to progress, accompanied by continued changes in lifestyle of communities. It is therefore of utmost importance to continue to monitor the nutritional status of communities. Systems to periodically collect data on nutritional status and dietary intake of communities should be in place in all countries.

In this respect, various efforts in sharing of experiences and collaboration amongst countries in the region should continue to be given emphasis. The strengthening of regional network is important. The convening of this conference in itself is an important effort in strengthening networking. There is a need for continuing harmonization of approaches to nutrition activities in the region. Successful past efforts in harmonisation, coordinated by international agencies such as ILSI, WHO, FAO, ASEAN included recommended dietary allowances, dietary guidelines, nutritional status assessment methodologies and development of food composition databases.

Dramatic changes in socio – economic conditions in the Asian region are expected to continue in the future. Lifestyle changes are expected to continue, including changes in food consumption pattern towards a “western” dietary pattern. Such dietary changes have been observed to be associated with increases in diet – related chronic diseases in many countries. The increase in these chronic diseases in developing countries in Asia should be a cause for real concern and real concerted interventions (Tee, 1999). For countries not yet afflicted with

diet – related chronic diseases, it is important to avoid or reduce the onslaught of these diseases. It is hoped that these countries will be able to learn from the mistakes of others and not follow the same path.

For example, the emerging problem of overweight amongst children cannot be ignored. Present estimates of overweight amongst preschool children in developing countries in 1995 is low, estimated to be 3.3%. There is of course considerable variation in this prevalence amongst the various countries. The estimate for Asia was 2.9%, with higher prevalence of 4.3% in Eastern Asia and 2.4% in Southeast Asia (de Onis, Frongillo and Blossner 2000). Data extract from individual Asian countries show much higher prevalences of 9% for Brunei Darussalam, 5.4% for Thailand, and not available for In terms of number of children, a total of 17.6 million preschool children in all developing countries were considered overweight. Out of this total, 61% or 10.6 million were in Asia. The region is therefore having the double burden of the most number of stunted preschool children as well as the most number of overweight children. It is indeed a challenge for governments to formulate and intervention programmes to tackle both facets of the malnutrition problem. It is imperative that the overweight problem be identified and recognized early enough for firm actions to be taken immediately.

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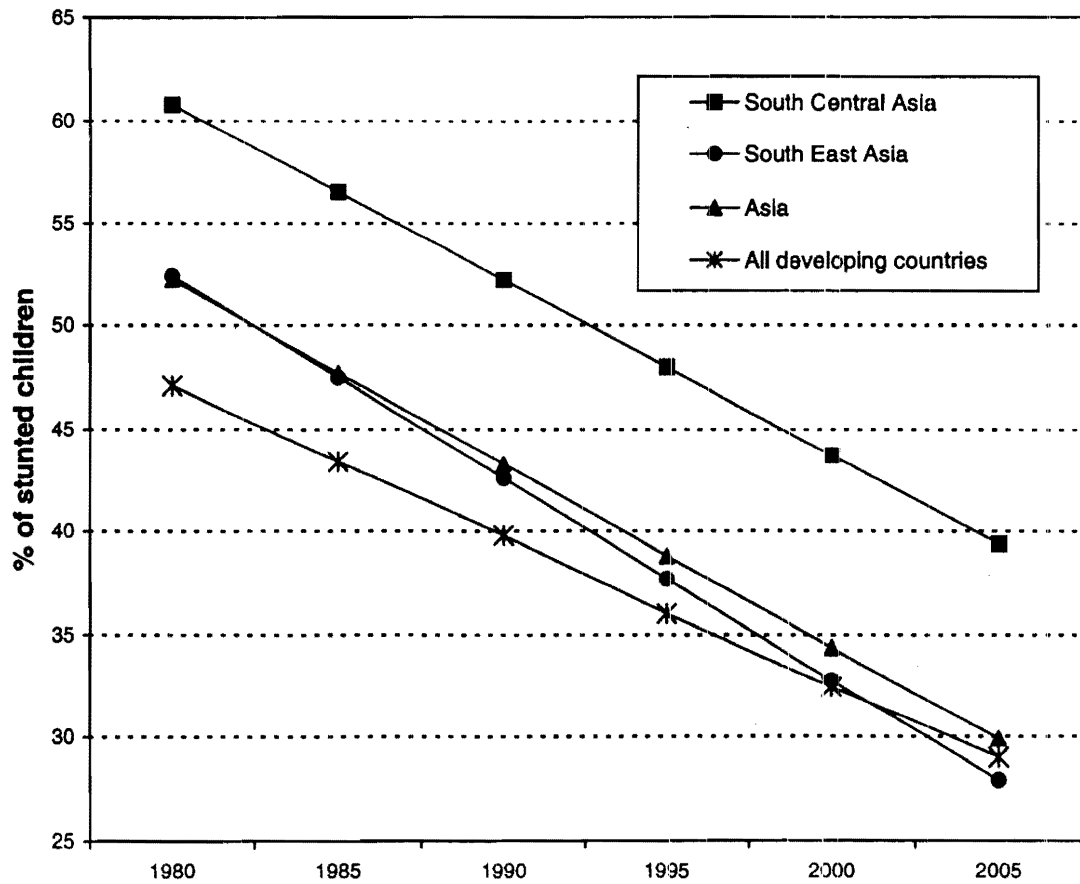


Figure 1. Prevalence of Stunting in Asia, 1980 – 2005

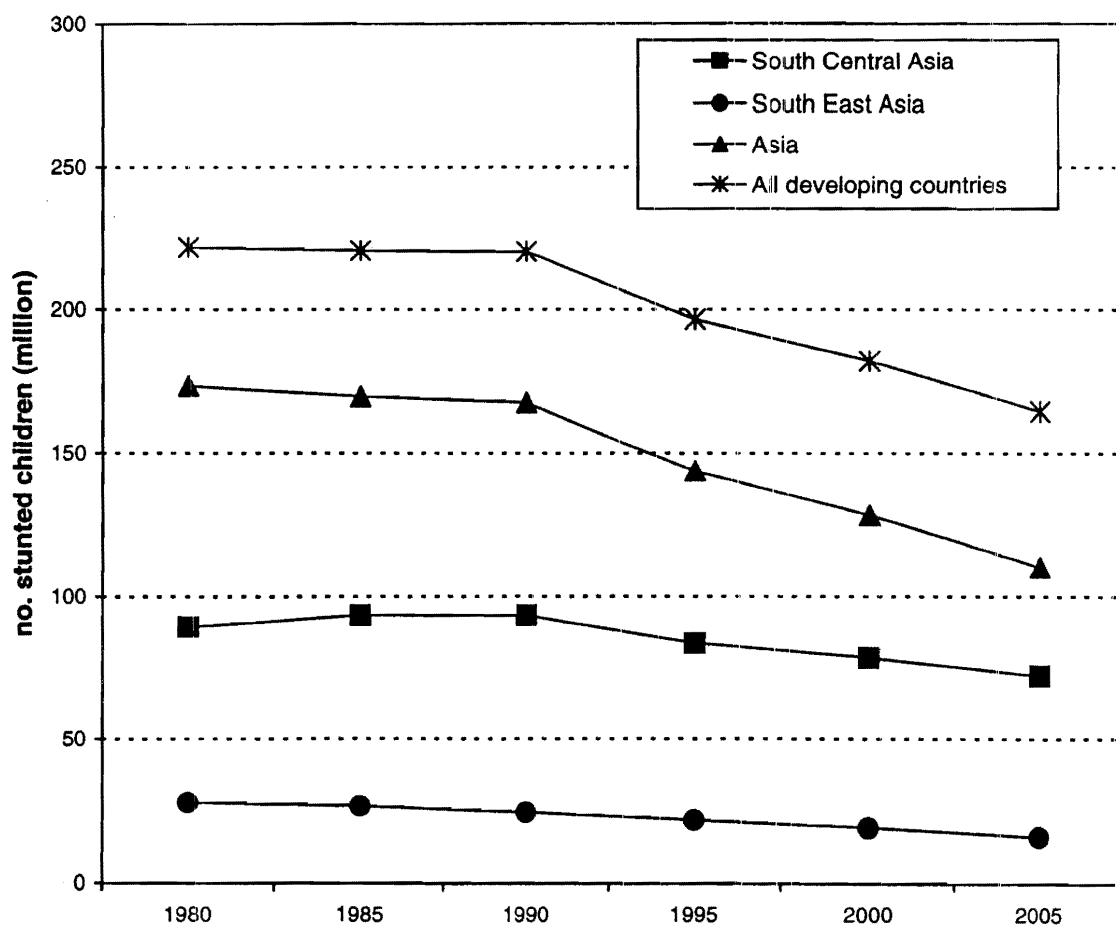


Figure 2. Number of Stunted Children in Asia, 1980 – 2005

Table 1 . Estimated prevalence of stunted children , 1980 – 2005

UN Regions and subregions	Prevalence of stunting (%)					
	1980	1985	1990	1995	2000	2005
Africa	40.5	39.2	37.8	36.5	35.2	33.8
Eastern	46.5	46.9	47.3	47.7	48.1	48.5
Northern	32.7	29.6	26.5	23.3	20.2	17.0
Western	36.2	35.8	35.5	35.2	34.9	34.6
Asia	52.2	47.7	43.3	38.8	34.4	29.9
South Central	60.8	56.5	52.2	48.0	43.7	39.4
South – East	52.4	47.5	42.6	37.7	32.8	27.9
Latin America & the Caribbean	25.6	22.3	19.1	15.8	12.6	9.3
Caribbean	27.1	24.4	21.7	19.0	16.3	13.7
Central America	26.1	25.6	25.0	24.5	24.0	23.5
South America	25.1	21.1	17.2	13.2	9.3	5.3
All developing countries	47.1	43.4	39.8	36.0	32.5	29.0

Source: de Onis, Frongillo and Blossner (2000)

Table 2. Estimated number of stunted children , 1980 -- 2005

UN Regions and sub – regions	Number stunted (million)					
	1980	1985	1990	1995	2000	2005
Africa	34.78	38.51	41.68	44.51	47.30	49.40
Eastern	12.88	14.83	17.13	19.28	22.03	24.41
Northern	6.01	6.01	5.55	4.90	4.44	3.86
Western	9.04	10.51	11.99	13.47	14.74	16.03
Asia	173.	169.	167.	143.	127.	110.
South Central	37	72	66	49	80	19
South – East	89.36	93.45	93.36	83.62	78.53	72.28
Latin America & the Carribean	27.71	26.47	24.24	21.51	18.94	15.78
Carribean	13.19	11.87	10.38	8.59	6.82	5.11
Central America	0.92	0.86	0.81	0.71	0.61	0.51
South America	3.87	3.81	3.87	3.94	3.92	3.82
All developing countries	8.38	7.35	6.05	4.55	3.16	1.84
	221.	220.	219.	196.	181.	164.
	35	10	73	59	92	70

Source: de Onis, Frongillo and Blossner (2000)

Table 3. Prevalence of protein energy malnutrition among children under 5 years in Lao PDR, 1993

Region	% of children				
	N	Under-weight ¹	Stunting ²	Wasting ³	Over-weight ⁴
Lowland Lao	1,033	42.0	44.0	11.0	-
Midland Lao	267	53.0	61.0	10.0	-
Highland Lao	65	39.0	54.0	5.0	-
Total	1,365	44.0	48.0	10.0	-

¹ < -2SD weight - for - age of NCHS reference

² < -2SD height - for - age of NCHS reference

³ < -2SD weight - for - height of NCHS reference

⁴ > +2SD weight - for - height of NCHS reference

Source: Phimmasone et al. (1994)

Table 4. Prevalence of undernutrition amongst children under 5 years old , Vietnam 1999 nutrition survey

Region	% of children				
	N	Under – weight ¹	Stunting ²	Wasting ³	Over – weight ⁴
Red River Delta	13,128	33.8	35.4	9.1	–
North East	19,684	40.9	43.2	11.4	–
North West	4,413	45.3	13.0	–	–
Northern Centre Coast	9,053	42.6	46.7	10.1	–
Southern Centre Cost	8,520	39.2	40.1	9.7	–
Central Highland	4,500	49.1	53.2	11.3	–
South east	15,753	29.6	27.7	7.3	–
Me Kong River Delta	18,418	32.3	35.5	9.3	–
Total	93,469	36.7	38.7	9.8	–

¹ < – 2SD weight – for – age of NCHS reference

² < – 2SD height – for – age of NCHS reference

³ < – 2SD weight – for – height of NCHS reference

⁴ > + 2SD weight – for – height of NCHS reference

Source: Ha Huy Khoi, Nguyen Cong Khan, Le Danh Tuyen, Tu Ngu and Tran Thi Xuan (2000). 1999 Vietnam – Child Nutrition Situation.

Table 5. Prevalence of protein energy malnutrition among children under 5 years in China , 1992 National Nutrition Survey

Region	% of children				
	N	Under - weight ¹	Stunting ²	Wasting ³	Over - weight ⁴
Urban	1,606	10.5	20.3	2.9	6.5
Rural	6,789	19.8	35.8	3.7	4.9
Rural low income	2,487	24.8	44.4	4.3	4.9
Rural middle income	2,221	19.6	35.0	3.9	4.5
Rural high income	2,081	14.1	26.1	2.7	5.1
National	8,395	18.0	32.8	3.6	5.2

¹ < -2SD weight - for - age of NCHS reference

² < -2SD height - for - age of NCHS reference

³ < -2SD weight - for - height of NCHS reference

⁴ > +2SD weight - for - height of NCHS reference

Source: Keyou Ge et al. (1999)

Table 6 . Prevalence of protein energy malnutrition among children under 6 years in China , 1998 surveillance

Region	% of children				
	N	Under - weight ¹	Stunting ²	Wasting ³	Over - weight ⁴
Urban	5,780	2.7	4.07	2.08	5.22
Rural	10,688	12.59	21.98	2.62	3.46
General Rural	6,999	12.59	18.13	2.62	3.46
Less developed rural	3,689	19.46	30.98	3.36	2.58
National	16,468	10.12	17.5	2.49	3.9

¹ < - 2SD weight - for - age of NCHS reference

² < - 2SD height - for - age of NCHS reference

³ < - 2SD weight - for - height of NCHS reference

⁴ > + 2SD weight - for - height of NCHS reference

Source: Chunming Chen (2000)

Table 7. Prevalence of undernutrition amongst children 1 – 6 years old , rural Peninsular Malaysia , 1992 – 1995

Region	% of children				
	N	Under – weight ¹	Stunting ²	Wasting ³	Over – weight ⁴
Fishing	296	38.2	30.7	13.5	–
Padi	431	36.7	34.5	8.6	–
Rubber	320	34.7	33.3	10.7	–
Coconut	195	25.1	17.1	9.9	–
Estates	185	31.4	15.1	14.8	–
All communities	1,427	34.3	28.4	10.3	–

¹ < – 2SD weight – for – age of NCHS reference

² < – 2SD height – for – age of NCHS reference

³ < – 2SD weight – for – height of NCHS reference

⁴ > + 2SD weight – for – height of NCHS reference

Source: Khor & Tee (1997)

Table 8. Prevalence of undernutrition and overweight among children under 5 years in Thailand, 1995 national nutrition survey

Region	% of children				
	N	Under-weight ¹	Stunting ²	Wasting ³	Over-weight ⁴
Urban	754	28.8	12.5	10.6	8.8
Rural	3,549	31.8	16.3	8.7	4.6
Central	833	20.9	9.9	5.8	10.5
North	835	28.1	14.1	8.6	5.2
Northeast	1,849	39.1	17.9	12.1	2.1
South	789	27.4	17.2	5.6	7.8
National	4,304	31.3	15.6	9.0	5.4

¹<90% weight-for-age of Thai reference

²<95% height-for-age of Thai reference

³<90% weight-for-height of Thai reference

⁴>120% weight-for-height of Thai reference

Source: Ministry of Public Health (1996)

Table 9. Prevalence of undernutrition and overweight amongst children under 5 years old , Brunei Darussalam , 1997 survey

Region	% of children				
	N	Under - weight ¹	Stunting ²	Wasting ³	Over - weight ⁴
Brunei - Muasa	822	14.1	13.1	3.9	9.1
Tutong	129	12.4	15.5	3.1	7.8
Beliat	147	10.9	8.8	2.7	10.2
Temburong	39	15.4	15.4	2.6	7.7
Total	1,137	13.5	12.9	3.6	9.1

¹ < - 2SD weight - for - age of NCHS reference

² < - 2SD height - for - age of NCHS reference

³ < - 2SD weight - for - height of NCHS reference

⁴ > + 2SD weight - for - height of NCHS reference

Source: Ministry of Health Brunei (1999).

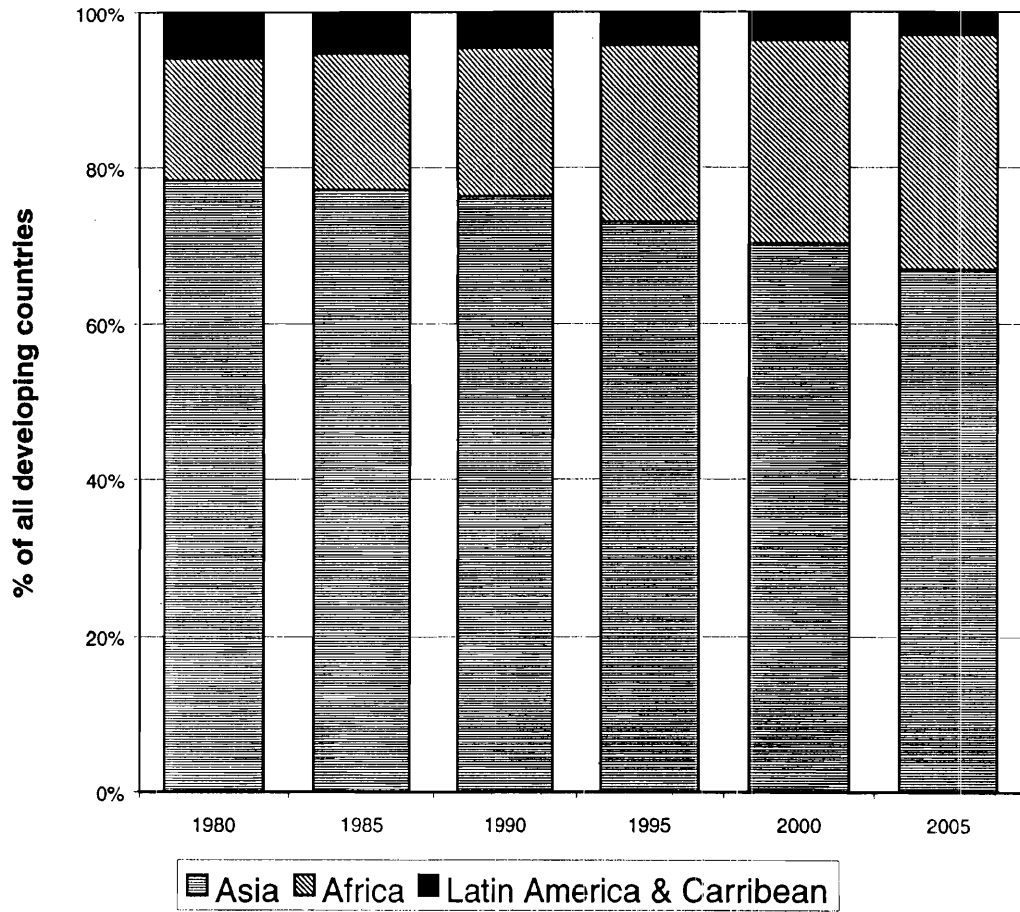


Figure 3. Distribution of stunted children in developing countries

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