REVIEW OF LITERATURE
2. REVIEW OF LITERATURE

2.1 HISTORICAL

The care of children must have been one of the mankind's greatest pre-occupation from time immemorial. Scattered information is available regarding infant care, feeding and certain diseases in the ancient literature of Egypt, Babylon, Greece and Rome of 16th century B.C. (Landsberger, 1964). The description of diphtheria, mumps, division of umbilical cord, salting the baby body with soda ash, importance of wet nurses, stress on breast feeding and avoidance of colostrum etc. finds a mention in this literature.

There are extensive references about child care in ancient Indian scriptures. Discussion on planned parenthood, antenatal care of mother, care of infants, their feeding on breast and animal milk are given in great details in vedic literature. Charak Samhita, anti dating Buddha, has not only given a catalogue of child diseases and their management but also lays specific instruction regarding breast feeding and selection of wet nurses. The value of cow milk for infant feeding was well established in India as early as 6,000 years ago (Ackles et al, 1943). Likewise,
Susruta, as observed by Jäger (1948) in his book on Hindu Medicine, advises the physician to supervise the initial feeding of the new born. The universal practice of 'Annaprashan'—administration of semi solid foods at 6 months, though very old still holds good. Jiwaka, the court physician of King Rimkisara (298 B.C. - 273 B.C.) popularly known as 'Kumara-bhartya' has written an excellent treatise on numerous diseases of children such as cirrhosis of liver, encephalitis, eruptive fever, diarrhoea etc.

In the middle ages super natural orientation and medico-religious ideas continued to dominate the concept of medicine. Ritual mutilation such as circumcision, scarification, scalding and ceremonial painting of child's body were practised, so to say for prevention of diseases (Nettler, 1947).

In 19th century in England, the children received scanty attention. Mortality rate was appalling and of London's 50,000 annual deaths, 21,000 were of children under 10 years (Higgins, 1932). However, in the 19th century itself the ground for modern concept of child care programmes was prepared replacing earlier religious attitude by scientific approach. Institutional care of the children was reorganised giving rise to establishment of separate children's hospital in France, Germany, England, America and other countries.
2.1.1 Child Care in India – Twentieth Century Landmarks

In India, though a lot more requires to be done, one has witnessed substantial progress since the turn of the present century regarding child care. Certain important landmarks in India have been as follows:

2.1.1.1 Pre-Independence

1) In 1902, programmes for the training of dais was instituted, for the supervisions of dais work, Lady Reading Health School was established in Delhi to train the midwifery supervisors and health visitors.

2) Consequent upon passing of the Child Welfare Act – 1913, Lady Chelmsford All India League, another voluntary organisation was constituted in 1920 to initiate child welfare work.

3) Maternity and Child Welfare Bureau under Indian Red Cross was established to coordinate the working of the voluntary agencies in 1930.

4) D.M.C.N. course was established in 1933 at All India Institute of Hygiene and Public Health, Calcutta for woman doctors to qualify in maternity and child welfare work.

5) The Central Board of Health appointed a committee in 1937 to report on maternity and child welfare work in the country.
vi) Around 1940, two more all India voluntary organisations, Kasturba Memorial Trust and Indian Council of Child Welfare came into being.

2.1.1.2 Post Independence

Prior to independence, the maternity and child welfare was mostly looked after by voluntary organisations. In 1948, the post of Adviser Maternity and Child Welfare was created in the office of Director General of Health Services; and the Government of India impressed upon the states the need for strengthening their maternity and child health services.

(i) First Five Year Plan (1951-56)

Government of India provided financial assistance to State Governments resulting in the establishment of 1000 maternity and child welfare units by the end of the plan. Expansion and improvement of nine health schools engaged in the training of health visitors and midwives, was also carried out. Assistance was given for upgrading paediatric departments of four medical colleges.

(ii) Second Five Year Plan (1956-1961)

In this plan maternity and child welfare became an integral part of the Primary Health Centres. There were 4500 Maternity and Child Welfare Centres in the states apart from Primary Health Centres.
(iii) **Third Five Year Plan (1961-66)**

Child welfare extended over the spheres of social welfare, education, health and community development departments. There was a link-up of the maternity and child health services associated with primary health units with extended facilities in referral and district hospitals.

(iv) **Fourth Five Year Plan (1969-74)**

Social welfare sector introduced many family and child welfare projects. The concept was to promote child development and the focus was on family. The main feature of this plan were basic training of women in home-craft, health, education, nutrition and child care.

(v) **Fifth Five Year Plan (1974-79)**

In this plan, more importance was placed on pre-school years. The scheme of integrated child development services was introduced.

(vi) **Sixth Five Year Plan (1980-85)**

A distinct recognition of the importance of child health was the highlight of this plan. The Government of India took decision to upgrade one out of the four Primary Health Centres as Community Health Centre having the specialities viz. medicine, surgery, gynaecology and pediatrics. A sum of rupees 250 – 300 crores for maternal and child health was allocated. Increasing the I.C.D.E.
projects to 1000 had been envisaged in the plan period (Boyal, 1982). Over and above these, the health and well-being of the mothers and children received due place in the 20 Points Programme of the Prime Minister of India.

(vii) Seventh Five Year Plan (1986-90)

A major component in this plan is the expansion of the social infrastructure for education, family welfare, health care, water supply and sanitation. As a result, the poverty ratio is expected to decline from 36.9% in 1984-85 to 25.8 percent in 1989-90 and simultaneously secure satisfaction of the basic needs of food, clothing and shelter and provide health for all. In this plan, target is to increase the coverage of elementary education in the age group of 6-14 years to 92%. The aim of this plan is to create, by the year 2000, the conditions necessary for self sustaining growth and to provide the basic material requisites of well being for all our people.

The major thrust of maternal and child health (MCH) care, in accordance with the National Health Policy, in the Seventh Five Year Plan would be as follows:

(1) Health care for mothers and children will be strengthened through the primary health care approach, which includes integrated comprehensive MCH care and suitable strengthening of referral services.
ii) Recognising the close relationship that exists between high birth rate and high infant mortality, a high priority should be given to MCH programme.

iii) Preventive, promotive and educational aspects of MCH services will be given the highest priority.

iv) Efforts should be made to maximise the use of I.C.D.S. infrastructure for the enhancement of MCH programmes.

2.2 INTRODUCED CHILD DEVELOPMENT SERVICES SCHEME

In pursuance of national policy for children, the Government of India sanctioned the Integrated Child Development Services Scheme which was introduced on an experimental basis on 2nd October, 1975. Thirty three experimental projects were started in the different parts of the country. On the basis of encouraging results, further extension of projects into 1000 areas has been planned (Tandon, 1983). Each project aims at the delivery of a package of services in an integrated manner to preschool children, expectant and nursing mothers, and women in the age group 15-44 years.

2.2.1 Objectives of I.C.D.S.

(i) To improve the nutritional and health status of children in the age group 0-5 years.

(ii) To lay the foundations for proper psychological, physical and social development.
(iii) To reduce the incidence of mortality, morbidity, malnutrition and school drop outs.

(iv) To enhance the capability of mother to look after the normal health and nutritional needs of the child through proper nutrition as well as health education.

(v) To achieve effective co-ordination of policy and implementation amongst the various departments to promote child development.

2.2.2 The Package of Services

To achieve the above mentioned objectives, I.C.D.S. provides a package of services (Tandon, 1982) which includes supplementary nutrition; immunization; health check-up; nutrition and health education; referral services and non-formal education.

Supplementary nutrition is, in terms of cost, the major input in I.C.D.S. package of services which is given to pregnant women and nursing mothers, malnourished children below six years and other children aged 3-6 years attending the non-formal pre-school educational activities.

2.2.3 Delivery of Services

These integrated services are delivered at a community centre - Anganwadi Centre for a population of 1000.
The key staff member at this centre is the Anganwadi worker (A.W.W.), who is invariably a female and comes from the local community. Anganwadi worker is assisted by a helper who is also from the same area. Anganwadi worker and helper get honorarium for their work, and are supervised by Mukhya Sevikas. The Child Development Project Officer (C.D.P.O.) is directly incharge of the I.C.D.B. Project concerned.

In rural project area, the health infra-structure is strengthened by adding one medical officer preferably with postgraduation in child health at the Primary Health Centre and by providing additional Lady Health Visitors and Auxiliary Nurse Midwives so that there is one A.N.M. for a population of about 5000 and one Lady Health Visitor for supervising the work of 4-5 A.N.Ms (Deyal, 1977).

2.3 **Environmental Sanitation and Child Health**

Environmental sanitation has been defined by an Expert Committee of the W.H.O. (1949) as 'The control of all those factors in man's physical environment which exercise or may exercise a deleterious effect on his physical development, health and survival'. The size, general health condition and maturing age of the child are influenced by the amount of fresh air and sunlight that one gets especially during the early years of life. This is evident when comparison are made between children from good and bad environment (Hullock, 1950).
Chandra Shekhar (1959) in his book "Infant Mortality in India" has stated that since infants more than any other section of the population, depend to a large extent on the environmental conditions for their survival, it would not be far wrong to say that the death of an infant in most cases is due to poor and insanitary environment.

Shivaram (1969) in his study of a group of villages in Lucknow found that 95.6 percent of families were consuming water from open wells, and 89.2 percent were using open field as latrines. About housing 72.0 percent were situated in congested or moderately congested locality. While Singh (1970) observed that 91.0 percent families were living in congested or moderately congested areas. Cross ventilation was only in 20.0 percent houses. 94.7 percent were using open shallow wells for drinking water and 89.0 percent of population was using open field for defecation.

A global survey conducted by W.H.O. (1976) showed that 20.0 percent of the urban and 82.0 percent of rural population in India had no access to safe water within reasonable distance from their home, while 34.0 percent of urban population had access to a public sewerage system and only 2.0 percent of rural population was thought to have adequate excreta disposal facilities.

Deekshant (1978) has reported that majority (46.5 percent) of children below six years were living in poor environmental conditions. On the other hand,
Maheshwari (1981) observed that 82.10 percent families were using open field defecation. Regarding water supply, 85.21 percent were using open shallow well for drinking purposes, 14.39 percent had handpumps. Indiscriminate throwing (42.07%) was observed the most common method for refuse disposal. Gupta et al (1984) observed that common source of drinking water in I.C.D.E. (94.2 percent) as well as non I.C.D.E. (97.8 percent) group has been open shallow wells and safe water supply observed more in I.C.D.E. area. Insanitary methods have been the commonest mode of excreta disposal in both the groups and no difference was observed in housing conditions except environment surrounding the child's house which was hygienic in respect of higher percentage in I.C.D.E. (30.7 percent) as compared to Non I.C.D.E. (18.9 percent) group.

2.4 NUTRITIONAL ANTHROPOMETRY

Nutritional anthropometry is concerned with the measurements of the variation of physical dimensions and the gross composition of the human body at different age levels and degree of nutrition. Three main anthropometric measurements have been mostly employed in community field surveys for detecting malnutrition of early childhood and where the age is known. These are weight, length/height and mid-upper arm circumference. In addition to this, triceps skinfold can also be usefully included. Circumference of head and chest are the two other anthropometric
measurements in detecting malnutrition. These can be compared with standards if the ages are known (Jelliffe, 1966).

2.4.1 Weight:

Five decades ago, Baldwin (1924) wrote that weight and height are probably the most sensitive measures of nutritional status of children. This is still valid; however, the major drawback of weight as an ideal anthropometric measurement is that in many communities, especially of rural areas and uneducated classes, the exact age is not known (Prasad, 1976). Waterlow (1973) criticized weight for age method of assessing mild and moderate malnutrition. He stated that it conceals two different conditions, one deficit in height for age (stunting) and other deficit in weight for height (wasting). He stressed that these conditions should be assessed and differentiated separately. However, Sen et al (1980) have observed that a valid age independent estimate can be made by using weight/height² ratio in a study of children below five years in Jaipur city. They found that weight/height² ratio (0.0015) was equally valid in comparison to weight for age method in detecting malnutrition.

Ghai et al (1968) in a study have reported that the birth weight was doubled at 3.5 months, tripled at one year and quadrupled at 2.5 years, whereas Banik et al (1970) concluded in their longitudinal study from birth to 5 years, that the birth weight was doubled at 4 months, tripled by 1.5 years and quadrupled by 3 years of age.
Males were heavier than females at all ages. Bhargava et al (1980) recorded that the birth weight of male children doubled in 3 months and tripled at one year of age.

Bakshi et al (1977), in their cross-sectional study of pre-school children, representing various socio-economic groups, reported gradual increase in weight with age. The boys had higher weight than girls. Girls were 2-3 months behind the boys. 50th percentile of weight was comparable with 3rd percentile of Harvard standards. Weight of male children at the age of 5 years was in line with I.C.M.R. standards, but at the age of 2 years they were much behind the I.C.M.R. standards.

Chandra (1978) from Tamil Nadu also found higher values for weight in boys than girls in all ages. Mean weight was much lower than I.C.M.R. standards. Similar observations have been made by Verma et al (1980) from Jhansi and Tomar et al (1982) from Rajasthan and Gupta et al (1984) from Lucknow.

I.C.M.R. conducted a collaborative study on the nutritional status of pre-school children in 3 rural and 2 urban regions in the country. All anthropometric measurements of Indian children were significantly lower than American children (Tandon et al, 1981).

Birth weight has been shown to be an important factor influencing the later growth in child (Bhargava et al, 1975) and, therefore, the differences in growth
pattern of Indian and western children may be partly due to birth weight of Indian babies being lower than that of western counterparts (Agarwal et al., 1974). A longitudinal study of physical growth from birth to six years in children with birth weight 2500 gm. or more, mainly from low socio-economic groups, showed that the growth velocity of children up to 2 years was comparable with western standards and Indian children of high income group. But after 2 years, there was decline in growth velocity. The weight of male children was recorded higher than female children from birth to 6 years (Shargawa et al., 1980).

2.4.2 Height:

The eighth report of FAO/WHO Expert Committee on nutrition emphasized upon the importance of measurement of height. The extent of height deficit in relation to age may be regarded as a measure of duration of malnutrition. This concept has been studied and confirmed by Becque & Latham in their study found that the height for age gives the information about the state of past nutrition, and they suggested that stunting occurs only in chronic malnutrition. This observation was confirmed by Bhantri et al. (1973) in their study.

Ghai and Sandhu (1968) observed that the length at birth was increased by about 50.0 percent at one year and was doubled at 4 years of age, while Banik et al. (1970) reported increase in birth length by 50.0 percent at 1.5 years and about double at 4.5 years.
Bakshi et al (1977) from Annapal reported boys to be taller than girls except at five years age when girls had slightly higher values. On comparison with Harvard standards, 27.4 percent children had mean height above 90.0 percent. 69.2 percent were between 81.0 - 90.0 percent and only 1.2 percent children had values below 70.0 percent of Harvard standards. On comparison with I.C.M.R. 50th percentile in girls at 2 years was below 25th percentile of I.C.M.R. and at the age of 5 years it was little above 50th percentile of I.C.M.R. In boys at 2 years, 50th percentile of this study was little above 25th percentile and, at the age of 5 years it was little below the 50th percentile of I.C.M.R. This indicated better growth rate after passing the vulnerable period of 1-3 years.

Chandra et al (1978) found that mean height of boys was more than girls up to the age of 2 years, than girls exceeded the boys. Mean height of both sexes at all ages was below the I.C.M.R. standards. While Srivastava (1980) and Gupta et al (1984) reported that boys were taller than girls at all ages. In comparison with All India Standards, they also showed considerably lower values. Similar observations were made by Verma (1980) who further noticed that 33.4 percent of pre-school children were under-weight. While Ram (1980) from Karnataka reported 66.4 percent of children below six years of age having less value for height than expected value for that age.
With better socio-economic status, it is possible to have growth potential similar to those of Americans. A semi-longitudinal study from birth to 14 years in different socio-economic group found mean (50th percentile) height and weight of children from higher socio-economic group well comparable with 50th percentile of American children. The mean (50th percentile) of height and weight of children of both the sexes belonging to lower socio-economic groups corresponded with 25th percentile and 10th percentile respectively of American standards (Banik, 1982).

2.5 **MILESTONES OF DEVELOPMENT**

Milestones are definite landmarks in growth and development of a child and they are influenced by nutritional status of children. Mathur et al (1974) in their study found that 26.5 percent of total children were having delayed milestone and in those who were malnourished this percentage was 37.7 percent. Nagendra et al (1976) in a study of 100 cases of P.B.M. observed growth retardation in all the cases.

Deoki Nandan (1978) in his study in pre-school children of Uttar Pradesh has also observed delayed milestones in grade III and IV P.B.M. and Gupta et al (1984) has also observed delayed milestones in malnourished children.

2.6 **MALNUTRITION**

It comprises of four forms - under nutrition, over nutrition, imbalance and specific deficiencies, malnutrition
has been defined as 'a pathological state resulting from relative or absolute deficiency or excess of one or more essential nutrients (W.H.O., 1966). What makes the situation more serious is that malnutrition's main victims are children. Most vulnerable group is the pre-school children (Scrimsheaw, et al., 1968).

2.6.1 Protein Energy Malnutrition

An analysis of 101 community surveys conducted in 59 developing countries during 1961-1970 indicated that not less than 100 million children below 5 years of age are affected by moderate to severe degree of Protein Energy Malnutrition (W.H.O., 1976). Also Baily et al (1976) have reported that a survey carried out in children below 5 years in 26 countries between 1966-1969 showed the prevalence of severe form of Protein Energy Malnutrition to be 0.5 to 7.0 percent which gives average prevalence of about 3.0 percent and 2.0 percent respectively. Many studies have been carried out in India regarding the problem of protein energy malnutrition in pre-school children. Kumar et al (1975) from Haryana reported that 61.7 percent children had body weight below 80.0 percent and 36.2 percent below 70.0 percent of the expected weight (Harvard Standards), while Chaudhary (1975) in Calcutta found the prevalence of severe P.E.M. to be 2.0 percent and mild and moderate grades of P.E.M. in 20.0 percent of pre-school children.

Sam et al (1977) reported the prevalence of third and fourth degree of P.E.M. in 11.5 and 2.9 percent
of pre-school children respectively in slum areas of Tamil Nadu, whereas Chandra (1978) observed severe grade of malnutrition in 21.7 percent of pre-school children. Grade one and two malnutrition (Gomez Standard) was found in 24.9 and 47.6 percent of cases respectively. On clinical examination 3.0 percent had kwashiorkor or marasmus or marasmic kwashiorkor. However, Aya Ram (1980) observed overall prevalence of P.E.N. to be 70.0 percent in pre-school children of Karnataka.

Gupta (1977) in his study of Health Status of Children in age group 1-4 years in rural area of Jaipur found 72.7 percent children malnourished, and 9.2 percent and 4.9 percent children having grade III and grade IV malnutrition respectively. Whereas, Nathur et al (1978) from their analytical study of malnourished children below the age of five years in rural area of Udaipur, reported that 33.33 percent were in grade I, 51.63 percent in grade II and 14.39 percent in grade III of malnutrition.

A study of under five years children of rural area of western Rajasthan showed Protein Energy Malnutrition in 82.5 percent of children (Soni, 1980). Similarly, a study from tribal belt of western Rajasthan has also reported very high prevalence of P.E.N. (73.5 percent). Prevalence of severe grade of Malnutrition (grade II and grade IV) has been 15.4 percent (Tomar et al, 1982).
A study conducted by I.C.D.E. in 1977 in different parts of India has shown prevalence of kwashiorkor in 1.0 percent and marasmus in 2.0 percent of pre-school children. Similarly a base line survey of 27 project blocks (I.C.D.E.) has revealed the prevalence of marasmus in 4.0 percent and kwashiorkor in 1.7 percent of rural pre-school children. Overall prevalence was found to be 77.0 percent in rural children. 26.1 percent of children were in grade I, 27.0 percent in grade II, 12.6 percent in grade III, and 4.7 percent in grade IV of malnutrition (Tandon et al, 1981).


Based on the reports of National Nutrition Monitoring Bureau, N.I.M. (1983) has reported the following prevalence of severely malnourished pre-school children in different states of India.

<table>
<thead>
<tr>
<th>State</th>
<th>P.E.M. Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uttar Pradesh</td>
<td>6.2 percent</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>11.5 percent</td>
</tr>
<tr>
<td>West Bengal</td>
<td>6.6 percent</td>
</tr>
<tr>
<td>Orissa</td>
<td>9.3 percent</td>
</tr>
<tr>
<td>Gujrat</td>
<td>9.4 percent</td>
</tr>
</tbody>
</table>
Maharashtra 11.3 percent
Andhra Pradesh 7.3 percent
Karnataka 7.7 percent
Tamil Nadu 6.5 percent
Kerala 4.3 percent

2.6.1.1 Protein Energy Malnutrition in Uttar Pradesh

The findings of various studies of P.E.M. undertaken in Uttar Pradesh are summarised here.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Place</th>
<th>Year</th>
<th>Prevalence rate (%)</th>
<th>Criteria of Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Siddhu &amp; Srivastava</td>
<td>Rural Kanpur</td>
<td>1970</td>
<td>5.1</td>
<td>Clinical</td>
</tr>
<tr>
<td>Singh Ratan et al</td>
<td>Rural Lucknow</td>
<td>1971</td>
<td>44.2</td>
<td>Gomez</td>
</tr>
<tr>
<td>Sharma P. et al</td>
<td>Urban Lucknow</td>
<td>1972</td>
<td>1.3</td>
<td>Clinical</td>
</tr>
<tr>
<td>Mathur J.B. ET AL</td>
<td>Kanpur</td>
<td>1974</td>
<td>1.9</td>
<td>Clinical</td>
</tr>
<tr>
<td>Srivastava et al</td>
<td>Lucknow</td>
<td>1978</td>
<td>40.7</td>
<td>Gomez</td>
</tr>
<tr>
<td>Deoki Nandan</td>
<td>Rae Bareli</td>
<td>1978</td>
<td>66.9</td>
<td>Gomez</td>
</tr>
<tr>
<td>Verma, B.L. et al</td>
<td>Jhansi</td>
<td>1980</td>
<td>97.5</td>
<td>Jelliffe</td>
</tr>
<tr>
<td>Srivastava, J.P. Jhansi et al</td>
<td>1980 Boys - 75.7</td>
<td>Girls - 75.1</td>
<td>Gomez</td>
<td></td>
</tr>
</tbody>
</table>

The food and nutrition survey carried out in different parts of U.P. by Food and Nutrition Board, has revealed the overall prevalence of P.E.M. to be 66.7 percent.
(Common Criteria) of these, 40.3 percent, 35.1 percent and 21.3 percent were having mild, moderate and severe grades of P.E.K. respectively (Sharma, 1981).

2.6.2 **VITAMIN DEFICIENCIES**

2.6.2.1 **Vitamin A Deficiency**

Vitamin deficiencies like infantile beri-beri, pellagra ariboflavinosis, infantile scurvy and rickets are quite frequently reported in India but Vit. A. deficiency is the commonest in pre-school children. The most common age for predominantly nutritional variety, is the third and fourth years of life, at least in countries where breast feeding is prolonged (Common, 1976). The prevalence of Vit. A deficiency has been reported to be about 3.0 - 6.0 percent in poorer section of pre-school Indian children (M.K.O., 1976).

Mathur et al (1974) have observed Bitot's spots in 4.9 percent children aged below 5 years in a rural community of Kupur. Also, I.C.M.A. (1977) reported Bitot's spots in 4.1 percent of pre-school children.

Contrary to this, Chandra et al (1978) observed very high prevalence of Vit. A deficiency in rural pre-school children of Tamil Nadu. Night blindness was found in 4.03 percent, Conjunctival xerosis in 27.7 percent, Bitot's spots in 6.7 percent, Corneal xerosis in 0.6 percent and Phrynoderma in 1.5 percent children.
A clinical study of pre-school children in rural and urban areas of western Rajasthan showed the prevalence of night blindness in 2.9 percent, Bitot's spots in 2.2 percent, conjunctival xerosis in 1.31 percent and corneal xerosis in 1.29 percent of children (Gupta et al., 1978). But Srivastava et al. (1979) reported Vit. A deficiency in 15.95 percent of pre-school children in a rural area around Jhansi. Whereas, Soni et al. (1980) observed Vit. A deficiency in 12.4 percent in rural pre-school children of Rajasthan. On the basis of baseline survey in different I.C.D.N. Project areas, Tandon et al. (1981) have reported Bitot's spots in 4.0 percent, keratomalacia in 0.4 to 0.2 percent of rural children below 6 years of age.

The prevalence of conjunctival xerosis as 4.0 percent, Bitot's spots 1.8 percent and follicular hyperkeratosis 0.4 percent in pre-school children has been reported in Food and Nutrition Survey carried out in Uttar Pradesh (Sharma, 1981). On the other hand, Tomar (1982) found Vit. A deficiency in 19.89 percent children aged under 6 years.

It has recently been estimated that amongst the 92 million children aged 1-5 years, 7.4 million have non-corneal and 0.22 million have corneal xerophthalmia at any one time. 52500 children become blind and between 110,000 and 13,200 become partially blind in India every year (M.M.O., 1982).

2.6.2.2 Vitamin 'B' Deficiency

Chandra et al (1978) have observed angular stomatitis in 34.7 percent of rural pre-school children of Tamil Nadu. But Srivastava et al (1979) from Jhansi reported Vit. B deficiency only in 3.82 percent and Soni et al (1980) found it to be in 4.2 percent of rural pre-school children of Rajasthan.

Sharma (1981) has reported angular stomatitis in 3.6 percent of pre-school children while Tomar (1982) found Vit. B deficiency only in 0.40 percent of children aged below 6 years and Gupta et al (1984) found no difference in prevalence of angular stomatitis in I.C.D.S. (5.2 per 100) and Non-I.C.D.S. (7.6 per 100) group. Maheshwari et al (1985) reported 2.13 percent Vit. B deficiency in pre-school children.

2.6.2.3 Vitamin 'C' Deficiency

Nathur (1974) observed bleeding spongy gums in 0.9 percent of pre-school children in rural community of Kampus, and Srivastava (1979) found Vit. 'C' deficiency in 0.67 percent of rural pre-school children of Jhansi. Soni
et al (1980) have reported that 0.4 percent of rural pre-
school children of Rajasthan were having Vit. C deficiency
while Sharma (1981) from Uttar Pradesh has reported Vit. C
deficiency in 0.9 percent of pre-school children.

2.6.2.4 Vitamin 'D' Deficiency

Pigeon chest was observed in 0.9 percent of pre-
school children of a rural community of Kanpur by Mathur
et al (1974), whereas Gupta et al (1973) observed clinical
ricket in 3.6 percent pre-school children of Rajasthan.

Srivastava et al (1979) have observed Vit. D
deficiency in 2.03 percent of pre-school children, while
Soni et al (1980) observed a high prevalence (5.9 percent)
of Vit. D deficiency in rural pre-school children. An
alarmingly high prevalence (11.99 percent) of Vit. D
deficiency has been recently reported by Tomar (1982) from
children aged under six years of a tribal belt of western
Rajasthan. Maheshwari et al (1985) have observed Vit. D
deficiency in 8.43 percent of rural pre-school children of
Rajasthan.

2.6.3 Anaemia

The frequency of anaemia may be as high as 40.0
percent in the first year of life (W.H.O., 1982). Mathur
et al (1974) noted pale conjunctiva in 13.5 percent children
below 5 years of age in rural area of Kanpur, while Malhotra
et al (1976) from the same area observed the prevalence of
Anaemia in 18.32 percent of pre-school children; majority (46.0 percent) of anaemic being aged 6 months to 2 years whereas it has been only 7.8 percent in those under six months of age. Anaemia was more prevalent in female than male children. The Haemoglobin level was below 7.0 gram percent in respect of 8.11 percent children, gastro-enteritis or respiratory illnesses were found associated in 64.7 percent of the anaemic children.

It has been estimated that prevalence of anaemia in pre-school children and pregnant women is about 50.0 percent (Gopalan, 1977). However, pallor was observed clinically in a very high percentage (69.1) of pre-school children of rural Tamil Nadu (Chandra et al., 1978). On the other hand, Srivastava (1979) clinically observed anaemia in 4.7 percent pre-school children of a rural community of Jhansi. Contrary to this, Soni et al. (1980) reported high incidence (62.0 percent) of anaemia in pre-school children of rural Rajasthan. Majority (69.2 percent) had haemoglobin between 90 - 70 percent of the expected values, 8.3 percent were found severely anaemic.

Tandon et al (1981) from the different project (ICDS) areas of the country have reported pallor in 22.0 percent of rural and 17.0 percent tribal children aged below six years. However, Khan (1981) observed anaemia in 24.2 percent pre-school children in the families having less than 3 children and in 31.6 percent children of the families having more than 3 children.
Tomar et al. (1982) from Manipur have commented that the prevalence of anaemia depends on the availability of medical facilities. They observed the prevalence of anaemia in 17.6 percent rural pre-school children who were not having sub-centre facilities, while it was only 11.3 percent in those for whom the sub-centre facilities existed. Gupta et al. (1984) was observed higher prevalence (27.3 per 100) of anaemia in Non-I.C.D.S. as compared to I.C.D.S. (13.2) group of children. Maheshwari et al. (1985) reported overall incidence of anaemia in the surveyed children was 53.33. and incidence of anaemia was 44 percent in the age group of 3 - 6 years.

2.7 MORBIDITY

In developing countries, the protein energy deficiency disease, kwashiorkor and marasmus are commonly precipitated by acute diarrhoeal diseases, measles, whooping cough and other infections and high mortality in these children is attributable to the interaction of malnutrition and infection (W.H.O., 1976).

Many investigators from India have reported gastro-intestinal and respiratory infections as major causes of morbidity in pre-school children (Ghai et al., 1973; Gulati, 1974; Mota, 1975; Datta et al., 1975). A cross sectional study carried out by Chandra (1973) in pre-school children of rural Tamil Nadu revealed 50.8 percent having current or recent episodes of diarrhoeal disorders,
respiratory illnesses, worm infestations and suppurative otitis media. Diarrhoea, U.R.T.I., L.R.T.I., C.M.D.M., were found in 50.7, 56.1, 17.6 and 13.1 percent children respectively. 32.0 percent suffered from active skin infections, heart diseases and C.N.D. disorders were noted in 1.07 and 0.23 percent children respectively.

Gupta et al (1980) from a longitudinal study in a rural area of Punjab reported that on an average a pre-school child was sick roughly for 2 months in a year, and respiratory and gastro-intestinal disorders constituted 45.37 percent of the total sickness. Agarwal et al (1980) studied the morbidity pattern of rural under five children of Varanasi by fortnightly visits over one year. Sickness per child was 6.69 suggesting recurrent episodes. The common problems were gastro-intestinal diseases (33.5 percent) respiratory tract infections (19.3 percent), skin disease (13.6 percent) and fevers (13.2 percent). The commonest easily preventable illness at an early stage, were mild diarrhoea and upper respiratory tract infections. Diseases of eye and ears were found to be in 7.65 and 2.74 percent children respectively.

Tandon et al (1981) from I.C.D.E. project areas have reported that about 9.0 percent of rural and 7.0 percent of tribal children were sick at the time of survey. Upper respiratory tract infections (1.0 - 1.5 percent) and acute diarrhoea (0.6 percent) were the two major significant illnesses. Measles was observed in 0.2 percent children by
There is significant evidence to the relation of family size and sicknesses in children. Khan (1981) observed high incidence of respiratory infection (39.7 percent), gastro-enteritis (40.9 percent) and skin infection (22.7 percent) in pre-school children belonging to families with 3 or less than children as compared to 67.9 percent, 62.0 percent and 50.5 percent respectively in children belonging to families with more than 3 children. However, respiratory infection, gastro-enteritis and skin infections were the major causes of morbidity in both the groups.

Gupta et al (1984) reported in his study that upper respiratory infections and diarrhoea & dysentery were major causes of sickness in both I.C.D.E. and Non-I.C.D.E. groups.

Maheshwari et al (1985) observed that malnourished children suffered more with variety of illnesses in the past as well as the time of study. Sickness per sick child in normally nourished children was 1.42, which increased to 2.41 in severely malnourished children. There was a significant correlation between malnutrition and infection in the past and present morbidity.

Intestinal worm infestation is another major health problem in young children. Its relation with malnutrition has been worked out by many investigators (Tripathy et al, 1977; Latham et al, 1977; Gupta et al, 1978; Gupta, 1980). Sharma (1969) has found 53.9 percent of stool samples positive for ova or cyst. Majority (75.0 percent) of
all positive samples showed the presence of ova of *Ascaris*,
*Ankylostoma*, *Taenia solium*, *E. histolytica* were found in
19.6, 1.3 and 1.6 percent of the samples respectively.
In 9.9 percent of cases, it was mixed infection. However,
Malhotra et al (1976) from Kanpur observed the overall
infestation rate of 23.5 percent in rural pre-school
children. Gupta (1977) has also reported *ascaris* as the
commonest parasite in pre-school children.

Chandra (1973) reported worm infestation rate to be
21.8 percent in pre-school children of rural Tamil Nadu.
Whereas a study carried out in Dalmau Block of Uttar Pradesh
(Deoki Nandan et al, 1980) revealed the presence of one or
other form of intestinal parasite in 34.1 percent of the
stool samples collected from the children below 6 years of
age. The most common parasite encountered was *ascaris*
(33.6 percent) followed by hook worm (33.6 percent).
Similarly, Braat et al (1980) from Patiala reported 31.9
percent stool samples positive for one or the other
infestation. *Ascaris* was most frequent (17.03) among all
the sample collected.

Aya Ram (1980) from Karnataka found positive history
of passing worm in 27.11 percent of malnourished and 10.60
from urban Aligarh have revealed prevalence of worm infestation
in 17.7 percent pre-school children belonging to small
families as compared to 25.6 percent in children belonging
to large families.
Gupta et al (1984) reported 33.1 percent in
Non-I.G.D.S. group and 17.2 percent in I.C.U.S. group
stool samples positive for one or the other parasites.
Ascaris was found to be most common parasite in both groups.

Maheshwari et al (1985) observed 24.84 percent of
the children suffered from intestinal parasites, and
infestation per infested child was 1.16. Ascariasis topped
the list (31.7 percent) of the infected children. Incidence
of parasitosis was 4 times higher in severely malnourished
children as compared to normally nourished.

2.6 IMMUNISATION

Inspite of the implementation of immunisation
programme in India for nearly three decades, the coverage
of population is poor especially of D.P.T. and Polio
vaccination. Kumar et al (1972) reported that only 60.0
percent pre-school children were protected for smallpox
in a rural area, while Philip et al (1976) found the
coverage of smallpox in 50.0 percent of rural pre-school
children and the coverage of B.C.G., D.P.T. and Polio
immunisation was observed in 13.5 percent each.

A study conducted by Sharma et al (1978) in rural
and urban areas of Jammu has revealed 70.0 percent children
below 5 years were vaccinated against smallpox while
revaccination was done only in 10.0 percent. 50.0 percent
children were given B.C.G. and D.P.T. while oral Polio was
given only to 10.0 percent children. Contrary to this, Ramesh et al (1978) from Agra have reported very poor immunisation coverage in infants of rural as well as urban areas. Only 1.2 percent rural and 6.3 percent of urban infants were given B.C.G. vaccination. The D.P.T. coverage was only in 1.3 percent of rural infants and 1.5 percent had received protection against polio.

Chandra et al (1978) from rural Tamil Nadu reported 93.0 percent coverage against smallpox, 4.8 percent against tuberculosis and 0.35 percent against polio. D.P.T. was given in 17.2 percent children. However, Gupta (1978) reported coverage of smallpox vaccination in 96.4 percent B.C.G. in 62.1 percent and D.P.T. and polio in 28.9 percent pre-school children of a rural area. The coverage of B.C.G. in 50.8 percent and D.P.T. in 29.6 percent of rural pre-school children.

Tandon et al (1981) from project (I.C.D.B.S.) areas have also reported poor immunisation as B.C.G. was 17.0 percent in rural and 23.0 percent in tribal areas. D.P.T. was given to 7.0 percent of rural and 6.0 percent of tribal children. A study from rural Aurangabad has revealed 88.7 percent coverage for smallpox, 23.01 percent for B.C.G., 7.53 percent for D.P.T. and 8.78 percent for oral polio (Desta, 1981).

Tomar (1982) found the total coverage for smallpox to be 83.0 percent. Complete D.P.T. vaccination was given
to 3.5 percent, while oral polio and B.C.G. was given to only 0.4 and 0.4 percent children respectively. Gupta et al (1984) reported higher coverage of all types of vaccination viz. B.C.G., D.P.T., Polio & D.T. in L.C.D. group as compared to Non-L.C.D. group. Bhattal et al and Sahu et al observed relatively low coverage of B.C.G. (25.0 percent and 12.8 percent respectively). The difference in coverage of B.C.G. in these study could be because of place variation and time of study which was in 1979 and 1982 respectively. Josesh et al found 8.8 percent and 12 percent coverage for 1st dose of D.P.V. and D.P.T. in pre-school children. However, a study in Rajasthan, carried out in 1981-82, showed a poor coverage of O.P.V. & D.P.T. (5.9 percent and 4.5 percent respectively) in the 1 - 2 years of age group. Coverage for measles was found 23.7% by D.P. Mohil.

2.9 FEEDING PRACTICE AND CHILD HEALTH

W.H.O (1973) has recommended that the breast feeding should be continued, if possible, upto the age of 12 months or longer in some circumstances to provide a valuable nutritional supplement. Food supplementary to breast milk will need to be introduced by 4-6 months of age. There has been remarkable progress in the technology of making infant food. Nevertheless, scientific evidence is confirming the superiority of breast feeding because of its support of the bonding of mother and child, and the psychological support
of the child, the nutritional and physiological properties of human milk, its immunological properties and other health benefits extending into adult life and its advantages for the mother (UNICEF, 1981).

Superiority of breast feeding in relation to morbidity has also been established by a number of studies (James, 1972; Chandra, 1979; Cunnigham, 1979). Recently Kumar et al (1981) reported that diarrhoea, U.R.T.I. and allergies were less common amongst breast fed infants and more so during first month of life. Idris et al (1981) from Lucknow have also reported less incidence of diarrhoea in breast fed in comparison to artificially fed infants.


2.9.1 First Breast Feed

I.C.H.E. (1974) conducted a survey in different parts of India and found that except for Hyderabad and Coimbatore, where majority of the mothers fed colostrum to infants, breast feeding in most of the parts of country was generally delayed until 3 - 4 days after birth due to widely prevalent belief that lactation is not established till then. Agarwal et al (1981) from Varanasi also had similar findings.
2.9.2 Period of Exclusive Breast Feeding

Prolonged breast feeding without supplementation has been a very common practice in India, specially in rural areas. Recently, a study conducted in urban and rural area of Lucknow by Idris et al (1981) showed that even after the age of six months, 42.1 percent rural infants were exclusively dependent on breast feeding. Moreover, even after the age of one year, 20.6 percent rural infants were exclusively breast fed. Indra Bai et al (1981) have also reported that in rural areas 38.4 percent infants were exclusively breast fed upto 6 - 9 months of age.

2.9.3 Total Duration of Breast Feeding

Studies in India have shown prolonged period of breast feeding in rural areas. Sharma et al (1977) observed that 47.7 percent of rural children continued the breast feeding even beyond 2 years of age while Bhal (1979) from Himachal Pradesh reported that majority (58.0 percent) of children were breast fed even upto 36 months of age. It was also observed that 30.0 percent of mothers continued to give breast milk to their children even beyond 3 years of age. Recently, Katiyar et al (1981) and Ajai et al (1982) have also observed prolonged total duration of breast feeding in rural area.

2.9.4 Weaning

Delayed weaning is very commonly observed in rural area. Sharma (1977) reported that only 22.6 percent of rural
children had received solids below 9 months of age. Also, Bakshi (1977) in Bhopal found that maximum number (62.8 percent) of rural pre-school children were weaned between the age of 1.5 to 2.5 years. Moreover, 2.6 percent children were still absolutely breast fed even after three years of age.

Bahl (1980) from Himachal Pradesh has also concluded that in majority (92.0 percent), semi-solid was introduced at the age of 13-24 months and only in 30.0 percent children semi-solids were introduced after 9 months of age. Katiyar et al (1981), observed delayed weaning in rural group of children. Weaning was introduced only in 33.63 percent of rural children up to the age of 6 months. Most of the rural children (27.00 percent) were weaned at the age of 13 - 18 months and 7.14 percent children were weaned after the age of 2 years. Similarly, a study from Chandigarh has reported delayed administration of semi-solids i.e. beyond 6 months of age in 93.6 percent rural infants. Mean age of starting semi-solid food was 8.3 months (Kumar et al, 1981) and Gupta et al (1984) observed mean age at weaning in I.C.D.S. group was 11.2 months while in Non-I.C.D.S. it was 15.4 months.

2.10 MORTALITY

According to estimates of Government of India, about one fifth of total deaths in population occur in the first year of life, while another one fifth of dies in the age
group of 1-4 years (School Health Committee, 1962). Sharma et al (1978) have also reported that out of the total deaths occurring in India, 30.6 percent occur during infancy and 14.6 percent in the age group of 1-4 years.

Gulati (1967), carried out a survey in children under 5 years of age in semi-urban area of Delhi and found overall mortality to be 66/1000 per year. Out of these, 74.0 percent died in the first three years of life. However, in 1981, 25-44/1000 mortality has been observed in pre-school children by the Ministry of Health and Family Welfare.

The leading causes of child deaths, in developing countries are, diarrhoea, respiratory infections, followed by communicable diseases and prematurity (N.M.O. 1976). Similarly, Gulati (1967) found diarrhoea, measles, pneumonia and prematurity as four leading causes of deaths in pre-school children. While Shetty (1981) observed respiratory infections, gastro-enteritis and accidents as leading causes of deaths in early childhood (1-5 years).

Studies, carried out in India by Chandra Shekhar (1972), Srivastava et al (1976) and Ghose (1976), had reported infection, malnutrition, prematurity and birth injury as the leading causes of infant mortality. While Reddiah and Nath (1978) observed prematurity (27.7 percent), respiratory infection (21.3 percent), diarrhoeal diseases
(12.1 percent), malnutrition (13.4 percent) and tetanus neonatorum (12.8 percent) as major causes of infant mortality. However, Gupta et al (1981) from rural Rajasthan reported infection (Pneumonia, Diarrhoea etc.) and malnutrition as major killer of infancy i.e. 53.8 percent and 19.3 percent respectively. Sufficiently large proportion of infants died due to prematurity (12.9 percent) and natal (9.6 percent) causes. He observed infant mortality to be 124/1000 live births. In a study from rural Lucknow the infant mortality has been assessed to be 117.6 per thousand live births (Shukla, 1981). The leading causes have been tetanus neonatorum (30.5 percent), diarrhoea (18.0 percent) and pneumonia (16.6 percent).

Gupta et al (1984) from rural Uttar Pradesh reported major causes of infant mortality in I.C.D.E. area were prematurity and respiratory infections (33.33 percent each), while in Non-I.C.D.E. area, single major cause was tetanus neonatorum (37.5 percent) and major killers in 1-5 years age in I.C.D.E. area were respiratory infections and marasmus (40 percent) each while in Non-I.C.D.E. area these were diarrhoea and marasmus (37.5 percent each).

Tandon et al (1984) reported in his study 'Impact of I.C.D.E. survey on infant mortality rate in India' that the I.H.R. (per 1000) was significantly lower (36) for the 1982-83 I.C.D.E. samples survey than for the country as a whole as provided by the sample registration system (1.14). Since I.C.D.E. projects are located in socio-economically
backward villages the I.M.R. would be expected to be higher than the national average in those areas. Indeed a 1978 survey had shown the I.M.R. in backward communities to be 159 (rural) and 90 (urban) compared with national estimates of 136 and 70 respectively.

The level of I.M.R. in I.C.D.S. projects was obvious in rural and tribal population. The I.M.R. for the rural and tribal population as calculated by sample registration survey data is 126 compared with 89.5 for I.C.D.S. project.

Tregiler (1984) reported in his study 'The role of health worker in an integrated child health programmes in slums' that death rate was reduced from 10 to 7.6/1000 population. Infant mortality was reduced from 132 to 31/1000 live births after three years of programme.

Sunder Lal (1985) reported in his study 'Early childhood mortality in I.C.D.S. Blocks of Haryana', the infant mortality rate of 107 per thousand, 1 to 3 years mortality rate of 16.26 per thousand, 3 to 6 years mortality rate of 8.06 per thousand.

2.11 INTEGRATED CHILD DEVELOPMENT SERVICES SCHEME AND CHILD HEALTH

Since the implementation of I.C.D.S. scheme in 1975, various studies have been undertaken to evaluate the
impact of these integrated services on the health and nutritional status of children, and have made varying conclusions.

2.11.1 Impact on Protein Energy Malnutrition

Sunder Lal (1980) carried out a study in a block of Haryana and analysed the impact of I.C.D.S. on health status of children on the basis of base line survey of 1976 and repeat survey of 1979. Improvement in grade III and IV P.E.M. was observed from 12.09 and 6.10 percent to 5.90 percent and 2.60 percent respectively. Also, in a study (Tandon et al., 1981) of 5 rural, 7 tribal and 3 urban projects, improvement was observed in severe grades of P.E.M. Initially, nearly 20.0 percent of pre-school children from all areas were suffering from severe grade of P.E.M. but due to I.C.D.S. services, the prevalence came down to 11.2 percent in rural areas and also there was improvement in other areas. Patel (1982) in her evaluation of I.C.D.S. on pre-school children of urban slums of Bombay noted a tremendous positive effect. A sharp decline in the prevalence of severe grades of malnutrition was observed. Within a period of 3 years, the prevalence was brought down from 15.7 to 4.6 percent.

Contrary to this, Patowary (1982), while evaluating the I.C.D.S. project in Assam could not establish a significant change in the state of severe grades of
malnutrition. However, the percentage of children in normal group which was 44.63 in base line survey of 1979 rose to 54.73 percent in 1980. Grade I malnutrition declined from 36.98 percent to 31.98 percent and grade II from 16.90 to 11.01 percent. Also, Bhandari et al (1981) did not find any significant improvement in the grades of P.E.M. during the period of one year i.e. from 1978 to 1979.

Domiciliary monitoring and management of 170 severely malnourished children in 12 Anganwadi centres showed improvement in 62.35 percent of children during the period of one year (Bhandari et al, 1981). Similarly, Sunder Lal (1982) noticed quite encouraging results as out of 270 severely malnourished children, 54.15 percent improved and 34.45 percent maintained with favourable trends of weight gain.

Gupta et al (1984) reported overall prevalence of P.E.M. was higher in Non-I.C.D.E. (77.1 per 100) as compared to I.C.D.E. (44.2 per 100) group. Sunder Lal (1983) observed in his study 'Integrated development and growth performance of under sixes in I.C.D.E. project Hathura (Maryana)' that the birth weight were adequate, indicating probably better nutritional status of the mothers. The deficit weight or weight lag started at 6 months of age, which coincides with the onset of weaning. Weight for age of cohort of 969 children born in the year 1977, when compared with reference standard revealed that 534 (60.27 percent) children were below "cut off point" (80.0 percent
of 50th percentile Harvard Standard). The overall performance of growth was nearly satisfactory in only 39.73 percent of children below one year of age. Severe growth lag was observed in 27.66 percent of infants. This lag or drop was observed at 6 months of age, which coincided with the weaning period.

2.11.2 Impact on Immunisation status

Immunisation coverage, which is one of the important component of this scheme has also been observed. Sunder Lal (1980) reported an increase in the coverage of B.C.G. and D.P.T. from 13.20 and 6.70 percent to 48.30 and 69.90 percent respectively during the period of three years. Polio vaccination which was not given even to a single child in 1976, was found to have been taken by 44.0 percent in 1979. Tandon et al (1981) also noticed remarkable improvement in the immunisation status. B.C.G. coverage showed maximum improvement from 11.3 to 49.2 percent, 20.9 to 55.4 percent and 67.1 to 74.1 percent in rural, tribal and urban projects respectively. Administration of all the three doses of D.P.T. also went up from 6.3 to 17.6 percent in rural, 10.0 to 19.6 percent in tribal and 15.1 to 51.0 percent in urban project areas. Similar results were observed by Patel (1983) in a slum area of Bombay, as the smallpox and B.C.G. coverage increased from 67.4 to 97.7 percent and from 37.5 to 94.6 percent respectively during the period of 3 years. Polio and Triple vaccination also
improved to a considerable extent i.e. from 18.1 percent to 74.2 percent in both types of vaccination.

Bhandari et al (1981) however, did not find much improvement in the immunisation status of pre-school children of Garhi (Rajasthan) during the period of one year. D.P.T. vaccination which was done in 44.29 percent of cases increased to 52.4 percent only. In respect of B.C.G. at the time of base line survey only 25.23 percent were found vaccinated, while at the repeat survey only 2.57 percent children were observed further immunised. However, there was much improvement in smallpox vaccination which increased from 76.6 to 89.2 percent. Gupta et al (1984) found higher coverage of all types of vaccination in I.C.D.S. group as compared to Non-I.C.D.S. group. Coverage for B.C.G. was 14.0 percent in I.C.D.S. and only 2.3 percent in Non-I.C.D.S. group. D.P.T. vaccine was given to 47.3 percent children in I.C.D.S. and only 4.8 percent in Non-I.C.D.S. group. 54.3 percent in I.C.D.S. and only 0.3 percent in Non-I.C.D.S. group received oral polio vaccine.

2.11.3 Impact on Morbidity

Though a number of workers have reported the pattern of various illnesses including nutritional deficiencies in different I.C.D.S. anganwadi areas but the impact of I.C.D.S. on morbidity has been assessed only by few workers. Patel (1983) has reported definite decline in the incidence of illnesses from 1977 to 1980. Decline in Vit. A deficiency, rickets, angular stomatitis was found
from 4.4, 1.1 and 1.7 percent to 0.7, 0.4 and 0.2 percent respectively. The prevalence of anaemia declined from 15.0 percent to 1.7 percent and similar declining trends were observed in respect of diarrhoea, worm infestation, pyoderma and otorrhia.

Vasudeva et al (1982) have only studied the prevalence of sickness in children below three years of age and found diarrhoea, eye infection, worm infestation, ear infection, U.R.T.I., skin infections, fever, tubercular lymphadenitis as principal causes of morbidity. 64.0 percent were found to be ill at the time of survey. Also Saxena (1982) found 21.8 percent children to be suffering from various vitamin deficiencies, of which 53.4 percent and 37.9 percent were having vitamin A and D deficiencies respectively. B-Complex deficiency was seen only in 1.89 percent of the total children. Gupta et al (1984) reported prevalence of sickness in higher percentage of children in Non-I.C.D.S. (40.6 percent) as compared to the I.C.D.S. (32.7 percent) group at the time of study. Average sickness per sick child being 1.4 and 1.3 respectively. Upper respiratory tract infections, diarrhoea & dysentery, skin infections and otitis media have been the major causes of sickness in both the groups of children. significantly higher prevalence of diarrhoea & dysentery and skin infections (15.4 & 10.9 per 100 respectively) has been found in Non-I.C.D.S. as compared to the I.C.D.S. group (10.2 & 4.5 per 100 respectively).
2.11.4 Impact on Maternal and Child Health Services

Sunder Lal (1980) observed an increase in the frequency of health check-up of children below 6 years of age from 23.2 percent to 92.0 percent during the period of 3 years (1976-1979). Similarly, utilization of supplementary and therapeutic nutrition increased from 8.0 percent and 0.0 to 50.0 percent and 97.0 percent respectively. Distribution of Iron and Folic Acid tablets had also increased to 55.0 percent from 2.3 percent. Increase in the coverage of tetanus toxoid was also noticed from 1.0 percent to 30.0 percent.

Gupta et al. (1981) reported that 31.54 percent of rural sick children were utilizing remedial services of Anganwadis. In another I.C.D.S. evaluation study, Tandon (1981) have reported increased coverage of rural pre-school children for supplementary nutrition from 18.7 percent to 57.3 percent during the period of 20-21 months. Similarly, 43.6 percent rural children had received Vit. A supplementation through I.C.D.S. as compared to only 6.0 percent at the base-line survey. Positive changes were noted in antenatal check-up of pregnant women. The base-line study registered a coverage of 11.8 percent for rural area whereas the follow-up study showed a rise to 53.5 percent. The immunization of pregnant women with 2 doses of tetanus toxoid rose from 2.1 to 33.4 percent in rural projects. Improvements were also noted in the distribution of iron and folic acid (14.1 to 41.7 percent) and supplementary
nutrition (35.2 to 41.3 percent) to pregnant women. Postnatal services and distribution of nutritional supplement showed an improvement from 8.3 and 7.2 percent to 49.2 and 26.3 percent respectively in the rural projects. Gupta et al (1984) in his study reported a higher percentage of children in I.C.D.S. (74.3) as compared to Non-I.C.D.S. (51.3) group have been utilising government agencies for medical care and mothers of significantly more (61.3 percent) children in I.C.D.S. as compared to only 19.9 percent in Non-I.C.D.S. group availed antenatal care. Some deliveries have been common feature in both groups. Coverage for all types of supplementary nutrition – Vit. A, Iron & Folic acid and supplementary food, was more in I.C.D.S. as compared to Non-I.C.D.S. group.

4.12 INTEGRATED CHILD DEVELOPMENT SERVICES SCHEME AND FAMILY PLANNING

In the initial phase of I.C.D.S. scheme there was no significant emphasis given, direct or indirect, to the family welfare services. It is well-understood and accepted that the health of development of child is very closely related to the birth rate, spacing between the deliveries and the total number of children in a family. No child development programs can be implemented meaningfully without introducing family welfare services through its forum. Although the Ministry/Department of Health and Family Welfare primarily and administratively is responsible
for the family welfare programme. Anganwadi is good focal point in a village from where this programme could be successfully implemented. Anganwadi worker develops and continues to develop a close relationship with all the participants. She can therefore utilize her position to emphasize upon the importance of family planning as well as health of children. She can create interest in the minds of the ladies to know more about family welfare services, develop right attitude towards family size and practice appropriate family planning methods. Once the Anganwadi worker has changed the knowledge and attitudes favourably, she can bring the beneficiaries into direct contact with family welfare workers who could then take advantage of this motivation and introduce appropriate measures for family planning. Though pivotal position of Anganwadi worker is important, it must be kept in mind that she is a young girl of the same village and as per rural cultures she cannot be frank and outspoken on the subject with more grown up women of the same village. The message from Anganwadi worker must be more indirect than direct, particularly referring to importance of healthy child, relevance of spacing between the two pregnancies and impact of the family size on the development of the child.

Vasundhara et al (1983) observed in their study ‘Integrated child development services — Impact on fertility regulation’ a significant increase in family planning acceptance was noticed after five years of implementation
of the ICDS scheme in the rural village of Korgeshwari and talked as against pre ICDS scheme levels. Further, the increase in the acceptance of family planning methods especially sterilisation in the ICDS areas was highly significant when compared to that of the control area at Hoskote and C.R. Mundg in the same districts Mysore for the same study period.

The study therefore indicates the importance of the ICDS scheme as a model of health care delivery and the role of its peripheral agent, the Anganwadi workers, as a "change agent" in the utilisation of health care services by the community. It is proposed to study this hypothesis in greater detail by comparing the acceptance of fertility regulation among eligible couples in Anganwadi areas with those in non-Anganwadi areas, as also by comparing family planning acceptance among parents of ICDS beneficiaries against those of non-ICDS beneficiaries in some villages of the ICDS project.

Srinivasan (1983) observed in his study 'India's family planning programme: its impact and implications' the programme has made a significant impact on the fertility levels of the population especially since 1966. The crude birth rate was declined only by about 9 points in about 16 years from about 41 per 1000 population in 1966 to 32 per 1000 population in 1982. It has to be realised that the Indian programme is a voluntary programme implemented in a democratic framework with freedom of choice on the number of children that a couple would like to have.
There appear to be a wide variation among the states in the efficiency with which the programme is operated and the effectiveness of the programme. The states such as Kerala, Maharashtra, Tamil Nadu and Orissa appear to have been more successful in implementing the programme. The success seems to be related to organisational efficiency and the quality of various services provided including maternal and child health care rather than to differences in the desired family size among the states. There appears to be a strong linkage between the success of programmes to reduce infant and child mortality levels and acceptance of family planning methods. In the recent years there appears to be a shift towards increased acceptance of female methods particularly laparoscopy, Copper-T and oral pills and this reflects the growing demand from women for controlling their family size.

It appears that the states which are backward in the programme in India can gain considerably from the experiences from those which have been more successful, by visits by officials, study tours and exchange of officials on short term basis.

Shattasharjes (1984) reported in his study 'The family planning programme, education and development' in Karnataka, the crude birth rate of Karnataka has been estimated to have declined from 39.0 to 34.0 during the last decade. This decline in birth rate can mainly be attributed to the performance of family planning programme.
over time and increases in the level of education have often been cited as one of the most significant factors influencing fertility reduction.

Chaurasia (1985) reported in his study 'Organisational aspects of family welfare programme in India' that the trends in the organisational efficiency of the programme has had many ups and downs. This is mainly because the policy of polarisation adopted in our family planning programme, drifting from one solution to another, as such offered an insufficient remedy. Very little attention has so far been paid to such aspects as mass education, research and training.