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IMPACT OF SOCIO-ECONOMIC,
DEMOGRAPHIC AND HEALTH CARE
CHARACTERISTICS ON NUTRITIONAL STATUS
OF CHILDREN:A CASE STUDY OF TAMIL NADU
AND BIHAR

Anita
Research Scholar , Centre for the Study of Regional
Development , Jawaharlal Nehru University,
New Delhi,India.

ABSTRACT:

This paper examines the influence of major factors such as socio-cultural, economic, demographic, political and health care system on child nutrition.Bivariate logistic regression is run for the characteristics such as place of residence, wealth index, sex of children, age of the children, birth order and breastfeeding time. Tamil Nadu has high age at marriage, high level of female education and autonomy. This increases the power of decision making and raisestheir status in the society,which leads to highnutritional status of the children. While in Bihar, where lower age at marriage and poor educational levelof the mother makes them more susceptible to have underweight child. Thus it is clear that, all these factors affect the nutritional status of children either directly or indirectly.

KEYWORDS: Underweight, Children, Bihar, Tamil Nadu, Social, Economic, Demographic.

1.INTRODUCTION

In India, the level of under-nutrition is much higher in rural areas as compared to urban areas. Due to wide practices of gender discrimination on various grounds female child faces negligence in treatment, breastfeeding and food consumption (National Family Health Survey-3). A higher female infant mortality rates are theresult of preferential treatment by family members for sons. Girls with at least one surviving older sister have the higher risk of mortality as well as suffer from more discriminatory treatment (Pebley Anne R. and Amin Sajeda, 1991). Social hierarchy is a major obstacle in the utilization of available education and health care services. Social stratification determines the way of living, obligations, privileges and cultural traditions which have a lot of impact on her perceptions regarding health, knowledge of health care and accessibility to health care resources (Roy T. K., et al., 2004).It is hypothesized that the efficiency and effectiveness of child health care such as personal hygiene, prenatal & postnatal care and feeding practices will improvethe level of education of the mother (Caldwell, 1986 cited in Kim S., et al., 1990).Early marriages followed by repeated pregnancies along with the lack of female autonomy which increases the chances of having low birth weight babies (Ghosh Shanti, 2006).

OBJECTIVE

The objective is to analyze the plausible reasons for the differential nutritional status of children in Tamil Nadu and Bihar.

The study is divided into two parts:

• The first part deals with the impact of the socio-economic, demographic and health care characteristics on nutritional status of children in Tamil Nadu and Bihar.
• The second part shows district wise distribution of underweight children in Tamil Nadu and Bihar by various socio-economic, demographic and health care variables.

SCOPE AND LIMITATIONS

Tamil Nadu is one of the best performing states and Bihar is among the worst performing in terms of nutritional status of children. Higher standard of education and access to health care services are the result of awareness among the people and Government intervention.This increases the implementation of policies in the state at grass root level. Thus, both the states are not comparable on the ground of nutritional status of children because both have different socio-cultural, economic and demographic background. Considering the differences between both the states, one of the major objectives of the study is to analyse the variation in district level performances within the states in terms of children's nutritional status.

METHODOLOGY

Data from District Level Health Survey (DLHS)-2 conducted 2002-04 is used to analysis the nutritional status of children in Tamil Nadu and Bihar.

Binary Logistic Regression: It is a kind of regression when the dependent variable is dichotomous in nature and is coded as 0 and 1 whereas the independent variables can be of any type. One category of the dependent variable is taken as reference. Odd ratios are used to observe the risk of being underweight among children.

Cross tabulation is a tool used to analyse the association between two variables. This helps in identifying the association between the background characteristics and nutritional status among children.

Rural-Urban Differential: It is calculated by subtracting percent of underweight children in rural areas by the percent of underweight children in urban areas. If the percent of rural-urban differential is high it shows that the percent of underweight children is high in rural areas and vice-versa.

Male-Female Differential: It is calculated by subtracting percent of underweight among male child from the percent of female underweight child. If the male-female differential is negative it shows the percent of underweight is high among female child, zero male-female differential show both male and female are equally underweight and positive male-female differential shows that male child is more underweight.

Poor-Rich Ratio: The poor rich ratio refers as ratio between the percent underweight children among poor and rich households. If the poor-rich ratio have a value equal to 1 than both and poor and rich household children are exposing equally to underweight but if the ratio is greater than 1 than children of poor households suffer more from underweight.

$$\text{Poor-Rich Ratio} = \frac{\text{Percentage of Children Underweight Children in Household of Poor Standard of Living}}{\text{Percentage of Children Underweight Children in Household of High Standard of Living}}$$

DISCUSSION AND RESULT

Impact of Socio-Economic, Demographic and Health Care Characteristics on Nutritional Status of Children: Tamil Nadu and Bihar

As shown in Table 1.1, Among Social characteristics, Place of residence significantly influence underweight children. In Tamil Nadu, rural areas have less prevalence of underweight children with odd ratio 0.933 as compared to urban area. Poor and medium households highly signify the underweight children. In the state, families with a high standard of living have less chance of having underweight children as compared to

families with lower and medium standard of living (with odd ratio 1.309 and 1.652 respectively).

Sex of the children'is a factor which influences the nutritional status of children. In Tamil Nadu, female children are at a lesser risk of being underweighted (having odd ratio 0.806) as compared to male children. The reason can be cited is a greater practice of gender equality and high educational level. 'Age of the children', of one, two and three years is highly significant. Nutritional status of one year old child is better as compared to two years old child. Children of one and two years old are at a higher risk of being underweight having odd ratio 2.109 and 2.181 respectively.This can be due to obvious reasons as the one year old child feeds solely on mother's breast milk which protects the child from diseases and infections but after six month or more, children depend more on complementary feeding. On the same line, two years old children are more prone than one year old children because of poor weaning and complementary feeding. The odd ratio is, however, lower for three year child but it is significantly influence underweight children (having odd ratio 1.274), now child is not solely dependent on their mother for feeding purposes. Among 'Birth order' category, second order births are moderately significant (having odd ratio 1.118). Children of second order births are at a higher risk of being underweight as compared to 3rd and above order births children. It is becausethe percent of 3rd and above births order among women is less as compared to 1st and 2nd order births in Tamil Nadu. In 'Breastfeeding time' category, children in 'Same day after 2 hours of birth' group are at higher risk of underweight. It is because if the Child is exclusively breastfed then the immunologic system of children increases which enhances resistance against many disease and infection (Lance B., el. at, 2004).

Table 1.1, Impact of Various Socio- Economic, Demographic and Health Care Characteristics on Underweight Children in Tamil Nadu, 2002-04.

Independent Variable		Odd Ratio
Place of residence	Urban ®	
	Rural	0.933*
Religion	Christian®	
	Hindu	0.893
	Muslim	0.908
Caste	Other ®	
	SC	1.277
	ST	1.23
	OBC	1.022
Year of schooling	10+ year®	
	Illiterate	0.508
	0-9 year	1.221
Age at consummation of marriage	Above 18 year ®	
	below 18	1.258
Household standard of living index	High ®	
	Low	1.652***
	Medium	1.309***
Sex of children	Male ®	
	Female	0.806***
Age of the children	5 ®	
	1	2.109***
	2	2.181***
	3	1.274***
	4	0.98
Birth order	3 & above ®	
	1	1.007
	2	1.118**
Breastfeeding time	After1-3 day ®	
	Immediately, within 2 hours of birth	0.85
	Same day after 2 hours of birth	1.537

Source: Computed from DLHS-2 (2002-04).
Note: ***P<1; **P<0.05: *P<0.1, ® Denotes to Reference Category

As shown in Table 1.2, Place of residence is signifying the underweight children. In rural areas of Bihar shows more chance of having underweight children, (having odd ratio 1.101) as compared to urban areas. The reasons can be cited as urban area have more medical facilities and infrastructure, along with high education level, awareness about sanitation and hygiene. In rural areas, due to lack of transport facilities and connectivity results, lack of proper access to health care system. Religion as a measure of social variable shows that, children belonging to Muslim households are highly signifying the underweighted children (having odd ratio 1.691) as compared to Hindu household's children. For caste of the household, the risk of being underweight is higher among the Schedule Castes and Other Backward Caste (having odd ratio 1.446 and 1.345) as compared to Other (General) with respect to Bihar.

The reasons can be attributed to low level of education and high incidence of poverty among SC and OBC. The percent of underweighted children declines with increasing standard of living index. In the context of standard of living, in Bihar, children from lower and medium standard of living families have significant influence over underweight (having odd ratio 1.499 and 1.31 respectively) as compared to families with a higher standard of living.

Table 1.2, Impact of Various Socio- Economic, Demographic and Health Care Characteristics on Underweight Children in Bihar, 2002-04.

Independent Variable		Odd Ratio
Place of residence	Urban ®	
	Rural	1.101*
Religion	Hindu ®	
	Muslim	1.619***
Caste	OTHER ®	
	SC	1.446***
	ST	1.28
	OBC	1.345***
Year of schooling	10+ year ®	
	Illiterate	0.975
	0-9 year	1.033
Age at consummation of marriage	Above 18 year ®	
	below 18	1.026
Household standard of living index	High ®	
	Low	1.499***
	Medium	1.31**
Sex of children	Male ®	
	Female	1.077*
Age of the children	5 ®	
	1	1.514***
	2	1.619***
	3	1.619***
	4	1.619**
Birth order	3 & above ®	
	1	1.186
	2	1.287
Breastfeeding time	After1-3 day ®	
	Immediately, within 2 hours of birth	0.679
	Same day after 2 hours of birth	0.802

Source: Computed from DLHS-2 (2002-04).
Note: ***P<1; **P<0.05: *P<0.1, ® Denotes to Reference Category

District Wise Distribution of Underweight Children in Tamil Nadu and Bihar by Various Socio-cultural, Economic, Demographic and Health Care Characteristics.
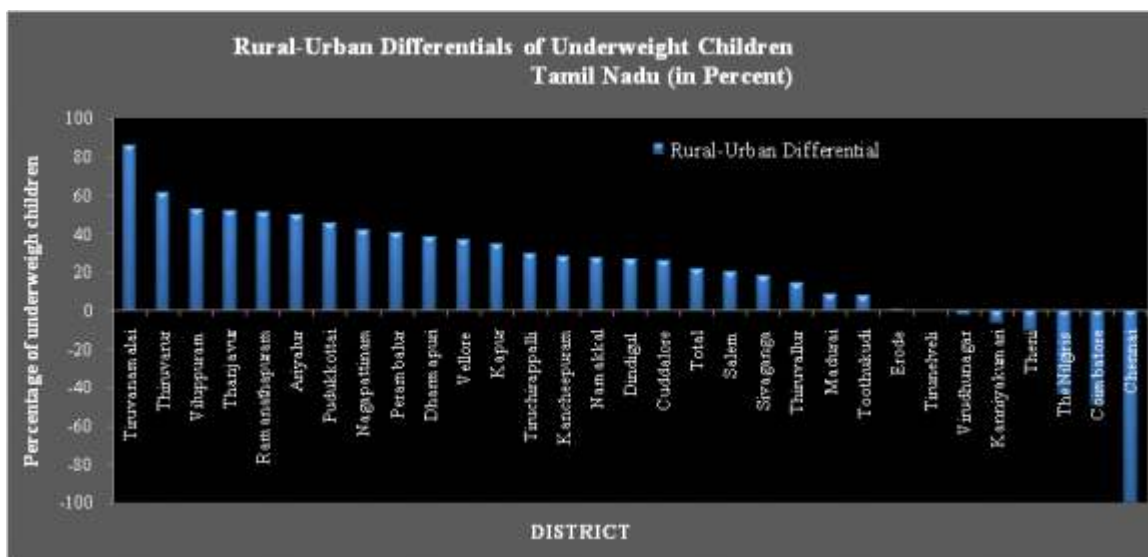
District Wise Distribution of Underweight Children in Tamil Nadu and Bihar by Place of Residence (Percent), 2002-04.

When the rural-urban differential is high it shows the percent of underweight children is high in the rural

area and vice-versa. As shown in graph 1.1, in Tamil Nadu some districts have positive rural-urban differential while some have negative rural-urban differential.In districts like Chennai, Coimbator, The Nilgiris, Theni, Kanyakumari and Virudhnagar, rural-urban differential is negative which shows that more underweight children are found in urban areas. This is because these districts are more urbanised and developed as a result having the high percent of slum population. In Chennai rural-urban differential is minus hundred (-100) due to absence of any rural population.

As shown in graph 1.2, in Bihar, rural-urban differential is high for all the districts. As a result, the distribution of underweighted children is more pronounced in rural areas than urban areas. The rural-urban differential is high in Bihar because the high level of education, better health facilities, awareness about sanitation and hygiene is high in urban areas than the rural area.

Graph 1.1, Percentage Distribution of Rural-Urban Differentials of Underweight Children in Tamil Nadu, 2002-04.

Source: Computed from DLHS-2 (2002-04).

Graph 1.2, Percentage Distribution of Rural-Urban Differential of Underweight Children in Bihar, 2002-04.
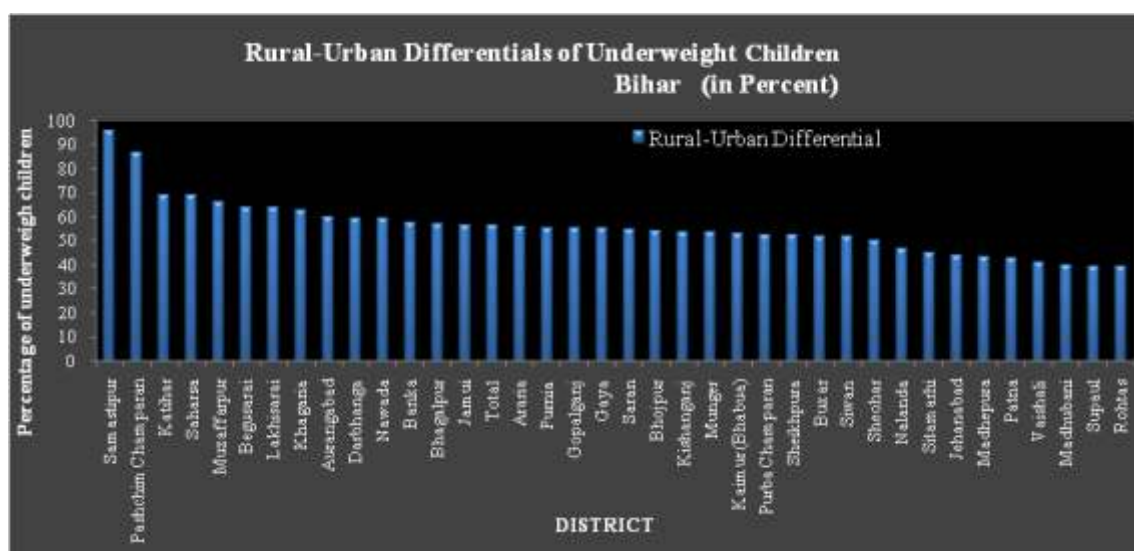
Source: Computed from DLHS-2 (2002-04).

Underweight Children in Tamil Nadu and Bihar by Sex of the Children (Percent), 2002-04.

As shown in graph 1.3, in the state, except Erode, Ramanathapuram and Salem districts all other districts have positive male–female differential which shows that in Tamil Nadu male children are more underweight as compared to female children. This is perhaps due to the biological fact that the female infant has the advantage over the male infant during the neonatal period.

Graph 1.3, Percentage Distribution of Underweight Children in Tamil Nadu by Sex of the Children (Percent), 2002-04.
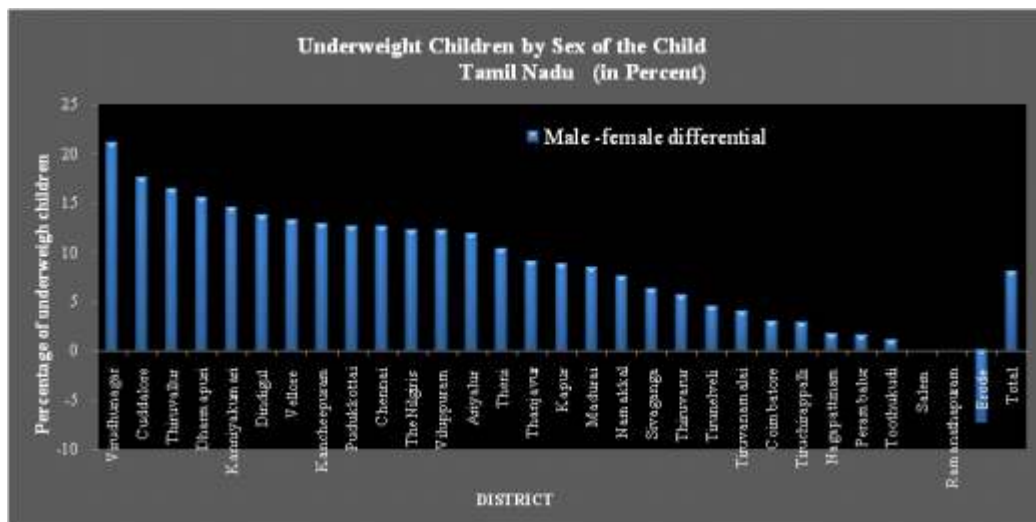
Source: Computed from DLHS-2 (2002-04).

Graph 1.4, Percentage Distribution of Underweight Children in Bihar by Sex of the Child, 2002-04.
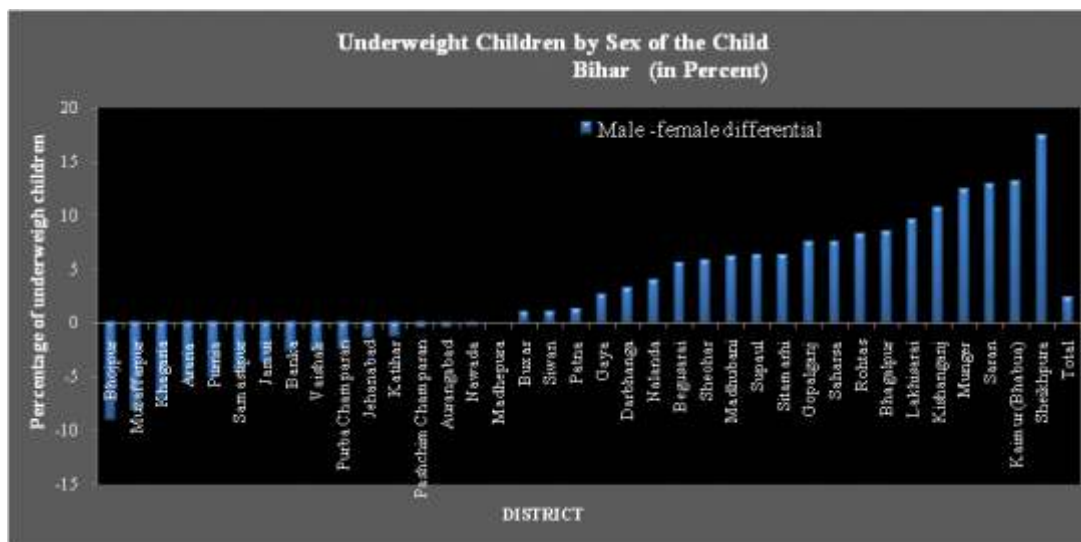
Source: Computed from DLHS-2 (2002-04).

Graph 1.4 shows, Districts like Bhojpur, Muzaffarpur, Khagaria, Araia, Purnia, Samastipur, Jamui, Banka, Vaishali, Purba Champaran, Jehanabad, Katihar have the negative male-female differential which shows more female children are in the underweight category as compared to male children this is because of high son preference in Bihar. While in Paschim champaram, Aurangabad, Nawada and Madhepura districts, the male-female differential is zero which show that both male and female children are equally underweight.

District Wise Distribution of Underweight Children by Household Standard of Living in the Study Area (Percent), 2002-04.

As shown in Table 1.3, poor-rich ratio is highest in Theni district i.e. 3.2 percent. The Poor-rich ratio is 1 percent in Toothukudi which shows that children from both rich and poor households are equally exposed to underweight. In Sivagang, Virudhnagar, Coimbatore and Erode districts poor-rich ratio is less than 1 which shows children of the rich household are more underweight as compared to children from the poor household. In these districts, percent of people below poverty line is lower (Tamil Nadu Human Development Report, 2003).

In Bihar, the entire district has the ratio greater than 1 which shows that children of poor households suffer more from underweight as compared to children of rich households. The Poor-rich ratio is 1 percent in Jehanabad which shows that both the rich and poor households have children who are equally exposed to underweight.

Table 1.3, District Wise Distribution of Poor-Rich Ratio in Tamil Nadu and Bihar, 2002-04.

POOR - RICH RATIO			
District	**Tamil Nadu**	**District**	**BIHAR**
Theni	3.2	Muzaffarpur	3.7
Thiruvarur	2.7	Katihar	3.6
Tiruvanamalai	2.2	Jamui	3.4
Namakkal	2.1	Darbhanga	2.6
Madurai	2	Gaya	2.6
Viluppuram	2	Banka	2.5
Salem	1.9	Saran	2.4
Perambalur	1.7	Sitamarhi	2.4
Ramanathapuram	1.6	Patna	2.3
Thiruvallur	1.6	Munger	2.3
Kapur	1.5	Lakhisarai	2.2
Kanniyakumari	1.5	Begusarai	2.2
Kancheepuram	1.5	Aurangabad	2.1
Thanjavur	1.5	Purnia	2
Tirunelveli	1.4	PashchimChamparan	1.9
Chennai	1.4	Sheohar	1.9
Vellore	1.4	**Bihar**	**1.8**
Tamil Nadu	**1.3**	Araria	1.8
Ariyalur	1.2	Saharsa	1.7
Nagapattinam	1.2	Buxar	1.6
Dharmapuri	1.1	Gopalganj	1.6
The Nilgiris	1.1	PurbaChamparan	1.6
Cuddalore	1.1	Samastipur	1.5
Pudukkottai	1.1	Sheikhpura	1.5
Tiruchirappalli	1.1	Bhagalpur	1.5
Toothukudi	1	Nawada	1.4
Dindigul	1	Supaul	1.4
Sivaganga	0.8	Rohtas	1.4
Virudhunagar	0.7	Nalanda	1.4
Coimbatore	0.7	Kishanganj	1.4
Erode	0.6	Bhojpur	1.3

	Vaishali	1.3
	Madhepura	1.3
	Kaimur (Bhabua)	1.3
	Khagaria	1.2
	Madhubani	1.2
	Siwan	1.2
	Jehanabad	1

Source: Computed from DLHS-2 (2002-04).

District Wise Distribution of Underweight Children by Age at Consummation of Marriage in the Study Area (Percent), 2002-04

Graph 1.5, shows the percent of underweight children among mothers who get married earlier (less than 18 years) and above that age group. In Tamil Nadu percent of underweight children is lower for below 18 years of ages because women are getting married here in the later year of ages.

As shown in graph 1.6, Consummation age of marriage is lower in Bihar where more than 50 percent women are getting married at early ages (less than 18 years). As a result, more than 40 percent children are underweight for those women who got married earlier (less than 18 years). In Sheohar district, 90 percent children are underweight for those motherswho married earlier. In Rohtas, Kishanganj, Patna, Nawada, Gaya, Siwan and Gaya districts, percent of underweight children decline among women who were married earlier (less than 18 years).

Graph 1.5, Percentage Distribution of Underweight Children by Age at Consummation of Marriage, 2002-04.
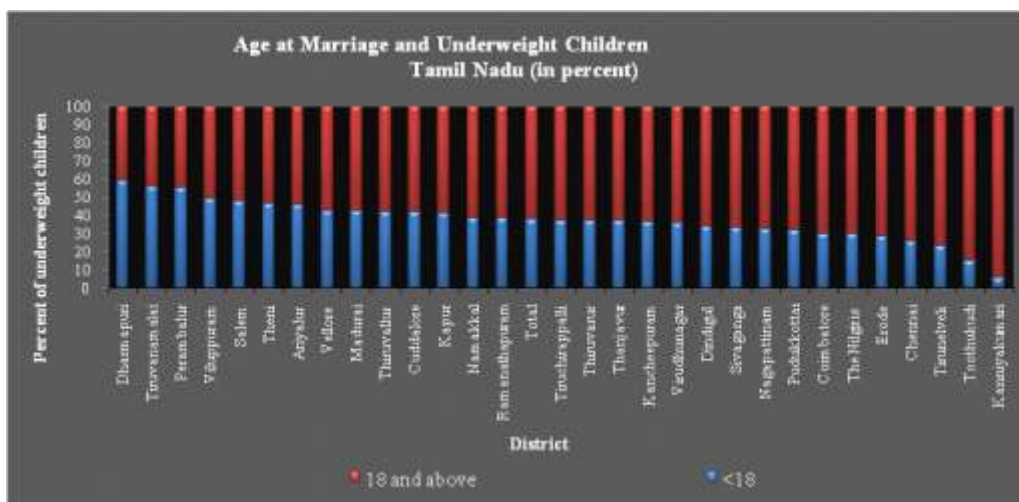
Source: Computed from DLHS-2 (2002-04).

Graph 1.6: Percentage Distribution of Underweight Children by Age at Consummation of Marriage, 2002-04.
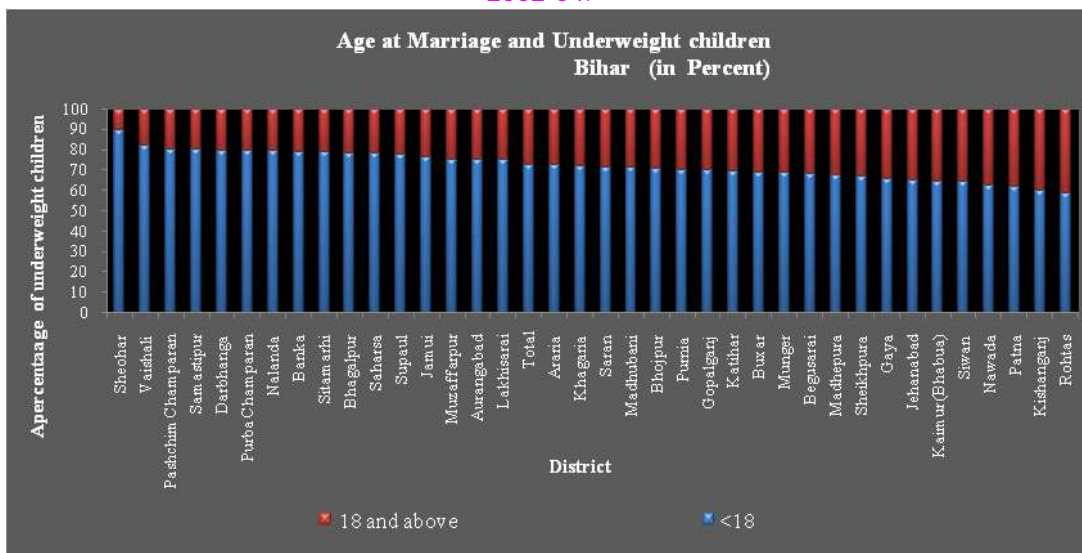
Source: Computed from DLHS-2 (2002-04).

District Wise Distribution of Underweight Children by Year of Schooling of Mother (in Percent), 2002-04

As shown in graph 1.7, In Tamil Nadu, percent of underweight children are equally distributed at each level of education because of high awareness among people along with high level of political intervention in development activities such as health infrastructure. In Tiruvannamalai district, the percent of underweight children is high due to the poor level of development. Other than level of education of women, the level of urbanization also affects the nutritional status of the children. In Chennai and Kanyakumari district level of urbanization is high which increases access of illiterate women to health care services.

Graph 1.7, Percentage Distribution of Underweight Children by Year of Schooling of Mother in Tamil Nadu, 2002-04.
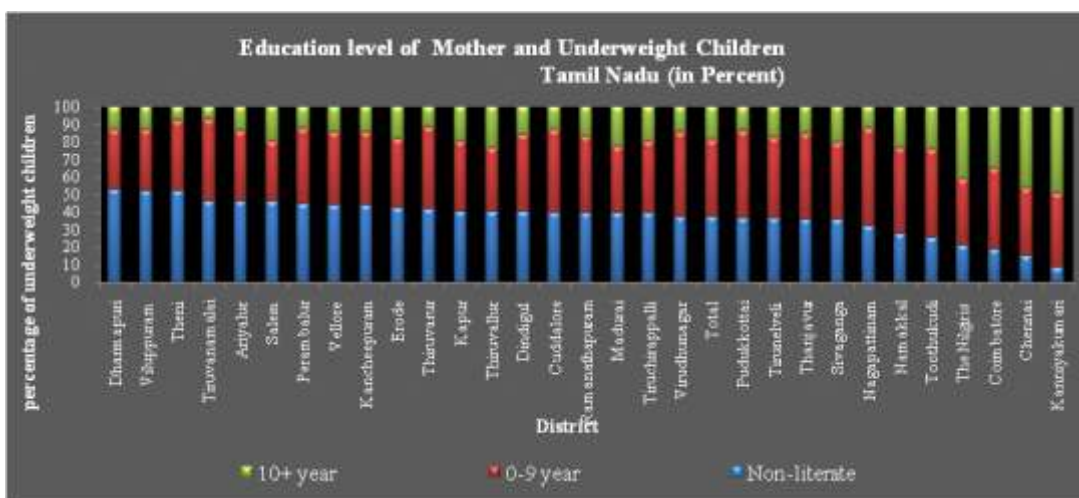

Source: Computed from DLHS-2 (2002-04).

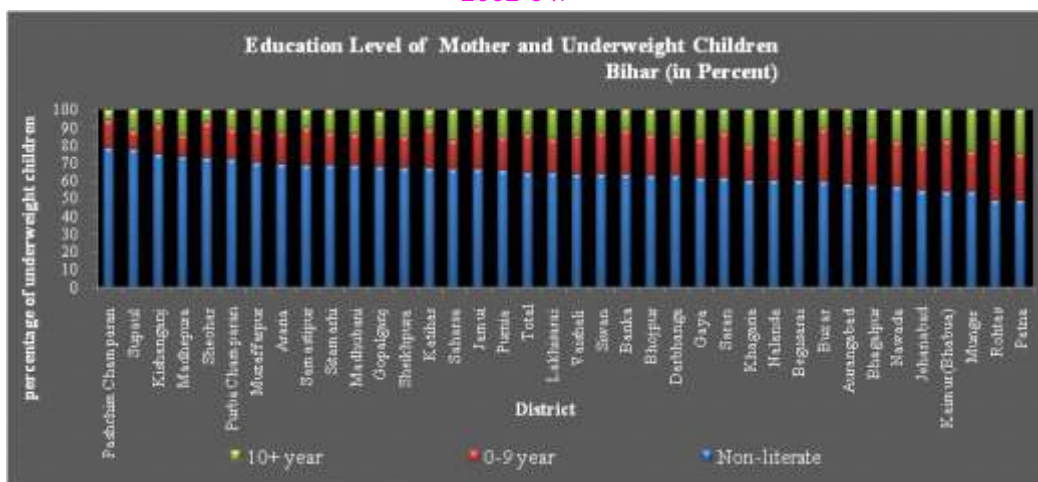Graph 1.8, Percentage Distribution of Underweight Children by Year of Schooling of Mother in Bihar, 2002-04.

Source: Computed from DLHS-2 (2002-04).

Graph 1.8 shows that in Bihar, the percent of underweight children is high among illiterate women as compared to those women who had 0-9 or more than 10 years of schooling. In Pashchim Champaran, percent of underweight children is 79 percent, which is highest among illiterate mothers. In Patna, percent of underweight children decline among illiterate mothers. The percent of underweight children is decline among illiterate women with the increase in the level of education and urbanization.

District wise distribution of underweight children by Order of Birth (in percent), DLHS, 2002-04.

The order of birth among mothers and percent of underweight children have a positive relation. Underweight children are found much higher among mothers with the high birth order due to decline in financial and biological factors like maternal depletion. In Indian society, the significance of birth order cannot be ignored due to high son preference (Gupta Das, 1987; Pal Sarmistha, 1999).From the graph 1.9, it can be inferred that in Tamil Nadu only 23.4 percent women belong to 3rd and above birth order, 32 percent belong to first birth order and 29 percent to second birth order. In Tamil Nadu, 1st, 2nd and 3rd order of births among women have almost the same percent of children in the underweight category. High level of consciousness and awareness due to the promotion of health care system by the Government in reducing child malnutrition disregard the impact order of birth on the nutrition status of children.

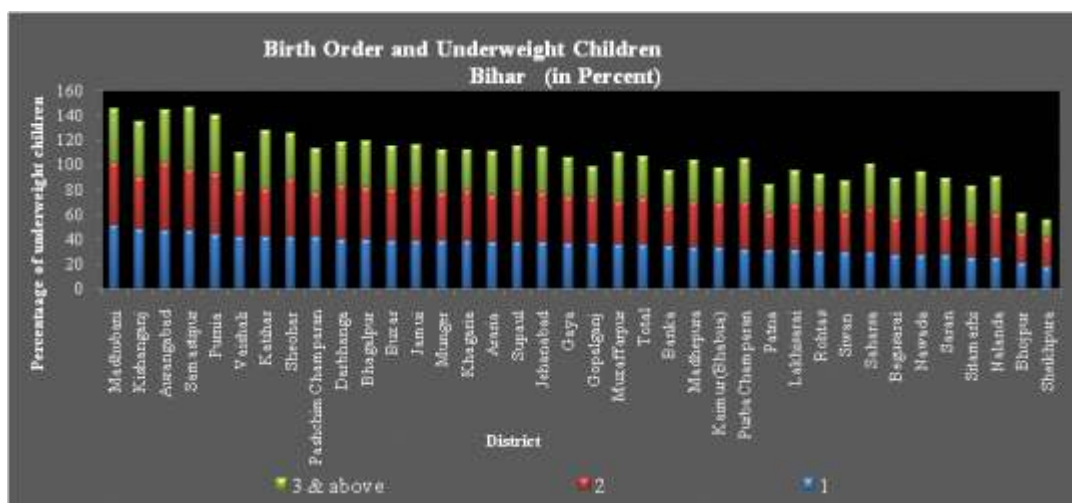Graph 1.9, Percentage Distribution of Underweight Children by Order of Birth, 2002-04.
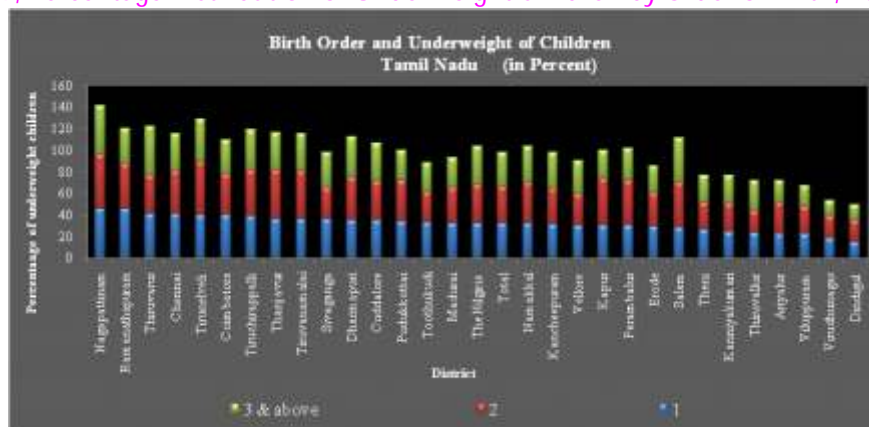
Source: Computed from DLHS 2.

As the graph 1.10 exhibits, in Bihar, the percent of underweight children is high in almost every order of childbirth. In Madhubani, district, 52 percent children are underweight in 1st order while in other districts percent of underweight children are almost equal in each order of birth.This shows the relation between birth order and underweight children is not significant in the case of Bihar and it is because of the high practices of age at marriage below 18 years, which increases the risk of giving birth to underweight children within 1st and 2nd birth order as compared to children of later birth orders. In later years other factors such as financial, biological and strong son preference become dominating and again increase the risk of underweight among 3rd and above order child births.

Graph 1.10, Percentage Distribution of Underweight Children by Order of Birth, 2002-04.

Source: Computed from DLHS-2.

7: CONCLUSIONS

In Tamil Nadu, the prevalence of underweight children five years of age is almost similar in both rural and urban areas. The prevalence of underweight children is slightly high among Christian households as compared to Hindu and Muslim households. Both who can and cannot read and write having almost same percent of underweight children. This is because of the high level of education and better health facilities. The percent of underweight children is lower for women who marry below 18 years of ages because women mostly have higher age at marriage. Male children are more prone to underweight as compared to female children. In Tamil Nadu, 1st order, 2nd order and 3rd order births among women have almost the same percent of underweight children.

In Bihar, the percent of underweight children among less the age of five year children is high in rural areas as compared to urban areas. Also, the prevalence of underweight children is slightly high in Muslims in comparison to Hindu households. The percent of underweight children is lower among those women who can read and write as compared to those who are not able to read and write. In Bihar, more than fifty percent of women are married earlier (less than 18 years). As a result, more than 40 percent children are underweight. Children of poor households are usually underweight as compared to rich households. Both male and female children are equally underweight. Children are equally underweight for 1st order, 2nd order and 3rd order births among women.

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Anita
Research Scholar , Centre for the Study of Regional Development ,
Jawaharlal Nehru University, New Delhi , India.

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