CHAPTER - VII

SUMMARY AND CONCLUSION
Summary

In today's scenario, fertility control is the most important way to check high population growth. Fertility is directly influenced by a set of biological and social factors. Among the factors responsible for fertility variation, maternal education, mother's age at marriage and use of contraceptives were found to play a significant role in fertility reduction (Dey and Goswami, 2009). On the other hand, the child mortality rate has in recent years been recognised as an excellent summary index of the level of living and socio-economic development of a country. This recognition has inspired international organisations as well as national governments to intensify their efforts to lower the level of mortality and raise the level of child survival (Jain and Visaria, 1988).

Most of the meaningful researches on mortality, particularly on infant and child mortality have been carried out since the 1980's which were mostly at macro level. It is proved beyond doubt that there are marked variations in mortality patterns and rates between various countries and between various populations, even within one country. It is also reported that there are lots of variations in respect of mortality patterns and rates between different ecological zones. Recent researches on mortality have shown that mortality patterns and rates are influenced by various types of biosocial phenomenon as fertility is. Mahadevan (1986) suggested that since there is no comprehensive and systematic analytical framework and conceptual model, most of the researches on mortality suffer from poor coverage of appropriate variables and lack of depth.
In the present study, we have taken into consideration the bio-social determinants of fertility and child mortality among the Khongsai Kukis of Saikul sub-division and Imphal town. The objectives of the present study are as follows:

1. To study the demographic structure of the Khongsai Kukis of Saikul sub-division and Imphal town.

2. To find out the status of fertility and child mortality in the study population.

3. To find out the biosocial determinants responsible for fertility and child mortality in the study population.

The findings of the present study may be briefly summarized as follows:

**Demographic characteristics**

**Age, Sex and Marital Status**

1. The overall sex ratio, i.e., the number of males per 100 females is slightly tilted in favour of males in both Saikul sub-division (103.17) and Imphal town (112.77) despite the absence of statistical difference (Table 4.1). Comparing the two areas, the overall sex ratio is higher in Imphal town than their Saikul counterparts.

2. According to Sundbarg’s classification of population, a population is referred to as *progressive* when the proportions of persons relative to the total population are 40.00%, 50.00% and 10.00% in the age groups 0-14 years, 15-49 years and 50+ years respectively. Following this, the Khongsai Kuki population in both the study
areas is of progressive type (Table 4.1). The population pyramid (Figure 1&2) also shows that the base of the pyramid in both the areas are generally broader at the base and becomes narrower as we move up to the higher age groups.

3. Of the total Khongsai Kuki population in the seven villages of Saikul sub-division, 21.95% of males and 22.73% of females belong to the pre-reproductive age group (0-14 years), whereas 23.72% of males and 23.82% of females belong to the reproductive age group (15-49 years). In the post-reproductive age group (50+ years), there are 5.11% of males and 2.65% of females. On the other hand, of the total Khongsai Kuki population in the four localities of Imphal town, 20.72% of males and 17.72% of females belong to the pre-reproductive age group, whereas 27.48% each of males and females belong to the reproductive age group. In the post-reproductive age group, 4.81% and 1.80% are males and females respectively.

4. The sex ratio in the post-reproductive age group (Saikul: 192.15; Imphal: 266.66) is much higher in the post-reproductive age group than the preceding age groups in both the areas indicating the higher average longevity in males than their female counterparts (Table 4.1).

5. Regarding marital status, the percentage of unmarried, married and widowed/divorced in Saikul sub-division are 31.23%, 18.82% and 0.73% respectively in males; 29.10%, 18.82% and 1.30% respectively in females. In Imphal town, these are 33.18%, 19.52% and 0.30% respectively in males; 26.13%, 19.67% and 1.20% respectively in females (Table 4.2).
6. The mean age at menarche (Table 4.3) of the Khongsai Kuki married women is found to be significantly greater ($t = 2.64$, $p < 0.01$) in Saikul sub-division ($14.53 \pm 0.21$) as compared to their Imphal counterparts ($13.94 \pm 0.08$).

7. The mean age at marriage (Table 4.4) of both males and females is significantly greater in Imphal town (Male: $26.85 \pm 0.31$ years; Female: $22.24 \pm 0.30$ years) than in Saikul sub-division (Male: $25.19 \pm 0.22$ years; Females: $20.36 \pm 0.17$ years). The differences between the two study areas are statistically significant (Male: $t = 4.37$, $P < 0.001$; Female: $t = 6.26$, $P < 0.001$) as well.

8. Similarly, the mean age at first child birth (Table 4.5) is found to be greater in Imphal town than in Saikul sub-division among both males ($t = 4.89$, $p < 0.001$) and females ($t = 5.99$, $p < 0.001$). Adjusting the rural-urban and sex differences the mean age at first marriage in the present population is found to be $24.51 \pm 0.15$ years. So, we have considered 25 years as a generation length of the Khongsai Kuki following the method suggested by Glass (1956).

**Fertility and mortality**

1. The fertility rate, i.e., the mean number of live births per mother is found to be higher in Saikul sub-division ($3.74 \pm 0.11$) than that of the Imphal town ($3.19 \pm 0.13$), although it is not statistically significant ($t = 0.93$, $p > 0.05$) (Table 4.6).
2. The infant mortality rate, i.e., the number of infant deaths below 1 year of age is found to be significantly higher ($\chi^2 = 4.02$, d.f. = 1, $p < 0.05$) in Saikul sub-division (2.39%) compared to their Imphal counterparts (0.99%) (Table 4.7).

3. The child mortality rate, i.e., the number of child deaths between 1 – 14 years of age is also higher in Saikul sub-division (3.51%) than in Imphal town (2.72%), despite the absence of statistically significant difference ($\chi^2 = 1.42$, d.f. = 1, $p > 0.05$) (Table 4.7).

4. The completed fertility size, i.e., the mean number of live births to mothers who are aged 45 years and above, and lived continuously in wedlock till the attainment of 45 years of age is found to be higher in Saikul sub-division (5.78) than that of the Imphal town (4.82) (Table 4.8).

5. The child-women ratio is found to be higher in Saikul sub-division than in Imphal town (Table 4.9). It is 75.71 and 50.82 respectively.

6. There are 96.42% of married women in Saikul sub-division and 97.64% in Imphal town who have had experienced pregnancy in their lifetime (Table 4.10). There is not a single mother aged ≥ 46 years and had not experienced any pregnancy in both the study areas.

7. The frequency of the total reproductive wastage is more or less similar in both the study areas (Saikul: 8.87%, Imphal: 8.39%) although it is slightly higher in Saikul sub-division. Of the total reproductive wastages in Saikul sub-division, 7.05% are
abortions and 1.82% still births whereas, of the total reproductive wastages in Imphal town, 7.94% are abortions and 0.45% still births (Table 4.11).

8. The average number of surviving children per all married women (Table 4.12) is slightly higher in Saikul sub-division (3.51) than in Imphal town (3.06). In Saikul sub-division, mothers having 4 numbers of surviving children are the highest (19.70%), whereas it is 3 numbers of surviving children in Imphal town (26.77%).

9. The age-specific marital fertility rate (ASMFR) reaches its highest peak in the age group 25-29 years in both Saikul sub-division (1.4408) and Imphal town (1.3966) (Table 4.13 & Figure 3). The ASMFR in Saikul sub-division exceeds their Imphal counterparts in all the age groups. Therefore, the total ASMFR is higher in Saikul sub-division (4.8498) than in Imphal town (3.7132).

**Biological determinants of fertility and child mortality**

**Age group of mothers**

1. The mean number of live births per mother is corresponding to the age group of mothers in both Saikul sub-division and Imphal town (Table 5.1). The differences are also statistically significant in both the study areas (Saikul: $F = 82.338, p < 0.001$; Imphal: $F = 28.746, p < 0.001$).

2. Although there is a positive correlation between age group of the mothers and infant mortality rates in both the study areas, they are not statistically significant sub (Saikul: $r = 0.07, p > 0.05$; Imphal : $r = 0.04, p > 0.05$) (Table 5.1.1). Unlike infant
mortality, mother’s age group has a significant positive relationship with the child mortality rate in both the study areas (Saikul: $r = 0.31, p < 0.01$; Imphal: $r = 0.22, p < 0.05$). In other words, the child mortality rate tends to increase as the mother’s age group increases.

**Age at marriage of the mothers**

1. The mean number of live births per mother (Table 5.2) tends to decrease as the mother’s age group at marriage increases in both the study areas, despite the absence of statistical differences in Imphal town (Saikul: $F = 3.967, p < 0.05$; Imphal: $F = 2.486, p > 0.05$).

2. The relationship between infant as well as child mortality rates and mother’s age group at marriage is not clearly perceptible in both the study areas, although there is an inverse relationship between the child mortality rate and mother’s age group at marriage in Saikul sub-division ($r = -0.07, p > 0.05$) (Table 5.2.1).

3. Of all the socio-economic variables included in the regression model, mother’s age at marriage is found to be positively associated with residence, i.e., rural/urban ($B = 0.343 \pm 0.094, p < 0.01$) and maternal education ($B = 0.178 \pm 0.049, p < 0.01$) (Table 5.2.2). In other words, urban setting and higher level of maternal education is likely to delay mother’s age at marriage in the present population.
ABO blood group mating types

1. ABO blood group incompatible mating among the Khongsai Kuki is slightly higher in Saikul sub-division (45.50%) than in Imphal town (43.65%). ABO blood group mating types seem to play no significant role in regulating the fertility rate in both the study areas (Table 5.3).

2. Unlike in Imphal town, the infant mortality rate in Saikul sub-division is found to be significantly higher among ABO blood group incompatible types of mating than compatible types (Table 5.3.1). The coefficient of correlation (r) is 0.14, p < 0.05 for Saikul sub-division and 0.11, p > 0.05 for Imphal town. However, the child mortality rate is significantly higher (Saikul: r = 0.14, p < 0.05; Imphal: r = 0.18, p < 0.05) among ABO incompatible matings than compatible matings in both the study areas (Table 5.3.1).

Birth order

1. Birth order does not show any consistent pattern in respect of the infant and child mortality rates in both Saikul sub-division and Imphal town (Table 5.4). The differences between the two areas in respect of both infant ($\chi^2 = 6.40$, d.f. = 5, p > 0.05) and child mortality ($\chi^2 = 3.54$, d.f. = 5, p > 0.05) rates are also not statistically significant.
**Birth intervals**

1. Greater mean birth intervals seem to play an important role in reducing the mean number of live births (Table 5.5), despite the absence of significant differences in Imphal town (Saikul: $F = 3.12, p < 0.05$; Imphal: $= 1.46, p > 0.05$).

2. There is a significant negative relationship between the infant mortality rates and mean birth intervals in both Saikul sub-division ($r = -0.16, p < 0.01$) and Imphal town ($r = -0.21p, < 0.05$) (Table 5.5.1) indicating that the infant mortality rate decreases as the mean birth interval increases. In contrary to this, the coefficients of correlation ($r$) between the child mortality rates and mean birth intervals are not statistically significant in both the study areas (Saikul: $r = -0.02, p > 0.05$; Imphal: $r = 0.06, p > 0.05$) (Table 5.5.1).

3. Of the many variables, birth intervals is significantly associated with household income ($B = 0.156 \pm 0.052, p < 0.01$) and family size ($B = -0.109 \pm 0.052, p < 0.05$) are significantly associated with birth intervals (Table 5.5.2). In other words, mean birth interval is likely to increase as the household income increases, whereas it tends to decrease as the size of family increases.

**Cause of infant and child mortality**

1. Unknown/accident is the main cause of infant mortality in both Saikul sub-division (1.21%) and Imphal town (0.74%). The differences between the two areas in respect of the infant mortality rates according to their causes are not statistically significant
In case of the child mortality, 'other health problems' (i.e., malaria, fever, BP stroke, cancer, and congenital disease) are responsible for the highest number of child deaths (1.52%) in both Saikul sub-division and Imphal town (1.48%) (Table 5.6). However, the differences between the two study areas in respect of child mortality rates are not statistically significant ($\chi^2 = 1.41$, d.f. = 4, $P > 0.05$).

2. The rural and urban differences in both infant and child mortality rates with respect to their causes are not statistically significant (Table 5.6).

**Socio-economic determinants of fertility and child mortality**

**Types of family**

1. The mean number of live births per mother is found to be significantly higher (Saikul: $F = 4.850$, $p < 0.05$; Imphal: $F = 7.039$, $p < 0.05$) among nuclear families than that of the joint families in both Saikul sub-division and Imphal town (Table 5.7). It is 3.89 $\pm$ 0.13 among nuclear families and 3.36 $\pm$ 0.22 among joint families in Saikul sub-division, whereas it is 3.26 $\pm$ 0.14 and 2.79 $\pm$ 0.36 respectively in Imphal town.

2. The correlation between infant mortality rates and types of family is found to be negative despite the absence of significant correlation in Imphal town (Saikul: $r = -0.12$, $p < 0.05$; Imphal: $r = -0.07$, $p > 0.05$) (Table 5.7.1). Unlike infant mortality, the child mortality rate is positively correlated with types of family in both the study areas (Saikul: $r = 0.02$, $p > 0.05$; Imphal: $r = 0.04$, $p > 0.05$), although it is not statistically significant in both the areas. (Table 5.7.1).
Size of family

1. The mean number of live births significantly increases from $1.76 \pm 0.16$ among small size family to $4.76 \pm 0.18$ among large size family in Saikul sub-division; and $1.68 \pm 0.12$ to $4.12 \pm 0.32$ respectively in Imphal town (Table 5.8). The F - ratios are 92.717, $p < 0.001$ for Saikul sub-division and 45.509, $p < 0.001$ for Imphal town.

2. The infant mortality rate is inversely related to the size of families in Saikul sub-division as it varies from 8.96% among small size 1.41% among large size families. In Imphal town, it is recorded among medium (1.45%) and large size families (0.75%) (Table 5.8.1). But, the coefficients of correlation (r) show no significant relationship between the infant as well as child mortality rates and size of family in both the study areas (Table 5.8.1). So, size of family is not an important factor regulating the mortality rate in the present population.

Consanguineous and non-consanguineous marriages

1. With only 4.18% of consanguineous marriages in Saikul sub-division and 3.94% in Imphal town, the influence of consanguineous and non-consanguineous marriages on the fertility as well as infant and child mortality rates in the present population are not clearly perceptible (Table 5.9 and 5.9.1).
Educational level of the mothers

1. Rural-urban setting seems to have a positive impact on mother's education in the present study as there are 14.33% of illiterate mothers in Saikul sub-division and none in Imphal town (Table 5.10).

2. The mean number of live births (Table 5.10) per mother tends to decline significantly as the educational level of mothers increases in both Saikul sub-division ($F = 8.790, p < 0.001$) and Imphal town ($F = 4.483, p < 0.05$). In Saikul sub-division, it decline from $4.67 \pm 0.30$ among illiterate mothers to $2.89 \pm 0.32$ among higher secondary and above educated mothers, whereas in Imphal town, it decline from $3.71 \pm 0.28$ among primary to $2.77 \pm 0.21$ among higher secondary and above educated mothers.

3. The infant mortality rate tends to decline as the mother's educational level increases in both the study areas, although it is not significant in Imphal town (Saikul: $r = -0.18, p < 0.01$; Imphal: $r = 0.14, p > 0.05$) (Table 5.10.1). In the case of child mortality rate, its relationship with maternal education is found to be significant negative in both the study areas (Saikul: $r = -0.25, p < 0.01$; Imphal: $r = -0.19, p < 0.05$) as it decline from 7.59% among illiterate mothers to 1.63% among secondary educated mothers in Saikul sub-division; and 4.62% among primary mothers to 0.69% among higher secondary and above educated mothers in Imphal town. No child death was recorded among higher secondary and above educated mothers in Saikul sub-division (Table 5.10.1).
4. Maternal education is found to play an important role in regulating the fertility and mortality rates in the present population, although the influence is more significant in Saikul sub-division.

Educational level of the fathers

1. Only 4.27% of fathers in Saikul sub-division are illiterate, whereas there are none in Imphal town indicating that rural-urban setting plays an important role on paternal education like in the case of mothers (Table 5.11).

2. The mean number of live births per father is inversely related to paternal education in Saikul sub-division, although there is no consistent pattern in Imphal town (Table 5.11). The differences in live births among father's educational levels are statistically significant in Saikul sub-division ($F = 3.788, p < 0.05$), although the same is not in Imphal town ($F = 0.309, p > 0.05$).

3. The relationships between the infant as well as child mortality rates and paternal education are negative in both the study areas (Table 5.11.1). In other words, the infant and child mortality rates tends to decline as the paternal educational level increases although their relationships are not statistically significant in Imphal town. The coefficients of correlation ($r$) are $0.14, p < 0.05$ for infant mortality and $0.23, p < 0.01$ for child mortality in Saikul sub-division, whereas these are $0.14, p > 0.05$ and $0.08, p > 0.05$ respectively in Imphal town).
4. The influence of father’s education on the fertility as well as infant and child mortality rates is much more in Saikul sub-division rather than in Imphal town.

**Occupation of the mothers**

1. Agriculture, being their main occupation in Saikul sub-division, there are 88.82% of mothers who are cultivators in this area, whereas majority of the mothers in Imphal town are housewives (37.79%) and service holders (37.79%). There is no housewife in Saikul sub-division and no cultivator in Imphal town *(Table 5.12).*

2. In Saikul sub-division, the mean number of live births per mother is highest among service holders (4.85 ± 0.53) followed by cultivators (3.75 ± 0.12) and other type of occupations (2.13 ± 0.32). In Imphal town, it is highest among other type of occupations (3.68 ± 0.23) which is followed by service holders (3.08 ± 0.23) and then housewives (2.98 ± 0.22). The differences in live births among mother’s occupational groups are statistically significant in Saikul sub-division (*F* = 14.553, *p* < 0.001), although the same is not in Imphal town (*F* = 0.448, *p* > 0.05) *(Table 5.12).*

3. The coefficient of correlation (r) shows that there is no significant relationship between the infant as well as child mortality rates and mother’s occupation in both the study areas *(Table 5.12.1).* However, the highest infant and child mortality rates are recorded among cultivators (Infant: 2.58%; Child: 3.73%) in Saikul sub-division and housewives (Infant: 1.39%; Child: 2.79%) in Imphal town (1.39%).

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4. Mothers who are cultivators in Saikul sub-division and mothers who are housewives in Imphal town are expected to be less educated and hence recorded the highest infant and child mortality rates.

**Occupation of the fathers**

1. Similar to mother's occupation, majority of the fathers in Saikul sub-division are cultivators (72.56%) whereas majority of them in Imphal town are service holders (87.70%) (Table 5.13).

2. The F-statistics shows that father's occupation has no significant influence on the mean number of live births in both the study areas, although it is highest among fathers who are cultivators (3.81 ± 0.13) in Saikul sub-division and service holders (3.29 ± 0.14) in Imphal town (Table 5.13).

3. Although, father's occupation has a significant negative correlation with the infant mortality rates in Saikul sub-division (r = -0.13, p < 0.05), it has no significant impact on the infant mortality rate in Imphal town as well as the child mortality rates in both the study areas (Table 5.13.1). However, the highest infant and child mortality rates are recorded among cultivators (Infant: 3.10%; Child: 3.90%) in Saikul sub-division and other type of occupation (Infant: 2.50%; Child: 7.50%) in Imphal town.
4. Further, father's occupation is found to play a significant role in Saikul sub-division when data for the infant and child mortality rates are pooled together, which is not so in the case of Imphal town.

**Household Income**

1. The fertility rate tends to increase as the monthly household income increases in both Saikul sub-division and Imphal town (Table 5.14). The mean number of live births ranges between 3.54 among LIG to 4.15 among HIG in Saikul sub-division; and 2.93 to 3.61 respectively in Imphal town. The one way ANOVA shows that the differences in live births among household income groups are statistically significant only in Imphal town (Saikul: F = 2.569, p > 0.05; Imphal: F = 3.580, p < 0.05).

2. The infant mortality rates in both the study areas as well as the child mortality rate in Imphal town are inversely related to household income, despite the absence of statistical correlation (Table 5.14.1). But, the child mortality rate in Saikul sub-division is recorded highest among MIG (4.64%) followed by LIG (4.08%) and HIG (1.17%).

3. The influence of household income is significant negative when data for the infant and child mortality rates are pooled together in Saikul sub-division ($r = -0.12$, $p < 0.05$), indicating that household income can play a significant role in reducing the mortality rates in this area rather than in Imphal town. (Table 5.14.1).
House types

1. There are only *kaccha* and *semi-pucca* type of house in Saikul sub-division, although there are *kaccha*, *semi-pucca* and *pucca* types in Imphal town. The differences in the mean number of live births among types of house are not statistically significant in both the study areas (Table 5.15).

2. The infant rate is found to be highest among *kaccha* type of house in both the study areas, although it is not statistically significant in Imphal town (Saikul: \( r = -0.13, p < 0.05 \); Imphal: \( r = -0.14, p > 0.05 \) (Table 5.15.1). Similarly, the child mortality rate is found to be higher among *kaccha* types (4.40%) than that of the *semi-pucca* types (2.07%) in Saikul sub-division, although the same is recorded only among *semi-pucca* (4.91%) and *pucca* types (2.08%) in Imphal town.

3. Pooling data for infant and child mortality rates, their relationship with house types is highly significant in Saikul sub-division \( (r = -0.16, p < 0.01) \), although the same is not in Imphal town \( (r = -0.14, p > 0.05) \) (Table 5.15.1).

Main fuel for cooking

1. Firewood is the only fuel for cooking in Saikul sub-division, whereas Liquid Petroleum Gas (LPG) is the only fuel for cooking in Imphal town (Table 5.16). Therefore, we could not find the relationship between the mortality rates and main fuel for cooking in the present study.
Main source of drinking water

1. Source of drinking water in Saikul sub-division includes village pipe water and PHE pipe water, whereas in Imphal town, these are PHE pipe water and ‘others’ (well, water tanker, etc.). Use of PHE pipe water is found to be associated with lower infant and child mortality rates in Saikul sub-division (Table 5.17) although there is no consistent pattern in Imphal town. The coefficient of correlation (r) also shows no significant relationship between the infant as well as child mortality rates and source of drinking water in both the study areas.

2. The coefficient of correlation (r) further shows that use of PHE pipe water can significantly decline the total mortality rates (pooling data for infant and child mortality) in Saikul sub-division ($r = 0.12, p < 0.05$) (Table 5.17).

Types of toilet

1. The infant mortality rate is higher among households who used own pit type of toilet (Saikul: 2.62%; Imphal: 2.70%) than septic tank types (Saikul: 1.07%, Imphal: 0.82%) in both the study areas. The child mortality rate as well is higher among households who used own pit type (4.03%) than septic tank type (0.53%) in Saikul sub-division, although it is similar among both own pit type (2.70%) and septic tank type (2.72%) in Imphal town. (Table 5.18). But, the coefficient of correlation (r) between the infant as well as child mortality rates and types of toilet used shows that their relationship is significant negative only in the case of child mortality rates in Saikul sub-division ($r = -0.13, p < 0.05$).
2. Even after pooling data for infant and child mortality rates, their relationship with types of toilet used is found to be significant only in Saikul sub-division \((r = -0.13, p < 0.05)\) indicating that types of toilet is not an important factor in influencing the mortality rate in Imphal town (Table 5.18).

**Actual and desire number of children**

1. The desire number of children among the Khongsai Kuki married women is significantly greater than their actual number of children in both Saikul sub-division and Imphal town (Table 5.19). The mean actual number of children is found to be 3.48 ± 0.12 children in Saikul sub-division and 3.11 ± 0.12 children in Imphal town, whereas the mean desire number of children are 4.23 ± 0.05 and 3.85 ± 0.08 children respectively. It may be mentioned that there are 9 mothers in Saikul sub-division and a single mother in Imphal town having no desire number of children.

2. The differences between the two areas in respect of actual and desire number of children is statistically significant (Actual: \(t = 2.22, p < 0.05\); Desire: 4.04, \(p < 0.001\)) (Table 5.19).

**Preference on sex of the child**

1. Being a patrilineal society, majority of the mothers, i.e., 81.80% in Saikul sub-division and 57.50% in Imphal town preferred male child over female child (Table 5.20).
2. With only 0.60% of mothers in Saikul sub-division and 4.72% of mothers in Imphal town preferring female child, we could not find its impact on the fertility rate in this population. There are also 59 (17.62%) mothers in Saikul sub-division and 48 (37.79%) in Imphal town having no preference (Table 5.20.1).

**Family planning method**

1. Awareness and adoption of family planning method are found to be higher in Imphal town compared to their Saikul counterparts. There are 92.12% of mothers in Imphal town and 82.02% in Saikul sub-division who were aware of family planning method. But, there are only 28.35% and 13.43% of couples respectively who were adopting it. The differences between the two areas in respect of awareness ($\chi^2 = 7.22$, d.f. = 1, $p < 0.01$) and adoption ($\chi^2 = 14.17$, d.f. = 1, $p < 0.005$) of family planning method are statistically significant (Table 5.21). Adoption of family planning in the present population is very low as compared to those reported among Assamese Hindus (61.30%), Muslims (46.10%) and Christians (45.60%) (NFHS-3); and the Lois (41.76%) of Manipur (Chanu, 2007).

2. The most common source of family planning is ‘others’ category (media, elders and friends) in both the study areas (Saikul: 63.88%; Imphal: 50.39%). The $\chi^2$ value i.e., $\chi^2 = 41.34$, d.f. = 3, $p < 0.005$ shows that the difference between the two study areas in respect of the source of family planning is highly significant (Table 5.21).
3. The frequency of mothers having positive attitude toward family planning method is higher in Imphal town (72.03%) than in Saikul sub-division (60.89%), although the difference is not statistically significantly \( (\chi^2 = 0.37, \text{d.f.} = 1, p > 0.05) \) (Table 5.21).

4. The mean number of live births is found to be similar among both adopters and non-adopters of family planning method in both the study areas (Table 5.21.1) which is a result of the higher desire number of children than their actual number by mothers of both Saikul sub-division and Imphal town as shown in Table 5.19.

5. The infant mortality as well as the child mortality rates are slightly higher among non-adopters than that of the adopters of family planning in both the study areas, although their relationships are not statistically significant (Table 5.21.2). So, family planning method is not an important factor influencing the fertility and mortality rates in the present population.

**Antenatal and post-natal care**

**ANC Characteristics**

1. The frequencies of ANC attendance, number of ANC attendance and stage of pregnancy at first ANC attendance among mothers are all significantly higher in Imphal town compared to their Saikul counterparts (Table 5.22). There are 97.58% of mothers in Imphal town and 86.18% in Saikul sub-division who were attending ANC during their pregnancies. The \( \chi^2 \) - value between the two study areas in respect of ANC attendance, number of ANC attendance and stage of pregnancy at first ANC
attendance are: $\chi^2 = 12.38$, d.f. = 1, $p < 0.005$; $\chi^2 = 90.21$, d.f. = 5, $p < 0.005$ and $\chi^2 = 24.29$, d.f. = 2, $p < 0.005$ respectively. So, mothers in Imphal town are far more advanced than their Saikul counterparts in respect of ANC characteristics.

2. Consumption of iron and folic acid tablet by mothers during pregnancy is significantly higher ($\chi^2 = 60.10$, d.f. = 1, $p < 0.005$) in Imphal town (79.03%) compared to Saikul sub-division (38.10%) (Table 5.22). Tetanus toxoid injection during pregnancy is slightly higher in Imphal town (95.97%) than in Saikul sub-division (93.58%), although the difference is not statistically significant ($\chi^2 = 0.99$, d.f. = 1, $p > 0.05$) (Table 5.22).

3. The mean number of live births per mother is significantly higher among mothers who were not attending ANC during pregnancy in both Saikul sub-division ($F = 9.679$, $p < 0.01$) and Imphal town ($F = 9.155$, $p < 0.01$) (Table 5.22.1).

4. The infant mortality rate is found to be higher among mothers who were not attending ANC in both the study areas, despite the absence of statistical relationship in Saikul sub-division (Saikul: $r = -0.05$, $p > 0.05$; Imphal: $r = -0.27$, $p < 0.01$) (Table 5.22.2). But, the relationship between the child mortality rate and ANC attendance during pregnancy is significant negative in both the study areas (Saikul: $r = -0.23$, $p < 0.01$; Imphal: $r = -0.32$, $p < 0.01$). In other words, ANC attendance is an important factor in reducing the infant and child mortality rates in the present population (Table 5.22.2).
5. Of all the variables included in the model, the coefficients of regression (B) of ANC attendance is negatively associated with maternal age \((B = -0.034 \pm 0.016)\) and positively associated with paternal education \((B = 0.066 \pm 0.023)\) (Table 5.22.3). In other words, mothers of the younger age groups are more likely to attend ANC during pregnancy, whereas higher educational level of the husbands is also related to ANC attendance during pregnancy.

6. The main reasons for not attending ANC during pregnancy are: financial burden (2.56%), far location of health centres (5.88%), did not feel necessary (5.57%) and no visit of ANM (1.23%) in Saikul sub-division whereas in Imphal town the only reason is did not feel necessary (2.42%) (Table 5.22.4).

**Mother's obstetric morbidity**

1. The overall percentage of mothers having obstetric morbidity during pregnancy in the present population is higher in Imphal town (89.52%) than in Saikul sub-division (78.33%) (Table 5.23).

2. The coefficients of regression (B) of mother's obstetric morbidity is positively associated with residence \((B = 0.132 \pm 0.058, p < 0.05)\), maternal education \((B = 0.061 \pm 0.029, p < 0.05)\) and ANC attendance \((B = 0.234 \pm 0.063, p < 0.001)\) among all the other factors included in the Model 1 (Table 5.23.1). Among these factors, ANC attendance is found to be the most important factor influencing the obstetric morbidity. However, it is not clear why obstetric morbidity is significantly higher...
among mothers who are highly educated and attended ANC during their pregnancy. But, it is also reported that mothers who attended ANC services have higher rate of obstetric morbidity due to the fact that such women are more aware of their health problems in consultation with health personnel (McDonagh, 1996).

**Mother's health problem after delivery**

1. The overall prevalence of mothers having health problems during the first week after delivery is 80.57% in Saikul sub-division and 83.74% in Imphal town (Table 5.24).

2. Of all the independent factors included in the Model 1, only residence (B = 0.143 ± 0.063, p < 0.05), maternal occupation (B = -0.050 ± 0.024, p < 0.05) and place of delivery (B = -0.177 ± 0.061, p < 0.001) are significantly associated with mother's health problem during the first week after delivery (Table 5.24.1). In Model 2, we included only those factors which are significant in Model 1 as covariates and found the same result as in Model 1. In other words, mothers who are in urban area as well as whose delivery took place at home are more vulnerable to health problems during the first week after delivery.

**Place of delivery**

1. Use of medical facilities at the time of delivery is much higher in Imphal town (58.53%) compared to their Saikul counterparts (10.54%) (Table 5.25).
2. Although place of delivery is not significantly correlated with the infant as well as child mortality rates in both the study areas, these rates are higher among mothers whose delivery took place at home rather than hospital/clinic (Table 5.25).

3. Pooling data for the infant child mortality rates, their relationship with place of delivery is statistically significant in Imphal town \((r = -0.19, p < 0.05)\), but not in Saikul sub-division \((r = -0.10, p > 0.05)\) (Table 5.25). So, place of delivery can be an important factor influencing the mortality rate in Imphal town.

**Persons conducting delivery**

1. Like in the case of place of delivery, use of health personnel during delivery is much higher in Imphal town \((81.30\%)\) than in Saikul sub-division \((14.37\%)\) (Table 5.26).

2. The relationship between the infant mortality rate and persons conducting delivery is highly significant in Imphal town \((r = -0.27, p < 0.01)\) which is not so, in Saikul sub-division (Table 5.26). But, the child mortality rate in both the study areas is significantly higher among mothers whose deliveries were conducted by elderly persons than the health personnel (Saikul: \(r = -0.14, p < 0.05\); Imphal: \(r = -0.29, p < 0.01\)) (Table 5.26).

**Mother’s additional diet during pregnancy**

1. The overall percentage of mothers having additional diet during pregnancy is very low in Saikul sub-division \((12.07\%)\) as compared to their Imphal counterparts
(57.25%). So, the F - ratio between the two areas is statistically significant ($\chi^2 = 52.56$, d.f. = 1, 0.005) as well (Table 5.27).

2. Fruit is the most common diet during pregnancy among the Khongsai Kuki mothers in both the study areas (Saikul: 10.22%, Imphal: 33.87%) (Table 5.27). Besides, fresh milk, raw egg, meat/fish and nutrients are the other additional diets.

**Mother's special diet after delivery**

1. The overall percentage of mothers taking special diet after delivery is significantly ($\chi^2 = 5.56$, d.f. = 1, p < 0.025) higher in Imphal town (86.18%) than in Saikul subdivision (58.92%) (Table 5.28).

2. The most common special diet after delivery among the Khongsai Kuki mothers is chicken and its soup (Saikul: 57.01%; Imphal: 69.92%) (Table 5.28). The other diet includes fruits, fresh milk, raw egg, beef soup and nutrients.

**Immunization and child care**

**Feeding of colostrums**

1. The frequency of mothers feeding colostrums to their children is higher than those who did not fed in both the study areas. But, comparing the two areas, feeding of colostrums is much higher in Imphal town (86.57%) as compared to their Saikul counterparts (64.78%) (Table 5.29).
2. The relationship between the infant as well as child mortality rates and feeding of colostrums is not statistically significant in both the study areas (Table 5.29). However, these rates are higher among mothers who did not fed colostrums in both the study areas, excepting the infant mortality rate in Imphal town.

**Persons consulted for diarrhoea**

1. Although, majority of mothers in both the study areas consulted doctor than that of the medicine man for treatment of diarrhoea, this frequency is slightly higher in Imphal town (83.58%) than in Saikul sub-division (73.04%) (Table 5.30).

2. The infant as well as child mortality rates are found to be higher among mothers who consulted medicine man than that of the doctor in both the study areas, although their relationships are not statistically significant (Table 5.30). However, pooling data for the infant and child mortality rates, their relationship with persons consulted for treatment of diarrhoea is highly significant in Saikul sub-division (r = 0.16, p < 0.01), although the same is not in Imphal town (r = 0.23, p > 0.05) (Table 5.30). Therefore, consulting doctor for treatment of diarrhoea can significantly decline the mortality rates in Saikul sub-division.

**Persons consulted for Pneumonia**

1. Like in the case of diarrhoea, majority of the mothers in both Saikul sub-division (76.52%) and Imphal town (82.08%) consulted doctor than that of the medicine man
for treatment of Pneumonia. Comparing the two areas, it is higher in Imphal town (Table 5.31).

2. Although, the infant as well as child mortality rates are found to be higher among mothers who consulted medicine man than to those who consulted doctor in the present population of both areas, its influence is significant only in the case of infant mortality (Saikul: \( r = 0.15, p < 0.05 \); Imphal town: \( r = 0.38, p < 0.01 \)). In other words, consulting doctor rather than medicine man can significantly reduce the infant mortality rates in both the present study areas (Table 5.31).

Immunization of the children

1. The overall percentage of immunization rate (polio, BCG, whooping cough and measles) is higher in Imphal town compared to their Saikul counterparts among both males (Saikul: 91.01%; Imphal: 95.92%) and females (Saikul: 92.02%; Imphal: 96.00%). But, the rural and urban differences are not statistically significant among both males (\( \chi^2 = 0.05, \text{d.f.} = 1, p > 0.05 \)) and females (\( \chi^2 = 0.03, \text{d.f.} = 1, p > 0.05 \)) (Table 5.32).

2. In respect of sex differences, the overall percentage of immunization rate is slightly higher among females (Saikul: 92.02%; Imphal: 96.00%) than their male counterparts (Saikul: 91.01%; Imphal: 95.92%) in both the study areas (Table 5.32).

3. Of the many independent factors, the coefficients of regression (B) of immunization of children is significantly associated with maternal education (B = 0.036 ± 0.020, p
< 0.05) and household income (B = 0.038 ± 0.018, p < 0.05). So, the overall immunization rate tends to increase as the maternal educational level and household income increases (Table 5.32.1).

Reported child morbidity

1. The overall prevalence of child morbidity (below 15 years) is slightly higher among females than their male counterparts in both the study areas. It is 34.76% among males 38.37% among females in Saikul sub-division, whereas, it is 33.81% and 36.84% respectively in Imphal town (Table 5.33). It indicates that female children are more vulnerable to illness than their male counterparts in the present population.

2. Comparing the two study areas, the overall prevalence of child morbidity is slightly higher in Saikul sub-division than in Imphal town among both males and females, although the they are not statistically significant (Males: \( \chi^2 = 0.02, \text{d.f.} = 1, p > 0.05 \); Females: \( \chi^2 = 0.04, \text{d.f.} = 1, p > 0.05 \)) (Table 5.33).

3. Of the many independent factors, the coefficients of regression (B) of the child morbidity is negatively and significantly associated with age of the children (B = -0.034 ± 0.004, p < 0.01) and maternal education (B = -0.046 ± 0.022, p < 0.05). In other words, the prevalence of child morbidity decreases as the age of children and their maternal educational level increases (Table 5.33.1).
Conclusion

According to Sundbarg’s classification of population, the present populations in both the study areas are of *progressive type*. The higher sex ratio in the post-reproductive age group compared to the preceding age groups indicates the higher average longevity in males than their female counterparts in both the study areas. The hypothesis that women who marry at an early age have on average, a longer period of exposure to pregnancy and a greater number of childbirths is confirmed by the present findings (NFHS-3) (IIPS, 2007). As reported in many human populations, the females in the present population get married earlier than their male counterparts (Khongsdier, 2005).

The demographic indicators like fertility as well as infant and child mortality rates in the present population are higher in rural area than their urban counterparts (UN, 1999; IIPS, 2007), although it is not statistically significant in the case of fertility and child mortality rates. The absence of statistical differences between the two study areas in respect of the fertility and child mortality rates including the reproductive wastage may be attributed to the similarities in ABO blood group incompatible mating types and tetanus toxoid injection during pregnancy, other than the various bio-social factors. However, the difference between Saikul sub-division and Imphal town with respect to the fertility and mortality rates may not be neglected especially with respect to the infant mortality rate which is significantly higher in Saikul sub-division. These differences are mainly due to the differences in demographic and bio-social factors such as maternal age.
and age at marriage, mean birth interval, access to health care facilities, maternal and paternal education, obstetric morbidity, etc., as presented in Chapter IV and V.

The impact of various bio-social factors on fertility and mortality rates in the present study is found to be more in Saikul sub-division than in Imphal town as seen in chapter V. It is due to the fact that mothers in Imphal town are more advanced than their Saikul counterparts in almost every aspect. For example, all mothers in Imphal town are literate which is not so in the case of Saikul sub-division. Similarly, mothers in Imphal town have a greater score with respect to ANC characteristics than their Saikul counterparts. In contrast to many other findings (Caldwell, 1979; Lee, 1979; Reddy et al, 2006 and others), family planning is not an important factor in influencing the fertility and child mortality rates in the present population of both the study areas, as most of the couples were found to adopt family planning method only after attaining their desired number of children, which incidentally is higher than their actual number of children.
Policy Implications

The Registrar General of India (RGI), 2009 reported that the infant mortality rate in Manipur has been traditionally low; and in many surveys, it has been the lowest in the country recording 1.2%. Although, the infant mortality rate in the overall Manipur is very close to the present finding in Imphal town, it is much lower than the present finding in Saikul sub-division indicating the rural and urban difference in the state. With respect to the fertility rate, the present findings in both the areas are higher than the overall Manipur, i.e., 2.8 (RGI, 2010). So, there is a need to bring down the fertility and mortality rates, especially that of the Saikul sub-division. The people, especially in rural areas should not only be aware, but should also make use of these facilities. Although, awareness of family planning method is high in both Saikul sub-division and Imphal town, very few couples were found adopting it and therefore, reliable source of family planning is essential as it directly influence the fertility rate in every population.

The introduction of NRHM in Northeast India by the year 2005 had increased the total immunization rate of Manipur as much as above 90% (MOHFW, 2011). ANM who are posted in the available sub-centres along with the help of ASHA (Accredited Social Health Activist) under supervision of NRHM are reported to visit the villages in Saikul sub-division at least once in a month. But, this alone can never be expected to bring down the mortality rate as their duty is only to give immunization to the children, although reduction in child and maternal mortality rates is one among their many objectives. So, the planners and policy makers should improve the facilities like medical, education,
transportation, etc. to reduce the fertility and mortality rates in Saikul sub-division in particular and the rural areas of Manipur in general. Further, the people joining hands with the government, NGO's and media should improve the condition of the health centres or sub-centres and make sure that doctors and nurses are available. However, a more in-depth study is suggested to find out the other possible factors that can influence the fertility and mortality of the Khongsai Kuki in Manipur, including the reasons for higher reproductive wastages besides having lower infant and child mortality rates than the other neighbouring populations.