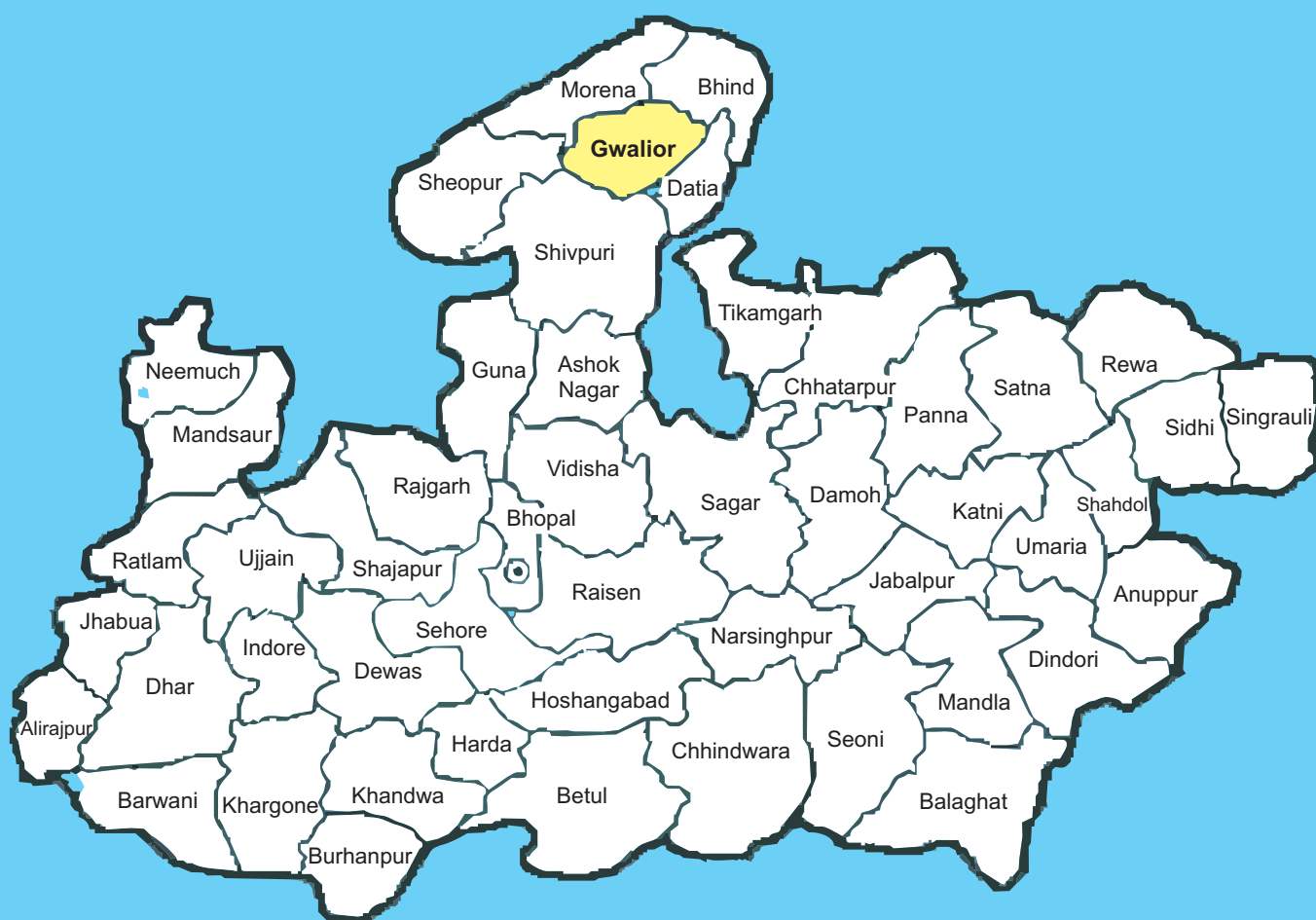


# Assessment of Nutritional Status of under-five year rural children in the Districts of Madhya Pradesh State

District: **GWALIOR**



**NATIONAL INSTITUTE OF NUTRITION**

Indian Council of Medical Research  
Hyderabad – 500 007

2011

*Assessment of Nutritional Status of under  
Five year Rural children in the Districts of  
Madhya Pradesh State*

**- Gwalior District**

**G.N.V.Brahmam  
K.Venkaiah  
A.Laxmaiah  
I.I.Meshram  
K.Mallikharjuna Rao  
Ch.Gal Reddy  
Sharad Kumar  
M.Ravindranath  
K.Sreerama Krishna**



**National Institute of Nutrition**  
Indian Council of Medical Research  
Hyderabad – 500 007

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**Authors**

## PROJECT STAFF

### RESEARCH ASSISTANTS

<b>Sl.No.</b>	<b><i>Name</i></b>
1.	<i>Mr. Pushpendra Kumar Singh</i>
2.	<i>Mr. Amol Kumar Uke</i>

### FIELD INVESTIGATORS

<b>Sl.No.</b>	<b><i>Name</i></b>
1.	<i>Mr. Dileep Patel</i>
2.	<i>Mr. Nikhil Sharma</i>



***RESULT AT GLANCE***

## RESULTS AT A GLANCE

<b>DISTRICT PROFILE</b>	
Total population (2001 Census)	16,29,881
Sex Ratio	847
Population density (per sq km)	357
Percent of Schedule caste	19.0
Percent of Schedule Tribes	3.5
Literacy status (%)	69.8
Female literacy (%)	56.8
<b>SAMPLE CHARACTERISTICS</b>	
HHs surveyed (n)	397
Average Family size (n)	6.2
Average per capita monthly income (Rs)	927
<b>COMMUNITY (%)</b>	
Scheduled Caste	10.8
Scheduled Tribe	9.8
<b>TYPE OF FAMILY (%)</b>	
Nuclear	50.4
Extended Nuclear	18.6
Joint	31.0
<b>LITERACY STATUS (%)</b>	
Father	71.5
Mother	41.4
<b>LAND HOLDING (% HHs)</b>	
Land less Families	44.9
Marginal Farmers	15.1
Small Farmers	24.9
Large Farmers	15.1

(Contd... 2)



## RESULTS AT A GLANCE (Contd...2)

MAJOR OCCUPATION OF HOUSEHOLD	Percent
Labourers	40.8
Cultivators	45.1
Land Lords	0.3
Artisans	4.0
Service	4.8
Business	4.5
<b>TYPE OF HOUSE</b>	
Kutchha	37.3
Semi-Pucca	42.5
Pucca	20.2
<b>SOURCE OF DRINKING WATER</b>	
Open well	8.6
Tube well	91.1
Tap	0.3
<b>HOUSEHOLD ELECTRICITY</b>	33.2
<b>PRESENT AND USING SANITARY LATRINE</b>	9.6
<b>IODINE CONTENT OF COOKING SALT</b>	
0 ppm	46.3
<15 ppm	42.6
≥15 ppm	11.1
<b>ANTE-NATAL CARE</b>	
Antenatal registration before 16 weeks of gestation	57.6
<b>PLACE OF DELIVERY</b>	
PHC/CHC	80.4
Pvt Hospital	10.8
Sub-centre	2.9
Home	5.9

(Contd..3)

### RESULTS AT A GLANCE (Contd...3)

Delivery conducted by		Percent	
M.O. PHC		56.9	
ANM/LHV		28.4	
Pvt. Doctor		8.8	
Untrained Dai/Others		4.9	
Low birth weight (% infants)		16.9	
<b>BREAST FEEDING AND COMPLEMENTARY FEEDING</b>			
<b>Initiate of Breast feeding (hours)</b>			
<1hr		44.1	
1-3 hrs		49.0	
Pre-lacteals given		4.9	
Fed colostrum		97.1	
Children solely breast fed			
0-5 months		87.9	
6-11 months		30.4	
<b>Age of initiation of complementary Feeding</b>			
At 6 months		11.6	
<b>Immunization (% 12-24 of children)</b>			
Fully Immunized		96.6	
Partially immunized		2.3	
Not immunized		1.1	
<b>Coverage For Massive Dose Vitamin A (9-59 months children)</b>		81.9	
<b>Coverage for IFA (1 -5 Yrs children)</b>		30.2	
<b>NUTRITIONAL STATUS (0-5 YR CHILDREN)</b>			
Nutrition status	Current survey (Dist.)	State Figures	
		NFHS-3	NNMB (2006)
Underweight (<Median -2SD of Wt for age)	56.5	60.0	46.2
Stunting (<Median -2SD of Ht for age)	65.2	50.0	58.7
Wasting (<Median -2SD of Wt for Ht)	21.1	35.0	24.0



***EXECUTIVE SUMMARY***

## **Executive Summary**

*Undernutrition continues to be a major public health problem in the developing countries, including India, the most vulnerable groups being women and young children. Proper nutrition is necessary for adequate growth and development of children. Undernutrition is of multi-factorial aetiology, which include both food and non-food factors.*

*According to the recent reports of NFHS-3 (2005-06), the prevalence of underweight among under five year children in the State of Madhya Pradesh was 60%, stunting was 50% and wasting was 35%, while according to NNMB surveys carried out during the same period (2005-06), the prevalence of underweight and wasting was lower (46% and 24% respectively) and that of stunting was more (59%). The prevalence of undernutrition especially among under five year children may vary geographically. Therefore, for the development of area specific intervention strategies, assessment of district level prevalence of undernutrition is very essential. At the request of DWCD, Government of Madhya Pradesh, the National Institute of Nutrition, Hyderabad therefore carried out the present study to estimate the prevalence of undernutrition among under five year rural children and infant and young child feeding practices. It was a cross sectional study carried out using multi-stage random sampling procedure. A total of 397 HHs from 20 randomly selected villages, including 417 children were covered for the present study.*

*A majority of the HHs covered in the present survey belonged to backward communities (64%) followed by Scheduled Caste (10.8%) and Scheduled Tribes (9.8%). About a half of the HHs were nuclear families. About 59% of the mothers were illiterate, and about 45% of the HHs did not possess any agricultural land. A total of about 41% were engaged in either agricultural or other labours. Majority of the women were housewives. About 43% of the HHs lived in semi pucca houses and 37% in kutcha. Majority (91%) of the HHs were using bore well water, while only 0.3% HHs had access to tap water. Only 10% of the HHs were using sanitary latrine. Majority (98%) of HHs were using firewood for cooking purpose and only 33% HHs had electricity. Only about 11% were using adequately iodized salt ( $\geq 15$  ppm).*

About two thirds (66.7%) of pregnant women had undergone Antenatal check-up (ANC) of whom about 18% had  $\geq 3$  ANCs. About 58% pregnant women were registered for ANC before 16 weeks of gestation. About three fourth (76%) of pregnant women received IFA tablets during pregnancy, 21% received  $\geq 90$  tablets and about 18% reportedly consumed  $\geq 90$  tablets. Majority (94%) of deliveries were institutional, either in government or private hospitals. Majority (66%) of deliveries were conducted by a medical doctor. Birth weights were reportedly recorded in case of 71% infants, and records were available for all the infants weighted. The overall prevalence of low birth weight was 17%.

Most of the mothers (97%) fed colostrum to their newborns. About 44% of mothers initiated breastfeeding within 1 hour and 49% did so within 1-3 hours of delivery. Only 1% initiated breast feeding after 24 hours of delivery. Pre-lacteal feeds such as glucose/sugar water, honey, etc. were given to 5% of the new borns.

Among 6-11 months children, complementary feeding was initiated at 6 months of age in about 12%, while 38% children received during 7-11 months of age. About half of children (49%) did not receive complementary feeding.

Of the 6-11 months infants, about 48% were receiving cow/buffalo milk, and 43% were receiving home made semisolids/solids. About 41% were receiving complementary foods at least 3 times a day. Among 12-35 months children, 57% received complementary feeding in addition to breast milk. Majority were receiving home made solids and 87% were receiving such foods at least 3 times a day.

Majority (96.6%) of children were completely immunized, while about 1% did not receive any immunization. About 82% of 9-59 months children received at least one dose of Vitamin A during the preceding year. About 80-81% of 18-59 months children received the stipulated two doses.

About 4% of 12-59 months children received  $\geq 90$  IFA tablets, while only 3% of the children consumed  $\geq 90$  tablets.

None of the infants exhibited the clinical signs of nutritional deficiency, while 0.5% of 12-35 months children exhibited the signs of Bitot spots indicating that vitamin A deficiency is a public health problem.

About 15% of children reportedly had one or more morbidities such as fever, ARI and diarrhoea during the preceding fortnight. The prevalence was relatively higher among 6-11 months children, which tended to decrease with increase in age. About 90% of the mothers reported that they generally consult private practitioner, while 10% went to PHC, to seek treatment for their sick children.

The overall prevalence of undernutrition (<Median -2SD of WHO Child Growth Standards), such as underweight was 57%, stunting was 65% and that of wasting was 21%. The prevalence of underweight and stunting tended to increase with age from 24% and 12% respectively at 0-5 months of age to 70% and 80% respectively between 24-35 months of age. No gender differentials were observed in the prevalence of underweight, and wasting.

The study revealed a significant association between nutritional status and different socio-economic variables. The prevalence of underweight was significantly associated with literacy status of father, and availability of separate kitchen. The prevalence of stunting was significantly associated with community, literacy status of father, type of house, type of cooking fuel used, electricity, sanitary latrine and availability of separate kitchen. The prevalence of wasting was significantly associated with literacy status of mother, occupation of father, type of house and availability of separate kitchen.

The study highlights the need to impart health and nutrition education to the pregnant and lactating mothers through effective IEC activities with emphasis on infant and young child feeding practices. The existing national nutrition intervention programmes such as supplementary feeding under ICDS and massive dose of Vitamin A supplementation have to be strengthened further. The poverty alleviation programme and other income generating activities may be strengthened to improve the household food security.

## 1. INTRODUCTION

India, in the past few decades, has witnessed rapid progress in terms of industrialization and agricultural production. Yet malnutrition, especially undernutrition continues to be a major problem of public health significance in the country. It is a major contributor to high rates of childhood mortality, maternal mortality and morbidities in the community<sup>1</sup>. Though, poverty is a major underlying cause, scores of other factors such as socio-demographic, socio-cultural and lifestyle practices contribute significantly to the problem of malnutrition.

Prevalence of low birth weight, mainly due to intrauterine growth retardation continues to be high, which is attributable to maternal undernutrition. This is further aggravated by inappropriate infant and young child feeding practices, such as discarding of colostrum, delayed initiation of breast feeding, early or delayed initiation of complementary feeding, and sub-optimal complementary feeding practices in terms of type of feed, quantity, and frequency.

It has been found that non-exclusive breast feeding in the first six months of life results in 1.4 million deaths and 10% of the disease burden among infants and young children every year in the developing countries<sup>2</sup>. It is also estimated that about 10-15% of under five year deaths in resource poor countries could be prevented by achieving 90% of exclusive breast feeding alone<sup>3</sup> and 22% of neonatal deaths could be prevented if breast feeding is initiated within the first hour of birth<sup>4</sup>.

About 21% of global deaths and DALYs (Disability Adjusted Life Years) in children younger than 5 years are attributed to stunting, severe wasting, and intrauterine growth retardation. Long term consequences of undernutrition during the early stages of child growth and development include likelihood of short stature in adult life, low educational achievements, giving birth to smaller children, lower economic status and reduced physical work capacity and productivity in adulthood<sup>5</sup>.

Further, the country is passing through a phase of rapid socio-economic transition leading to over nutrition in certain segments of the population, especially in the urban communities. Changing lifestyles and dietary habits are contributing to increase in the prevalence of overweight/obesity among children and young adults exposing them to the risk of chronic degenerative disorders such as hypertension, Type 2 diabetes, coronary artery disease, stroke, cancers etc in the later part of life. More over undernutrition during early childhood can lead to overweight/obesity in adulthood, a risk factor for diet related chronic diseases<sup>6</sup>.

The major nutritional problems of public health significance in the country are, protein energy malnutrition (PEM), vitamin A deficiency (VAD), iron deficiency anaemia (IDA), and iodine deficiency disorders (IDD). Preschool children, adolescent

girls, women of reproductive age group, elderly, those belonging to socio-economically backward groups such as scheduled caste and schedule tribe communities, communities residing in chronically drought affected rural areas are nutritionally the most vulnerable segments of the populations.

Several nutrition programmes have been designed and are being implemented in India, through respective State Governments, during the past few decades for the prevention and control of both macro and micronutrient malnutrition in the population. They include supplementary feeding through ICDS, distribution of iron and folic acid tablets, massive dose vitamin A supplementation, Mid-day meal programme etc. Also, several poverty alleviation and developmental programmes are being implemented by central and State governments, for the overall socioeconomic development of the communities. In addition, Public Distribution System and TPDS are striving to provide essential commodities at affordable price, especially to those below poverty line throughout the year, all over the country, to ensure household food security.

Children, who are subjected to socio-economic and dietary constraints during their critical years of growth and development, end up as adults with small body size. Such adults may be apparently healthy, but there is evidence to suggest that their productivity and earning capacity are impaired (Satyanarayana and Naidu, 1977<sup>7</sup>). Repeat surveys by National Nutrition Monitoring Bureau (1999<sup>8</sup>) in eight States revealed that, despite very little or no change in the dietary intakes of rural population over a period of time, there was a decrease in the prevalence of severe forms of undernutrition among young children with concomitant increase in normal grades. However, the proportion of children with mild to moderate undernutrition remained similar. Recent survey carried out by NNMB (2006<sup>9</sup>) in the rural areas of nine States revealed that about 40% under 5 year children were underweight, 45% were stunted and 20% were wasted. The corresponding figures for the State of Madhya Pradesh were, 46%, 59% and 24% respectively.

According to NFHS-3<sup>10</sup>, in the State of Madhya Pradesh, 60% of <5 year children are underweight, 50% are stunted and 35% are wasted, which are much above the National figures of 42.5%, 48% and 19.8% respectively. Madhya Pradesh tops the list of States and Union Territories in India, with highest prevalence of underweight among <5 year children, while the State of Sikkim having lowest prevalence of 20%.

The Government of India, in its National Nutrition Policy (1993)<sup>11</sup>, has set nutrition goals for the control and prevention of malnutrition in the country and has recommended several action programmes in its National Plan of Action on Nutrition



(1995)<sup>12</sup>. Though, the Government of India and the respective State Governments have been implementing several health, nutrition intervention and developmental programmes through its National Nutrition Policy and National Plan of Action on Nutrition for overall improvement of health and nutrition status of the community, the prevalence of undernutrition continues to be significantly high.

The type and magnitude of undernutrition may vary from district to district, depending on geographical and agro-climatic conditions and therefore, warrant region-specific interventions. In order to devise and implement area specific intervention strategies and to monitor their impact over a period, it is necessary to generate data base at district level.

In this context, the Government of Madhya Pradesh is contemplating to develop State Nutrition Policy and develop plan of action for implementation, in order to improve the nutritional status of the communities. Therefore, at the request of the Department of Women & Child Development, Government of Madhya Pradesh, the National Institute of Nutrition carried out survey in all the following 50 districts of the State, to assess the nutritional status of under 5 year children and infant and young child feeding practices.

Sl. No.	District	Sl. No.	District	Sl. No.	District	Sl. No.	District	Sl. No.	District
1	Alirajpur	11	Chindwara	21	Indore	31	Neemuch	41	Shadol
2	Anuppur	12	Damoh	22	Jabalpur	32	Panna	42	Shajapur
3	Ashokngar	13	Datia	23	Jhabua	33	Raisen	43	Sheopur
4	Balaghat	14	Dewas	24	Katni	34	Rajgarh	44	Sidhi
5	Barwani	15	Dhar	25	Khandwa	35	Ratlam	45	Singrauli
6	Betul	16	Dindori	26	Khargone	36	Rewa	46	Shivpuri
7	Bhind	17	Guna	27	Mandla	37	Sagar	47	Tikamgarh
8	Bhopal	18	Gwalior	28	Mandsaur	38	Sathna	48	Ujjain
9	Burhanpur	19	Harda	29	Morena	39	Sehore	49	Umaria
10	Chhatarpur	20	Hoshangabad	30	Narasimhapur	40	Seoni	50	Vidisha

The results of the study carried out in **Gwalior** district of Madhya Pradesh State during February-August 2010, is presented in this report.

### 1.1 Profile of Gwalior District

The Gwalior district is surrounded by Morena in the North, Shivpuri in the south, Bhind and Datia in the East and Sheopur in the west. It lies between 25°43' - 26°21' North latitude and 77°40' – 78°39' East Longitudes. The total population of the district is 16,29,881 (2001 census), with a population density of 357/sq.km. About 60% of the population was rural and 40% was urban. The proportion of Scheduled Caste population was 19.0%, while that of Scheduled Tribe was 3.5%. The district has a sex ratio of 847. The overall literacy rate is 69.8% with 80.8% for males and 56.8% for females.

## **2. OBJECTIVES**

### **2.1 General Objective**

The general objective of the study was to assess the health and nutritional status of <5 year children and infant and young child feeding practices among <3 year children in the rural areas of *Gwalior* district of Madhya Pradesh State.

### **2.2 Specific objectives**

The specific objectives of the study were,

1. To assess the nutritional status of <5 year children in terms of anthropometry such as heights & weights, and prevalence of clinical signs of nutritional deficiency.
2. To assess the prevalence of morbidities among <5 year children during the preceding fortnight.
3. To assess the infant & young child feeding practices of mothers of under 3 years children, and
4. To estimate the iodine levels in the household (HHs) salt samples used for cooking, by spot testing kit.

## **3. METHODOLOGY**

### **3.1 Sampling Design**

It was a cross sectional, community based study by adopting random sampling procedure.

#### **3.1.1 Sample size**

Assuming an overall prevalence of underweight (weight for age < median-2SD of NCHS standards) of 50% among <5 year children, with 5% absolute precision and 95% CI, a sample size of 383 (or say 400) children per district was arrived at.

#### **3.1.2 Selection of Villages**

For the purpose of survey, in each district, a total of 20 villages were selected, using systematic random procedure, covering all the *taluks/blocks* based on Population Proportion to Size of the village.

#### **3.1.3 Selection of Households**

In each of the selected villages, a total of 20 households (HHs) having at least one index child of <5 years were covered. For this purpose, the main village and its hamlets, if any, were divided into 5 geographical areas, based on natural groups of households/streets/*mohallas/areas* etc. Households belonging to Scheduled Caste and Scheduled Tribe communities generally formed one group. From each of these groups, four consecutive HHs having at least one <5 year child

were surveyed by selecting a random start, starting from the Northeast corner of the area. In the selected HH, all the children of <5 year were included in the study.

### 3.2 Investigations

The following investigations were carried out during the study:

#### 3.2.1 Household demographic and socioeconomic particulars

Information on household demographic and socio-economic particulars were collected in all the 20 households selected for survey, using a pre-coded and pre tested questionnaire.

#### 3.2.2 Anthropometry

Height (up to nearest 1mm) and weight (up to nearest 100g) of the children were measured using standard anthropometric equipment and procedures<sup>13</sup>. The nutritional status of children was assessed according to SD classification<sup>14</sup> using WHO growth standards (2006)<sup>15</sup>.

#### Standard Deviation Classification

Nutritional status of preschool children was assessed according to weight for age, height for age and weight for height, by Standard Deviation classification recommended by WHO, as given below:

Cut-off level	Nutritional grade		
	Weight for Age	Height for Age	Weight for Height
≥ Median -2SD	Normal	Normal	Normal
< Median -2SD to <Median -3SD	Moderate underweight	Moderate Stunting	Moderate Wasting
<Median - 3 SD	Severe underweight	Severe Stunting	Severe Wasting

#### 3.2.3 Clinical examination

All the children covered for anthropometry were examined clinically for the presence of signs of nutritional deficiency.

#### 3.2.4 History of Morbidity

Information on history of morbidity among the children such as fever, respiratory infection, diarrhoea etc., if any, during the preceding 15 days of visit was collected.

#### 3.2.5 Maternal Particulars

Maternal particulars such as parity, antenatal care, TT immunization, receipt of IFA tablets, particulars of delivery and recording of birth weight were collected on mothers of <6 months children.

### **3.2.6 Infant and Young child feeding practices**

Infant and young child feeding practices such as initiation of breast feeding, feeding of colostrum, duration of exclusive breast feeding for <6 months of children and particulars of complementary feeding in terms of age of initiation, the type of complementary food and frequency of feeding was assessed for <3 years children by administering pre-coded, structured questionnaires. In addition, information on socio-cultural aspects of infant and young child feeding practices by mothers of <3 years children was also collected.

### **3.2.7 Coverage of children under various health & nutrition intervention Programmes**

Particulars of coverage of children for all the immunizations such as BCG, DPT, Polio and measles during first year of life was collected for children aged 12-24 months. In addition, the coverage of 9-59 months children for supplementation of massive dose vitamin A was collected. The coverage of 1-5 year children for distribution of Iron & Folic acid (IFA) tablets/syrup was also collected. Information on participation of 6-59 months children in the ICDS supplementary feeding programme was also collected.

### **3.2.8 Spot testing of household cooking salt for Iodine**

Cooking salt samples collected from the households were tested for iodine content by using spot testing kits, supplied by UNICEF, Madhya Pradesh.

### **3.3 Recruitment, training, standardization of field Investigators and data collection**

Ten teams, each consisting of two post graduate Research Assistants (Nutritionist/Anthropologist/Social worker) and one graduate Field Investigator having proficiency in local language were recruited, trained and standardized in various survey methodologies, by the scientists from the National Institute of Nutrition. All the survey instruments (proformae) were developed, translated into *hindi* vernacular and pre-tested before being used in the survey. Data was collected in each district by two teams.

### **3.4 Quality Control**

Random checks were carried out by scientists from NIN, periodically by revisiting the households surveyed by the field staff, to ensure quality of data collection.

### **3.5 Data Analysis**

The data was scrutinized and entered into the computers as soon as it was received at NIN. The data cleaning was done by carrying out range and consistency checks. Descriptive and analytical statistics of the data were carried out using SPSS Windows version 15.0. Appropriate statistical tools were used wherever needed.

## **4. RESULTS**

### **4.1 Coverage**

A total of 397 households from 20 villages were covered for the study (**Table 1**). A total of 417 children (Boys:248; Girls:169) <5 years of age were covered for nutritional anthropometry, examination for presence of clinical signs of nutritional deficiency, history of morbidity during the previous fortnight and food preferences and taboos during health and disease. In addition, socio-economic and demographic particulars were collected from the respective households. A total of 102 mothers of <12 months children, 183 mothers having 12-35 months children and 132 mothers having 36-59 months children were interviewed to assess infant and young child feeding practices, as well as coverage for immunization, receipt of iron folic acid tablets and massive dose of vitamin A. In addition, cooking salt samples from all the households surveyed were tested for iodine content, by using spot testing kits.

### **4.2 Household Socio-economic and Demographic particulars**

The demographic and socio-economic particulars of the households (HHs) covered for the survey is provided in **Table 2**.

#### **4.2.1 Community**

About 64% of households covered for the survey belonged to backward communities, while 16% belonged to other communities. Scheduled Caste and Scheduled Tribe communities accounted for 11% and 10% respectively.

#### **4.2.2 Type of family**

About half (50.4%) of the HHS were nuclear families and 31% were joint, while the remaining 19% were extended nuclear families.

#### **4.2.3 Family size**

The average family size was 6.2. About 33% of the HHs had family size of  $\leq 4$  members, 56% of HHs had 5-9 and 11% of HHs had  $\geq 10$  members.

#### **4.2.4 Literacy status of father**

About 71% of the fathers of the index children were literates. About 18% had an education level of 1-5<sup>th</sup> class, 41% had schooling of 6<sup>th</sup> -10<sup>th</sup> class, 6% each were studied up to intermediate and graduation or above.

#### **4.2.5 Literacy status of mother**

About 41% of the mothers of the index children were literates. About 16% of them had an education level of 1-5<sup>th</sup> class, 20% were educated up to 6<sup>th</sup>-10<sup>th</sup> class, while very few (about 4%) had education level of intermediate or above.

#### **4.2.6 Household landholding**

About 45% of households did not possess any agricultural land, one fourth (25%) were small farmers (2.5 - 5 acres), while 15% each were either marginal farmers (<2.5 acres) or large farmers ( $\geq 5$  acres).

#### 4.2.7 Major occupation of father

The major occupation of the father of the index child was 'owner cultivators' (45%), followed by other labour (38%), service (4.8%), business (4.5%) and artisan (4%).

#### 4.2.8 Major occupation of Mother

A majority (70.3%) of the women were housewives, 23% were engaged in other labour and 6% were 'owner cultivator'.

#### 4.2.9 Per capita monthly income

The average monthly per capita income (PCI) of HHs was Rs 927. About 8% of the HHs had average PCI of < Rs. 300, 33% had Rs.300-600 and 29% had Rs. 600-900, while about 30% had monthly PCI of  $\geq$  Rs.900.

### 4.3 Household Physical facilities

#### 4.3.1 Type of house

About 43% percent of the houses were semi-*pucca* in nature, 37% were *kutchra* and 20% were *pucca* (**Table 3**).

#### 4.3.2 Household amenities

The major source of drinking water was from tube well (91%), followed by open well (8.6%), while less than 1% of the households had access to tap water. Only about 2% of the HHs were using LPG or bio-gas for cooking purposes, while 98% of HHs were using firewood. About 33% of the houses were electrified. About 10% of the HHs were using sanitary latrine. Only one fifth (21%) of HHs had provision of separate kitchen.

#### 4.4 Iodine content of Cooking salt

The distribution of HHs according to iodine content of cooking salt as estimated by spot testing kit is presented in **Table 4**. It was observed that about half of the HHs (50.6%) were using powdered salt while only 21% were using free flowing salt. Only 11% of HHs were using adequately iodized ( $\geq 15$  ppm) salt, 43% samples had <15 ppm, while 46% of the HHs were using non-iodized salt.

### 4.5 Maternal characteristics

#### 4.5.1 Age and parity of mother

About 85% of mothers were between 20 and 29 years of age, while 13% were in the age group of 30-39 years. About 30% mothers were *primi*, 37% had 2 children, 26% had 3-4 children, while 7% had  $\geq 5$  children (**Table 5**).

#### 4.5.2 Particulars of last Pregnancy (mothers having <6 months children)

Particulars of antenatal check up (ANC) of mothers having < 6 months children are given in **Table 6**. Two thirds (66.7%) of them had reportedly undergone antenatal check up (ANC) during the last pregnancy. About 18% of mothers had

undergone at least three ANCs. About 58% registered for ANC before 16 weeks of gestation. About 12% each of mothers had ANCs either at sub-centre/PHC or CHC or at taluk/district hospitals, 18% of the mothers had ANCs at the Anganwadi Center (AWC), while 24% had ANC at private clinic.

In about 42% of cases, the ANCs was conducted by either ANM (15%) or by Medical officers (27%). Major components of ANC included physical examination (66.7%), blood pressure measurements (51.5%), weight recording, urine examination and haemoglobin estimation (48.5% each). About 58% women received advice from health personnel to consume more green leafy vegetables and fruits, attend ANCs regularly and consume IFA tablets during pregnancy.

About 76% of pregnant women received IFA tablets. While about 21% received  $\geq 90$  tablets, 18% consumed  $\geq 90$  tablets during the pregnancy. The IFA tablets were received mostly from AWW (63.7%). Nearly 91% of the mothers reportedly received TT immunization. While about 88% received two doses of TT, 3% received one dose only.

#### **4.5.3 Particulars of last Delivery (Mothers having <12 months children)**

Particulars of last delivery of mothers having <12 months children is provided in **Table 7**. About 94% were institutional deliveries, either at PHC/Govt. Hospital (80.4%), sub-centre (2.9%) or private hospitals (10.8%). A majority of the deliveries were conducted by a doctor (66%), followed by LHV/ANM (28%) and untrained dais (4.9%). About 71% of mothers reported that the birth weight was recorded and mostly (70%) on the same day. Birth records were available for all the infants weighed. As per the records, 17% of the newborn babies had birth weight of < 2.5 kg.

### **4.6 Under five year children**

#### **4.6.1 Profile of the Children Covered**

##### ***Birth order and interval between last two births***

Among the children surveyed, about 38% children were of first birth order, 32% were of second birth order and 30% were of third birth order or more. Among children of birth order of 2 or more, the birth interval between the last two children was <2 years in about 25%, 2- 3 years in about 31% and  $\geq 3$  years in about 45% (**Tables 8 & 9**).

#### **4.6.2 Infant and Young child feeding practices (IYCF)**

##### **4.6.2.1 0-11 month children**

Information on breastfeeding and complementary feeding practices with respect to <12 months children obtained from the mothers, is provided in **Table 10**. About 5% of the women reportedly gave pre-lacteal feeds to the newborn, which included mostly plain water (2%) or cow/buffalo milk (2.9%) etc. About 44% of the newborns were given breast feeding within an hour of delivery, 49% between 1-3

hours and 6% between 4 to 11 hours (**Fig. 1**). Ninety seven percent of the mothers interviewed reportedly fed colostrum to the newborn.

#### **0-5 month infants**

About 88% of the infants below 6 months were solely breastfed, while about 12% received complementary feeding in addition to breast milk (**Table 11**).

#### **6-11 months infants**

About 30% of the 6-11 months infants were currently solely breast fed. About 19% received water and about 51% received complementary foods in addition to breast milk. About 17% were solely breast fed up to six months. Of those who were currently receiving complementary foods (50.8%), the complementary feeding was initiated at 6 months of age in about 12% of infants, at 7 months in 29% and at 8 months in 9% of infants (**Fig. 2**). The commonly used complementary foods included cow/buffalo milk (47.9%) and home made solids (26%), followed by home made semisolids (17.4%) and formula milk (3%) (**Table 11**).

The foods generally included in the complementary feeds were milk & milk products (37.7%), pulses (31.9%), cereals & millets (30.4%), GLV (23%) and fruits (21.7%). About 41% of the children received 3-4 complementary feeds per day, while the rest (10%) received 2 feeds a day. About 34% of mothers fed the infants with their hand, while 10% gave complementary feeding with spoon. In about 7% of cases, the infants fed by themselves. The feeding was supervised mostly by the mother (49.4%) (**Table 12**).

#### **4.6.2.2 12-35 month children**

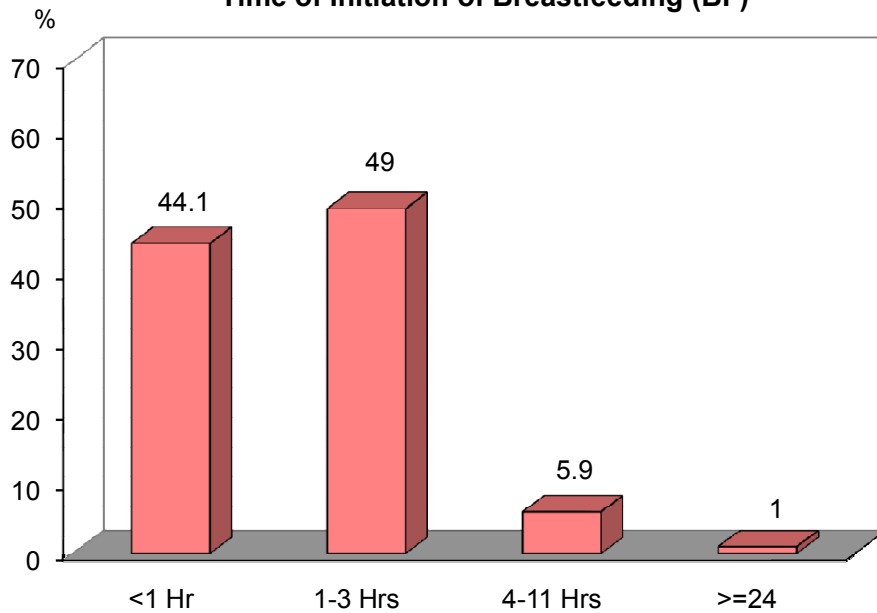
About 57% of the children were currently receiving complementary foods in addition to breast milk, and 43% of the children were completely weaned. The type of food being currently given included home made solids (97.8%), cow/buffalo milk (94%) and home made semi-solids (43.2%). The most commonly used food groups included cereals & millets and pulses (99.5% each), Milk & milk products (96.7%), GLV (96.2%) followed by roots & tubers (95.1%), other vegetables (92.9%), fruits (92.9%), and fats & oils (91.8%), eggs (13%) and flesh foods (14%). About 46% of the children were fed  $\geq 4$  times a day, 41% were fed 3 times a day, while 13% were fed  $\leq 2$  times a day. About 53% of the children consumed food themselves mostly with hands (52.5%) or with spoon (0.5%). About 47% of children were fed by their mothers. In most cases, feeding was supervised by their mothers (99.5%) (**Table 13**).

#### **4.6.3 Care of the Child**

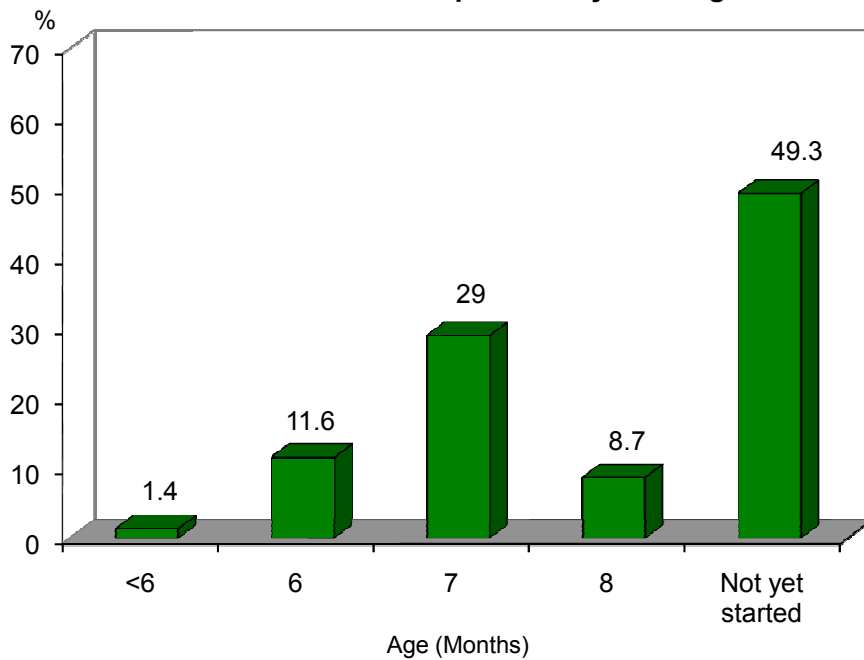
About 71% of mothers reportedly were taking care of their children by themselves at home, while 5% stated that they were cared by either the grand parents (4.3%) or by



**Fig.1 Distribution (%) of 0-11 months Children according to Time of Initiation of Breastfeeding (BF)**



**Fig.2 Distribution (%) of 6-11 months Children according to Age of Initiation of Complementary Feeding**



the older siblings (0.2%) (**Table 14**). About 23% of the mothers carried their children to the work-spot.

#### **4.6.4 Personal Hygiene**

About 30% of mothers washed their hands with soap before feeding the child and 11% of children washed their hands with soap before eating food. About three fourth of mothers (75.8%) were using soap for washing their hands after defecation (**Table 14**).

#### **4.6.5 History of Morbidity**

The particulars of morbidity during preceding fortnight among <5 years children according to age groups are provided in **Table 15**. About 15% of the children suffered from one or more morbidities during the period, the proportion of which was maximum (20.3%) in the age group of 6-11 months infants, and tended to decrease with increasing age to 15% in 36-47 months children. The common morbidities reported were diarrhoea (9.8%) followed fever (7.2%) and acute respiratory infections (7.0%). The prevalence of diarrhoea was maximum in 48-59 months children (18.5%) followed by 6-11 and 36-47 months children (10.1% each). Similarly, the prevalence of other morbidities viz., ARI and fever was maximum in 6-11 months infants (11.6% and 8.7% respectively), and tended to decrease with increasing age to 5% and 6% respectively in the age group of 36-47 months.

A majority of the mothers in general stated that, they consult a private practitioner (89.9%), or visit the PHC (9.6%), when the children fall sick (**Table 16**). About 10% of the children reportedly had diarrhoea during the previous fortnight, while about 14% received ORS, either home made (7%) or that given by ANM/AWW (7%) or commercial one (0.7%). A relatively higher proportion (22%) of children (36-59 months) were given ORS, compared to 0-11 months children (9.8%). About 7% reportedly had acute respiratory infection, while only 0.5% had received co-trimoxazole.

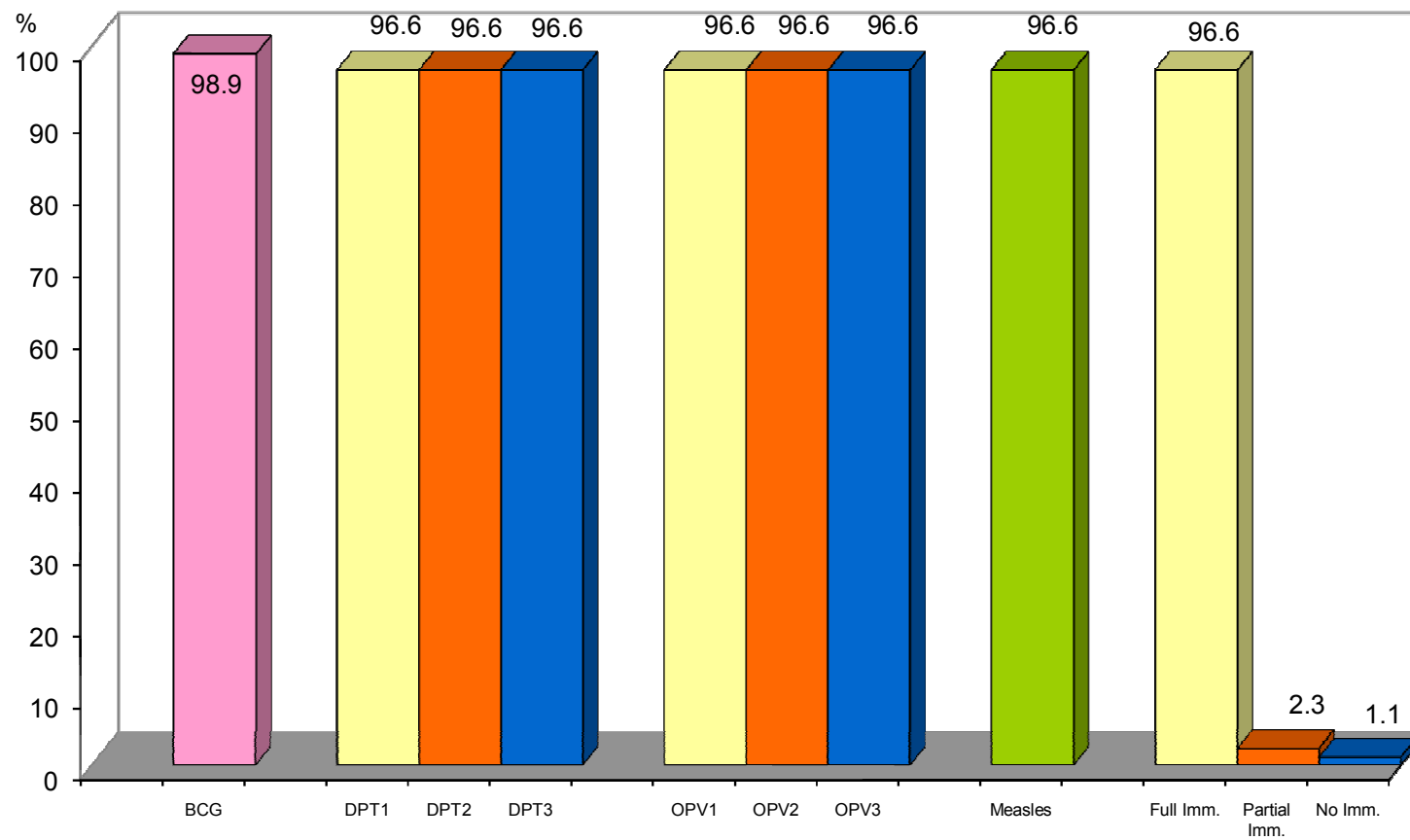
#### **4.6.6 Participation in ICDS Supplementary feeding Programme.**

About 66% of the children of 6-59 months age group were participating in the ICDS supplementary feeding programme, with 38% being regular. The extent of participation was observed to be high (93%) among 36-59 months and 52% among 6-35 months age group (**Table 17**). A higher proportion of older children (36-59 months) were regular (56%), than younger counterparts (28%).

#### **4.6.7 Coverage for Immunization under UIP**

The particulars of coverage of 12-24 months children for immunization under Universal Immunization Programme (UIP) during the first year of life are provided in **Table 18** and **Fig. 3**. About 97% of the children were fully immunized, 2% were partially immunized, while about 1% did not receive any immunization. About 97-99% received polio, DPT & BCG vaccines, while only 97% received measles vaccination.

**Fig. 3 Coverage (%) of 12-24 months Children for Immunization under Universal Immunization Program (UIP)**



Major source of this information was from mother and child protection card (36.9%), followed by AWC records (28.7%), parents (23%) and immunization card (10.3%). The major reason for not immunized or partially immunized was 'not offered' (3.4%).

#### **4.6.8 Coverage for Massive dose of Vitamin A Supplementation**

The National programme on Prevention and control of blindness due to Vitamin A deficiency envisages that all the children between 9 to 60 months should receive biannual massive dose of vitamin A. The particulars of coverage of children for massive dose vitamin A during the previous one year are provided in **Table 19**. In general, about 82% of 9-59 months children reportedly received at least one dose of vitamin A. While the coverage was 82-84% among 18-59 months children, and 78% children of 9-17 months received massive dose of vitamin A. About 80-81% of 18-59 months children received 2 doses during preceding one year, and 2% received one dose only. In a majority of cases, the massive dose vitamin A was administered at AWC (81%), mostly by AWW (61.3%) or ANM (20.6%). The major reason for non-receipt of massive dose of Vitamin A was 'not offered' (15.3%).

#### **4.6.9 Coverage for Iron and Folic acid tablets Supplementation**

About 30% children of 12-59 months reportedly received IFA tablets during the preceding year, either from AWW (28.9%) or ANM (0.7%). Only about 4% received  $\geq 90$  IFA tablets, while only 3% consumed  $\geq 90$  tablets (**Table 20**).

### **4.7 Nutritional status of children (<5 years)**

#### **4.7.1 Prevalence of clinical signs of nutritional deficiency**

The prevalence of clinical signs of nutritional deficiency by age group is presented in **Table 21**. The prevalence of Bitot spots, an objective sign of Vitamin A deficiency was 0.2%, which was below the WHO cut-off level of 0.5%. None of the infants exhibited clinical signs of nutritional deficiency.

#### **4.7.2 Nutritional anthropometry**

##### **4.7.2.1 Mean Weight and Height**

The mean weight and heights of <5 year children by age group and gender is provided in **Table 22 and Figs. 4-7**. The children were observed to be shorter and lighter, when compared to WHO child growth standards (2006).

##### **4.7.2.2 Prevalence of Undernutrition**

The prevalence of underweight (Weight for age < median – 2SD), stunting (Height for age < median – 2SD) and wasting (Weight for Height < median – 2SD) according to Standard Deviation classification using WHO child growth standards among <5 year children according to age and gender are presented in **Tables 23&24**.

### **Underweight**

The overall prevalence of underweight (<Median -2SD), was 57%. While 23% were of severe underweight (<Median -3SD), about 34% had moderate underweight (<Median - 3SD to - 2SD). The prevalence of underweight increased with increase in age, from about 24% in the age group of 0-5 months, through 70% in 24-35 months, then declined to 55% in 36-47 months age group (**Tables 23, Fig. 8**). The prevalence was essentially similar among boys (57%) and girls (56%) (**Tables 24, Fig. 9**).

The overall prevalence of underweight among <5 year children in the district was lower (57%) compared to that reported for the State of Madhya Pradesh, by NFHS-3 (60%) and but higher than NNMB (46%).

### **Stunting**

In general, about 65% of <5 year children were stunted (<Median -2SD). The prevalence of severe stunting (<Median -3SD) was about 37%, while that of moderate stunting (<Median - 3SD to - 2SD) was about 28%. The prevalence of stunting increased with increase in age, from about 12% in the age group of 0-5 months, through 80% in 12-35 months, and then declined to about 52% in 48-59 months age group (**Table 23, Fig.8**). The prevalence was significantly higher (68%) among boys compared to girls (61) (**Table 24, Fig.9**).

The overall prevalence of stunting among <5 year children in the district was higher (65%) compared to that reported for the State of Madhya Pradesh, by NFHS-3 (50%) and NNMB (59%).

### **Wasting**

The overall prevalence of wasting (<Median -2SD) was 21%, with about 8% of children severely wasted (<Median -3SD) and 13% moderately wasted. The extent of wasting tended to decrease with increase in age from 52% in <6 months children to about 10% in 36-47 months children and 11% in 48-59 months age group (**Table 23, Fig.8**). The prevalence was observed to be marginally higher among boys (22%) compared to girls (20%) (**Table 24, Fig.9**).

The overall prevalence of wasting among <5 year children in the district was lower (21%) compared to that reported for the State of Madhya Pradesh, by NFHS-3 (35%) but comparable to NNMB (24%).

### **4.7.3 Association between Socio-economic variables and Nutritional status of Children**

Association between various socio-demographic variables and nutritional status of children was analysed using Chi-square test and results are presented in **Table 25**.

## **Community**

The prevalence of underweight among <5 year children belonging to ST, SC, and BC communities was higher (59.5% & 58%) compared to other castes (46%). The difference was, not found to be statistically significant. The Prevalence of stunting was significantly ( $p<0.01$ ) higher among ST and SC (65.5%), and BC (69.8%) compared to OC (46%). The prevalence of wasting was marginally higher among BC (23.5%) as compared to OC (15.4%) and SC & ST communities (17.9%). The differences, however, were not statistically significant (**Fig. 10**).

## **Type of Family**

The prevalence of underweight, and stunting though not statistically significant was relatively higher among children from nuclear and extended nuclear families (58%, and 68% respectively) compared to those living in joint families (55%, and 58% respectively). The prevalence of wasting was similar among children from joint families and those living in nuclear and extended nuclear families.

## **Family size**

The prevalence of underweight was observed to be higher among HHs with family size of 1-4 and 5-9 (58% each), compared to those with family size of  $\geq 10$  members (48%). Similarly, the prevalence of stunting was higher among HHs with family size of 1-4 (70%), compared to those with family size of 5-9 (62%) and  $\geq 10$  members (65%). The prevalence of wasting was marginally higher among those with family size of 1-4 (25%) compared to those with family size of 5-9 and  $\geq 10$  members (13% & 21% respectively). These differences, however, were not statistically significant.

## **Literacy status of father**

The nutritional status of children was found to be significantly associated with literacy status of father. The prevalence of underweight and stunting was significantly higher ( $p<0.05$ ) among children of illiterate fathers (66% & 73% respectively), compared to those of 'literate' (53% & 62% respectively). Though not statistically significant, the prevalence of wasting was higher among 'illiterate' (27%) compared to 'literate' (19%) (**Fig. 11**).

## **Literacy status of mother**

The prevalence of underweight though not statistically significant was higher among children of illiterate mothers (60%), compared to those of 'literate' (52%). The prevalence of stunting was similar among both the groups (65%). The prevalence of wasting was significantly higher ( $p<0.001$ ) among children of illiterate mothers (27%) compared to 'literate' (13%) (**Fig.12**).

### ***Household possession of land***

The prevalence of underweight was similar (57%) among children from landless households and those possessing land. The prevalence of stunting was observed to be higher (70%) among children from landless households compared to those possessing land (62%) (**Fig.13**) but was not statistically significant. The prevalence of wasting was higher among landholders (23%) compared to landless (19%), however the difference was not statistically significant.

### ***Occupation of father***

The prevalence of underweight among children with father's occupation being 'labours' was higher (about 59%) compared to 'others' (56%) and 'cultivators' (54%). Similarly the prevalence of stunting was higher among those with 'other' occupations (68%) and among 'labour' (69%) compared to 'cultivators' (61%). The prevalence of wasting on the other hand, though not statistically significant, was found to be higher among 'labour' (22%), and 'cultivators' (24%) compared to 'others' (7%), however, none of the differences were not statically significant (**Fig. 14**).

### ***Occupation of mother***

The prevalence of underweight among children with mothers were engaged in labour and housewives/'other' was higher (60% & 57%) than those who were 'cultivators' (46%). The prevalence of stunting was higher among 'labour' (67%) and 'cultivators' (69%) compared to 'housewives'/'other' (64%). On the other hand, the prevalence of wasting was found to be higher among 'labour' (27%) compared to 'cultivators' (15%) and 'housewives'/'others' (20%). However, none of the differences were found to be statistically significant.

### ***Per Capita Income (Rs.)***

The prevalence of underweight among <5 year children was maximum among HHs with per capita monthly income of 300-600 Rs. (65%), which tended to decrease with increasing income to about 54% with PCI of  $\geq$  Rs.900. The prevalence of stunting tended to increase with increasing income from about 58% among those with PCI of <300 Rs. to about 69% among those with  $\geq$  Rs. 900. The prevalence of wasting was higher (24.5%) among those with PCI of Rs.300-600, compared to those with PCI of Rs. 600-900 (15%). However, none of the differences were found to be statistically significant (**Fig. 15**).

### ***Type of house***

The prevalence of underweight was higher among children from families living in kutcha houses (61%), compared to those living in semi-pucca house (57%) or pucca houses (47%), although not statistically significant. The prevalence of stunting and wasting was significantly ( $p < 0.01$ ) higher among children from families living in

kutchra houses (72% & 27% respectively), compared to those living in semi-pucca house (65% & 22%) or pucca houses (52% & 8% respectively) (**Fig.16**).

### ***Source of drinking water***

No association was observed between the prevalence of underweight, stunting and wasting and source of drinking water. However, though not statistically significant, the prevalence of underweight and stunting was lower among those children from households having tap/tube well as source of drinking water (56% & 65%), compared to those with 'other' sources (64% & 69% respectively).

### ***Type of cooking fuel***

The prevalence of underweight and wasting, though not statistically significant, was higher among children from HHs using firewood as cooking fuel (57% & 21% respectively), compared to those using 'other' fuels (46% & 9% respectively). The prevalence of stunting was significantly ( $p<0.05$ ) higher among children from HHs using firewood as cooking fuel (66%), compared to those using 'other' fuels (36%).

### ***Electrification***

The prevalence of underweight, though not statistically significant, was higher among children from HHs not having electricity (59%) compared to those having electricity (52%). The prevalence of stunting was significantly ( $p<0.001$ ) higher among children from HHs not having electricity (71%) compared to those having electricity (55%). The prevalence of wasting was similar between the groups.

### ***Sanitary Latrine***

The prevalence of underweight, and wasting was similar among children from HHs using sanitary latrines and those not using or not having sanitary latrines. The prevalence of stunting was significantly ( $p<0.05$ ) lower among children from HHs using sanitary latrines (49%) compared to those not using or not having sanitary latrines (67%).

### ***Separate Kitchen***

The prevalence of underweight, stunting and wasting was significantly ( $p<0.05$ ) higher (59%, 68% and 23% respectively) among children from HHs who did not have separate kitchen compared to those having separate kitchen (47%, 55% and 13% respectively).

### ***History of Morbidity during preceding fortnight***

The prevalence of underweight was marginally higher among children with history of morbidity (such as fever, diarrhoea, respiratory infections etc) in the preceding fortnight (58%) compared to those children with no history of morbidity (56%). The prevalence of stunting was higher among children with history of



morbidity in the preceding fortnight (74%) compared to those children with no history of morbidity (64%), however, the differences were not found to be statistically significant.

## 5. DISCUSSION AND CONCLUSIONS

National population policy 2000 envisaged that about 80% of deliveries should be Institutional and 100% should be conducted by trained personnel<sup>16</sup>. The study revealed that about 67% of pregnant women had undergone antenatal check-up, 18% undergone at least three ANCs and about 91% received TT immunization in the Gwalior district of Madhya Pradesh. According to NFHS-3 survey, about 80% of the pregnant women had undergone ANC in the state of Madhya Pradesh<sup>10</sup>. About 94% deliveries took place either in Government or Private hospitals and about 65% were conducted by medical doctors. This finding is encouraging, as majority of the deliveries were conducted by trained medical personnel.

Birth weights were recorded in about 71% of the newborns, and the records were available for all of them. The proportion of low birth weight (LBW) was about 17% in the district. The birth weight of an infant is the single most important determinant of new born survival and in developing countries. Low birth weight infants are at increased risk of being malnourished at one year of age, become victims of “infection-malnutrition cycle” which leads to further physical stunting and impaired growth and development<sup>17</sup>. In addition, children born with intrauterine growth retardation are at a higher risk of developing overweight/obesity and associated chronic degenerative disorders during adulthood<sup>6</sup>.

Infant and young child feeding practices have a significant impact on child health and survival. Appropriate feeding including early and exclusive breastfeeding and optimal complementary feeding practices such as right time of initiation, right type and quantity of complementary foods and frequency of complementary feeding is important for proper physical growth and mental development of the child. In its policy statements, the American Academy of Paediatrics (1997)<sup>18</sup> stated that the mother’s milk is uniquely superior for infant feeding.

Epidemiological research showed that mother’s milk and breastfeeding of infants provides advantages with regard to general health, growth and development while significantly decreasing risk for a large number of acute and chronic diseases. In this study, breastfeeding was the common practice among the mothers. About 44% of the mothers reportedly initiated breastfeeding within one hour after delivery which is higher than that reported by NFHS-3 (16%), while 49% of mothers initiated between 1-3 hours. Pre-lacteals were given in about 5% of the newborns. This finding is encouraging as Pre-lacteal feeds might harm the immature gut of the child,

especially if they are contaminated and early initiation of breast feeding is the primary determinant of maternal milk production and secretion. Avoidance of other fluids or foods is essential to optimize breast milk intake by the newborn. Most of the other fluids or foods are less nutritious than breast milk and therefore, if displacement occurs, the infant may be at a nutritional disadvantage even if prepared hygienically<sup>19</sup>. In many communities, it is traditionally believed that colostrum is unhealthy and therefore is harmful to the baby. However in the present study, colostrum was given by majority (97%) of mothers which is good for the child's health and nutrition and such desirable practices should be encouraged in the community.

Breast milk can contribute significantly as a source of energy, fat, high quality protein and micronutrients, especially when the quality of available complementary food is low (Academy of Educational Development, 1999<sup>19</sup>). WHO<sup>20</sup> and UNICEF (1993a<sup>21</sup>) recommends that complementary feeding should be initiated immediately after 6 months of the infant's age and breastfeeding should be continued well into the second year of life and for longer duration, if possible. In this study, the mothers continued to breastfeed for a longer duration (up to 2 years), however undesirable complementary feeding practices appear to be significant in the district of Gwalior in terms of initiation and frequency of feeding.

The initiation of complementary feeding was unduly delayed. Only about 51% of the 6-11 months children were getting complementary feeds, while only 12% started receiving the same at the age of 6 months. The complementary foods being given mostly included cow/buffalo milk and home made semi-solids. The frequency of feeding was at least 3 times in 41% of the infants. Effective immunization programme against the common communicable diseases are required for the majority of the susceptible populations particularly in the developing countries, wherein the risk of disability or death from preventable infectious diseases is a matter of concern. Therefore, coverage under universal immunization programme should be 100%. The coverage for complete immunization is about 97% in this district.

The programme for prevention of blindness due to vitamin A deficiency envisages distribution of massive dose vitamin A to all the children aged between 9-59 months, every 6 months. It was observed that about 78% of children between 9-17 months and 82-84% children between 18-59 months received at least one dose vitamin A during previous one year. About 80% of 18-59 months children received the suggested two doses during the preceding one year. The coverage for iron-folic acid supplementation was very low (30%), while only 4% received  $\geq 90$  tablets indicating, poor coverage. Low compliance (only 3% consumed  $\geq 90$  tablets)

indicates weak education component. There is a need to strengthen the service delivery and monitoring mechanisms for these programmes.

The common morbidities such as ARI, fever and diarrhoea were reported by the mothers with the prevalence being higher in the younger age group (6-11 months) compared to the older age group (12-23 months). The possible reasons for this could be prevailing suboptimal infant and young child feeding practices coupled with non-receipt of appropriate health care management.

The consumption of adequately iodised salt was very poor (11%) in the district as compared to National level (51%) and the State (36%)<sup>10</sup>.

Nutritional status of infants and young children is not only a vital health issue, but it is also central to sustainable growth and development of the child<sup>22</sup>. In the present study, the prevalence of underweight, stunting and wasting was 57%, 65% and 21% respectively. It was observed that the nutritional status of children deteriorated as age advances especially from six months onwards. Undernutrition in all its three forms continues to be a significant problem in the district of Gwalior, even though the current prevalence of underweight in the district is considerably lower than that reported for the State of Madhya Pradesh by NFHS-3 (2006), but prevalence of underweight and stunting is higher than NNMB (2006). Probably, factors such as, the energy and nutrient density of the complementary foods given, the frequency and variety of foods offered, hygiene aspects of food preparation, personal hygiene, the amount of breast milk consumed at different stages of complementary feeding, the frequency of breastfeeding and inappropriate complementary feeding during and after illness may have an important contributory role for the observed high prevalence of undernutrition in the district.

The study revealed significant association between nutritional status and different socio-economic variables, which indicate higher rates of undernutrition in the households of vulnerable sections of society (SC & ST), among children of illiterate parents, living in *kutcha* house and in households with no facility of electricity, a sanitary latrine and separate kitchen. Promotion of better infant and young child feeding and health care practices is needed for improving the health and nutritional status of young children.

Last, but not the least, there is need to strengthen the programme aimed at income generation, so as to enhance HH food and nutrition security.

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**Table - 1**  
**Particulars of Coverage**

<b>Particulars</b>	<b>Coverage (n)</b>
Socio-economic particulars (HHs)	397
Under 5 year children for anthropometry	417
Children below 12 months	102
Children 12-35 months	183
Children 36-59 months	132
Spot testing of HHs salt for iodine	397
<b>Infant &amp; young child Feeding Practices</b>	
Mothers with <12 month children	102
Mothers with 12-35 month children	183

**Table - 2**  
**Socio-economic Profile of the Households of Index children**

Particulars	Percent
<b>n</b>	<b>397</b>
<b>Community</b>	
Scheduled Tribe	9.8
Scheduled Caste	10.8
Backward Community	63.8
Others	15.6
<b>Type of Family</b>	
Nuclear	50.4
Extended Nuclear	18.6
Joint	31.0
<b>Family Size</b>	
1 -4	33.0
5 – 9	55.7
≥ 10	11.3
<b>Average Family Size</b>	6.2
<b>Literacy status of Father</b>	
Illiterate	28.5
Read & write	1.0
1 – 5 Class	17.6
6 – 7 Class	7.8
8 – 10 Class	33.0
Intermediate	5.8
Graduate & above	6.3
<b>Literacy status of Mother</b>	
Illiterate	58.6
Read & write	1.5
1 – 5 Class	15.9
6 – 7 Class	4.8
8 – 10 Class	14.9
Intermediate	2.3
Graduate & above	2.0

(Contd....)

**Table – 2 (Contd...)**  
**Socio-economic Profile of the Households of Index children**

Particulars	Percent
n	<b>397</b>
<b>Extent of HH landholding (Acres)</b>	
Nil	44.9
Marginal farmers <2.5	15.1
Small farmers 2.5 – 5.0	24.9
Large farmers ≥ 5.0	15.1
<b>Major Occupation of Father</b>	
Agricultural labour	2.5
Other labour	38.3
Owner Cultivator	45.1
Land lord	0.3
Artisan	4.0
Service	4.8
Business	4.5
Others	0.5
<b>Major Occupation of Mother</b>	
Other labour	22.9
Owner Cultivator	6.3
Service	0.5
Housewife	70.3
<b>Per capita monthly income (Rs)</b>	
< 300	8.1
300 - 600	33.4
600 - 900	28.5
≥ 900	30.0
<b>Average per capita monthly income (Rs)</b>	<b>926</b>



**Table - 3**  
**Physical facilities of the Households**

Particulars	Percent
<b>n</b>	<b>397</b>
<b>Type of house</b>	
<i>Kutcha</i>	37.3
<i>Semi Pucca</i>	42.5
<i>Pucca</i>	20.2
<b>Source of Drinking Water</b>	
Open Well	8.6
Tube Well	91.1
Tap	0.3
<b>Type of Cooking Fuel</b>	
Firewood	97.7
Kerosene	0.3
Bio-gas	0.5
LPG	1.5
<b>Household electricity present</b>	<b>33.2</b>
<b>Sanitary Latrine</b>	
Present and in use	9.6
Present and not in use	2.3
Absent	88.1
<b>Separate Kitchen Present</b>	<b>20.9</b>

**Table – 4**  
**Distribution (%) of HHs according to use of Iodized salt and iodine content**

Particulars	Percent
<b>n</b>	<b>397</b>
<b>Type of salt used</b>	
Powdered salt	50.6
Crystal Salt	10.6
Rock salt	17.9
Free-flowing	20.9
<b>Iodine content</b>	
0 ppm	46.3
<15 ppm	42.6
≥15 ppm	11.1

**Table – 5**  
**Distribution (%) of Mothers according to age and parity**

Age group (Years)	Percent
<b>n</b>	<b>397</b>
<20	0.8
20-29	85.3
30-39	13.1
≥40	0.8
<b>Parity</b>	
1	30.2
2	36.7
3	16.9
4	8.8
≥5	7.4

**Table - 6**  
**Particulars of last pregnancy of mothers of < 6 months children**

<b>Particulars</b>	<b>Percent</b>
<b>n</b>	<b>33</b>
<b>Undergone Antenatal check-up (ANC)</b>	
Yes	66.7
No	33.3
<b>Total number of ANCs</b>	
One	9.1
Two	39.4
Three	15.2
Four	3.0
Not availed ANC	33.3
<b>Undergone First ANC at (Weeks of gestation)</b>	
≤ 8 weeks	3.0
9- 12 weeks	21.3
13- 16 weeks	33.3
17-20 weeks	6.1
>20weeks	3.0
Not availed ANC	33.3
<b>Place of ANC</b>	
AWC	18.2
Sub-centre	6.1
PHC/CHC	6.1
Taluk/Dist.hospital	12.1
Private Clinic	24.2
Not availed ANC	33.3
<b>ANC conducted by</b>	
ANM/LHV	15.2
Medical Officer	27.3
Pvt. Doctor	24.2
Not availed ANC	33.3

( Contd..)

**Table – 6 (Contd...)**

**Particulars of last pregnancy of mothers of < 6 months children**

<b>Particulars</b>	<b>Percent</b>
<b>n</b>	<b>33</b>
<b>Components of ANC*</b>	
Physical Examination	66.7
Weight Recording	48.5
Urine Test	48.5
Haemoglobin Estimation	48.5
Blood pressure measurement	51.5
<b>Health &amp; Nutrition advise given during ANC</b>	
Yes	57.6
No	9.1
Not availed ANC	33.3
<b>If yes, what advise*</b>	
To attend for regular checkups	57.6
To consume more GLVs	57.6
To consume more Vegetables & fruits	57.6
To take IFA tablets for 100 days	57.6
Others	21.2
<b>Reasons for not availing ANCs*</b>	
Not aware of the need	21.2
Timings are inconvenient	3.0
Place is not accessible	9.1
Loss of wages	3.0
<b>TT Immunization receiving</b>	
Yes	90.9
No	9.1
<b>If yes, No. of doses</b>	
One dose	3.0
Two doses	87.9
Not received	9.1
<b>Reasons for not receiving TT *</b>	
Not aware of the need	6.1
Not offered	3.0

\* Multiple responses

(Contd..)

Table – 6 (Contd...)

Particulars of last pregnancy of mothers of < 6 months children

Particulars	Percent
n	33
<b>Received IFA tablets</b>	
Yes	75.8
No	24.2
<b>IFA tablets received from</b>	
AWW	63.7
MO-PHC	3.0
Private Doctor	9.1
Not received	24.2
<b>No. of IFA tablets received</b>	
30-60	9.1
60-90	45.5
≥90	21.2
Not received	24.2
<b>No. of IFA tablets consumed</b>	
<30	18.2
30-60	33.3
60-90	6.1
≥90	18.2
Not received	24.2

**Table –7**  
**Particulars of last Delivery of mothers of <12 months children**

Particulars	Percent
n	102
<b>Place of delivery</b>	
Home	5.9
<b>Institutional deliveries</b>	94.1
Sub-centre	2.9
PHC/Govt. Hospital	80.4
Private hospital	10.8
<b>Delivery conducted by</b>	
Elders	1.0
Untrained Dai	4.9
ANM/LHV	28.4
Medical Officer -PHC	56.9
Pvt. Doctor	8.8
<b>Birth weight recorded</b>	
Yes	70.6
No	15.7
DNK	13.7
<b>If yes, when</b>	
Same day	69.6
Second day	1.0
Not recorded	29.4
<b>Records of birth weight available (n= 71)</b>	
Birth weight <2.5 Kg.	16.9
Birth weight ≥2.5 Kg.	83.1

**Table - 8**  
**Distribution (%) of < 60 months children according of Birth order**

<b>Birth order</b>	<b>Percent</b>
<b>n</b>	<b>417</b>
First	38.1
Second	32.4
Third	16.1
Fourth	7.2
Fifth and above	6.2

**Table - 9**  
**Distribution (%) of < 60 months children having siblings according to interval between last two births**

<b>Interval between last two births(months)</b>	<b>Percent</b>
<b>n</b>	<b>258</b>
<12	0.4
12-23	24.4
24-35	30.6
≥36	44.6

Table - 10

Distribution (%) of <12 months Children according to Breast feeding practices (Respondents: Mothers of index Children)

Particulars	Percent
n	102
<b>Child given pre-lacteals</b>	
Yes	4.9
<b>Type of pre-lacteals given before initiation of breast feeding</b>	
Plain water	2.0
Cow or buffalo milk	2.9
<b>Time of Initiation of breast feeding after delivery (Hrs)</b>	
< 1	44.1
1-3	49.0
4 – 11	5.9
24 - 36	1.0
<b>Child fed with colostrums</b>	
Yes	97.1
No	2.9
<b>Reasons for discarding colostrums</b>	
Child could not suck	2.0
Elders advice	1.0



**Table - 11**  
**Distribution (%) of infants (<12 months) according to Feeding Practices**

Particulars	Age group (months)	
	0-5	6-11
<b>Feeding Practices</b> n	<b>33</b>	<b>69</b>
solely breast fed	87.9	30.4
Breast milk + water	-	18.8
currently Breast fed + complementary feeding	12.1	50.8
<b>Up to what age (Months) the infant was given only breast milk not even water</b>		
≤ 1	3.0	-
3	-	1.4
4	9.1	
5	-	15.9
≥ 6	-	52.3
<b>Age of initiation complementary feeding</b>		
<4 months	3.0	-
4 – 5 months	9.1	1.4
At 6 months	NA	11.6
> 6 months	NA	37.8
Not yet started	87.9	49.2
<b>Type of complementary food currently being given*</b>		
Cow/buffalo milk	12.1	47.9
Formula milk	-	2.9
Home made semi-solids	-	17.4
Home made solids	-	26.1
Not yet started	87.9	49.2

\* Multiple responses

**Table - 12**  
**Distribution (%) of 6-11 months Children according to Feeding Practices**

<b>Feeding Practices</b>	<b>Percent</b>
<b>n</b>	<b>69</b>
<b>Foods generally included in home made complementary foods*</b>	
Cereals & Millets	30.4
Pulses	31.9
Green Leafy Vegetables	23.2
Other vegetables	18.8
Roots & Tubers	15.9
Fruits	21.7
Milk & milk products	37.7
Eggs	7.2
Meat & Chicken	2.9
Fats & Oils	23.2
<b>Number of complementary feeds per day</b>	
2	10.1
3	26.2
4	14.5
Not yet started	49.2
<b>Mode of complementary feeding</b>	
Mother with spoon	10.1
Mother with hand	33.5
Self with spoon	1.4
Self by hand	5.8
Not yet started	49.2
<b>Supervision of complementary feeding by</b>	
Mother	49.4
Father	1.4
Not yet started	49.2

\* Multiple responses

**Table - 13**  
**Distribution (%) of 12-35 months Children according to Feeding Practices**

Feeding Practices	Percent
<b>n</b>	<b>183</b>
Children currently Breast fed + complementary feeding	57.4
Weaned	42.6
<b>Age of initiation complementary feeding</b>	
At 5 months	1.0
At 6 months	18.0
At 7 months	56.4
At 8 months	17.5
At 9 months	4.9
At 10 months	1.1
At 12 months	1.1
<b>Type of food currently being given*</b>	
Cow/buffalo milk	94.0
Formula milk	1.1
Commercial baby food	0.5
Home made semi-solids	43.2
Home made solids	97.8
<b>Foods generally included in home made foods*</b>	
Cereals & Millets	99.5
Pulses & legumes	99.5
Green Leafy Vegetables	96.2
Other Vegetables	92.9
Roots & Tubers	95.1
Fruits	92.9
Milk & milk products	96.7
Eggs	13.1
Flesh foods	14.2
Fats & Oils	91.8

\* Multiple responses

( Contd....)

**Table – 13 (Contd...)  
Distribution (%) of 12-35 months Children According to Feeding (CF)  
Practices**

<b>Feeding Practices</b>	<b>Percent</b>
<b>Number of complementary feeds per day</b>	
<b>n</b>	<b>183</b>
≤2	12.6
3	41.0
≥4	46.4
<b>Mode of feeding complementary food</b>	
Mother with hand	47.0
Self with spoon	0.5
Self by hand	52.5
<b>Supervision of complementary feeding by</b>	
Mother	99.5
Grand parents	0.5

**Table – 14**  
**Distribution (%) of mothers of 0- 59 months Children according to**  
**Care of the child and personal Hygiene**

Particulars	Age group (months)			
	<12	12-35	36-59	0-59
<b>n</b>	<b>102</b>	<b>183</b>	<b>132</b>	<b>417</b>
<b>Care of the child when mother goes out for work</b>				
Mother-in-law	7.8	1.6	5.3	4.3
Elder siblings	-	0.5	-	0.2
Carry the child to work spot	17.6	27.9	19.7	22.8
Others	2.9	1.1	2.3	1.9
Self	71.6	68.9	72.7	70.7
<b>Wash child hands before feeding</b>				
With soap	7.8	12.6	10.6	10.8
Without soap	27.5	80.3	86.4	69.3
<b>Wash hands with soap before feeding the child</b>				
Yes	45.1	22.4	28.0	29.7
No	54.9	77.6	72.0	70.3
<b>Wash hands with soap after defecation of self/child</b>				
Yes	61.8	80.9	79.5	75.8
No	38.2	19.1	20.5	24.2

**Table – 15**  
**Prevalence (%) of the Morbidity among 0- 59 months children during**  
**previous fortnight by age groups**

<b>Age Group (months)</b>	<b>n</b>	<b>Fever</b>	<b>Diarrhoea</b>	<b>ARI</b>	<b>At least one morbidity</b>
0-5	33	-	3.0	-	3.0
6-11	69	8.7	10.1	11.6	20.3
12-23	87	8.0	8.0	6.9	12.6
24-35	96	6.3	8.3	4.2	12.5
36-47	78	6.4	10.3	5.1	15.4
48-59	54	11.1	18.5	13.0	22.2
<b>Pooled</b>	<b>417</b>	<b>7.2</b>	<b>9.8</b>	<b>7.0</b>	<b>14.9</b>

**Table – 16**  
**Distribution (%) of mothers of 0- 59 months Children according to**  
**Care of the child during Sickness**

Particulars	Age group (months)			
	<12	12-35	36-59	0-59
<b>n</b>	<b>102</b>	<b>183</b>	<b>132</b>	<b>417</b>
<b>Personnel generally consulted during illness of the child</b>				
AWW	2.0	-	-	0.5
MO,PHC	16.7	8.2	6.1	9.6
Pvt. Practitioner	81.3	91.8	93.9	89.9
<b>Morbidity during previous fortnight</b>				
Any of the Morbidity	14.7	12.6	18.2	14.9
Fever	5.9	7.1	8.3	7.2
Diarrhoea	7.8	8.2	13.6	9.8
Cough	7.8	5.5	8.3	7.0
<b>Particulars of feeding of child during diarrhoea*</b>				
<b>Given ORS</b>	9.8	12.2	22.0	14.7
Home made ORS	4.9	5.5	10.6	7.0
ORS given by AWW/ANM	4.9	5.5	10.6	7.0
Commercial ORS	-	1.1	0.8	0.7
Rice Gruel	1.0	4.9	3.8	3.6
Others	2.0	1.6	2.3	1.9
<b>Co-trimoxazole tablets given by ANM during ARI</b>				
Yes	1.0	-	0.8	0.5

\* Multiple responses

**Table - 17**  
**Participation (%) in ICDS supplementation programme**  
**(6- 59 months children)**

Particulars	Age group (months)		
	6-35	36-59	6-59
n	252	132	384
Participating			
Regular	27.8	56.1	37.5
Irregular	24.2	37.1	28.6
Not participating	48.0	6.8	33.9



**Table -18**  
**Distribution (%) of 12- 24 months children according to Coverage for**  
**Immunization under UIP**

Immunization Particulars	Percent
<b>N</b>	<b>87</b>
Received all vaccines ( Fully Immunized)	96.6
Partially immunized	2.3
Not immunized	1.1
BCG	98.9
DPT1	96.6
DPT2	96.6
DPT3	96.6
OPV1	96.6
OPV2	96.6
OPV3	96.6
Measles	96.6
<b>Reasons for no / incomplete immunization</b>	
Not offered	3.4
Fully immunized	96.6
<b>Source of information</b>	
Mother & child protection card	36.9
Immunization card	10.3
Parents	23.0
AWC Records	28.7
Not immunized	1.1

**Table - 19**  
**Distribution (%) of 9-59 months Children According to receipt of massive dose vitamin A during previous one year**

Particulars	Age group (months)			
	9-17	18-35	36-59	9-59
N	77	145	132	354
<b>Receipt of massive dose vitamin A</b>				
Yes	77.9	84.1	81.8	81.9
No	14.3	15.9	14.4	15.0
Do not remember	7.8	0.0	3.8	3.1
<b>No. of doses of vitamin A</b>				
One	77.9	2.8	1.5	18.7
Two	0.0	81.3	80.3	63.2
Not received	14.3	15.9	14.4	15.0
Do not remember	7.8	0.0	3.8	3.1
<b>Place of administration</b>				
Home	2.6	0.0	0.8	0.9
AWC	75.4	84.1	81.0	81.0
SC	0.0	0.0	0.0	0.0
Not received/do not remember	22.0	15.9	18.2	18.1
<b>Massive dose vitamin A administered by</b>				
AWW	58.5	62.7	61.3	61.3
ANM	19.5	21.4	20.5	20.7
LHV	0.0	0.0	0.0	0.0
Not received/do not remember	22.0	15.9	18.2	18.1
<b>Reasons for not receiving/incomplete massive dose vitamin A</b>				
Unaware of need	0.0	1.4	0.0	0.6
Not offered	14.3	15.2	15.9	15.3
Time or place not convenient	0.0	1.4	0.0	0.6
Mothers was busy	0.0	0.0	0.0	0.0
Others	0.0	0.7	0.0	0.3

**Table - 20**  
**Distribution (%) of 12-59 months Children according**  
**to receipt of Iron & folic acid tablets**

Particulars	Age group (months)		
	12-35	36-59	12-59
<b>n</b>	183	132	315
<b>Received IFA tablets</b>			
Yes	24.6	37.9	30.2
No	75.4	62.1	69.8
<b>IFA tablets received from</b>			
ANM	0.5	0.8	0.7
AWW	23.6	36.3	28.9
MO-PHC	0.5	-	0.3
Private Doctor	-	0.8	0.3
Not received	75.4	62.1	69.8
<b>Number of IFA tablets received</b>			
<30	8.8	11.4	9.9
30-60	7.1	9.8	8.3
60-90	6.0	10.6	7.9
≥90	2.7	6.1	4.1
Not received	75.4	62.1	69.8
<b>No. of IFA tablets consumed</b>			
<30	13.2	22.7	17.2
30-60	7.1	6.1	6.7
60-90	1.6	6.8	3.8
≥90	2.7	2.3	2.5
Not received	75.4	62.1	69.8

**Table - 21**  
**Prevalence (%) of nutritional deficiency signs among 0 - 59 months children**

Clinical signs	Age groups (Months)			
	0-11	12-35	36-59	0-59
No of children examined	102	181	132	415
NAD	100.0	98.9	100.0	99.5
Bitot spots	-	0.5	-	0.2

NAD: No Abnormality Detected

**Table -22**  
**Mean Height and weight of 0-59 months Children by age group and gender**

n	BOYS				Age (Months)	n	GIRLS			
	Height (cm)		Weight (kg)				Height (cm)		Weight (kg)	
	Mean	± SD	Mean	± SD			Mean	± SD	Mean	± SD
3	54.0	2.55	3.3	1.19	<1	5	52.8	4.57	2.8	0.54
1	52.3	-	4.9	-	1	1	53.3	-	3.8	-
3	63.2	1.23	5.7	0.94	2	3	57.2	3.81	4.3	0.26
3	60.6	2.55	5.4	0.20	3	4	58.9	2.24	4.52	0.69
3	60.9	0.53	5.3	0.64	4	2	61.1	3.74	5.0	0.14
1	59.3	-	6.1	-	5	4	61.8	4.27	5.4	0.52
7	62.3	3.03	5.7	1.00	6	5	60.4	5.84	5.5	0.98
4	64.5	1.41	6.5	0.38	7	3	61.5	1.76	6.3	0.55
7	67.4	3.65	7.5	0.85	8	4	62.9	2.11	6.2	0.73
8	65.9	2.52	7.0	0.89	9	4	64.8	2.88	5.9	0.60
10	68.3	2.50	7.3	0.98	10	2	62.6	6.22	6.0	1.83
8	66.8	4.75	7.3	1.29	11	7	65.4	5.19	6.6	1.39
20	69.8	2.84	7.6	1.06	12-17	18	69.0	3.93	7.1	1.07
33	75.1	3.97	8.2	1.08	18 -23	16	74.2	4.52	8.1	1.11
18	78.9	3.93	9.4	1.05	24-29	20	77.9	3.57	9.0	0.99
34	81.9	4.79	10.1	1.38	30 -35	24	82.4	4.67	9.9	1.26
25	86.8	5.76	11.4	1.83	36-41	15	86.3	5.24	11.3	1.64
26	92.4	6.13	12.4	1.41	42 - 47	12	92.4	3.18	12.3	1.71
16	94.2	3.63	12.4	1.23	48 -53	10	93.5	4.48	12.9	1.23
18	100.3	3.76	14.2	0.91	54 -59	10	99.5	3.56	13.8	0.91

**Table - 23**  
**Distribution (%) of 0-59 months Children according to nutritional status by**  
**SD Classification: By Age group**

<b>Underweight (Weight for Age)</b>					
<b>Age Group (months)</b>	<b>n</b>	<b>Severe (&lt;Median-3SD)</b>	<b>Moderate (Median - 3SD to Median- 2SD)</b>	<b>Normal (≥Median-2SD)</b>	<b>Overall Underweight (&lt;Median - 2SD)</b>
0-5	33	12.1	12.1	75.8	24.2
6-11	69	21.7	37.7	40.6	59.4
12-23	87	35.6	29.9	34.5	65.5
24-35	96	29.2	40.6	30.2	69.8
36-47	78	17.9	37.2	44.9	55.1
48-59	54	7.4	29.6	63.0	37.0
<b>0-59</b>	<b>417</b>	<b>23.0</b>	<b>33.6</b>	<b>43.4</b>	<b>56.6</b>
<b>Stunting (Height for Age)</b>					
<b>Age Group (months)</b>	<b>n</b>	<b>Severe (&lt;Median-3SD)</b>	<b>Moderate (Median - 3SD to Median- 2SD)</b>	<b>Normal (≥Median-2SD)</b>	<b>Overall Stunting (&lt;Median - 2SD)</b>
0-5	33	3.0	9.1	87.9	12.1
6-11	69	33.3	27.5	39.2	60.8
12-23	87	57.5	23.0	19.5	80.5
24-35	96	51.0	29.2	19.8	80.2
36-47	78	29.5	35.9	34.6	65.4
48-59	54	14.8	37.0	48.1	51.9
<b>0-59</b>	<b>417</b>	<b>36.9</b>	<b>28.3</b>	<b>34.8</b>	<b>65.2</b>
<b>Wasting (Weight for Height)</b>					
<b>Age Group (months)</b>	<b>n</b>	<b>Severe (&lt;Median-3SD)</b>	<b>Moderate (Median - 3SD to Median- 2SD)</b>	<b>Normal (≥Median-2SD)</b>	<b>Overall Wasting (&lt;Median - 2SD)</b>
<b>0-5</b>	33	<b>33.3</b>	<b>18.2</b>	<b>48.5</b>	51.5
6-11	69	13.0	11.6	75.4	24.6
12-23	87	11.5	18.4	70.1	29.9
24-35	96	3.1	11.5	85.4	14.6
36-47	78	2.6	7.7	89.7	10.3
48-59	54	0.0	11.1	88.9	11.1
<b>0-59</b>	<b>417</b>	<b>8.4</b>	<b>12.7</b>	<b>78.9</b>	<b>21.1</b>

WHO New Child Growth Standards (2006)

*Nutritional Status of <5yr Children*

*Gwalior Dist. - Madhya Pradesh*

Table -24

Distribution (%) of 0- 59 months Children according to nutritional status by SD Classification\*: By Gender

Gender	n	Nutritional Status			
		<Median - 3SD	Median - 3SD to Median - 2SD	≥Median - 2SD	<Median - 2SD
<b>Weight for Age</b>					
Boys	248	26.6	30.6	42.8	57.2
Girls	169	17.8	37.9	44.3	55.7
<b>Pooled</b>	<b>417</b>	<b>23.0</b>	<b>33.6</b>	<b>43.4</b>	56.6
<b>Height for Age</b>					
Boys	248	42.3	25.8	31.9	68.1
Girls	169	29.0	32.0	39.0	61.0
<b>Pooled</b>	<b>417</b>	<b>36.9</b>	<b>28.3</b>	<b>34.8</b>	65.2
<b>Weight for Height</b>					
Boys	248	8.5	13.7	77.8	22.2
Girls	169	8.3	11.2	80.5	19.5
<b>Pooled</b>	<b>417</b>	<b>8.4</b>	<b>12.7</b>	<b>78.9</b>	21.1

\* WHO New Child Growth Standards (2006)

**Table -25**  
**Distribution (%) of 0- 59 months Children by Nutritional status according to**  
**SD Classification: By Socio-demographic variables**

Particulars	n	Weight for age		Height for age		Weight for height	
		<Median -2SD	≥ Median -2SD	<Median -2SD	≥ Median -2SD	<Median -2SD	≥ Median -2SD
<b>1. Community</b>							
ST and SC	84	59.5	40.5	65.5	34.5	17.9	82.1
BC	268	58.2	41.8	69.8	30.2	23.5	76.5
OC	65	46.2	53.8	46.2	53.8	15.4	84.6
$\chi^2, p$ value		<b>3.46, NS</b>		<b>12.87, 0.002</b>		<b>2.73, NS</b>	
<b>2. Type of Family</b>							
Nuclear + Extended	285	57.5	42.5	68.4	31.6	20.7	79.3
Joint	132	54.5	45.5	58.3	41.7	22.0	78.0
$\chi^2, p$ value		<b>0.33, NS</b>		<b>4.04, NS</b>		<b>0.08, NS</b>	
<b>3. Family Size</b>							
1-4	138	58.0	42.0	70.3	29.7	24.6	75.4
5-9	231	57.6	42.4	62.3	37.7	20.8	79.2
≥ 10	48	47.9	52.1	64.6	35.4	12.5	87.5
$\chi^2, p$ value		<b>1.66, NS</b>		<b>2.41, NS</b>		<b>3.18, NS</b>	
<b>4. Literacy status of father</b>							
Illiterate	119	65.5	34.5	73.1	26.9	26.9	73.1
Literate	298	53.0	47.0	62.1	37.9	18.8	81.2
$\chi^2, p$ value		<b>5.43, 0.02</b>		<b>4.56, 0.03</b>		<b>3.35, NS</b>	
<b>5. Literacy Status of Mother</b>							
Illiterate	248	59.7	40.3	65.3	34.7	26.6	73.4
Literate	169	52.1	47.9	65.1	34.9	13.0	87.0
$\chi^2, p$ value		<b>2.37, NS</b>		<b>0.002, NS</b>		<b>11.15, 0.001</b>	
<b>6. Land Holding Status</b>							
Land less	180	56.7	43.3	70.0	30.0	18.9	81.1
Land holders	237	56.5	43.5	61.6	38.4	22.8	77.2
$\chi^2, p$ value		<b>0.001, NS</b>		<b>3.18, NS</b>		<b>0.93, NS</b>	

NS: Not significant

**Contd...**



**Table -25 (Contd...)**  
**Distribution (%) of 0- 59 months Children by Nutritional status according to**  
**SD Classification: By Socio-demographic variables**

Particulars	n	Weight for age		Height for age		Weight for height	
		<Median -2SD	≥ Median -2SD	<Median -2SD	≥ Median -2SD	<Median -2SD	≥ Median -2SD
<b>7. Major occupation of father</b>							
Labour	165	59.4	40.6	69.1	30.9	22.4	77.6
Cultivatlion	195	54.4	45.6	61.0	39.0	24.1	75.9
Others	57	56.1	43.9	68.4	31.6	7.0	93.0
$\chi^2, p$ value		<b>0.93, NS</b>		<b>2.86, NS</b>		<b>8.02, 0.01</b>	
<b>8. Major occupation of mother</b>							
Labour	94	59.6	40.4	67.0	33.0	26.6	73.4
Cultivators	26	46.2	53.8	69.2	30.8	15.4	84.6
Housewife/ Others	297	56.6	43.4	64.3	35.7	19.9	80.1
$\chi^2, p$ value		<b>1.49, NS</b>		<b>0.43, NS</b>		<b>2.48, NS</b>	
<b>9. Per Capita Income (Rs)</b>							
≤ 300	33	48.5	51.5	57.6	42.4	21.2	78.8
300-600	143	65.0	35.0	63.6	36.4	24.5	75.5
600-900	116	50.9	49.1	65.5	34.5	14.7	85.3
≥ 900	125	54.4	45.6	68.8	31.2	23.2	76.8
$\chi^2, p$ value		<b>6.82, NS</b>		<b>1.72, NS</b>		<b>4.20, NS</b>	
<b>10. Type of House</b>							
Kutcha	152	61.2	38.8	72.4	27.6	27.0	73.0
Semi Pucca	182	57.1	42.9	65.4	34.6	22.0	78.0
Pucca	83	47.0	53.0	51.8	48.2	8.4	91.6
$\chi^2, p$ value		<b>4.44, NS</b>		<b>10.01, 0.007</b>		<b>11.23, 0.004</b>	

NS: Not significant

Contd...

**Table – 25 (Contd...)**  
**Distribution (%) of 0- 59 months Children by Nutritional status according to**  
**SD Classification: By Socio-demographic variables**

Particulars	n	Weight for age		Height for age		Weight for height	
		<Median -2SD	≥ Median -2SD	<Median -2SD	≥ Median -2SD	<Median -2SD	≥ Median -2SD
<b>11. Source of Drinking Water</b>							
Tap/Tube well	378	55.8	44.2	64.8	35.2	21.4	78.6
Others	39	64.1	35.9	69.2	30.8	17.9	82.1
$\chi^2, p$ value		<b>0.98, NS</b>		<b>0.30, NS</b>		<b>0.25, NS</b>	
<b>12. Type of cooking fuel used in the Household</b>							
Fire wood	406	56.9	43.1	66.0	34.0	21.4	78.6
Others	11	45.5	54.5	36.4	63.6	9.1	90.9
$\chi^2, p$ value		<b>0.57, NS</b>		<b>4.15, 0.04</b>		<b>0.97, NS</b>	
<b>13. Presence of Electricity</b>							
Present	143	52.4	47.6	54.5	45.5	21.7	78.3
Absent	274	58.8	41.2	70.8	29.2	20.8	79.2
$\chi^2, p$ value		<b>1.52, NS</b>		<b>10.94, 0.001</b>		<b>0.04, NS</b>	
<b>14. Presence/use of Sanitary Latrine</b>							
Present & Using	41	58.5	41.5	48.8	51.2	19.5	80.5
Present but not using/ Absent	376	56.4	43.6	67.0	33.0	21.3	78.7
$\chi^2, p$ value		<b>0.07, NS</b>		<b>5.42, 0.02</b>		<b>0.09, NS</b>	
<b>15. Separate Kitchen</b>							
Present	87	47.1	52.9	55.2	44.8	12.6	87.4
Absent	330	59.1	40.9	67.9	32.1	23.3	76.7
$\chi^2, p$ value		<b>4.01, 0.04</b>		<b>4.91, 0.02</b>		<b>4.75, 0.03</b>	
<b>16. History of Morbidity</b>							
Present	62	58.1	41.9	74.2	25.8	12.9	87.1
Absent	355	56.3	43.7	63.7	36.3	22.5	77.5
$\chi^2, p$ value		<b>0.06, NS</b>		<b>2.58, NS</b>		<b>2.94, NS</b>	

NS: Not significant