

Analysis of Women and Child Deprivation in Uttar Pradesh: Focus on Health using Data of NFHS 4 (15-16)

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ABSTRACT

This article uses the latest data available through the National Family Health survey 4 (2015-2016) to measure and analyse the regional variation of health deprivation among Women and Children in Uttar Pradesh. It also examined the pattern of nutritional deprivation and anaemia of women and children with special reference to certain background characteristics such as age, education, residence, religion, caste etc. Women's health matters not only to women themselves, but it is also crucial to the health of the children they will bear. This underlines an important point: paying due attention to the health of girls and women today is an investment not just for the present but also for future generations. Nearly one fourth of the world's undernourished population live in India in which proportion of women and children are more pronounced. Among children between the ages of 6 and 59 months, a large majority (63%) are anaemic.

Key Words : Human societies, Education, Residence, Region, Caste

INTRODUCTION

In virtually all human societies, women are the main carers in a family, often willing to sacrifice their own welfare for the benefit of other family members, especially their children (Tisdell, 2002). Women's health matters not only to women themselves, but it is also crucial to the health of the children they will bear. This underlines an important point: paying due attention to the health of girls and women today is an investment not just for the present but also for future generations (World Health Organization, 2009). Women in poor health are more likely to give birth to low weight infants. They also are less likely to be able to provide food and adequate care for their children. Finally, a woman's health affects the household economic well-being, as a woman in poor health will be less productive in the labor force (Velkoff and Adhakh, 1998)

Nearly one fourth of the world's undernourished population live in India in which proportion of women and children are more pronounced. Thirty four per cent

women are severely undernourished and 55 per cent are suffered from anaemia. Likewise, the country has 40 per cent children under nourished and 58 per cent anaemic ("*Poshan se Dur hai Mahilaye or Bachche,*" 2018). Findings of the new Global Nutrition Report 2017 place India at the bottom of the table with maximum number of women impacted with anaemia in the world, followed by China, Pakistan, Nigeria and Indonesia. In India, more than half (51 %) of all women of reproductive age have anaemia, whereas more than one in five (22 %) of adult women are overweight (Dey, 2017). Therefore, the anaemia situation has worsened over time for women. Reason for high prevalence of anaemia in these women could be due to age, socioeconomic condition, low food intake, increase tendency to lose weight for zero size figure combined with menstrual losses (Singh *et al.*, 2017). Maternal malnutrition has been associated with an increased risk of maternal mortality and also child birth defects. Studies have shown how women can influence their child's nutrition indirectly through their own nutritional

status. It is alarming that with an absolute increase in population of about 181 million in the population during the census 2001 and 2011, there is a reduction of 5.05 million in the child population aged 0-6 years during the same period (Usmani and Ahmad, 2017).

Uttar Pradesh lags far behind other states in child health. Among BIMARU states in India, UP is one the worst state in terms of malnutrition rates. More than two fifth of women are either too thin or overweight (NFHS-4, 15-16) in which the shares of women with low BMI (too thin) and obese are twenty five per cent and 17 per cent respectively. On the other hand, the proportion of women who are too thin has decreased from NFHS-3, and the proportion of obese/overweight has increased in the state. Anaemia is also a major health problem in Uttar Pradesh, especially among women and children. Fifty-two per cent of women in Uttar Pradesh have anaemia, among children between the ages of 6 and 59 months, a large majority (63 %) are anaemic.

Objectives:

The present study has been undertaken with the following objectives:

1. To analyse the regional variation of health

deprivation among Women and Children in Uttar Pradesh.

2. To examine the pattern of nutritional deprivation and anaemia among women and children with spatial reference to certain background characteristics such as age, education, religion, caste etc.

Study area:

Uttar Pradesh (U.P.) is a densely populated state, located in the northern region of the Indian subcontinent extends between latitudes 23°52'N to 30°28'N and longitudes 77°3'E and 84°39'E (Fig. 1). It covers 243,290 square kilometres (93,933 sq mi), equal to 7.33% of the total area of India, and is the fourth-largest Indian state by area. Uttar Pradesh is the most populous state in India, with 199,581,477 persons (Census, 2011). The state contributes 16.16% of India's population. The population density is 820 people per square kilometre, making it one of the most densely populated states in the country. Sex ratio in 2011, at 908 women to 1000 men, was lower than the national figure of 933. Uttar Pradesh has a large number of people living below the poverty line. Estimates released by the Planning Commission for the year 2009–10 revealed that Uttar Pradesh had 59 million people below the poverty line.

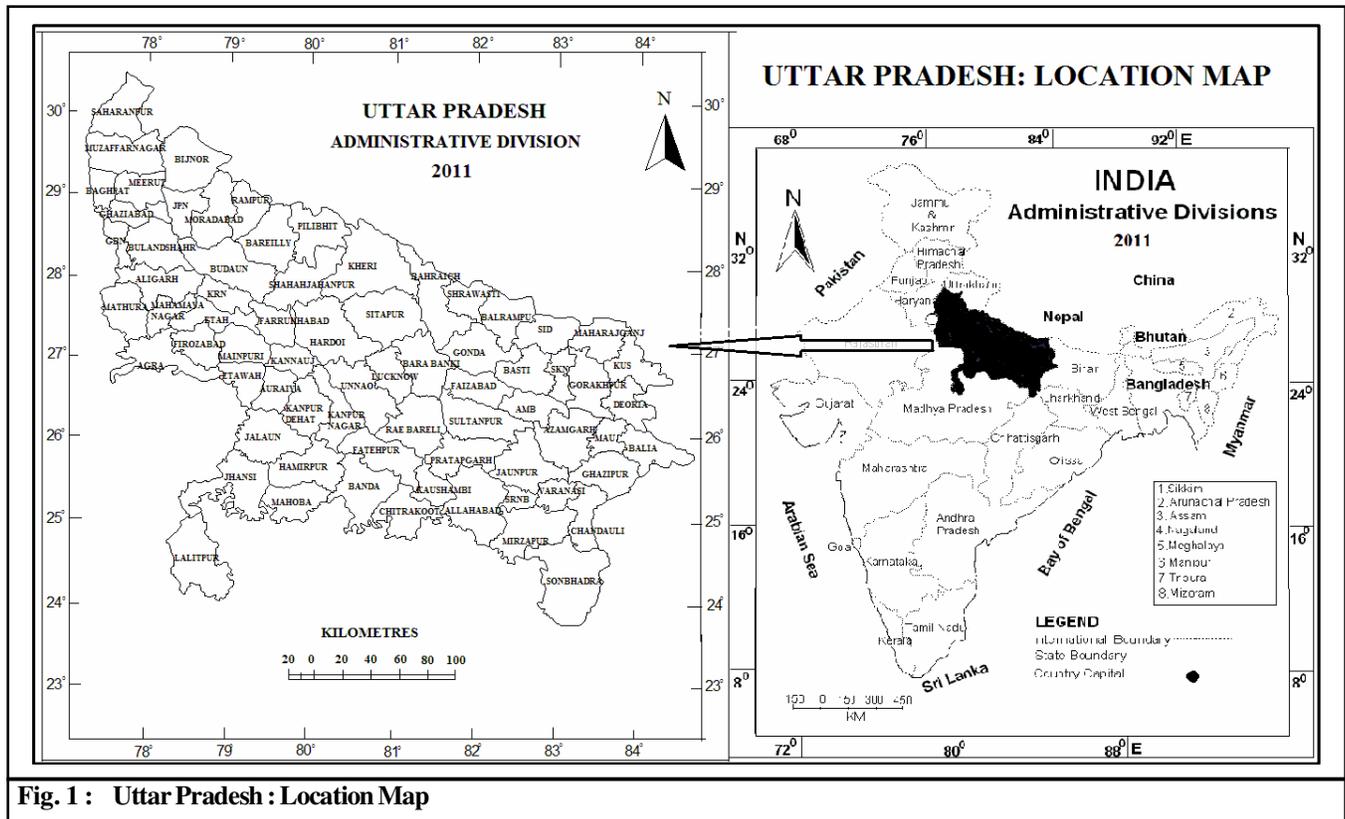


Fig. 1 : Uttar Pradesh : Location Map

METHODOLOGY

The present work is essentially based on secondary data taken from National Family Health survey 4 (2015–2016) Uttar Pradesh have been conducted under the stewardship of the Ministry of Health and Family Welfare (MoHFW), Government of India. District has been chosen as a unit of analysis.

World Health Organization (1995) has recommended that body mass index could be used to assess the nutritional and health status of adults. So, in the present analysis, following indicators of have been taken into account to determine the level of health deprivation among women and children:

- Percentage of women with BMI <18.5 (total thin)
- Percentage of women with BMI ≥ 25.0 (overweight or obese)
- Percentage of women having any anaemia (<12.0g/dl)
- Percentage of stunted (Height-for age) children (< 5 Years)
- Percentage of wasted (Weight-for height) children (< 5 Years)
- Percentage of underweight (Weight-for age) children (< 5 Years)
- Percentage of children (6-59 months) having any anaemia (<11.0g/dl)

The spatial variation of health deprivation among women and children has been examined using z-scores and composite z-score techniques. In order to reach standardization, the raw data for each variable has been computed into standard score or 'Z' score. The scores measure the departure of individual observation from the arithmetic mean of all observations; expressed in comparable form. The formula is:

$$Z_{ij} = \frac{X_{ij} - \bar{X}_i}{\sigma_i}$$

where,

Z_{ij} = Standardized value of the variable i in block j .

X_{ij} = Actual value of variable i in block j .

\bar{X}_i = Mean value of variable i in all block.

σ_i = Standard deviation of variable i in all block.

In the second step, the z-scores of all variables have been added which may be called as composite score (CS) for each district and may be algebraically expressed as:

$$CS = \frac{\sum Z_{ij}}{N}$$

where,

CS is composite score,

N refers to the number of indicators (variables),

$\sum Z_{ij}$ indicates Z-Scores of all variables i in District j .

The positive values relating to the Z-Score of particular district explain high level of deprivation in respect of nutritional deprivation and anaemia and the negative values show the low level of in these aspects.

The choropleth maps have been prepared for the levels of nutritional status and anaemia among women and children. A careful section of the class intervals to divide the categories drawn on the maps is based on the mean and standard deviation technique.

RESULTS AND DISCUSSION

Malnutrition among women and children remains abysmally high in Uttar Pradesh despite several thousand crores spent annually on supplementary nutrition programmes. According to data kept by the Union ministry of women and child development, UP is among the worst performing states in the area of underweight and malnutrition among women as well as children between the age group of 0 to 6 years (Mathur, 2014).

Nutritional deprivation and anaemia among women:

Anaemia is an indicator of poor nutrition and thus it is a public health issue which affects social and economic development of the region. The body mass index of married women is a high quality sign of a country's health status as well as economic condition and generally it has four categories *i.e.* underweight, normal weight, overweight or obese. Hence, BMI can be used as an indicator for nutrition status, and association with some diseases can be expected (Singh *et al.*, 2017). Obesity is associated with chronic inflammation (including elevated levels of hepcidin), thus obesity is associated with anaemia of chronic disease (Cheng *et al.*, 2011).

With the purpose, to look at nutritional deprivation and anaemia among women in Uttar Pradesh at district level, the composite z-scores of three indicators, such as percentage of Women with BMI <18.5 (total thin), percentage of Women with BMI ≥ 25.0 (overweight or obese) and percentage of women having any anaemia (<12.0g/dl), have been calculated. To illustrate the spatial pattern, the districts of the study area are divided into three categories of high (above 0.23), medium (-0.23 to 0.23) and low (below -0.23) computed by Mean and Standard Deviation Method. From Fig. 2, it is clear that

the concentration of high score of women with nutritional deprivation and anaemia is found in 23 district situated in the north-western belt (thirteen district namely Gautam Buddha Nagar, Pilibhit, Bareilly, Rampur, Bijnor, Muzaffarnagar, Ghaziabad, Moradabad, Shahjahanpur, Meerut, Saharanpur, Baghpat and Jyotiba Phule Nagar), eastern Uttar Pradesh (district namely Deoria, Ghazipur, Kaushambi, Bahraich, Azamgarh, Chandauli, Sultanpur and Faizabad) and Bundelkhand region (Chitrakoot and

Mahoba). Rampur, Moradabad, Bareilly, Shahjahanpur belong to the relatively developed Western region but due to low literacy rate and also high infant mortality rate came under the category of low Human Development Index (Planning Commission, Government of UP and UNDP, 2008). Most of twenty seven districts with medium level of nutritional status and anaemia are found in north-eastern and south-eastern portion of the study area. And remaining ten districts are scattered in western and south western part of Uttar Pradesh. Twenty one districts fall under the category of low grade in terms of nutritional deprivation and anaemia among women. These districts are stretching from south-western to central Uttar Pradesh.

Table 2 demonstrates the nutritional status and prevalence of anaemia among women who are in the age group of 15-49 by their background characteristics such as age, residence, schooling, religion and caste. An examination of data shows that under nutrition is particularly common in the younger age groups such as 41.6 per cent and 25.6 per cent women are found thin (*i.e.* BMI <18.5) or chronic energy deficient in the age groups 15-19 and 20-29, respectively. While overweight and obesity are most prevalent in older adults. Because population groups that are less likely to be too thin are the same groups that are more likely to be overweight or obese. As far as anaemia is concern, the haemoglobin levels of <12.0 g/dl was considered as any anaemia (normal anaemia), 10.0 – 10.9 g/dl as mild anaemia, 7-9.9 g/dl as moderate anaemia, and <7.0 g/dl as severe anaemia (Suryanarayana et. al. 2016) .It is a major health problem in Uttar Pradesh, especially among women and children. More than half of women in all age groups are having any anaemia (<12.0 g/dl) and the proportion of

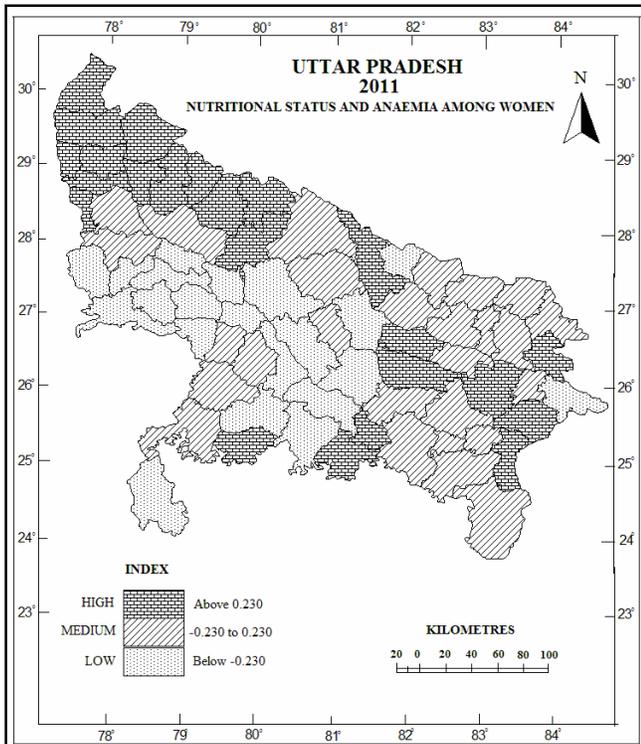


Fig. 2 : Map of Nutritional status and Anemia among women

Table 1 : Levels of Nutritional Deprivation and Anaemia among Women in Uttar Pradesh, 2014-2015			
Category	Composite Z-Score	No of District	Name of District
High	Above 0.230	23	Deoria, Ghazipur, Gautam Buddha Nagar, Kaushambi, Bahraich, Azamgarh, Pilibhit, Bareilly, Rampur, Chandauli, Sultanpur, Bijnor, Chitrakoot, Muzaffarnagar, Ghaziabad, Faizabad, Mahoba, Moradabad, Shahjahanpur, Meerut, Saharanpur, Baghpat, Jyotiba Phule Nagar
Medium	-0.230 to 0.230	27	Jalaun, Sant Ravidas Nagar (Bhadohi), Sant Kabir Nagar, Sitapur, Lucknow, Pratapgarh, Allahabad, Balrampur, Kheri, Mahrajganj, Kushinagar, Varanasi, Jhansi, Mau, Basti, Sonbhadra, Gorakhpur, Auraiya, Bulandshahr, Gonda, Siddharth Nagar, Aligarh, Mirzapur, Budaun, Kanpur Dehat, Jaunpur, Ambedkar Nagar
Low	Below -0.230	21	Mainpuri, Kannauj, Farrukhabad, Firozabad, Etawah, Unnao, Shrawasti, Banda, Lalitpur, Etah, Kanshiram Nagar, Rae Bareli, Hardoi, Kanpur Nagar, Hamirpur, Fatehpur, Bara Banki, Agra, Mahamaya Nagar, Mathura, Ballia

Table 2 : Nutritional Status and Anaemia among Women (15-49 Years) by Background Characteristics in Uttar Pradesh (2015-16)

Background characteristics	< 18.5 (Total thin)	≥ 25.0 (obese)	Mild (10.0-10.9 g/dl)	Moderate (7.0-9.9 g/dl)	Severe (<7.0 g/dl)	Any Anaemia (<12.0 g/dl)
Age						
15-19	41.6	2.8	40.8	12.0	0.9	53.7
20-29	25.6	11.6	38.1	14.1	1.2	53.4
30-39	17.2	24.6	38.2	11.7	1.1	50.9
40-49	15.8	30.1	38.5	11.5	1.1	51.1
Residence						
Urban	17.6	27.1	39.3	12	1	52.7
Rural	28.1	12.6	39	12.6	1.1	52.3
Schooling						
No schooling	24.1	16.7	38.3	13	1.4	52.8
<5 years complete	28.1	13.6	38.8	12.1	1	51.9
5-9 years complete	28.7	14.8	39	13.1	1.1	53.2
10-11 years complete	28.8	14.4	40.6	11.9	1.1	53.6
12 or more years complete	20.9	19.6	38.6	11.1	0.6	50.3
Religion						
Hindu	25.3	15.7	38.9	13	1.1	52.4
Muslim	25.5	19.4	39	12.8	1.2	52.6
Sikh	9	32.3	41.5	9.5	3	54
Other	13.5	32.2	33.2	11	0.4	44.7
Caste/tribe						
Scheduled caste	28.9	10.8	39	13.6	1.2	53.9
Scheduled tribe	29.8	10.8	41.1	15.3	1.2	57.6
Other backward class	26.2	15.5	38.8	12.4	1.1	52.3
Other	19	25.1	38.5	12	1	51
Don't know	39.6	13.4	33.6	16.1	1.4	51.1

Source: NFHS-4 (2015-2016) of Uttar Pradesh

severe and moderate anaemia is found more in 20-29 age group and mild anaemia in 15-19 age group. Moreover, proportion of thin women is more in rural areas *i.e.* 28.1 per cent than that of urban areas. While the situation is totally reversed for obesity as the percentage of women living in urban areas were are obese or overweight than rural areas. Furthermore, overweight and obesity increase with age, education, and parity of women. But any anaemia exceeds fifty per cent in both rural and urban sector. The most interesting finding is that there is no rural–urban difference of probability of being anaemic.

The proportion of women with BMI less than 18.5 (thin) and anaemia is to some extent more prevalent in illiterate women, while proportion of women with schooling 12 or more years complete are more obese (BMI more than 25.0). About one and half per cent women with severe anaemia and 13 per cent women with moderate anaemia are illiterate.

As far as religion and caste is concern, women belonging to Hindu and Muslim religion are more undernourished while obesity was more prevalent in Sikh and other religion. However the women with any anaemia, severe anaemia and mild anaemia are found more in Sikh religion than that of other religion. In terms of ethnicity, the concentration of women with BMI less than 18.5 was high in ST population (19.8 %) followed by SC (28.9 %) and other Backward Castes (26.2 %) while condition was found reversed with obese women. Furthermore ST women are more anaemic than that of other castes.

Nutritional deprivation and anaemia among children:

Malnutrition indicates that children are either too short for their age or too thin. Children whose height is below the average for their age are considered to be

stunted. Similarly, children whose weight is below the average for their age are considered thin for their height or wasted. Together, the stunted and wasted children are considered to be underweight- indicating a lack of proper nutritional intake and inadequate care post childbirth. According to one NGO Report the highest incidence of malnutrition was observed in the eastern belt which is a waterlogged region, followed by Vindhyaachal which also includes the dry Bundelkhand region. This distribution of underweight children in the state was not in concurrence with the common belief that the highest incidence of malnutrition in the state is in the poorer socio-economic region of Bundelkhand. Higher incidence of under nutrition was, in fact, noted in the waterlogged eastern and the wet Gangetic belt. This can be attributed to possibly higher occurrence of diarrhoea, infection and worm infestation which adversely affect the nutritional status of children (Vir and Nigam, n.d.).

The scores of nutritional status and is in fact an aggregate of composite scores of percentage of stunted, wasted, underweight children (< 5 Years) and percentage of children (6-59 months) having any anaemia. In the identification of regions, the composite z-score values of district have been arranged into three categories: high (above 0.320), medium (-0.319 to 0.320) and low (below -0.319), computed by the mean and standard deviation. From Table 3, it is obvious that the highest position of nutritional deprivation and anaemia is registered in twenty one districts in which four border districts such as Siddharth Nagar, Shrawasti, Balrampur, Bahraich situated in northeast and five districts belong to the north-western region (i.e. Rampur, Pilibhit, Budaun, Jyotiba Phule Nagar, Shahjahanpur,). And remaining twelve districts are found scattered in southern Uttar Pradesh and Bundelkhand region (namely Mahoba, Lalitpur, Jalaun, Chitrakoot).

According to government figures in Jhansi district, the number of malnourished children is more than 60 thousand. Even in Hamirpur, Jalan, Chitrakoot, Mahoba, Lalitpur and Banda, the situation is no different. In these districts, the number of children suffering from malnutrition is in thousands. The UPA Government spends millions of rupees every year, but does not fill the children’s stomachs. Because of this, many kinds of diseases are dwelling in them. Due to these diseases children have to lose their lives for a while (“Thousands of children of

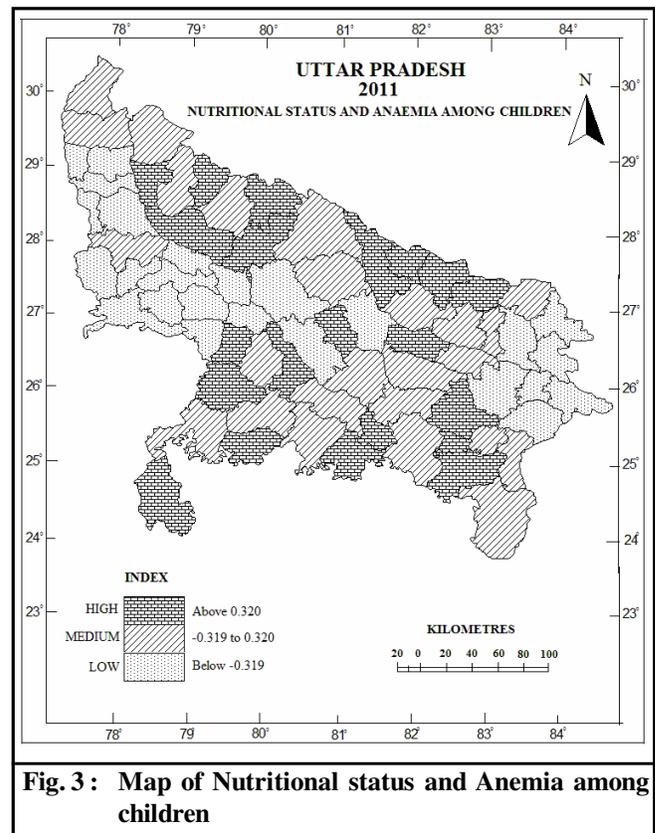


Fig. 3 : Map of Nutritional status and Anemia among children

Table 3 : Levels of Nutritional Deprivation and Anaemia among Children in Uttar Pradesh, 2014-2015			
Category	Composite Z-Score	No. of District	Name of District
High	Above 0.320	21	Faizabad, Kanpur Nagar, Siddharth Nagar, Mirzapur, Shrawasti, Jyotiba Phule Nagar, Rampur, Lucknow, Sant Ravidas Nagar (Bhadohi), Balrampur, Mahoba, Jaunpur, Pilibhit, Budaun, Auraiya, Bahraich, Shahjahanpur, Kaushambi, Lalitpur, Jalaun, Chitrakoot.
Medium	-0.319 to 0.320	25	Fatehpur, Chandauli, Saharanpur, Kanpur Dehat, Mahrajganj, Basti, Sant Kabir Nagar, Aligarh, Kheri, Muzaffarnagar, Allahabad, Banda, Ambedkar Nagar, Hamirpur, Pratapgarh, Sultanpur, Rae Bareilly, Gonda, Jhansi, Moradabad, Sonbhadra, Bijnor, Varanasi, Bareilly, Sitapur
Low	Below -0.319	25	Firozabad, Farrukhabad, Mahamaya Nagar, Mathura, Ghaziabad, Mainpuri, Etah, Gautam Buddha Nagar, Unnao, Kannauj, Ballia, Kanshiram Nagar, Etawah, Agra, Azamgarh, Deoria, Kushinagar, Bara Banki, Baghpat, Ghazipur, Meerut, Hardoi, Bulandshahr, Mau, Gorakhpur

Bundelkhand”, 2015). The state government has already declared all the districts of this region- Jhansi , Mahoba, Hamirpur, Jalaun, Lalitpur, Chitrakoot, Banda to be drought affected.

Medium level of nutritional deprivation and anaemia is reported in 25 districts. Most of the districts are found in southern Uttar Pradesh and some of them are situated in the north-western peak of the state. Twenty five districts come under the category of low level of nutritional deprivation and anaemia among children, most of the located in the western Uttar Pradesh and remaining nine districts are situated in eastern border of the state.

The nutritional status of young children is an important indicator of health and development-it is not only a reflection of past health insults but an important indicator of future health trajectories. Children under age three are particularly vulnerable to under-nutrition, and because the growth rate in this period is greater than any other age period, it increases the risk of growth retardation (Subramanyam *et al.*, 2010). The most

immediate determinants of under-nutrition are poor diet and disease, which are caused by a set of underlying factors: household food security, education, income, nutritional situation of the parents, access to clean water and sanitation, access to primary health care, sex and age of child (Pal *et al.*, 2017). Table 4 gives a detailed account of the nutritional status and prevalence of anaemia among children who are in the age of 6 to 59 months by their background characteristics such as age, sex, residence, religion and caste. An analysis of data given in Table 4 reveals that on an average 46 per cent children (> 5 years) are stunted or too short for their age, which indicates that they have been undernourished for some time in which more than half of the population of stunted children are found in 12 to 47 months. The share of wasted (too thin for their height) children is slightly higher in the age of 6 to 11 months *i.e.* thirty per cent than that of other age groups under 5 years which may result from inadequate recent food intake or a recent illness causing weight loss. Around two fifth of

Table 4 : Nutritional Status and Anaemia among Children (below 5 Years) by Background Characteristics in Uttar Pradesh (2015-16)

Background characteristics	Stunted	Wasted	Under weight	Mild (10.0-10.9 g/dl)	Moderate (7.0-9.9 g/dl)	Severe (<7.0 g/dl)	Any Anaemia (<11.0 g/dl)
Age in months							
6-11	24.1	29.2	32.2	27	42.3	2.1	71.4
12-23	50.3	20.3	40.1	24	48.5	4.6	77.1
24-35	54.1	15.1	42	27.1	39.2	3.1	69.4
36-47	52.8	13.3	41.6	28.1	26.7	1.3	56.2
48-59	49	12.3	41.4	26.1	19.6	0.7	46.4
(6-59)or >5 Year	46.1	18.0	39.5	26.5	35.3	2.4	64.1
Sex							
Male	46.3	19.1	39.4	25.9	34.8	2.5	63.2
Female	46.2	16.6	39.6	27	33.9	2.2	63.1
Residence							
Urban	37.9	18	33.7	25.6	36	3.3	65
Rural	48.5	17.8	41	26.6	33.9	2.1	62.7
Religion							
Hindu	46.2	18	39.5	26.5	33.1	2.2	61.8
Muslim	46.5	17.5	39.7	26.3	39.1	3	68.4
Sikh	16.5	10	13.2	30.2	33.1	4.9	68.2
Other	45.1	16	35.5	10.2	29.7	1.3	41.1
Caste/tribe							
Scheduled caste	52.3	18.6	44.4	26.8	34.2	2.4	63.4
Scheduled tribe	50.9	22.3	46	25.8	38.9	0.9	65.7
Other backward class	46.5	18	40.2	26.8	33.8	2.3	62.9
Other	36.7	16.2	30	24.5	36	2.7	63.3
Don't know	58	16.2	29.7	26.4	29.9	7.2	63.5

child population are underweight which takes into account both chronic and acute under nutrition. Among children between the ages of 6 and 59 months, a large majority (63%) are anaemic. This includes 26.5 per cent who are mildly anaemic, 35.3 per cent who are moderately anaemic, and 2.4 per cent who suffer from severe anaemia.

There is no difference in stunting and underweight among girls and boys below the age of 5 years. But wasting is slightly higher in male than female children. There is also no difference in the prevalence of anaemia among girls and boys. The prevalence of stunted and underweight children is higher in rural areas than that of urban areas, while the share of wasted children is almost same in rural as well as in urban areas. Table 4 also shows that anaemia is slightly higher in urban than rural sector.

As far as religion is concern, Hindu as well as Muslim having highest percentage of stunted (*i.e.* around 46 %), wasted (18 %) and underweight (around 40 %) children than that of Sikh and other religion. The share of mildly anaemic severely anaemic is common in Sikhs and moderately anaemic in Muslims. Further examination of data regarding to caste shows that children belonging to scheduled caste and unknown caste are found more stunted than that of other castes. On the other hand, ST population have the highest share of wasted and underweight children than other caste. The condition of anaemia is almost same in the children of all castes, still Scheduled tribe population is lag behind than others.

Conclusion:

This study concludes that malnutrition and anaemia are the major health problems of women as well as children in India. There are also considerable regional variations. The concentration of high score of women with nutritional deprivation and anaemia is found in district situated in the north-western belt, eastern Uttar and Bundelkhand Region. Moreover, highest position of nutritional deprivation and anaemia is registered in twenty one districts in which four border districts situated in northeast and five districts belong to the north-western region and remaining twelve districts are found scattered in southern Uttar Pradesh and Bundelkhand region. Under nutrition is particularly common in the younger age groups in women. More than half of women in all age groups are having any anaemia. Proportion of thin women is more in rural areas than that of urban areas.

While the situation is totally reversed for obesity as the percentage of women living in urban areas were are obese or overweight than rural areas. In terms of ethnicity, the concentration of women with chronic energy deficiency is high in ST population. At the same time, the condition of malnutrition and anaemia is almost same in the children of all castes, still Scheduled tribe population is lag behind than others. On an average, 46 per cent children (> 5 years) are stunted, 18 per cent are wasted and two fifth of child population are under-weight. Among children between the ages of 6 and 59 months, a large majority (63%) are anaemic. Thus, present study could help in the choice of the target group and the most important biosocial determinants for combating the problem of anaemia as well as under-nutrition among women and children.

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