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# Fertility and Mortality Trends in Rural Area of Bangladesh

## Introduction

INTERNATIONAL Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR, B) has been operating a field hospital in a rural area of Matlab Upazilla, Bangladesh. With this hospital station as base, a demographic surveillance of the surrounding areas had been maintained since 1966. In 1966, the population under the demographic surveillance system were 110,000 residing in 132 villages, la 1968, the surveillance system increased to cover 233 villages with a population of 277,000. The surveillance system consists of periodic census and bi-monthly registration of births, deaths, marriages and migrations. In October 1978, the study area was reduced to 159 villages with a population of 173,000, all these villages are in the neighbourhood of Matlab hospital station (Ruzicka, 1978).

Matlab is located in a deltaic area, which is intersected by innumerable tidal rivers, canals, and branches of the major rivers : the Ganges, Brahmaputra and Meghna. The climate is subtropical with the Tropic of Cancer passing through the area.

Villages have an average population of 1,000 persons. Each village is divided into many baris, a unit of two or more patrilineally-related families. Each family has its own one or two-room house with a mud floor, jute stick walls, and thatched graws or galvanized iron roof. The houses in baris are arranged around a central courtyard. The average population density is approximately 2,000 per square mile. During the monsoon, when most of the land is under water, the actual population density is much higher. Internal communication is primarily by country boat or on foot.

The population of the area is 85 percent Muslim and 15 percent Hindu, The average household consists of six persons. Landholdmg is skewed, with 18 percent of the households owning 47 percent of the land. About 40 percent males and 16 percent females over the age 15, have completed four years of schooling. About 70 percent males and 6 percent females are classified as "economically active." Over the past decade, the Matlab demographic surveillance system (DSS) has generated an enormous volume of reliable data, unusually for a developing country.

In 1978, the DSS area was divided into two parts, one called the Treatment area and the other Comparison area. In the Treatment area, family planning service with a package of MCH care has been provided with an expectation of immediate decline in mortality and fertility. Family planning services include both home and clinic base services of various contraceptive methods with extensive follow up services. The MCH package includes maternal and child health services, where tetanus immunization and oral therapy for diarrhoeal disease components have been fully implemented. Adequate advice is given also to pregnant women on delivery practice and nutritional, hygienic and sanitary care. Since the health component is mainly oriented to the treatment and care of contraceptive users, the approach is more of comprehensive family planning service delivery than an integrated health service. In the comparison area no such input is provided (Phillips, 1983).

The treatment area was similar to comparison area in respect of the socio-demographic characteristics such as age, family size, family type, education and housing except religion. In the treatment area, there were twice as manyHiodus than the comparison area.

The long range goal of the Matlab DSS is to obtain reliable information on demographic and other selected characteristics of the Matlab population and to monitor changes of these characteristics over time, which might occur through the interventions or development programs. The hospital and speedboat ambulance service during this period probably reduced the mortality rate by at least 1 per 1000 population (Mosley, 1970). *In* this paper, we are going to present some basic demographic data for the last 16 years of this area to show whether there has been any changes in demographic characteristics of this population.

## Results

Figure 1 shows the crude birth rate and death rates from 1966 to 1982. We can see that there are three distinct drops in crude birth rates. One in 1972, second was in 1975 and the other in 1978. There were two peaks in 1973 and 1977. These peaks represented the rebound effect of sudden drops in birth rates in previous years. Overall, both the birth and death rates show a slow downward

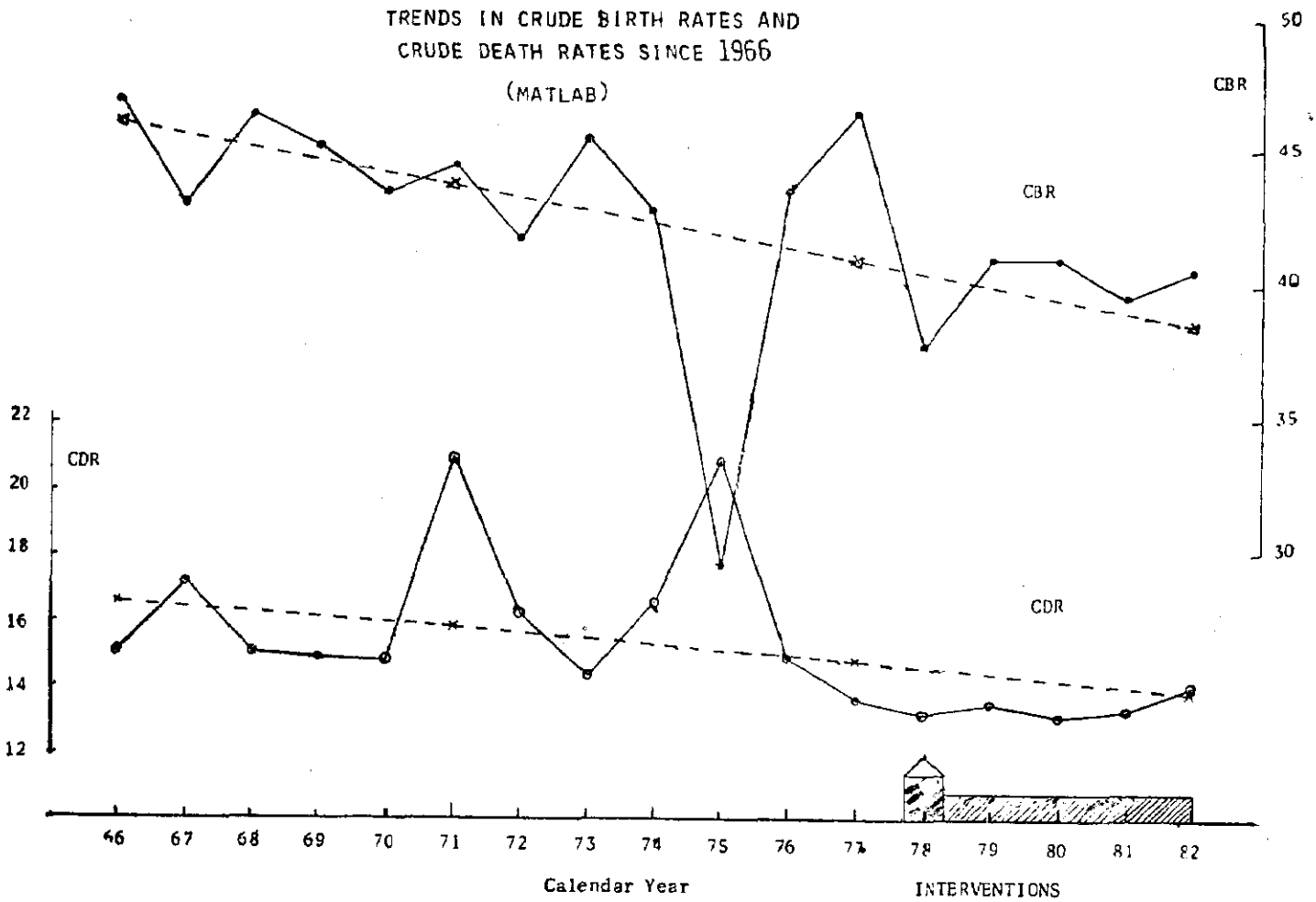
TRENDS IN CRUDE BIRTH RATES AND
CRUDE DEATH RATES SINCE 1966
(MATLAB)
CBR
CDR
50
45
40
35
30
22
20
18
16
14
12
46
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
Calendar Year
INTERVENTIONS

Fig. 1.

trend till 1978. After 1978 the birth as well as the death rates declined faster. A straight line regression fit by least square method showed a significant declining trend in crude birth rate during the period of study,

The lower rates after 1978 are again attributable to the interventions initiated by ICDDR, B in 1978 in the treatment area. These interventions, as described earlier consists of the comprehensive family planning service with limited MCH services. Contraceptive use prevalence rate in the treatment area increased from 7-8 percent in 1978 to 39-40 percent in 1979 and remained there till 1982. The comparison area remained at the level of 7-8 percent during the period 1978 through 1982. The decline in birth rate upto 1978, which was slower, may have been due to increasing age of marriage. Trend in crude death rate also showed decline. However, the fitted regression line showed such decline was not statistically significant.

Table 1 shows the trends in total fertility, infant mortality and child mortality for the period 1966-1977. During this period TFR did show declining trend, with year to year fluctuation; such a declining trend could not be substantiated by straight line fit. Like TFR neither infant mortality, nor child mortality, showed any definite decline during this period.

TABLE 1-DEMOGRAPHIC TRENDS IN MATLAB BETWEEN 1966-1977

| *Year* | *TFR* | *IMR* | *CMR (1-4)* |
|---|---|---|---|
| 1966 | 6.7 | 110.7 | 25.0 |
| 1967 | 6.3 | 125.4 | 24 0 |
| 1968 | 6.5 | 124.1 | 24.0 |
| 1969 | 6.1 | 127.6 | 24.1 |
| 1970 | 6.0 | 131.3 | 24.4 |
| 1971 | 6.3 | 146.8 | 40.2 |
| 1972 | 6.2 | 126.8 | 31.7 |
| 1973 | 7.1 | 126.0 | 18.8 |
| 1974 | 6.5 | 137.9 | 25.4 |
| 1975 | 4.3 | 174.3 | 33.8 |
| 1976 | 6.2 | 119.9 | 36.6 |
| 1977 | 6.7 | 113.7 | 19.6 |

TABLE 2-DEMOGRAPHIC TRENDS IN MATLAB BETWEEN 1978-1982 CLASSIFIED BY INTERVENTION AND NON-INTERVENTION AREA

| | | CBR | TFR | CDR | CMR | IMR |
|---|---|---|---|---|---|---|
| 1978 | Comparison | 37.8 | 5.5 | 13.8 | 22.1 | 125.8 |
| | Treatment | 32.1 | 4.5 | 12.5 | 22.5 | 114.5 |
| 1979 | Comparison | 47.0 | 6.9 | 15.9 | 26.2 | 118.0 |
| | Treatment | 34.9 | 4.9 | 12.1 | 17.1 | 114.0 |
| 1980 | Comparison | 45.5 | 6.0 | 14.8 | 25.4 | 114.0 |
| | Treatment | 37.1 | 5.1 | 11.3 | 18.6 | 91.0 |
| 1981 | Comparison | 43.3 | 6.3 | 14.8 | 24.8 | 114.5 |
| | Treatment | 35.3 | 4.8 | 11.9 | 19.1 | 102.6 |
| 1982 | Comparison | 44.6 | 6.3 | 15.9 | 27.4 | 114.5 |
| | Treatment | 36.9 | 5.0 | 12.6 | 18.6 | 105.9 |

Demographic trend from 1978 to 1982 is shown by areas in Table 2. As the interventions were initiated during 1978 slowly, the impact of these interventions during that year on fertility and mortality were expected to be negligible. Data for the year 1978 can be used to show the basic difference of the two areas at the beginning of the interventions.

In the comparison area both fertility and mortality rates were found to be slightly higher than that of the treatment area, where the intervention was initiated. This difference at initial year in part may be of religion selectiveness in the treatment and in part some effect of intervention occurred at the last part of that year. Fertility rate of both the areas in 1978 was observed to be unusually low. This may probably be the oscillation effect of the 1974-75 famine. However, the infant and child mortality rates observed in 1978 were not different from the previous years in the two areas.

In 1979, the fertility rate in the comparison area rebounded and increased to the previous level of 45-46 per 1000 and remained that way for the rest of the study period. In the treatment area, the fertility rate was observed to remain low with little rebound effect. For the rest of the study period, in the treatment area the fertility rate remained about 25 percent below that in the comparison area for last four years of study.

Infant mortality rates in both the areas showed a very slow and equal decline during the period 1978-82. Hence such a decline may not be attributable to interventions in treatment area. The child mortality rate in the comparison area did not show any decline during 1978-82. On the contrary, child mortality rate in the treatment area showed significant decline within one year of intervention and remained low for rest of the study period.

TABLE 3—COMPARISON OF ASPR OF MATLAB TREATMENT AND CONTROL AREAS BY CALENDAR YEAR

| Age | ASFR | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1978 | | 1979 | | 1980 | | 1981 | | 1982 | |
| | T | C | T | C | T | C | T | C | T | C |
| 15-19 | 108 | 128 | 119 | 141 | 121 | 131 | 105 | 128 | 122 | 122 |
| 20-24 | 228 | 247 | 256 | 338 | 264 | 304 | 259 | 309 | 250 | 306 |
| 25-29 | 216 | 268 | 265 | 341 | 246 | 342 | 251 | 316 | 251 | 303 |
| 30-34 | 192 | 228 | 188 | 308 | 210 | 285 | 186 | 251 | 208 | 269 |
| 35-39 | 111 | 161 | 109 | 201 | 127 | 184 | 120 | 187 | 123 | 198 |
| 40-44 | 44 | 58 | 33 | 47 | 43 | 73 | 35 | 51 | 40 | 53 |

*T*-Treatment area.
*C*-Control area.

In Table 3, age specific fertility rates of the treatment area and the comparison area were compared by year for the period 1978-82. In 1978, both the treatment as well as the comparison area age specific fertility rates were found to be low. During the period of 1979-82 ASFR in the treatment area was significantly lower than in the comparison area. These decline occurred in the comparison area in all age groups, except the 15-19 years age group.

In Figure 2, fertility trend of age groups 15-19 and 20-39 are presented from 1966 to 1982. Fertility of age group 15-19 showed a significant decline. However for age group 20-39, apparently there was no declining trend in fertility, which may probably be due to increasing age of marriage. This decline in fertility in lowest age group is attributable to the both areas. Although there was a decline in fertility of age group 15-19, this could not produce any significant impact on TFR because of frequent year to year fluctuations of large magnitudes.

## Discussion

Fertility and mortality rates in Matlab did show a slow declining trends between 1966 and 1978. In most cases these trends were not statistically significant. There were large year to year variations in both fertility and mortality. During 1966-82, two unusually low fertility rates were observed : one in 1975 having TFR 4.3 and the other in 1978 having approximately TFR 5.5. The 1975 rates were attributable the 1974-75 famine. The 1978 low rate is also speculated

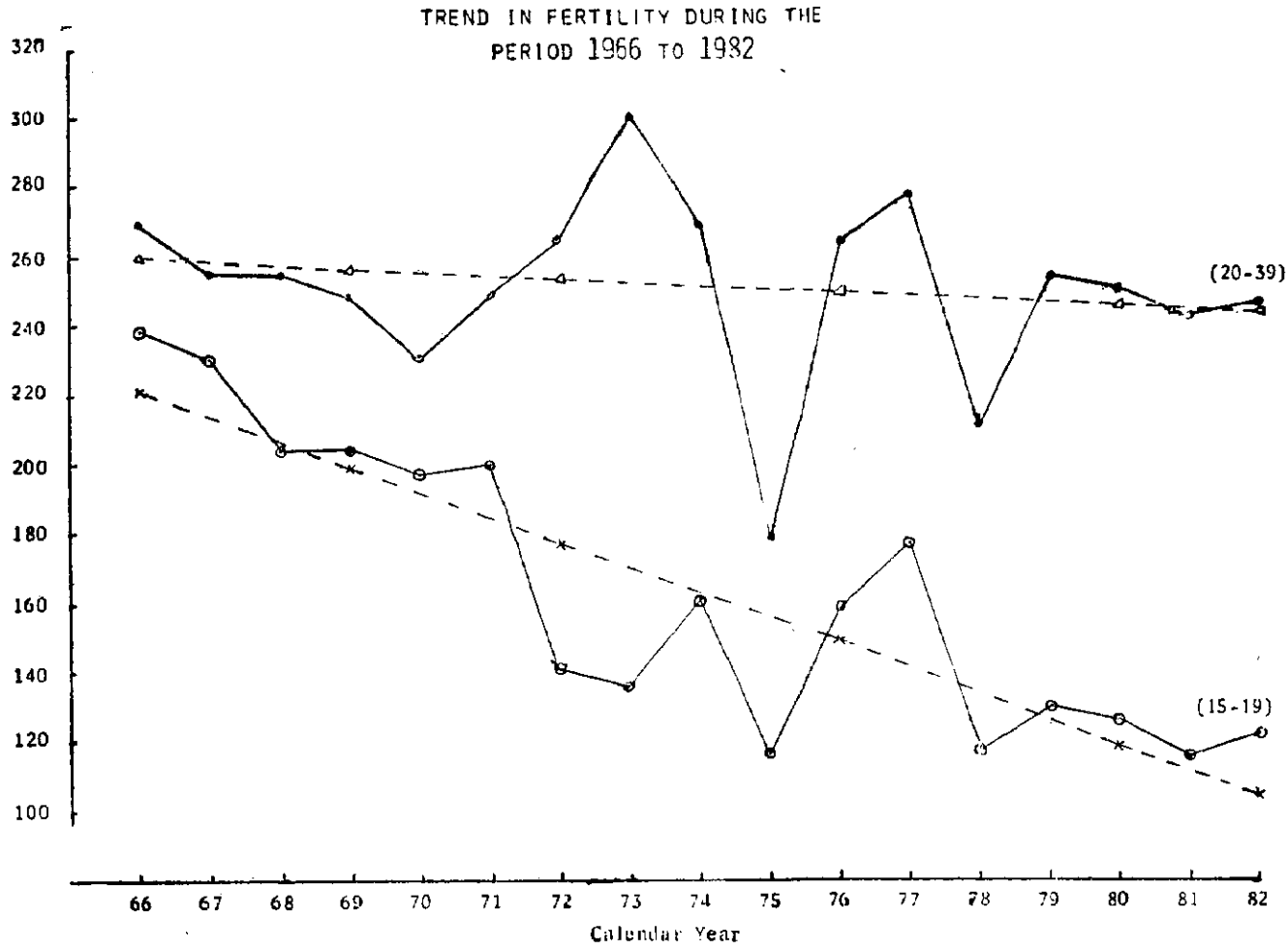
TREND IN FERTILITY DURING THE
PERIOD 1966 TO 1982
Birth/1000 women
320
300
280
260
240
220
200
180
160
140
120
100
(20-39)
(15-19)
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
Calendar Year

**Fig. 2.**

as oscillation effect of 1974-75 famine which needs further investigation. The MCH-FP interventions area was found to have slightly lower rates in the base year than those in the comparison areas. Intervention produced a significant impact of reducing fertility and child mortality (1-4 year), within one year and the continued interventions kept both fertility and child mortality rates at the levels achieved in the first year. Only trend visible is that of the birth rate of young women. Probably this was because of changing age of marriage.

## References


1. Ruzicka, L. T, and Chowdhury, A. K. M. A., 1978, *Demographic Surveillance System—Matlab,* Volumes 3-5, Scientific Report Nos. 9-13, Dhaka, Bangladesh; Cholera Research Laboratory.
2. Phillips, J. F., Stinson, W., Bhatia, S., Rahman, M. and Chakraborty, J., 1982, The demographic impact of the family planning health services project in Matlab, Bangladesh, *Studies in Family Planning,* 13(5), 131-140.
3. Mosley, W. H., Chowdhury, A. K. M. A. and Aziz, K. M. A., 1970, Demographic characteristics of population laboratory in rural East Pakistan, *Population Research,* Centre for Population Research, NICHD.