The aim of the present study is to see the infant and child mortality and their major determinants. The determinants considered are the demographic, Socio-economic and Health care factors. Mothers’ age at first child birth, birth interval and birth order are the demographic factors; type of family, size of family, educational level of the parents, occupation of the parents, sanitary facility, monthly household income, availability of drainage facility, source of drinking water, and types of house are the Socio-economic factors; place of delivery, attendant at the time of delivery, nature of delivery, instruments used for cutting umbilical cord, umbilical cord care, birth weight and status of immunization are the Health care factors considered in the present study.

The study was carried out among the Bodos and the Rabhas the two main schedule tribes of Udalguri district in Bodoland Territorial Autonomous Districts, Assam. 285 Bodo couples and 250 Rabha couples were interviewed for the collection of the data on child mortality and morbidity. The help of doctors and nurses of the primary health centre were also taken whenever necessary.

Data have been analyzed applying proper statistics. A summary of the findings is presented here:

**Infant and child mortality**

Among the Bodos the total child mortality is found 4.84% and the highest mortality is found in <1 year of age group and it is 9.89%. In the age group of 1-4
years and 5-14 years the percentages of mortality are 7.94 and 2.24 respectively. The mortality of the female children is quite higher in comparison to the male in each age group.

1 year > 1-4 years > 5-14 years

Mortality of males = 4.39 > 2.64 > 0.84
Mortality of females = 5.49 > 5.29 > 1.40

Among the Rabhas total child mortality is 6.95% and the highest mortality is found in <1 year age group and it is 11.76%. In the age group of 1-4 years and 5-14 years mortality is found to be 10.71% and 3.98% respectively. The mortality of the female children is quite higher in comparison to male mortality in each age group.

1 year > 1-4 years > 5-14 years

Mortality of males = 4.70% > 4.76% > 2.27%
Mortality of females = 7.05% > 5.95% > 1.70%

Chi square test shows no significant difference in mortality between the children of the Bodos and the Rabhas in the age group of <1 year, 1-4 years and 5-14 years.

Causes of death

Among the Bodos, the major cause of death during infancy (0-1 year) is low birth weight followed by pneumonia, diarrhoea, respiratory problem and asphyxia. In the age group 1-4 years the major cause of death is asthma, followed by diarrhoea, jaundice, fever, pneumonia and unknown cause. In the age group of 5-14 years diarrhoea is the main cause of death followed by fiver, dysentery and accident.

Among the Rabhas the major cause of death of the infant is low birth weight, followed by asphyxia, pneumonia, diarrhea and evil spirit. The major cause of death
in the age group of 1-4 years it is diarrhoea, followed by in the grip of evil spirit, jaundice, fever, asthma and asphyxia. While fever is the main cause of death among the children of 5-14 years age group category followed by jaundice, diarrhoea, animal bite and dysentery.

**Bio-demographic factors**

Bio-demographic factors play vital role on infant and child mortality in both the study groups. Bio-demographic factors examined in the present study are:

(i) mother’s age at first child birth, (ii) birth interval and (iii) birth order.

(i) **Mother’s age at first child birth**

Infant and child mortality is found to be the highest among mothers whose age at first child birth is $\leq 19$ years of age in both of the study groups. Statistically a significant association is also found between child death and mothers age at first child birth in both the populations. The relative risk of child mortality among the Bodos is found to be 1.593 times higher for the mothers of younger age ($\leq 19$ years) as compared to mothers whose age at first child birth is 24 years and above. Similarly, among the Rabhas also the risk is found to be 1.261 times higher for the mothers of younger age ($\leq 19$ years) as compared to mothers whose age at first child birth is 24 years and above.

(ii) **Birth interval**

Infant and child mortality is found to be the highest in short birth interval period in both the populations. Statistical association is also found between birth interval and child death. Among the Bodos the relative risk of child mortality is found to be 1.738 times higher for a birth interval of $\leq 24$ months when it is compared to the
birth interval of $\geq 36$ months. On the other hand, among the Rabhas the risk of child mortality is 2.312 times higher for a birth interval of $\leq 24$ months when compared with the birth interval of $\geq 36$ months.

(iii) Birth order

Infant and child mortality is found to be the highest in higher birth order (4+) in among the Bodos and the Rabhas. Chi square test shows significant statistical association between child death and birth order in both the populations. The risk of child mortality among the Bodos is 3.449 times higher for birth order 2-3 and 26.040 times higher for birth order 4+ when compared with first birth order. Among the Rabhas the risk is 2.792 times higher for birth order 2-3 and 12.623 times higher for the birth order 4+ as compared to first birth order.

Socio-economic factors

Socio-economic factors play a very significant role in determining the infant and child mortality in the present study. The socio-economic factors considered are: (i) type of family, (ii) type of house, (iii) mother’s education, (iv) father’s education, (v) mother’s occupation, (vi) father’s occupation, (vii) sanitary facility, (viii) monthly household income (ix) availability of drainage facility and (x) Source of drinking water.

(i) Type of family

Among the Bodos the infant and child mortality is found to be the highest in joint families as compared to nuclear families. But among the Rabhas it is the highest in nuclear families as compared to joint families. No statistical association is found between child death and types of family in the both the study groups.
(ii) Type of house

Among the Rabhas both Infant and child mortality are found to be the highest in families living in kutcha houses but among the Bodos infant mortality is the highest in families living in kutcha houses while child mortality is the highest in families living in semi-pucca houses. Statistically no significant association is found between child death and types of house among the Bodos while a statistically significant association is found among the Rabhas. The risk of is child mortality among the Rabhas is 1.146 times higher in semi-pucca houses and 3.510 times higher in kutcha houses when compared with pucca houses.

(iii) Mother’s education

Mother’s education is found to play a very significant role in infant and child mortality among the Bodos and the Rabhas. Infant and child mortality are found to be inversely related to mothers’ education in both the study groups. Statistically mothers’ education is found to have significant association with child mortality in both the study groups. Among the Bodos the risk of child mortality is 14.591 times and 5.253 times higher for illiterate and primary educated mothers respectively, when it is compared with secondary level and above educated mothers. Among the Rabhas the risk is found 3.940 times higher for illiterate mothers and 7.135 times higher for primary educated mothers when it is compared with secondary level and above educated mothers.

(iv) Father’s education

Father’s education is also found to be inversely related to infant and child mortality among the Bodos, but among the Rabhas only infant mortality is found to be
inversely related. However, no statistically significant association is found between child death and fathers’ education in both the groups. The education of mother has more influence on infant and child mortality than education of father.

(v) **Mother’s occupation**

In both the study groups infant mortality is found to be the highest when mothers’ occupation is labour.

(vi) **Father’s occupation**

Among the Bodos both infant and child mortality are found to be the highest when fathers’ occupation is unskilled labour. On the other hand among the Rabhas infant mortality is found to be the highest when fathers’ occupation is business but child mortality is found to be the highest when the fathers’ occupation is unskilled labour. A statistically significant association is found between child death and fathers occupation among the Bodos but among the Rabhas no such type of association is found.

(vii) **Sanitary facility**

Among the Bodos and the Rabhas both infant and child mortality are found to be the highest in families where there is no sanitary facilities and members go to the open air for defecation and it is the lowest in families where flush toilet facilities are there. Statistically significant association between child death and toilet facility is found in the both study groups. Among the Bodos the risk of child mortality is found 2.917 times and 11.296 times higher in the households having kutcha and no toilet facilities respectively when it compared with the households having flush toilet facilities. While among the Rabhas the risk is found 2.551 times and 7.959 times
higher in the households having kutch and no toilet facilities when it compared with
the households having flush toilet facilities.

(viii) Monthly household income

Infant mortality among the Bodos is the highest in the middle income group
(MIG) whereas among the Rabhas it is the highest in low income group (LIG). On the
other hand child mortality is the highest in low income group in both the study
groups. Only the Bodos shows statistically significant association between child death
and monthly household income. The relative risk of child mortality among the Bodos
is found to be 3.878 times and 5.928 times higher in households with middle income
group (MIG) and lower income group (LIG) respectively as compared to the
households of high income group (HIG).

(ix) Availability of drainage facility

In both the study groups the infant and child mortality is found to be the
highest in families having no proper drainage facilities. Statistically significant
association is found between child death and drainage facility in both the study
groups. When the drainage system and child mortality is considered the risk of child
mortality among the Bodos is 8.651 times higher in families having no drainage
system as compared to the families having proper drainage system. Among the
Rabhas the risk of child mortality is 3.013 times higher in families having no drainage
system.

(x) Source of drinking water

Chi square test shows significant statistical association between child death
and source of drinking water among the Bodos but no such association is found
among the Rabhas. Among the Bodos the relative risk of child mortality is 4.771 times and 7.481 times higher for households where sources of drinking water are hand pump and well respectively as compared to public tap.

**Health care factors**

Health care variables are found to play very significant role in regulating the infant and child mortality in both the study groups. Place of delivery, birth attendant, instruments used for cutting umbilical cord, umbilical cord care, status of immunization and birth weight are considered here.

(i) **Place of delivery**

Among the Bodos and the Rabhas the infant and child mortality is higher in home delivery cases as compared to hospital deliveries. Chi square test also shows statistically significant association between child death and place of delivery in both the study groups. Among the Bodos the risk of child mortality is 2.828 times higher for children born at home as compared to children born at hospital; among the Rabhas the risk is 3.730 times higher.

(ii) **Birth attendant**

Among the Bodos and the Rabhas infant mortality is the lowest when deliveries were attended by doctors. Chi square test shows significant statistical association between child death and attendant at the time of delivery in both the study groups. Among the Bodos the logistic regression shows the risk of child mortality is 23.556 times higher in deliveries attended by untrained *dhai* as compared to the deliveries attended by doctors; while among the Rabhas the risk is 6.368 times higher.
(iii) **Instruments used for cutting umbilical cord**

The infant and child mortality is the highest when unsterilized equipments were used for cutting umbilical cord in both the study groups. Chi square test shows strong statistical association between child death and instruments used for cutting umbilical cord. Among the Bodos when child mortality is compared with the instruments used for cutting umbilical cord the risk is found to be 1.812 times and 6.135 times higher when unsterilized blades or unsterilized scissors were used as compared to sterilized equipments. Among the Rabhas the risk is 2.002 times higher when unsterilized blades were used and 6.135 times higher when unsterilized scissors were used for cutting umbilical cord.

(iv) **Umbilical cord care**

It is seen that both infant and child mortality are the highest when traditional methods are used for UC care among the Bodos and the Rabhas. Chi square test shows a statistically significant association between child death and UC care among the Bodos but no such association is found among the Rabhas. Among the Bodos the risk of child mortality is 1.812 times higher when talcum powder is used and 4.388 times higher when vermillion mixed with mustard oil is used for umbilical cord care as compared to the use of medicated powder.

(v) **Status of immunization**

Immunization of children against six vaccine preventable diseases (tuberculosis, diphtheria, pertusis, tetanus, poliomyelitis, and measles) is observed to have significant effect in reducing infant mortality. In the study groups both infant and child mortality are found to be the highest in children who are not at all
immunized. Chi square test shows statistically significant association between child death and status of immunization in the both study groups. Among the Bodos the risk of child mortality is 12.059 times, 3.742 times and 183356397099.978 times higher in still continuing, half immunized and not immunized categories respectively when it compared with the completely immunized children; among the Rabhas it is 11.190 times, 2.914 times and 29.500 times higher respectively.

(vi) Birth weight

In both the study groups low birth weight babies show higher risk of mortality during infancy and childhood period as compared to the normal birth weight babies. Significant statistical association is found between child death and birth weight. Among the Bodos the risk of child mortality is 8.651 times higher in children whose birth weight are below normal (<2.5 kg) as compared to normal weight babies (2.5 kg or above); while among the Rabhas the risk is 3.013 times.

Patterns of Morbidity

Along with mortality the morbidity prevalent among the infant and children is also studied. Worm infestation is found to be the highest in the children of age group <1 year and 1-4 years in both the study groups. In the age group of 5-14 years fever is found to be the highest among the Bodos while among the Rabhas diarrhea and dysentery is found to be the highest.

In the both the study groups four main water related diseases are found and these are water borne disease, water based disease, water based vector disease and water scarcity disease. Besides these allergic disorder, viral infection and infectious diseases are also found to be prevalent.

Child morbidity and house type
In the present study child morbidity is found to decreased with the better house types. Significant statistical association is found between type of house and child morbidity in both the study groups.

**Child morbidity and sanitary facility**

In both of the study groups the incidence of child morbidity is found to be the highest in families using open air for defecation followed by the families having kutcha and pucca toilet facilities. Chi square test shows significant association between sanitary facility and child morbidity in both the study groups.

**Child morbidity and nature of use of drinking water**

In both the study groups child morbidity is lower in the families using boiled or filtered drinking water compared to families using plain drinking water. A significant statistical association is found between the nature of drinking water and child morbidity in both the study groups.

**Weight for age**

Among the Bodos 21.79% children are found to be below weight for age and among the Rabhas the percentage is 29.54.

**Type of treatment**

Like many other indigenous communities of the world the present study groups are also not very much conscious about the diseases. In some cases they wait for sometime for natural recovery, if the conditions do not improve they take either ethno medicine or seek help of traditional medicine man or ‘Ojha’. Finally, when the conditions further deteriorate then only they prefer allopathic treatment.
Conclusion

From the present study it may be concluded that the percentage of infant and child mortality among the Rabhas is higher than the Bodos. But statistically there is no significant difference. Infant and child mortality rates of both the study groups are higher than that of India or Assam (NFHS-III).

A number of factors have been found to have statistically significant effect on child mortality and these factors are (i) bio-demographic factors like mothers age at first child birth, birth interval and birth order; (ii) socio-economic factors like mother’s education, sanitary condition, monthly household income, drainage system and source of drinking water and (iii) health care factors like place of delivery, delivery attendant, instruments used for cutting umbilical cord, umbilical cord care, status of immunization and birth weight. Thus from the present study it can be said that increase of age at first child birth, enough spacing between child birth, increase in mothers education, hygienic sanitary condition, proper utilization of health care services like hospital delivery, complete immunization may decrease infant & child mortality and morbidity among the Bodos and the Rabhas of the present study.