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NUTRITIONAL STATUS OF CHILDREN IN ASSAM

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OKDISCD

There are several factors which affect the child health and their nutritional status especially during their infancy. Apart from nutritional deficiencies, child morbidity, educational level of the mother, living standards, and social practices have significant influences on child health. The paper has made an assessment of the overall health and nutritional status of children in Assam based on the secondary data from National Family Health Survey (NFHS), District Level Household Survey (DLHS), Annual Health Survey (AHS), and other government publications. The paper has analyzed nutritional status of children by looking into key indicators viz. maternal health and mortality, morbidity, food habits child mortality, anaemia, immunization and dietary intake of children.

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Nutritional Status of Children in Assam[#]

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Introduction

The problem of food and nutrition insecurity still remains a great threat to a large number of poor and vulnerable people across the world. In the first half of the decade following the World Food Summit of 1996, official data registered a decrease in the number of India's undernourished by almost 13 million (FAO, 2004). During the second half of the decade, however, a reversal has been observed with the number of undernourished in India reportedly increasing substantially. The Global Hunger Index 2012 reported that India has lagged behind in improving its GHI score despite strong economic growth. According to the GHI 2012, 43.5 percent of children under five are underweight in India which accounts for almost two-thirds of the country's alarmingly high GHI score (GHI:2012). From 2005-2010, India ranked second to last on child underweight— below Ethiopia, Niger, Nepal, and Bangladesh. This stagnation in GHI scores occurred during a period when India's gross national income (GNI) per capita almost doubled, rising from about 1,460 to 2,850 constant 2005 international dollars between 1995–97 and 2008–10 (World Bank 2012). One of the major effects of hunger and malnutrition is child mortality. The latest GHI 2012 shows that even Bangladesh has been successful in reducing its child mortality below that of India.

The consequences malnutrition or under nutrition on children is enormous, further still there is an appreciable impact of malnutrition on human productivity which if unaddressed will reduce potential economic growth. The deficiency of proper nutrition impairs cognitive development, intelligence, strength, energy and productivity of the human being especially of the infants and early stages of children. The major victims of malnutrition are children and women. Malnutrition of the children occurs almost entirely during the first two years of their life. Malnutrition is the largest single contributor to child mortality in the developing countries (Cravioto and DeLicardie 1970). Often child malnutrition is inherited from poor maternal diet, both prior to and during pregnancy. In India, more than 2.42 million children under the age of five die annually and there are 60 million underweight children under the age of five (Gupta

and Rohde 2004). One of the main reasons of this high mortality of children under the age of five in India is malnutrition. Findings from various studies and surveys including the three National Family Health Surveys (NFHS) revealed that malnutrition cannot be attributed to a single cause; rather it is the result of multiple causes like poverty, health care, ignorance on nutrition and health education, female illiteracy, social convention, economic profile of households etc. There is also wide regional variation in malnutrition among children, e.g. Rajasthan, Uttar Pradesh, Assam Odisha have fairly high proportion of malnourished children.

Focus of the Paper

Assam has a child population share of 14 percent as per Census 2011 data. The various rounds of NFHS data indicate a low level of nutrition among the children of Assam. A simple indicator like proportion of babies with birth weight of less than 2.5 kg to the total number of babies born indicates that Assam ranks third from bottom among the states in India with almost a quarter of the new born weighing less than 2.5 kg*. Also the proportion of still birth in Assam is second highest (2.61) in the country next to Odisha (2.62).† As per NFHS-III, in Assam during the first six months of life, when most babies are breastfed, 30 percent of children are stunted, 22 percent are wasted, and 30 percent are underweight. Children in rural areas are more likely to be stunted, but even in urban areas, 36 percent of the children suffer from chronic under nutrition.

The paper has made an assessment of the overall health and nutritional status of children in Assam based on the secondary data from National Family Health Survey (NFHS), District Level Household Survey (DLHS), Annual Health Survey (AHS), and other government publications. There are several factors which affect the child health and their nutritional status especially during their infancy periods. Apart from nutritional deficiencies, child morbidity, educational level of the mother, living standards, and social practices have significant influences on child health. The status of maternal health has been analysed as well as because condition of maternal health influences the health of the unborn and new born child. The paper has analyzed nutritional status of children by looking into key indicators viz. maternal health and

* Source: Ministry of Health Govt. of India, State-wise Performance of selected indicators, Financial tear 2012-13, State wise Status, October, 2012.

† *Ibid.*

mortality, morbidity, food habits child moratility, anaemia, vimmunization and dietary intake of children. Apart from the key indicators the paper has also analysed the status ICDS in Assam to see how far the programme has been able to deliver the required support fo which it had been envisaged.

An Analytical Assessment

Apart from economic factors of food production, and income, various social factors also influence the nutritional intake of pregnant mother, gender biases towards male child contributes significantly towards child malnutrition. Although hunger and malnutrition broadly signifies lack of food, the deficiencies of food types in the diet indicate what may be termed as 'hidden malnutrition'; e.g. calories intake being at the recommended level, absence micro nutrients from the diet indicates 'hidden malnutrition'. The lack of micronutrients impedes correct physical and mental development, increases the risk of contracting infectious diseases, reduces productivity and also the risk of premature death. Lack of vitamins and minerals is one of the main causes of death and disability among children. The first two years of life of a child are fundamental in preventing child undernourishment and malnutrition which can otherwise cause of irreversible damage. Recent studies have also shown that there is a connection between malnutrition in early years, including the period in the womb, and subsequent development of chronic diseases such as diabetes, high blood pressure and heart disease‡.

Maternal Health

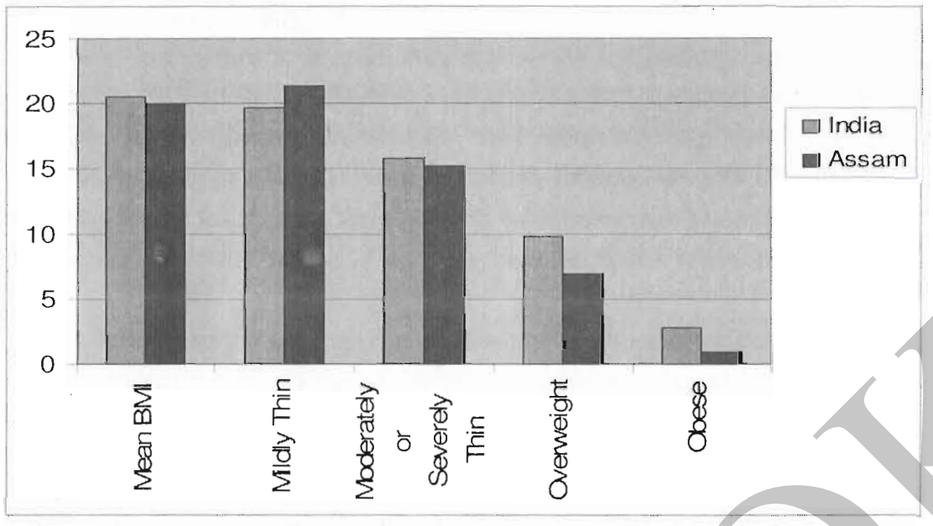
Maternal Health and its impact on nutrition of the child

There is a close relationship between maternal and child health. Weak, undernourished anaemic women give birth to low birth –weight babies. As per the AHS-2011, 33 percent currently married women in the State were illiterate and 40 percent of the currently married women in the age group of 20-24 years were married before 18 years of age and were mothers to two or more children. Further 54 percent of the women in the age group of 15-19 years were already mothers at the time of AHS-2011 survey. The high teenage pregnancy in the State is a matter of great concern as there has been a sharp rise (16 percent as per NFHS-III) during the five year period from 2005-06 to 2010-11. Girls

‡ *Healthy Growth and Nutrition in Children:* Barilla centre for Food and Nutrition, Italy.

in the age group 15-19 are still adolescents and their physical capability to bear child is fragile and with 50 percent of this adolescent group of girls in the State reported to be mothers, the possibility of child mortality and malnutrition remains high for the State. More critical is the fact that these women were already mother to more than three children. While age of the mother is one determining factor on the overall child health, a woman's height also has a decisive influence on delivery since small stature is often related to small pelvic size. The risk of having a baby with a low birth weight is also higher for mothers who are short. The cut off point for height, below which a woman can be identified as nutritionally at risk, varies among populations, but it is usually considered to be in the range of 140-150 centimetres (cm). The mean height for women is taken to be 145 in India as per NFHS-III.

Figure1: Body Mass Index of women in Assam (NFHS-3)



The NFHS-III data shows that 37 percent of women in Assam were malnourished and thin and 42 percent of women in the age group 15-19 years were malnourished and 16 percent were severely malnourished. The low BMI for Assam women indicates their poor health status which contributes towards building up *'structural deficiency'* in child health. Approximately 45 percent women were below normal BMI which indicates that malnutrition is fairly high in the State. Further 39 percent of rural women in the State were malnourished and another 16 percent were severely malnourished.

Table 1: BMI levels of women in India and Assam
(Percentage of women aged 15-49 years and height below 145 cm)

Category		NFHS-3	
		India	Assam
Height (Percentage below 145 cm)		11.4	15.8
Body Mass Index	Mean BMI	20.5	20
	Normal (18.5-24.9)	51.8	55.7
	Mildly thin (17.0-18.4)	19.7	21.4
	Moderately /severely thin (<17.0)	15.8	15.2
	Overweight or obese (≥25.0)	12.6	7.8
	Overweight (25.0-29.9)	9.8	6.9
	Obese (≥30.0)	2.8	0.9

Desegregating the data across religious groups shows that one-third of the Hindu and Christian and a little less than half of the Muslim women in the State are thin. In addition, one-fourth of the Muslim women are moderately and severely thin which shows that prevalence of malnutrition among Muslim women is higher in the State which is mainly due to the lower socio economic condition of these people[§]. The low socio economic status of population adversely impacts effects the food intake especially for women which also effects the reproductive and child health of the community.

Table 2: BMI levels of among women from different religious groups in Assam
(Percentage of women aged 15-49 years and height below 145 cm)

Category	NFHS-3		
	Hindu	Muslim	Christian
Total thin (<18.5)	33.1	46.0	37.8
Moderately /severely thin (<17.0)	13.0	21.7	14.3
Overweight or obese (≥25.0)	9.0	5.5	1.4
Obese (≥30.0)	1.1	0.4	0.7

§ 31 percent Muslim women belong to lowest wealth index NFHS-III.

The incidence of malnutrition among women from lowest and second quintile was high (more than 45 percent) and also women with no education were likely to be more malnourished (47 percent) than women with some education The low nutritional status for women often results in maternal death. India has one of the highest maternal deaths in Asia and among the states in India Assam has very high maternal deaths. Low nutritional status as revealed by low BMI and neglected medical attentions are among the prime reasons of high maternal mortality in Assam.

Maternal Mortality in Assam

Maternal mortality scenario in Assam is one of the worst in the country, and even among the special focus states particularly the Empowered Action Group (EAG) States. Government of India has been paying special attention to reduce the maternal mortality ratio (MMR) in 18 states which includes 8 EAG states (i.e. Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Uttar Pradesh, Uttaranchal, Orissa and Rajasthan), 8 North Eastern states and Himachal Pradesh and Jammu & Kashmir under the operation of National Rural Heath Mission (NRHM). However, the NRHM has become partially successful reducing the MMR in these 18 states especially in Assam compared to other states of India.

In Assam, the MMR has declined from 480 in 2004-05 to 381 in 2009 (AHS 2011) though it continues to be high compared to the national averages of 212. As mentioned in the preceding section 54 percent of the women in the age group of 15-19 years were already mothers at the time of AHS-2011 survey. This raises very critical question as because girls in the age group 15-19 are still adolescents and their physical capability to bear child is still fragile, further nutritional deficiencies of women in the age group 15-19 is also the highest in the reproductive age group of 15-45 years. The region wise distribution of maternal mortality ratio in the State shows that highest MMR is observed in the upper Assam region comprising the tea garden districts of Tinsukia, Dibrugarh, Sibsagar, Jorhat and Golaghat. The lower Assam and north Assam districts with concentration of minority population has the next highest MMR in the State. Therefore the focal point for RCH intervention in the State is the tea garden districts and the minority concentrated districts which also comprise the bulk of low wealth index population in the State.

The different factors that contribute towards reducing maternal death show that there is wide disparity in these key indicators in the State with the national average. One of the prime requirements for preventing maternal death is ante natal check up and as per the AHS-2011 approximately 61 percent women completed three or more antenatal check ups in the State, but full ante natal check up was completed by only 12 percent of the pregnant women. The proportion for for rural women was 11 percent and 19 percent for urban women. The consumption of IFA tablets was also found to be lower.

Table.3: Maternal care in Assam over different rounds of NFHS

Health care services availed	NFHS-I		NFHS-II		NFHS-III	
	India	Assam	India	Assam	India	Assam
P.C. receiving antenatal care	62.3	49.3	65.4	60.1	76.4	70.7
P.C. receiving two doses of TT vaccine	53.8	34.9	66.8	51.7	76.3	65.4
P.C. receiving IFA tablets	50.5	39.4	57.6	55	65.1	62.1
P.C. of births delivered in medical institutions	25.5	11.1	33.6	17.6	38.7	22.4
P.C. of deliveries assisted by health professionals	34.2	17.9	42.3	21.4	46.6	31

Table.3: Percentage of pregnant women receiving maternal care in Assam AHS-2011

Health services taken	Total	Rural	Urban
At least three antenatal checkups	61	59	73
At least one TT injection	91	90	96
IFA tablets consumed for 100 days or more	15	14	21
Full ante natal check up	12	11	19

The AHS data reveals that consumption of IFA tablets and full ante natal check up is quite low in the State which obviously makes both the pregnant mother and the child vulnerable to mortality. Religious group wise distribution of women taking maternal health care services shows that Hindu women are more likely to receive higher maternal cares in terms of antenatal care, IFA tablets, and two doses TT vaccine than the other two religious groups-Muslim and Christian. Also the percentage of institutional delivery for Muslim women is lowest among all the religious groups in the State (NFHS-III).

Table 4: Percentage of Institutional delivery

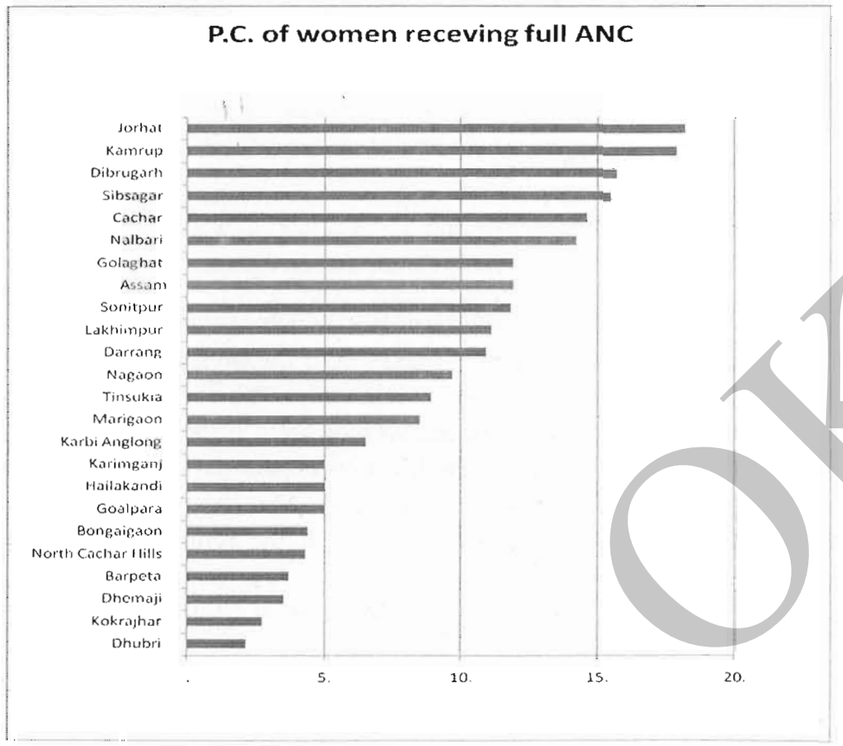
Category	NFHS-I		NFHS-II		NFHS-III	
	India	Assam	India	Assam	India	Assam
P.C. of institutional delivery	25.5	11.1	33.6	17.6	38.7	22.4
P.C. of deliveries assisted health professionals	34.2	17.9	42.3	21.4	46.6	31

The proportion of institutional delivery in the State has increased in the post NRHM period especially with the launching of the JSY. The proportion of safe deliveries in the State has also shown improvement; the proportion of safe deliveries to total deliveries in 2011-12 was 80 percent which increased to 84 percent. (MOHFW: March 2013).

Table 5: Percentage of Institutional deliveries in Assam

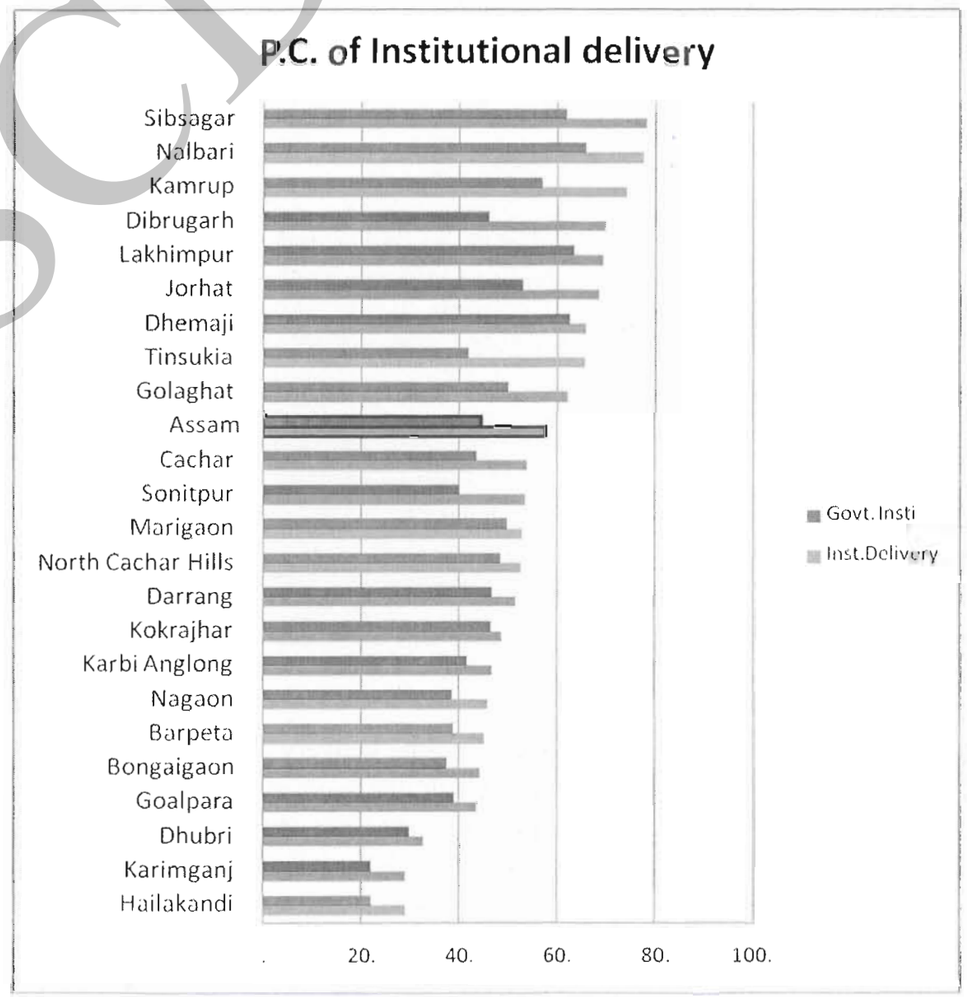
Delivery Status	Total	Rural	Urban
Percentage of total institutional delivery (AHS-2011)	57.7	53.9	76.4
Percentage of deliveries at Govt. hospitals (AHS-2011)	44.5	44.0	46.9
Percentage of deliveries at Pvt. Hospitals (AHS-2011)	13.1	9.7	29.3
Percentage of total institutional delivery (MHFW-2012-13)	82.5	-	-
Percentage of deliveries at Govt. hospitals (MHFW-2012-13)	92.18	-	-
Percentage of deliveries at Pvt. Hospitals (MHFW-2012-13)	7.82	-	-

Figure3: District wise coverage of Antenatal Care in Assam (AHS-2011)



Notwithstanding the improvements in maternal health care services in the State, institutional delivery was 58 percent and home delivery was 42 percent. Further, there exist wide disparities across the districts. Districts like Kamrup, Hailakandi, and Jorhat have the widest coverage of women with antenatal care whereas the districts like Dhubri and Kokrajhar have the lowest coverage under antenatal care. Institutional delivery is low in districts like Dhubri, Krimganj and Hailakandi which are essentially minority concentrated districts with Muslim population from low wealth index.

Figure 4: District wise p.c. of Institutional in Assam (AHS-2011)



Thirty percent of the births in the three districts of Hailakandi, Karimganj and Dhubri take place at institutions while 70 percent of the deliveries take place at home. Incidentally, these three districts are also the minority concentrated districts of Muslim population with low wealth index. While socio economic background of the population is one important factor for low institutional deliveries, the non availability of facilities is yet another factor. The NRHM facility survey reflects that less than 20 percent of the block primary health centres (BHPC) in Dhubri and Karimganj have 24 hours child delivery services and only a quarter of the BHPCs in Hailakandi are equipped to handle 24 hours delivery services. Further lady medical doctors are also either not in place or deficit in these BHPCs. The low institutional delivery in these three districts is therefore also affected by the availability of services.

Table 6: Percentage of women receiving post natal services in Assam

Services received	Total	Rural	Urban
P.C. of post natal care received within 48 hours (AHS-2011)	57	53.1	76.6
P.C. of post natal care received within one week (AHS-2011)	60.4	56.5	79.3
P.C. who did not receive post natal care (AHS-2011)	36.9	40.5	19.3

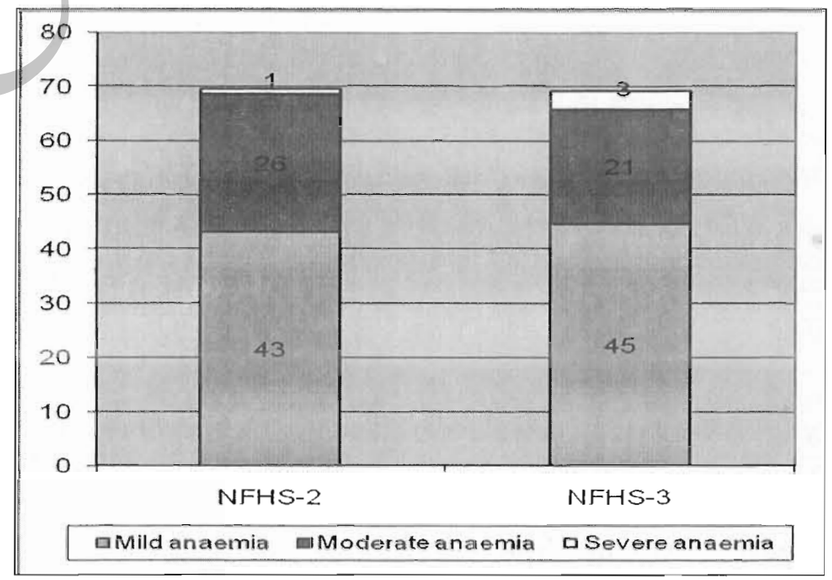
Further the post natal check up status shows that 57 percent women received the care within 48 hours of delivery, while 60 percent received care within one week of delivery. Significantly, the post natal care received by rural women in the State was less than that by urban women. One of the factors that have positively impacted on the maternal mortality in the State is improvement in the coverage of Institutional delivery in the post NRHM period, but rural maternal health care services still remain beyond the reach of 50 percent women in the State.

Anaemia in women

One of the common factors responsible for unsafe delivery and maternal mortality is anemia of the mother. In Assam, almost half the women (45 percent) are mildly anaemic, one-fifth (21 percent) are moderately anaemic and three percent are severely anaemic. The proportion of moderate anaemic women has marginally decreased over the years as indicated by the NFHS survey data, but the proportion of mild and severely anaemic women has increased during the same period, which indicates that overall anaemic condition for women in the State has worsened. Almost 70 percent

women suffer from any form of anaemia (<12g/dl) in the State. Significantly, there is no perceptible difference among women from different wealth index as also from different educational attainment level which indicates that anaemia among women in Assam is more structural and also to some extent due to dietary practice. As per the NRHM 2011** data for Assam, 25 percent maternal deaths were due to anemia. Anaemia was more pronounced (68 percent) among women in the age group of 15-19 years which reflects the high risk associated with teenage motherhood in the State. Almost 90 percent Christian women were anaemic. Anaemia was less among Hindu and Muslim women in Assam. A shortage of iron can cause retarded growth, lower resistance to illness, disorders in reproductive functioning and a deficit in mental and motor development.

Figure 5: Anaemia among Women in Assam



Thus anemia in pregnant mothers contributes to structural nutritional deficiency in children especially future reproductive health of the girl child. Anaemia is the single most important factor that contributes to low birth weight and maternal mortality. Therefore intervention for reduction of maternal mortality and low birth weight needs to focus on dietary guidance and nutritional input for women especially pregnant and lactating mothers. Anaemia in pregnant and breastfeeding mothers in Assam was fairly

** http://pipnrhm-mohfw.nic.in accessed on 31.5.2013

high and almost 70 percent pregnant and breastfeeding women were anaemic. A major cause of worry for the anaemic status of women in the State is that proportion of anaemic women in Assam has remained almost the same (70 percent) during the period 1997-98 to 2005-06.

Table7: Percentage of women having Anaemia in India and Assam

Category	NFHS-2		NFHS-3	
	India	Assam	India	Assam
Mild Anaemia (10.0-10.9 g/dl)	35	43.2	38.6	44.8
Moderate Anaemia (7.0-9.9 /dl)	14.8	25.6	15	21.2
Severe Anaemia (<7.0 g/dl)	1.9	0.9	1.8	3.4
Total (<11.0 g/dl)	51.8	69.7	55.3	69.5

Table 8: Percentage of Anaemia in women among different religions in Assam

Category	NFHS-2			NFHS-3		
	Hindu	Muslim	Christian	Hindu	Muslim	Christian
Mild anaemia (10.0-10.9 g/dl)	43.3	42.8	41.4	46.0	41.9	43.9
Moderate anaemia (7.0-9.9 g/dl)	22.1	32.0	34.7	21.9	15.5	38.9
Severe anaemia (<7.0 g/dl)	1.3	0.3	0.0	3.8	1.8	6.9
Total (<11.0 g/dl)	66.7	75.1	76.1	71.6	59.2	89.7

Significantly the anaemic condition of women in the State was almost same across all wealth index. Also 40 percent men in Assam were found to be anamic (NFHS-III) which indicate that it is essentially the food habit of the population that contributes to the overall hemoglobin level in the blood.

Women and their Food intake in Assam

In India, it is observed that diets of women from the low socioeconomic groups are essentially similar during pre pregnant, pregnant and lactating periods. Consequently, there is widespread maternal malnutrition leading to high prevalence of low birth weight infants and very high maternal mortality. The consumption of food with sufficient nutritional requirement by women in Assam is related to the income status of the household. A household with low wealth index is more likely to have nutritional

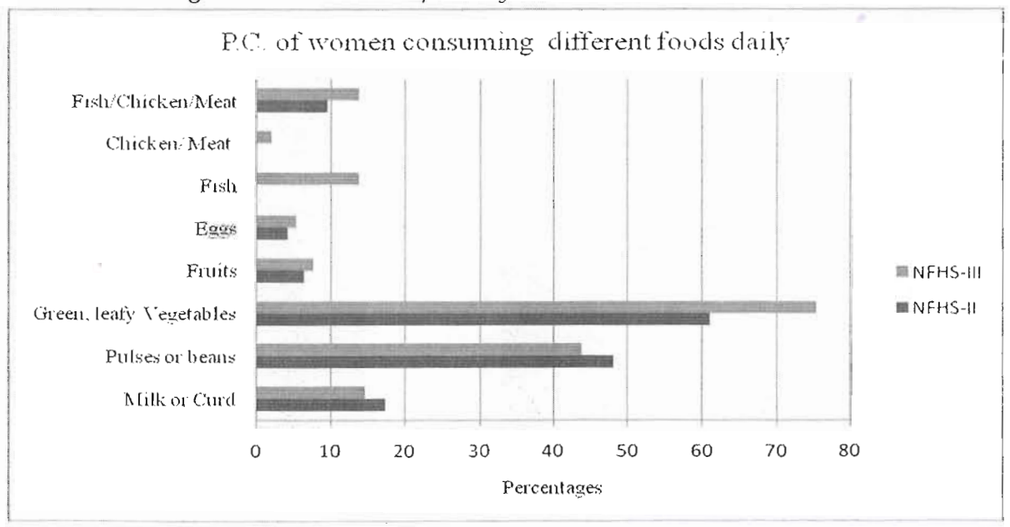
deficiencies in foods consumed than women from higher wealth index. Iron is found in food in two forms, heme and non-heme iron.

Table 9: P.C. of women consuming different foods daily

Food group	NFHS-II	NFHS-III
Milk or Curd	17.4	14.7
Pulses or beans	48.1	43.8
Green, leafy Vegetables	60.9	75.2
Fruits	6.4	7.7
Eggs	4.2	5.3
Fish/Chicken/Meat	9.6	13.9

Heme iron, which makes up 40 percent of the iron in meat, poultry, and fish, is well absorbed. Non-heme iron, 60 percent of the iron in animal tissue and all the iron in plants (fruits, vegetables, grains, nuts) is less well absorbed. The dietary pattern for women in Assam indicates that the diet is low in iron content as also in vitamins reflected by low consumption of fruits. The food habits of women indicate that while most women consume proteins, the consumption of fruits as a support for absorption of non heme iron from green and leafy vegetables is low. It is thus obvious that nutritional deficiencies in children starts from the womb of the mother and is repeat cycle process and thus embedded.

Figure 6: Food Consumption by Women in Assam (NFHS-III)



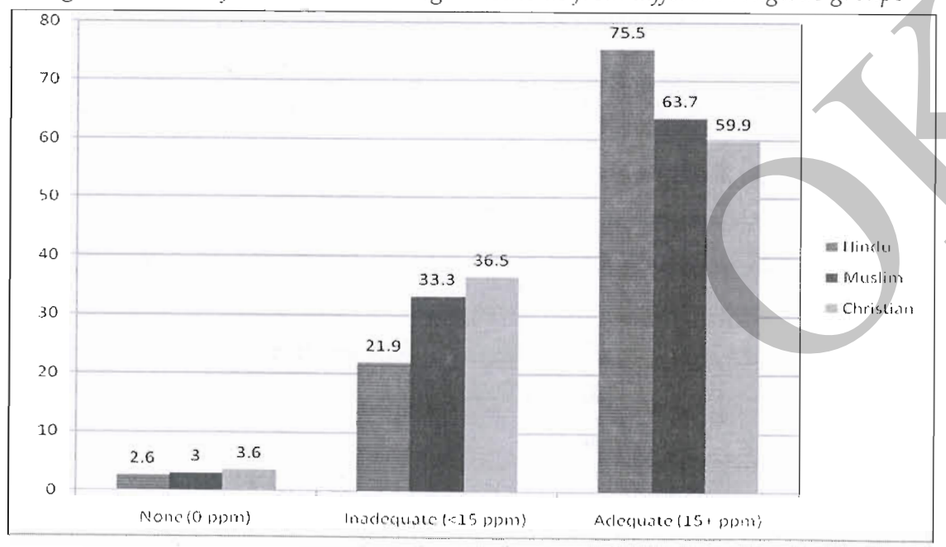
Apart from iron deficiency, shortage of iodine also poses serious health challenges in children. Iodine deficiencies can cause permanent brain damage, mental retardation, sterility and a lowering of the probability of survival in children. A shortage of iodine in a pregnant woman can cause a range of levels of mental retardation in her unborn child.

Table 8: P.C. of households which take Iodized Salt

Iodized salt	NFHS-II	NFHS-III
None (0 ppm)	1.8	2.8
Inadequate (<15 ppm)	18.3	25.4
Adequate (15+ ppm)	79.9	71.8

The consumption of iodized salt among the households in Assam has decreased over the years as reflected by the NFHS different rounds data. Also consumption of iodized salt by households from higher wealth index is more than those from lower wealth index. The consumption of iodized salt among the households of various religious groups in the State shows that consumption of iodized salt is less among Christian households. It is thus obvious that apart from access to facilities and services on maternal and child health the food consumption of pregnant women and lactating women has a special impact on the health and nutritional status of the child.

Figure7: Intake of Iodized Salt among households from different religious groups



Children and their Nutritional Status

During early childhood – characterized by rapid growth – it would seem very necessary that children be provided with adequate nutrition for their healthy growth-both physical as well as mental. The severity of child malnutrition in Assam has been a matter of grave concern. One of the basic indicators of child malnutrition is the low birth weight and infant mortality rate which continues to be fairly high for Assam.

Child Malnutrition

In Assam, the AHS-2011 results indicate that of the fifty percent new born who were weighed at birth, a little over quarter of these children were less than 2.5 kg with no rural urban differences. This indicates that malnourishment in Assam is almost same across both rural and urban areas. The NFHS-III data showed that in Assam, breastfeeding is nearly universal (96 percent) and 63 percent of children under six months were exclusively breastfed, as the World Health Organization (WHO) recommends. However, exclusive breast feeding for six months has decreased among lactating mothers and 39 percent of the infants in the State were exclusively breast fed for first six months, the proportions for rural and urban areas are 39 and 41 percent respectively. The AHS-2011 data shows that 70 percent of the new born are put to the breast feeding within the first hour of life. However, rural new born are more fortunate than their urban counterparts as 66 percent urban new born are breast fed within first one hour against 70 percent in rural areas of the State. This means that nearly thirty percent of the new born are deprived of the highly nutritious first milk (colostrum) and the antibodies it contains within the first hour of life.

The available data on nutritional requirement to be supplemented from the required food groups show that in Assam among all children age 6-23 months, only 41 percent of children are fed the recommended minimum times per day and 32 percent are fed from the minimum number of food groups. Overall, only 16 percent are fed according to all the three recommended practices by WHO. Even during the first six months of life, when most babies are breastfed, 30 percent of children are stunted, 22 percent are wasted, and 30 percent are underweight. Further only 28 percent of the newly born receive IFA syrup and 73 percent children receive Vitamin A during the first 6-35 months (AHS-2011). Children in rural areas are more likely to be stunted, but even in urban areas, 36 percent of the children suffer from chronic under nutrition.

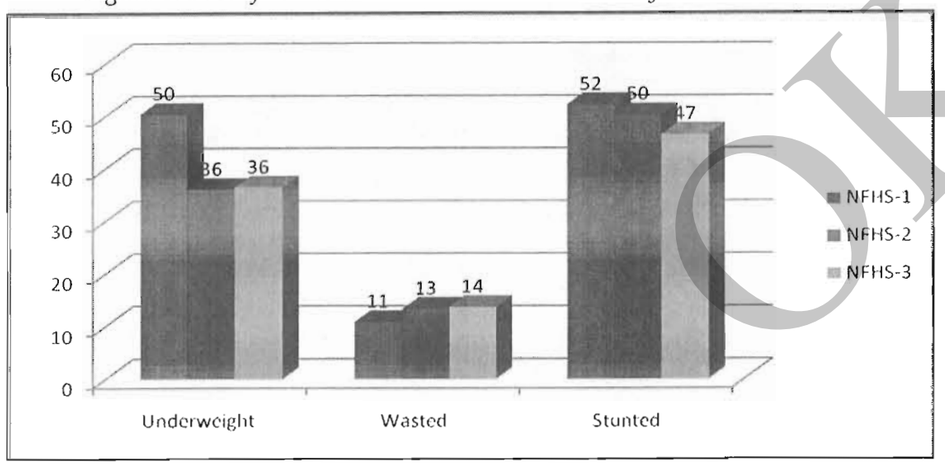
Nearly half of children (47 percent) under age five years are stunted or too short for their age, which indicates that they have been undernourished for some time. 14 percent are wasted, or too thin for their height, which may result from inadequate recent food intake or a recent illness. More than one-third (36 percent) are underweight, which takes into account both chronic and acute under nutrition.

Table 10: P.C. of malnourished children in India and Assam

Category		NFHS-I		NFHS-II		NFHS-III	
		India	Assam	India	Assam	India	Assam
Underweight	Below -3SD	20.6	18.7	18.0	13.3	15.8	11.4
	Below -2SD	53.4	50.4	47.0	36.0	42.5	36.4
Stunted	Below -3SD	28.9	26.3	23.0	33.7	23.7	20.9
	Below -2SD	52.0	52.2	45.5	50.2	48.0	46.5
Wasted	Below -3SD	3.2	1.7	2.8	3.3	6.4	4.0
	Below -2SD	17.5	10.8	15.5	13.3	19.8	13.7

While there has been an improvement in children's nutritional status with respect to height for age (54 percent to 41 percent) and weight for height (19 percent to 17 percent) during 1998-99 to 2005-06, there has been marginal increase in low weight for age category (35 percent to 36 percent) during the same period.

Figure 8: P.C. of malnourished children under three years in Assam



The proportion of stunted male children in the State was 47 percent and the same for females was 46 percent, the proportion of wasted male children is 13 percent and for females, the proportion is 15 percent.

Table10: Nutritional Status of Children among different religious groups in Assam

Category	NFHS-I		
	Hindu	Muslim	Christian
Underweight	45	60	56
Wasted	48	61	47
Stunted	11	10	16
	NFHS-II		
Underweight	27	49	NA
Wasted	10	19	NA
Stunted	45	56	NA
	NFHS-III		
Underweight	32	44	40
Wasted	12	16	17
Stunted	41	53	59

However, chronically undernourished female children in Assam are higher (38 percent) than the male children (34 percent). Thus chronic malnourishment among female children indicates towards poor reproductive health of women of the State in future. Over the years, the proportions of underweight and stunted children have declined in the State but there is increase in the proportion of wasted children. While proportion of underweight and stunted children has declined over the years, the proportion of wasted children has increased for all religious groups. The inadequate nutritional status of Christian children indicates that poor nutritional status observed for Christian women has a definite bearing on the overall inadequate nutritional status of their children.

The inadequate protein content in diet is one of the main reasons for wasted children. The consumption pattern in Assam reveals that the dietary content of proteins in Assam is around 7 percent in rural areas while the same for urban areas is 10 percent. The per capita per diem intake of protein in rural Assam is 54.4 gm while the same for urban areas is 58.8 gm. The average calorie intake per capita per diem in rural areas of the State is 2120 and the same for urban areas is 2176. While urban calorie intake per capita is above the recommended calorie intake for poverty level (2100 calorie per day per

person) in India, the same for rural areas is below the poverty level (2400 calorie per day per person). The standard calorie intake for nutritional sufficiency is 2700 per day per adult person[††]. The NSSO 66th Round data shows that in rural Assam 59 percent and in urban Assam 52 percent households were calorie deficit (<2700 calorie intake per consumer unit per day).

Table 11: Per capita per day consumption of calorie, protein and fat in Assam

	Rural				Urban			
Nutrition	1993-94	1999-2000	2004-05	2009-10	1993-94	1999-2000	2004-05	2009-10
Calorie	1983	1915	2067	2120	2108	2174	2143	2176
Protein	50.8	47.7	52.7	54.4	53.5	56.5	55.9	58.8
Fat	27.2	22.3	36.8	28.6	30.8	38.7	36.8	36.9

Source: NSSO different rounds

Table12(a): Dietary intake of food groups in rural areas of Assam (in p.c.)

Food groups	1993-94	1999-2000	2004-05	2009-10
I (cereals)	76.46	75.91	69.44	70.02
II (roots & fibers)	2.19	2.73	1.11	3.2
III (sugar & honey)	3.12	3.18	3.11	2.98
IV (pulses, nuts & oilseeds)	3.3	3.62	5.02	2.87
V (veg. & fruits)	3.02	2.35	2.44	3.88
VI (meat, egg & fish)	1.4	1.62	0.97	2.08
VII (milk & milk products)	2.18	2.28	5.22	2.57
VIII (oils & fats)	4.63	5.62	8.39	6.66
IX (misc. food & prod.)	3.69	2.69	4.32	5.74
Total	100	100	100	100

Source: NSSO different rounds

Table12 (b): Dietary intake of food groups in urban areas of Assam (in p.c.)

Food groups	1993-94	1999-2000	2004-05	2009-10
I (cereals)	65.62	64.59	63.8	62.33
II (roots & fibers)	2.56	2.59	3.08	3.31
III (sugar & honey)	4.24	3.87	3.68	3.04
IV (pulses, nuts & oilseeds)	4.46	4.39	4.3	3.8
V (veg. & fruits)	3.37	2.69	3.15	4.71
VI (meat, egg & fish)	1.81	2.12	2.04	3.06
VII (milk & milk products)	3.4	5.84	3.85	3.3
VIII (oils & fats)	7.35	9.38	9.3	9.72
IX (misc. food & prod.)	7.18	4.51	6.8	6.73
Total	100	100	100	100

Source: NSSO different rounds

[††] Minimum level set by 5th Labour Conference (1957)

The NSSO various rounds data shows that while urban areas of the State barely fulfill the minimum calorie requirement of 2100 calorie set by Planning Commission, the rural areas of the State fail to meet the required 2400 calorie requirement. Thus nutritional poverty in Assam especially in rural areas is acute. It is therefore obvious that overall status of women in Assam is expected to be lower given the overall deficiency in the calorie intake as reflected by the NSSO data.

Child Mortality

The child mortality rates in Assam are fairly high. A comparative status on child mortality (NFHS rounds) indicates fairly high rates of mortality across various age groups although there is decline in the mortality over time. Further child mortality among Muslims is fairly high. The high child mortality among the Muslims can be attributed to their low economic well being and poor living practices.

Further with high birth order among the Muslims who also start child bearing from an early age, the chances of child mortality are therefore higher. As NFHS-III survey revealed, in Assam girls in the first five years of life face a higher mortality risk than boys except during the post-neonatal period (1-11months). The under-five mortality rate for girls is 11 percent higher than for boys.

Table13: Mortality rates of children in Rural and Urban areas in Assam

	NFHS-I					
	Rural		Urban		Total	
Category	India	Assam	India	Assam	India	Assam
Neonatal Mortality (NM)	57.7	-	35.5	-	52.7	50.9
Post neonatal Mortality (PNM)	36.6	-	23.9	-	33.7	37.8
Infant Mortality Rate (IMR)	94.3	-	59.4	-	86.3	88.7
Child Mortality	40.4	-	20.1	-	35.5	58.7
Under-five Mortality	130.9	-	78.3	-	118.8	142.2
	NFHS-II					
Neonatal Mortality (NM)	51.7	37.3	33.5	32.5	47.7	37
Postneonatal Mortality (PNM)	28	25.3	15.8	11.4	25.3	24.5
Infant Mortality Rate (IMR)	79.7	62.6	49.2	43.9	73	61.5
Child Mortality	34.6	19.7	17	11.4	30.6	19.2
Under-five Mortality	111.5	81.1	65.4	54.8	101.4	79.5
	NFHS-III					
Neonatal Mortality (NM)	42.5	49.7	28.5	42.9	39	48.9
Post neonatal Mortality (PNM)	19.7	23.9	13	7.7	18	22
Infant Mortality Rate (IMR)	62.2	73.5	41.5	50.6	57	70.9
Child Mortality	21	27.4	10.6	17.6	18.4	26.2
Under-five Mortality	82	98.9	51.7	67.4	74.3	95.2

Children of illiterate mothers have twice the chances of dying than those children whose mothers have had education for at least ten years. Children from scheduled caste, scheduled tribe and backward classes families who are also economically disadvantaged have higher chances of dying. Children born to mothers under the age of 20 years are at a much higher risk of dying in infancy than children born to mothers in the prime childbearing ages. Infant mortality is 94 deaths per 1,000 births for teenage mothers, compared with 50-68 for mothers age 20-39. Thus higher the proportion of teenage marriage and pregnancy in a society higher is the chances of child mortality. With 54 percent women in the age group of 15-19 years reporting to be mothers (AHS-2011), the possible status of child mortality in Assam leaves little to be explained.

Apart from nutritional deficiencies in mothers along with socio economic factors low immunization coverage for children also exposes children to higher risks of mortality and morbidity. Also the spacing between births is an important factor that contributes to child mortality. The risk of death in the first year of life is twice as high for children born less than two years after a previous birth than for children whose mothers waited four or more years between births. In Assam 41 percent of live births take place after a gap of 36 months which indicates that awareness on healthy child birth is still low and in urban areas the proportion is 50 percent. One of the possible reasons for this may be the changing life styles and rise in the mean years of marriage to 24 years (AHS-2011).

Figure9: Different Mortality Rates of Children in Assam

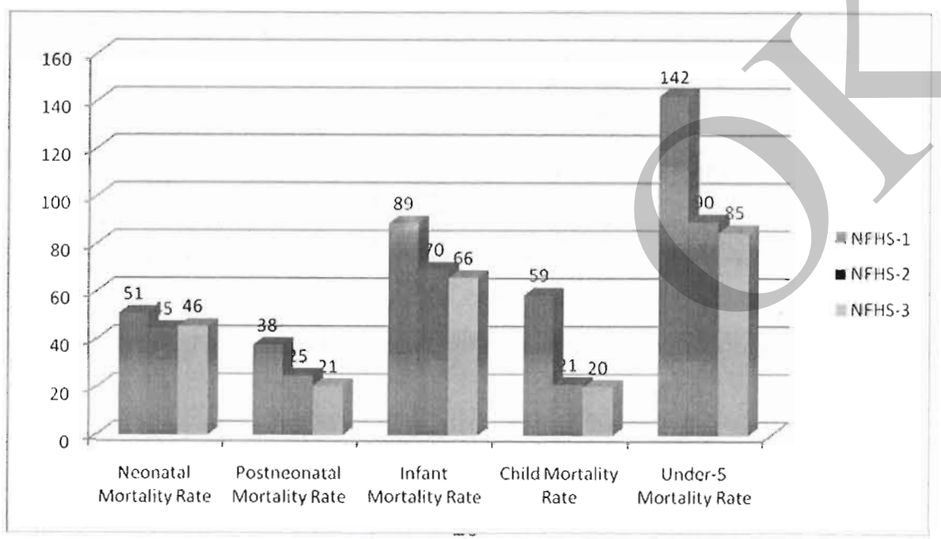


Table14: Mortality rates of children among different religions in Assam

Category	NFHS-I		NFHS-II		NFHS-III	
	Hindu	Muslim	Hindu	Muslim	Hindu	Muslim
Neonatal Mortality Rate	52.3	66.6	35.2	39.1	45.5	51.5
Post neonatal Mortality Rate	36.9	40.4	21.8	29.3	18.0	28.9
Infant Mortality Rate	89.2	107.0	57.1	68.4	63.5	80.4
Child Mortality Rate	51.4	63.1	19.7	20.2	21.2	37.3
Under-5 Mortality Rate	136.0	163.3	75.6	87.2	83.3	114.7

Following the intervention of NRHM since the year 2005, there has been significant drop in the child mortality in the State mostly because of an improvement in the antenatal and post natal checkups and institutional deliveries. The recent data on child mortality (AHS-2011) shows that there has been an appreciable improvement in different mortality rates but the situation fares worse for rural areas compared to the NFHS-III rounds (2005).

Table15: Mortality rates of children in Rural and Urban areas in Assam

Category	AHS 2010-11 (Assam)		
	Total	Rural	Urban
Neonatal Mortality (NM)	39.0	42.0	22.0
Post neonatal Mortality (PNM)	20.0	22.0	12.0
Infant Mortality Rate (IMR)	60.0	64.0	35.0
Child Mortality	NA	NA	NA
Under-five Mortality	78.0	84.0	42.0

Source: AHS 2010-11

Immunization

Child immunization has steadily improved in the State since the year 1995 (NFHS-I). Vaccination for children in the age group 12-23 months is given for major diseases like polio, tetanus, tuberculosis, diphtheria, pertussis and measles. While only 31 percent of children were immunized in 2005 (NFHS-III), the same has improved to 59 percent in 2011 (AHS-2011). Religious taboos and customary practices also play an influencing role in deterring mothers from immunizing their children. Muslim children are likely to be less vaccinated than the Hindu children against all type of vaccines which is largely due to the low literacy rate lack of awareness among mothers and religious taboos.

Incomplete vaccination exposes children to the risk of morbidity. In Assam almost 19 percent of children suffer from acute respiratory problem and 32 percent children are susceptible to suffer from fever. This calls for awareness among mothers on the urgency and importance of immunization of children.

Table16: Immunization of Children in India and Assam
(P.C. of children between 12-23 months)

Vaccine	NFHS-1		NFHS-2		NFHS-3		AHS Assam (2010-11)		
	India	Assam	India	Assam	India	Assam	Total	Rural	Urban
BCG	62	48	72	54	78	62	93.3	93	95.5
DPT 1	66	53	71	57	76	67	-	-	-
DPT 2	59	42	65	49	67	56	-	-	-
DPT 3	52	31	55	38	55	45	72.2	71.5	76
Polio 0	5	1	13	3	48	28	-	-	-
Polio 1	67	54	84	62	93	82	-	-	-
Polio 2	61	43	78	54	89	73	-	-	-
Polio 3	53	33	63	38	78	59	75.5	74.8	79.4
Measles	42	26	51	25	59	37	77.3	76.8	80.3
All	35	19	42	17	44	31	59	58.2	63.7
None	30	44	14	33	5	15	-	-	-

Figure10: Immunization of Children in Assam

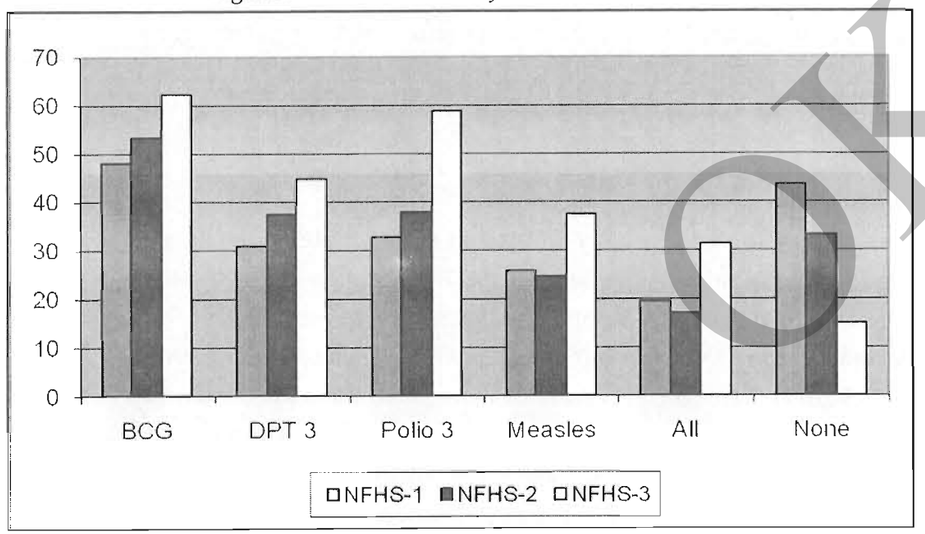


Table17: Immunization of Children among different religions in Assam
(P.C. of children between 12-23 months)

Vaccine	NFHS-I		NFHS-II		NFHS-III	
	Hindu	Muslim	Hindu	Muslim	Hindu	Muslim
BCG	61	34	61	45	74	48
DPT 3	45	13	46	29	54	32
Polio 3	47	15	44	32	67	46
Measles	35	17	30	18	46	24
All	30	7	21	12	38	20
None	30	59	29	29	7	24

Consumption of Micronutrients by children

Micronutrients are essential for reducing stunted growth of children. Absence or deficiency of micronutrients can cause severe physical and intellectual disorder especially of the children. According to WHO micronutrients are like 'magic wands' because they enable the human body to produce enzymes, hormones and other substances essential for proper growth and development. World Summit for Children in 1990, states that most of the children in low income countries suffers deficiency in three micronutrients viz. iodine, iron and vitamins A.

Figure11: Micronutrient intake in India and Assam
(P.C.of children as provided by NFHS-III)

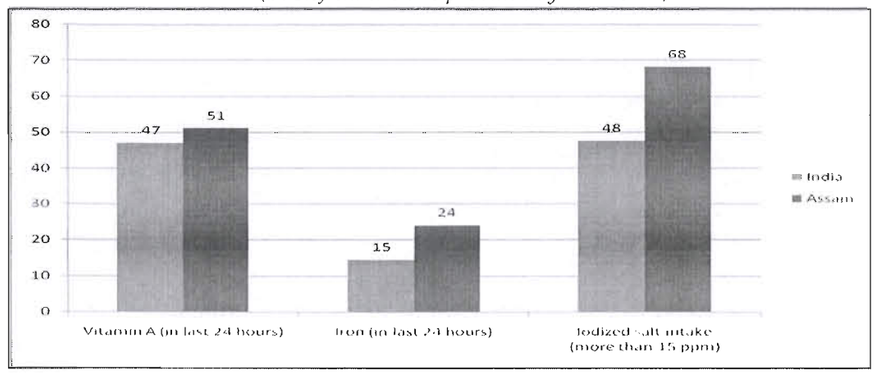


Table18: P.C. of children who consumed Vitamin A and IFA (iron) Supplement in Assam (AHS-2011)

Category	Rural	Urban	Total
Children (aged 6-35 months) who have received at least one Vitamin A dose during last 6 months	71.6	74.8	72.0

Children (aged 6-35 months) who have received IFA tablets/syrup during last 3 months	27.9	26.8	27.7

The intake of Vitamin A for children has improved in Assam during last five years (2005-2011), however the consumption of IFA syrup tablets continue to be low. One of the main reasons for increase in Vitamin A coverage is the administration of oral dose by health department in recent years. The consumption of IFA remains low as there is no compulsory drive for IFA administration. The awareness level on child health and nutrition is rather low. Although the ICDS service supposed to give the guidance to mothers on the dietary practices of the child, in practice these services are absent and in many cases the Anganwadi workers in the State are themselves untrained for such services.

Table19: Micronutrient intake in India and Assam

Category		NFHS-III		
		Assam	Rural	Urban
Children (6-35 months)	Percentage who consumed foods rich in vitamin A in last 24 hours	51.1	50.3	57
	Percentage who consumed foods rich in iron in last 24 hours	24.0	22.9	32.8
Children (12-35 months)	Percentage given vitamin A supplements in last 6 months	18.7	18.8	17.9
Children (6-59 months)	Percentage given vitamin A supplements in last 6 months	12.6	14.6	12.3
	Percentage given iron supplements in last 7 days	0.8	3.5	0.5
	Percentage given de worming medication in last 6 months	15.0	23.2	14
Children (6-59 months)	Percentage living in households using adequately iodized salt	68.1	89.7	65.3

The NFHS-III data showed that children from Muslim and Christian families who have low proportion of children consuming different micro nutrients like Vitamin A supplement, IFA syrup and therefore the chances of nutritional efficiencies in these children is also higher.

Table20: Micronutrient intake among children from different religious groups in Assam

Category		NFHS-III		
		Hindu	Muslim	Christian
Children (6-35 months)	Percentage who consumed foods rich in vitamin A in last 24 hours	56.1	42.0	52.0
	Percentage who consumed foods rich in iron in last 24 hours	27.3	20.3	13.0
Children (12-35 months)	Percentage given vitamin A supplements in last 6 months	21.6	16.2	6.7
Children (6-59 months)	Percentage given vitamin A supplements in last 6 months	15.0	10.3	3.8
	Percentage given iron supplements in last 7 days	1.0	0.8	0.0
	Percentage given de worming medication in last 6 months	16.1	14.9	6.9
Children (6-59 months)	Percentage living in households using adequately iodized salt	73.3	61.7	56.2

Child Anaemia

As noted in the previous section consumption of IFA syrup tablets is low among the children in Assam, consequently iron a deficiency in children is also fairly high. Nearly two-thirds (70 percent) children in the age group of 6-59 months are anaemic which includes 29 percent suffering from mild anemia, 39 percent suffering from moderate anemia and two percent who are severely anaemic (NFHS-III). Boys and girls are about equally vulnerable to anaemia in Assam.

Moreover, the distribution of anaemic children among various religious groups is quite different in Assam. The Muslim and Hindu children are likely to be less anaemic than Christian children. It is thus obvious that higher prevalence of anaemia among Christian women also results in birth of anaemic children.

Table21: Comparative Status of anaemic children in Assam
(P.C. of children in the age group 6-59 months)

Type of anaemia	NFHS-II	NFHS-III
Mild Anaemia (10.0-10.9 g/dl)	31	28.7
Moderate Anaemia (7.0-9.9 g/dl)	32.2	38.7
Severe Anaemia (<7.0 g/dl)	0	2.2
Total (<11.0 g/dl)	63.2	69.6

Figure11: Children's Anaemia in Assam
(Percentage of children aged between 6-59 months)

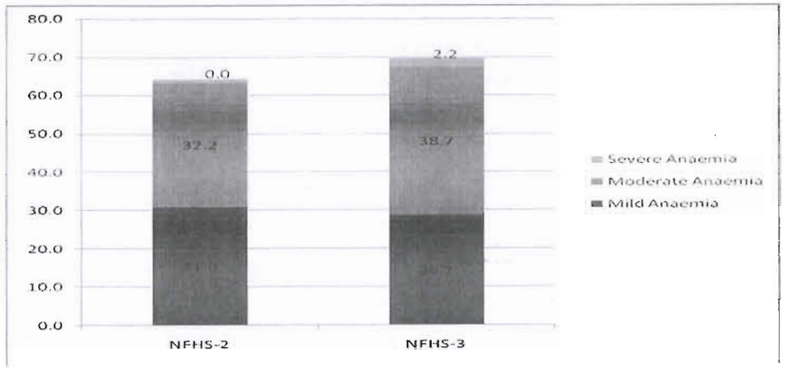
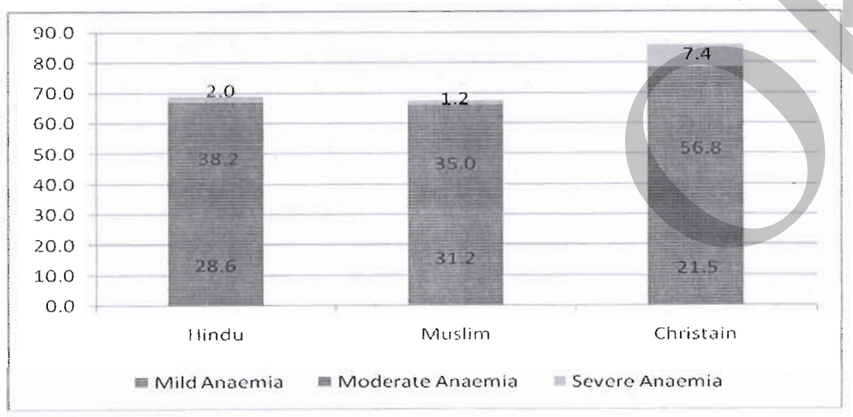


Table 22: Anaemia among children from different religious groups in Assam
(Percentage of children in the age group 6-59 months)

Category	NFHS-II		NFHS-III		
	Hindu	Muslim	Hindu	Muslim	Christian
Mild Anaemia	31	33	29	31	22
Moderate Anaemia	28	37	38	35	57
Severe Anaemia	NA	NA	2	1	7
Any anaemia (<11g/dl)	-	-	69	67	89

Figure12: Percentage of children suffering from anaemia in Assam (NFHS-III)



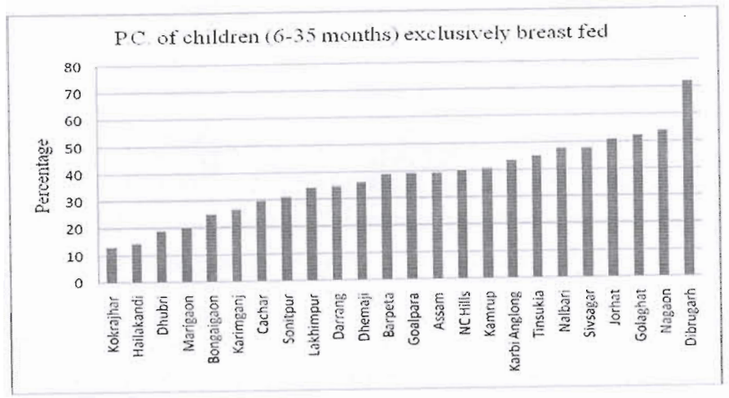
An important factor that contributes to iron deficiency in children is the early food supplement.

Although the iron in human milk is highly bio-available (with 50 percent absorption rate) the iron content is at its highest in early transitional milk and decreases steadily over the course of lactation‡‡. In general, infants born at term and with an adequate birth weight have sufficient iron stores for the first 4–6 mo of life. However, evidence suggests that infants with adequate birth weight born to anemic mothers have low iron stores and are more likely to develop anemia. By six months, complementary foods are required because certain nutrients (including iron, zinc, and vitamin D) are present at low concentrations in breast milk. The nutrient composition of breast milk is ideal for young infants (< 6 months), but in older infants, breast milk is really no longer the perfect food. Since children only absorb about 10 percent of the iron they eat, most children need to receive 8-10 mg of iron per day. Cow's milk is a common cause of iron deficiency. Cow's milk has several times higher content of calcium, which is found to be a potent inhibitor of iron absorption in babies. The risk of developing iron deficiency anemia is higher in infants younger than 12 months who drink cow's milk rather than breast milk or iron-fortified formula. Also young children who drink a lot of cow's milk rather than eating foods that supply the body with more iron are also likely to be anaemic. The AHS (2011) data on feeding practices for children in the State shows that 39 percent children are exclusively breast fed during first six months of life. The data also reflects wide disparity among the districts. The food supplements given to children less than six months of age shows that proportion of children receiving food supplements is obviously higher in those districts where exclusive breastfeeding for first six months was less. However what is worrisome for the State is that although the average proportion of children receiving water as food supplement is only 30 percent, there were only three districts where the proportion of children receiving water as food supplement was less than the State average, in all other districts 35-70 percent children received water as supplementary food. While animal or formula milk was given to 30 percent of babies of the State on an average, the district wise variations reflect that majority of the districts gave milk as food substitutes. The supplementation of semi

‡‡ M F Picciano & H A Guthrie (1976): Copper, iron, and zinc contents of mature human milk in *The American Journal of Clinical Nutrition*.

solid food was administered on eight percent babies of less than six months old, but there were wide variations among the districts.

Figure 13: P.C. of children who are breast fed for first six months



The consumption of fruits and vegetables as food supplement by babies less than six months in the State is rather low. Only two percent babies were given fruits and vegetables but in as many as 12 districts the proportion was less than two percent. The proportion of children given semi solid mashed foods also varied widely across districts. The AHS data shows that lesser proportion of children from the districts of Kokrajhar, Hailakandi, Karimganj, Morigaon and Cachar have been exclusively breastfed for first six months and they have been given other food supplements. It may also be noted that IMR for the districts of Kokrajhar, Morigaon and Karimganj are also fairly high. The data also showed that children were given adult foods for a longer period of time (more than nine months) during the first 6-35 months compared to milk (five months) and semi solid mashed foods (seven months). However vegetable and fruits were also given for a fairly long time (nine months).

Table23: Consumption other types of food by children during first six months of life

Place	Water	Milk	Semi solid	Solid (adult)	Veg/Fruits
Dibrugarh	17.7	42	8.1	1.6	1.5
Sivsagar	28.6	48.5	17.3	1.4	0.9
Barpeta	30.6	30.6	8.3	0.9	0.6
Assam	30.6	30.6	8.3	2.8	2.1

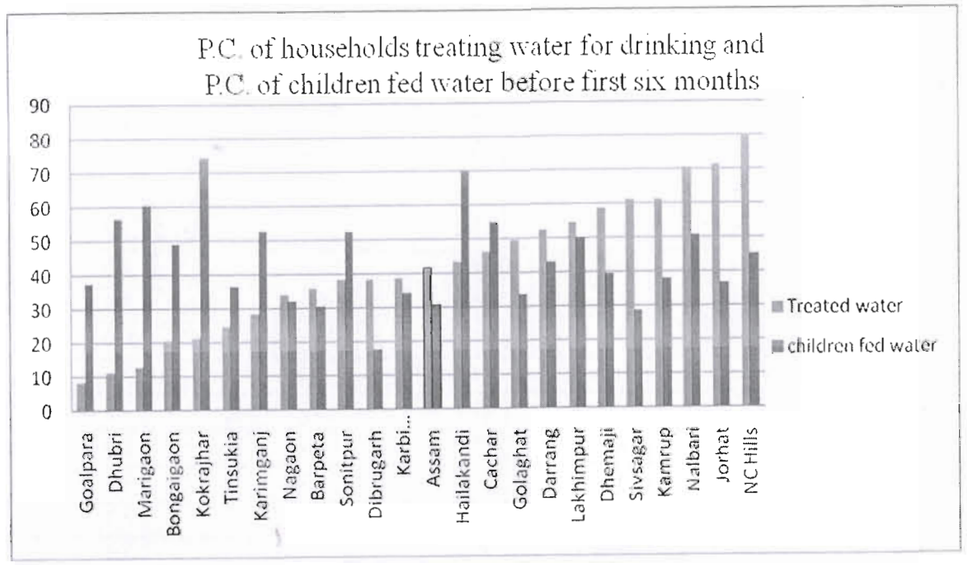
Nagaon	32.1	49.1	21.3	2.6	1.7
Golaghat	33.7	49.7	20.6	2.5	1.9
Karbi Anglong	34.4	55.9	17.4	3.5	2.2
Tinsukia	36.3	43.5	20.6	2.5	2.1
Jorhat	36.6	54.8	23.3	3.3	2.6
Goalpara	37.5	28.6	12.9	2.7	1.9
Kamrup	38	29.4	11.9	2.3	1.8
Dhemaji	39.4	32.7	12.4	4.9	4.8
Darrang	43	43.5	21.6	1.5	1.3
NC Hills	45.1	60.9	11.2	3.5	2.3
Bongaigaon	48.9	44.6	19.2	3.4	2.5
Lakhimpur	50.2	36.8	1.6	0.7	1.4
Nalbari	50.8	25.8	9.8	0.6	0.5
Sonitpur	52.4	48.6	12.7	3.3	3
Karimganj	52.7	70.5	21.9	2	1.9
Cachar	54.8	72.9	25.9	2.9	2.5
Dhubri	56.4	43.1	9	4.2	4.1
Marigaon	60.5	60.2	31.3	3.2	3.1
Hailakandi	70	64.6	23.4	6.6	3.1
Kokrajhar	74.2	70.5	35.6	12.3	3.2

Source: AHS-2011.

It would be pertinent to understand the hygienic practices among the households in Assam to understand the overall health of children. Almost 31 percent babies are fed water as additional food supplement during first six months. However, the proportion of households treating water before consumption in districts of Kokrajhar, Morigaon, Haliakandi, Cachar, Karimganj and Goalpara is lower than the proportion of babies given water as food supplement which therefore expose the children to the risk of diarrhea. Approximately nine percent children in the state suffer from diarrhea but in districts like Karimganj, Hailakandi, Kokrajhar, Cachar and Goalpara the proportion of children suffering from diarrhea is also higher.

Therefore types of food given to the baby and hygiene of the household have a decisive influence on the overall nutritional status and health condition of the children.

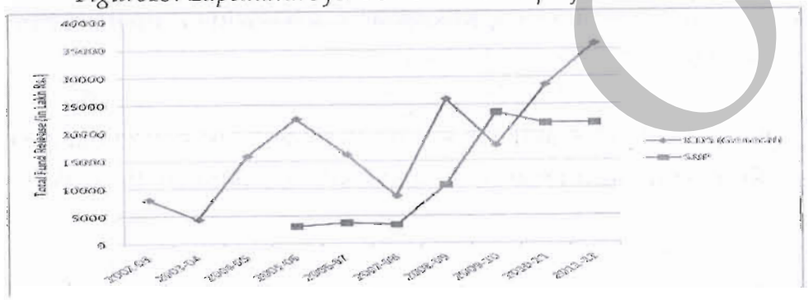
Figure 14: P.C. of households treating water and percentage of children given water to drink before six months



ICDS in Assam

The ICDS and SNP (supplementary nutrition projects) which looks into child wellbeing have been implemented throughout the country. In Assam the Department of Social Welfare is entrusted with the responsibility of implementing the ICDS. The total allocation of the fund for the various ICDS and SNP by the Govt. of India has increased over the years. Assam accounts almost eight percent of the total fund released for ICDS projects and four percent of the funds for the SNP. The following graph shows the fund release for ICDS and SNP in Assam.

Figure15: Expenditure for ICDS and SNP projects in Assam



The number of beneficiaries for supplementary nutrition in Assam has increased from 1408189 in 2005-06 to 2611117 in 2011-12 which shows almost two-fold increase during the same period.

Table 24: Number of SNP beneficiary in Assam and India

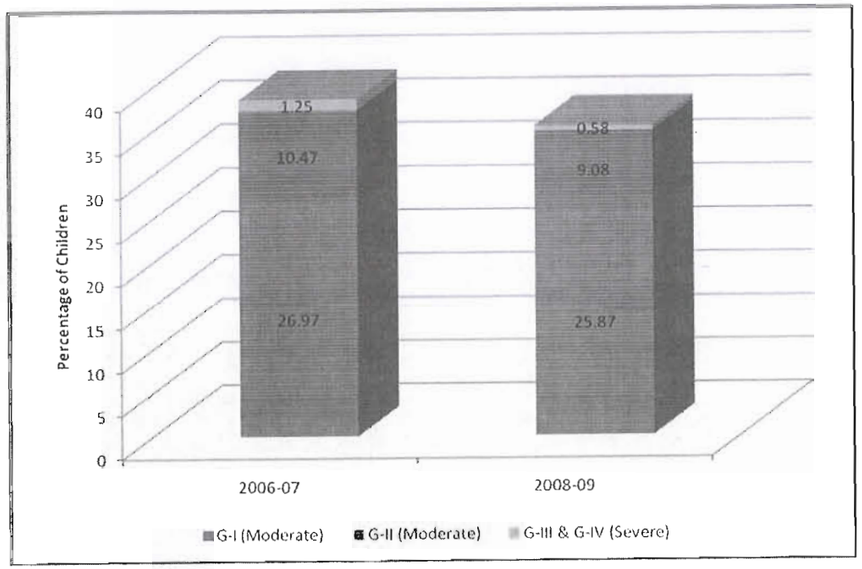
Year	Place	Beneficiaries for Supplementary Nutrition				
		Children (6 months-3 years)	Children (3 years-6 years)	Total Children (6 months-6 years)	Pregnant and Lactating Mothers (P&LM)	Total Beneficiaries (6 months-6 years plus P&LM)
2005-06	Assam	683842	576171	1260013	148176	1408189
	India	22711152	24006555	46717707	9500401	56218108
2006-07	Assam	792361	805792	1598153	269859	1868012
	India	30755232	29894421	60634506	13046087	73680593
2009-10	Assam	1175670	1232548	2408218	490967	2899185
	India	39615907	35487071	75102978	16762402	91865380
2011-12	Assam	1015405	1195597	2211002	400115	2611117
	India	39871756	33738750	73610506	18047322	91657828

While expenditure under ICDS and SNP has increased along with number of beneficiaries, the outcome of the programme do not posit a favourable picture. As per the State ICDS data[§§], 96 percent children were normal to mildly malnourished and 50 percent children under the age of four years were moderate to severely underweight in Assam. Further the SNP[***] data shows that 61 percent children were normal, 27 percent were Grade-I malnourished, 11 percent Grade-II malnourished and 1.3 percent were in Grade-III and IV in 2013. The malnourishment status of children in the State do not show an improvement as one-fourth of the children were moderately malnourished (Grade-I and Grade-II) and less than one percent were severely malnourished (Grade-III and Grade-IV) in 2008-09.

[§§] http://socialwelfareassam.com accessed on 31.5.2013.

[***] *ibid*

Figure16: Nutritional Status of Children under ICDS scheme in Assam



The field level experience from the 'Baseline Survey of thirteen Minority concentrated Districts in Assam' (2007) conducted by OKDISCD for Ministry of Minority Affairs, Government of India also indicate that even though many Anganwadi centres in the State have their own buildings but they provide minimal services and often are restricted to counseling activities only. As many as 22000 AWC in the State out of a total of 37000 AWC (60 percent) have own building. Although the registers are maintained for each village child population yet in many cases they were found to have been maintained in a haphazard manner. Field observations also revealed that in many AWC adolescent girls are provided with meal which is not at all a part of the program. The pre-school education is the backbone of the ICDS program. However, as the Midterm review of the Eleventh Five Year Plan for Assam showed, supplementary Nutrition was supplied between 75 to 129 days as against the norm of 300 days a year during the year 2009-10. Attendance at the AWCs is also very low. As government primary schools also have lower primary classes children go to the primary schools but often children are found registered in both primary and the AWCs. Thus fund flow under MDM and the SNP needs to be re examined as there is likely to double flow of fund for the same number of heads. Also supervision of the AWC and the implementation remains rather slack and tardy in the State.

Assam Vikas Yojana

Under the rubric of Assam Bikas Yojna, the Govt. of Assam has undertaken a number of initiatives to revamp the maternal and child health in the state. A slew of schemes have been launched for the well-being and welfare of the child and women. The program MAMONI (launched in 2008) is intended to provide nutritious food to pregnant women and MAJONI for newborn girl child to safeguard them with the educational, health and nutritional needs.

Under the Mamoni, all pregnant women are eligible for availing the scheme. During the first registration, the pregnant women is given Mamoni, a book on antenatal, natal and postnatal care. During her second ANC, the pregnant women is given an account payee cheque of Rs.500/- for spending on her nutritional support and on her third ANC she is given Rs.500/.

The Government of Assam has assisted a total of 648,850 women with the first installment and 509565 women with second installment during March 2009-2011. The families conforming to the norm of two children have been covered by the scheme which aims to reduce the fertility rate and also improve the nutritional status along with institutional coverage for ANC, natal and PNC to bring down MMR and child mortality in the State.

Majoni is a special assistance given to the girl child born in the family up to second order. It is a fixed deposit of Rs. 5000/- for 18 years of age of the child and families conforming to the norm of two children has been covered by the scheme. During March 2009-2011, a total of 1,53,529 applications have been received against which Rs.119618 have been given as fixed deposit assistance. The scheme aims to reduce the vulnerability of the girl child and also improve mortality for girl child.

Key Findings

The foregoing analysis reveals that nutritional status of children is a complex issue which includes dietary practices of the mother, the children and overall health status of the mothers and the children. The State has made improvements in the post NRHM intervention period especially in respect of MMR and IMR.

The MMR in the State has come down from 480 (SRS, 2006) to 381 (AHS, 2011). The increase in institutional delivery has been the major factor that has helped in reducing the MMR in the State. However, there are wide variations across the State in respect of MMR. The following table sums up the overall MMR status in the State.

Region	Maternal Mortality Ratio (MMR)
Assam	381
HILLS AND BARAK VALLEY DIVISION (Karbi Anglong, North Cachar Hills, Cachar, Karimganj, Hailakandi)	342
LOWER ASSAM DIVISION (Kokrajhar, Dhubri, Goalpara, Darrang, Bongaigaon, Barpeta, Kamrup, Nalbari)	366
NORTH ASSAM DIVISION (Marigaon, Nagaon, Sonitpur, Lakhimpur, Dhemaji)	367
UPPAR ASSAM DIVISION (Tinsukia, Dibrugarh, Sibsagar)	430

The MMR is high in the upper Assam districts which are dominated by the tea garden communities.

The child mortality shows that districts with minority population have higher mortality rates compared to districts with Hindu majority population. Among the districts Kokrajhar is the worst performing district in respect of child health with highest mortality. Of the nine districts with high IMR, five districts viz. Marigaon, Dhubri, Karimganj, Darrang and Nagaon are Muslim majority districts. Dhubri, Karimaganj and Nagaon also have high neo natal mortality rate. The Muslim majority districts also have high under five mortality for children.

Rank	IMR	Rank	Neo-natal	Rank	PNN	Rank	U5M
9	Golaghat	10	Kokrajhar	11	Dhubri	11	Dhubri
8	Nalbari	9	Lakhimpur	10	Sivsagar	10	Sivsagar
7	Nagaon	8	Nagaon	9	Bongaigaon	9	Bongaigaon
6	Sonitpur	7	Jorhat	8	Sonitpur	8	Sonitpur
5	Darrang	6	Marigaon	7	Karbi Anglong	7	Karbi Anglong
4	Karimganj	5	Karimganj	6	NC Hills	6	NC Hills
3	Dhubri	4	Sonitpur	5	Karimganj	5	Karimganj

2	Marigaon	3	Golaghat	4	Nagaon	4	Nagaon
1	Kokrajhar	2	Nalbari	3	Marigaon	3	Marigaon
		1	Dhubri	2	Darrang	2	Darrang
				1	Kokrajhar	1	Kokrajhar

The major reasons for overall deficiencies in child health are the poor nutritional status of mothers and the children, prevalence of anemia among women and children. Christian women were more anaemic compared to Hindu and Muslim women and the same status has been observed for children as well. The immunization coverage in the State continues to be low and 60 percent of the children have been fully immunized. Further, the various rounds of NFHS surveys have showed that religious taboos and customary practices also play an influencing role in deterring mothers from immunizing their children. Muslim children are likely to be less vaccinated than the Hindu children against all type of vaccines which is largely due to the low literacy rate lack of awareness among mothers and religious taboos.

Although there has been perceptible improvement in consumption of Vitamin A thanks to the oral Vitamin A campaign by the health administration in the State, the consumption of IFA syrup/tablets continue to be low and is also responsible for low hemoglobin level in the children. The latest ICDS data (2013) reveals that 96 percent children were normal to mildly malnourished and 50 percent children under the age of four years were moderate to severely underweight in Assam. Further the SNP data (2013) shows that 61 percent children were normal, 27 percent were Grade-I malnourished, 11 percent Grade-II malnourished and 1.3 percent were in Grade-III and IV in 2013. The supplementary nutrition was supplied between 75 to 129 days in the ICDS centres of the State as against the norm of 300 days a year during the year 2009-10.

Observations

A recent study of malnourished children in India by Gragnolati et al. (2006) is of the view that without a major shake-up in policy and an improvement in the effectiveness of its implementation, the attainment of the MDGs in this regard by India looks extremely unlikely compared to other countries. With approximately 59 percent of the rural households and 52 percent of the urban households in Assam being calorie deficit it is quite understandable that overall health and nutritional status of women and children in the State is unlikely to be robust.

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