The population of the world has been growing on a massive scale during the second half of the last century. "World population was only about 1 billion in 1800 AD and it took 130 years (1930) to add the second billion. However, it took only 30 years (1960) to add the 3rd billion, 15 years (1975) to add the 4th billion and only 12 years (1987) to add the 5th billion" (Alexander, 1994). Such population explosion has been considered as a serious problem in the world specially in the developing countries.

In terms of the global population, India is the second most populous country in the world. According to the 1991 Census, the population of India is 846.3 million. With this, India's share in the world
<table>
<thead>
<tr>
<th>Census Year</th>
<th>Total Population (in Millions)</th>
<th>Birth Rate (Per 1000 Population)</th>
<th>Death Rate (Per 1000 Population)</th>
<th>Average Annual Growth Rate (%)</th>
<th>Exponential Growth Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1901</td>
<td>238.40</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1911</td>
<td>252.09</td>
<td>5.75</td>
<td>49.2</td>
<td>48.1</td>
<td>1.04</td>
</tr>
<tr>
<td>1921</td>
<td>251.32</td>
<td>(-0.31)</td>
<td>48.1</td>
<td>46.4</td>
<td>1.04</td>
</tr>
<tr>
<td>1931</td>
<td>278.98</td>
<td>11.00</td>
<td>45.2</td>
<td>36.3</td>
<td>1.33</td>
</tr>
<tr>
<td>1941</td>
<td>318.66</td>
<td>14.22</td>
<td>45.2</td>
<td>31.2</td>
<td>1.25</td>
</tr>
<tr>
<td>1951</td>
<td>361.09</td>
<td>13.31</td>
<td>41.7</td>
<td>27.4</td>
<td>1.96</td>
</tr>
<tr>
<td>1961</td>
<td>439.23</td>
<td>21.51</td>
<td>41.2</td>
<td>22.8</td>
<td>2.20</td>
</tr>
<tr>
<td>1971</td>
<td>548.16</td>
<td>24.80</td>
<td>37.2</td>
<td>19.0</td>
<td>2.22</td>
</tr>
<tr>
<td>1981</td>
<td>683.33</td>
<td>24.66</td>
<td>15.0</td>
<td>15.0</td>
<td>2.22</td>
</tr>
<tr>
<td>1991</td>
<td>846.30</td>
<td>23.85</td>
<td>9.8</td>
<td>9.8</td>
<td>2.14</td>
</tr>
</tbody>
</table>

population increased to 16 per cent in 1991 from 15.2 per cent of 1981; and every seventh person in the world is now an Indian. In India, population growth declined from 24.66 per cent during 1971-81 to 23.85 per cent during 1981-91. Thus the annual growth rate of India's population of 2.14 per cent during the eighties is slightly less than 2.22 per cent recorded during seventies (Table V.I). As of today, India has already reached the one billion mark for her population. Thus, every year, 15.5 million children are born in this country, making it virtually impossible to provide the basic necessities of life to all.

Most of the countries of the world experienced rapid population growth after World War II, not as a result of an increase in the birth rate but as a result of decline in the death rate which is continuing to come down, while birth rates in the majority of the developing countries remain very high. Thus, fertility and mortality are considered to be the primary forces behind the population growth. Besides these two components, migration is another component which influences population growth of a country. Hence, the study of levels, trends and differentials of these components are fundamental towards rectification of population problems.

Northeast India is the homeland of numerous populations of various ethnic origins having different cultural heritages and social structures. Assam, a state in Northeast India, shows strikingly demographic diversity. Besides the disparate demographic profiles, the
levels of development also vary substantially within the state because of different factors, like, biological, socio-cultural, environmental and economic, which influence the population growth. Therefore, there should be situation-specific study at the micro-level.

With every decennial census, Assam is experiencing a higher rate of population growth than the all India average. From 1901 to 1991 year, the growth rate of Assam (581.35 per cent) is comparatively much higher than the nation (255 per cent) as a whole. According to the 1991 Census, the annual birth and death rates in Assam are higher than the all India figures. The estimated annual live birth rate, both rural and urban combined for the country, as a whole is 29.5 per cent, while, that of Assam is 30.9 per cent. In case of annual death rates, the all India figure is 9.8 per cent, while that of Assam is 11.5 per cent. Though death rate is also high, the base population is so large that it has very little impact on the population scenario. Again, the state of Assam has been experiencing the influx of population from time to time and from different directions. Thus, apart from the natural increase of population, migration is an important factor that results in higher population growth in Assam.

Moreover, within the state, during the past 90 years, the increase in urban population is 3127.80 per cent as against 520.26 per cent in the rural. Among the urban areas, Kamrup district shows the highest per cent of increase of population (5518.86 per cent). In 1901, the share of urban population of Kamrup district was only 3.35 per cent
to the total population in the district; while, at 1991, the urban population formed with 32.76 per cent.

A review of the earlier research works revealed that very little work seems to have been done so far in Assam and most of the works that have undertaken by different scholars were conducted in rural areas only. No full length studies on demography so far has been done in urban areas. The present study, therefore, has been undertaken in Guwahati city, the largest urban centre of Assam.

Guwahati was a small town before independence. But in the era of independence rapid growth and expansion took place. The influx of people from outside Assam gives a cosmopolitan character to the population of Assam. Different types of people not only live under different conditions but follow different types of cultures. Since it is the largest urban centre, it is not possible to cover the entire city within a limited period of time by a single researcher. Therefore, two linguistic groups, i.e., the Assamese and the Bengali, have been chosen for the present study. Again, there are lots of variations in terms of the way of living, economy and other basic amenities available to people. In order to have a control at least on basic amenities, the railway colony of Maligaon area, which is also the headquarters of NF railway, has been selected. In the railway colony, employees of different categories avail more or less of the same amenities provided by the railway, living under the same environmental conditions.
In this chapter, an attempt has been made to discuss the results of the analysis made in the preceding chapter. The findings of the present study have also been compared with the available data from the Northeast and the national average.

**DEMOGRAPHIC COMPOSITION**

The total population covered in the present study is 3466. The percentage of female population (50.23 per cent) is found to be slightly higher than that of the male population (49.77 per cent). However, the difference between the two groups in respect of the proportions of males and females is not statistically significant ($x^2 = 0.141$, $df = 1$, $.70 > p > .80$).

The overall sex ratio (females per 1000 males) of the present study population is 1009, which indicates excess of females over males. This ratio is much higher than the ratio for the state of Assam (923) as well as of India (927) as per 1991 Census. However, within India, Kerala state records the highest sex ratio (1036, as per 1991 Census).

The sex ratios of the Assamese (996) and the Bengalis (1024) are much higher than the ratios for the Kamrup district (879) as well as the state of Assam (923) as per 1991 Census.
TABLE V. 2: PERCENT DISTRIBUTION OF POPULATION GROUPS OF INDIA, ASSAM AND STUDY POPULATION GROUPS

<table>
<thead>
<tr>
<th>Population Group</th>
<th>Percentage Aged 0 - 14 Years</th>
<th>Percentage Aged 15 - 59 Years</th>
<th>Percentage Aged 60 + Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>India ¹</td>
<td>38.0</td>
<td>55.2</td>
<td>6.8</td>
</tr>
<tr>
<td>Assam ²</td>
<td>41.3</td>
<td>52.7</td>
<td>5.9</td>
</tr>
<tr>
<td>Total Study Group</td>
<td>34.22</td>
<td>62.35</td>
<td>3.43</td>
</tr>
<tr>
<td>Assamese</td>
<td>39.16</td>
<td>58.51</td>
<td>2.33</td>
</tr>
<tr>
<td>Bengali</td>
<td>28.31</td>
<td>66.94</td>
<td>4.75</td>
</tr>
</tbody>
</table>

Further, in the study of both the population groups, female population outnumber the male population in the age groups of 0-14 years and 15-49 years but the male population is found to be higher in the age group of 50 years and above (Table IV.2).

The higher proportion of the females in earlier age groups of 0-14 years, and 15-49 years indicates that there is reduction in gender preference and the discrimination of female child.

However, among the populations in the age of 50 years and above there is a strong preference for sons over daughters, resulting in higher male child.

The child population among the Assamese (39.16 per cent) is found to be much higher than that of the Bengalis (28.31 per cent), which indicates relatively higher fertility among the Assamese. The child population of Assam and India as a whole as reported by the NFHS (1992-93) are 41.3 per cent and 38.0 per cent respectively (Table V.2). The percentage of child population among the Assamese is lower than that of the figure of Assam; however, it is more or less the same with that of the all India average. The low percentage of child population among the Bengalis, seems akin to the developed countries, amongst whom fertility has declined in the recent past. This is because of the fact that when fertility is low, birth rates are low, the number of children born is low and the population is 'old' as seen in developed countries.
### TABLE V.3: DEPENDENCY RATIOS OF POPULATION GROUPS OF INDIA, ASSAM AND STUDY POPULATION GROUPS

<table>
<thead>
<tr>
<th>Population Group</th>
<th>YOUNG</th>
<th>OLD</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>India ¹</td>
<td>64.26</td>
<td>11.97</td>
<td>76.23</td>
</tr>
<tr>
<td>Assam ²</td>
<td>78.37</td>
<td>11.19</td>
<td>89.56</td>
</tr>
<tr>
<td>Total Study Group</td>
<td>54.88</td>
<td>5.51</td>
<td>60.39</td>
</tr>
<tr>
<td>Assamese</td>
<td>66.94</td>
<td>3.98</td>
<td>70.92</td>
</tr>
<tr>
<td>Bengali</td>
<td>42.29</td>
<td>7.09</td>
<td>49.38</td>
</tr>
</tbody>
</table>

On the other hand, the percentage of old population (60 years and above) among the Assamese is much lower (2.33 per cent) than that of the Bengalis (4.75 per cent). In both the population groups, it shows much lower proportion than that of Assam (5.9 per cent) and India (6.8 per cent) according to NFHS, 1992-93.

Dependency ratio is said to be a measure of impact of age composition on economy (Jones, 1974). It is based on the fact that every member of a society is a consumer and only some members are producers. The total dependency ratio for India (76.25) and the state of Assam (89.56) as per NFHS (1992-93) have been found to be rather higher than the total study population (60.39) (Table V.3). Among the Assamese (70.92), the ratio is much higher than among the Bengalis (49.38) ; largely because of higher young age dependency ratio among the Assamese than among the Bengalis.

To have an overall picture of the age distribution of a population, it is conventional to study population pyramid of that population, because the population pyramid provides an overall comprehension of the age structure of the population and their demographic scenario. But the population pyramids (Figures IV.1, 2, 3) of the study population groups provides an irregular pattern of age distribution. There is a decrease of population from 5-9 years age group to 0-4 years. From 5-9 years age group, population is found to decrease with the increase of age upto the age of 20-24 years, after which it again
starts increasing up to 30-34 years age group. However, after that age group, there is gradual decrease of population with the increase of age.

It is very difficult to explain this irregular pattern of age structure. This type of age structure can be found among the migrant people. The Union Territory of the Andaman and Nicobar Islands provides an apt illustration of irregular shaped population pyramid, where internal migration affect the age-sex structure of the population during British period (Bhende and Kanitkar, 1997). Though the study population is not a migrant people, here the people come to avail themselves of employment and leave the place after retirement. Moreover, since the railway campus is not the permanent place of residence, many of the employees keep their family members in their permanent place of residence. This might be one of the reasons which gives an irregular trend of age structure.

Education is a key component of development and well-being of the population. A person who can both read and write with understanding is treated as literate.

As regards literacy rate of the populations aged 7 years and above, it is found that the literacy rate of the study population (98.03 per cent) is much higher than that of Assam (52.89 per cent), Arunachal Pradesh (41.59 per cent), Meghalaya (59.89 per cent), Manipur (59.89 per cent), Tripura (60.44 per cent), Nagaland (61.65 per cent), Mizoram (82.27 per cent), Kerala (89.79 per cent) and India as a whole (52.22 per
cent) as per 1991 Census. However, 1991 Census figure of the literacy percentage in the urban areas of Assam (79.39 per cent) and India (73.1 per cent) are much higher than the rural areas (Assam, 49.32 per cent; India, 44.5 per cent). In the district of Kamrup also, literacy percentage of urban area (80.57 per cent) is much higher than the rural area (56.88 per cent); however, the percentage of urban area of Kamrup district is lower than that of the study area. The figures obtained from Census report as well as from the present study reveal that the urban area has considerably much higher level of literacy than the rural areas. Similar findings have also been reported by Chakraborty (1995) among the Jaintias of Meghalaya. The higher literacy rate in the urban areas may be due to the fact that in the urban areas there are ample opportunities and facilities of education. However, in most of the remote areas of India these are fewer and far between. So, probably the illiterate population of those remote areas contributed to the resultant literacy rate as it came to be. The present study shows the female literacy (96.45 per cent) is lower than the male literacy (99.53 per cent). The same trend is also found in the state of Assam (Male, 61.87 per cent; Female, 43.03 per cent), district of Kamrup (Male, 73.67 per cent; Female, 55.01 per cent) and India (Male, 64.13 per cent; Female, 39.29 per cent) as per 1991 Census.

The services of the Railway personnel are classified into four classes (Chapter IV). The persons who do not work in Railway but live on the campus, enjoy the same facilities, and are categorised as other workers. Non-workers or economically inactive persons comprise the
persons who are either not doing any work or pensioners or students or housewives. The present study shows that the percentage of working population (in total population) is 29.52 of which male workers (22.91 per cent) are higher than the female workers (6.61 per cent).

The percentage of working population of the study area is much lower than that of Assam (31.20 per cent) and Guwahati city (33.21 per cent) as per 1991 Census. On the other hand, the working population of Kamrup (28.71 per cent) is lower than our study population. The number of male workers exceed the female workers in both the Assamese and the Bengalis, and in Assam (Male, 48.30 per cent ; Female, 12.57 per cent) ; Kamrup (Male, 48.30 per cent ; Female, 6.40 per cent) ; and in Guwahati city (Male, 29.39 per cent ; Female, 3.82 per cent).

The present study shows that majority of the non-workers are concentrated in the age groups below 19 years and above 60 years. Among the populations of the present study, excluding the age group of 19 years and below, half of the population is found to be workers (50.24 per cent) and the remaining half is non-workers (49.75 per cent). Of these total workers 42.26 per cent are engaged in different services of the railway and the remaining 7.98 per cent are working in other services.

Further, the women workers have been found to be comparatively higher among the Assamese (23.34 per cent) than among the Bengalis (21.94 per cent), though the difference is not glaring. The same trend is also observed among male workers (Table IV.8).
FERTILITY

Inspite of being a biological phenomenon, fertility is greatly influenced by a number of demographic, economic, socio-cultural factors, as well as attitude, behaviour related to sex composition of child and family size.

One of the important physiological factors responsible for determining fertility is menarche. Prakasam (1981) stated that the age at menarche varies widely from population to population and is dependent on environmental factors, diet, racial and genetic factors.

The mean age at menarche of the present study population is $12.31 \pm 0.05$ years. The Assamese women show higher mean age at menarche ($12.37 \pm 0.07$ years) than the Bengali women ($12.26 \pm 0.07$ years). However, no statistically significant difference has been noticed between the two populations ($t = 1.10 ; 0.20 > p > 0.10$).

It is observed that the meanarcheal age of the study population ($12.31 \pm 0.05$ years) is almost similar as shown in the findings of Das and Sengupta (1980) among the Jogi girls ($12.31 \pm 0.08$ years) of Kamrup district of Assam. It is lower than the menarcheal age among the Ahom females of Assam ($12.96 \pm 0.60$ years), as studied by Gogoi (1972); the Brahmins ($12.51 \pm 0.11$ years), Kalitas ($12.61 \pm 0.14$ years), Baishyas ($12.97 \pm 0.12$ years), Kaibartas ($12.89 \pm 0.12$ years) of Assam as studied
by Das and Das (1967) ; and that of the Brahmins (12.33 ± 0.08 years), the Kalitas (12.51 ± 0.07 years) and the Ahoms (12.83 ± 0.12 years) of Assam as studied by Das (1987) ; and the menarcheal age of the Kalitas (12.4 ± 0.04 years) as studied by Kalita (1997). It is also lower than the menarcheal age of the Singphos (12.59 ± 0.15 years) of Arunachal Pradesh studied by Kar and Mahanta (1975) ; that of the Jaintias (14.5 ± 0.01 years) of Meghalaya (Chakraborty, 1995) and the Rajbanshis (14.70 ± 0.11 years) of Darjeeling District, West Bengal (Chakravarty, 1994). The menarcheal age of the present study population is higher than that of the Kalitas (12.12 ± 0.25 years) of Assam studied by Rakshit (1960), the Adis (11.45 ± 0.98 years) of Arunachal Pradesh studied by Duarah (1969) and that of the Brahmins (11.85 years), Kayasthas (12.00 years), the Kalitas (11.32 years) and the Ahoms (11.65 years) of Assam as studied by Srivastava and Goswami (1968).

It is interesting to note that in western countries, the average menarcheal age is gradually going down. In India the same trend is also observed. Today's Indian girl child is attaining puberty earlier than ever before. Just a decade ago, the age for menarche was around 12 to 14. Two decades ago, it was not unusual for the first periods to occur even at 16. But "pubertal age for girls has dipped considerably" says Kamini Rao, President of the Federation of Obstetrics and Gynaecological Society of India. Her study of 5,000 school-girls in Bangalore in 2000 indicated that girls attain puberty as early as ten years of age. Ramchandra Naik, consultant endocrinologist at the Bombay Hospital, says - "In urban India,
increased socio-economic and improved dietary standards have girls attaining critical body mass much earlier than before. In turn, triggering hormones essential for puberty. The World over, the lowest pubertal ages are in countries where diets are the heaviest". R.K. Anand, head of the department of paediatrics at Mumbai's Jaslok hospital, also cites the sedentary life styles of urban children as a reason for early puberty (Outlook, March 19, 2001).

In the present study, the menarcheal age varies from 9 to 16 years. Sarkar and Roy Choudhury (1968) observe that the average age at menarche of the Bengali Hindu girls of the city of Calcutta is going down at the rate of 5-7 days per annum.

It is worth mentioning that the data of the present study and the data collected by Rakshit (1960) and by Srivastava and Goswami (1968) represent urban populations which are lower than the mean age at menarche observed among different rural populations of Northeast India.

When the women are divided into three broad age groups, i.e., 15-34, 35-54 and 55 years and above to look into any generational change in age at menarche among the women under study, it is observed that there is no any distinct change in age at menarche from one generation to the other (Table V.4).
TABLE V. 4: AGE SPECIFIC MEAN AGE AT MENARCHE OF WOMEN IN BROAD AGE GROUPS

<table>
<thead>
<tr>
<th>Present Age group of women (in years)</th>
<th>ASSAMESE</th>
<th>BENGALI</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No of Women</td>
<td>Age at menarche</td>
<td>No of Women</td>
</tr>
<tr>
<td></td>
<td>Range</td>
<td>Mean</td>
<td>Range</td>
</tr>
<tr>
<td>15-34</td>
<td>213</td>
<td>9-16</td>
<td>12.33</td>
</tr>
<tr>
<td>35-54</td>
<td>192</td>
<td>9-16</td>
<td>12.34</td>
</tr>
<tr>
<td>55+</td>
<td>22</td>
<td>9-16</td>
<td>12.23</td>
</tr>
</tbody>
</table>

TOTAL Age at menarche

<table>
<thead>
<tr>
<th>No of Women</th>
<th>Age at menarche</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range</td>
</tr>
<tr>
<td>393</td>
<td>9-16</td>
</tr>
<tr>
<td>369</td>
<td>9-16</td>
</tr>
<tr>
<td>65</td>
<td>9-16</td>
</tr>
</tbody>
</table>
Figure V. 7: Age specific mean age at menarche of women in broad age groups.
The age at marriage of women is an important determinant of population dynamics and growth. The institution of marriage represents the socially sanctioned initiation of cohabitation and childbearing.

In the present study, the mean age at marriage of women is $20.50 \pm 0.15$ years. The overall mean age at marriage among the Assamese is $20.27 \pm 0.19$ years and that among the Bengalis is $20.75 \pm 0.23$ years. There is no statistically significant difference between the two groups ($t = 1.60, 0.20 > p > 0.10$). Though the Government of India in 1976 had fixed the minimum age at marriage of the females at 18 years, 25.27 percent of women are found to get married before that age. In Assam, the mean age at marriage of women has been found to be 21.6 years (NFHS, 1992-93) which is higher than the two population groups of the present study. However, the present findings of the two populations are more or less same with the nation as a whole (20.0) (NFHS, 1992-93) and that of the Kalitas (20.6 $\pm$ 0.14 years) of Assam studied by Kalita (1997) and that of Kerala women (20.6 years) studied by Mahadevan and Sumangala (1987). Das, et al., (1980) in their studies among five Mongoloid population groups of Assam (Ahom, Moran, Mishing, Chutiya, Deuri) find that the mean age at marriage of women varies from 17.98 years to 18.51 years, which is lower than that of the present studies. The mean age at marriage of the present study of the two populations shows higher than that of the Jaintia women (18.74 $\pm$ 0.02 years) studied by Chakraborty (1995), the Meities of Manipur (19.1 years) studied by Choudhury and Devi (1997) and that of the women of Kolar Gold Field in Karnataka state (19.3 $\pm$ 3.2 years) studied by Ramu (1988).
The rural-urban differentials for India have shown that the mean age at marriage varies from 19.3 years in rural areas to 21.5 years in urban areas (NFHS, 1992-93) and that for Assam it varies from 21.4 years in rural areas to 23 years in urban areas (NFHS, 1992-93). The mean age at marriage of the two populations is found to be higher than the rural areas but lower than the urban areas of India. However, it is found to be lower than both the rural and urban areas of Assam.

Earlier marriages might be the result of weak enforcement of the Child Marriage Restraint Act. Moreover, the age at marriage itself is influenced by such factors as, place of residence, degree of modernization and urbanization, educational characteristics, family structure, religion, caste, etc. (Agarwala, 1962; Choudhury, 1982).

While continuing as students, many men and women of marriageable age tend to postpone their marital decisions in urban areas (Ramu, 1988).

In the present study, when the women are divided into three broad age groups, i.e., 15-34, 35-54 and 55 years and above, it is observed that there is a distinct change in age at marriage from one generation to the other in both the population groups under study (Table V.5).

In the age-group of 55 years and above, the mean age at marriage is low but in the next age group of 35-54 years, the marriageable
### TABLE V. 5: AGE SPECIFIC MEAN AGE AT MARRIAGE OF WOMEN IN BROAD AGE GROUPS

<table>
<thead>
<tr>
<th>Present Age group of women (in years)</th>
<th>ASSAMESE</th>
<th>BENGALI</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No of Women</td>
<td>Age at marriage</td>
<td>No of Women</td>
</tr>
<tr>
<td></td>
<td>Range</td>
<td>Mean</td>
<td>Range</td>
</tr>
<tr>
<td>15-34</td>
<td>213</td>
<td>11-32</td>
<td>17.51</td>
</tr>
<tr>
<td>35-54</td>
<td>192</td>
<td>11-33</td>
<td>21.06</td>
</tr>
<tr>
<td>55+</td>
<td>22</td>
<td>11-33</td>
<td>17.86</td>
</tr>
<tr>
<td></td>
<td>393</td>
<td>11-32</td>
<td>20.16</td>
</tr>
<tr>
<td></td>
<td>65</td>
<td>9-37</td>
<td>18.80</td>
</tr>
</tbody>
</table>
age increases in both the population groups. This could be reasonably attributed to the economic reality as they perceive it. In relevant age group, the trend was that after completion of study, both men and women tried to engage themselves in service and wanted to settle in urban areas. Thus they delayed their marriage till a happy opportunity should arise in terms of employment. But in recent years, it is observed that they have already settled in urban areas. So, they got married immediately after getting a job. As a result, there is a decreasing trend in their age at marriage.

This syndrome is much more apparent among the Assamese under our study than the Bengalis. This might be because of the fact that while the Assamese are already settled, the Bengalis still continue to come reasons of influx, natural or otherwise.

The mean age at first delivery of the present study population is 22.37 ± 0.15 years. It is found slightly higher among the Bengalis (22.66 ± 0.22 years) than among the Assamese (22.10 ± 0.20 years). However, 't' value does not show any significant difference between the two population groups (t = 1.87, 0.10 > p > 0.05). The present findings are almost similar to those of the Kalitas (22.2 ± 0.14 years) of Assam, representing semi-urban population as studied by Kalita (1997). It is higher than that of the Jaintias (19.91 ± 0.02 years) of Meghalaya, studied by Chakraborty (1995), Bodo-Kacharis (20.6 ± 0.14 years) of Assam, studied by Kalita (1997) and that of the Ahoms (19.53 years), the Mishings (19.64 years), the Morans (19.49 years), the Chutiyas (19.02 years) and the Deuris (19.42 years) of Assam, studied by Das, et al., (1980).
The average number of conceptions to the women in the present study has been found to be 3.17. It is a little higher among the Assamese (3.32) than among the Bengalis (3.01). The findings of the present study are lower than that of the Ahoms (4.64), the Mishings (5.64), the Morans (5.74), the Chutiyas (4.58) and the Deuris (5.62) of Assam, as observed by Das, et al., (1980).

The average number of live births in the present study has been found to be 2.79 per woman. Variation between the two populations under study shows that the fertility of Assamese (2.95) is slightly higher than that of Bengalis (2.61). The higher fertility of the Assamese may be because of their relatively lower literacy and lower age at marriage than the Bengalis (Tables IV.6a and IV.10). The finding of the present study is found to be similar to that of the population of Ladakh (2.7) in Jammu and Kashmir, studied by Nag (1998), and that of Karnataka (2.8), studied by Ramu (1988). The average number of live births in both the population groups is found to be lower than various populations of Northeast India, like, the Kalitas (3.7), the Bodo-Kacharis (3.9) (Kalita, 1997) the Pati Rabhas (4.1) (Sarma, 1991), the Ahoms (4.44), the Chutiyas (4.54), the Mishings (5.34), the Morans (5.52) and the Deuris (5.54) (Das, et al., 1980) of Assam. The average number of live births is also lower than the Jaintias (4.6) studied by Chakraborty (1995) and the Khasis (3.9) of Meghalaya, studied by Baruah (1980). It is also lower than the caste Hindus (3.9), the Harijans (3.4) and the Muslims (4.5) of Karnataka (Mahadevan, 1986), and that of the national (3.6) average (SRS, 1992) and the state (3.53) average (NFHS, 1992-93).
The rural-urban differentials in the total fertility rate for India have shown that the rate varies from 3.9 in rural areas to 2.6 in urban areas (SRS, 1992) and that for Assam, it varies from 3.68 in rural areas to 2.53 in urban areas (NFHS, 1992-93). The present study also shows more or less similar results comparable to that of the urban areas of India and Assam. There are a number of studies to show that fertility in the urban areas is lower than that in the rural areas (Agarwala, 1972; Chakraborty, 1995; Nag, 1998). Increasing age at marriage and increasing literacy rate of women in urban areas might be the contributing factors in the decreasing fertility levels of urban women.

An analysis of the age-specific fertility shows that the average live births increase with the increase in age of the mothers. The difference in fertility of the women with age becomes clearer when the women are divided into three broad age groups, i.e., 15-34, 35-54 and 55 years and above (Table IV.14b). This broad division is expected to give a generational change in fertility. It is observed that there is a distinct change in fertility rate from one generation to the other in both the population groups under study. Thus younger mothers have lower fertility than those of older mothers. The same trend has also been observed by Sarma (1991), Das, et al., (1980), Chakraborty (1995) and Kalita (1997). The reason for this trend is that the women of younger age groups have experienced only a few years of married life and have not achieved desired number of children. On the other hand, the women of the older age groups have experienced comparatively longer duration of married life and thus had
the opportunity to bear a larger number of children. Moreover, most of the younger women are educated and motivated to restrict their family size due to widespread availability of modern methods of family planning and socio-economic imperatives.

**Education** is considered to be one of the most important variables affecting fertility behaviour. It is also considered to be the single most important variable accounting for a significant reduction in fertility in those countries which have already experienced fertility decline (*Coale*, 1965; *Kirk*, 1969). The present study shows a definite inverse relationship between education of couples and fertility. The literate couples have on an average lesser number of children (2.77) compared to the illiterate ones (4.67) among our study population groups. A similar inverse relationship has also been noticed in many studies, viz., *UN Mysore Population Study* (1961); *Bhowmik, et al.*, (1971); *Kesarwani* (1989); *Sarma* (1991); *Baruah* (1980); *Chakraborty* (1995); *Nag* (1998); *Kalita* (1997). Additionally, the number of children seems to decrease with the increase in the educational level of the couples. This trend is also reported by *NFHS, 1992-93* of Assam.

When the education of the husbands and the wives is considered separately, the wives' education is found to be more effective in fertility control than that of the husbands'. It might be because of the fact that the educated women are likely to postpone the age at marriage, births and hence, control their fertility. Education boosts the self-
perception of women within the home and allows them greater participation in family decision-making. Choudhury (1982) is of the opinion that education with its social and economic correlates exposes a person to a wide range of general information including attitudes favourable to birth control, knowledge and access to modern and effective means of family planning.

**Occupation** is an important variable which influences fertility in various ways. An examination of the relationship between occupational status and fertility in the present study shows that the working couples have lesser number of children (2.59) compared to the non-working couples (4.89).

As already stated, the services of the railway families among whom the present study was undertaken, are classified into four categories, viz., Class I, Class II, Class III and Class IV (*Chapter II*) by way of devoting the status and functions of various employees. It is evident from the present study that the fertility is universally correlated with the occupational categories of the couples. Couples of Class I category show the lowest fertility and that Class IV category show the highest fertility. The same trend is observed when occupation of the husbands and the wives are considered separately. Both the Assamese and the Bengalis under the present study show the same trend. Generally, it is hypothesised that the people holding high occupations like professionals, managerial services, etc., have lower fertility compared to agricultural labours and
other lower occupational categories. The studies conducted in Madras by Srinivasan (1967); differential fertility in Central India by Driver (1963); the UN Mysore Population Study (1961); the Khasi women of Meghalaya by Baruah (1980); the Rabhas of Assam by Sarma (1991); the Jaintias of Meghalaya by Chakraborty (1995); the Kalitas and the Bodo-Kacharis of Assam by Kalita (1997) have all revealed that the couples with higher occupational categories show lower fertility than the couples with lower occupational categories. In the present study also the fertility increases with the decrease of occupational status of couples. However, it is also observed that when wives are working but husbands are not working, the fertility is found to be slightly higher (av. 2.81) than those couples when husbands are working but wives are unemployed or housewives (av. 2.70) (Table IV.20a).

Female participation in occupation has often been considered as one of the means of reducing fertility. In fact, a number of studies have reported inverse relationship between fertility and female participation in various occupations (UN, 1961; Choudhury, 1984; Kasarda et al., 1986). This relationship, however, is more pronounced in the urban than in the rural areas. In the present study also, in-service employed wives show lower fertility (av. 2.20) than the unemployed wives (av. 3.00). However, service holder Bengali women show slightly lower fertility (av. 2.04) than their Assamese counterpart (av. 2.34) (Table IV.19).
**TABLE V. 6 : FERTILITY AND INFANT AND CHILD MORTALITY WITH THE INTERACTION OF WIVES' OCCUPATION AND HUSBANDS' OCCUPATION**

<table>
<thead>
<tr>
<th>Wives' Occupational Status</th>
<th>Non-Worker</th>
<th>CLASS I</th>
<th>CLASS II</th>
<th>CLASS III</th>
<th>CLASS IV</th>
<th>Other Services</th>
<th>Business</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No. of Couples</strong></td>
<td>81</td>
<td>4</td>
<td>39</td>
<td>188</td>
<td>274</td>
<td>6</td>
<td>5</td>
<td>597</td>
</tr>
<tr>
<td><strong>Live Births</strong></td>
<td>396(4.89)</td>
<td>10(2.50)</td>
<td>112(2.87)</td>
<td>451(2.40)</td>
<td>783(2.86)</td>
<td>21(3.50)</td>
<td>19(3.80)</td>
<td>1792(3.00)</td>
</tr>
<tr>
<td><strong>Mortality</strong></td>
<td>28(7.07)</td>
<td>-</td>
<td>5(4.46)</td>
<td>10(2.22)</td>
<td>15(1.29)</td>
<td>2(9.52)</td>
<td>2(10.53)</td>
<td>62(3.46)</td>
</tr>
<tr>
<td>Infants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infant Mortality</td>
<td>22(5.56)</td>
<td>-</td>
<td>3(2.68)</td>
<td>3(0.67)</td>
<td>7(0.86)</td>
<td>1(4.76)</td>
<td>2(10.53)</td>
<td>38(2.12)</td>
</tr>
<tr>
<td>Neonatal</td>
<td>3(0.76)</td>
<td>-</td>
<td>2(1.78)</td>
<td>-</td>
<td>3(0.38)</td>
<td>1(4.76)</td>
<td>2(10.53)</td>
<td>11(0.61)</td>
</tr>
<tr>
<td>Post-neonatal</td>
<td>19(4.80)</td>
<td>-</td>
<td>1(0.89)</td>
<td>3(0.67)</td>
<td>4(0.51)</td>
<td>-</td>
<td>-</td>
<td>27(1.51)</td>
</tr>
<tr>
<td>Child mortality</td>
<td>6(1.52)</td>
<td>-</td>
<td>2(1.78)</td>
<td>7(1.55)</td>
<td>8(1.02)</td>
<td>1(4.76)</td>
<td>-</td>
<td>24(1.34)</td>
</tr>
<tr>
<td><strong>No. of Couples</strong></td>
<td>83</td>
<td>19</td>
<td>44</td>
<td>15</td>
<td>3</td>
<td>41</td>
<td>13</td>
<td>218</td>
</tr>
<tr>
<td><strong>Live Births</strong></td>
<td>233(2.81)</td>
<td>34(1.79)</td>
<td>78(1.77)</td>
<td>32(2.13)</td>
<td>7(2.33)</td>
<td>76(1.85)</td>
<td>20(1.54)</td>
<td>480(2.20)</td>
</tr>
<tr>
<td><strong>Mortality</strong></td>
<td>14(6.01)</td>
<td>1(2.94)</td>
<td>1(1.28)</td>
<td>-</td>
<td>-</td>
<td>2(2.63)</td>
<td>3(15.00)</td>
<td>21(4.37)</td>
</tr>
<tr>
<td>Infant mortality</td>
<td>9(3.86)</td>
<td>1(2.94)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1(1.32)</td>
<td>1(5.00)</td>
<td>12(2.50)</td>
</tr>
<tr>
<td>Neonatal</td>
<td>3(1.29)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3(0.63)</td>
</tr>
<tr>
<td>Post-neonatal</td>
<td>6(2.58)</td>
<td>1(2.94)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1(1.32)</td>
<td>1(5.00)</td>
<td>9(1.87)</td>
</tr>
<tr>
<td>Child mortality</td>
<td>5(2.15)</td>
<td>-</td>
<td>1(1.28)</td>
<td>-</td>
<td>-</td>
<td>1(1.32)</td>
<td>2(10.00)</td>
<td>9(1.87)</td>
</tr>
</tbody>
</table>

Percentages are shown in brackets.
The inverse relationship between fertility and female participation in the occupation might be due to the fact that work outside the home delays the age at marriage and a working wife, being an earning member of the family, improves her status and finds greater opportunity to participate in family decision-making; it also improves husband-wife communication. Moreover, working women by attaining economic independence do not require to depend on their children as an old age economic security.

The age at last birth is another important determinant of overall fertility levels. In the present study, the mean age at last delivery of the women who have attained menopause is $29.47 \pm 0.34$ years. Among the Assamese ($29.37 \pm 0.53$ years), it is lower in comparison with the Bengalis ($29.54 \pm 0.45$ years). However, there is no statistically significant difference between the two populations ($t = 0.25, p > 0.10$). The present finding is found to be lower than that of the Kalita women ($32.5 \pm 0.44$ years) and the Bodo-Kachari women ($31.6 \pm 0.53$ years) of Assam, as observed by Kalita (1997); Jaintia women ($35.13 \pm 0.06$ years) by Chakraborty (1995); and of the Rabha women ($37.77$ years) of Kamrup district of Assam, observed by Sarma (1991).

Menopause, the lack of menstrual period, is another important factor that affect the fertility. The mean age at menopause of the present population is $44.92 \pm 0.25$ years. The Assamese ($45.13 \pm 0.40$ years) show higher mean age at menopause than the Bengalis.
(44.78 ± 0.32 years). However, the difference is statistically insignificant ($t = 0.68; p > 0.10$). The mean age at menopause of the two populations is found to be lower than that of the Ahoms (48.44 ± 0.52 years) (Gogoi, 1972) and the Kalitas (46.9 ± 0.20 years) and the Bodo-Kacharis (46.8 ± 0.20 years) of Assam (Kalita, 1997). The menopausal age of the Assamese women is similar to that of the Pati Rabhas (45.42 ± 0.30 years) of Assam (Sarma, 1991); the Jaintias (45.53 ± 0.04 years) of Meghalaya (Chakraborty, 1995). On the other hand, the mean age at menopause of the Bengali women is lower than the Pati Rabhas of Assam and the Jaintias of Meghalaya but more or less similar to that of the Meiteis (44.95 years) of Manipur (Choudhury and Devi, 1997).

The variation in the age at menopause among different populations could be due to variation in environmental, nutritions and genetic factors (Bhende and Kanitkar, 1982). However, menopausal age appears to be somewhat later in urban than in rural areas as observed in NFHS (1992-93).

The interval between mean age at last birth and the age at menopause among the Assamese (15.76 years) is found to be somewhat higher than in the case of the Bengalis (15.24 years). In both the population groups, it is found to be higher than that of the Jaintias (10.4 years) of Meghalaya (Chakraborty, 1995), the Kalitas (11.9 years) and the Bodo-Kacharis (11.2 years) of Assam (Kalita, 1997). This high interval indicates the adoption of family planning measures.
The **completed fertility** is a good indicator to understand the fertility level of a population (*Thompson and Lewis*, 1980). In the present study, the average number of live births in completed families is 3.96 per woman. Variation between the two population groups shows that the fertility in completed families among the Assamese (4.33) is slightly higher than the Bengalis (3.70). The average number of live births of the two populations is found to be lower than that of the Kalitas (5.9) and the Bodo-Kacharis (7.5) (*Kalita*, 1997); the Rabhas (6.97) of Assam (*Sarma*, 1991), and the Jaintias (7.41) of Meghalaya (*Chakraborty*, 1995). The much lower fertility of the two groups under the present study than the above mentioned population groups clearly reflects the rural-urban difference in fertility. The lower average number of live births in completed families of the Bengalis than the Assamese in the present study indicates that the use of family planning measures is much higher among the Bengalis. The literacy level and the age at marriage of the Bengalis is also higher than the Assamese.

**FAMILY PLANNING AND CULTURAL VALUES RELATED TO FERTILITY**

Family planning appears to be one of the important aspects which helps to reduce the population growth through promotion of fertility limitation.

It has been observed from the present study that the **knowledge** of family planning methods is nearly universal in a study area,
since 97.55 per cent of women reported to have knowledge of atleast one method of family planning (Table IV.21). Among the Assamese, it is 97.41 per cent and 97.69 per cent among the Bengalis. NFHS (1992-93) also reported that in Assam, 97.5 per cent of women have knowledge of atleast one method of family planning.

In terms of methods, sterilization is the most commonly known method, being 79.76 per cent among the Assamese women and 93.85 per cent among the Bengali women. The knowledge of certain traditional methods of contraception, as periodic abstinence and withdrawal, also appear to be widely known (71.90 per cent). NFHS (1992-93) also observed similar types of findings in Assam.

The main source of knowledge of family planning methods in the study area is found to be the mass media, mainly, television, radio and newspaper. According to NFHS (1992-93) report, the electronic media play only a limited role in reaching potential users of family planning in Assam.

Among the study population groups, 67.17 per cent of women are found to adopt various family planning methods. A higher proportion of Bengali women (68.24 per cent) than the Assamese women (66.18 per cent) adopt various family planning methods. Though the difference is not so high, it is perhaps due to higher percentage of literacy among the Bengali women than the Assamese women (Table IV.6a) for which most
of the Bengali women are aware of the different types of family planning devices. Agarwala (1972) has reported that the rate of adoption of family planning has been generally more among the urban dwellers than their rural counterparts. The percentage of the couples adopting family planning measures in both the population groups of the present study is found to be much higher than that of the urban dwellers (26.69 per cent) in the city of Calcutta (Piplai, et al., 1990), the Pati Rabhas (36.70 per cent, Sarma, 1991), and the Bodo-Kacharis (54.7 per cent, Kalita, 1997) of Kamrup District, Assam and the Jaintias (22.46 per cent) of Meghalaya, (Chakraborty, 1995) and the state of Assam (43 per cent) according to NFHS (1992-93) report. However, it is lower than that of the Kalita women (77 per cent) of Kamrup District, Assam (Kalita, 1997).

Among the adopters, in the study population groups, the highest percentage of women are found to have been sterilised (35.21 per cent). The percentage of sterilisation is found higher among the Bengali women (36.54 per cent) that in the case of the Assamese women (33.94 per cent). According to Mahadevan and Sumangala (1987) tubectomy (female sterilisation) has been reported to be the single most popular method both in Kerala and Andhra Pradesh. Similar types of findings are also observed by Sarma (1991), NFHS (1992-93), Rao et al., (1993) Chakraborty (1995) and Kalita (1997). It is interesting to note that there is not a single case of male sterilisation among the study population groups. However, uses of traditional methods, like abstinence and withdrawal methods, are higher among the Assamese (35.40 per cent)
than among the Bengalis (33.07 per cent). NFHS (1992-93) has also been reported that traditional methods are more popular in Assam (54 per cent). Uses of other modern methods, oral pill, copper-T and condom are understood to be fewer by far.

The world over, women have been more responsive to population control than men. In India also women have taken the initiative. In Assam, 12 per cent of women have undergone sterilisation as against 2.5 per cent vasectomies (NFHS, 1992-93). The country's family planning administrators have noted typically Indian social factors for this difference. For instance, if the sterilised woman bears a child, she does not have to face social stigma. Their husbands easily accept that the tubectomy was not properly done. But if the wife delivers a baby after the husband has undergone vasectomy, she is often accused of having a illegitimate child. The husband refuses to believe that his vasectomy could go wrong (The Telegraph, 10 April 1998).

The largest proportion of women, in both the population groups stated that they use family planning methods for limiting the family size. The incidence of higher percentage of female sterilisation among the study population groups may be due to the fact that they consider it to be the most effective method to control further child birth and they get cash incentive for undergoing sterilisation. Temporary family planning methods are, however, believed to be unreliable, troublesome and inconvenient.
Many scholars have observed a strong preference for sons over daughters (Arnold, 1996; 1997; UN, 1985; Williamson, 1976). Studies in India have identified three major factors that underlie son preference. One is the economic utility of sons. Sons are more likely than daughters to earn wages and support their parents during old age. Another important advantage of having sons is their socio-cultural utility. In the context of India's patrilineal and patriarchal family system, having one son is imperative for the continuation of the family line. Finally, the utility of having sons arises from the important religious functions that only sons can perform. According to the Hindu tradition, sons are needed to kindle the funeral pyre of their deceased parents and to help in the salvation of their souls.

Although a daughter provides help in housework before marriage, she is considered to be an economic liability to her parents mainly because of the heavy dowry payment demanded by the groom's family (Kishor, 1995). Assamese society is, however, generally free from the system of obligatory dowry payment. According to the Hindu tradition there is an important reason for having a daughter; her parents can earn religious merit by giving her away in marriage (Kanyadaan).

In the present study, a higher proportion of women (49.21 per cent) states that the sex of the child does not matter. Among the Bengalis 51 per cent of the women have no gender preference as against 47.54 per cent of the Assamese women. A preference for sons (28.17 per
cent) over daughters (23.61 per cent) is found in the present study. The desire for a son is more prevalent among the Assamese (28.81 per cent) than among the Bengalis (27.50 per cent). This difference between the two population groups may be because the Assamese women, although educated, still preserve deeply rooted cultural traditions which influence their attitudes and behaviour pattern of preference for sons. NFHS (1992-93) also reported a preference for sons (57 per cent) over daughters (15.2 per cent). The desire for a son is more prevalent among rural women (58 per cent) than among urban women (48.5 per cent) of Assam. However, son preference is comparatively weak but it is still substantial in Assam (Mutharayappa et al., 1997). Reddy (1986) found that the prevalence of son preference was very high and strong among the slum dwellers in comparison to the non-slum dwellers of urban areas. Preference for daughters in the present study may be to earn religious merit by giving her away in marriage (Kanyadaan) or to provide for companionship as sister to a lonely brother. There may be also a desire to have children of both sexes. On the other hand, to continue the lineage many of the women prefer at least one son in the family.

The present study shows that a major proportion of women (41.48 per cent) desire to have three children in an ideal family. However, a higher proportion of the Bengali women (36.50 per cent) desire two children as against generally three children by the Assamese women (49.41 per cent). It has been observed that the infant and child mortality rate among the Assamese (39.94) is higher than among the Bengalis
Therefore, due to higher mortality rate, the Assamese may feel that they should have more children in order to make sure of having a few grown up children.

It is also observed that among the population groups, only 40 per cent of women have attained their desired number of children. 25.28 per cent of them have less than their desired number of children. On the other hand, a higher percentage of women (34.72 per cent) are found to have more than their desired number of children. Majority of the young and middle aged mothers of age groups 15-29 years (41.38 per cent) and 30-44 years (25.53 per cent) have less than their desired number of children, as they are yet to complete their reproductive period. Of the women having the desired number of children, the majority is in the age group of 30-44 years (51.26 per cent) and the majority of the women with more than desired number of children is found in the higher age group of 45+ years (59.22 per cent).

The percentage of women having more than their desired number of children is found to be much higher among the Assamese (41.18 per cent) than among the Bengalis (27.69 per cent). One of the major causes of having more than desired number of children among the study population groups is the accidental birth (37.10 per cent) (Table IV.27). Among the Assamese, accidental birth (37.71 per cent) is the main cause of having more than the desired number of children. As already found, higher percentage of the Assamese women follow traditional methods to
restrict family size, with the result that accidentally they might give birth to more children. However, higher percentage of the Bengali women (37.96 per cent) did not use any family planning device and, as a result, they had more than the desired number of children. Few women go on producing children with the hope of being blessed with sons or daughters. The women, aged 45 years and above, have more than their desired number of children because they did not use any family planning method. However, the women, in the age groups of 15-29 years and 30-44 years, have more children due to accidental birth.

Women having the desired number of children and less than desired number of children are found to be higher among the Bengalis than among the Assamese. The main cause of having less than desired number of children in both the population groups is found to be incomplete family (Table IV.27). Majority of the young and middle aged women of age groups 15-29 years and 30-44 years have less than desired number of children, as they are yet to be achieve their desired number of children. The main cause of having less than desired number of children of older women above the age of 45 years, is the mortality of the children or reproductive wastage.

**MORTALITY**

Mortality, especially the infant mortality rate, has been recognized as one of the indicators of the state of socio-economic
development of a country. The determinants of infant and child mortality vary across different geographical and cultural groups as well as in the developed and developing countries (Mahadevan, 1986). Differences in mortality rates have also been observed among the different states in India. It has been observed in the present study that out of the total 2272 live births, 83 are infant and child deaths, mortality rate being 36.53.

An examination of the infant and child mortality in both the population groups of our study reveals that infant mortality rate is much higher than the child mortality rate (Table IV.29a).

The infant mortality rate among the Assamese (20.77) is found to be lower than that of the Bengalis (23.53). The infant mortality rates for the total study population as well as for the Assamese and the Bengalis are much lower, when compared with the national average (72) and the state (Assam) average (75). The infant mortality rate is always higher in rural than in urban areas at the national level (78 and 46 respectively - SRB, 1998); a similar picture obtains in Assam (79 and 37 respectively - SRB, 1998).

It is a universal phenomenon that mortality is higher in the rural areas compared to the urban areas (Mahadevan, 1986). This difference may be because of the fact that urban residents are relatively better off than their counterparts in rural areas in terms of their economic conditions as well as access to medical and educational facilities. Public
health services and facilities are concentrated in urban areas and a higher proportion of urban people with higher education and higher income can readily avail themselves of such medical facilities. On the other hand, in rural areas we usually find a higher concentration of traditional beliefs. Rahman et al., (1993) stated mortality was found to be higher rural regions than in the urban areas, because of the difference in standard of living, health condition and availability of or access to public health facilities.

The present study area, which is the headquarters of NF Railway, has a Central Hospital where all the people of the Railway can avail, themselves of medical facilities free of cost. There are altogether 40 doctors, including specialists, and about 317 beds in the NF Railway Hospital. It has eight departments: Medicine, Surgery, ENT, Eye, Pathology, Orthopaedics, Gynaecology and Obstetrics and Family Welfare. It has also ICU (Intensive Care Unit) and outdoor department.

Therefore, due largely to the availability of a modern well-equipped hospital within the study area and higher literacy level among the population groups, the present study populations show comparatively lower infant mortality.

The infant mortality rate is based on deaths up to one year of age and it can be divided into neonatal mortality (0-28 days) and post-neonatal mortality (29 days-12 months). The factors which affect neonatal deaths are primarily endogenous, that is, the age of mothers,
birth order, prematurity, weight at birth, multiple births, etc. But post-
neonatal deaths are mainly due to exogenous factors, namely, epidemics
caused by communicable diseases, such as, diarrhoea, enterities,
bronchities, pneumonia, faulty feeding pattern, poor hygiene, insanitary
surroundings, etc. (Bhende and Kanitkar, 1997).

It has been observed in the present study that among the
study populations, infant deaths during the post neonatal period is slightly
higher than that in the neonatal period (Table IV.29a). The NFHS (1992-
93) has registered post-neonatal mortality rate of 29.9 for India and 37.8
for Assam. In contrast with these estimates, the present study population
groups has shown relatively low post-neonatal mortality rate (Assamese-
12.78 ; Bengalis, 19.61). Kalita (1997) also found higher post-neonatal
mortality than the neonatal mortality in the Kalita village which is a semi-
urban in character.

As pointed out earlier in the relevant place, the mean age at
marriage of the study population group is comparatively higher which
results in delay in childbearing among the women. Mortality, particularly
neonatal mortality, is higher among children of very young mothers (Choe
et al., 1999). Higher literacy rate, higher age at marriage and availability
of modern hospital facilites in the study area may be some of the causes
for lower neonatal mortality among the population groups. However,
female participation in the various occupations might be the cause of
higher post-neonatal mortality among the study populations. Working
women cannot give proper care to their children. Their infants cannot receive adequate breast milk from their mothers and they are given supplementary food. The supplementary food given to the children is neither sufficient in quantity nor nutritive enough in relation to the requirement of the children (Visaria, 1988). Moreover, the working mothers while going out, have to depend on mid-wives to look after the child. These mid-wives while giving food to the child often enough do not maintain proper hygiene care.

**Sex differences** in infant mortality are a good indicator of the value system and the social customs relating to the care of babies. Biologically, male infants, especially in the neonatal period, are at a higher risk of death than female infants. Several studies in India have shown that except for the early period of infancy, female mortality in childhood exceeds male mortality (Arora, 1980). In India, male mortality is 14 per cent higher than female mortality during the neonatal period because of biological factors.

While, post-neonatal mortality is 19 per cent higher for girls than for boys, it is most likely that parents in India take better care of their sons than they do in relation to daughters (Choe et al., 1999). However, the present study reveals a different picture. It is observed that there is higher neonatal mortality among females and higher post-neonatal mortality among males (Table IV.29b). This may be because of the fact that due to the availability of the well-equipped modern hospital within the study area, almost all the deliveries take place in the Railway Hospital.
As a result, the biological factors which relate to mortality of the children, especially the male infants during neonatal period are minimised. Ramanujam (1988) also observed higher female neonatal mortality among the Hindu Kongo Vellalas and among the Muslins in a rural area of Tamil Nadu.

The available literature provides enough evidence that infant mortality is associated with order of births. The first order births experiences higher infant mortality rates. The mortality rate declines for second, third and fourth order births and again increases for the fifth and higher order births. In general, infant mortality rates described as U-shaped or reversed J-shaped curve in relation to birth order (Omran and Standley, 1976).

Various investigators (Agarwala, 1972; Srinivasan et al., 1979; Khan, 1988; Kalita, 1997; Deka, 1991; Sarma, 1991; Choe, 1999) reported very high infant mortality in the first birth order. Sathar (1985) noted that first order children face the highest risk of death both through infancy and childhood. He is also of the opinion that although the second child also faces a high risk, it is less than that for the first child, and subsequent children face roughly equivalent chances of survival till about the fifth child where risk increases again. The present study also shows that infant mortality is higher in the first order births and higher order births. Among the Bengalis, the infant mortality is the highest in the first birth order, then it decreases gradually with the increase of birth order but it increases again in the fifth birth order. However, among the
Assamese, the lowest infant mortality is observed at the first birth order (0.94 per cent) and the highest percentage of mortality at the eight birth order (16.66 per cent) (Table IV.30). This finding is found to be similar to the findings of Chakraborty, (1995).

The higher mortality for the first birth order may be due to the lack of adequate experience in child care. When experience is gained mothers are possibly able to avert mortality for the second born. However, increasing deaths after the sixth birth order could be due to deteriorating health of the mother. But if mother's age at first childbirth increases, infant mortality decreases. This may be one of the reasons for lower infant mortality at the first birth order among the Assamese, where mean age at first delivery is higher compared to the average Indian women.

As regards the child mortality rate, the present study shows that the mortality of children below 5 years of age is much higher than that of the children of 5-9 years and 10-14 years of age (Table IV.29a). Though the child mortality rate among the Assamese (19.17) is found to be higher than that of the Bengalis (8.82), yet it is much lower than that of the Assam (59.0) as a whole (NFHS, 1992-93). The preservation of traditional attitudes towards health, personal hygiene and child care habits among the Assamese might be the reason of higher child mortality rate among the Assamese than that of the Bengalis.

The present study reveals that infant and child mortality is found to be relatively higher among the mothers of the age of 45 years
and above. However, the Assamese women in the age group of 25-29 years show a higher percentage of mortality (Table IV.28). It may be due to the fact that younger mothers, being inexperienced may not be able to take proper care of the infants. *Hobcraft, et al.,* (1984) stated that children born to very young or to very old mothers experience more mortality compared to those born to mothers in the intermediate age groups. *Mahadevan* (1979) found relatively higher infant mortality among the middle aged and elderly women of caste Hindus, as seen in the present study. *Ruzicka and Kane* (1987) are of the opinion that the increased risk of infant death among the old mothers may be due to maternal depletion syndrome such as undernourishment, anaemia and general weakness associated with the biological demands of excessive reproduction. However, *Ahmad et al.,* (1991) reported that older maternal age had tended to lower risk of child death. This may be because of the fact that with the increase in maternal age, mothers become more experienced in taking care of their children. *Talwar* (1988) found that the risk of infant mortality increases among early or late childbearing women in rural Madhya Pradesh. The higher infant and child mortality among the older women in the present study may be because of the fact that they are least educated an as such ignorant about the proper health care of infant and children.

The infant and child mortality among the Assamese (3.99 per cent) is found to be higher than that of Bengalis (3.23 per cent). Though the difference is not so high, the possible reason may be that the
Bengali women of our study area have been found to be more educated than the Assamese women (Table IV.6a); and most of the Assamese women, though educated, may still preserve their traditional attitudes towards health, personal hygiene, child care habits and most importantly, the concept of illness and the way to cure it. On the other hand, being relatively better educated, Bengali women may be more aware of the health services available and are likely to be more receptive to modern medicine.

In general, in the developing countries, mortality is caused by communicable diseases, parasitic infestation diarrhoeal and respiratory diseases; whereas in the developed countries, accidents and congenital malformations assume greater importance (Mahadevan, 1986). Of course, several infections could be prevented by using appropriate immunisation and preventive measures with the help of modern technology (Chen, 1983).

In the present study, fever and cough, diarrhoea and respiratory infection are found to be some of the major causes of infant and child deaths (Table IV.31). Among the Assamese fever and cough appear to be main cause of infant and child death. Chakraborty (1995) also found the same result among the Jaintias of Meghalaya. However, among the Bengalis, majority of the infant and child deaths occurred due to diarrhoea, along with fever and cough, followed by respiratory infection. Deka (1991) and Kalita (1997) reported diarrhoeal disease as the most common cause of infant death. Kalita (1997) also found
respiratory problem as one of the major causes of deaths among the Kalitas and the Bodo-Kacharis. Central Bureau of Health Intelligence (1991) reported that in India, the two major causes of death among infants and children are acute respiratory infection and diarrhoea. Deaths from acute diarrhoea are most often due to dehydration that results from loss of water and electrolytes (Black, 1984).

Several studies have shown that there is a close relationship between the infant and child mortality rates and the fertility rates (Wyon and Gordon, 1971; Mahadevan, 1985; Nayar, 1986; Agarwala, 1975; Kulkarni, 1975). High child mortality induces couples to have more children than they actually desire in the hope of having the desired number of children alive. By achieving a drastic reduction in infant mortality, a fall in fertility rate has been possible in Kerale (Nayar, 1986). The present study shows the highest percentage of mortality among the women with 10 live births (Table IV.33). The study also indicates a trend of increasing deaths with an increase in the number of live births in both the communities. Reddy (1986) and Kalita (1997) have observed a strong positive relationship of mortality of infants and children with fertility. Srinivasan, et al., (1979), however, stated that the association between fertility and infant mortality cannot be predicted with certainty for developing countries.

Rapid diffusion of higher education and particularly education of women lead to a rapid decline in the mortality level.
According to Caldwell (1979) and Caldwell et al., (1983) education enhances a mother's ability to provide adequate child care by changing their traditional attitudes, beliefs as well as her role in family decision-making about proper allocation of resources basically, food. In the present study, percentage of infant and child mortality to the illiterate couples are found to be comparatively much higher than that of the educated couples (Table IV.34a).

The same trend is observed when educational status of husbands and wives are considered separately. However, education of the wives is more relevant than the education of the husbands to lower the mortality level. The present finding is in agreement with the findings of Sarma (1991), Chakraborty (1995) and Kalita (1997).

The present study also shows that the infant as also child mortality is found to decrease with the increase in educational status of the parents. However, it is interesting to note that at the highest educational level (graduate and above), the infant and child mortality is found to be comparatively higher in both the population groups. This may be due to the fact that as the age at marriage increases with education, they are exposed to a higher risk of mortality.

Various scholars have shown the effect of education on mortality through its effect on age at marriage. Educated girls tend to get married at a later age, some of them late enough to help reduce the total number of children they eventually bear (UN, 1961; Hussain 1970a).
Khan et al., (1986) has pointed out that the education of the mother has a strong bearing on infant mortality. A number of studies have found inverse relationship between education of women and infant and child mortality (NFHS, 1992-93; Mahadevan, 1985; Bhende and Kanitkar, 1982; Bharati et al., 1990; Choe et al., 1999). Sathar (1985) stated that education of mothers seems to be a critical factor in their ability to avail themselves of health facilities, food and other means of saving the lives of their children.

Another usually important determinant of infant and child mortality is the occupation of the mother. Gubhaju (1991) found that working mothers experienced higher infant and child mortality than those who do not work because children of working mothers are deprived of adequate care. A similar result was found in India as a whole, where working mothers have higher infant and child mortality than mothers who are not employed (Kishor et al., 1998). The present study also shows that in both the population groups employed women show higher mortality rate than the unemployed women (Table IV.36a). Research in India suggests that women's employment may have at least one disadvantage: the survival of young children appears to be negatively affected if women work (Basu and Basu, 1991; Kishor, 1992). However, not all types of employment have an equally negative effect on infant and child survival. Children born to rural women working in agriculture experienced lower infant mortality than those women working in other activities, presumably because agriculture tends to be seasonal and permits flexibility in work.
The amount of time that mothers spend on child care - ranging from holding children to breast feeding, preparing meals and feeding children - is an important factor in the health and survival of children (Miller, 1981).

The present study also shows that the effects on infant and child mortality may vary with the interaction of wife's employment status and husband's employment status (Table V.4). As already stated, the railway services in the present study area are classified into four categories (Chapter II). It is observed in the present study of population groups that the working couples (2.83 per cent) show lower mortality than the non-working couples (7.07 per cent). It may be due to the fact that working women are better educated and exposed to modern facilities more than the non-working women. So, it is quite expected that working women have lower infant and child mortality. However, when wives are working but husbands are not working, the mortality becomes higher (6.01 per cent), especially the post-neonatal (2.58 per cent) and the child mortality (2.15 per cent). Again, when husbands are working but wives are not working, the mortality becomes lower (2.44 per cent). Hence, it is seen that occupational status of the women has a greater effect on mortality than the husband's employment status. In a study conducted by the UN (1985), child mortality seemed to vary by father's occupation.

In the present study, among the Assamese, the highest percentage (20.57 per cent) of pregnancy wastage is found among the women of age group 40-44 years whereas among the Bengalis, the highest
percentage (24.71 per cent) is found among the women of 35-39 years of age. The lowest percentage of pregnancy wastage (5.88 per cent) is found among the Assamese women of 60-64 years of age against the Bengali women (7.25 per cent) of the age group of 65-69 years (Table IV.32). However, no regular trend of increase or decrease of pregnancy wastage with the increase of age could be observed in both the population groups, as observed by Kalita (1997) among the Bodo-Kachari and the Kalita women. This finding is more or less similar to that of Murthy et al., (1989) who reported higher incidence of pregnancy wastage in women below 25 years of age. Ram (1989) stated that among the Kashmiri Pandit women, the mothers of lower age groups had higher reproductive wastage than the mothers of higher age groups. However, Gandhi (1989) showed that the average pregnancy wastage among the Maheswaris was more in the older women than in the middle aged and young women. Buzarbaruah and Phookan (1986) have reported that pregnancy wastage is high among the younger and older mothers while it is found to be low among the middle aged mothers. It is also observed that of the pregnancy wastage, abortion is comparatively very high among the present study population groups than still birth. Among the Assamese, the spontaneous abortion (7.74 per cent) is very much higher than the induced abortion (2.2 per cent) ; and the highest percentage of abortion is recorded by the women in the age group of 70 years and above (16.67 per cent). On the other hand, among the Bengalis, induced abortion is comparatively higher (6.24 per cent) than the spontaneous abortion (5.99 per cent) ; and the women in the age group of 35-39 years shows the highest percentage of abortion
(19.54 per cent). Thus, it indicates that the higher percentage of pregnancy wastage in the middle age groups is probably due to induced abortion. It has been observed that generally educated women now-a-days opt for a small family.