

Hunger and Malnutrition In The Bread Basket of India: Nutritional Status of Children In Punjab

Harpreet Kaur Narang

(Department of Economics, SGTB Khalsa College/ University of Delhi, India)

Abstract:- Within the three aspects of food security-availability, economic access, absorption/nutritional security-there has been a growing concern for the latter, ever since the World Food Summit in 1996. The prevention of malnutrition-an essential investment in human capital, is the basic foundation for the achievement of the Millennium Development Goals. Because of uneven economic growth and growing inequities in the South Asian region faster economic growth in the last two decades has failed to have an impact on under nutrition rates. It still ranks first in the global estimates of undernourished children and women. Since Punjab, the food abundant state, helped India achieve food self sufficiency during the Green Revolution of the 60s, it seems paradoxical to investigate into the nutritional well-being of its people. However given the agrarian crisis, ecological crisis, growing unemployment, inequities in access, institutional and gender based discrimination, poor status of women and declining public investment in rural development, the under nutrition epidemic in this presumably prosperous state deserves a special attention.

Keywords – *Anaemia, Stunting, under nutrition, Underweight, Wasting*

I. INTRODUCTION

Today ‘nutritional security’ is considered as, one of the most important aspect of food security. The concept of ‘food security’ has evolved from just a focus on ‘availability’ in the 70s to include ‘economic and physical access’, in the mid 80s. By the mid 90s there was a growing concern for ‘food safety’ and ‘nutritional balance’ needed for an “active, healthy life”. Thus, in the World Food Summit, 1996 food security was defined at the individual, household, national, regional and global levels as (being achieved) when all people, at all times, have physical & economic access to sufficient, safe & nutritious food to meet their dietary needs and food preferences for an active & healthy life.

Globally, maternal and child under nutrition contribute to 3.5 million deaths every year and account for 11% of total global Disability Adjusted Life Years (DALYs), that equate to lost years of healthy life. Disability Adjusted Life Years (DALYs) is a measure of the burden of ill health taking into account the reduced life expectancy and quality of life. It is an estimate of lost years of healthy life (DFID, 2009). Of the 112.4 million underweight children, globally, 33% are in South Asia; of the 178 million stunted children under 5 years of age, 112 million are in South Asia (DFID, 2009).

The positive economic impact of good nutrition include direct gains in productivity and lifetime earnings, savings of resources currently being directed to health care, disease treatment and so on; indirect gains arise from links between nutritional status, schooling and cognitive development as well as subsequent adult productivities. Evidence indicates that the benefit-cost ratios of investing in direct nutrition are high. It has been estimated that just by preventing micronutrient deficiencies India would save \$2.5 billion per annum (DFID, 2009). Under nutrition is a concentrated epidemic, but of a low national priority. The recent data shows that though many countries are on track in improving income poverty (MDG1a), less than a quarter of the developing countries are on-track for achieving the goal of halving under nutrition. Moreover 80% of the world’s undernourished live in just 20 countries in the world (DFID, 2009). In 13 of these 20 countries, mainly in Sub Saharan Africa and south Asia, nutrition is given a very low priority. Economic growth has failed to have a significant impact on under nutrition rates because of uneven growth and inequity. Nutrition is essentially a foundation for the attainment of the Millennium Development Goals. Improved nutrition will significantly reduce child and maternal mortality; improve educational outcomes and increase productivity and growth. Prevention of malnutrition is therefore a long term investment which greatly benefits both present and successive generations and preserves human capital.

Investing in nutrition has been recognized as the key way to advance global welfare by the G8. The UN Secretary General has included the elimination of stunting (inadequate height for age) as a goal in his Zero Hunger Challenge. In the most recent Copenhagen Consensus a panel of top economists selected stunting reduction as a top investment priority. The World Health Assembly has set the goal of achieving a 40% reduction in the number of stunted children under 5 years old by 2025 (UNICEF, 2013).

II. OBJECTIVES AND METHODOLOGY

The aim of the paper is to analyze the various manifestations of chronic and hidden hunger in Punjab, especially amongst the vulnerable sections of the people of Punjab. Food absorption problems manifest in the form of an unhealthy population consisting of malnourished adults with low body mass index and suffering from diseases. Children are stunted, underweight and wasted. Prolonged malnutrition, disease and morbidity, impairs the mental and physical faculties of a person and may lead to outcomes like premature deaths and shorter life spans. In this, maternal health care and child health care are of utmost importance for the nutritional well being and productivities of the future generations.

The data used in the investigation is mainly secondary data provided by the Ministry of Health and Family Welfare, Government of India, the Department of Planning, Government of Punjab; and international development institutions like UNICEF, Department for International Development (DFID), the World bank and the World Health Organisation. Various secondary data sources have been used like National Sample Survey Organisation (NSSO), National Family Health Survey (NFHS rounds 2 &3), Census data, National Nutrition Monitoring Bureau (NNMB surveys), District Level Household Facility Survey (DLHS- 3& 4) conducted by International Institute of Population Sciences (IIPS) and various state level reports.

There are limitations with the data used. For example, the most recent NFHS-4 survey results have not been released for the state of Punjab. Therefore mainly the DLHS-4 survey, 2012-13, results have been used. This data, along with the NFHS-3 survey results have been relied upon even by the state's most recent "Mother and Child Health Action Plan, 2014-17".

The DLHS surveys have been undertaken by the Ministry of Health and Family Welfare, Government of India, with the objective to provide reproductive and child health related database at the district level in India. In the DLHS-4 survey, field work in Punjab was conducted during January to August 2013, gathering information from 33,662 households, 31,670 ever married women and also from 983 health facilities. At the district level, all Community Health Centres, District and sub-divisional hospitals, Sub-Health Centres and Primary Health Centres were covered. Moreover most of the focus is on rural Punjab as almost more than two-thirds of the population is rural. Wherever possible the rural-urban and gender based disparities have been highlighted.

III. UNDER-NUTRITION: DETERMINANTS, CONCEPTS

Nutrition fundamentally determines life chances and people's ability to convert opportunities into outcomes. The consequences are long term, intergenerational and irreversible. The effects of poor foetal growth and/or stunting and the resultant cognitive-social impairment in the first two years of life are sustained into adulthood. Data supports a strong association between maternal & child under nutrition and adult short stature, reduced school attendance and diminished economic potential (DFID, 2009). The most essential and critical goal of nutrition intervention policies is to boost the lifetime wellbeing of the individual and weaken the intergenerational cycle of poverty. For achieving this goal the two basic forms of direct interventions include the improvement of nutritional status of women before and during pregnancy and secondly, improving of the nutritional status of infants in the first two years of life.

There are three key determinants critical for good nutrition (World Bank, 2014). These are:

1. Food care- A minimum acceptable diet as defined by WHO: 0-6 months: exclusively breast fed; 6-8 months: breastfeeding along with supplementary foods from 3 or more food groups fed at least twice a day; 9-24 months: At least three meals a day with food from 4 or more food groups.

2. Health Care- includes regular antenatal visits; age appropriate immunisations; birth through skilled attendants; mother's BMI greater than threshold.

3. Environmental hygiene- Good hygiene with proper water and sanitation practices.

Another important key factor that adversely affects all the three determinants and hence nutritional security of children is the poor status and poor health of women. It directly affects the anthropometric status of children. This is one of the major reasons why Indian children are extraordinarily short compared with even some of the poorest countries of the world (Coffey et al, 2013).

Ultimately, all causes are embedded in the larger political, economic, social and cultural environment. Institutional discrimination and social exclusion equally contribute to under nutrition. Food insecurity, ill health, sub-optimal practices and poor sanitation-are all closely related to poverty.

IV. NUTRITIONAL SECURITY IN PUNJAB

It is a known fact that Punjab is a food abundant state and therefore one expects no problems related to the 'availability' aspect of food security. However given the inequity in access, institutional and gender based

discriminations, poor child feeding practices and micronutrient deficiencies, the ‘absorption’ aspect or ‘nutritional security’ deserves a special attention. This section makes an attempt to focus on the following main aspects of nutritional security in Punjab:

- 1 The outcome of proper absorption, indicated by nutritional status of the population, especially children, women and marginalised sections, through a focus on the key demographic indicators of health in Punjab and the relative position of the state in the Indian and global context.
- 2 A special emphasis on the nutritional status of children in Punjab through a look at the anthropometric indices of children, immunisation status, child feeding practices, birth weight and micronutrient deficiencies.

4.1 Key Demographic Indicators of Health

The child mortality rates and maternal mortality ratio are basic and crucial indicators of health and living conditions in a society. Out of the 8 Millennium Development Goals (MDG), MDG4 is to reduce child mortality by 2/3rds between 1990 and 2015. Two of the key indicators for monitoring the progress towards this goal are the under5 mortality rate (U5MR) and infant mortality rate (IMR).

4.1.1 Global Trends

Globally, under nutrition is the underlying cause of death in an estimated 45% of all deaths among children under 5 years of age. The first target (target1c) of the Millennium Development Goals is to halve the proportion of people who suffer from hunger, between 1990 and 2015. The indicator used to measure the progress towards this goal is the percentage reduction in the proportion of underweight children less than 5 years of age. Between 1990 and 2013 this target was met only in the AMR (Region of the Americas), EUR (European Region) and WPR (Western Pacific Region) WHO Regions. Globally there was a 40% reduction in underweight children less than 5 years of age from 25% to 15%. In the developing regions of the world, including India, the corresponding reduction from 28% to 17% was close but did not meet the MDG1c target (World Health Statistics, WHO, 2015). The MDG target 4A and 5A was to reduce the Under 5 Mortality Rate (U5MR) by 2/3rds and the Maternal Mortality Ratio by 3/4th, between 1990 and 2015. Globally, there was a 49% decline in U5MR from 90 deaths per 1000 live births to 46 deaths per 1000 live births over the period. This was a substantial progress but it not only failed to meet the MDG target but was not even on track. In the MMR, the global reduction rate is even worse it is a mere 45% against the targeted 75%. Although there has been a substantial progress of 64% in the South East Asian Region, it could not meet the MDG target (World Health Statistics, WHO, 2015). There are glaring differences in the basic demographic indicators of child and maternal health between developed and developing countries. Even within the developing Asian countries India has one of the worst positions. Countries like China, Malaysia, Indonesia, Philippines, Bhutan and even Sri Lanka have made remarkable progress in improving their child mortality indices. Globally, Punjab’s position is similar to that of Bangladesh and Nepal, which is slightly better off than the Indian averages. This is confirmed by table1.

Table 1: Demographic Indicators of Health, International comparisons, 2011-15

Region/countries	MMR	TFR	IMR	U5MR	NMR
Developed					
Australia	6	1.9	3	4	2
France	8	2	4	4	2
Germany	6	1.4	3	4	2
Japan	5	1.4	2	3	1
United Kingdom	9	1.9	4	4	2
United States	14	1.9	6	7	4
Neighbouring/Asian					
Bangladesh	176	2.2	31	38	23
Bhutan	148	2.1	27	34	18
China	-	-	11	12.7	7.7
Indonesia	126	2.5	23	27	14
Malaysia	40	2.0	6	7	4
Nepal	258	2.3	29	36	22
Pakistan	178	3.7	66	81	46
Philippines	114	3.0	22	28	13
Sri Lanka	30	2.3	8	10	5
India	206	2.5	42	55	31
Punjab	172	1.8	28	38	24

Source: World Bank data, 2011-15. www.data.worldbank.org Data for Punjab-SRS Bulletin, 2011.

4.1.2 Basic Demographic Indicators of Health in Punjab

Infant and child mortality rates are considered as the most reliable indicators of quality of life and socio economic conditions of a country. An attempt has been made to analyse the demographic indicators of health in the following table.

Table 2: Basic demographic indicators of health, current status and targets in Punjab

Indicator	Current Status		Projections (P) & Targets (T) for Punjab			
	India	PJ	2014-15		12 th plan (2017)	
			P	T	P	T
Maternal mortality Ratio, (2011) ^a	212	172	132	95	121	78
Total fertility rate (2013)	2.5	1.8	To maintain replacement level			
Under5 mortality rate (SRS 2011)	55	38	-	26	-	20
Infant mortality rate (SRS 2012)	42	28	22	20	19	16
Neonatal mortality rate (2013)	12	16	20	17	18	13

Sources: Data on Punjab: Punjab State Government Report, Dec 2013 on “Mother and Child Health Action Plan

(2014-17)” pp23-35. For Data on India and other states: All India Report on Health, 2011, pp62-63, Ministry of Health and Family Welfare, GOI & NIPCCD, 2014, pp 70. a. Maternal Mortality Ratio is measured as per 100,000 live births while all other indicators are measured as per 100 live births.

Punjab fares better for all the indices as compared to the all-India averages. However the achievements really fall far behind the targets set for the state, especially the MMR which is still very high at 172 per 100,000 live births, against the target of 78 per 100,000 live births for the 12th five year plan. The only exception is the total fertility rate, which has already reached the desired replacement level of 1.8 (Table2). Moreover there are residence-based and gender-based disparities. The indices of child mortality are worse in rural areas than in urban areas. For example, the infant mortality rate for rural areas is 33 per 1000 live births, while that of urban areas is 25 per 1000 live births (National Institute of Public Cooperation and Child Development, 2014). Differentials in terms of gender are also evident as child mortality rates are higher amongst female children. While under5 mortality rate for girls is 16 deaths per 1000 children, for boys the corresponding rate is 6 per 1000. The discrimination and marginalisation of certain social groups is revealed by a higher child mortality rate amongst scheduled castes (NFHS-3, Punjab State Report, 2008).

In spite of having the lowest poverty ratio and 5th highest per capita incomes in the country, Punjab has per capita expenditure on health which is less than Kerala, Goa, Himachal Pradesh, Sikkim, and even low income states like Tripura and Arunachal Pradesh (Ministry of Health and Family Welfare, GOI, 2011). One is able to appreciate Punjab’s status better when the indices are compared with states like Maharashtra and Kerala. The choice of these two states has been made on the basis of similar income levels and hence expected similarity in standards of living. While Punjab ranks 5th in terms of per capita net state domestic product in 2009-10 (Rs.33198), Maharashtra ranks 4th (Rs.33302) and Kerala ranks 3rd (Rs.35457). However Punjab lags far behind Kerala in terms of maternal mortality ratio, infant mortality rate, under 5 mortality rate and neonatal mortality rate. For example, while infant mortality rate has come down to 28 per 1000 live births in Punjab, it is still very high when compared with Kerala’s 12 per 1000 live births. It also fares worse than Maharashtra in all these indices despite spending more on health as measured by the per capita health expenditure in these two states (NIPCCD, 2014).

4.2 Nutritional Status of Children

Healthy children grow into healthy adults who are strong, more productive and an asset for the nation. The micronutrient deficiencies and ill health that is acquired from mother to child during the first two years of life are irreversible and cause permanent damage to cognitive and mental development of a child. Thus nutritional status of infants, younger children, pregnant and lactating mothers is of utmost importance for nutritional security (NFHS-3, Punjab State Report, 2008). Inadequate diets, heavy burden of disease, poor health care services, poor status and health of Indian women, social and gender based discrimination and marginalisation of certain sections of the population, directly affect the anthropometric status of children.

4.2.1 Anthropometric Indices of Nutritional Status

Stunting (inadequate height for age), wasting (inadequate weight for height), and underweight (inadequate weight for age) are the three anthropometric indices of nutritional status. They are a major contributor to child mortality, disease and disability. A severely stunted child faces a four times higher risk of dying and a severely wasted child is at a nine times higher risk. Stunting and other forms of under nutrition

reduce a child's chances of survival, while also hindering optimal health and growth. Through its long lasting adverse impact on cognitive abilities and school performances it affects future earnings and hence the development potential of nations (UNICEF, 2013).

4.2.1.1 Global Trends

Stunting captures chronic exposure to under nutrition; wasting captures acute under nutrition while underweight is a composite indicator that includes elements of both stunting and wasting. Overtime there has been a shift in focus from reducing underweight (MDG1s key indicator) prevalence to prevention of stunting as the key measure of under nutrition.

Stunting An estimated 165 million children under 5 years of age are stunted globally. Of these 80% live in just 14 countries in Sub-Saharan Africa and south Asia.

Table 3: Ranking of 14 countries with the largest number of children under 5 years who are moderately or severely stunted, 2005-11

Rank	Country	Stunting Prevalence (%)	Percentage of Global Burden	Number of Stunted Children (000s)
1	India	48	38	61,723
2	Nigeria	41	7	11,049
3	Pakistan	44	6	9,663
4	China	10	5	8,059
5	Indonesia	36	5	7,547
6	Bangladesh	41	4	5,958
7	Ethiopia	44	3	5,291
8	Dem Rep of Congo	43	3	5,228
9	Philippines	32	2	3,602
10	Tanzania	42	2	3,475
11	Egypt	29	2	2,628
12	Kenya	35	1	2,403
13	Uganda	33	1	2,219
14	Sudan	35	1	1,744

Source: UNICEF Report, April 2013, pp9 www.unicef.org

As can be observed from table 3, India is at the top of the list of 14 countries with the largest number of stunted children. Given the unmatched and phenomenal stunting prevalence both in absolute (61,723,000) and relative terms (48%), India bears the highest percentage of the global burden of stunted children at 38%. Among the rest of the 13 countries, Nigeria and Pakistan bear a burden of 7% and 6%, while the others bear a global burden of 5% or less. Regional and national averages conceal important disparities among population groups. Evidences of child health inequalities exist along several dimensions. There are huge disparities in health outcomes across gender, residence-rural/urban, socio-economic groups, wealth quintiles, and so on. These disparities arise because of differential access to health services, education, and nutrition and environmental factors such as clean drinking water, sanitation, hygiene, air pollution and overcrowding (UNICEF, 2013). Wasting In 2011, 52million children were wasted, globally (UNICEF, 2013).

Table 4: Wasting: Burden Estimates in the 10 most affected countries, 2011

Rank	Country	Wasting (%) Moderate / Severe	Number of wasted children (000s) (Moderate/ Severe)
1	India	20	25,461
2	Nigeria	14	3,783
3	Pakistan	15	3,339
4	Indonesia	13	2,820
5	Bangladesh	16	2,251
6	China	3	1,891
7	Ethiopia	10	1,156
8	Dem. Rep. of Congo	9	1,024
9	Sudan	16	817
10	Philippines	7	769

Source: UNICEF Report, April 2013, pp11 www.unicef.org

As in the case of stunting, South Asia is the region with the highest prevalence of wasting at 16%. In this region approximately one in six children are moderately or severely wasted. Among the 10 most affected countries of the world, India bears 20%, the highest burden of children with an inadequate weight for age. In absolute terms, India has 25,461 wasted children under 5 years, while 8,230 are severely wasted. This exceeds the combined burden of the other 9 high-burden countries (UNICEF, 2013).

Underweight This is used as an indicator to measure progress towards MDG1, which aims to halve the proportion of hunger by 2015. The percentage reduction in the proportion of underweight children from 25% in 1990 to 16% in 2015 was largely driven by greatest reductions in Central and Eastern Europe, Commonwealth of Independent States and East Asia and the Pacific, mainly China. The other regions like Sub Saharan Africa and South Asia showed slow reductions. At the global level, approximately 16% of the children under 5 years old are underweight. Of the 101 million underweight children, the highest proportion that is, 33% or 52 million are in South Asia. This is followed by 30 million or 21% in Sub Saharan Africa. The 25 countries that show insufficient progress towards the goal include India. Again India has a rank 1 in this regard (UNICEF, 2013).

4.2.1.2 Trends in Punjab

Malnutrition is still widely prevalent among pre-school children and is a direct or indirect underlying factor in about 60% of deaths in under-5 children. Stunting, wasting and micronutrient deficiencies have important consequences on children's susceptibility to infectious diseases and cause development delay, which if continued is irreversible (Department of Health and Family Welfare, Punjab, 2013).

The state or national averages conceal many disparities. In terms of gender disparity, while boys and girls are equally likely to be stunted and wasted, a greater percentage of girls are underweight. In terms of caste based differentials, the children of scheduled castes are much more likely to be stunted (44.5%), wasted (13.4%) and underweight (33.9%) than the children of other classes, the corresponding values for which were found to be 30%, 6.3% and 17.8% (NFHS-3, Punjab state Report 2008). Other factors that strongly influence the three indices are the nutritional status of the mother and the wealth index to which the family of the children belong. While 46% of the children born to underweight mothers are stunted, the proportion of stunted children born to mothers with a normal weight is 36%. Correspondingly, as high as more than 50% of the children born in the middle, second and lowest quintiles are stunted (NFHS-3, Punjab state Report 2008).

Table 5: Percentage of children under 5 years of age in rural and urban areas of Punjab in 2012-13, who are stunted, wasted and underweight, as measured by the international norm of 2 SD below the standards set by the World Health Organisation.

Anthropometric Index (below 2SD)	Total		Rural		Urban	
	2012-13	2005-06	2012-13	2005-06	2012-13	2005-06
Stunting	28.8	35	29.1	37.5	28.3	35.1
Wasting	21.1	10	22.4	9.2	18.9	9.2
Underweight	25.2	24	25.8	26.8	24.0	21.4

Source: District Level Household & Facility Survey-4, 2012-13, International Institute of Population Sciences,

Mumbai, pp4; National Family Health Survey- round 3, 2005-06, Punjab state Report, 2008, Ministry of Health and Family Welfare, GOI, pp78.

Table 6: Nutritional Status of children in major Indian states/UTs- percentage of children below 5 years who are wasted, stunted or underweight (below 2SD, WHO standards)-Total (T), Rural (R), Urban (U)

State/UT	Wasting			Stunting			Underweight		
	T	R	U	T	R	U	T	R	U
Andhra Pradesh	23.7	23.4	24.3	27.7	28.7	25.9	27.3	29.2	23.6
Arunachal Pradesh	21.4	20.8	23.9	39.8	41.8	32.4	27.3	27.3	27.2
A&N Islands	21.9	26.1	5.8	31.0	32.2	26.7	28.9	33.1	11.4
Goa	28.4	31.8	26.0	18.7	15.5	21.5	29.5	29.6	29.4
Haryana	32.3	33.5	30.3	31.9	32.1	31.8	36.2	38.0	32.9
Himachal Pradesh	21.6	21.7	20.5	32.4	32.2	36.1	28.5	28.9	23.0
Chandigarh	21.0	29.4	15.3	27.5	30.3	25.6	23.0	26.5	20.6
Karnataka	26.4	27.0	25.4	29.9	29.1	31.3	29.7	29.6	29.8
Kerala	24.1	22.3	25.9	22.7	25.4	20.6	20.9	22.6	19.4

Maharashtra	34.1	34.7	33.3	30.0	30.0	30.0	38.7	39.9	37.2
Manipur	15.7	16.2	14.5	37.7	39.0	32.5	27.4	28.2	25.4
Meghalaya	16.7	17.2	13.1	41.7	42.7	35.2	30.5	31.8	21.8
Mizoram	18.6	19.6	16.0	37.8	41.1	31.9	27.2	31.3	20.3
Nagaland	10.8	9.9	14.3	39.8	41.8	32.4	25.5	26.2	23.0
Punjab	21.1	22.4	18.9	28.8	29.1	28.3	25.2	25.8	24.0
Puducherry	24.8	37.8	20.3	23.4	22.9	23.5	23.8	30.9	21.3
Sikkim	13.1	12.9	14.1	35.0	36.2	26.9	23.6	24.3	19.3
Tamil Nadu	28.3	29.0	27.3	27.3	30.1	23.7	32.5	35.1	29.2
Tripura	16.9	17.3	15.0	38.0	39.5	29.9	27.7	29.2	20.4

Source: State Fact Sheets, District Level Household & Facility survey-4 (DLHS-4), 2012-13, Pages 1-8, International Institute of Population Sciences, Mumbai.

As can be observed from table 5 & 6, even in a prosperous state like Punjab, one-fourth of the children are underweight; 29% are stunted while almost 1 in 5 are wasted. Between 2005-06 and 2012-13, while there is some reduction in the proportion of children who are stunted from 35% to 29%, the proportion of wasted children has in fact doubled from 10% to 21% and the underweight have increased marginally from 24% to 25.2%. This shows that acute and chronic under nutrition is still a major problem in Punjab. Moreover in every state in India, the prevalence of all the three measures of malnutrition are worse in rural than in urban areas. In Punjab, while 18.9% children are too thin for height (wasted) in urban areas, the value for their rural counterparts is 22.4%.

4.2.2 Child Immunisation, Birth Weight and Feeding Practices

The burden of infectious diseases in children is an important determinant of morbidity and mortality. The major contributors to child mortality in India are pneumonia, diarrhoea and malnutrition. The incidence and severity of these depend on environmental factors- clean drinking water, air pollution, sanitation, overcrowding; and impaired immune response caused by low birth weight, inappropriate feeding practices, lack of exclusive breast feeding, artificial feeding and under nutrition. According to WHO, UNICEF and RCH (Reproductive and Child Health) programme, there are 3 key indicators of optimal infant and child feeding practices- initiation of breast feeding within one hour of birth; exclusive breast feeding for the first six months; timely and appropriate complementary feeding after six months along with continued breast feeding. These are important factors that improve nutritional status and reduce mortality and morbidity.

4.2.2.1 Global Trends

Table 7: Ranking of 5 Countries That Account for More Than Half the Global Low Birth Weight Burden

Rank	Country	Number of Infants with Low Birth Weight (million)
1	India	7.5
2	Pakistan	1.5
3	Nigeria	0.8
4	Bangladesh	0.7
5	Philippines	0.5
	Rest of the World	9.5
Rank	Region	Percentage of Infants Weighing less than 2.5 kg at Birth (%)
1	South Asia	28
2	Sub Saharan Africa	12
3	East Asia & Pacific	6
4	World	15

Source: UNICEF Report, April 2013, pp16 www.unicef.org

In 2011, more than 20 million children in the world or 15% infants were born with low birth weight. India again tops the list with 7.5 million infants and she alone accounts for one-third of the global burden. South Asia has the greatest regional incidence (table7). Moreover, in India, only 41% infants are introduced to early initiation of breast feeding and about 46% are exclusively breastfed for 6 months (UNICEF, 2013)

4.2.2.2 Trends in Punjab

In the case of Punjab, the following results emerge.

Table 8: Children (under 2 years of age) who have received vaccination, birth weight and child-feeding practices in 2012-13 (%)

CHILD IMMUNISATION (age 12-23 months)	Total	Rural	Urban
1.Received full vaccination	68.4	67.2	70.7
2.Not received any vaccination	4.7	3.8	6.2
3.Received BCG Vaccination	90.8	91.2	90.1
4.Received 3 doses of DPT vaccination	82.4	82.2	82.8
5.Received 3 doses of Polio vaccination	83.4	83.4	83.3
6.Received measles vaccination	80.4	80.5	80.1
7.Children age 9-35 months who received at l least one dose of Vitamin A supplementation	64.9	66.1	63.0
CHILD FEEDING PRACTICES			
1.Children aged 0-5 months exclusively breast fed			
2.Children aged 6-9 months receiving semi solid food as supplements to breast milk	56.4	55.4	58.0
3.Children breast fed within one hour of birth	74.4	72.7	77.5
	32.9	33.4	32.0
BIRTH WEIGHT less than 2.5 kg			
	10.8	10.3	11.6

Source: District Level Household and Facility survey- Round 4, 2012-13, IIPS, Mumbai, pp 2-3

The average figures in child immunisation, feeding practices and birth weight given in table 8, mask a wide inter-district variation. In Punjab, about 11% of the new-borns are under weight, varying between 16.5% in Mansa to 4.6% in Sangrur. Only 33% of the infants are breast fed within one hour of birth. Here the range is wider from 61% in Jalandhar to 18.6% in Moga. About 56.4% are exclusively breast fed during the first six months, ranging from 83.3% in Ludhiana to 31.3% in Firozpur. Roughly about 74.4% of the infants receive complementary feeding after six months, with the variation from 89.6% in Moga to 54.4% in Jalandhar. Further, it has been documented that a girl child is breast fed for a shorter duration than a boy child (IIPS, 2012-13). In 2012-13, only 68.4% of the children received full vaccination and the proportion was even lower for rural areas. This is a very nominal increase in coverage of full immunisation, when compared to the 60.1% achieved by 2004-05, according to NFHS round-3. Moreover this varied between 42.3% in Mukatsar to 83% in SASNagar. The proportion of children receiving just BCG vaccination is higher, at close to 90% as compared to DPT, polio and measles which is roughly at 80%. In this case rural-urban differentials are not much (IIPS, 2012-13).

4.2.3 Micronutrient Deficiencies among Children

Despite a dramatic increase in food production at the state level, the intake of macro and micronutrients are lower than the RDI (Recommended daily intake) particularly among the vulnerable groups like infants, preschool children, adolescent girls, pregnant and lactating women (Laxmaiah et al, 2002).

4.2.3.1 Anaemia

Iron and folic deficiency is one of the most common deficiencies among children. It leads to impaired cognitive performance and behavioural and motor development, reduced immunity and increased morbidity. The reasons associated with anaemia are not only poor intake and poor absorption of iron and folic acid, but also lack of environmental hygiene that cause infestation of hookworms, especially in rural areas. Two other factors that contribute to anaemia are gender discrimination in providing a nutritious diet and overemphasis on milk and milk products that leads to deprivation of nutrients such as iron.

Table 9: Percentage of anaemic male and female children in rural and urban Punjab

Category of anaemic children (%)	Total	Rural	Urban
Age,0-35months 2005-06	80.1	80	80.5
Age, 0-59 months 2005-06	66.0	-	-
2012-13	65.8	66.3	64.8
Male, age 6-9 yrs, 2012-13	53.6	53.3	54.0
Female, age 6-9 yrs, 2012-13	55.1	55.3	54.7

Male, age 6-14 yrs, 2012-13	50.3	50.9	49.2
Female, age 6-14 yrs,2012-13	53.8	54.5	52.3

Source: District level Household and Facility Survey-Round 4 (DLHS-4), 2012-13, pp3-4; NFHS-3, Punjab State Report, 2008, IIPS, Mumbai, pp 85

As can be observed from the table 9, anaemia seems to be a major problem amongst children in Punjab. In fact, there has been no change in the situation over a long span of time. Between National Family Health Survey Rounds 2 and 3, 80% of the children less than 3 years of age remained anaemic. Also it was found that only 10% children ate iron rich foods in the week before the survey (NFHS-3 Punjab State Report, 2008). Similarly, 66% of the children in the age group of less than 5 years, continued to remain anaemic throughout the decade of 2000s (IIPS, 2012-13). It was found that only 5% of the children consumed iron rich foods in the week before the NFHS-3 survey (NFHS-3 Punjab State Report, 2008). Secondly, the proportion of anaemic children for every age group, are slightly higher in the female category and in rural areas. However the disparity is not much. Anaemia seems to be a major problem in Punjab irrespective of gender, age or residence or literacy levels. Anaemia is very high among children in each and every district of Punjab, with highest incidence in the younger age groups. The highest proportion of anaemic, that is, 89% of the children less than 5 years of age are found in the Mukatsar district. In each and every district of Punjab more than 50% of the children are anaemic in this age group. Within 6-14 years of age group, Mukatsar again tops the list with the highest proportion of anaemic children with 61.2% boys and 66% girls suffering from iron-folic deficiency. Surprisingly, Hoshiarpur, the district with the highest literacy levels, also has the highest proportion of anaemic adolescents (IIPS, 2012-13).

4.2.3.2 Iodine Deficiency

Iodine is an important micronutrient required for preventing goitre, miscarriage and mental retardation. Iodine disorders have been identified as a public health issue since mid 1920s. National Iodine Deficiency Disorders Control Program has concentrated on ensuring the consumption of iodised salt. It was found that 75% of the households having children below 5 years adequately used iodised salt (NFHS-3 Punjab State Report, 2008). Due to the successful implementation of the ban on non-iodised salt, the percentage of households increased to 86.8% in 2012-13 (IIPS, 2012-13).

4.2.3.3 Fluoride Deficiency

Malnourished children, pregnant women and lactating women are especially vulnerable to fluorosis, a crippling disease caused by prolonged intake of water containing excess fluoride. In Punjab, almost one-tenth of them are at risk. It manifests itself in dental, skeletal and non-skeletal forms. Interventions include awareness and promotion of a diet rich in calcium, vitamin C, E and antioxidants (NFHS-3 Punjab State Report, 2008).

4.2.3.4 Vitamin A Deficiency

Severe vitamin-A deficiency can cause eye-damage; can increase the severity of infections such as measles, diarrhoeal diseases among children and slow recovery from illnesses. The WHO recommends a periodic dosing with vitamin A supplements, every six months, starting from 9 months until the age of 3 years to 5 years (National Institute of Public Cooperation and Child Development, 2014). The Copenhagen Consensus (2008) initiative selected the provision of supplements of Vitamin A and Zinc to children in the developing countries as the best way of advancing the welfare of these countries (DFID, 2009).

Table 10: Percentage of children aged 12-23 months who have received doses of Vitamin A supplements in Punjab (Coverage Evaluation Survey, 2009).

Country/ State	consumption of foods rich in Vitamin A	received the first dose of Vitamin A	received at least one dose of Vitamin A	received only one dose of Vitamin A in the past six months
India	47.1	73.1	73.4	71.7
Punjab	44.1	64	65.4	59.4

Source: National Institute of Public Cooperation and Child Development, GOI, 2014, pp226

Among children less than 3 years of age, one finds that only 44.1 % of the children in Punjab consumed Vitamin A rich food, against the national average of 47.1% (NFHS-3 Punjab State Report, 2008).

The Government of India's target is to increase the coverage of Vitamin A supplementation to 90% of the children between 9 months and 5 years. In Punjab, in 2009, 73.4% of children less than 2 years of age received at least one dose of vitamin A supplements. Clearly a lot needs to be done to meet the targets.

V. CONCLUSION

The issue Punjab is facing is not simply food security based on food availability. It is also food and nutrition security based on the access to a diet of high nutritional quality. The problem of food availability has been given considerable attention by the government. The paradox in Punjab is evident in the persistently high levels of child and maternal malnutrition that coexist with high levels of food supply. Nutritional security is particularly lacking as revealed by the problems of absorption of food in the body that are a result of lack of health care facilities, clean drinking water and sanitation. Also there is a noticeable decline in calorie and protein intake over the past few decades, which is even more marked in the rural areas. All this has had an impact on human outcomes such as life expectancy; maternal, child and infant mortality. Hence the prime indicators of child and maternal health have been found to be much worse than the targets set by the government of Punjab as well as other prosperous states. The IMR at 28, U5MR at 31 and MMR at 172 is much higher than other prosperous states. Micronutrient malnutrition especially anaemia, is widespread and has most critically affected women and children. 80% of the children less than 3 years of age and 66% less than 5 years have been anaemic throughout the decade of 2000s. The proportion of children who are underweight and wasted has in fact increased. Though there is a slight fall in the proportion of stunted children, still the ratio remains high as 1 in 3 children are stunted.

In addition, there is a strong evidence of social and gender-based discrimination in access to food, education and health care. The state fares very badly for indices related to maternity care, gender role attitudes and women empowerment. It was found that only 23% received full antenatal care in urban areas, while their rural counterparts were worse off at 19.3% only. Persistent and rising anaemia levels among women aged 15-49, from 38% in 2005-06 to 53% in 2012-13, is a major source of concern. Anaemia was found to be particularly high among adolescent girls, pregnant women, and women belonging to scheduled castes, lower wealth quintiles. Economic and social indices of women's empowerment are particularly disappointing as very minimal percentage have physical emotional and economic freedom (Statistical Abstracts of Punjab, 2014).

It was found that there is a sharp decline in school enrolment among girls above the primary level. Only about 42.3% of the women in Punjab received 10 or more years of schooling and the proportion was even lower for rural areas at 32.3%. The high and rising literacy rates of Punjab conceal some very serious issues like falling enrolments at higher levels of education, poor literacy rates among rural women and low average years of schooling (ESO Punjab, 2013-14).

Rates of growth of per capita expenditure on health have been declining in both real and nominal terms. Punjab has one of the lowest health expenditure as a percentage of GSDP at 0.65%, the share of government expenditure being even lower, among all Indian states. The rural areas are worse off (CSO, 2015). Although coverage statistics of water supply and sanitation are better than the national averages, there are many serious issues and challenges facing the government particularly in rural areas like sustainability, poor water quality, community participation, poor institutional capacity and services. Just 26.4% rural dwellings had piped water. Presence of heavy metals like uranium, lead and arsenic in 12 districts of Punjab, have created a cancerous belt in the region. Besides water quality water conservation and sustainability are major issues (World Bank, 2014).

The causes of persistent food insecurity are deep-rooted, related to poverty, inequality, illiteracy, discrimination and neglect. In addition it is also related to unhygienic living, lack of basic amenities and health care, which is ultimately related to failed governance.

REFERENCES

- [1] Department for International Development, *The neglected crisis for under nutrition: evidence for action* (DFID, UK, 2009)
- [2] UNICEF, *Improving child nutrition-the achievable imperative for global progress* (United Nations International Children Education Fund Report, UN Publications, New York, April 2013) 5-78, accessed from <http://www.unicef.org> on 10th Apr, 2016
- [3] World Bank, *Nutrition in India* (World Bank Report, Washington DC, Nov 13, 2014) 21-22, accessed from <http://go.worldbank.org> on 5th Dec, 2015
- [4] Coffey, D et al , Stunting among Children: Facts and Implications, *Economic and Political Weekly* 48(34) Aug, 24 2013, 68-70
- [5] WHO, *World health statistics* (World Health Organisation, Geneva, Switzerland, 2015) 3-103, accessed from <http://www.who.int> on 10th Apr, 2016

- [6] Department of Health and Family Welfare, *Mother and child health action plan Punjab: 2014-17*(Government of Punjab, Dec 2013)accessed from [http://www.pdf.usaid.gov/pdf _doc/](http://www.pdf.usaid.gov/pdf_doc/) on 4th Feb 2016
- [7] National Institute of Public Cooperation and Child Development, *An analysis of levels and trends in infant and child mortality rates in India*(NIPCCD, New Delhi, 2014)
- [8] International Institute for Population Sciences and Macro International, *National family health survey (NFHS-3), 2005-06:Punjab*(IIPS, Mumbai,2008) accessed from <http://www.nfhsindia.org> on 12th Jan 2016
- [9] Ministry of Health and Family Welfare, *Annual report to the people on health* (Government of India, New Delhi, Dec 2011) 1-3, 13-20, 62, accessed from <http://www.mohfw.nic.in> on 26th Feb 2016
- [10] Department of Health and Family Welfare, *NRHM Punjab state action plan: 2008-12*(Government of Punjab, National RuralHealth Mission ,2013) accessed from <http://www.mohfw.nic.in> on 4th Feb 2016
- [11] International Institute for Population Sciences, *District level household and facility survey DLHS-4: state fact sheet, Punjab* (Ministry of Health and Family Welfare, GOI, Mumbai,2012-2013) accessed from <http://www.mohfw.nic.in> on 3rd Dec 2015
- [12] Laxmaiah, A et al, Diet and Nutritional Status of Rural Preschool Children in Punjab *Indian paediatrics*(National Institute of Nutrition, Indian Council of Medical Research, Hyderabad,2002) 39, 331-338
- [13] Economic and Statistical Organisation, *Statistical abstracts of Punjab, 2014* (Government of Punjab, Chandigarh, March 2015) accessed from [http:// www.punjab.gov.in](http://www.punjab.gov.in) on 16th Nov, 2015
- [14] Economic and Statistical Organisation , *Economic survey of Punjab, 2013-14*(Department of Planning, Government of Punjab, Chandigarh, 2014) 167-168
- [15] Central Statistical Office, *Manual on health statistics in India* (Ministry of Statistics and Programme Implementation, Government of India, New Delhi, May, 2015). 163-173, accessed from <http://www.mospi.gov.in> on 27th Jan 2016