

Nutrition Situation of Women in India: Current Status, Implications on Child Undernutrition and Challenges Ahead

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Abstract

Women play a central role in the nutritional status of children. This review highlights the urgent need to address the public health problem of undernutrition in women. The dimension of malnutrition problem in women in India is presented with reference to its implications on birth outcome and undernutrition in children. The causative factor of undernutrition in women is not limited to access to adequate and diversified food but is influenced by early marriage and conception, education, empowerment and decision making power, domestic violence. These factors directly or indirectly impact on the nutrition situation of women. A number of policies in India address these issues but implementation remains weak. The crucial role of women's nutrition on their right to healthy living as well as for reducing undernutrition in children needs to be recognised and accorded a high programme priority.

Keywords: women nutrition, maternal undernutrition, overnutrition, anemia, birth outcome, child undernutrition

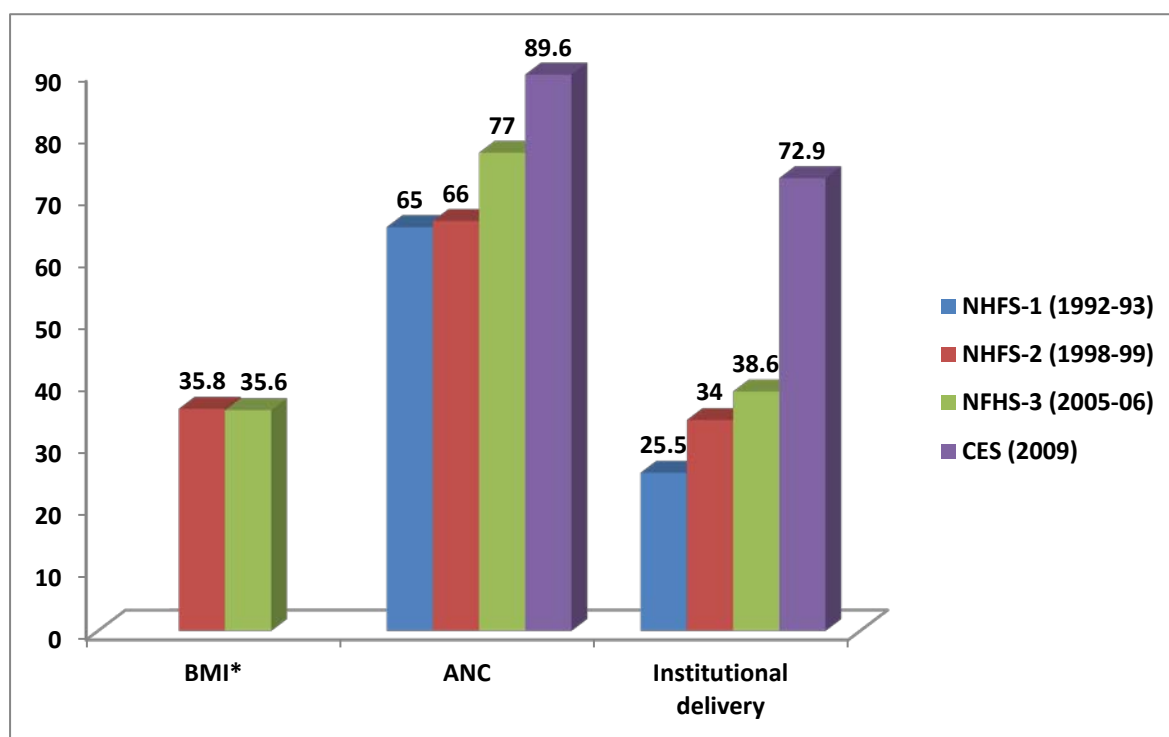
1. Introduction

Maternal undernutrition plays a crucial role in influencing maternal, neonatal and child health outcomes (Mason et al., 2012). With India's commitment to Millennium Development Goal (MDG 4), actions for maternal mortality reduction has received substantial attention. New programme directions and strategies have been introduced. These include focus to increase antenatal service (ANC), institutional delivery coverage and provision of family planning services. With such intensive efforts, health services for women in India have increased substantially and the maternal mortality rate (MMR) has dropped from 301 per 100,000 live births in 2003 to 212 in 2009 (SRS Report, 2009). However, for reaching the MDG target of 109 and for reduction of stunting rates in children, interventions for improving nutritional status of women is crucial but has remained a low priority except for measures directed for reduction of anaemia or policy for providing supplementary food to pregnant women under the Integrated Child Development Services (ICDS) programme of Government of India. Today, the relationship of women's nutrition with birth outcomes, and stunting rates in young children is well established and it is imperative that measures for improving nutritional situation in the country is accorded a high priority.

1.1.Nutrition Situation of Women in India: An Overview

National data (NFHS-1 1993, NFHS-2 1999, NFHS-3 2006, and CES, 2009) reveals that percentage of women with low body mass index (BMI) has remained almost stagnant in the last two decades despite improvement in provision of maternal health services, including institutional delivery which has increased significantly (Fig1). As per the national data (NFHS-3, 2005-06), over a third of women are reported to have low BMI and the undernutrition situation is almost stagnant since 1998-99 (NFHS-1, 1993).

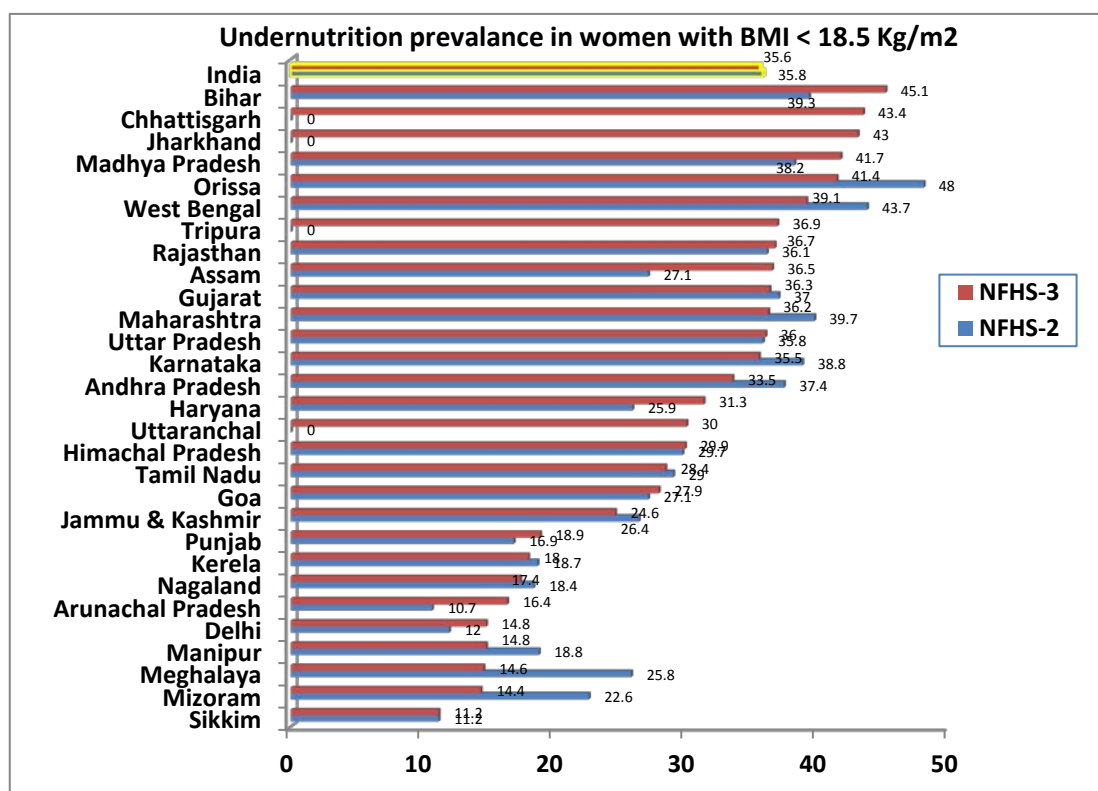
Figure 1: Trend in maternal nutrition and health services



Source: Adapted from (NFHS-1 1993, NFHS-2 1999, NFHS-3 2006) and Coverage Evaluation Survey (2009).

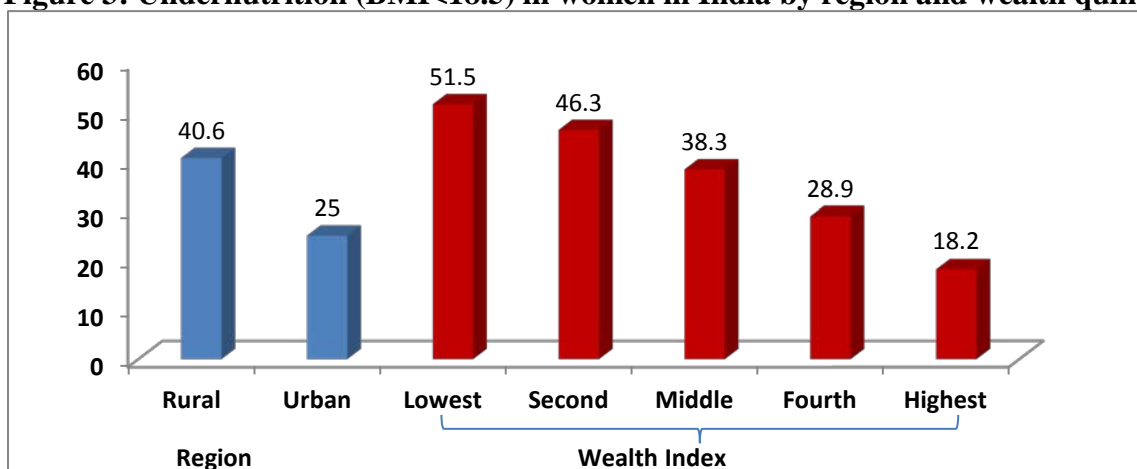
*No data available on BMI for NHFS-1 and CES 2009

There is a wide state-wise variation in rate of undernutrition in women (fig 2). As per the last national survey 13 states in the country have a higher percentage of mothers with low BMI compared to the national average of 35.6 percent (NFHS-6, 2007). A study of state-wise situation between NFHS 2 and NFHS 3 reveals that there has been a substantial decline in undernutrition in women in five states- Mizoram, Meghalya, Manipur, West Bengal and Odisha.

Figure 2: State-wise prevalence of Undernutrition in women in 1998-99 and 2005-06

Source: NFHS (2007)

The prevalence rate of undernutrition in women is much higher in rural areas (40.6 %) compared to urban regions (25 %). The undernutrition rates in women in low wealth index is almost three fold higher compared to highest wealth index (figure 3). Moreover, unlike Nigeria and Ethiopia, a substantial and sharp decrease in undernourished prevalence rate of women is observed in India with increase in wealth quintile (Black et al., 2013). This highlights the significant equity issue which needs to be addressed.

Figure 3: Undernutrition (BMI<18.5) in women in India by region and wealth quintile

Source: NFHS-3 (2005-06)

Overnutrition in women is also being observed to be an emerging problem in India with serious implications on adult onset non-communicable diseases. The rate of

overnutrition (BMI > 25.5) at national level is 12.6 percent with Delhi, Kerala, Punjab and Tamil Nadu having over a quarter of women overnourished. Of these states, only Delhi reports a decline in overnutrition rate between 1998-99 and 2005-6—from 33.8 percent to 26.4 percent (NFHS-2 1993 and NFHS-3, 2006). Interestingly, the state of Assam is observed to have a substantial increase in both undernutrition and overnutrition. States with higher percentage of women with completed elementary education have corresponding lower percentage of undernourished mothers but these states also have a higher percentage of overnourished women (NFHS-3 2006). This is possibly a reflection of gap in knowledge regarding how to use the available resources and execute the decision making power appropriately for nutrition and health care.

Anemia is prevalent across all age groups— about 70 percent young girls below 5 years, 55.8 percent adolescent girls, 56.2 percent women in reproductive age group and 58.7 percent pregnant women are reported to be anaemic. State-wise anemia prevalence rate in women 15-49 years is higher than the cut off prevalence rate of 40 percent, indicator of anemia being a severe public health problem, in all the states of India except five states (Table 1) (NFHS-3, 2006).

Table 1: Anaemia prevalence in women 15-49* years in India# - State-wise Profile

Percentage Prevalence of Anemia	States
< 40% (5 states)	Punjab, Manipur, Mizoram, Goa, Kerala
> 40-60% (16 states)	Delhi, Haryana*, Himachal Pradesh, Jammu & Kashmir, Uttaranchal, Chhattisgarh*, Madhya Pradesh*, Uttar Pradesh, Arunachal Pradesh, Meghalaya, Sikkim, Gujarat, Maharashtra*, Karnataka, Tamil Nadu
> 60% (7 states)	Bihar*, Jharkhand*, Orissa*, West Bengal*, Assam*, Tripura*, Andhra Pradesh*

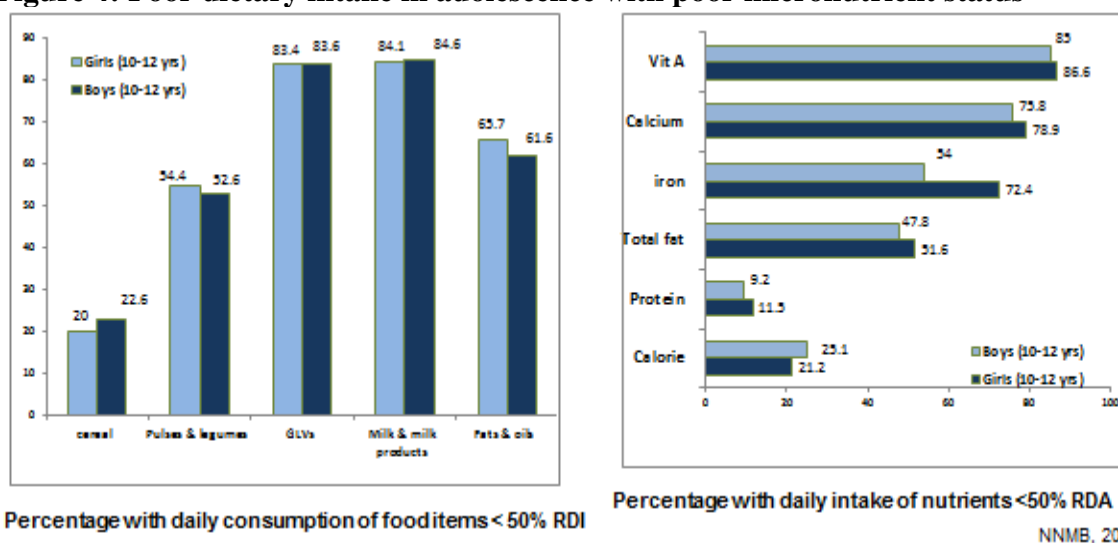
All India anemia prevalence is 55.3%.

* Ten states have anemia prevalence over the national average of 55.3%

Source: NFHS-3 (2006).

Anemia prevalence rate is almost similar in all wealth quintiles in India. Pregnancy greatly increases the demand for iron and other micronutrients. There is almost a ten-fold increase in iron requirements by the third trimester of pregnancy. Most local diets fail to meet such higher needs. The data of the National Nutrition Monitoring Bureau (NNMB) reveals that in rural India, only 23.0 percentage adolescent girls, 15.2 percent adult women and 9.6 percent pregnant women consume over 70 percent of the recommended dietary allowances (RDA) of iron (NNMB, 2012). The main source of iron is from cereals in Indian diet which is high in phytate reduces the availability of iron consumed.

As in case of anemia, the primary cause of undernutrition in women is inadequate consumption of energy, proteins and fats. The NNMB 2012 data pooled from ten states indicates poor intake of nutrients during adolescence and prior to onset of pregnancy and during the period of pregnancy. In 10-12 years girl, except for cereals, intake of pulses and legumes as well as vegetables, milk and fat is extremely low (figure 4) (NNMB 2012).

Figure 4: Poor dietary intake in adolescence with poor micronutrient status

Protein consumption appears high but the source is primarily cereals which provide poor quality protein. No gender difference is observed in consumption of nutrients in boys and girls. The RDA for iron is high in girls and therefore the intake of iron in terms of Percentage of RDA is rather low in girls compared to boys.

As per the NNMB 2012 data, consumption of mean energy and protein is almost identical in pregnant (1773 Calories and 49 grams protein) and adult non-pregnant women (1709 and 47 grams). Only 61 percent of pregnant women report consuming over 70 percent of the recommended dietary allowances (RDA) of energy while only 30 percent consume over 70 percent RDA of protein. No increase in intake of vitamin A and calcium is observed during pregnancy with less than 10 percent consuming >70 percent RDA of calcium while only 13 percent reported to be consuming >70 percent RDA of vitamin A (NNMB, 2012).

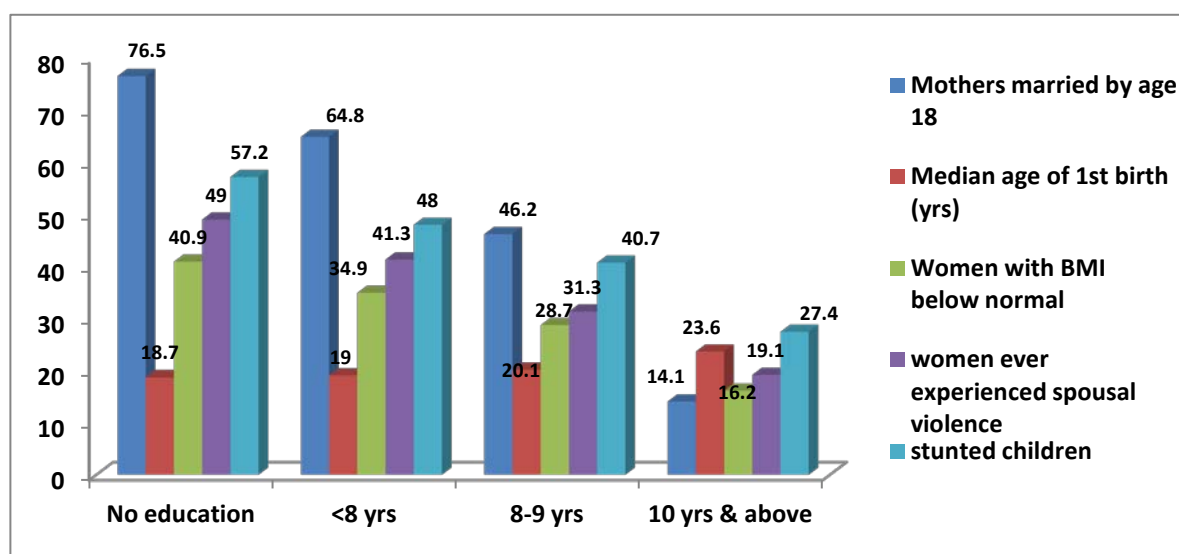
Poor dietary intake combined with excessive energy expenditure due to high levels of daily physical activity, related to agriculture and domestic activities in India has been reported to influence maternal nutrition with adverse impact on birth weight (Rao et al., 2013). A direct relationship between maternal physical activity and birth weight has also been reported (Muthayya, 2009). Working in farms, fetching fuel wood and water are other activities by women are energy consuming and influence energy balance with significant negative impact on preventing weight gain with adverse impact on birth outcomes. Moreover, farming activities have a seasonal energy stress on women depending on lean or harvesting period of farming with its impact on energy balance and impact on pregnancy outcome.

Besides poor purchasing power and low consumption of diversified food, factors such as early marriage, conception at a young age of below 20 years, women entering pregnancy with poor nutrition and poor knowledge of self-care play a central role in maternal under nutrition. Marriage and conception before the age of 18 years is a major contributory cause of undernutrition in women. In India, percentage of women 15-19 years who have begun child bearing is 16.0 percent. Of these, 2.5 percent are reported to have begun child bearing at 15 years while 42.9 percent are reported to have begun child bearing between 16-18 years and 35.7 percent of by 19 years of age (CES, 2009). The proportion of women age 15-19 years who have begun child bearing is more than twice as high in rural areas (19 percent) compared to urban areas (9 percent). Early marriage combined with social pressure to prove fertility

increases adolescent conception which hinders the second growth spurt of adolescent girls (NFHS-2, 1999). Such mother's often enter pregnancy with poor height and weight.

Poor education and knowledge of women, low status in society, inadequate decision making power are some of the important underlying causes resulting in poor maternal health and nutrition situation. An analysis of the National Health and Family Survey-3 (NFHS-3) data reveals that with increase in level of education of women, there is reduction in percentage of adolescent marriage, increase in mean age of first birth, decrease in spousal violence as well as decrease in percentage of women with low BMI (figure 5) (NFHS-3, 2006 and Addo et al., 2013). It has been reported that "if women and men had equal status in South Asia, with other factors remaining unchanged, the percentage of underweight children would be reduced by 13 percentage points (from 46 percent to 33%)—roughly 13.4 million children (Bhatia et al., 1988).

Figure 5: Women's education and trend in maternal factors and stunting in children



Source: NFHS-3 (2005-06) and NNMB Survey (2012)

Education empowers women and higher level of education can be considered a proxy indicator of increase in the decision making power of women. This is also reflected in experience of violence reported by women with level of education (figure 5). Overall, 39.7 percent women in India report having suffered emotional, physical or sexual violence. Domestic violence against women plays an important role in women's nutrition through its adverse impact on self and child care practices as well as possibly by having an adverse impact on metabolism. The pathways relating impact of domestic violence on nutrition and growth are not very well understood (Yount et al., 2011).

1.2. Undernutrition in Women and Poor Birth Outcome

Poor maternal nutritional status of woman before and during pregnancy such as short maternal stature due to mother's own childhood undernutrition, low BMI at conception and inadequate gestational weight gain due to poor dietary intake has serious implications on birth outcome (UNICEF, 2013). Maternal malnutrition leads to intrauterine growth restriction (IUGR) and low birth weight (Mason et al., 2012). Association between maternal nutrition and birth outcome is complex and is influenced by many biologic, socioeconomic, and demographic factors, which vary widely in different populations.

Almost a quarter of children in India, estimated 7.5 million babies each year, have a low birth weight of less than 2.5 kg (UNICEF, 2013). In fact, India is one of the five developing countries where the incidence of LBW exceeds 20 percent and accounts for one third of the global burden of LBW (Fig 6). The situation of LBW in India is possibly worse since the data is primarily based on birth weight records of institutional delivery. Despite an increase in institutional delivery to 73 percent in 2009, only three fourths of institutional delivery babies are weighed before discharge (UNICEF, 2013).

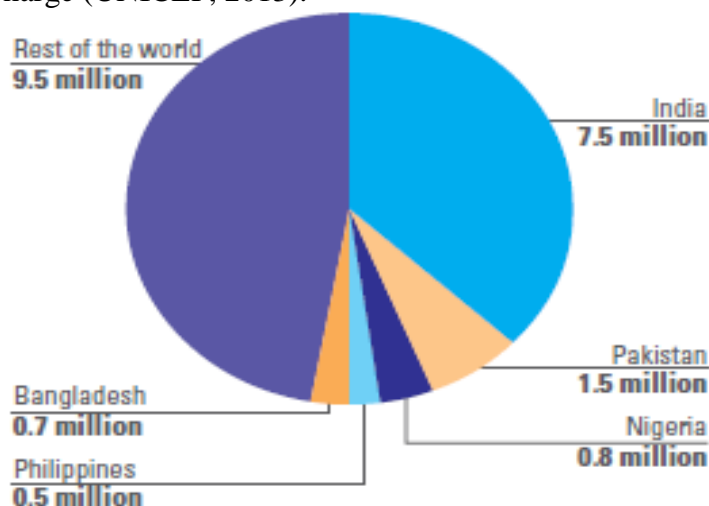


Figure 6: Low birth weight (< 2500 g) prevalence in India and South Asian countries
Source: UNICEF (2013)

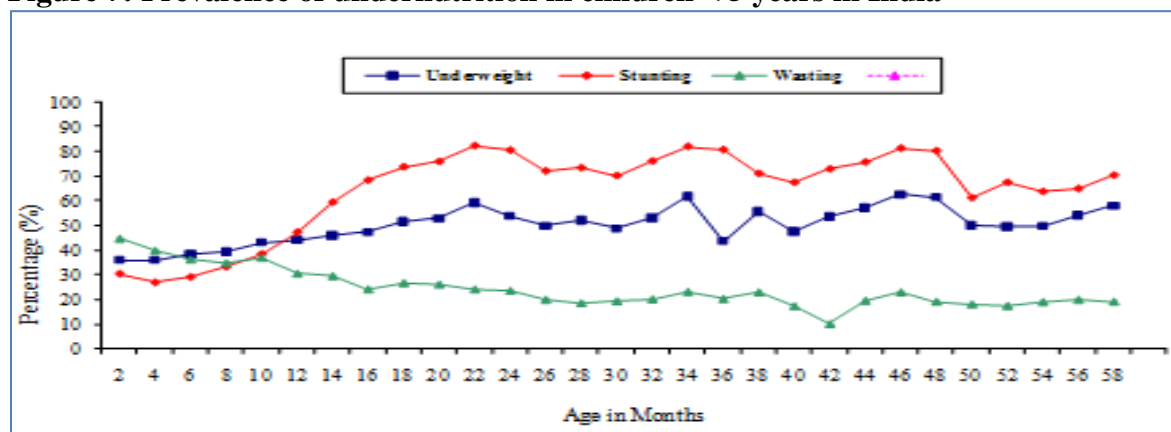
Incidence of LBW is 3-4 times higher in mothers who are adolescent or below 18 years as compared to those over 18 years (NFHS-1, 1993). Low birth weight and preterm delivery are twice as common and neonatal mortality is almost three times higher in adolescent pregnancies than adult pregnancies (NFHS-3, 2006). Poor nutrition in utero and during early childhood in girls constraints future capacity to support healthy and foetal and infant growth and this capacity is further diminished by continued poor nutrition throughout lifecycle (CES, 2009).

Longitudinal study from India confirms that LBW children have a poor start in life and continue to grow rather poorly and rarely catch up in growth (Ghosh et al., 1971). A recent analysis using data of low and middle income countries, it was noted that LBW is associated with 2.5 to 3.5 fold higher odds of wasting, stunting and underweight in children. The analysis reveals that childhood undernutrition may have its origins in the foetal period, suggesting a need to intervene during pregnancy to prevent foetal growth retardation and pre-term birth (Christian et al., 2013). High incidence of LBW sets up a vicious cycle of stunting that passes from generation to generation, contributing to high number of stunted children and short adults with small pelvic size with risk factors for delivery complications, morbidity and mortality.

The impact of LBW is evident from an analysis of age-wise trend in undernutrition (figure 7) (NFHS-3, 2006). Almost a third of children in India are stunted by the time these infants are six months of age. This is to great extent a result of poor growth of LBW infants which contribute to stunting in children in the first six months of life itself. The serious implication of undernutrition in women on the prevalence rate of childhood stunting is evident. Poor child feeding practices and high incidence of ill health add to the problem of

undernutrition in children. As indicated in the figure below, stunting prevalence rate of almost 20 percent at six months continues to increase sharply beyond 6 months and stabilises at around 55 percent by two years of age (NNMB, 2012 and Addo et al., 2013). This slow growth and stunting is largely irreversible. The first 1000 days, from conception to 24 months of age, is therefore referred as the “window of opportunity” for addressing undernutrition in children. Maternal malnutrition therefore needs to be recognised as a key contributor to poor foetal growth, LBW, infant morbidity and mortality and can cause long term irreversible and detrimental cognitive, motor and health impairments (Rao et al., 2013).

Figure 7: Prevalence of undernutrition in children < 5 years in India



Source: NFHS-3 (2005-06)

Women’s anthropometry in the pre-pregnancy period is considered a strong predictor of LBW. In India, mean birth weights of infants born to mothers below 45 kg is reported to be about 2.63 kg as compared to mean birth weight of 3 kg in case of mothers 55 kg and above (Ramachandran, 1989). Besides weight, maternal stunting (<145 cm) increases the risk of both term and preterm small for gestational age (SGA) babies (Black, et al., 2013). An association of birth weight and economic situation of mothers has also been reported with poor mothers having lower height and weight (NNMB, 1979-2006). Several studies have reported a positive relationship between maternal anthropometry such as weight, height, body mass index (BMI) and birth weight (Rao, 1986).

The significance of BMI of mothers in contributing to undernutrition in children was first statistically studied and reported in India in 1999. A regression analysis of data of the nutrition survey undertaken by the Institute of Applied Statistics and Development for the State Government of Uttar Pradesh revealed that the four highest loading risk factors for stunting rate in children were BMI of mother, literacy of mother, child age and hygiene practices with factor loading being 1.30, 1.27, 1.26 and 1.19 (Vir SC, 2011). Recent analysis of the National Family Health Survey (NFHS 3) undertaken by the National Institute of Medical Statistics also reveals that most of the highest risk factors contributing to undernutrition in children under two years in India pertain to situation of women and these include factors such as no education of mothers, low maternal height, mothers with no institutional delivery, households with low standard of living and households with no toilet facility (Adhikari et al., 2014).

2. Addressing Women’s Nutrition: A Challenge

Interventions for improving women’s nutrition gained attention in 1998 when the conceptual framework of undernutrition in children positioned maternal nutrition as an

important underlying cause and stressed on breaking the inter-generation cycle of undernutrition (UNICEF, 1998). In recent years, the need to concentrate in the first 1000 days of life for prevention of undernutrition has been emphasised (World Bank, 2006). In 2008, along with promotion of infant and young child feeding practices, improving nutritional status of women and adolescent girls been included in the set of selected high priority direct essential nutrition interventions proposed for reducing undernutrition rates in children in developing countries (Bhutta, et al., 2008). These global guidelines were further contextualized with reference to India's nutritional epidemiology and a list of ten nutrition interventions was proposed by the Nutrition Coalition of India which include actions for improving nutrition of adolescent girls and pregnant women (The Coalition, 2010). The interventions refer to prevention of anemia and iodine deficiencies in adolescent girls and women as well as provision of food supplements to disadvantaged women. Policies for these interventions have already been issued by the two nodal ministries of the Government of India—Ministry of Health and Family Welfare (MHFW) and Ministry of Women and Child Development (MWCD). The micronutrient programmes are managed by MHFW while provision of food supplements as supplementary Nutrition Programme (SNP) to meet one third of energy and protein requirements of pregnant and lactating women has been a part of the ICDS programme of MWCD since its inception in 1976 (Evaluation report on ICDS, 2011). Policy guideline regarding composition and cost of the supplementary food has undergone a number of changes in the last four decades (Evaluation report on ICDS, 2011). The food supplement policy of ICDS has also shifted from targeted pregnant and lactating mothers approach to universal coverage. However translating policy into action has been rather poor with less than a quarter of women reported to be receiving supplementary food (NFHS-3, 2006).

Other initiatives launched in the last five years to improve the health and nutrition situation of women are with reference to improving health and nutrition of adolescent girls. The Adolescent Reproductive Sexual Health (ARSH), the adolescent health programme of MHFW and Rajiv Gandhi Scheme for Empowerment of adolescent girls (RGSEAG) or SABLA programme of MWCD. These programmes offer opportunity to improve nutritional situation of adolescent girls. ARSH aims to educate youth about their sexual and reproductive health and the availability of youth-friendly services to encourage them to access health services SABLA programme is being implemented in 200 districts in India (NRHM 2006). Additionally, the Weekly Iron-Folic acid Supplementation (WIFS) programme, launched as pilot projects a few states of India in mid- 2000, has today been scaled up in the entire country by the MHFW. Deworming at 6 monthly intervals is a part of the WIFS programme guidelines (WHO, 2010). The model of WIFS programme exists for adolescent girls enrolled in government run schools and for non-school going girls. Reaching of out of school adolescent girls is primarily through the ICDS programme. A number of innovations have been experimented such as using adolescent kitty group forum for not only WIFS but for providing inputs for family life education which has been successfully piloted in the state of Uttar Pradesh (WHO, 2010).

A review of India case study indicates nutrition counselling during pregnancy is not explicitly included in the ANC package. The dietary intake and weight gain remains also a low priority.³⁰ (Incomplete Reference, 2012). The launch of the Reproductive, Maternal, Newborn , Child and Adolescent Health (RMNCH+A) approach by the Ministry of Health and Family Welfare is a confirmation of the significance now being attached by Government of India to continuum of care approach in the development of state, district, block and panchayats plans of action (Table 2) (NRHM, 2013). A few interventions, such as provision

of only folic acid supplement in the pre-conception period have been included for the first time in a programme in India. Effective implementation and scaling up interventions remains the primary challenge.

Table 2: Continuum of care across life cycle and different levels of health system

	Reproductive care	Pregnancy and child birth care	Newborn and childcare	
Clinical	<ul style="list-style-type: none"> Comprehensive abortion care RTI/STI case management, Postpartum IUCD and sterilisation; interval IUCD procedures Adolescent friendly health services 	<ul style="list-style-type: none"> Skilled obstetric care and immediate newborn care and resuscitation Emergency obstetric care Preventing Parent to Child Transmission (PPTCT) of HIV Postpartum sterilisation 	<ul style="list-style-type: none"> Essential newborn care Care of sick newborn (SNCU, NBSU) Facility-based care of childhood illnesses (IMNCI) Care of children with severe acute malnutrition (NRC) Immunisation 	
Outreach/Sub centre	<ul style="list-style-type: none"> Family planning (including IUCD insertion, OCP and condoms) Prevention and management of STIs Peri-conception Folic acid supplementation 	<ul style="list-style-type: none"> Full antenatal care package PPTCT 	<ul style="list-style-type: none"> Postnatal care Early detection and management of illnesses in mother and newborn Immunisation 	<ul style="list-style-type: none"> Child health care First level assessment and care for newborn and childhood illnesses Immunisation Micro-nutrient supplementation
Family & Community	<ul style="list-style-type: none"> Weekly IFA supplementation Information and counselling on sexual reproductive health and family planning Community based promotion and delivery of contraceptives Menstrual hygiene 	<ul style="list-style-type: none"> Counselling and preparation for newborn care, breast feeding, birth preparedness Demand generation for pregnancy care and institutional delivery (JSY, JSSK) 	<ul style="list-style-type: none"> Home-based newborn care and prompt referral (HBNC scheme) Antibiotic for suspected case of newborn sepsis Infant and Young Child Feeding (IYCF), including exclusive breast feeding and complementary feeding, Child health screening and early intervention services (0–18 years) Early childhood development Danger sign recognition and care-seeking for illness Use of ORS and Zinc in case of diarrhoea 	
Intersectoral: Water, sanitation, hygiene, nutrition, education, empowerment				

Source: NRHM report (2013)

Provision of calcium supplements is under consideration for inclusion in the national ante natal care services guidelines. As per the WHO guidelines, daily calcium supplement of 1.5-2 grams elemental calcium /day is recommended from 20 weeks of pregnancy and micronutrient supplementation during pregnancy has also been recommended as key proven practices (WHO, 2013). Micronutrient supplementation trial in India is limited. Multi-centre research on use of micronutrient supplements is needed in India to help quantify the efficacy and effectiveness of interventions in different settings with vast variation in dietary habits, seasonal variations and accessibility to vegetables and fruits.

In the past two years, a new incentivised programme *Indira Gandhi Matritva Yojna* (IGMSY) for pregnant mothers has been launched in 52 selected districts across the country by the Department of Women and Child, as a part of the ICDS programme (IGMSY, 2011). The Scheme is designed to address socio-economic problems of pregnant women. The 12th Five Year Plan of the Government of India aims to scale up the IGMSY scheme in the entire country and is included as a component of the Food Security Bill (National Food security Act, 2013).

In the last five-seven years, a number of state governments have demonstrated high level of political commitment for addressing undernutrition with focus on the first 1000 days of life. In the state of Odisha, attention has been directed to strengthen the supply of supplementary nutrition and improve maternal care services (WCD, GoOdisha, 2011). In late 2011, decentralized production and supply of Ready to Eat (RTE) foods for pregnant and lactating mothers, as Take Home ration (THR) supplementary food, is managed by self- help groups (SHG) of women. Another major initiative of the state government is the launch of the MAMTA (literal meaning ‘maternal love’) scheme, a conditional maternity benefit cash scheme (WCD, GoOdisha, 2011). The current evaluation of MAMTA programme is expected

to facilitate in modifying the scheme with reference to broadening of cash incentive support to include actions essential for improving maternal nutrition such as regular weighing of pregnant mothers, recording and counselling on weight gains, counselling undernourished pregnant women on dietary practices and ensuring high compliance of iron-folic acid tablets.

Nutrition Missions have been launched with high political visibility, support and commitment in the states of Maharashtra, Gujarat and Uttar Pradesh. Specific interventions to improve maternal nutrition for reduction in the incidence of LBW and improving child nutrition situation are important components of the state missions. One of the primary interventions of the State Nutrition Mission of Maharashtra (*Rajmata Jijau Mother-child Health and Nutrition Mission*), launched in 2005, is to improve children's birth weight by intensifying efforts on promoting weight gain during pregnancy, as a part of ANC services.

Maternity protection laws is another important measure for improving maternal and child nutrition in India with women increasingly getting engaged in employment in formal and non-formal sector in urban India (Imdad and Bhutta, 2011). In other developing countries, such as Sri Lanka and Vietnam, care of working mother is a high priority. Maternity leave in government and private jobs combined with advocacy and persuasion of exclusive breastfeeding and child health care have proved effective in reducing malnutrition. Women in India have maternity rights under the Maternity Act of 1961 and 180 days leave pattern is being followed by most of the formal sector in the states. Effective implementation of maternity leave policy is important for ensuring provision of an appropriate maternal and child care support.

Besides direct nutrition actions, there is increased appreciation of the significance of simultaneously addressing collaborative partnership across various sectors with the objective of improving women's education, economic and social status. In India, special incentive based strategies and schemes have been introduced by the various state governments for promoting completion of school education by girls. Education system could also be effectively used for systematically introducing health and nutrition education to the girls enrolled in middle and high school.

Evaluation of Janani Suraksha Scheme (JSY), a conditional cash transfer scheme, reveals a significant effect on increasing antenatal care and in-facility births with an effective reach and coverage of families who are below poverty line or BPL families (Lim et al., 2010) and Programme Evaluation of JSY, NHSRC (2011). JSY offers a platform to reach the poorest and most disadvantaged women with improved coverage and quality of ANC services, including counselling on diet, weight gain monitoring and IFA consumption.

Special efforts are also being directed to empower women and address the issue of gender inequality and limited decision making power. Inequalities caused by poverty, landless situation etc. are recognized to be critical in influencing nutritional and health status of women. Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) Scheme offers an opportunity to improve the economic situation. About a third of work force of MGNREGA is stipulated to be women for unskilled manual work. A special attention to enrol pregnant and lactating women in MNREGA and assigned 'soft' or sedentary jobs, instead of manual work, could be considered. Such jobs could include sanitary napkin production at local level, weaving or tailoring work, counselling in family care sessions etc. Involvement of pregnant women in MNREGA could yield not only social-economic improvement but also

influence in conservation of energy with resulting benefits in weight gain, growth of foetus and improvement in child's nutrition.

In the 12th Five Year plan, a multi-sector approach is also being accorded special attention for maintaining a focus on equity and ensuring that most disadvantaged are reached through involvement of sectors beyond health and ICDS. Platforms of self-help or microcredit groups, livelihood programmes, agriculture men groups, seed bank group, public distribution system etc. are planned to be used to reach women who are missed out by health or ICDS systems. Investing in strategies of linking nutrition interventions with such non-traditional programme platforms is being systematically explored in high priority 200 districts in the first phase (Planning Commission, 2012).

In India, women are at risk of entering pregnancy undernourished. Tracking the newly-weds and linking health and nutrition interventions until onset of first pregnancy is critical. Involvement of private sector in reaching adolescent girls and women from higher wealth quintile is also crucial since over a third of the women in this group are also undernourished and anaemic. Moreover, the problem of overnutrition is also increasing and timely preventive measures are required where private sector along with school system could play an important role. Social marketing of IFA tablets as well as low cost nutrient dense supplement for promoting minimum weight gain of mothers are interventions which could be spearheaded by the private sector. The challenge of the private sector is to disseminate knowledge on proposed interventions, create demand for services and market product and services.

Periodical update of national and state data on women and child nutrition situation, dietary and nutrition intake pattern, maternal weight gain pattern, birth weight scenario and programme impact data through surveys and evaluations is critical. Systematic analysing of raw data as undertaken by IASDS in UP state and at the national level by the National Medical Statistics Institute are critical for effective advocacy, programme planning and for enhancing commitment and investment in the right direction for seriously addressing the issues of women and child nutrition in the country (Vir SC, 2011 and Adhikari et al., 2014).

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