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## Maternal Health, Fertility Control and Child Nutrition

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In recent years, fertility control programmes in the country have received far greater attention, emphasis and resource allocation than child health/nutrition programmes. It is argued that restriction of family size would bring about improvement in child health/nutrition of poor families even in the absence of direct interventions designed to bring about improvement in their socio-economic and nutritional status. "Child survival" is the new slogan that has replaced the old goal of "maternal and child health and nutrition"; and even child survival is being promoted as an important means of facilitating fertility control and of promoting acceptance of family planning on the part of poor families.

In table 1, available data regarding crude birth rate (1980), death rate for children 0-4 years (1980), and prevalence of undernutrition in children under five years in four States of the Indian Union—two with the highest birth rates (Uttar Pradesh and Madhya Pradesh) and two with the lowest birth rates (Kerala and Karnataka)—have been set out. It will be seen that while there is a fairly close association between birth rate and 'child survival' (as inferred from death rates of children under four years), the prevalence of malnutrition in children appears to be just as high in States with low fertility and high child survival (Kerala and Karnataka) as in those with high fertility and poor child survival (Uttar Pradesh and Madhya Pradesh). Lest it be argued that differences in crude birth

rates between the two sets of States in the table could be largely due to differences in acceptance of family planning by the high-income groups (and not the low income groups of these States from among whom cases of malnutrition are generally drawn) we have also included available data (1978) for crude birth rates specifically for populations with per capita expenditure below Rs. 50 per mensem in those four States. These data will show that the greater acceptance of family planning by poor populations has not necessarily resulted in better nutritional status of their children. It stands to reason that where there is abject poverty, mere reduction in the number of the children from four to two may not be able to bring about any striking change in the quality of life and nutritional status of the family.

The association between low birth rate and better child survival has been interpreted in different ways. It has been argued that when mothers are assured of the survival of their children, they

would accept family planning; there is no hard evidence that this seemingly reasonable explanation is actually valid. On the other hand, evidence has been advanced that spacing of births (which implies lowered birth rate) helps to reduce infant mortality (Population Reports: Series 1.27 p. 680 1984). Both these above postulates could be wrong. It is just possible that better family planning and lower infant mortality may *both* be due to a common factor, namely, better acceptance of health services by the community. Whatever the explanation for the association between low birth rate and increased child survival, both of them together by themselves alone cannot obviously bring out striking improvement in child health/nutrition of poor families. Fertility control programmes cannot be a proxy for programmes for direct improvement of socio-economic and nutritional status of poor population groups.

In an earlier communication (Gopalan C., Bull. Nut. Found India 5.1.1984) it had been pointed out that better "child survival" does not necessarily imply better child nutrition. From a comparison of birth rates, death rates, child mortality and anthropometric status of children of Kerala, Punjab and Uttar Pradesh, it had been pointed out that Kerala's excellent record with regard to acceptance of family planning was not reflected in either

Table 1: Crude birth rate (1980), death rate for children 0-4 years (1980), and prevalence of undernutrition in children under 5 years.

State	Crude birth rate 1980*	Death rate (0-4 years) 1980	Prevalence of 'moderate and severe' malnutrition in children under 5 years **
Kerala	26.8 (31.6)	12.6	38.3%
Karnataka	27.6 (32.9)	30.4	47.1%
Uttar Pradesh	39.4 (42.7)	64.5	32.9%
Madhya Pradesh	37.1 (42.1)	61.0	51.7%

\* S.R.S. Registrar General of India

\*\* NNMB data (1975-79)

Figures within brackets in the second column indicate crude birth rate for the group of population with per capita expenditure below Rs. 50 per mensem.

lowered prevalence of malnutrition in under-fives nor in better growth-performance of its older children. It was therefore concluded that it was misleading to speak of "child survival" as being equivalent to "eradication of undernutrition or attainment of sound child health".

The success achieved by China in lowering her birth rate significantly in recent years, has been lauded. Apart from differences in the political systems between China and India, it is important to remember that in China, the "health revolution" and "nutrition revolution" clearly preceded the country's major thrust on the fertility control front. China had ensured at least minimal basic health services, and had greatly reduced overt malnutrition in its children *before* it embarked on its family planning drive. On the other hand, while India had adopted family planning as its major policy long before China, its "health revolution" is as yet far from finished while its "nutrition revolution" has indeed yet to make a serious start; it is not surprising that the country finds its family planning drive has not made the desired impact. This is *not* to suggest that India's major family planning drive must wait till it completes its health and nutrition revolution, but to emphasise that it will be a self-defeating strategy to accord health and nutrition programmes a lower priority than for family planning programmes.

It is important that family planning programmes must be part of an integrated package of services to poor communities, in which other components like nutritional uplift, child health promotion, income generation and female literacy will receive equal emphasis.

**Maternal health:** The emergence of paediatrics as a major dominant medical discipline during the last four decades, has promoted exclusive attention to the child almost to the point of relegating the all-important "maternal factor" in child health/nutrition, let alone maternal health itself, to the background. The obstetrician who concerns himself/herself mostly with deliveries and ante-natal care has not been able to remedy the situation. There is no "specialist" in the current medical hierarchy who can look at the mother and her child as an organic physiological unit. Much of the failure of child health/nutrition and family welfare programmes may perhaps be traced to our failure to support and strengthen the *woman* in her, playing the pivotal role in

Table 2: Sex differentials in death rates (15-49) in selected States in 1980

State	Age						
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
India	M. 2.0	2.3	2.2	3.4	4.7	7.2	9.6
	F. 2.9	3.8	4.0	3.6	4.6	5.5	5.3
Uttar Pradesh	M. 2.0	2.4	2.4	3.1	4.6	9.3	12.2
	F. 3.8	6.0	5.9	4.4	6.0	5.1	6.9
Madhya Pradesh	M. 1.8	2.2	2.2	1.9	3.4	7.6	8.0
	F. 3.9	4.1	5.0	3.4	6.4	5.6	8.8
Kerala	M. 1.5	1.2	2.0	3.4	4.5	5.6	7.6
	F. 0.8	1.2	1.2	2.4	1.9	3.0	2.9

ensuring and safeguarding the health of the family.

**Maternal mortality:** Unfortunately data regarding maternal mortality in the country appear to be unreliable. According to one report (Analysis of the situation of children in India—UNICEF p. 40. 1984) maternal mortality in the country ranged between 376 to 418 per 1,00,000 live births in 1970-1972. Corresponding figures for Sweden (1979), U.S.A. (1978), and U.K. (1980), were reported to be 1, 10, and 11 respectively (Population Reports Series 1. 27. 1984). An idea of the increased risks arising from maternity, suffered by women in the country may be gathered from data on sex differentials in death rates of adults of the 15-49 age groups in the country as a whole, and in selected States (table 2). Unlike the developed countries, where male death rates exceed female death rates, in India, death rates of women in the reproductive period exceed those of men of corresponding ages. It is only after the age of 40 years that male death rates in the country as a whole overtake female death rates. This trend is particularly marked in Uttar Pradesh and Madhya Pradesh. Kerala again is the exception.

These trends again highlight the fact that high birth rate, poor child survival and high maternal mortality go together and are the hall-marks of poor "social development". We will later show that "better survival" of women in the repro-

ductive period in Kerala does not necessarily reflect their better *physical status* or better nutrition even as "better child survival" in that State does not reflect better child nutrition. Economic development and removal of poverty are basic requisites for better nutrition; "social development" and even female literacy can be no proxy for this.

**Maternal status and lactation performance:** The fact that poor women, despite their poor diets, poor body size and poor nutritional status are able to breast feed their infants for prolonged periods, unlike women of the affluent group, has tended to obscure the importance of maternal health/nutrition in ensuring and sustaining good lactation. It is true that the protein concentration of breast-milk of even poor mothers is apparently satisfactory, though the vitamin concentrations are not. Studies at the National Institute of Nutrition had shown that among poor undernourished women, nutritional supplementation could increase the output of breast milk and increase the concentration of some vitamins, though it had no significant beneficial effect on protein concentration, which in any case was satisfactory even without nutritional supplementation (Gopalan C. Ind. Jour. Med. Res. 46. 317. 1958).

We had earlier reported (Scientific Report 4 - Nutr. Found. of India) that the lactation performance of mothers in the Calcutta region was much poorer than

Table 3: Anthropometric measurements of women of West Bengal (W.B.) and Maharashtra (M) NNMB data (1974-79)

Age Group (in years)	Mean Height in cm		Mean Weight in kg.		Mean Arm Circumference in cm.	
	W.B.	M	W.B.	M	W.B.	M
20-24	149.37	151.06	41.04	41.92	21.35	22.12
25-29	149.08	150.55	40.79	41.76	21.36	22.16
30-34	148.42	150.20	40.21	41.08	21.34	22.18
35-39	147.86	149.76	39.13	41.76	21.15	22.49
40-44	148.00	149.69	39.12	41.43	21.32	22.41

\*Source: NNB Report for the year 1979

NNMB: NIN, Hyderabad 1980 - Pages 64 & 68

that of mothers in the Bombay region and that this was reflected in the poorer growth status of the infants of Calcutta. Unfortunately, we have not carried out simultaneous studies on the dietary intake, physical and nutritional status of the mothers in these two regions as part of the same study. However, the comparative data presented in table 3 on anthropometric measurements of women of the reproductive age groups in West Bengal and Maharashtra are highly suggestive. It will be noted that the women of West Bengal were poorer with respect to body weight, height and arm circumference than those of Maharashtra. Since these data, collected and published by the National Nutrition Monitoring Bureau, pertain to a fairly large number of subjects belonging to similar socio-economic groups, cover a five year period (1974-79) and are consistent in all age groups, they must be considered to be of significance. The Nutrition Foundation of India, in its report on Infant Feeding Practices (Scientific Report 4) had recommended that improvement of maternal health and nutritional status must be an important plank in programmes for improvement of infant nutrition; it had also recommended that in programmes wherein food supplements are being offered, such supplements must be offered to the mother at least during the first six months of lactation.

Incidentally, in a more recent study undertaken by the Nutrition Foundation of India in Punjab and Uttar Pradesh, striking differences in anthropometric measurements in the reproductive ages were observed between women (as also men) of nearly similar socio-economic groups in Punjab and Uttar Pradesh (table 4). These are, however, preliminary observations covering much smaller numbers (about 600 women and 600 men) than those covered by the NNMB report quoted earlier and would need further confirmation with more extensive data. However, these studies suggest that considerable regional variations in the physical and health status of adult

women of reproductive age groups could be reflected in variations in their lactation performance and in the growth and nutrition of their infants. These observations have thus a significance which extends beyond the present generation.

**The significance of regional differences in bodysize:** Differences in body size of poor adults (both males and females) between different regions of the country, discussed above, are apparently *not* ethnic differences attributable to genetic factors. It has been shown by earlier country-wide studies from the National Institute of Nutrition that there are no significant differences with respect to growth-performance of children drawn from the *affluent sections* of the community, as between different regions of the country. Regional differences, thus, pertain to the poor sections of the populations of different regions. Apparently the order of socio-economic constraints suffered by poor population groups in different regions of the country varies considerably. The poor of the Calcutta region, of Uttar Pradesh, of Tamil Nadu and of Kerala could be poorer than those of Punjab, Haryana or Maharashtra. Better utilisation of health services and better acceptance of family planning, and even better education cannot obviously compensate for, and overcome, the effects of poverty, economic deprivation and poor diets on nutrition, body build and stature. We will be deluding ourselves if we think that we can bring about substantial improvements in the nutritional status of the poorest population groups in the country merely through the soft option of providing for them programmes for fertility control and child survival through better health services, *in the absence of substantial economic improvement*. On the other hand, it is also true that the effects of economic improvement will be greatly reinforced through parallel improvement of health services and literacy.

**Women at risk:** International agen-

cies and expert bodies have recommended that women with weights of 38 kg. or less during pregnancy and 42 kg. or less during the last month of pregnancy, and those with heights less than 145 cms., are to be considered as being at risk during pregnancy. These are the women likely to have complications during pregnancy or at delivery; they are also the women who are more likely to deliver low birth weight babies who in turn are at risk and whose growth and development are usually below par. It must be pointed out here that the above height and weight cut-off points considered to be indicative of risk have been set down by international agencies specially *for poor developing countries*; the cut-off points indicative of risk proposed for women of developed countries are higher. Even accepting the lowered yardstick proposed by international expert bodies, it is important to examine what percentage of poor women in India in the reproductive ages are pregnancy risks.

The percentages of women with weights less than 38 kg. in different States of the Indian Union and the percentages of women with heights less than 145 cms. in the same States, have been set out in tables 5 and 6. These figures have been calculated from NNMB data (1974-79). Since the NNMB operations do not cover Punjab, we have indicated in table 7 the comparative percentage of women with heights less than 145 cms. in Punjab and Uttar Pradesh from the ongoing Nutrition Foundation of India studies in these two States (the samples here are admittedly much smaller than those of NNMB).

For purposes of comparison, the percentage of American women with heights less than 145 cms. and weights less than 40 kgs. as calculated from the 1960-62 and 1971-74 NCHS data are also indicated in table 8. It will be noted that percentages of American women at risk on the basis of this yardstick are insignificant.

These data vividly illustrate the danger of the "small is healthy" hypothesis proposed by some experts as applicable to India. Even by the reduced yardsticks for assessment of risk proposed by international bodies, a distressingly high proportion of our poor women because of their poor physical state face "pregnancy risks". The cumulative result of poverty, undernutrition and neglect which girls in our countryside suffer right from birth is reflected

Table 4: Mean heights (in cm.) and weights (in kg.) of adults in Punjab and Uttar Pradesh

Sex	Age Group	Punjab		Uttar Pradesh	
		Heights	Weights	Heights	Weights
Male	18-40	164.57	54.75	163.18	49.85
	40+	164.76	53.39	160.53	47.59
Female	18-40	155.46	47.97	152.83	43.89
	40+	154.27	49.08	150.66	41.50

Table 5: Percentage of females with weight less than 38 kg. calculated\* from NNMB data 1974-79

Age Group	Kerala	Tamil Nadu	Karnataka	Andhra Pradesh	Maharashtra	Gujarat	Madhya Pradesh	Orissa	West Bengal	Uttar Pradesh
20-24	20	20	23	22	24	15	17	16	29	17
25-29	21	22	21	24	25	20	15	24	32	20
30-34	23	23	22	27	30	21	16	22	35	24
35-39	27	22	26	25	29	24	18	28	42	25
40-44	34	24	28	28	32	25	19	29	43	26

\*Calculated on the basis of values given for means and standard deviation assuming normal distribution.  
Source: Report for the year 1979 NNMB, NIN, Hyderabad, 1980.

Table 6: Percentage of women (with height less than 145 cm.) calculated\* from NNMB data 1974-79

Age Group	Kerala (1781)	Tamil Nadu (1827)	Karnataka (2573)	Andhra Pradesh (2131)	Maharashtra (1995)	Gujarat (2376)	Madhya Pradesh (1128)	Orissa (608)	West Bengal (1641)	Uttar Pradesh (1577)
20-24	20	14	16	16	15	12	16	23	21	22
25-29	20	14	12	15	17	13	17	25	22	25
30-34	22	14	12	17	21	13	16	22	25	22
35-39	24	14	14	16	24	14	17	27	29	25
40-44	30	@	-	18	24	16	18	22	29	26

1. @ The value given for standard deviation is not reliable and the percentage figure is not calculated.
2. \* The percentages have been calculated on the basis of mean and standard deviation values using normal probability tables.  
Source: NNMB Report for the year 1979, NIN, ICMR, Hyderabad.
3. Figures in bracket indicate total sample sizes.

in their poor adult body size, which in turn is reflected in high maternal mortality, low birth weights and poor nutritional status of their infants.

When pregnant women at risk do not also have adequate diet and access to proper care in the ante-natal period, at delivery and post-partum, high maternal mortality is inevitable. This indeed is the current unfortunate scenario. If, on the top of this, we exhort mothers (as we do now and indeed as we must continue to do in future) to rear their infants exclusively on their breast-milk in early infancy, and to continue breast-feeding them for an indefinite period (as long as

possible) thereafter, we are placing an enormous burden on them. This is certainly not to argue against encouraging breast-feeding; it is an argument for according the highest priority to the *woman and the mother*—in short for a total reassessment of our present strategy for the promotion of child health/nutrition in the country.

There is a need to institute some innovative strategies to improve health, nutrition and competence of mothers and mothers-to-be. I would like to draw attention to three proposals which I had made in this connection: (1) the institution of an imaginative programme of "education for better living" and vocational training for rural girls (between 12 and 20 years) on the threshold of marriage (Gopalan C. Bull. Nut. Found. India. 5. 1. 1984); (2) the use of the vast network of rural schools in the country to

mount a sustained programme of community education in health care, nutrition, child care and mothercraft to rural women (Scientific Report 3, Nutrition Foundation of India); (3) the introduction of a nation-wide system of food subsidies for pregnant and lactating women and mothers of under-lives in rural areas, to be operated through health clinics/anganwadis with the assistance of a chain of village bakeries and rural fair-price shops (the details of this proposal are being separately published).

The key to child health lies in much greater emphasis than has been evident hitherto on all-round improvement of the competence of the mother—her physical state, her economic state, her health and nutrition and her education. Such attention to the mother must start not after she has become a mother, not even when she is just about to become a mother, but even when she is herself an infant and a child, because it is what happens to her during her own childhood that will eventually determine the adequacy of her maternal state.

Table 7: Percentage of women (with height less than 145 cm.) in Punjab and Uttar Pradesh

Punjab	4% (Sample size 288)
Uttar Pradesh	20% (Sample size 310)

Table 8: Percentage of American women with height 145 cms. according to age calculated from 1960-62 and 1971-74. NCHS data

Age Group (in years)	1960-62 Study		1971-74 Study	
	Height less than 145 cm.	Weight less than 40 kg.	Height less than 145 cm.	Weight less than 40 kg.
18-24	0.3	0.47	0.7	0.82
25-34	0.9	0.47	0.7	0.82
35-44	1.3	Nil	0.6	0.82

Source: 1. Weight by height and age of adults United States 1960-62 National Institute of Health Statistics, Vital & Health Statistics Series 11, Number 14, Page 14.

2. Weight by height and age of adults, United States 1971-74, NCHS Vital and Health Statistics Series 11, Number 208, Page 21 and 22.

Reports published by United States Department of Health, Education and Welfare, Washington in May 1966 and September 1979.

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