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MAY 1971—APRIL 1972

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## PREFACE

**The International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) is an autonomous, international, philanthropic and non-profit centre for research, education and training as well as clinical service. The Centre is derived from the Cholera Research Laboratory (CRL). The activities of the institution are to undertake and promote study, research and dissemination of knowledge in diarrhoeal diseases and directly related subjects of nutrition and fertility with a view to develop improved methods of health care and for the prevention and control of diarrhoeal diseases and improvement of public health programmes with special relevance to developing countries. ICDDR,B issues annual report, working paper, scientific report, special publication, monograph, thesis and dissertation, and newsletter which demonstrate the type of research activity currently in progress at ICDDR,B. The views expressed in these papers are those of authors and do not necessarily represent views of International Centre for Diarrhoeal Disease Research, Bangladesh. They should not be quoted without the permission of the authors.**

# ABSTRACT

Children under 14 and adults over 60 comprise 48 and 4.4 percent respectively of the total population. The CBR was 44.6 per 1000 population. The CDR was 20.6 per 1000 population (the highest since 1966). These rates resulted into a crude rate of natural increase of 2.4 percent. The reasons for very high mortality may be primarily attributed to the war of liberation. The in-and out-migration rates were 29.5 and 30.6 per 1000 population respectively. The net balance of migration was 1.1 per 1000 population.

Overall, 146.8 per 1000 of infants died before reaching the age of one year. The excess female mortality is evident in the 1-4 year age group. There was a sharp fall of mortality in pre-school children. From age 10 the death rates rise slowly with mortality of females exceeding that for males up to the age of 30-34 years. From the ages of 35-59, the male mortality exceeded those for females. Slightly more than 41 percent of deaths occurred during the four-month period of September to December. One-fourth of all deaths were attributed to unknown causes or *tākuriā* (evil spirits). Most of these deaths occurred amongst infants aged less than one year. Gastrointestinal diseases other than cholera and fever were important causes of death. For both sexes the expectation of life at birth was 42.1 years. This figure represent a drop in life expectancy of almost 10 years from the 1970-71 period which reflects the effects of the on-going war of liberation.

The sex ratio at birth was 104.1 males per 1000 females. One stillbirth occurred for every 26.4 live births. Slightly over 21 pregnancies occurred for every miscarriage. There was a marked decline in fertility among women aged 40-49 years. The gross reproduction rate was 3.1, the net reproduction rate was 2.0 and the mean length of generation was 27.1 years.

## INTRODUCTION

Since 1963, the International Centre for Diarrhoeal Disease Research, Bangladesh (former the Cholera Research Laboratory) has been maintaining a continuous registration of births, deaths and migrations in Matlab thana, Comilla District as part of a cholera vaccine trial surveillance. In 1966, this demographic surveillance system was enlarged and a census was conducted covering 132 villages with a population of 111,748, called the "old trial area (OTA)". In 1968, the vaccine trial surveillance area was further expanded to include an additional 101 villages with a population of 109,055 people, called the "new trial area (NTA)". Both OTA and NTA villages are included in the following analysis. Annual data for the period covering May 1966 to April 1971 were presented in earlier publications (Mosley *et al.* 1968; Chowdhury *et al.* 1969, 1970; Chowdhury *et al.* 1981a and 1981b). In this paper, a descriptive analysis of the demographic data is provided for the period May 1971 to April 1972. A general description of the study area and the surveillance system have been provided in the initial annual report (Mosley *et al.* 1968).

## RESULTS

There were 111,748 persons in the 132 villages at the time of the census in April 1966 and 109,055 persons in the 101 villages at the time of the census in April-May 1968. As illustrated in Table 1, the population reached 246,423 in 233 villages by the middle of 1971-72. This adjusted mid-year population for 1971-72 has been obtained by adding the live-births and in-migrants to the 1970-71 base population and by subtracting the deaths and out-migrants, with an adjustment made for age (see Appendix A).

Table 2 provides a summary of the total live births, deaths and migrations for the period May 1971 to April 1972. The crude birth rate (CBR) was 44.6 per 1000 representing a slight increase from that of the preceeding year (43.3 per 1000). In conjunction with a crude death rate (CDR) of 20.6 per 1000 (the highest since 1966), the result was a crude rate of natural increase of 2.4 percent. The reason for this higher figure may be attributed primarily to the war of liberation and secondarily to the attendant problems of non-availability of food and inadequate transportation. The in-and out-migration rates were 29.5 and 30.6 per 1000, respectively, resulting in an overall net out-migration rate of 1.1 per 1000 population.

## MORTALITY

The classification of 1614 neonatal and post-neonatal deaths recorded

TABLE 1

ADJUSTED MID-YEAR POPULATION BY AGE AND SEX, MAY 1971 - APRIL 1972

| Age        | Male   | Female | Total  | Sex ratio | Cumulative percent |        |       |
|------------|--------|--------|--------|-----------|--------------------|--------|-------|
|            |        |        |        |           | Male               | Female | Total |
| <1         | 4906   | 4773   | 9679   | 102.8     | 3.9                | 3.9    | 3.9   |
| 1-4        | 15754  | 14807  | 30561  | 106.4     | 16.4               | 16.2   | 16.3  |
| 5-9        | 20312  | 19539  | 39851  | 103.9     | 32.6               | 32.4   | 32.5  |
| 10-14      | 20112  | 18105  | 38217  | 111.1     | 48.6               | 47.4   | 48.0  |
| 15-19      | 13596  | 11510  | 25106  | 118.1     | 59.4               | 56.9   | 58.2  |
| 20-24      | 7459   | 8345   | 15804  | 89.4      | 65.3               | 63.8   | 64.6  |
| 25-29      | 5840   | 9187   | 15027  | 63.6      | 69.9               | 71.5   | 70.7  |
| 30-34      | 6766   | 8426   | 15192  | 80.3      | 75.3               | 78.4   | 76.8  |
| 35-39      | 6965   | 6626   | 13591  | 105.1     | 80.9               | 83.9   | 82.4  |
| 40-44      | 5850   | 5076   | 10926  | 115.2     | 85.5               | 88.1   | 86.8  |
| 45-49      | 4734   | 3700   | 8434   | 127.9     | 89.3               | 91.2   | 90.3  |
| 50-54      | 3993   | 3479   | 7472   | 114.8     | 92.5               | 94.1   | 93.3  |
| 55-59      | 3033   | 2605   | 5638   | 116.4     | 94.9               | 96.2   | 95.6  |
| 60-64      | 2299   | 1961   | 4260   | 117.2     | 96.7               | 97.8   | 97.3  |
| 65 & above | 4089   | 2576   | 6665   | 158.7     | 100.0              | 100.0  | 100.0 |
| Total      | 125708 | 120715 | 246423 | 104.1     |                    |        |       |

# APPENDIX A

The method of estimation of 1971-72 mid-year population by age and sex.

The estimation of the total population for each sex was based on the balancing equation (Shryock and Seigel, 1973:736-738).

$$P_1 (1971-72) = P_0 (1970-71) + B - D + I - O$$

Where  $P_1$  is mid-year population of all ages.

B is all births

D is all deaths

I is all in-migrants

O is all out-migrants

Population sizes for different ages:

$$\text{Age under 1 year: } P_0 (1971-72) = B - 0.8D_0 - 0.5M_0$$

$$\text{Age one year: } P_1 (1971-72) = P_0 (1970-71) - \{0.2D_0 + 0.5D_1 - 0.5M_0 - 0.5M_1\}$$

$D_0$  is all deaths of age under one year.

$M_0$  is all net migrants of age under one year.

$D_1$  is all deaths of aged one year.

$M_1$  is all net migrants of aged one year.

$$\begin{aligned} \text{Age 2 years and above: } P_t (1971-72) = P_{t-1} (1970-71) - \{ & P_a^t - \frac{1}{2} (D_a - M_a) \\ & + \frac{1}{2} (D_{a+1} - M_{a+1}) \} \end{aligned}$$

$P_t$  is the original population at the beginning of the year.

a refers to age.

TABLE 2

SUMMARY OF BIRTHS, DEATHS AND MIGRATIONS, MAY 1971 - APRIL 1972

|                           | Number | Rate per 1000<br>population |
|---------------------------|--------|-----------------------------|
| Live births               | 10994  | 44.6                        |
| Deaths                    | 5082   | 20.6                        |
| Migration in              | 7262   | 29.5                        |
| Migration out             | 7542   | 30.6                        |
| *Net balance of migration | 280    | 1.1                         |

\* (out-migration) - (in-migration)

during this period (Table 3) indicates that 83 out of a 1000 live births die in the first month of life and 147 out of a 1000 live births die in the first year. Males had a higher mortality rate than females in the neonatal period. In the post-neonatal period, female mortality exceeded male mortality, apparently reflecting the preference for sons and the tendency for parents to provide better care for male children (Aziz 1979:52; D'Souza *et al.* 1980:26; Chen *et al.* 1981:60-61).

Table 4 and Figure 1 show the distribution of deaths by age and sex. The excess mortality in female children is evident in the 1-4 year age group. Overall, these figures show high mortality among infants, followed by a sharp fall in mortality in pre-school children, reaching a minimum in the age group 5-9 years. Thereafter the death rates rise slowly with mortality of females exceeding that for males up to the age of 30-34, the primary years of reproduction. From the ages of 35-59, the death rates for males exceeded those for females. However, from age 60 onward this trend was reversed, with the death rate for females exceeding that for males by a substantial margin. Overall, the mortality rates for males and females were quite comparable.

The pattern of seasonality of deaths is shown in Table 5 and Figure 2. The seasons of lowest mortality occurred in the May-August and February-April periods, and this tendency held within all age groups. The peak periods of death occurred between October and January in the <1 age group, October to December in the 1-4 and 5-9 year age groups, and November-December for those aged 40 and over. The higher percentage of deaths during the October to December period may be partially due to the fact that this is also the peak season for births, and the related occurrence of neonatal mortality.

Table 6 shows the distribution of deaths by age and cause of death. The death reports were collected by the field workers and the causes of death were obtained from a reliable source within the household at the time of interview. One-fourth of all deaths were attributed to unknown causes or *tākuridā* (evil spirits). Most of these deaths involved infants aged one year or less. The category of 'other' diseases such as dropsy, rheumatism and asthma was the leading cause of death among those aged 40 and over, with almost one-half of all deaths so classified in this age group. Gastro-intestinal diseases other than cholera was also an important cause of death and was the leading cause of death among children aged 1-4 and 5-14. Fever was also an important cause among this age group.

Diarrhoeal illnesses were attributed as a cause of 5.1 percent of all deaths. The period under study coincided with the war of liberation in Bangladesh, and during this period, the ICDDR,B ambulance service was suspended.

The abridged life table was used to calculate the average life expectancy for both males and females. The results were obtained from the

TABLE 3

INFANT AND NEONATAL DEATH BY SEX, MAY 1971 - APRIL 1972

| Age                  | Male | Female | Both | Rate per 1000 population |        |       |
|----------------------|------|--------|------|--------------------------|--------|-------|
|                      |      |        |      | Male                     | Female | Both  |
| Total                | 859  | 755    | 1614 | 153.2                    | 140.2  | 146.8 |
| <u>Neonatal</u>      |      |        |      |                          |        |       |
| 0-7 days             | 313  | 241    | 554  | 55.8                     | 44.8   | 50.4  |
| 8-29 days            | 193  | 168    | 361  | 34.4                     | 31.2   | 32.8  |
| <u>Post-Neonatal</u> |      |        |      |                          |        |       |
| 1-11 months          | 353  | 346    | 699  | 63.0                     | 64.3   | 63.6  |

TABLE 4

AGE-SPECIFIC DEATH RATES BY SEX, MAY 1971 - APRIL 1972

| Age   | Male | Female | Both | Rate per 1000 population |        |        |
|-------|------|--------|------|--------------------------|--------|--------|
|       |      |        |      | Male                     | Female | Both   |
| 0     | 859  | 755    | 1614 | 153.3*                   | 140.2* | 146.8* |
| 1-4   | 506  | 722    | 1228 | 32.1                     | 48.8   | 40.2   |
| 5-9   | 119  | 147    | 266  | 5.9                      | 7.5    | 6.7    |
| 10-14 | 36   | 41     | 77   | 1.8                      | 2.3    | 2.0    |
| 15-19 | 29   | 52     | 81   | 2.1                      | 4.5    | 3.2    |
| 20-24 | 31   | 43     | 74   | 4.2                      | 5.2    | 4.7    |
| 25-29 | 33   | 57     | 90   | 5.7                      | 6.2    | 6.0    |
| 30-34 | 32   | 45     | 77   | 4.7                      | 5.3    | 5.1    |
| 35-39 | 73   | 45     | 118  | 10.5                     | 6.8    | 8.7    |
| 40-44 | 65   | 37     | 102  | 11.1                     | 7.3    | 9.3    |
| 45-49 | 86   | 31     | 117  | 18.2                     | 8.4    | 13.9   |
| 50-54 | 76   | 49     | 125  | 19.0                     | 14.1   | 16.7   |
| 55-59 | 100  | 49     | 149  | 32.9                     | 18.8   | 26.4   |
| 60-64 | 102  | 92     | 194  | 44.4                     | 46.9   | 45.5   |
| 65+   | 424  | 346    | 770  | 103.7                    | 134.3  | 115.5  |
| Total | 2571 | 2511   | 5082 | 20.4                     | 20.8   | 20.6   |

\* Rate per 1000 live births. Other rates based on per 1000 population.

Fig. 1  
AGE SPECIFIC DEATH RATE BY SEX  
1971-72

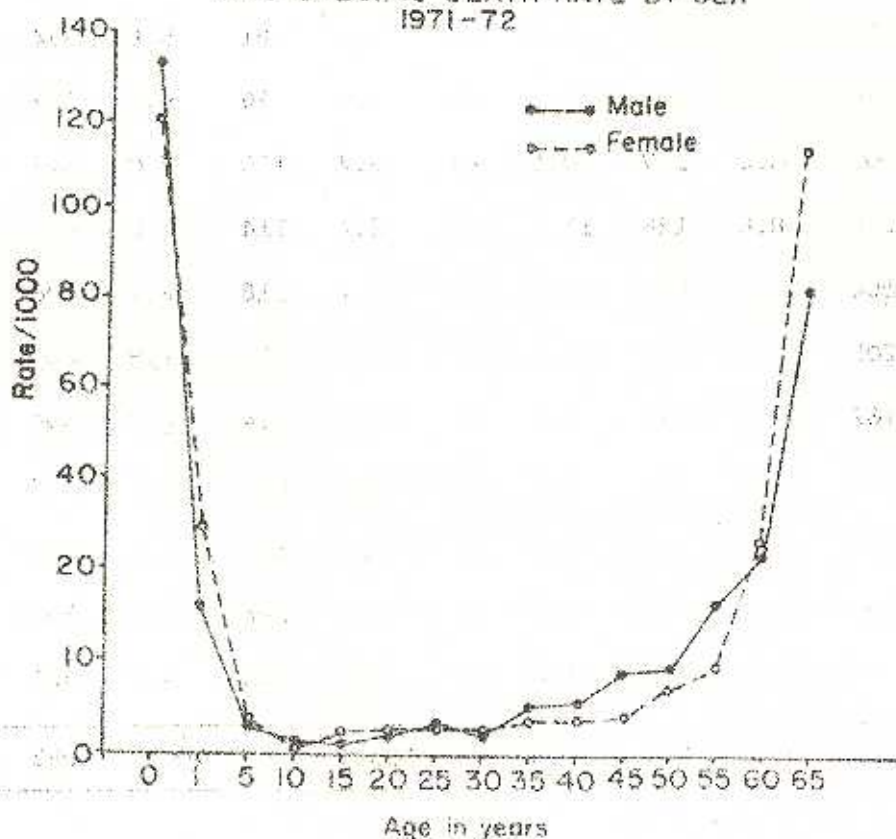


TABLE 5

AGE DISTRIBUTION OF PERSONS WHO DIED DURING  
MAY 1971 - APRIL 1972 BY MONTHS

| Months    |      | %     | 1-4  | %     | 5-39 | %     | 40 &<br>above | %     | Total | %     |
|-----------|------|-------|------|-------|------|-------|---------------|-------|-------|-------|
| May       | 113  | 7.0   | 86   | 7.0   | 45   | 5.7   | 77            | 5.3   | 321   | 6.3   |
| June      | 108  | 6.7   | 110  | 9.0   | 55   | 7.0   | 81            | 5.6   | 354   | 7.0   |
| July      | 94   | 5.8   | 103  | 8.4   | 60   | 7.7   | 96            | 6.6   | 353   | 6.9   |
| August    | 100  | 6.2   | 117  | 9.5   | 64   | 8.2   | 116           | 8.0   | 397   | 7.8   |
| September | 138  | 8.6   | 136  | 11.1  | 66   | 8.4   | 114           | 7.8   | 454   | 8.9   |
| October   | 164  | 10.2  | 139  | 11.3  | 87   | 11.1  | 118           | 8.1   | 508   | 10.0  |
| November  | 205  | 12.7  | 139  | 11.3  | 113  | 14.4  | 173           | 11.8  | 630   | 12.4  |
| December  | 162  | 10.0  | 85   | 6.9   | 93   | 11.9  | 164           | 11.3  | 504   | 9.9   |
| January   | 160  | 9.9   | 69   | 5.6   | 65   | 8.3   | 136           | 9.3   | 430   | 8.5   |
| February  | 147  | 9.1   | 61   | 5.0   | 42   | 5.4   | 122           | 8.4   | 372   | 7.3   |
| March     | 126  | 7.8   | 80   | 6.5   | 46   | 5.9   | 146           | 10.0  | 398   | 7.9   |
| April     | 97   | 6.0   | 103  | 8.4   | 47   | 6.0   | 114           | 7.8   | 361   | 7.1   |
| Total     | 1614 | 100.0 | 1228 | 100.0 | 783  | 100.0 | 1457          | 100.0 | 5082  | 100.0 |

FIG.2: SEASONAL PATTERN OF DEATHS BY DIFFERENT AGE GROUPS AND ALL AGES (MAY 1971-APRIL 1972)

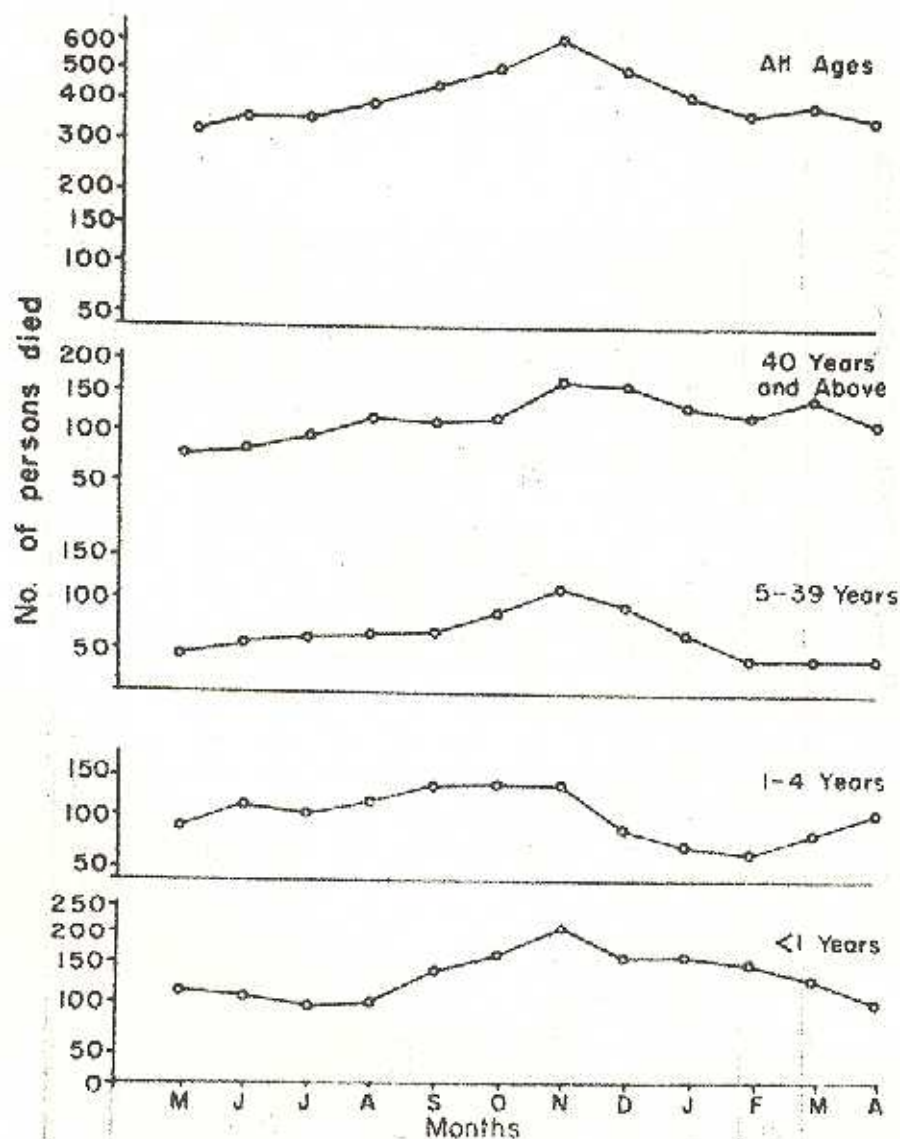


TABLE 6

DISTRIBUTION OF PERSONS WHO DIED FROM MAY 1971 - APRIL 1972  
ACCORDING TO THEIR AGE AT DEATH AND CAUSE AT DEATH

| Cause at death                                    | < 1  | %     | 1-4  | %     | 5-14 | %     | 15-39 | %     | 40+  | %     | Total | %     |
|---------------------------------------------------|------|-------|------|-------|------|-------|-------|-------|------|-------|-------|-------|
| Fever (all forms)                                 | 130  | 8.1   | 194  | 15.8  | 58   | 16.9  | 45    | 10.2  | 169  | 11.6  | 596   | 11.7  |
| Acute diarrhoea                                   | 34   | 2.1   | 74   | 6.0   | 58   | 16.9  | 51    | 11.6  | 44   | 3.0   | 261   | 5.1   |
| Gastrointestinal diseases<br>(other than cholera) | 103  | 6.4   | 506  | 41.2  | 103  | 30.1  | 49    | 11.1  | 365  | 25.1  | 1126  | 22.2  |
| Respiratory disease                               | 95   | 5.9   | 69   | 5.6   | 11   | 3.2   | 28    | 6.4   | 122  | 8.4   | 325   | 6.4   |
| Measles and smallpox                              | 26   | 1.6   | 85   | 6.9   | 11   | 3.2   | -     | -     | 1    | 0.1   | 123   | 2.4   |
| Accident                                          | 14   | 0.9   | 87   | 7.1   | 26   | 7.6   | 30    | 6.8   | 24   | 1.6   | 181   | 3.6   |
| Unknown (தகராசி)                                  | 1150 | 71.8  | 52   | 4.2   | 9    | 2.6   | 26    | 5.9   | 21   | 1.4   | 1268  | 25.0  |
| Other                                             | 52   | 3.2   | 161  | 13.2  | 66   | 19.2  | 178   | 40.5  | 707  | 48.5  | 1164  | 22.9  |
| Child birth                                       | -    | -     | -    | -     | 1    | 0.3   | 33    | 7.5   | 4    | 0.3   | 38    | 0.7   |
| Total                                             | 1614 | 100.0 | 1228 | 100.0 | 343  | 100.0 | 440   | 100.0 | 1457 | 100.0 | 5082  | 100.0 |

mortality data using conventional methods of calculation. Using the Reed and Merrell standard table, the age specific death rates ( $n^a_x$ ) were converted to life table probabilities ( $n^b_x$ ) (see Appendix B). Table 7 shows the expectation of life at birth to be 42.1 years for the total population, and slightly higher for males (42.9 years) than for females (41.8 years). This mortality rate is significantly higher than the preceding years of 1966 to 1970. These figures represent a drop in life expectancy of almost 10 years from the 1970-71 period and no doubt reflect to a considerable degree the effects of the on going war of liberation in Bangladesh during this period (Curlin *et al.* 1976).

### FERTILITY

Table 8 shows the outcome of pregnancy by age of mother. Among the live births, 51 percent were males, yielding a sex ratio of 104.1 males per 1000 females. During the 1971-72 period, 109 multiple births occurred with a ratio of 109 pregnancies for every multiple birth. Children who were born dead after a gestation period of seven months or more occurred at a rate of 36.1 per 1000 pregnancies. This resulted in a ratio of 1 still-birth for every 26.4 live births. The actual number of miscarriages remained unknown since the identification of early pregnancies was problematic. During the one year period under consideration, 561 miscarriages were recorded, yielding a ratio of 21.1 pregnancies for every miscarriage.

Table 9 and Figure 3 show the seasonal pattern of pregnancy outcomes. The findings indicate that the peak period of pregnancy outcome occurred during the October to January period, and this pattern held within all categories of number of previous pregnancies experienced.

Table 10 shows the age-specific fertility rates - the general fertility rate was 154.9 births per thousand women aged 10-49. The ASFR increased with the age of the mother, with the highest rate of live births among women in the 25-29 age group. Table 10 illustrates the marked decline in fertility among women aged 40-49. The influence of cultural norms which deter child-bearing by older woman, particularly women with grown children, has been noted by several authors (Mandelbaum 1974; Aziz 1980; Maloney *et al.* 1981).

Table 11 shows that during 1971-72 the gross reproduction rate was 3.1 and the net reproduction rate was 2.0. The mean length of generation was 27.1 years and the intrinsic rate of natural increase was 2.5 percent per year.

# APPENDIX B

Notation for abridged life table: (Barclay 1958, page 286-297).

$$n^q_x = \frac{2n \cdot n^M_x}{2+n \cdot n^M_x}$$

$$n^p_x = 1 - n^q_x$$

$$n^d_x = l_x \cdot n^q_x$$

$$l_{x+n} = l_x - n^d_x$$

$$\frac{L_x}{n_x} = \frac{n(l_x + l_{x+n})}{2}$$

$$L_0 = 0.3l_0 + 0.7l_1$$

$$L_{65+} = l_{65+} \cdot \log l_{65+}$$

Assumed

$$T_x = \sum_{65+}^x L_x$$

$$e_{ox} = \frac{T_x}{l_x}$$

TABLE 7

AVERAGE LIFE EXPECTANCY  $^e_x$  AT SPECIFIED AGES BY SEX  
(BASED ON 1971 - 72 DEATH REPORTS)

| Ages | Males | Females | Both |
|------|-------|---------|------|
| 0    | 42.9  | 41.8    | 42.1 |
| 1    | 49.6  | 47.1    | 48.3 |
| 5    | 51.6  | 52.3    | 51.9 |
| 10   | 48.0  | 49.2    | 48.5 |
| 15   | 43.5  | 44.8    | 44.0 |
| 20   | 38.9  | 40.7    | 39.7 |
| 25   | 34.7  | 36.7    | 35.6 |
| 30   | 30.6  | 32.8    | 31.6 |
| 35   | 26.3  | 28.6    | 27.3 |
| 40   | 22.5  | 24.5    | 23.4 |
| 45   | 18.7  | 20.4    | 19.4 |
| 50   | 15.2  | 16.1    | 15.6 |
| 55   | 11.5  | 12.1    | 11.8 |
| 60   | 8.1   | 8.1     | 8.1  |
| 65 + | 4.5   | 4.6     | 4.5  |

Note : See appendix B for equations used.

TABLE 8

DISTRIBUTION OF WOMEN WITH PREGNANCY OUTCOME DURING MAY 1971 - APRIL 1972  
ACCORDING TO THEIR AGE AND OUTCOME OF PREGNANCY

| Age   | Miscar-<br>riage | Still<br>birth | Twin<br>still<br>birth | Live<br>birth<br>male | Live<br>birth<br>female | Twin<br>live<br>birth<br>male | Twin<br>live<br>birth<br>female | Twin live<br>birth male<br>and female | Twin male-<br>live birth<br>and still<br>birth | Twin female<br>live birth<br>and still<br>birth | Total |
|-------|------------------|----------------|------------------------|-----------------------|-------------------------|-------------------------------|---------------------------------|---------------------------------------|------------------------------------------------|-------------------------------------------------|-------|
| 10-14 | 12               | 8              | -                      | 60                    | 56                      | -                             | -                               | -                                     | -                                              | 1                                               | 137   |
| 15-19 | 125              | 98             | -                      | 1180                  | 1107                    | 6                             | 5                               | 1                                     | -                                              | -                                               | 2522  |
| 20-24 | 105              | 60             | -                      | 1318                  | 1234                    | 1                             | 4                               | 10                                    | 1                                              | 4                                               | 2737  |
| 25-29 | 131              | 104            | 1                      | 1481                  | 1465                    | 8                             | 5                               | 4                                     | 3                                              | 3                                               | 3205  |
| 30-34 | 110              | 67             | 2                      | 880                   | 831                     | 6                             | 8                               | 10                                    | 1                                              | 1                                               | 1916  |
| 35-39 | 57               | 42             | 1                      | 473                   | 468                     | 4                             | 8                               | 3                                     | -                                              | 2                                               | 1058  |
| 40-44 | 19               | 17             | -                      | 103                   | 92                      | 2                             | 4                               | -                                     | -                                              | -                                               | 237   |
| 45-49 | 2                | 1              | -                      | 25                    | 24                      | -                             | -                               | -                                     | -                                              | -                                               | 52    |
| Total | 561              | 397            | 4                      | 5520                  | 5277                    | 27                            | 34                              | 28                                    | 5                                              | 11                                              | 11864 |

Male live birth 5,607  
Female live birth 5,384  
Total live birth 10,991  
Sex ratio at birth 104.1

TABLE 9

DISTRIBUTION OF WOMEN WHO EXPERIENCED PREGNANCY DURING MAY 1971 - APRIL 1972  
ACCORDING TO THE MONTH OF OUTCOME

| Month of<br>pregnancy<br>outcome | Distribution of pregnancies (number) |      |      |      | All preg-<br>nancies | Distribution of pregnancies (percent) |       |       |       | All preg-<br>nancies |
|----------------------------------|--------------------------------------|------|------|------|----------------------|---------------------------------------|-------|-------|-------|----------------------|
|                                  | 1                                    | 2-3  | 4-7  | 8+   |                      | 1                                     | 2-3   | 4-7   | 8+    |                      |
| 1971 May                         | 106                                  | 158  | 259  | 113  | 636                  | 5.1                                   | 5.1   | 5.5   | 5.6   | 5.4                  |
| June                             | 131                                  | 141  | 247  | 120  | 639                  | 6.3                                   | 4.6   | 5.2   | 6.0   | 5.4                  |
| July                             | 111                                  | 131  | 181  | 94   | 517                  | 5.4                                   | 4.3   | 3.8   | 4.7   | 4.4                  |
| August                           | 169                                  | 214  | 253  | 123  | 759                  | 8.2                                   | 7.0   | 5.4   | 6.1   | 6.4                  |
| September                        | 199                                  | 272  | 377  | 155  | 1003                 | 9.6                                   | 8.9   | 8.0   | 7.7   | 8.5                  |
| October                          | 267                                  | 352  | 556  | 210  | 1385                 | 12.9                                  | 11.5  | 11.8  | 10.5  | 11.7                 |
| November                         | 266                                  | 427  | 697  | 249  | 1639                 | 12.9                                  | 13.9  | 14.8  | 12.4  | 13.8                 |
| December                         | 237                                  | 411  | 659  | 257  | 1564                 | 11.5                                  | 13.4  | 14.0  | 12.8  | 13.2                 |
| 1972 January                     | 188                                  | 334  | 511  | 209  | 1242                 | 9.1                                   | 10.9  | 10.8  | 10.4  | 10.5                 |
| February                         | 119                                  | 251  | 360  | 167  | 897                  | 5.8                                   | 8.2   | 7.6   | 8.4   | 7.5                  |
| March                            | 153                                  | 203  | 347  | 167  | 870                  | 7.4                                   | 6.6   | 7.4   | 8.4   | 7.2                  |
| April                            | 121                                  | 179  | 273  | 140  | 713                  | 5.8                                   | 5.8   | 5.8   | 7.0   | 6.0                  |
| Total                            | 2067                                 | 3073 | 4720 | 2004 | 11864                | 100.0                                 | 100.0 | 100.0 | 100.0 | 100.0                |

FIG. 3. SEASONAL PATTERN OF PREGNANCY TERMINATION BY  
DIFFERENT NUMBER OF PREGNANCY AND ALL PREGNANCIES  
(MAY 1971-APRIL 1972)

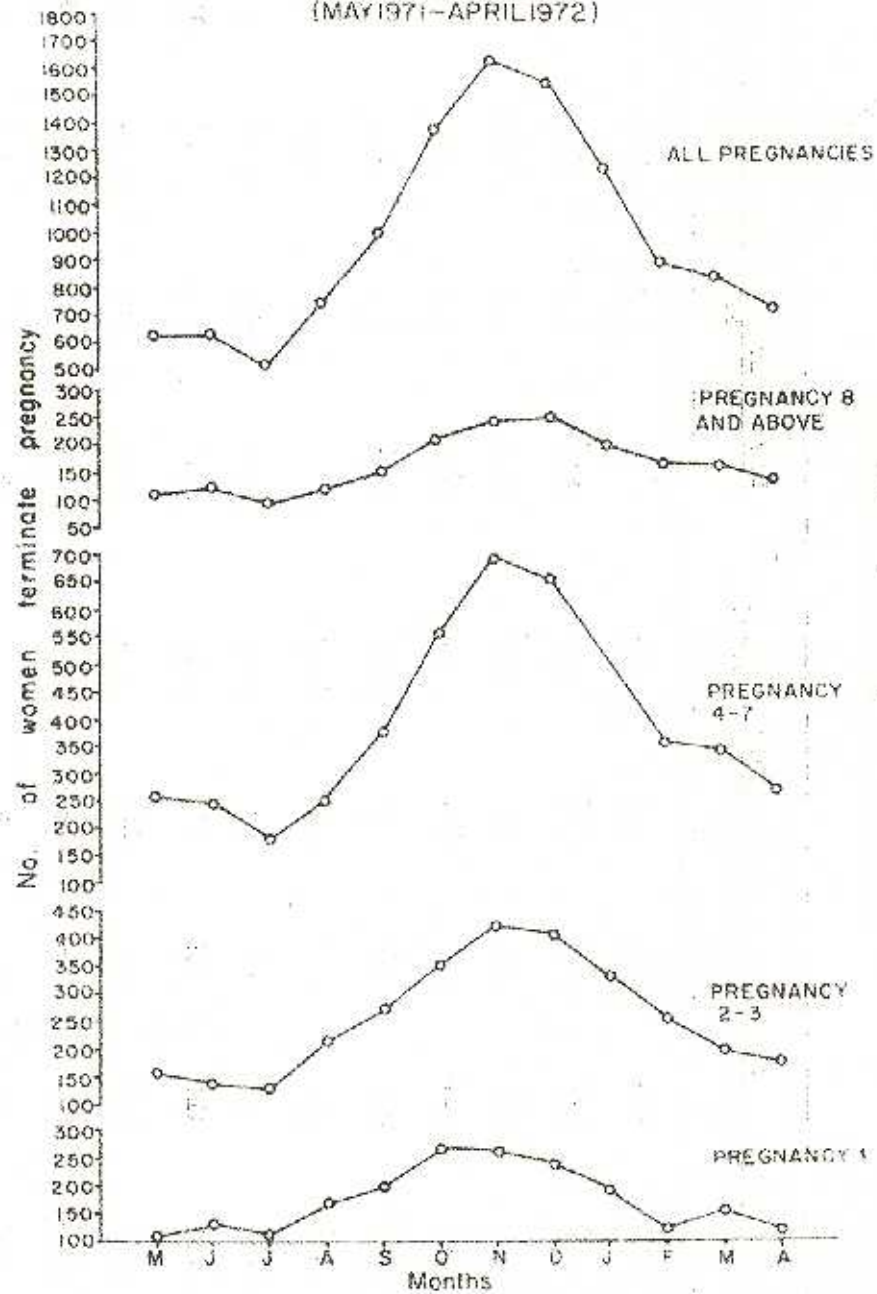


TABLE 10

DISTRIBUTION OF AGE-SPECIFIC FERTILITY RATES PER 1,000 WOMEN  
(MAY 1971 - APRIL 1972)

| Age of mother<br>(corrected) | Number of<br>women | Male live<br>birth | Female live<br>birth | Total live<br>birth | Rate per<br>1,000 |
|------------------------------|--------------------|--------------------|----------------------|---------------------|-------------------|
| 10-14                        | 18105              | 60                 | 57                   | 117                 | 6.4               |
| 15-19                        | 11510              | 1193               | 1118                 | 2311                | 200.8             |
| 20-24                        | 8345               | 1331               | 1256                 | 2587                | 310.0             |
| 25-29                        | 9187               | 1504               | 1482                 | 2986                | 325.0             |
| 30-34                        | 8426               | 903                | 858                  | 1761                | 209.0             |
| 35-39                        | 6626               | 484                | 489                  | 973                 | 146.8             |
| 40-44                        | 5076               | 107                | 100                  | 207                 | 40.8              |
| 45-49                        | 3700               | 25                 | 24                   | 49                  | 13.2              |
| All child<br>bearing ages    | 70975              | 5607               | 5384                 | 10991               | 154.9             |

TABLE 11

CALCULATION OF GROSS AND NET RATES AND INTRINSIC RATE OF  
NATURAL INCREASE (MAY 1971 - APRIL 1972)

| Age       | Female<br>population | Live<br>birth<br>female | Daughters<br>per 1000 | Pivotal<br>age | Proportion<br>surviving<br>the pivotal<br>age | Women<br>surviving<br>at given<br>age | Persons<br>years |
|-----------|----------------------|-------------------------|-----------------------|----------------|-----------------------------------------------|---------------------------------------|------------------|
| 10-14     | 18105                | 57                      | 3.15                  | 12.5           | .68087                                        | 2.14                                  | 26.75            |
| 15-19     | 11510                | 1118                    | 97.13                 | 17.5           | .67309                                        | 65.38                                 | 1144.15          |
| 20-24     | 8345                 | 1256                    | 150.51                | 22.5           | .65811                                        | 99.05                                 | 2228.62          |
| 25-29     | 9187                 | 1482                    | 161.31                | 27.5           | .64122                                        | 103.43                                | 2844.32          |
| 30-34     | 8426                 | 858                     | 101.83                | 32.5           | .62164                                        | 63.30                                 | 2057.25          |
| 35-39     | 6626                 | 489                     | 73.80                 | 37.5           | .60538                                        | 44.68                                 | 1675.50          |
| 40-44     | 5076                 | 100                     | 19.70                 | 42.5           | .58514                                        | 11.53                                 | 490.02           |
| 45-49     | 3700                 | 24                      | 6.49                  | 47.5           | .56417                                        | 3.66                                  | 173.85           |
| Total     |                      |                         | 613.92                |                |                                               | 393.17                                | 10640.46         |
| 5 X Total |                      |                         | 3069.60               |                |                                               | 1965.85                               | 53202.30         |

Gross reproduction rate 3.1

Net reproduction rate 2.0

Mean length of generation 27.1

Intrinsic rate of natural increase 2.5 percent per year.

# MIGRATION

Tables 12 and 13 show the rates of in-and out-migration by age and sex. In the age group 15-19, the in-migration and out-migration rates were significantly higher for females than for male. The higher rates of mobility for females are largely attributable to the high incidence of marriage for this age group. Customarily, following marriage females move to the residence of their respective husbands. At ages 25-59, both in-and out-migration rates were considerably higher among males than females, reflecting the tendency of males to migrate for employment. Overall, the rate of out-migration was slightly higher than the rate of in-migration.

TABLE 12

AGE AND SEX SPECIFIC MIGRATION-IN RATE FOR 1971 - 72

| Age   | Number |        |      | Rate per 1000 population |        |      |
|-------|--------|--------|------|--------------------------|--------|------|
|       | Males  | Female | Both | Male                     | Female | Both |
| 0-4   | 398    | 368    | 766  | 19.3                     | 18.8   | 19.0 |
| 5-9   | 522    | 519    | 1041 | 25.7                     | 26.6   | 26.1 |
| 10-14 | 457    | 453    | 910  | 22.7                     | 25.0   | 23.8 |
| 15-19 | 425    | 823    | 1248 | 31.3                     | 71.5   | 49.7 |
| 20-24 | 330    | 438    | 768  | 44.2                     | 52.5   | 48.6 |
| 25-29 | 419    | 318    | 737  | 71.7                     | 34.6   | 49.0 |
| 30-34 | 303    | 164    | 467  | 44.8                     | 19.5   | 30.7 |
| 35-39 | 273    | 143    | 416  | 39.2                     | 21.6   | 30.6 |
| 40-44 | 143    | 74     | 217  | 24.4                     | 14.6   | 19.9 |
| 45-49 | 131    | 59     | 190  | 27.7                     | 15.9   | 22.5 |
| 50-54 | 97     | 64     | 161  | 24.3                     | 18.4   | 21.5 |
| 55-59 | 80     | 41     | 121  | 26.4                     | 15.7   | 21.5 |
| 60-64 | 48     | 48     | 96   | 20.9                     | 24.5   | 22.5 |
| 65 +  | 64     | 60     | 124  | 15.7                     | 23.3   | 18.6 |
| Total | 3690   | 3572   | 7262 | 29.4                     | 29.6   | 29.5 |

TABLE 13

AGE SPECIFIC MIGRATION-OUT RATE 1971 - 72

| Age   | Number |        |      | Rate per 1000 population |        |      |
|-------|--------|--------|------|--------------------------|--------|------|
|       | Males  | Female | Both | Male                     | Female | Both |
| 0-4   | 522    | 472    | 994  | 25.3                     | 24.1   | 24.7 |
| 5-9   | 455    | 470    | 925  | 22.4                     | 24.1   | 23.2 |
| 10-14 | 528    | 708    | 1236 | 26.3                     | 39.1   | 32.3 |
| 15-19 | 485    | 859    | 1344 | 35.7                     | 74.6   | 53.5 |
| 20-24 | 334    | 372    | 706  | 44.8                     | 44.6   | 44.7 |
| 25-29 | 384    | 277    | 661  | 65.8                     | 30.2   | 43.9 |
| 30-34 | 243    | 166    | 409  | 35.9                     | 19.7   | 26.9 |
| 35-39 | 249    | 138    | 387  | 35.8                     | 20.8   | 28.5 |
| 40-44 | 138    | 62     | 200  | 23.6                     | 12.2   | 18.3 |
| 45-49 | 129    | 83     | 212  | 27.2                     | 22.4   | 25.1 |
| 50-54 | 77     | 59     | 136  | 19.3                     | 17.0   | 18.2 |
| 55-59 | 59     | 47     | 106  | 19.5                     | 18.0   | 18.8 |
| 60-64 | 38     | 34     | 72   | 16.5                     | 17.3   | 16.9 |
| 65 +  | 85     | 69     | 154  | 20.8                     | 26.8   | 23.1 |
| Total | 3726   | 3816   | 7542 | 29.6                     | 31.6   | 30.6 |

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