Mortality is the study of the effect of death in a population. The United Nations and World Health Organisation have defined death as "The permanent disappearance of all evidences of life at any time after birth has taken place (Post-natal cessation of all vital functions without capacity of resuscitation)" [Bhende and Kanitkar 1996].

India had a high death rate till the first quarter of the present century. Though, at present a declining trend in the death rate in India is observed, it is still much higher than those in the developed countries. Life saving drugs, dramatic advances in medical research, massive health infrastructure have raised general life expectancy of the people but child mortality has still remained high in India and many developing countries. Of all the deaths, under five mortality rate (U5MR) has been considered as one of the most important non-economic indicators of development because it precisely reflects many of the elements that are widely regarded as contributing to the quality of life. It is directly affected by the income and education of parents, the prevalence of malnutrition and diseases, the quality of safe drinking water and safe sanitation, the efficacy of health services and health and status of women (Progress of Nation 1993).
In the present study, the infant and early childhood mortality of four tea-working communities of Dibrugarh district namely - the Mundas, the Oraons, the Tantis and the 'Others' have been studied with reference to various demographic, socio-cultural, health and medical, housing and environmental and nutritional factors. It has also been tried to find out the causes of death. The findings of the present study are presented in the preceding chapters. In this chapter an attempt has been made to discuss the findings of the present study vis-a-vis the findings of other studies of similar nature.

The percentages of mortality of the 0-5 years children of the Mundas, the Oraons, the Tantis and the 'Others' of the present study (16.05%, 12.93%, 16.05% and 13.30% respectively) are found to be higher than the mortality of the children of 0-5 years at the National level (12.6%) as well as the state level (14.2%) [NFHS report 1992-93].

The infant mortality rate (IMR) of the major states of India ranges from 24 per thousand live births in Kerala to 112 in Orissa. Other major states with infant mortality rate above the national average are Uttar Pradesh (100), Bihar (89) and Madhya Pradesh (85) [The Times of India, New Delhi, 2nd June 1995]. The IMR of Assam (76) is also higher than that of India (70) (Statistical Hand Book of Assam 2002). The percentages of infant mortality for the Mundas, the Oraons, the Tantis and the 'Others' of the present study are 13.27, 11.67, 14.81 and 11.79 respectively. It is therefore, observed that the rate of infant mortality of all the communities of the present study are higher than the infant mortality rate of Assam as well as of India.

The cause of death and nature of treatment are always related to the mortality rate.
In the present study unknown causes, diseases peculiar to early infancy-("hawa laga"), diarrhoea, stomach trouble and fever are identified as major causes of child death in all the four communities.

Lack of hygienic sense of the mother, poor house sanitation, less care given to the children, delay in the treatment of the babies may be the causes of death and suffering of the children. Both endogenous and exogenous causes are found responsible for neo-natal deaths. Home delivery with the unsafe hands is a major point noticed in all the four communities of the present study. From a study conducted by UNICEF it was reported that nearly 60% of the 13 million child-deaths in the world each year are caused by pneumonia (3.6 million), diarrhoea (3 million), vaccine preventable diseases (2.1 million) like measles (0.8 million) whooping cough (0.36 million), tuberculosis (0.36 million) and neo-natal tetanus (0.56 million) [The Times of India, New Delhi December 17, 2000].

A. DEMOGRAPHIC FACTORS AFFECTING INFANT AND EARLY CHILDHOOD MORTALITY

Studies of infant and childhood mortality reveal that a few demographic characteristics of mother have certain impact on infant and child mortality.

Mahadevan et al. (1983), Basu and Puri (1963), Karn and Penrose (1952), Mills and Cheng (1953), Basavarajappa (1962), Olukunie (1985) and Puffer (1982) are some of the researchers who established the importance of demographic variables in the study of infant and early childhood mortality. Three important demographic factors – age of the mother at first child birth, birth interval and birth order are considered in the present study to see their effects on infant and early childhood mortality.
Age at first child birth

From the present study it is seen that there is a noticeable decline in the proportion of infant and early childhood death when the age of the mother at first child birth is 22 years and above. The percentage of infant and early childhood mortality among the Mundas, the Oraons, the Tantis and the 'Others' in this category are 1.85, 1.26, 0.82 and 1.14 respectively. On the other hand, the child mortality is higher when the mother's age at first child birth is 15 years or below and the percentages are 6.17, 5.68, 8.64 and 5.70 respectively.

Talwar, P (1988) also in his study of rural Madhya Pradesh has shown that mother's age at the birth of the child is significantly associated with the risk of infant deaths. For mothers below the age of 20 years or above the age of 40 years, the risk of infant death is increased by 34 percent than the mothers bearing children between ages 20-39 years.

Thus the previously established fact that lower the age at first child birth, higher is the infant and early childhood mortality seems to hold good in the four communities i.e. the Mundas, the Oraons, the Tantis and the 'Others' of the present study. Less interest of the parents in educating their daughters may be one of the factors for early age at marriage and early age at first child birth of the women.

Spacing or birth interval between two children

In all the four communities of the present study a clear decreasing trend in child mortality is noticed when the birth interval between two children increases from twelve months or below to two years or above. Among the Mundas the percentages are 5.86 and 1.85; among the Oraons it is 6.31
and 0.63, among the Tantis it is 8.64 and 0.82 and among the 'Others', it is 5.70 and 0.76 respectively (Ref. Table IV.A.2).

A study in Punjab in 1958 also demonstrated that the risk of death of infants with a birth interval of less than two years was 50% higher than the children born in the gap of two to four years (Gordon et al. 1972). With fewer intervals between two births the mother cannot provide proper care neither to elder nor to younger.

Mother's parity

Ruzica and Kanitkar (1973) in their studies in India noted that the highest infant and neonatal mortality occurs in the first order and lowest in the fifth order pregnancy. It again starts increasing thereafter. Arora (1980) also found similar results.

In the present study also the percentage of infant and child mortality is the highest for the first order birth in all the four communities and the percentages of mortality are 4.63 for the Mudas, 4.1 for the Oraons, 6.58 for the Tantis and 4.56 for the 'Others' (Ref. Table IV.A.2).

The factors like early age at marriage, inadequate development of women for conception, wrong procedure of conducting delivery may be the causes of high mortality of the first order birth of the present study.

B. SOCIO-CULTURAL FACTORS AFFECTING INFANT AND EARLY CHILDHOOD MORTALITY

Chandrakekhar (1972) and Mahadevan, K et al. (1982) in their studies clearly shown the relationship between infant and early childhood mortality and a variety of socio-cultural, health and nutritional variables.
Faith in talisman

The present study reveals that 70 to 80% mothers from all the four communities believe that talisman can protect their children from evil spirit causing illness. As a result child mortality is found to be much higher to those children who wore talisman given by the "Oja" (the local medicine man) than those who did not put talisman but have faith in doctors and modern medicine. The percentages of infant and early childhood mortality for those having faith in talisman and those who do not have faith in talisman among the Mundas are 11.42 and 4.63 respectively. For the Oraons, it is 8.83% and 4.10%; for the Tantis, it is 10.29% and 5.76% and for the 'Others', it is 8.75% and 4.56% respectively (Ref. Table IV.B.1). A section of tea workers still believe that the causes of some diseases of the children are sins committed by the parents and no medicine can cure them.

Status of mother

Gunasekaran (1980), Ruzicka and Kanitkar (1972) in their studies reported higher infant and child mortality among the women of the lower strata as well as of lower social status. The present study also reveals similar results i.e. the highest infant mortality to the woman of lower strata in all the four communities. For the Mundas the percentages of infant and child mortality for the low and high status are 10.80 and 1.85 respectively. For the Oraons, it is 8.52% and 1.26%, for the Tantis, it is 9.47% and 1.23% and for the 'Others', the percentages are 8.74 and 0.76 respectively.

Child mortality and mother's education

One of the most often used socio-economic variables in the study of infant and child mortality is the level of mother's education. There are
numerous studies showing that maternal education plays an important role in determining the level of infant and child mortality. In a cross cultural study Mahadevan et al. (1981) covering eleven countries found that the mortality rate of children whose mothers had ten or more years of schooling was only one-third to one-fifth the rate of death of children of illiterate mothers. The percentages of infant and child mortality of the illiterate mothers of the Mundas, the Oraons, the Tantis and the 'Others', are 8.95, 7.25, 12.35 and 8.74 respectively. On the other hand the percentages are 2.77, 2.21, 0.82 and 1.14 respectively for mothers having education of high school level (Ref. Table IV.B.12).

The present study of the Mundas, the Oraons, the Tantis and the 'Others', Once again proves that there is a negative correlation between education of the mother and infant and child mortality.

A negative correlation is found when child mortality is considered with father's education also, but mother’s education plays a stronger role than father’s education in the present study (Ref. Table IV.B.11).

Caldwell also reported a similar finding in 1979. It is because mother’s education level facilitates acquiring knowledge of personal hygiene, better nutrition and increased awareness regarding preventive and curative health services. They include ante natal, post-natal care and care of the baby resulting in the reduction of infant and early childhood mortality.

Family income and child mortality

The occupational status of husband and wife reflect the economic status of the family. It is, in fact, the occupational status, which determines the income, the residence and all other things in a person's life. Singh (1986)
in her study in Punjab and Haryana found that the percentage of child death increases consistently with the lowering of occupational prestige or income.

Patnaik (1984), also showed that there is a inverse relation between income and child mortality.

Arora et al. (1979), Meendik and Ramachandran (1962), stated that the occupation of the father shows significant influence on infant and early childhood mortality.

In the present study the parents of all the four communities are mostly wage labourers; only a few of them are in other occupations. The labourer's monthly income is quite low and on the other hand they spent a substantial earning in the consumption of alcoholic drinks. Child mortalities is found to be the highest in the lowest income group i.e. among the labourers of the four communities of the present study. It is 11.42% for the Mundas, 8.83% for the Oraons, 9.47% for the Tantis and 5.70% for the 'Others' (Ref. Table IV.B.8).

Family type and child mortality

When infant and child death are considered in relation to family type it has been found that in all the four communities of the present study child mortality is higher in nuclear families than in joint families. The percentages of infant and early childhood mortality in the nuclear families of the Mundas, the Oraons, the Tantis and the 'Others' are 9.88, 7.25, 11.93 and 9.12 respectively. On the other hand, the percentages for the joint families are 6.17, 5.65, 4.12 and 4.18 respectively.
A study conducted by Saksena and Srivastava (1980) also reveals similar result. It may be attributed to the fact that babies in the joint family receive more care than the babies in a nuclear family.

C. HEALTH AND MEDICAL FACTORS AFFECTING INFANT AND CHILD MORTALITY

Antenatal care and child mortality

Better health care practices of the mothers during the period of pregnancy and also the care of the infants and children may decrease the level of infant and early childhood mortality. In a study about the situation of children in India by UNICEF (1984), it is stated that in rural areas the family system compels the women including the pregnant women to take food in less quantity and improper in quality which cause nutritional deficiency among the pregnant and nursing mothers resulting in the death of the infants in many occasions. Venkatacharya in 1985 also reported similar observations.

In the present study when the ante natal care of the women during pregnancy is considered it is seen that in all the four communities more than 50% women have undergone medical checkup during pregnancy but more than 50% women did not take the iron and folic acid tablets provided by the hospital. There is no provision for special nutritious food or rest for the pregnant women in any of the communities. The percentages of infant and child mortality are found to be much higher to those women who did not care for medical checkup during pregnancy than those who were in regular checkup. The percentage of mortality for the Mundas, the Oraons, the Tantis and the 'Others', in the two categories are 12.04 and 4.01; 10.41 and 2.52; 13.99 and 2.86 and 7.60 and 5.70 respectively.
Attendant of child birth and child mortality

In a study conducted by World Health Organization (WHO) in 1984, it is stated that the members of the family who are quite ignorant of the antiseptic techniques conduct 60% of the deliveries in India. Again only 14.2% mothers have been vaccinated against tetanus before delivery.

In the present study among the Mundas, the Oraons, the Tantis and the 'Others', the highest percentages of deliveries are attended by family members and neighbours who lack scientific techniques. The percentages of this practice vary between 47.66 and 54.89 (Ref. Table IV.C4). The child mortality is also the highest in this category and these are 8.95% for the Mundas, 7.26% for the Oraons, 8.64% for the Tantis and 6.46% for the 'Others'.

The study of S. Sandhya (1991) also reported that higher the dependence of untrained 'dhai' higher would be the infant mortality.

Cutting and treatment of umbilical cord and infant mortality

Sharma (1977) in his study stated that the frequency with which unscientific instruments were used for cutting the umbilical cord was quiet alarming in India. It is 19% in urban 69% in rural areas. In the present study the use of modern equipment like blade and knife are more than the use of indigenous equipment like bamboo stripe for cutting the umbilical cord but it is difficult to say whether the equipment was properly sterilized or not. The child mortality is the highest in the indigenous non-sterilizes equipment category and the percentages are 10.49 for the Mundas, 8.83 for the Oraons, 8.23 for the Tantis and 7.22 for the 'Others'.
Neo-natal tetanus is a major problem in many developing countries including India. In the present study also the application of non-conventional substance like burnt excrement of goats, dry mud and ash are still practiced by a section of the workers.

Immunization of children and infant and child mortality

The immunization of children against six serious but preventable diseases namely tuberculosis, diphtheria, pertussis, tetanus, poliomyelitis and measles is an important aspect of child health care system in India. According the National Family Health Survey Report of 1992-93 only 40% children in Assam and 31 percent in India are vaccinated against the six dreadful diseases.

In the present study inspite of having the facilities of free immunization in the garden hospitals the percentage of immunized children among the Mundas, the Oraons, the Tantis and the 'Others' varies between 28 and 35 only. The percentages of infant and child mortality for the non-immunized children among the Mundas, the Oraons, the Tantis and the 'Others', are 8.03, 4.1, 6.58 and 6.84 respectively. On the other hand, the percentages for the immunized children are 1.54, 2.52, 2.47 and 1.14 respectively. It is therefore clear that if the percentages of immunized children were more there had been less infant and child mortality, among the four communities. Child mortality is also the highest in the non-immunized children in all the four communities.
D. HOUSING AND ENVIRONMENTAL FACTORS AND CHILD MORTALITY

A highly negative association of infant and early childhood deaths with ecological variables like house conditions, sanitation, water supply, excreta disposal have already been reported by a number of studies (Mahadevan 1986; Farah and Preston 1982).

UNICEF also in its report in 1985 stated that providing safe drinking water and good sanitation to the people could eliminate a major proportion of health problems of the world.

WHO in 1980, estimated that 57% of the people in the developing countries (excluding China) lacked safe drinking water and 75% did not have adequate sanitation.

Kutcha wells are the main source of drinking water for a majority of the families of all the four communities of present study, though a portion of them use tube wells as a source of drinking water.

The percentages of infant child mortality are the highest for the users of kutcha well in all the four communities of the present study. It is due to that unsafe drinking water may be the cause of many water born diseases like typhoid, cholera, dysentery etc. (Ref. Table IV.D.4)

Nearly 70% mothers in each of the four communities do not care to purify drinking water by boiling, filtering etc. and the infant and child mortality is found to be the highest in this category (Ref. Table IV.D.5).

Once again it is proved by the present study that unsafe drinking water is the cause of many water born diseases that ultimately may be one of the causes of child mortality.
Human excreta and polluted water are the vehicles for a host of intestinal infections and parasitic diseases which are responsible for half of the infant death that occur in the highest mortality areas (Saridhya 1991).

It is found from the present study also that child mortality is very high in all the four communities to those who do not have latrine facilities and use to go open air for nature's call (Ref. Table IV.D.6).

E. NUTRITIONAL FACTORS AND CHILD MORTALITY

Nutritional status, health and mortality are interlinked. Poor nutritional status of the mother during pregnancy and lactation period may expose risks to both the mother and the child. Mother's good nutritional status may have more chances of having healthy children (Dhanalakshmi, 1993).

Initiation of breast feeding and infant mortality

Infant feeding and child nutrition have significant effects on child survival. Breast feeding improves the nutritional status of young children and reduces morbidity and mortality. Breast milk not only provides the child with important nutrients but also protect the child against certain infections. The day on which breast milk is initiated significantly determines the survival chances of the newborn baby (Mahadevan, 1983).

From the present study it is found that more than 50% women of each of the communities initiate their breast feeding after 24 hours of children. In all the four communities the child mortality is found to be higher in those children who were breastfed after 24 hours than those who were breastfed immediately after birth. It may be due to the fact that those children were deprived of cholesium, which is very essential for the new born babies; at
the same time the substances like honey, cow and goats milk and powder milk, which are given to the babies may cause stomach infection.

Duration of breast feeding and child mortality

Breast feeding improves the nutritional status of young children and reduces mortality and morbidity. According to Knodel (1978) and Wray (1977), long duration of breast feeding bears a positive relationship to the nutritional status of the child and a negative relationship to the incidence of mortality. But in the present study no trend of decreasing infant and child mortality is seen with the increase of duration of breast feeding (Ref. Table IV.E.5). It may be due to the fact that as the mothers of the present study are working as waged labour, they are compelled to give supplementary food like milk with water, flour mixed with water and sugar to their babies at a very early age and children are deprived of the benefit of complete and frequent breast feeding during their early infancy.