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The Nutrition Scene in India: Time Trends

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The first decade of the new millennium began on a momentous and exciting note. In August 2001, India's Prime Minister announced the setting up of a National Nutrition Mission with the objective of achieving substantial reduction in undernutrition, as well as reduction or elimination of micronutrient deficiencies. A National Nutrition Council headed by the Prime Minister will supervise the National Nutrition Mission. The Nutrition Mission and 10th Five Year Plan[1] embody the country's vision for Nutrition by 2010. The 10th Plan has set ambitious goals of 50 per cent reduction in severe undernutrition and anaemia and substantial reduction in overall undernutrition and micronutrient deficiencies. There is a debate whether these goals can be achieved within the time frame.

Over the years, India has built up abundant time-series data sets to monitor interventions and their impact in some of the critical sectors affecting nutritional status at state and national levels. This paper attempts to review these, gain insights about problems and bottlenecks which have hindered improvement in the nutritional status and to assess whether the new strategies proposed in the 10th Plan will enable us to achieve the targets.

Food consumption expenditure: Income has been a major determinant of dietary intake, especially among the lowest income group population, and so, India had defined the poverty line as the income necessary to purchase a basket of foodstuffs to meet energy requirements (2,200 kcal per day in urban and 2,400 kcal per day in rural) of the population. Over the years there has been a substantial improvement in per capita income and reduction in the proportion of population living below the poverty line.

Data from the National Sample Survey Organisation (NSSO) survey[2] indicate that over the last three decades there has been a progressive decline in the proportion of household expenditure on food, mainly due to decline in expenditure on cereals (Figure 1). However, the per capita cereal intake has remained unaltered, because there has been a decline in the cost of cereals. On the other hand, in spite of unaltered expenditure on pulses, there has been a decline in pulse consumption, especially in the lower socio-economic group because of soaring prices. Fat consumption has shown an increase over the years in both urban and rural areas (Table 1).

Average per capita energy intake in different socio-economic categories is given in Table-2[3]. If a part of the expenditure currently being incurred on beverages and intoxicants is spent on low cost micronutrient rich vegetables and fruits, micronutrient needs will be met. Nutrition education can play a pivotal role in ensuring that the families understand the importance of dietary diversification, so that their nutrient needs are met from farms and not from pharmacies.

Consumption of all foodstuffs (especially sugar, oil, milk and animal products) and energy intake increases with increasing income. Over the last two decades, the energy intake among the lowest income group has remained unaltered and is inadequate to meet the minimum requirement of even moderately active individuals. There has been a reduction in the per capita calorie intake in the top 30 per cent income families as a whole (Table 2). However, the current per capita energy consumption in the sedentary upper income group is still far above its actual requirement. Nutrition and health education to reduce the energy intake and increase the physical activity is essential to minimise the risk of overnutrition and non-communicable diseases in this segment of the population.

NUTRITIONAL STATUS OF ADULTS

Data from NSSO[2] and National Nutrition Monitoring Bureau (NNMB)[4] indicate that, in the last three decades, there has not been any increase in dietary intake (Tables 1 and 3). However, data from NNMB[4] (Figure 2) and National Family Health Survey (NFHS-I,II)[5,6] show that there has been some

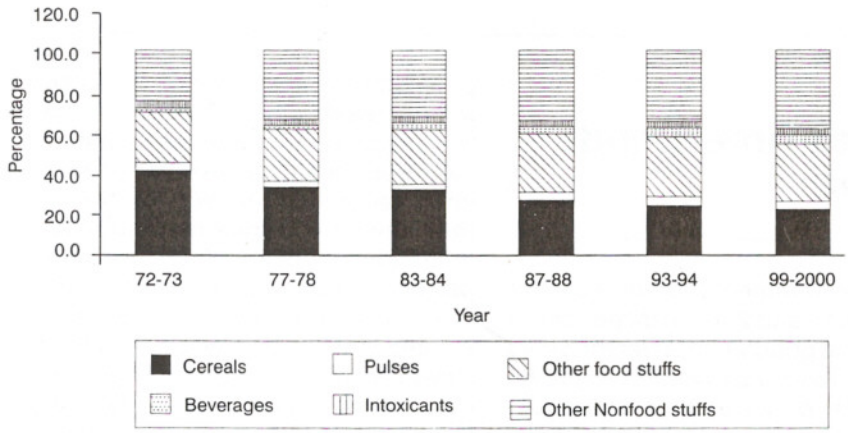
CONTENTS

Table 1: Average daily per capita dietary intake

	Energy (kcal)		Protein (gm)		Fat (gm)	
	Rural	Urban	Rural	Urban	Rural	Urban
1972-73	2266	2107	62	56	24	36
1983	2221	2089	62	57	27	37
1993-94	2153	2071	60.2	57.2	31.4	42
1999-2000	2149	2156	59.1	58.5	36.1	49.6

Source: NSSO 2001

Figure 1: Percent consumer expenditure on food and nonfood items



Source: NSSO 2001

decline in the prevalence of undernutrition in all age groups, including adults, and some increase in the percentage of overweight, especially among women.

These data suggest that the country is entering an era in which undernutrition may continue to be the major public health problem but there are segments of the population in whom prevention, detection and management of overnutrition will have to receive increasing attention.

UNDERNUTRITION IN INFANCY

Vigorous efforts to protect and promote breast-feeding during the last three decades has resulted in universal breast-feeding in the country. However, efforts to communicate the importance of exclusive breast-feeding in the first six months of life and timely introduction of adequate quantity of energy dense complementary food after six months have not been as successful. Data from NFHS-II[6] clearly show that even though breast-feeding is nearly universal, as early as three months, a substantial proportion of infants get breast milk substitutes. On the other hand, nearly two-thirds of infants do not receive semi-solid supplements even as late as nine months. As a result, even today, there is a sharp increase in the prevalence in undernutrition during infancy and early childhood[6] (Figure 3). This is a major non-economic factor responsible for undernutrition in early childhood and should be corrected through intensive nutrition education aimed at bringing about changes in infant feeding and caring practices.

CHANGING PROFILE OF UNDERNUTRITION IN CHILDREN

Over the years, there have been efforts aimed at improving the purchasing power of the people through poverty alleviation programmes, and improving access to subsidised food grains through the Targeted Public Distribution System (TPDS). As a result, there has been a reduction in the percentage of the population living below the poverty line. Improved access to subsidised food grains, coverage under health and family welfare services, supplementary feeding programmes for vulnerable groups of the population – have all apparently contributed to a reduction in severe undernutrition. However, there is no change in the prevalence of mild and moderate undernutrition[4] (Figure 4). This might imply that, apart from poverty, there are other determinants of undernutrition.

Over the last three decades, there has not been any change in the dietary intake of preschool children[4] (Table 4). In spite of this, NNMB data indicate that over this period there has been a substantial decline in severe grades of undernutrition in children[4] (Figure 4). This might, to a large extent, be due to better access to health care, thus reducing the adverse impact of infection on nutritional status, and better access to contraception and consequent decline in undernutrition associated with high parity. However, the decline in mild and moderate undernutrition has been relatively slow. This may at least in part be due to:

- The steep decline in mortality over the same period which had resulted in the survival of many undernourished children who added to the pool of undernutrition
- Food supplementation under Integreted Child Development ServicesI(ICDS) tends to provide food to those who come to the anganwadi;

Table 2: Average per capita energy (kcal) intake by expenditure classes

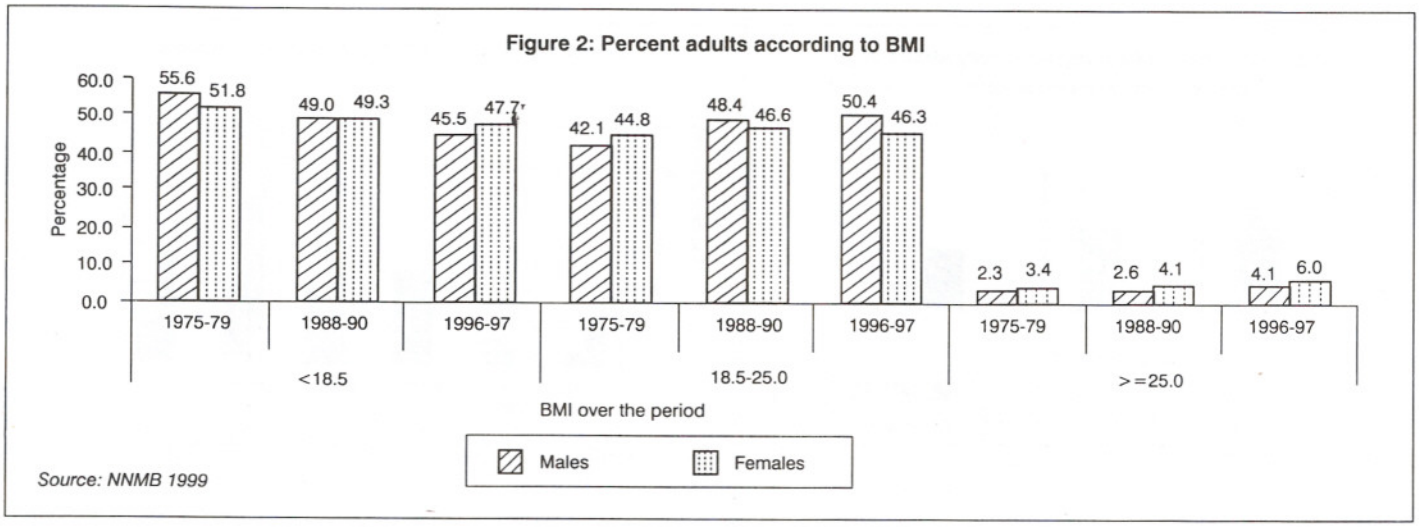
Expenditure	Rural		Urban	
Classes	1972-73	1993-94	1972-73	1993-94
Lower 30%	1504	1678	1579	1682
Middle 40%	2170	2119	2154	2111
Top 30%	3161	2672	2572	2405

Source: NSSO, 1997

Table 3: Time trends in dietary intake

	RDA*	75-79	88-90	96-97
Energy (kcal)	2425	2300	2283	2108
Protein (g)	60	63	62	54
Iron (microg)	28	30	28	25
Vit A (Microg)	600	257	294	28.2
Riboflavin (mg)	1.4	0.97	0.94	0.9

**Recommended Dietary Allowance. Source: NNMB, 1999*



the approach is more as a welfare programme with the belief that the programme will be self-targeting and attract mainly the needy. Screening for detection of undernutrition and management through appropriate health and nutrition intervention has not yet been operationalised as a part of the ICDS programme.

- In India, even today about a third of infants weigh less than 2.5 kg at birth. The majority of them are mature but small. As birth weight is a major determinant of growth in infancy and childhood the growth trajectory of these infants may be low and contribute to the higher prevalence of undernutrition as assessed by the most commonly used parameter, namely, weight for age. Any attempts at increasing the energy intake in these infants may not be effective in terms of altering the growth trajectory.

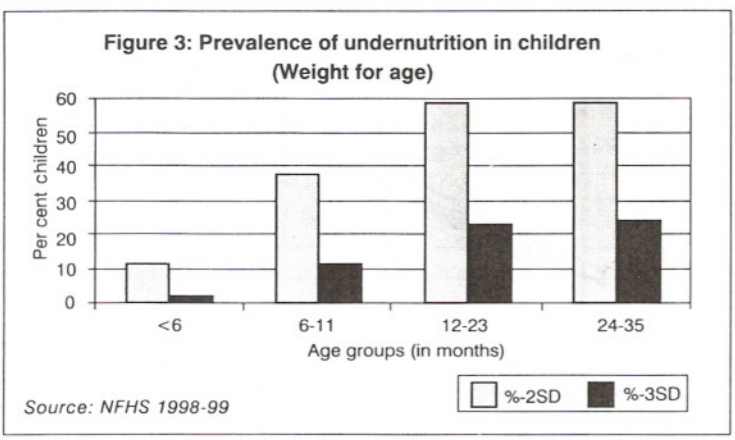
Intrafamilial distribution: Data from NNMB on time trends in intrafamilial distribution of food[7] (Figure 5) indicate that while the proportion of families where both adults and preschool children have adequate food have remained at about 30 per cent over the last 20 years, the proportion of families with inadequate intake has come down substantially. However, the proportion of families where the preschool children receive inadequate intake while adults have adequate intake has nearly doubled. These data clearly indicate that one of the major reasons for undernutrition in young children is faulty child feeding practices. Nutrition education to the family that young children have a very low stomach capacity and in order to ensure adequate dietary intake, it is important to feed them once in every four hours or even more often, may go a long way in reducing the prevalence of undernutrition in young children.

Surveys carried out in the 1990s have shown that there are massive interstate differences in undernutrition which are not related to income. Data from NFHS-II[6] showed the poorest in Kerala have undernutrition rates comparable to the richest in UP (Figure 6). All these data suggest that, at present, non-economic factors such as infant and young child feeding and rearing, access to health and contraceptive care are becoming major determinants of the current high levels of undernutrition in children.

NUTRITIONAL STATUS OF ADOLESCENTS

The number of adolescents (in the 10-19 age group) is expected to increase from 200 million in 1996 to 215.3 million in 2016. Adolescents gain 30 per cent of their adult weight and more than 20 per cent of their adult height between 10 and 19 years. Adolescents, undergoing rapid growth and development, are one of the nutritionally vulnerable groups but they have not received the attention they deserve.

Data from the NNMB repeat surveys[4] has shown that while there has not been any substantial increase in the dietary intake of adolescents, there has been some improvement in height (2.5-3.5 cms), weight (1-1.5 kg) and Body Mass Index (BMI) between 1975-79 and 1995-97 (Figures 7,8 and 9). Data from NNMB also show that, over this period, there has been some increase in obesity among adolescents, especially, in the affluent groups both



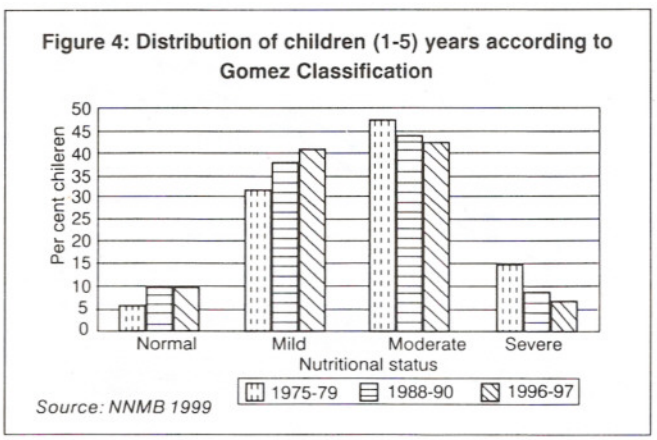
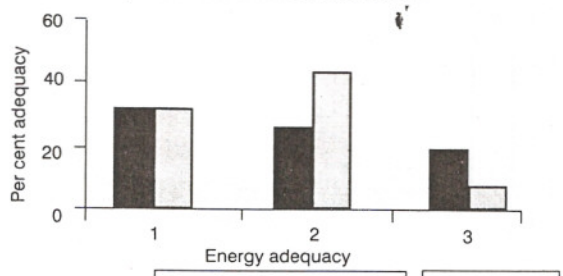


Figure 5: Comparison of energy adequacy status of preschool children and adults

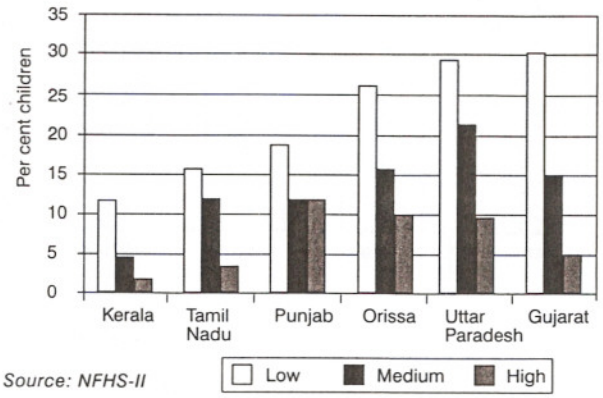


	Adult	Child
1	+	+
2	+	-
3	-	-

1975-80
1996-97

Source: NNMB 2000

Figure 6: Nutritional status of children by income



Source: NFHS-II

in urban and rural areas. However, the prevalence of micronutrient deficiencies continue to be high. With the onset of menstruation, girls in this age group are vulnerable to anaemia and all its adverse consequences. It is obvious that currently undernutrition, overnutrition and anaemia are major problems among adolescents.

Data from NFHS–II[6] indicate that the median age at marriage of girls in India is 16 years; 61 per cent of all girls were married before the age of 18. The mean age at first birth is 19.2 years. Undernutrition, anaemia and poor ante-natal care inevitably lead not only to increased maternal morbidity but also to a higher incidence of low birth weight and peri-natal mortality. Poor child rearing practices of these girls add to infant morbidity and undernutrition, thus perpetuating the intergenerational cycle of undernutrition. Appropriate education, including vocational training, delay in age at marraige, optimum health and nutrition interventions during pregnancy are some of the intersectoral initiatives to break this vicious cycle.

Table 4: Average nutrient intakes among preschool children

	1-3 years			4-6 years		
	1975-79	1988-90	1996-97	1975-79	1988-90	1996-97
Protein (g)	22.8	23.7	20.9	30.2	33.9	31.2
Energy (Kcal)	834	908	807	1118	1260	1213
Vitamin A (µg)	136	117	133	159	153	205
Thiamin (mg)	0.50	0.52	0.40	0.76	0.83	0.70
Riboflavin (mg)	0.38	0.37	0.40	0.48	0.52	0.60
Niacin (mg)	5.08	5.56	4.60	7.09	8.40	7.40
Vitamin C (mg)	15	14	15	20	23	25

Source: NNMB (1999)

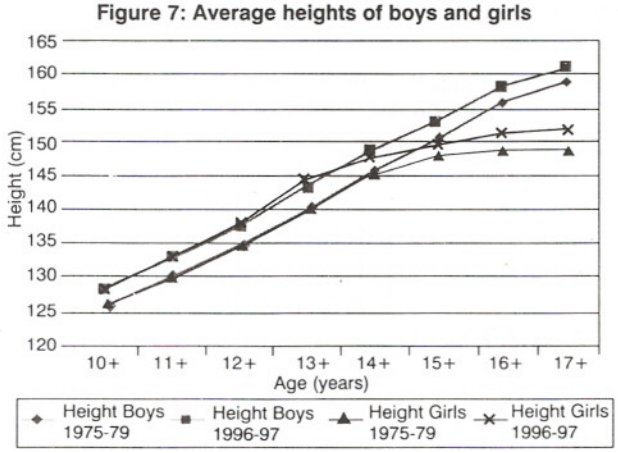
NUTRITION FERTILITY INTERACTIONS

The adverse effect of high parity and low inter birth intervals on birth weight, undernutrition during infancy and childhood have been well documented. Over years there has been a sustained steady decline in the fertility and family size (Figures 10,11)[4,5,6]. Data from the District Level Household Survey[8] (DLHS) has shown that, even now, undernutrition is more common in children of birth order 3 and above (Figure 12); the reduction in fertility over the decades has been a non-nutritional intervention which had a role in the decline in severe undernutrition rates.

SUMMARY AND CONCLUSIONS

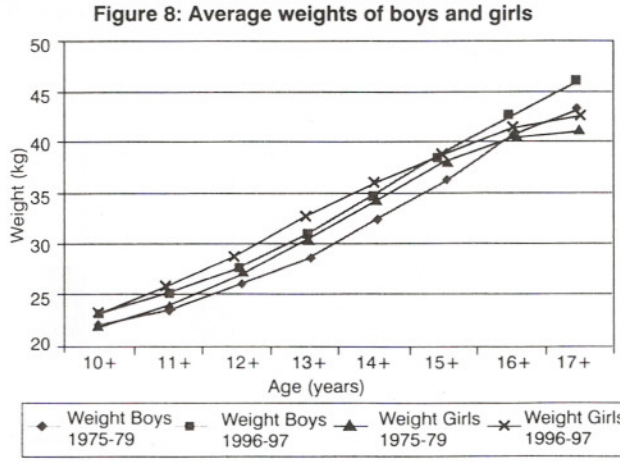
The review shows that considerable progress has been achieved in all sectors related to nutrition in the last five decades. However, there are still some areas of concern. The Green Revolution ensured that the increase in food production stayed ahead of the increase in population. The coun-

Figure 7: Average heights of boys and girls



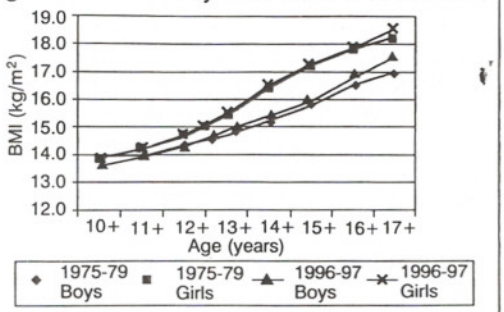
Source: NNMB, 1999

Figure 8: Average weights of boys and girls



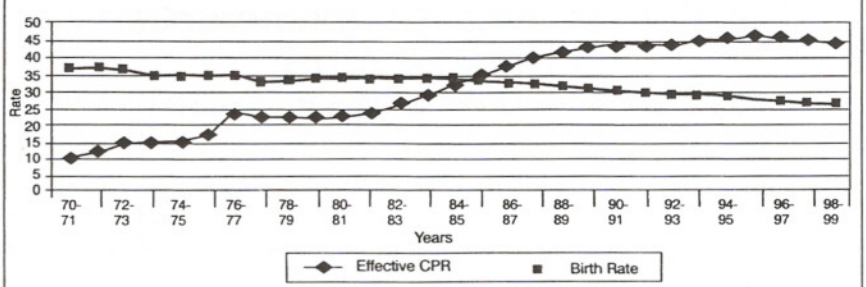
Source: NNMB, 1999

Figure 9: Median body mass index of adolescents



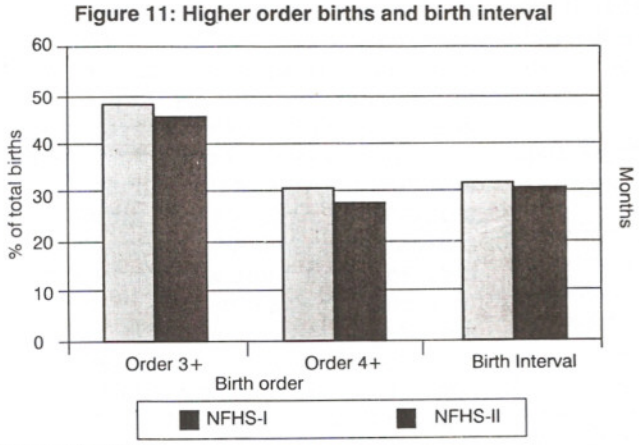
Source NNMB -1999

Figure 10: Couple protection rate and birth rate



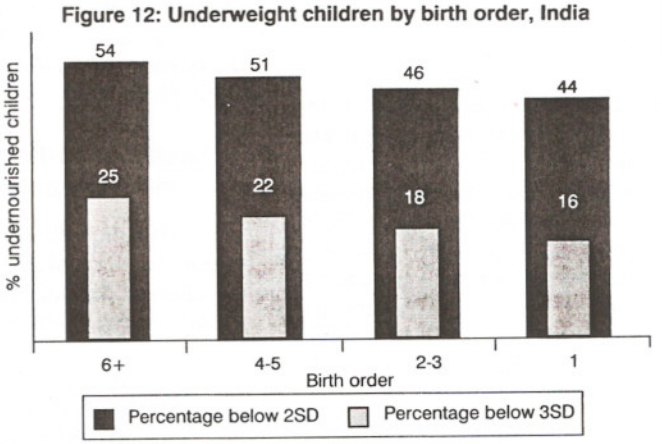
Source: Registrar General of India, Department of Family Welfare

Figure 11: Higher order births and birth interval



Source: NFHS I,II

Figure 12: Underweight children by birth order, India



Source: DLHS, 2002

try has moved from chronic shortages to an era of self sufficiency, surplus and export in most food items. Currently, there is a buffer stock of over 60 million tonnes of food grains. However, 8 per cent of Indians do not get two square meals a day and there are pockets where severe undernutrition takes its toll even today.

Along with the steps to achieve adequate production, initiatives were taken to reach foodstuffs of the right quality and quantity to the right places and persons at the right time and at an affordable cost through the Public Distribution System (PDS). The food for work programme has addressed the needs of vulnerable out-of-work persons. The ICDS programme aimed at providing food supplementation for preschool children, pregnant and lactating women, nearly covers all blocks in the country. The Mid-day-meal Programme for improving the dietary intake of primary school children and reduction in the school drop out rates has been operationalised. There has been substantial improvement in access to health care. National programmes for tackling anaemia, iodine deficiency disorders and Vitamin-A deficiency are being implemented. However, in none of these programmes, has universal, well targeted coverage been achieved.

In spite of lacunae in quality and coverage, these programmes have resulted in substantial reduction in severe grades of undernutrition, especially in children but improvement in mild and moderate undernutriton has been very slow. In the 1970s, poverty and poor access to health and nutrition services were the major causes of undernutrition. In the 1990s, poor infant and young child feeding and caring practices rather than poverty is emerging as the major factor responsible for undernutrition in childhood.

The 10th Plan[1] aims at achieving substantial improvement in nutritional status within a short time by focussing interventions on those factors which are amenable to immediate correction and have a functional significance.

The country can achieve the goals set in the 10th Plan for reduction in undernutrition, fertility and mortality if

- there is optimal use of available infrastructure and abundant human resources,
- there is convergence of services at the community level,
- at-risk population groups, households and individuals are screened and those with nutritional problems are identified,
- well targeted comprehensive interventions are implemented efficiently, and
- community-based organisations and PRI monitor implementation and ensure midcourse corrections.

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