Abstract

Nutritional status and Health implication of ongoing Nutrition Transition in India

Vandana Bhattacharya
Research Officer
Department of social science,
National Institute of Health and Family Welfare,
Munirka , New Delhi -67
Email Id vandanabhattacharya@rediffmail.com

India is a vast and varied subcontinent. With 2.4percent of the global land mass it has been supporting over one sixth of the world's population. As of 2001 census India's population is 1028 million; they live in two hundred and twenty million households in 35 states and union territories. As a developing country with high population density India's planners recognized right from the time of India's independence the importance of planned growth of the economy with emphasis on human resource development. Policy makers recognized that the optimal nutrition and health as prerequisites for human development. Article 47 of the Constitution of India states, that the State shall regard raising the level of nutrition and standard of living of its people and improvement in public health among its primary duties". Over the last five decades successive Five-Year Plans laid down the policies and multi-sectoral, multi-pronged strategies to combat nutrition related public health problems and improve nutritional and health status of the population.

Currently the country is in the midst of rapid socioeconomic, demographic, nutrition and health transition. While the country is yet to overcome

poverty, under-nutrition and communicable diseases, it is increasingly facing problems related to affluence due to industrialization, urbanization and economic betterment. Over the last two decades over nutrition and obesity have emerged as public health problems; there has been increase in prevalence of diabetes and cardiovascular diseases especially in urban areas; the magnitude of the problem varies between states, urban and rural areas and different socioeconomic strata. It is a matter of concern that these diseases occur a decade earlier in Indians and affect even poorer segments of population and those in rural areas. The case fatality rates are reported to be higher in poor and rural population probably due to delays in diagnosis and treatment. The impact of ongoing socioeconomic, demographic and life style transition on nutritional status and health implication of ongoing nutrition transition are reviewed in this Paper.

Department of Social Sciences
N.I.H.F.W

F.No.Podu-Con./DSS/VB/08

Subject- Request for the permission to send an abstract in the conference.

Health, Equity and Human Rights is the core issue of the sixth conference of Indian Association for Social Sciences and Health .The conference is in Puducherry on March 7-8, 2009.

The kind Director is requested to allow the undersigned to send an abstract of the paper entitled, "The Nutritional status and health implication of ongoing nutrition transition in India" for the participation in the conference.

Enclosed is the brochure and the abstract for the same.

This is for Director's Approval Please.

Vandanabhattacharya
Research Officer
Department of Social Sciences

Through proper Channel

HOD/
Social Sciences

Director/

Dietary intake and Nutritional Status in different age groups

Nutritional status of Indian population has been extensively investigated over the past three decades. NNMB (NNMB, 1979-2002) and INP (Department of Women and Child Development, 1995-96) provide information on nutritional status of different age groups of the population in relation to their dietary intake. NNMB provides information on time trends in nutritional status in all age group population. The National Family Health Survey 1 (liPS. 1992-93) & 2 (liPS, 1998-99) provide state level estimates of time trends in nutritional status of women and preschool children during the nineties in all major state. The District Level Household Survey *2002-03* (Ministrv of Family and Health Welfare, *2004)* provides district level estimates on nutritional status preschool children. In addition there are several smaller cohort studies providing follow up data on nutritional status of specific groups over decades. In this section data on time trends in dietary intake and nutritional status of different age group of population is reviewed.

5.1. Time trends in anthropometric indices

Data NNMB (NNMB, 1979-2002) rural surveys on time trends in weight, height, mid-arm circumference and triceps fat fold thickness in all age groups in both males and females. Even in rural population there is an increase of about four cms in adult height; the increase in body weight over the period is greater. This is mainly hue to fat deposition as shown by progressive increase in the fat fold thickness over this period. The increase in fat fold thickness begins in childhood and increases with age in both males and females. The increase is more in women.

5.2. Low birth weight

Nearly one-third of all Indian infants weigh less than 2.5 kg at birth.

Incidence of low birth rate is the highest among the low-income groups (Table-5.11) (Prema, 1989). There is a good correlation between birth weights and maternal body weight. Low birth weight rate doubles when HB levels fall below 8 gms/dl.Low birth weight incidence has remained unaltered over the last three decates (Nutrition foundation of India,2002)
In spite of the fact that there has been no decline in the prevalence of low birth weight, India has achieved substantial decline in IMR (Registrar Genera! of India, 2002). With the increase in survival of the low birth weight neonate, there is growing concern regarding the relationship between low birth weight and poor growth during childhood adolescence as well as increased risk of chronic degenerative diseases in later life.

Under the Reproductive and Child Health Programme 1 (Ministry of Family and Health Welfare, 1998-99) and 2 (Ministry of Family and Health Welfare, 2002) efforts are under way to provide effective antenatal care and achieve reduction in low birth weight. Factors such as maternal height,

which has significant influence on birth weight, are not amenable to short term corrective interventions. On the other hand, Anaemia, pregnancy induced hypertension and low maternal weight gain during pregnancy can be detected and treated. Effective management of these could result in substantial reduction both in pre-term births and birth of small for date neonates.

5.3. Growth during infancy and early childhood

Growth during infancy and childhood depend upon birth weight, adequacy of infant feeding and absence of infection. Available data clearly indicate that in India exclusively breast-fed infants thrive normally during the first six months of life and have lower morbidity episodes (diarrhea, respiratory tract infection and fever) than those receiving supplements in addition to breast milk. In India, steps taken for the protection and promotion of the practice of breast-feeding have been effective and breast-feeding is almost universal (Planning Commission, 2002). However, the message that exclusive breast feeding up to six months and gradual introduction of semisolids after that are critical for the prevention of under-nutrition in infancy has not been as effectively communicated. Data from NFHS 2 (lIPS. 1998-99) indicated that though breastfeeding was nearly universal and mean duration of lactation is over 2 years, exclusive breast-feeding among infants in the age group of 0-3 months was only 55.2 percent. In spite of the emphasis on the need for timely introduction of complementary food only 33.5 per cent of the infants in the age group of 6-9 months received breast milk and semi-solid food.

There are substantial inter-state differences in exclusive breastfeeding and timely introduction of semi-solid food . Too early introduction of supplements is a major problem in states like Delhi, Himachal Pradesh and Punjab and too late introduction of supplements is a big problem in Bihar, Uttar Pradesh, Madhya Pradesh, Rajasthan, and Orissa. Kerala fares well in terms of appropriate infant feeding practices and this might be one of the reasons for the relatively low under nutrition rates in the state (lIPS, 1998-99)

Too early introduction of milk substitutes and too late introduction of complimentary food are associated with increased risk of under nutrition and infection. As a result of faulty infant feeding practices there is a steep increase in the prevalence of under-nutrition from 11.9 per cent at less than 6 months to 58.5 per cent in the 12- 23 months age group 30. A major thrust during the Tenth five Year plan is aimed at prevention of onset of under-nutrition in infancy and early child hood through nutrition education so that by 2007 more than 80% of women exclusive breast feeding up to six month and complementary feeding rate at six month goes up to 75 per cent (lIPS, 1998-99).

5.4. **Time trends in the dietary intake and nutritional status of pre-school children**

Data from NNMB (NNMB 1979-2002) on energy intake and prevalence of under nutrition in fewer than three children is. There has been a steady

decline in under-nutrition in children even though the dietary intake has not shown a major change over years. The decline in under nutrition is most probably attributable to the better access to health care and effective, management of infections.

Pre-school children constitute one of the most nutritionally vulnerable segments of the population and their nutritional status is considered to be a sensitive indicator of community health and nutrition. There has not been a substantial improvement in their dietary intake over the last two decades (Table 5.2).

Data on energy intake in children, adolescents and adults from NNMB 2000 (NNM~t 2000) is shown in Table 5.3. Mean energy consumption, as percentage of RDA is the least among the preschool children. Time trends in intra familial distribution of food indicate that while the proportion of families where both the adults and preschool children have adequate food has remained at about 30% 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 in all while adults have adequate intake has nearly doubled. This is in spite of the fact that the RDA for preschool children forms a very small proportion (on an average 1300 Kcal/day) of the family's total intake of around 11000 *Kcal/day* (assuming a family size of 5). It would, therefore, appear that poor young child feeding and caring practices and not poverty is factor responsible for inadequate dietary intake. Tenth Five Year Plan (Planning Commission, 2002) has emphasized the importance of health and nutrition education to ensure proper interfamily distribution of food based on needs.

5.5. Time trends in prevalence of under nutrition in preschool children

Over the last three decades there has been a steep decline in the prevalence of moderate and severe under nutrition as assessed by weight for age and height for age . There has been relatively no change in the prevalence of wasting. In spite of the steep decline in the prevalence of stunting over the last three decades, the change in the mean height of children is very low. The increase in adult height is also modest 2-4 cms in three decades.

Indian children are short as compared to the NCHS norms; even when they have appropriate weight for their height they get classified as undernourished by NCHS norms. The so-called South Asian paradox (high under nutrition rates but comparatively good health status) will disappear if BMI for age is used as criteria for defining under nutrition. Early detection and correction of wasting will have to be taken up on priority basis so that there is reduction in wasting; this will intern enable Indian children to achieve their growth potential. In India there are considerable interstate difference in the dietary intake and nutritional status of children . Though dietary intake is a major determinant of nutritional status in children, it is not the only determinant. Energy intake is low and under nutrition is high in Uttar Pradesh, Bihar and Rajasthan. However in spite of low energy intake

prevalence of under nutrition is low in Kerala and Tamil Nadu, most probably because of more equitable intra-familial distribution of food based on needs and better access to health care. In spite of high energy intake prevalence of under nutrition is high in Madhya Pradesh and Orissa perhaps due to inequitable distribution of food and poor access to health care (II PS, 1998-99) Nutritional status of poor children in Kerala is similar to the nutritional status of the rich in Uttar Pradesh and Orissa. This is probably attributable to better access to health care and equitable distribution of food between members of the family in Kerala and lack of these in Uttar Pradesh. These data clearly indicates that lack of access to health care is a major factor responsible for under nutrition in preschool children. The decline in fertility and reduction in the higher order births may also have contributed to this because prevalence of severe forms of under nutrition is higher among higher order births (lIPS, 1998-99).

Poor dietary intake, poor caring practices and poor access to health care are some of the major factors responsible for under-nutrition and under five mortality (U5MR). In most of the states e.g. Orissa where under-nutrition is high, under five mortality rate is also high; in states like Kerala where under-nutrition is low, U5MR is also low . However there are exceptions to this. In Maharashtra U5MR is relatively low in spite of relatively high under nutrition rates, perhaps because access to health care is better. In Punjab, in spite of high per capita income, high dietary intake and good access to health care, both under-nutrition and IMR are relatively high. These data indicate the importance of health care in reducing both under nutrition and under five mortality (lIPS, 1992-93).

5.6. Nutritional status of affluent school children

of India (1991) (Nutrition Foundation of India, 2004) showed that growth of affluent children in 0-6 years of age was similar to the NCHS-WHO norm. Data from studies carried out by NFl in Delhi between 20002004 (Nutrition Foundation of India. 2004) showed that while under nutrition is the problem in children from low income group (LlG) who are studying in Government schools, over nutrition is the cause for worry in high income group (HIG) children in public schools right from six years of age.

5.7. Growth of adolescents from urban affluent families

Comparison between the heights and weights of adolescent girls and boys from affluent segments show that their heights and weights are comparable to NCH8 norms and are higher than adolescents surveyed by NNMB (NNMB 1979-2002)

Data on height and weight distribution (as compared to NCH8 norms) in Delhi school children from affluent segments of the population investigated by Nutrition Foundation of India (1998-2005).Even among affluent segments there are some children who are stunted (-280 height for age).

There are overweight children in all classes right from play school. After the age of ten there is a reduction in overweight children because they are conscious of being overweight and try to lose Weight either through exercise or through skipping meals (Nutrition Foundation of India, 2004). However consistent habits in eating and exercise often elude these adolescents; as a result they have cyclical weight gain and loss and incur all the health hazards associated with it.

5.8. Nutritional status of adults

Data from NNMB and INP shows that prevalence of under-nutrition in adults is higher in
rural areas., as compared to urban areas (Table 5.5). Prevalence of over nutrition is higher in urban areas. Over the last three decades there has been a progressive decline in under nutrition and some increase in over-nutrition both in urban and in rural areas.

Prevalence of both under nutrition and over nutrition are higher in women as compared to men.

Table 5.5 Prevalence of Under-nutrition and over nutrition among adults

	Underweight						Overweight					
	NNMB					INP*	NNMB					INP
	'75-79	'89-90	'96-97	'00-01	'932'94	'95-96	'75-79	'89-90	'96-97	'00-01	'93-94	'95-96;
Rural	53,2	49	48,5	38,6		34.6	2.9	3.1	46.5	6.6		4.1
Urban					20.3	27.7					8.8	6.0
Male	55.6	49	45.5	37.4	22.2	28.6	2.3	2.6	4.1	5.7	5.0	4.3
Female	51.8	49.3	47.7	39.3	19.4	36.3 ',)	;3.4	4.1	6.0	8.2	10.6	4.6

Source: NNMB -90, 1996-97, *2oo0-01lNP.1995-96; NFHS,* 1998-99: """,
,.survey Population: NNMB Rural (1975-79,1988-90, 1995-96, *2000-01) &Urban* (1993-94); *INP (1995-96)both urban and rural (U+R)Sample !,ze:JjJ':lMB,* 11973 (1975-79),21398 *(1989-90),30773* (1996-97), *11074 (2000-01); NNMB* 2772 (1993-94); *INP,* 177841 *(199/1':96),* '

5.9. Nutritional status of women

Data from National Family Health Survey indicates that as of 1998-99 prevalence of under nutrition in urban areas is half of the prevalence of under nutrition in rural areas (Table 5.6). Prevalence of over nutrition is four folds higher in urban as compared to rural areas. There is a progressive decline in the prevalence of under nutrition and progressive increase in the prevalence of over nutrition in adult women with increase in age.

Table 5.6 Prevalence of Under-nutrition and over nutrition among women(15-45)

Characteristic	Mean BMI	BM1<18.5	BM5
	1998.99	1998.99	1998.99
Rural	19.6	40.6	5.9
Urban	21.1	22.6	23.5
Age			
15-19	19.3	38.8	1.7
20-24	19.3	41.8	3.6
25-29	19.8	39.1	7.3
30-34	20.4	35.0	11.7
35-49	21.1	31.1	16.8
All	20.3	35.8	10.6

Source: NFHS, India, 1998-99. *Survey Population: Rural & Urban; Sample Size:* 77119 (1998-99)

Data from NFHS -2 show that while prevalence of under nutrition is continuing to be high among women poorer segment of the population, over nutrition and obesity are emerging as major problems in all the states. There are substantial differences in the prevalence of under and over nutrition between states but all states have to gear up for detection and management of these dual nutrition problems in women.

Increase in fat deposition in the absence of increase in energy consumption is attributed to the reduction in physical activity. There are very few studies documenting the physical activity pattern over the last three decades

5.10. To sum up

During the past three decades there has been

- A very small (2-4 cm) increase in adult height over the last three decades
- Significant increase in the mean body weight; this is mostly due to increase in
- Reduction in the number of the persons engaged in manual work
- Substantial improvement in mechanical aids in agriculture, industry and allied activities
- Improvement in access to water and fuel near households both in urban and rural areas
- Availability of urban mass transport at affordable cost has resulted in less number of people walking or cycling to work place, school or market

- Mechanical aids have reduced physical activity during cooking and household chores
- among urban affluent class TV and computers contributed to steep reduction in physical activity.

As a result of these life style changes, there has been a reduction in energy requirements. Unchanged energy intake and reduced energy requirement is associated with positive energy balance and *fat* deposition.

References

5.1 **NNMB** National Nutrition Monitoring Bureau. 1979-2002. NNMB *Reports.* National Institute *Of* Nutrition, Hyderabad.

5.2 Department of Women and Child Development. 1995-96. *Indian Nutrition Profile.* Government of India, New Delhi.

5.3lnternational Institute of Population Sciences. 1992-93. *National Family Health Survey* 1. Mumbai.

5.4lnternational Institute of Population Sciences. 1998-99. *National Family Health Survey* 2. Mumbai.

5.5 Ministry of Family and Health Welfare. 2004. *District Level Household Survey 2002-03.* Government of India, New Delhi.

5.6Nutrition Foundation of India. 2005. Twenty *Five Years Report 1980-2005.* New Delhi.

5.7 Registrar General of India. 2002. *Bulletin* of *Sample Registration System.* New Delhi. 5.8 Planning Commission. 2002. *Tenth Five year* Plan. New Delhi 5.9 Ministry of Family and Health Welfare. 1998-99. *Reproductive and Child Health-1.* Government of India, New Delhi.

5.10 Ministry of Family and Health Welfare. 2002. *Reproductive and Child Health-2.* Government of India, New Delhi.

5.11 **NNMB** National Nutrition Monitoring Bureau. *2000.* NNMB *Reports.* National Institute Of Nutrition, Hyderabad.

5.12 Prema Ramachandran. 1989. *Nutrition in Pregnancy. In.* Women *and Nutrition in India,* Eds. C. gopalan, Suminder Kaur. Special Publication No.5. Nutrition Foundation of India. New Delhi.