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Progress in Demographic and Other Factors and Its Influence on Nutritional Status of Mothers and Children in India

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Abstract

Background: It is well known that child nutrition is affected by many factors like socio-cultural, economic and demographic, etc. Studies found that maternal education, wealth index, and ethnicity have an influence on child nutrition. In this paper, comparative study of malnutrition among children and mothers between 1992-93 and 2005-06 has been done.

Objective: The main objective of the paper is to study how progress in demographic and other socioeconomic factors influence nutritional status of mother and children.

Data and Methods: First round (1992-93) and third round (2005-06) of National Family Health Survey has been used to reach the objective of the study. To show the progress in nutritional status, percentage change in prevalence of malnutrition in different background characteristics from 1992-93 to 2005-06 has been calculated. To show the progress in different background characteristics and its effect on child malnutrition decomposition analysis has been done.

Result: Almost all variable are significantly associated with child malnutrition thus more contribution of any variable in bringing the change in prevalence of malnutrition shows the more progress in that variable from 1992-93 to 2005-06. The decomposition analysis clearly shows that the condition of mother's

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education and timing to initiate breastfeeding are found to be contributing significantly to the reduction of underweight among children between 1992-93 and 2005-06.

Conclusion: This study shows that improvement in mother's education contributed the most in improving the nutritional status of children. Thus by increasing the educational in female under-nutrition can be reduced to a larger extent.

Keywords: Nutrition, Stunting, Underweight, wasted, BMI, Oaxaca Decomposition Model,

1. INTRODUCTION:

Nutrition is the energy available to the body cells to fulfill the energy requirement of the body and malnutrition is the state when a body doesn't get required level of energy through food intake. Malnutrition among children is caused by inadequate or improper food intake or repeated attack of parasitic or other childhood diseases like diarrhea [11, 13]. NFHS – 1 has calculated percentage of malnourished children below age four as stunted(52%), underweight(54%) and wasted(17%) [8]. According to NFHS-3, 48% children below five years were stunted, 42.5% underweight and 19.8% wasted. Mean BMI of women in India was found to be 20.5 kg/m^2 in 2005-06 and prevalence of anemia among women was 55.3% [4]. The adolescent pregnancy wastage is considerably higher (15–20%) specially in case of teenage pregnancy [12]. The prevalence of overweight and obesity is higher among rural women than their tribal counterparts. Three standard indices of physical growth that describe the nutritional status of children are: height-for-age (stunting), weight-for-height (wasting) and weight-for-age (underweight), each of these three indicators is expressed in standard deviation units (Z-scores) from the median of the reference population [4]. Malnourishment or undernutrition is another common factor found among the children born to adolescent mothers. It has been categorized as acute and chronic considering the duration over which it occurred. The acute form of malnutrition mainly affects the weight of the body than height whereas in chronic malnutrition both weight and height of the body are affected. India has the highest percentage of malnourished children along with Ethiopia, Bangladesh and Nepal. Irrespective of state's level of development, widespread diversity is found in the level of malnourishment of children in the country. [8].

Underweight is the indicator of acute malnutrition, stunting is the indicator of chronic malnutrition whereas wasting is the composite measure of acute and

chronic malnutrition in children [1]. Malnutrition in developing countries is due to poor diet and exposure to repeated illness [10]. Better child nutrition is an important part of child health since nutrition during childhood makes a major contribution to child development, growth, and survival, ultimately influencing the human and social capital of a society. The breastfeeding plays a very important role in the post-neonatal period. The mother's milk not only provides the complete nutritional requirements of the child but also provides protection against infections [5].

Socioeconomic well being of a family determines the nutritional intake of the children which affects the nutritional status of children to a large extent. The main reason for steep rise in child malnutrition during first two years of life is poor infant feeding practices [8]. The government of India promotes exclusive breast feeding up to six months of life and other supplementary foods after that. The modern science and technology has not been able to produce a better food for young infants that can replace mother's milk. It is well known that child nutrition is affected by many factors like socio-cultural-economic and demographic etc. studies found that maternal education, wealth index and ethnicity have influence on child nutrition [2]. The prevalence and severity of underweight children varied significantly by age. the prevalence of stunting both moderate and severe form increases up to the age three and decline marginally thereafter, the rate of growth is maximum up to 36 month of life and lowers thereafter henace the prevalence is maximum at this age. The stunting among children is lower among the first born children and higher among children with birth order above three [7].

Malnutrition is costing poor countries up to 3 percent of their yearly GDP, malnourished in children decreases their life time earnings by about 10 percent. Malnourished children are more likely to join school late and drop out early and also they are less likely to benefit from schooling and eventually they would have lower earning potential than other healthy adults in near future. The popular notion that the amount of food intake determines the level of nutrition turns to be untrue when children of wealthy family suffers the outcome of malnutrition like stunting or underweight therefore, the choice of food with its amount are two important facts to determine the nutrition level of human body. The food intake at the time of pregnancy plays an important role in determining the health of new born. In developing countries sometimes the under weight babies are born due to low calorie intake of mother during pregnancy. Sometimes babies are deprived from having 'colostrums' which strengthen the child's immune system [15]. Ideally a baby should be put to mother's breast immediately after the birth, but in India about 46% babies have to wait to be put to breastfed for more than a day. In some of the poor

states like Uttar Pradesh and Bihar this percentage is very high 76% and 70% respectively (estimated from NFHS-3).

Child malnutrition is highly associated with maternal education. The children whose mother has the only primary education or no education tend to have lower nutritional status in comparison to children whose mothers are more educated [9]. The age of the child, birth order, and household's economic status all have independent effects on child nutritional status. Considering the strong influence of maternal education on child nutritional status, the women's education and literacy program could play an important role in improving child nutritional status [2]. The prevalence of malnutrition is high and diversification of dietary intake is low in India. In 1999-2000 for average caloric intakes India was ranked at 67th among 167 countries, it means more than half of the developing countries have a lower prevalence of under-nutrition than those of India. The states which are growing faster can improve literacy rates and reduce infant mortality rates and proportion of children severely malnourished [15]

2. DATA SOURCES

The main sources of the data which are used for this study are NFHS-1 and NFHS-3 which is available on Demographic Health Survey (DHS). The National Family Health Surveys (NFHS), initiated in the early 1990s, has emerged as a nationally important source of data on population health, and nutrition for India and its states. The third National Family Health Survey (NFHS-3), in 2005-06 was preceded by NFHS-1 in 1992-93 and NFHS-2 in 1998-99. NFHS-1 and NFHS-3 have designed to provide estimates of important indicators of family welfare, maternal, child health, and nutrition. Further, unlike the earlier surveys in which only ever-married women aged 15-49 were eligible for individual interviews, NFHS-3 interviewed all women aged 15-49 and all men aged 15-54. Information on nutritional status, including the prevalence of anemia, is provided in NFHS-3 for women aged 15-49, men aged 15-54, and young children. To assess nutritional status, NFHS-3 included an anthropometric component, in which all children under five years of age were weighed and measured. Three standard indices of physical growth that describe the nutritional status of children are stunting, underweight and wasted. NFHS-3 collected information on the height and weight of women aged 15-49 years.

3. METHODOLOGY

The prevalence of stunting, underweight and wasting has been shown for 16 major states and the country as a whole. For this z-score for height for age

of child below 2-SD is coded as stunted and 2-SD or above 2-SD is coded as non-stunted, whereas z-score for weight for age of child below 2-SD is coded as underweight and 2-SD or above 2-SD is coded as non-underweight and similarly z-score for weight for height of child below 2-SD is coded as wasted and 2-SD or above 2-SD is coded as non-wasted. In decomposition table the percentage contribution of selected background characteristics in bringing the change in prevalence of malnutrition among children from 1993 to 2006 has been shown. Almost all variable are significantly associated with child malnutrition thus more contribution of any variable in bringing the change in prevalence of malnutrition shows the more progress in that variable from 1993 to 2006. The data analysis has been done using STATA version 12.0 and Arc GIS 10.1 software.

4. RANK CORRELATION:

Rank correlation has been calculated between mother's underweight and children's underweight by different background conditions or characteristics. To calculate the rank correlation coefficients, 16 major states are ranked according to the prevalence of underweight among women and children. Rank correlation coefficient is calculated as follows

$$t = \rho\sqrt{\frac{n-2}{1-\rho^2}} \qquad \text{(i)}$$

Where d_i is the difference between the rank of underweight among mothers and children for the i^{th} state, ϱ is the correlation coefficient and n is the number of states. The value of ϱ lies between -1 to +1. If the value of ϱ is negative, it means ranks of both variables are going in opposite directions, and if its value is positive it means rank of both variables are going in the same direction. If value of ϱ is close to –1 or +1 it means there is a high linear correlation between rank of two variables. If its value is close to 0 it means there is very low linear relationship between rank of two variables, and if its value is 0 then it implies that there is no linear relationship between the rank of two variables.

The significance of ϱ values can be tested using:

$$t = \rho\sqrt{\frac{n-2}{1-\rho^2}} \qquad \text{(ii)}$$

which is distributed approximately as Student's t distribution with n - 2 degrees of freedom under the null hypothesis.

5. OAXACA DECOMPOSITION MODEL

Decompositions are useful for quantifying the contribution of various factors to a difference or change in outcomes. If there are two groups A and B and an outcome variable y and a set of predictors ; for example let children surveyed in NFHS-1 and children surveyed in NFHS-3 from the two groups, and underweight among children and the demographic and socio-economic variables such as birth order of child, education of mother and economic status as the predictors. Then what we want to know is that how much of the mean difference outcome

$$R = E(YA) - E(YB) \quad \text{(iii)}$$

Where E(Y) denotes the expected value of the outcome variable, is explained by a change in predictors. Based on the linear model**.**

6. RESULTS

Irrespective of the place of residence, the highest prevalence of under-weight children is recorded by Bihar while lowest prevalence is found in Kerala during both the time periods, i.e., 1993 and 2006. In rural areas, the largest decline in the prevalence of underweight from 1993 to 2006 is recorded by the state of Punjab whereas in urban areas the largest percentage change was noted in West Bengal (a fall of 47 percent).

Among children with birth order less than three, Punjab shows the maximum fall in prevalence of underweight (50.6%) followed by Tamil Nadu, which showed a decline of 42.9 percent. On the contrary, the neighbouring state Haryana shows an increase in the prevalence by 8.4 percent. Among children with birth order three and above, 33.7% decrease in prevalence of underweight was revealed by Andhra Pradesh followed by Punjab (31.8%). The Haryana and two EAG states Madhya Pradesh and Rajasthan have seen a positive increase in the prevalence of underweight from 1993 to 2006 by 6.2, 4.2 and 9.1 percent respectively.

Among children with preceding birth interval less than 36 months, the highest percentage of decline (39.7%) in the prevalence of underweight was reported by Andhra Pradesh. Two major states Haryana and Madhya Pradesh have revealed an increase in the prevalence of underweight of 6.4 and 1.6 percent respectively from 1993 to 2006.

In 1993 highest prevalence of underweight among children who was put to the breast within one hour was noted by Madhya Pradesh, while the minimum was in Kerala. However, in 2006, it is Punjab followed by Kerala.

Table 1: Percentage change in proportion of children and mother s by different demographic characteristics from 1993 to 2006.

States	Children with birth order <3	Children who put to breast within 1 hour	Children with preceding birth interval<36 months	Mothers with age at first birth < 20 years	Educated mothers	Non poor mothers
Andhra Pradesh	34.1	16.9	11.8	–22.3	93.6	47.8
Assam	41.7	146.9	–24.0	–20.7	70.0	61.3
Bihar	1.4	140.8	19.9	8.0	47.7	20.2
Gujarat	9.3	93.5	2.3	–7.9	38.7	21.7
Haryana	22.9	706.6	–5.0	–26.4	62.7	–9.6
Himachal Pradesh	29.0	269.0	–5.5	–46.2	50.9	15.3
Karnataka	25.8	539.2	–1.4	–23.8	79.9	24.1
Kerala	10.7	293.1	–23.7	–31.9	5.7	23.6
Madhya Pradesh	–1.3	29.6	16.0	–12.6	80.2	–15.9
Maharashtra	25.0	580.4	–8.6	–25.1	40.9	21.0
Orissa	18.5	192.4	–0.3	–14.1	42.1	10.9
Punjab	22.2	136.5	1.9	–16.6	31.6	–4.5
Rajasthan	0.0	68.5	19.0	1.2	79.3	2.8
Tamil Nadu	13.9	165.3	–1.7	–32.3	36.8	32.3
Uttar Pradesh	1.5	48.4	11.5	3.4	58.8	9.6
West Bengal	26.5	113.2	–10.2	–7.0	27.2	–9.7
INDIA	11.7	139.7	4.8	–8.2	42.9	9.2

Notes NFHS-1 and NFHS-3

The highest decline (46%) was found in Punjab followed by Tamil Nadu whereas in Haryana the prevalence of underweight has been increased by 4.6 percent. At the national level, the percentage decline in the prevalence of underweight is revealed at 21.2 percent (Fig1).

In 1993, Kerala followed by Tamil Nadu has the highest percentage of children with birth order less than three. In 2006 Kerala sustained its first position but the second position was replaced by Andhra Pradesh instead of Tamil Nadu. In 1993 Assam shows the lowest proportion of children with birth order less than three. Also it the state which has recorded highest percentage

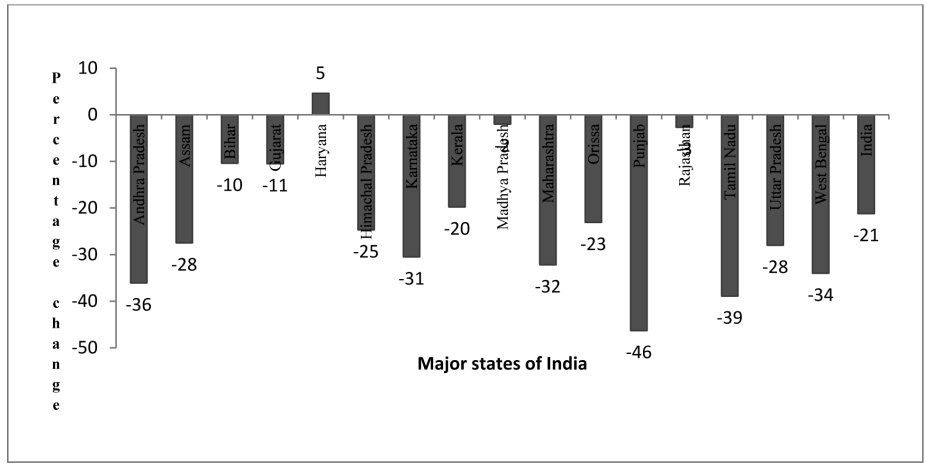

Figure 1: Percentage change in prevalence of underweight among children from 1993 to 2006.

change in proportion of children with birth order less than three. In 2006, Uttar Pradesh was the state where proportion of children with birth order less than three was lowest. In 1993, the highest percentage of mothers with age at first birth less than twenty years was shown by Andhra Pradesh followed by West Bengal and lowest percentage was reported by Kerala. In 2006, the highest percentage of mothers with age at first birth less than twenty years was shown by West Bengal followed by Uttar Pradesh and lowest percentage was shown by Himachal Pradesh followed by Kerala. Himachal Pradesh has shown highest percentage change (-46.2%) in the proportion of mothers with age at first birth less than twenty years (Fig 2a and 2b).

In 1993 the state which shows the highest percentage of children with preceding birth interval of less than 36 months is Karnataka followed by Haryana and lowest percentage of children with preceding birth interval less than 36 months was shown by Kerala followed by Bihar. In 2006, it was Madhya Pradesh which has the highest percentage of children with preceding birth interval of fewer than 36 months whereas Kerala has the lowest percentage of such children. Kerala has shown highest percentage change (23.7% decrease) among children with preceding birth interval of less than 36 months. In 1993 and in 2006 , it was found that Tamil Nadu has the highest percentage of children who breastfed within one hour after birth whereas Bihar and Uttar Pradesh has the lowest percentage of such children. Highest percentage change among children breastfed within one hour after birth was shown by Haryana where there was 706.6% increase of children breastfeed within one hour after birth from 1993 to 2006 (Fig 3a and 3b).

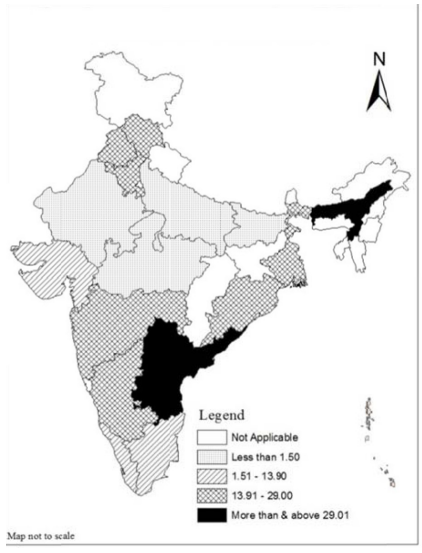

Figure 2a: Percentage change in proportion of children with birth order <3 from 1993–2006.

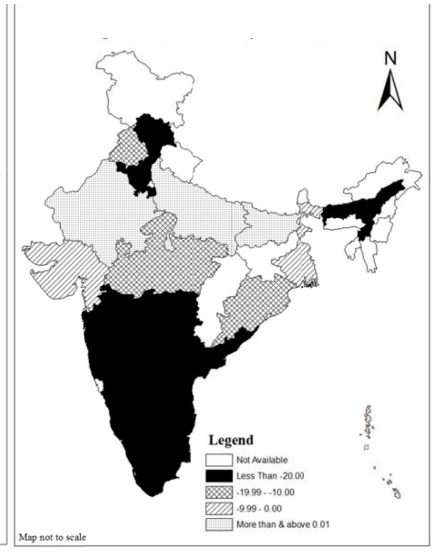

Figure 2b: Percentage change in proportion of mothers whose age at first birth is <20 years from 1993–2006..

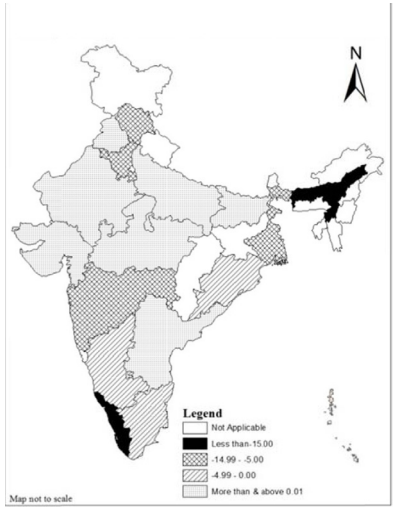

Figure 3a: Percentage change in proportion of children with preceding birth interval <36 months from 1993–2006.

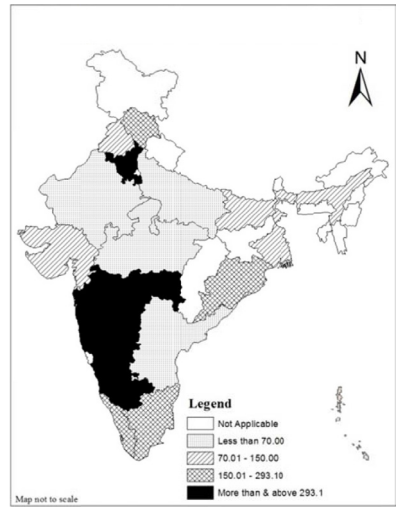

Figure 3a: Percentage change in proportion of children who put to breast with in 1 hour from 1993–2006.

Among children who belong to a poor family, the highest percentage (30.3 %) decline in the prevalence of underweight was shown by Tamil Nadu followed by West Bengal where percentage decline is 28.3 whereas Madhya Pradesh and Rajasthan has experienced an increase in the prevalence of underweight in children by 0.6 and 20.0 percent respectively. Among children who belong to a non-poor family, the highest percentage (50 %) decline in the prevalence of underweight was shown by Punjab followed by West Bengal where percentage decline is 44.4. The state of Haryana has shown an increase in the prevalence of underweight by 2.6 percent in this category of children (Fig 5a and 5b).

Rank correlation coefficients between underweight mother and underweight children have been calculated for 16 major states. Rank of states, according to the mothers'underweight as well as children underweight in rural areas are correlated at 5% level of significance. The result indicates that states ranks in both variables are highly correlated. The analysis was further extended to scheduled caste (SC) and scheduled tribe (ST) population. Rank of states by SCs or STs underweight mothers and SCs/STs underweight children are correlated at 5% level of significance. Rank of states among mother's underweight and children underweight are correlated at 1% level of significance this means that states ranks in both variables are highly correlated (Table 3).

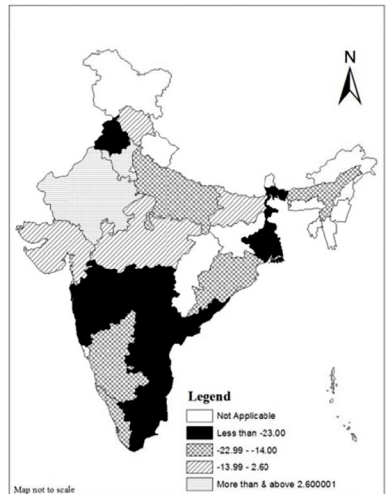

Figure 4a: Percentage change in prevalence of underweight among children whose mother are educated from 1993–2006.

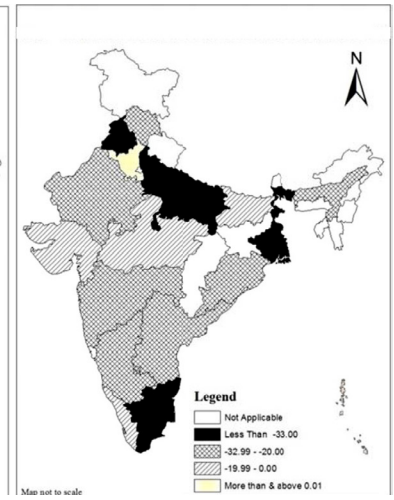

Figure 4b: Percentage change in prevalence of underweight among children whose mother are uneducated from 1993–2006.

Table 2: Percentage change in prevalence of underweight among children from 1993 to 2006 by different sociodemographic characteristics.

States	Birth order<3	Birth order>=3	Age of mother at first birth<20 years	Age of mother at first birth>=20 years	Previous birth interval<36 months	Previous birth interval>=36 months	Put to breast within one hour	Put to breast after one hour	Hindu	Non-Hindu	Poor	Non-Poor	Rural	Urban
Andhra Pradesh	-34.9	-33.7	-37	-21.7	-39.7	-30.7	-32.2	-33.1	-34.9	-42.6	-23.4	-34.8	-35.4	-32.2
Assam	-30.6	-18.7	-25.9	-19.9	-13.8	-32.2	-22.8	-26.5	-30	-26.2	-21.7	-29.1	-27.2	-28
Bihar	-17.4	-5.2	-9.9	-13.8	-5.3	-8.4	10.9	-10.7	-11.8	-4.7	-3	-23.4	-10.9	-10.2
Gujarat	-9.9	-9.7	-5	-16	-10.8	-20.4	7	-6.4	-12.5	8.8	-6.7	-4.9	-8.4	-11.8
Haryana	8.4	6.2	3.7	15.2	6.4	21.7	-30.1	17.9	1	24.4	-4	2.6	4.3	6.8
Himachal Pradesh	-29.4	-8.6	-17.8	-23.4	-19.8	-24.1	-12.5	-21.8	-24.6	-31	-6.7	-25.6	-24.2	-25.3
Karnataka	-32.7	-21.8	-24.9	-31.5	-25	-33.8	-15.5	-26.4	-30.3	-31.9	-21.2	-32.5	-28	-33.2
Kerala	-18.6	-11.8	-21	-14	-15.6	-18.8	-25.7	-29.1	-14	-25.4	-8.4	-9.5	-13.8	-33.6
Madhya Pradesh	-8.4	4.2	-2	0.5	1.6	-1.8	-20.7	3.4	-1.9	-1.3	0.6	-10.3	-1.2	-2.8
Maharashtra	-32.9	-27	-29.2	-26	-24.9	-33.6	-24.9	-26.1	-31.2	-36.3	-26.2	-31.2	-29.7	-34.8
Orrisa	-29.1	-12.3	-17.5	-28	-13	-25.9	-17.1	-23.8	-23.5	-14.1	-15.9	-38.6	-22.3	-31.4
Punjab	-50.6	-31.8	-34.5	-51.7	-36.7	-44.2	-59	-39.5	-39	-53	-26.3	-50	-44.1	-46.7
Rajasthan	-15.3	9.1	-3.9	-1	-5.5	11.9	-15.2	1.6	-4.1	13.6	20	-23.9	4.1	-29
Tamil Nadu	-42.9	-24.7	-33.6	-39.6	-36.4	-39	-28.8	-43.4	-35.1	-73.3	-30.3	-37.1	-40.3	-31.9
Uttar Pradesh	-33	-24.2	-27.3	-29.9	-28.2	-25.8	-28.3	-25.6	-26.8	-32.5	-21.6	-35.3	-26.4	-34.6
West Bengal	-37.3	-25.8	-34	-31.1	-27	-32.7	-27.5	-33.1	-33.8	-35.1	-28.3	-44.4	-32.1	-47.4
India	-26.6	-13.6	-19.1	-22.5	-17.1	-20.4	-23.9	-16.2	-20.4	-24.4	-13.3	-28.5	-19.2	-28.2

Notes NFHS-1 and NFHS-3

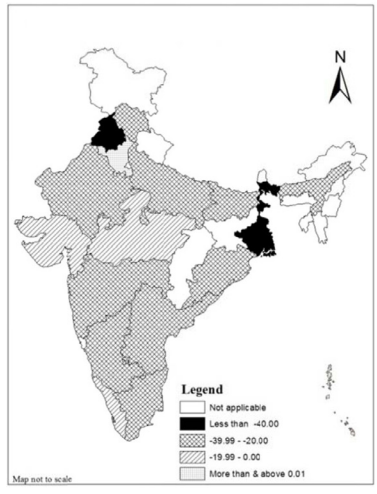

Figure 5a: Percentage change in prevalence of underweight among children who are Non–poor from 1993–2006.

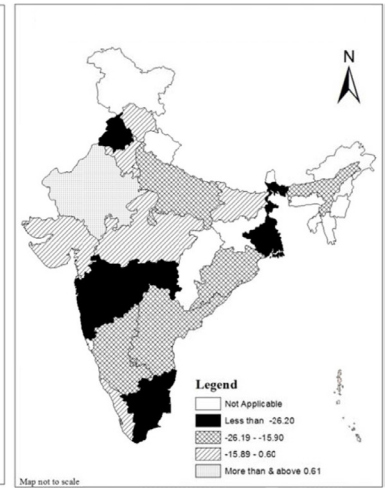

Figure 5b: Percentage change in prevalence of underweight among children who are poor from 1993–2006.

Table 3: Rank correlation coefficient between mother underweight and children underweight among major states of India NFHS-3.

	Mother underweight							
Children underweight	Rural	Urban	Poor	SC/ST	Educated	Uneducated	Total	t value cal.
Rural	**0.61****							**2.85**
Urban		**0.58****						**2.68**
Poor			**0.43**					**1.78**
SC/ST				**0.74*****				**4.09**
Educated					**0.42**			**1.75**
Uneducated						**0.59****		**2.74**
Total							**0.71*****	**3.79**

Authors calculated

Oaxaca Decomposition Model (ODM) represents the contribution of different factors that have made a change in the prevalence of underweight among children from 1993 to 2006. The probability of underweight among children in 1993 was 0.501 and 0.397 in 2006. Thus a decline of 0.104

percentage points has been observed. The overall background characteristics taken in the table can explain 32.2 percent of total change in the probability of underweight among children from 1993 to 2006. Mothers education contributed 14.5 % change in the probability of underweight among children from NFHS1 to NFHS3. The other factors like the time when a child put to breast, economic status, birth order, and age of mother has contributed 5.6%,4.2%,2.2% and 2.9 percent respectively.

Table 4: Oaxaca decomposition Model to show the contribution of each factor in decreasing the prevalence of underweight among children from 1993 to 2006.

Total number of observations	**41284**
Number of observations in 1993	**20251**
Number of observations in 2006	**21033**
Probability of underweight in 1993	**0.501**
Probability of underweight in 2006	**0.397**
Difference in probability of underweight	**0.104**
Total difference in probability explained	**0.033**
Total percentage contribution in explaining difference	**32.2**

Contribution of factors in decreasing the prevalence of underweight among children from 1993 to 2006

Factors affecting underweight	**Individual Contribution**	**Percentage of individual contribution**
Birth order	**0.002**	**2.2**
Age of mother at first birth	**0.003**	**2.9**
Preceding birth interval	**-0.001**	**-1.4**
When put to breast	**0.006**	**5.6**
Religion	**0.002**	**2.1**
caste	**0.001**	**0.9**
Education	**0.015**	**14.5**
Economic status	**0.004**	**4.2**
Residence	**0.001**	**1.2**

Authors calculated

DISCUSSION

Kumar and others showed that delay in initiation of breastfeeding and higher birth order of the child increases the risk of underweight [6]. NFHS reports showed that delay in initiation of breastfeeding and proportion of children having higher birth order have decreased between 1993 to 2006 (NFHS-I report, 1993 and NFHS-III report, 2006). These two findings support our study that these two factors played a crucial role in lowering the prevalence of underweight in children between the period of 1993 to 2006. Mishra and others studied that education has a strong positive association with child malnutrition (Mishra and others, 2000), which support the finding of this study that education has contributed significantly to reduce under-nutrition among children between 1993 and 2006. As seen higher female education, ANC, institutional delivery, etc plays a significant role in affecting child health status and all these factors can only be ensured with a higher age of the mother. Higher education of girls leads to higher age at marriage. Furthermore, higher age at marriage along with the higher level of education empowers the women to have her decision-making abilities as well as high autonomy. Thus women having high autonomy may have their own decision power regarding their health seeking behavior like access to reproductive health services, family planning measures etc. All these will lead to better child health status.

This study suggests that any policy formulation to improve the malnutrition status of women and children cannot downplay the role of demographic behavior at the individual level. Otherwise, direct and curative measures to arrest the malnutrition level for any these two important segments (children and mothers) of our population may not yield desired outcomes.

CONCLUSION

As far as nutrition level of children is concerned, Haryana shows the maximum change in percentage of stunted and wasted children, followed by Rajasthan and Jharkhand. Poverty, lack of nutritional food, low breastfeeding of infants due to mother's employment (mostly daily wage laborers), low mother education are the main causes of under nutrition in children (GOI, 2012). The decomposition analysis clearly shows that the condition of mother's education and timing to initiate the breastfeeding are the significantly contributing factors to the reduction of underweight among children in the period of 1993 to 2006. Mother's age at first birth and birth order also have played a crucial role in lowering the prevalence of underweight among children during 1993 and 2006. Finally, the demographic and health dimensions like birth spacing, mother's BMI, mother's age at first birth, parity, birth order, time of initiation

of breastfeeding have shown evidence that they play an important role in deciding the nutritional status of children as well as mothers. The results of the rank Correlation analysis clearly shows that states with poor nutritional level among women also lag behind in nutritional level among children. The nutritional health policy in India requires an effective and responsive public health system bat the state/region/district level to provide easy access to health care services. There is a greater need basic education for compulsory to the lower age of marriage girls cohort population. Additionally, in India, several schemes and policies should be launched at the gross root level for particular of adolescent mothers and their child, to ensure their proper health system.

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