THE CHILD UNDERNUTRITION IN DISTRICT MALAPPURAM: THE REALITIES REVISITED

Research Paper

Submitted to

Malabar Praxis

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INTRODUCTION

Children are the first call on agenda of development not only because young children are the most vulnerable, but because the foundation for lifelong learning and human development is laid in this crucial early years. It is now globally acknowledged that investment in human resource development is a pre-requisite for economic development of any nation.

There can be few issues of greater policy importance and international concern than that of malnourished children in developing countries. This is not only because of its high prevalence but also because of its manifold impact. Studies indicated that the functional consequences of nutritional limitation in the early years of life are enormous and its impact persists forever. Evidences suggest that poor nutrition among children is associated with frequent infections and continued undernutrition manifested in mortality (Rice et al., 2000; Pelletier et al., 1993). Half of worldwide child mortality is attributable to child undernutrition (Pelletier DL et al, 1995). It retards cognitive development and physical growth. Malnourished children are more likely to join school late, remain in the school less and perform poorly (Gleww, 1999; Gleww et al., 2001; Alderman et al., 2001). Thus child undernutrition impairs the productivity and ultimately affects the lifetime-earning potentials of the child.

In India inspite of of its economic advances the proportion of undernurished amongst children has not improved much in the last two decades. According to the latest National Family Health

Survey 40 % of the children under five are undernourished (IIPS, 2007). Even in Kerala, which has been regarded as one of the few success stories in the spheres of human development, more than one fifth of the children under five are undernourished (IIPS, 2008). Hence child undernutrition is regarded as one of the greatest development challenges facing modern India. To tackle this challenge the first thing need to do is to understand the reasons behind it. In order to find the major determinants of child undernutriton a field enquiry was made into fourteen developmental blocks in district Malappuram. The objective of this paper is to report into the prelimanary findings of the prevalence of undernutrition in district Malappuram.

The paper proceeds by brief introduction of the child undernutrition and its consequences. After that the study presents a descriptive overview of the data and methods. This is followed by the results of the survey which lead to the concluding remarks.

Data and Methods

The data for the study come from a primary survey conducted by the researcher in the district Malappuram in 2010. The district is located in the 75^0 to 77^0 east longitude and $10^0$to 12^0 north latitude of the geographical map and share borders with the Nilgiris of Tamil Nadu in the east, Arabian Sea in the west, Kozhikode and Wayanad districts in the north and Palakkad and Thrissur districts in the south. The district has a population density of 1158 per square kilometre with a total population of 41,10,956 which covers 12.3 % of total population of Kerala (Cesus of India, 20011).

The target populaton of the survey includes all households in the district Malappuram having at least one child aged below five years old. The study utilised a multi stage cluster sampling to choose the samples. Whole district is divided into 14 clusters which is defined on the basis of the

14 developmental blocks. One panchayath was systematically selected from each block. From each panchayath 100 children in the age group 0-5 years was randomly selected with the help of Anganwadi teachers. Altogether, data with respect to weight, height, age and gender of 1400 children were effectivley collected. For this purpose a pilot tested structured questionnaire was administered face-to face to mothers in their home or in Anganwadi Centre.

Measurement of undernutrition

The nutritional status of children is frequently measured using three anthropometric indicators: low weight for age (underweight), low height for age (stunting) and low weight for height (wasting). All indicators are expresssed in standard deviation units (commonly called "Z scores") which are calculated by comparing a child's weight and height with that of a well healthy population (frequently called "reference population") defined by the US National Center for Health Statistics (NCHS)/World Health Organisation or by the new WHO Child Growth Standards (WHO Multicentre Growth Reference Study Group, 2006). More precisely, z score is the difference of a child's weight or height from the median weght or height of the children of the same age and sex in the reference population. The standard cut-off point to identify the severity of undernourishment is -2 z score. Thus a child is undernourished if the z score any of the anthropometric indicators, namely, weight for age height for age and weight for height, is below -2. Similarly, a child is severely undernourished if the z score falls below -3 standard deviation.

FINDINGS

This section presents the major findings of the primary survey conducted in district Malappuram with regard to the nutritional status of children

Pattern of undernutrition in district Malappuram

Table 1 shows the prevalence of stunting, wasting and underweight in district Malappuram. The data indicates that on average, 40 percent of children aged under five are stunted (i.e., their height-for-age is more than two standard deviations below the median for the WHO Child Growth Standards, 2006) which translates into approximately quarter of a million malnourished children.

Stunting reflects the long term nutritional status of a population because it is not affected by short term factors such as season of data collection, epidemic illness, acute food shortages, or shifts in economic conditions (Arnold , 2009). In the reference population (green coloured curve in the figure 1) only 2.28 percent of children aged under five would be stunted or falls below -2 Z score (Cogill, 2003).

Meanwhile, the percent of children who are stunted in the district is 17 times the expected level in a healthy, well nourished population. In figure 1 red coloured curve indicates the Z score distribution for height in district Malappuram. The leftward shift of the line implies the poor nutritional status of the children in terms of height-for-age.

Table 1 also shows that 17 percent of children aged below five are severely stunted (i.e., their height-for-age is more than three standard deviations below the median of a healthy, well nourished population).

Another measure of undernutrition exhibited in the Table 1 is wasting (low weight-for-height). Almost 23 percent of the children aged under five in the sample area are wasted (i.e., their

weight-for-height is more than two standard deviations below the median for the WHO Growth Standards). In other words, closely 1 out of four children aged below five in the sample area, district Malappuram, is wasted. This is higher than the national average of 20% (Intrnational Institute of Population Sciences, 2007). Wasting depicts the recent failure to attain adequate nutrition immediately before the survey and may be the result of insufficient food intake or due to recent episodes of diarrhoea or illness (Arnold, 2009). Hence, it is subject to high fluctuations in any given population (Alderman et al.,1994). On average, 6 percent of the children are severely undernourished in terms of low weight-for-height (i.e., the percentage of children whose Z score is below minus three standard deviations from the median of the reference population, WHO Child Growth Standards, 2006). This is nearly at par with the national average of 6.4%, while higher than the Kerala state average of 4.1 % (Intrnational Institute for Population Sciences and Macro International, 2007).

The figure 2 compares the Z score distribution of weight-for-height of the sample with that of the WHO Child Growth Standards. Similar to the normal curve of the Z score distribution of the height-for-age (in figure 1), the left ward shift of the normal curve of the weight-for-height pictures the grim situation of the nutritional status of children in district Malappuram in terms of wasting (weight-for-height).

Another measure of undernutrition shown in the Table 1 is underweight (low weight-for-age). It is a composite index of both heights-for-age and weight-for-height (International Institute of Population Science and Macro International, 2007). On average, 36.6% of children aged under five are underweight (i.e., their weight-for-age is more than two standard deviations below the median of the reference population) and 12% of them are severely underweight (i.e., their weight-for-age is more than three standard deviations below the reference population). This

estimate is consistent with that reported in the DLHS-RCH, India 2002-2004 (International Institute for Population Scinces, 2006). According to the DLHS-RCH, 36.7% of the children in district Malappuram are underweight. However, Comparability of the DLHS-RCH-2002-04 estimate compromised because, this survey covers 0-6 years old and used NCHS/WHO as the reference population, while the present study covered 0-5 years old and used WHO New Child Growth Standard, 2006 as the reference population.

Further, the data indicate that more than one out of every 10 young children (12%) in the district is severely underweight (i.e., their weight-for-age is more than three standard deviations below the reference population). In a healthy well nourished population (reference population) it is expected that 2.28% of the children would be underweight and .13% would be severely underweight (Cogill , 2003). In contrast, it is 16 times as high in district Malappuram as would be expected in a healthy well nourished population. Severely underweight children are 92 times higher than that of the reference population.

Likewise the former two figures, (figure 1 and 2), the figure 3 shows that high proportion of children outside of normal range in terms of weight-for-age. The figure indicates that the mean of the Z score distribution of the reference population is 0. In contrast, it is -1.6 for the Z score distribution of the weight-for-age of the children in the district (red coloured curve in the figure 3). The rate of stunting and wasting is higher among male children compared to their female counterparts (Table 1).

The pattern of the levels of undernutrition in the district is in line with the established literature, that being cumulative the HAZ (height-for-age) and WAZ (Weight-for-age) always assume

higher values. Whereas, WHZ (weight-for-height) only shows high values during periods of severe food shortages (Alderman , 2005).

High proportions of undernourished children in terms of all indices confirm that child undernutrition is a grave but ignored issue in the study setting, the district Malappuram. (See appendix-I for block wise distribution of malnutrition in district Malappuram).

Conclusion

The nutritional status of children has considerable importance because of its beneficial effects on later years of life. The wide and long lasting consequences of undernutrition put it as one of the biggest developmental challenges. The study drawn upon the recent evidence of the high prevalence of undernutrition amongst under five children in district Malappuram. The study finds alarming proportions of undernutrition amongst children in district Malappuram. In the district, 40 % of children are stunted, 37 % are underweight and 23 % are wasted. The problem of undernutrition is so widespread in the district that the prevalence is huge across sex and localities. This high prevalence is comparable to Sub-Saharan African countries.

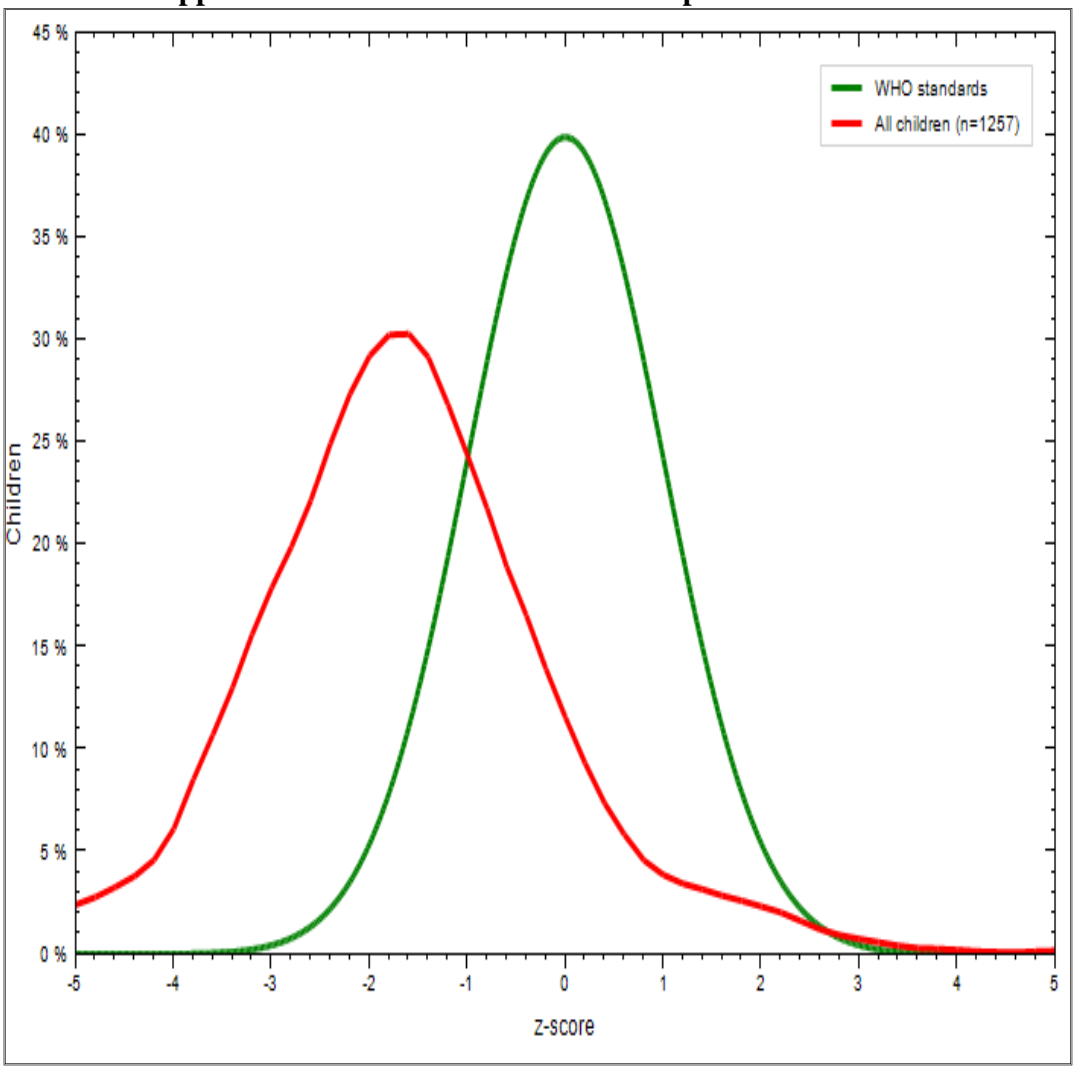
As stated in introduction, this uncomfortable level of prevalence of undernutrition has lasting consequences. Retarded growth in early years of life can affect rest of their life by compromising academic performance, reducing productivity, receding economic achievement and failing their ability to contribute to society. Hence, eliminating undernutrition should be the primary priority of the government.

Table 1: Nutritional Status of Children in District Malappuram

	Height- for-age	Weight-for-age	Weight-for-height
Fraction of children whose z score is below -2 SD[1]			
Male	0.42	0.38	0.23
Female	0.39	0.35	0.23
Total	0.40	0.37	0.23
Fraction of children whose z score is below -3 SD			
Males	0.18	0.11	0.06
Females	0.16	0.13	0.06
Total	0.17	0.12	0.06

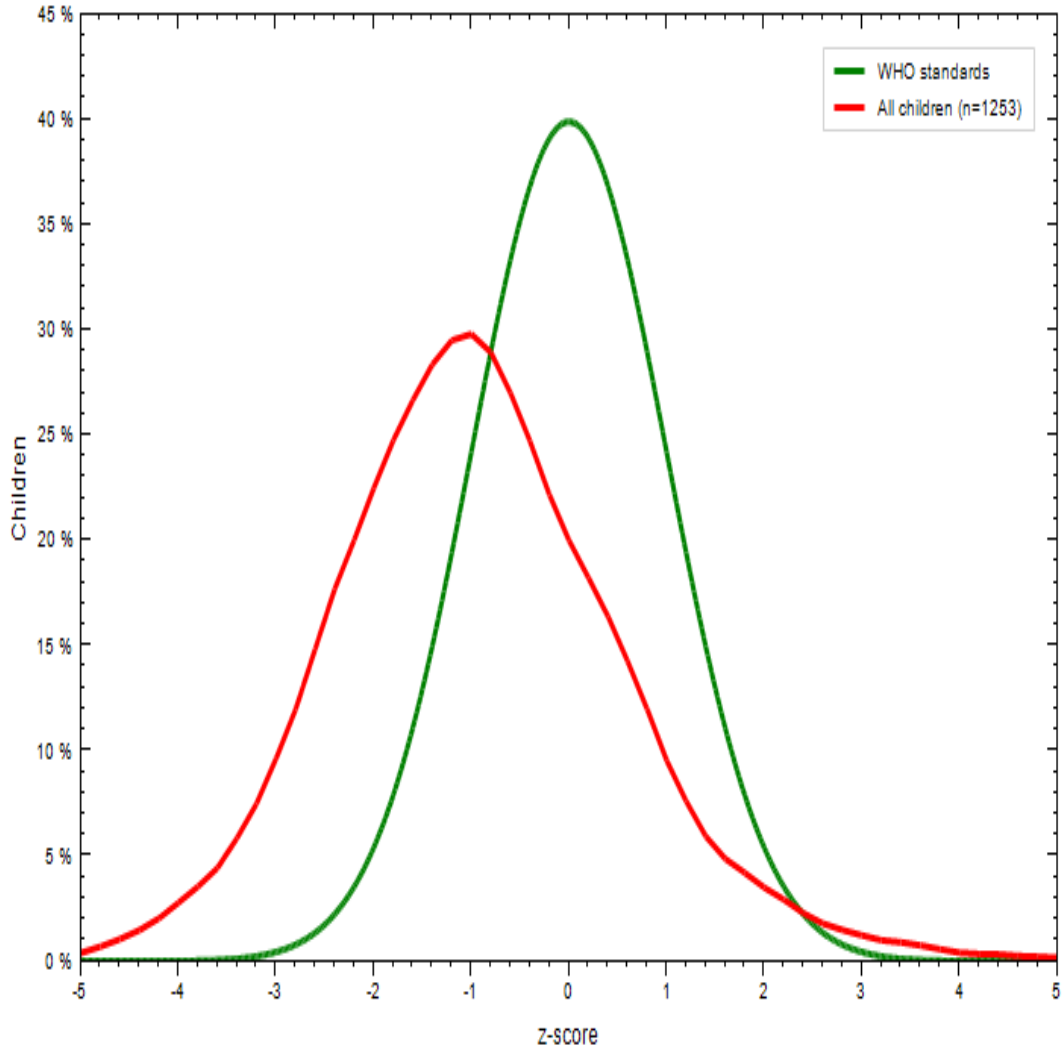
Source: Calculated from the primary survey conducted in District Malappuram.
Note: The indices are expressed in standard deviation units (Z score) based on the WHO Child Growth Standards, 2006.
[1]Include a child who's Z score is below -3 SD from the International Reference Population median.

Figure-1: Height- for- age Distribution: A Comparison of Children Aged under Five in District Malappuram with the Global Reference Population



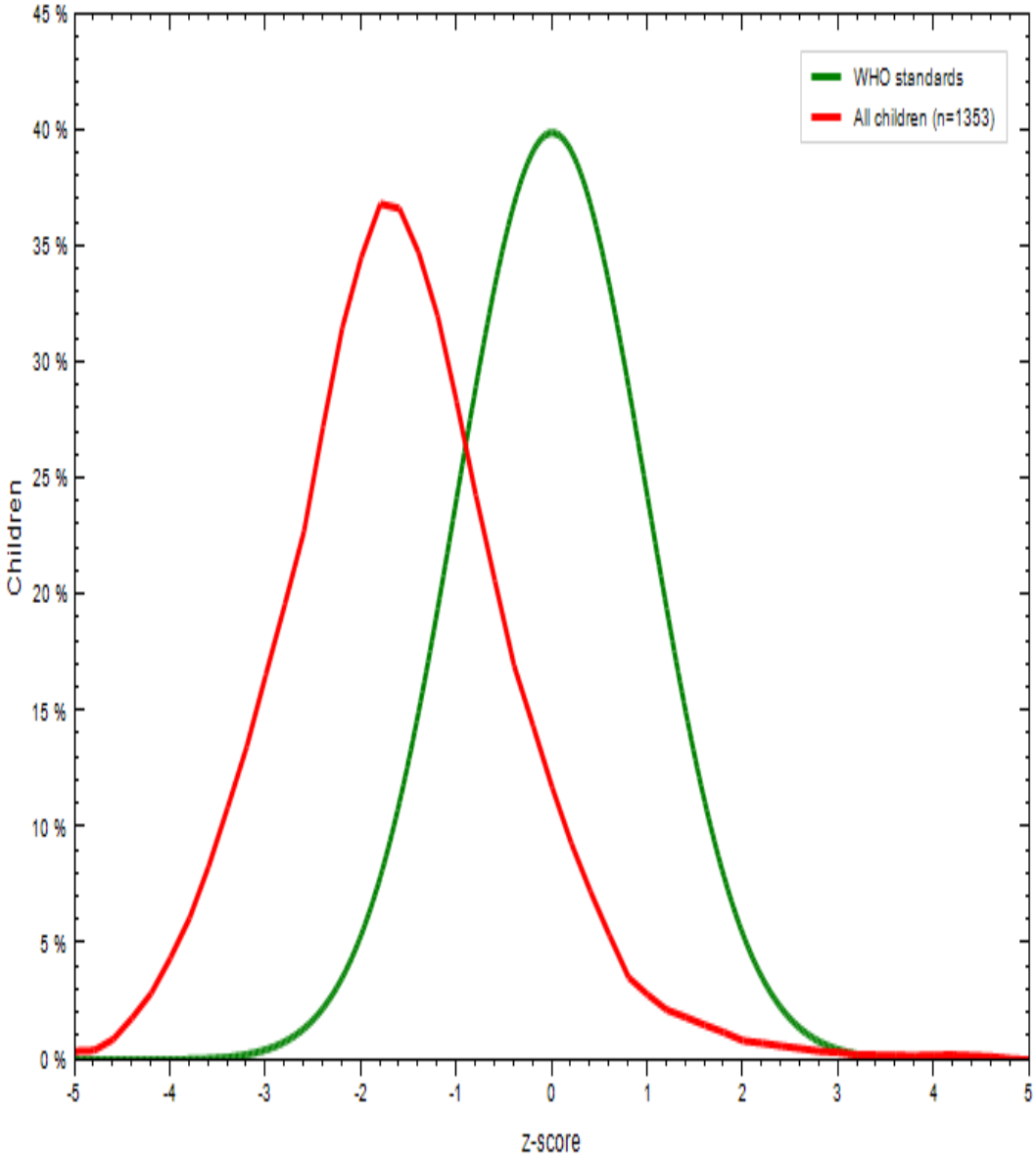
Source: calculated from the primary survey conducted in District Malappuram.

Figure-2: Weight-for-height: a comparison of children aged under five in district Malappuram with the global reference population



Source: calculated from the primary survey conducted in District Malappuram

Figure-3: Weight-for-age: a comparison of children aged under five in district Malappuram with the global reference population



Source: calculated from the primary survey conducted in District Malappuram

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Appendix-I: Block Wise Distribution of Undernutrition and Average WAZ*

Blocks	Undernutrition		Weight-for-Age Z Score
	Undernourished	Normal	
	Row N %	Row N %	Mean
Arecode	40	60	-1.72
Kondotty	38	62	-1.65
Kuttippuram	45	55	-1.81
Malappuram	44	56	-1.68
Mankada	39	61	-1.70
Nilambur	30	70	-1.21
Perintalmanna	38	62	-1.58
Perumbadapp	35	65	-1.24
Ponnani	26	74	-1.03
Tanur	35	65	-1.75
Tirurangadi	41	59	-1.89
Tirur	35	65	-1.61
Vengara	33	67	-1.51

Wandoor	33	67	-1.42