HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM – MATLAB

Volume Forty One
Registration of Health and Demographic Events 2007

Scientific Report No. 106 – February 2009

icddr,b
KNOWLEDGE FOR GLOBAL LIFESAVING SOLUTIONS

HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM – MATLAB

Volume Forty One

Registration of Health and Demographic Events 2007

Scientific Report No. 106 – February 2009

icddr,b

KNOWLEDGE FOR
GLOBAL LIFESAVING SOLUTIONS

All staff members of the Health and Demographic Surveillance System, Dhaka and Matlab have contributed for the preparation of this report.

Report prepared by:
Karar Zunaid Ahsan and Md. Mahfuzur Rahman

Cover page: A Community Health Research Worker (CHRW) is explaining data collection procedures she follows in Matlab to Dr. Ayaga Bawah and Mr. Titus Tei, visitors from INDEPTH-Network, Ghana. Mr. Md. Taslim Ali, Senior Manager of Matlab HDSS and the respective Field Research Supervisor are also seen in the picture (Photo: Karar Zunaid Ahsan).

ACKNOWLEDGEMENTS

Matlab HDSS is a founding member of INDEPTH (International Network of field sites with continuous Demographic Evaluation of Populations and Their Health in developing countries), an international network of HDSS field sites involved in demographic and health research in developing countries since 1998. Matlab HDSS makes use of INDEPTH Standardized verbal autopsy (VA) tools. For more information on INDEPTH Network, please refer to INDEPTH Monograph Series and visit www.indepth-network.org.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

SUMMARY

This report presents the vital registration and maternal and child health data gathered from Matlab, Bangladesh, in 2007. The data were collected by the Health and Demographic Surveillance System of ICDDR,B. The surveillance area is divided into an ICDDR,B service area and a Government service area which receives usual government services. The ICDDR,B service area is sub-divided into four blocks, and the Government service area into three blocks.

In the surveillance area, as a whole, fertility remained the same in 2007 compared to 2006. The crude birth rate (CBR) was 22.8 per 1,000 population and total fertility rate (TFR) was 2.7 per woman in 2007, similar to 2006 rates. In 2007, CBR was 22.6 and TFR was 2.6 in the ICDDR,B service area, and in the Government service area, CBR and TFR were 23.0 and 2.8 respectively.

The crude death rate was 6.8 per 1,000 population in the ICDDR,B service area, and in the Government service area it was 7.1 in 2007. The infant mortality rate was 27.7 per 1,000 live births in the ICDDR,B service area, and in the Government service area it was 39.3. The neonatal mortality fell in both areas; post-neonatal mortality increased in the ICDDR,B service area and decreased in the Government service area. The mortality rate among children aged less than 5 years has decreased from 41.9 in 2006 in the ICDDR,B service area to 41.0 in 2007, and in the Government service area, the reduction was from 50.7 in 2006 to 50.3 in 2007. In 2007, the rate of natural increase in population size was 15.8 per 1,000 in the Matlab surveillance area.

In the surveillance area, the rate of in-migration decreased to 40.0 per 1,000 population in 2007 from 43.5 in 2006, and the rate of out-migration increased to 63.5 in 2007 from 57.3 in 2006. The overall annual population growth rate was -0.8%. The marriage rate was 14.6 per 1,000 population, and the divorce rate was 103.9 per 1,000 marriages in the surveillance area.

INTRODUCTION

Since 1963, the ICDDR,B, formerly Cholera Research Laboratory, has implemented a health research programme in Matlab, Bangladesh. Matlab is located about 55 km southeast of Dhaka, the capital city of Bangladesh (Figure 1.1). The Health and Demographic Surveillance System (HDSS), formerly Demographic Surveillance System (DSS), is one of the major components of this field programme. Today the Matlab HDSS is recognized worldwide by population experts and health scientists as one of the longest continuing demographic surveillance sites in a developing country.

Since 1966, the HDSS has maintained the registration of births, deaths, and migrations, in addition to carrying out periodical censuses. Registration of marital unions and dissolutions began in 1975, internal movement in 1982, and household headship as well as household dissolution in 1993. Later in 2001, the Record Keeping System (RKS) and Geographical Information System (GIS) were integrated into HDSS. The Community Health Research Workers (CHRWs) obtain vital demographic and health information by visiting each household monthly in their assigned areas and fill out the event registration forms. The activities of CHRWs are supervised by Field Research Supervisors (FRSs), and quality of collected information is monitored through independent data verification in the field. A detailed description of the Matlab HDSS and its operation appears in the CRL Scientific Report No. 9 (1978)[1], ICDDR,B Special Publication No. 35 (1994), and ICDDR,B Special Publication No. 72 (1998)[2].

In October 1977, the surveillance area was reduced from 233 to 149 villages, and a Maternal and Child Health and Family Planning (ICDDR,B service) Programme was initiated in 70 villages. The remaining 79 villages were treated as a Government service area (Figure 1.1). Since the introduction of the ICDDR,B service programme, the CHRWs have been collecting data on child and reproductive health from female respondents, delivered maternal health care, provided information on contraception and contraceptives, and administered immunizations to mothers and children in the ICDDR,B service area. This system of collecting data on child and reproductive health is known as the Record-Keeping System (RKS), which was later on expanded to Government service area in 2001. The changes have been described in the ICDDR,B Scientific Report No. 47 (1981)[3] and ICDDR,B Special Publication No. 72 (1998). Due to river erosion, 7 villages disappeared from the Government service area in 1987, leaving 142 villages in the HDSS. In 2000, 3 of the 70 villages of ICDDR,B area were transferred to the Government service area.

This is the forty-first volume of a series of scientific reports of the Matlab Health and Demographic Surveillance System produced by ICDDR,B. Data obtained from the Matlab HDSS area in 2007, along with brief notes and explanations of the tables, are presented in this volume.

---

[1] Available online at: http://www.icddrb.org/pub/publication.jsp?classificationID=64&pubID=7869
[2] Available online at: http://www.icddrb.org/pub/publication.jsp?year=1998&classificationID=63
[3] Available online at: http://www.icddrb.org/pub/publication.jsp?classificationID=64&pubID=7862

Figure 1.1 Map of Matlab study area showing ICDDR,B and Government service areas
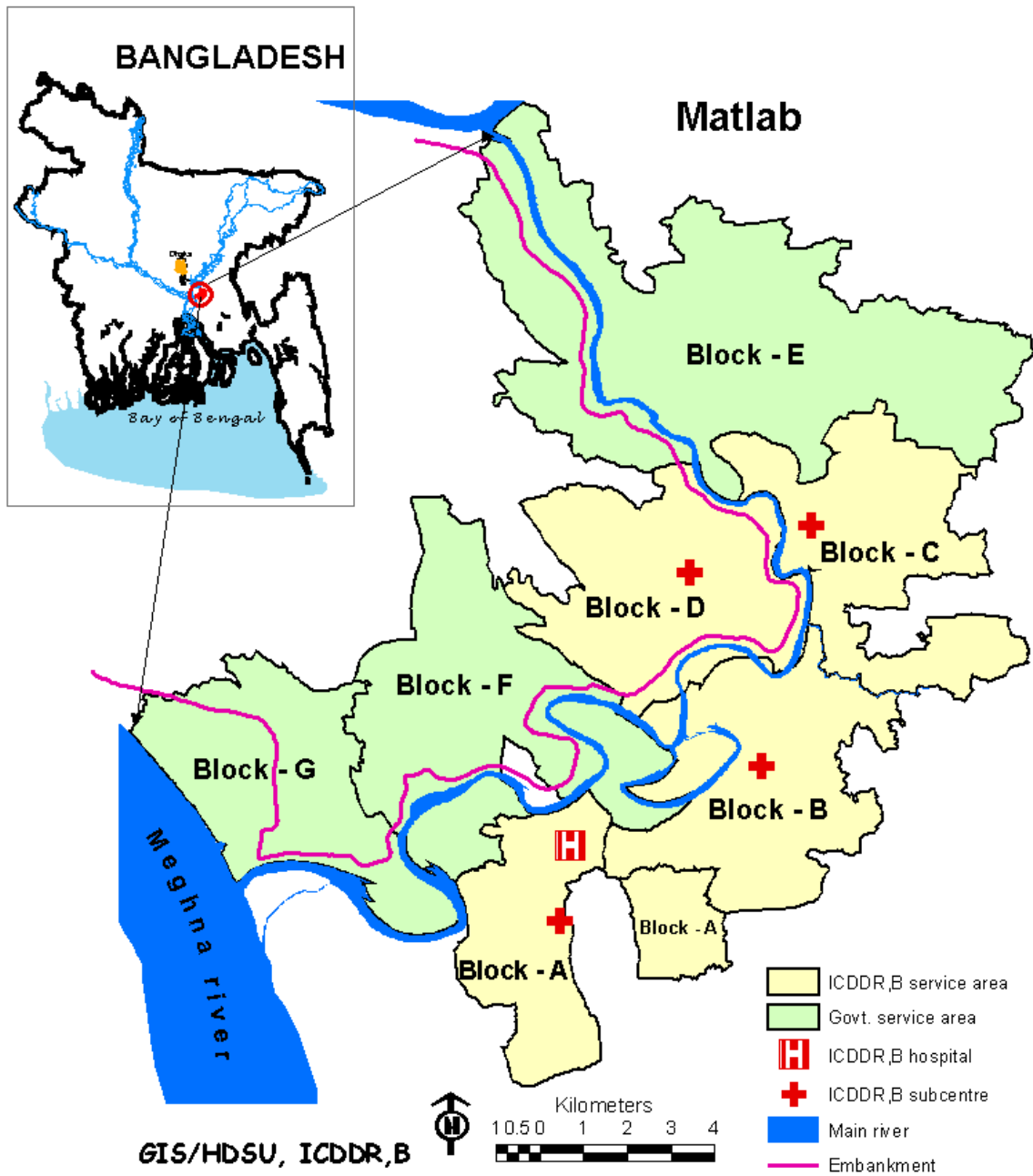
CHAPTER 2

DEMOGRAPHIC TRENDS IN MATLAB

Long term Matlab HDSS data show the demographic transition in the Matlab population over the period 1966-2007. In the early stages of demographic surveillance (1960s and 1970s), the Matlab population was characterized by high fertility, high mortality and high population growth. Apart from a shigella outbreak in 1984 following the famine in 1974 and the Liberation War in 1971, there has been steady decline in natural increase, fertility and mortality to the present. Figure 2.1 shows that over the period 1966-2007, crude birth rate (CBR) has dropped by 52%, crude death rate (CDR) by 53%, and natural increase by 51%. Fertility in Matlab has remained at a moderate level since the early 1990s, and coupled with gradual declines in mortality, it is evident that Matlab is now at the third stage of the demographic transition.

Figure 2.1 Demographic Transition in Matlab 1966-2007
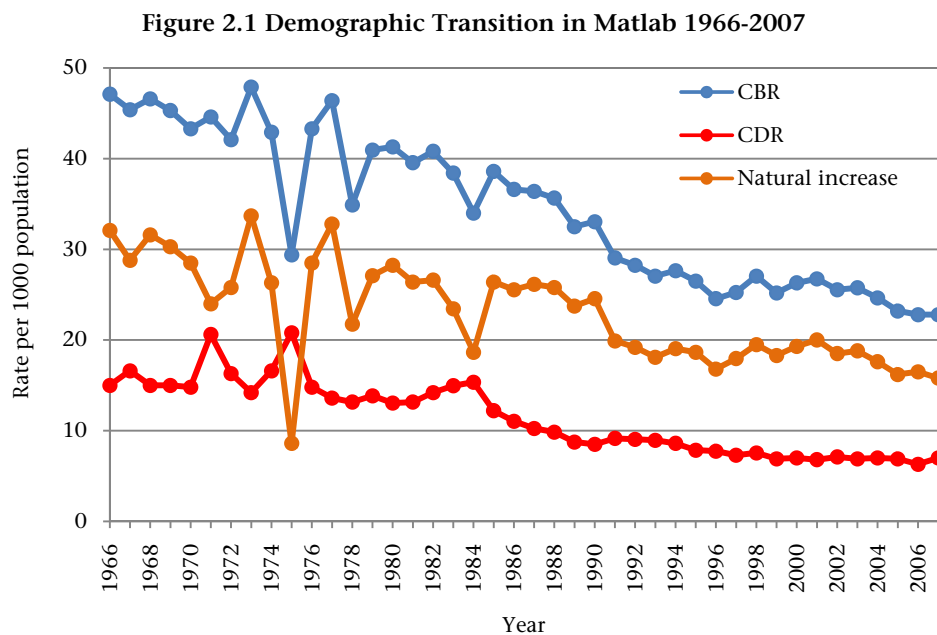
Matlab surveillance area started with a high fertility level of 6.7 children per women in 1966. After re-organization of the surveillance area into ICDDR,B and Government service areas in 1978, total fertility rate (TFR) in ICDDR,B service area remained substantially lower than the Government service area (on average 1.1 child less per woman during 1978-2000). But from 2001, TFR in both areas converged at the level just below 3 children per woman (Figure 2.2).

Figure 2.2 Total Fertility Rate (TFR) in Matlab by area, 1966-2007
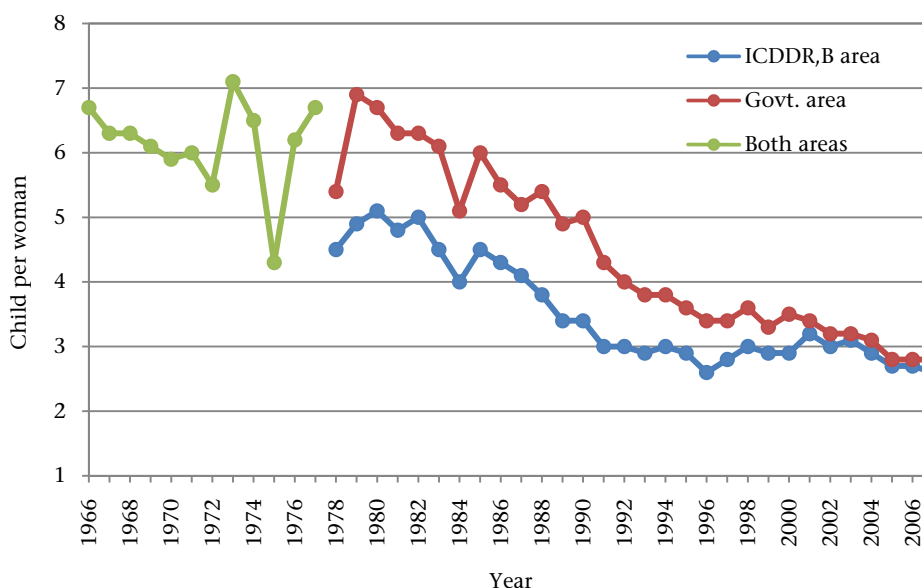
Provision of contraceptive supply and advice has been carried out since the inception of the program by female CHRWs. From 2001, this service delivery system was switched to fixed-site system from door-step delivery in the ICDDR,B service area. Both the methods of service provision have dramatically increased access of contraceptive services to women in Matlab and are associated with a low rate of contraception discontinuation. The service and surveillance records show that during this period, contraceptive prevalence rate (CPR) increased from 33.2% in 1978 to 69.2% in 2006, and then declined to 56.6% in 2007 in ICDDR,B service area. This level of CPR is similar to the national level but substantially higher than the Government service area level (Figure 2.3).

Figure 2.3 Contraceptive Prevalence Rate (CPR) in Matlab and Bangladesh, 1978-2007
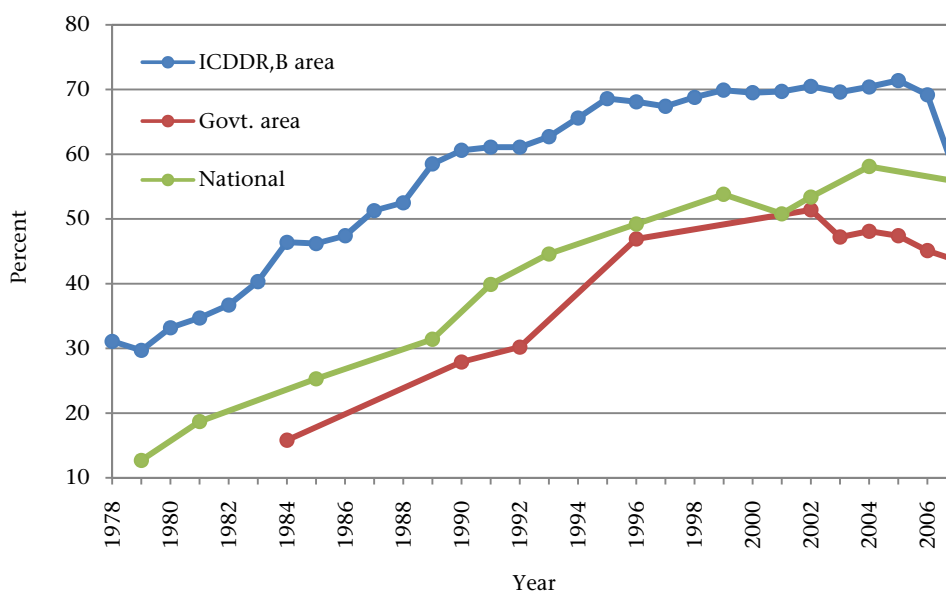
A large part of the decline in mortality in Matlab since the mid 1960s is a result of substantial reductions in infant and child mortality. Figure 2.4 shows that in the areas of Matlab receiving maternal and child health services (the ICDDR,B service area), infant mortality rate (IMR) fell by 76% over the period 1966-2007. In Government service area, IMR declined 69% for the same period. Figure 2.5 shows that, during the same period, under-five mortality rate (U5MR) declined by 78% in ICDDR,B service area and 75% in Government service area. In both areas, the famine in 1974 had the greatest influence on the infant and child mortality followed by the shigella outbreak in 1984.

Figure 2.4 Infant Mortality Rates (IMR) in Matlab by area, 1966-2007
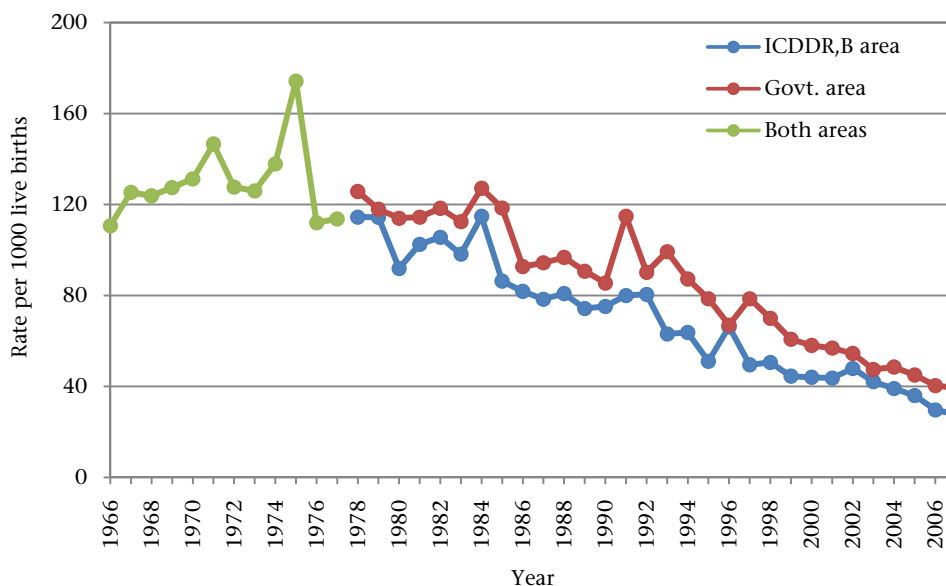
Figure 2.5 Under-five Mortality Rates (U5MR) in Matlab by area, 1966-2007
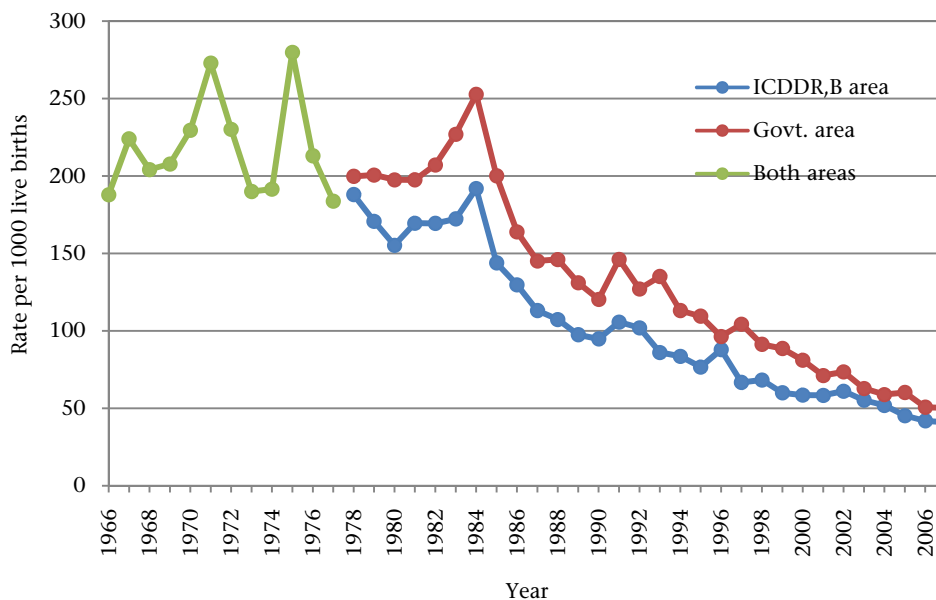
Massive reduction of infant and child mortality has resulted in remarkable improvement in life expectancy at birth during the last 40 years. The life expectancy at birth for males rose from 53 years in 1966 to 68 in 2007, a gain of 15 years and for women, the improvement is even more evident, from 51 to 71, a gain of nearly 21 years (Figure 2.6).

Figure 2.6 Expectation of life at birth (e^0) by sex in Matlab, 1966-2007
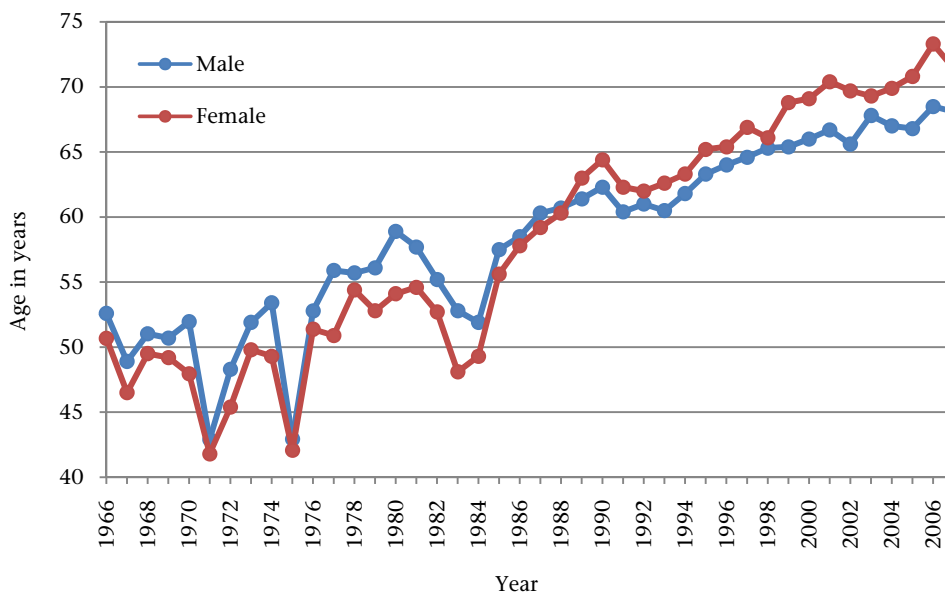
The Figure 2.7 shows the trends in mean age at first marriage for brides and grooms in Matlab. Mean age at first marriage has increased in both areas in 1975-2007. During this period, brides' mean age at marriage increased by 3.8 years and for grooms, it increased by 2.9 years.

Figure 2.7 Mean age at marriage in Matlab, 1975-2007
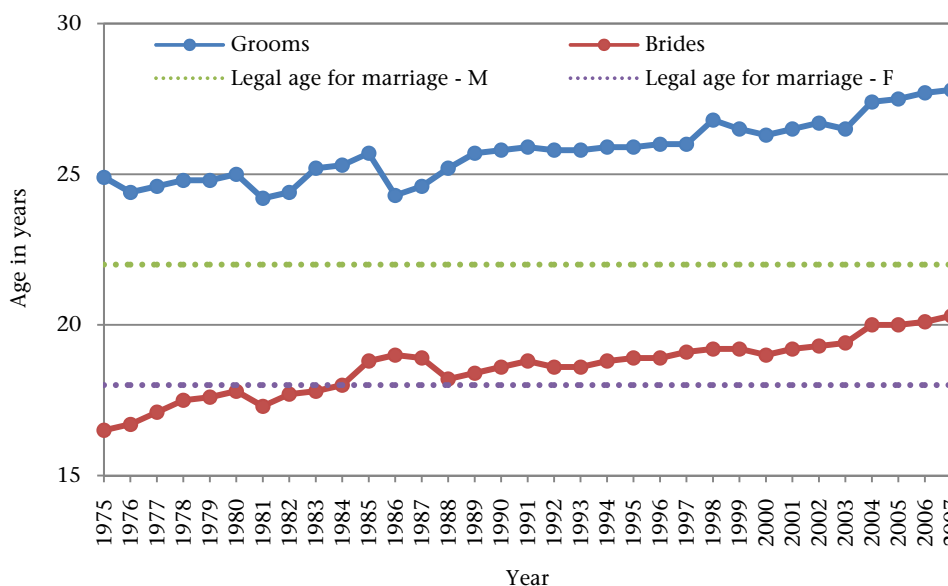
CHAPTER 3

POPULATION CHANGES

The principal vital statistics of the ICDDR,B and Government service areas from 1996 through 2007 are summarized in Table 3.1. The size of mid-year population and the demographic events registered in 2007 in both ICDDR,B and Government service areas are shown in Table 3.2. Appendix B shows the mid-year population, number of births, and deaths by village.

The crude birth rate slightly decreased to 22.6 in 2007 from 22.9 in 2006 in the ICDDR,B service area and increased to 23.0 in 2007 from 22.7 in 2006 the Government service area. In the ICDDR,B service area, the crude death rate increased to 6.8 in 2007 compared to 6.3 in 2006, and in the Government service area it increased to 7.1 in 2007 compared to 6.4 in 2006. In both areas, the TFR remained almost same at 2.6 in ICDDR,B area and 2.8 in Government service area in 2007 compared to 2006. The trends in the TFR in both areas are illustrated in Figure 2.2 of Chapter 2.

The rate of infant mortality decreased to 27.7 in 2007 from 29.7 in 2006 in the ICDDR,B service area, and to 39.3 in 2007 from 40.4 in 2006 in the Government service area. In the ICDDR,B service area, neonatal mortality decreased to 20.3 in 2007 from 23.5 in 2006, and in the Government service area it decreased to 29.9 in 2007 from 30.1 in 2006. There was an increase in the mortality rate of children aged 1-4 years in both the ICDDR,B and the Government service areas, in 2007 compared to 2006 level. As a result of these changes, mortality of children aged less than 5 years remained almost similar in both the areas – in the Government service area, it decreased from 50.7 per 1,000 live births in 2006 to 50.3 in 2007, and in the ICDDR,B service area, it decreased from 41.9 in 2006 to 41.0 in 2007. The trends in mortality of children aged less than 5 years are illustrated in Figures 2.3 and 2.4 in Chapter 2.

The numbers of in- and out-migrants registered in 2007 were 8,953 and 14,235 respectively, giving an in-migration rate of 40.0, out-migration rate of 63.5 and a net migration rate of 23.6 per 1,000 population leaving the area. Out-migrants continued to outnumber in-migrants, thus offsetting the rate of natural increase and keeping the overall annual population growth rate to -0.8%.

The age-sex distribution of the mid-year population of the Matlab HDSS villages is shown in Tables 3.3 and 3.4. Block-wise mid-year population in the ICDDR,B service area is shown in Appendix A.1. The age-sex distribution of the mid-year population is illustrated by the population pyramid (Figure 3.1). The fertility decline in the surveillance area in the 1978-2007 period caused a change in the age structure of the population. Children aged less than 15 years constituted 43.4% of the total population in the ICDDR,B service area at the beginning of the ICDDR,B service project in 1978. By 2007, this proportion had fallen to 33.2%. In the Government service area, the change in age distribution was slightly less than that in the ICDDR,B service area – children aged less than 15 years in the Government service area decreased from 43.3% of the total population in 1978 to 34.3% in 2007. This difference in age structure was due to the difference in fertility decline in the two areas. On the other hand, the

percent of elderly population (60 years and over) in the surveillance area has increased from 5.6% in 1978 to 9.2% in 2007 due to the decline in both fertility and mortality. The net population increase was -7.7 per 1,000 in 2007 while it was 2.7 per 1,000 in 2006, due to the increase in the number of out-migrants. A possible major cause for men being fewer than women in age group 15-44, as shown in the population pyramid, could be higher out-migration rate among the men in that age group.

Table 3.1. Vital statistics of ICDDR,B and Government service areas*, 1996-2007

Vital rate (per 1,000)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Crude birth rate												
ICDDR,B area	22.4	23.7	25.8	24.5	24.9	26.4	25.8	26.4	24.5	23.2	22.9	22.6
Government area	26.7	26.8	28.3	25.9	27.7	27.1	25.3	25.1	24.8	23.1	22.7	23.0
Both areas	24.5	25.2	27.0	25.2	26.3	26.8	25.6	25.7	24.7	23.2	22.8	22.8
Total fertility rate**												
ICDDR,B area	2.7	2.8	3.0	2.9	2.9	3.1	3.0	3.1	2.9	2.7	2.7	2.6
Government area	3.5	3.4	3.6	3.3	3.5	3.4	3.2	3.2	3.1	2.8	2.8	2.8
Both areas	3.0	3.1	3.3	3.1	3.2	3.3	3.1	3.1	3.0	2.8	2.7	2.7
Crude death rate												
ICDDR,B area	7.6	6.6	7.0	6.4	6.8	6.5	6.9	6.8	6.7	6.9	6.3	6.8
Government area	7.9	8.0	8.1	7.4	7.2	7.0	7.3	7.0	7.4	7.0	6.4	7.1
Both areas	7.7	7.3	7.5	6.9	7.0	6.8	7.1	6.9	7.0	6.9	6.3	7.0
Neonatal mortality***												
ICDDR,B area	39.5	33.1	36.8	25.4	32.3	26.4	34.4	31.5	29.6	26.5	23.5	20.3
Government area	42.1	50.0	44.0	38.6	43.6	42.4	36.4	33.8	35.3	35.4	30.1	29.9
Both areas	40.9	41.9	40.5	32.0	38.4	34.7	35.4	32.6	32.5	30.9	26.8	25.1
Post-neonatal mortality***												
ICDDR,B area	26.6	16.4	13.8	19.1	11.8	17.2	13.5	10.6	9.5	9.6	6.2	7.4
Government area	24.8	28.6	26.0	22.2	14.4	14.5	18.1	13.7	13.2	9.6	10.3	9.4
Both areas	25.7	22.7	20.1	20.6	13.2	15.9	15.9	12.1	11.4	9.6	8.2	8.4
Infant mortality***												
ICDDR,B area	66.2	49.5	50.6	44.5	44.0	43.7	47.9	42.1	39.1	36.0	29.7	27.7
Government area	67.0	78.6	70.0	60.8	58.0	56.9	54.5	47.5	48.5	45.0	40.4	39.3
Both areas	66.6	64.7	60.6	52.7	51.6	50.5	51.2	44.8	43.9	40.5	35.0	33.5
Child mortality (1-4yrs) #												
ICDDR,B area	6.0	4.5	4.7	4.1	3.9	3.9	3.5	3.6	3.4	2.4	3.2	3.4
Government area	8.0	7.0	5.8	7.5	6.4	3.8	5.2	4.1	2.7	4.0	2.6	2.8
Both areas	7.1	5.8	5.2	5.8	5.2	3.9	4.4	3.9	3.1	3.2	2.9	3.1
Under five mortality***												
ICDDR,B area	87.9	66.7	68.3	60.0	58.6	58.4	61.1	55.2	51.9	45.3	41.9	41.0
Government area	96.4	104.4	91.3	88.6	81.1	71.2	73.6	62.9	58.9	60.2	50.7	50.3
Both areas	92.3	86.3	80.1	74.4	70.7	65.0	67.5	59.1	55.4	52.8	46.2	45.7
Rate of natural increase												
ICDDR,B area	14.8	17.1	18.8	18.1	18.1	19.9	18.9	19.6	17.8	16.3	16.6	15.8
Government area	18.8	18.7	20.2	18.5	20.5	20.1	18.0	18.0	17.5	16.1	16.3	15.9
Both areas	16.8	17.9	19.5	18.3	19.3	20.0	18.5	18.8	17.6	16.2	16.5	15.8
In-migration	25.1	34.6	30.3	34.8	35.1	34.0	45.7	40.4	42.1	35.7	43.5	40.0
Out-migration	35.0	41.7	36.9	48.0	48.5	46.2	52.4	55.4	57.9	53.3	57.3	63.5
Growth (%)	0.7	1.1	1.3	0.5	0.6	0.8	1.2	0.4	0.2	-0.1	0.3	-0.8

*ICDDR,B area refers to ICDDR,B service area and Government area refers to Government service area
**Per woman
***Per 1,000 live births
#Per 1,000 children aged 1-4 years

Table 3.2. Mid-year population, events registered, and population changes, 2007

Demographic indicator	Number			Rate per 1,000		
	Total	Male	Female	Total	Male	Female
Total Population (as of 30 June 2007)						
ICDDR,B service area	113660	53620	60040	-	-	-
Government service area	110379	52006	58373	-	-	-
Both areas	224039	105626	118413	-	-	-
Events registered (Jan-Dec. 2007)						
Births						
ICDDR,B service area	2564	1307	1257	22.6	-	-
Government service area	2542	1286	1256	23.0	-	-
Both areas	5106	2593	2513	22.8	-	-
Deaths						
Infants*						
ICDDR,B service area	71	38	33	27.7	29.1	26.3
Government service area	100	53	47	39.3	41.2	37.4
Both areas	171	91	80	33.5	35.1	31.8
All deaths						
ICDDR,B service area	769	413	356	6.8	7.7	5.9
Government service area	789	423	366	7.1	8.1	6.3
Both areas	1558	836	722	7.0	7.9	6.1
In-migration	8953	4185	4768	40.0	39.6	40.3
Out-migration	14235	7749	6486	63.5	73.4	54.8
Marriage	3263	-	-	14.6	-	-
Divorce**	339	-	-	103.9	-	-
Population change (Jan-Dec. 2007)						
Net migration	-5282	-3564	-1718	-23.6	-33.7	-14.5
Natural increase						
ICDDR,B service area	1795	894	901	15.8	16.7	15.0
Government service area	1753	863	890	15.9	16.6	15.2
Both areas	3548	1757	1791	15.8	16.6	15.1
Net increase	-1734	-1807	73	-7.7	-17.1	0.6

*Rate per 1,000 live births
**Rate per 1,000 marriages

Table 3.3. Mid-year population by age and sex, 2007

Age (years)	Number			Percent		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	224039	105626	118413	100.0	100.0	100.0
<1 year	4955	2508	2447	2.2	2.4	2.1
1 – 4	20826	10648	10178	9.3	10.1	8.6
1	*5051*	*2590*	*2461*	*2.3*	*2.5*	*2.1*
2	*5119*	*2604*	*2515*	*2.3*	*2.5*	*2.1*
3	*5311*	*2741*	*2570*	*2.4*	*2.6*	*2.2*
4	*5345*	*2713*	*2632*	*2.4*	*2.6*	*2.2*
5 – 9	25893	13210	12683	11.6	12.5	10.7
10-14	24024	12017	12007	10.7	11.4	10.1
15-19	22328	10645	11683	10.0	10.1	9.9
20-24	18318	7777	10541	8.2	7.4	8.9
25-29	15081	6162	8919	6.7	5.8	7.5
30-34	13928	5992	7936	6.2	5.7	6.7
35-39	13836	5905	7931	6.2	5.6	6.7
40-44	14392	6379	8013	6.4	6.0	6.8
45-49	13313	6754	6559	5.9	6.4	5.5
50-54	9278	4586	4692	4.1	4.3	4.0
55-59	7358	3511	3847	3.3	3.3	3.2
60-64	6907	3002	3905	3.1	2.8	3.3
65-69	5434	2481	2953	2.4	2.3	2.5
70-74	4120	1985	2135	1.8	1.9	1.8
75-79	2346	1169	1177	1.0	1.1	1.0
80-84	1093	562	531	0.5	0.5	0.4
85+	609	333	276	0.3	0.3	0.2

Table 3.4. Mid-year population by age, sex, and area, 2007

Age (years)	ICDDR,B service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	113660	53620	60040	110379	52006	58373
<1 year	2543	1282	1261	2412	1226	1186
1 – 4	10572	5424	5148	10254	5224	5030
1	*2576*	*1354*	*1222*	*2475*	*1236*	*1239*
2	*2623*	*1340*	*1283*	*2496*	*1264*	*1232*
3	*2698*	*1384*	*1314*	*2613*	*1357*	*1256*
4	*2675*	*1346*	*1329*	*2670*	*1367*	*1303*
5 – 9	12925	6485	6440	12968	6725	6243
10-14	11754	5857	5897	12270	6160	6110
15-19	10594	4979	5615	11734	5666	6068
20-24	9441	3977	5464	8877	3800	5077
25-29	7830	3226	4604	7251	2936	4315
30-34	7520	3292	4228	6408	2700	3708
35-39	7232	3096	4136	6604	2809	3795
40-44	7578	3419	4159	6814	2960	3854
45-49	6848	3527	3321	6465	3227	3238
50-54	4726	2375	2351	4552	2211	2341
55-59	3704	1772	1932	3654	1739	1915
60-64	3492	1537	1955	3415	1465	1950
65-69	2761	1264	1497	2673	1217	1456
70-74	2050	1037	1013	2070	948	1122
75-79	1169	593	576	1177	576	601
80-84	595	292	303	498	270	228
85+	326	186	140	283	147	136

Figure 3.1. Age pyramid of the mid-year population in Matlab, 2007
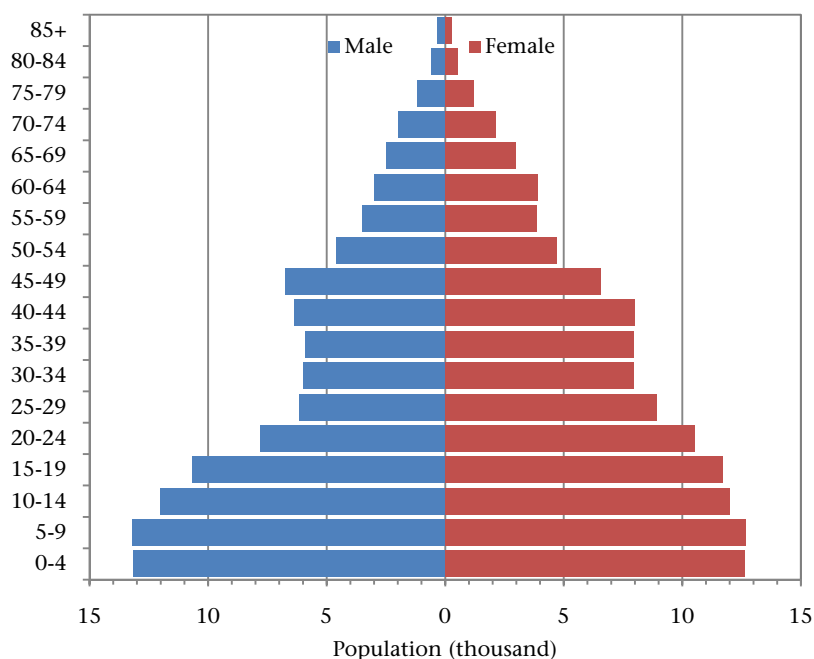
CHAPTER 4

MORTALITY

The distribution of 1,558 deaths by age at death and sex for the Matlab HDSS area and for the ICDDR,B and Government service areas is shown in Tables 4.1 and 4.2 respectively. Of the 1,558 deaths, 11.0% were infants, 4.2% were of children of age 1-4 years, and 64.0% were aged 60 years and above in 2007.

Tables 4.3 and 4.4 show the corresponding age-sex-specific mortality rates for the whole HDSS area and for the ICDDR,B and Government service areas. Block-wise deaths in the ICDDR,B service area by age and sex are shown in Appendix A.2. In 2007, the overall death rates for males and females were 7.9 and 6.1 respectively. Infant mortality rate was 35.1 per 1,000 live births for males and 31.8 per 1,000 live births for females. It was lower in the ICDDR,B service area than in the Government service area, a result of improvements in the neonatal mortality in the former area. The maternal mortality ratio was 156.0 per 100,000 live births in ICDDR,B service area and 196.7 per 100,000 live births in Government service area.

Table 4.5 shows the abridged life tables for males and females derived from age-sex specific death rates, and the survival (l_x) values are plotted in Figure 4.1 (for Life Table Equations see Appendix C). The expectation of life at birth declined in 2007 compared to the 2006 level (previous report). It was 68.1 years for males and 71.4 for females in 2007. The level of adult (15-59 years) mortality decreased as a whole in 2007 compared to 2006. The probability of dying for males between age 15 and 60 years ($_{45}q_{15}$) was 173, and for females it was 91.6 per 1,000 population in 2007. For all age-groups, expectation of life is longer for females than males.

The expectation of life at birth was a little higher for males in the ICDDR,B service area than the Government service area. In 2007, the gender difference in expectation of life was more pronounced in the Government service area (3.6 yrs) than in the ICDDR,B service area (3.0 yrs). Up to 60 years of age, expectation of life at each age in each area was higher for females than for males (Appendices A.3 and A.4).

Table 4.6 shows the distribution of deaths by age and month of occurrence. Deaths of those aged 5 years and above tend to peak in the winter months (December-January). Neonatal deaths were most frequent in October and December. Post-neonatal deaths were higher in December and child deaths, on the other hand, were highest in July-August. Figure 4.1 shows that probability of survival for males and females started to differ from age 40 with males having a lower probability of survival in later age-groups. At the highest age-group (85 years or more), probability of survival for males and females converges again.

Deaths by underlying causes, sex, age, and by areas are shown in Appendices A.5 – A.8. Table 4.7 gives the age-standardized mortality rates by cause of death (obtained using Verbal Autopsy) and sex and by area, using the WHO-standard world population age structure as shown in Appendix D (WHO, 2000). Deaths due to non-communicable diseases were prominent, led by diseases of circulatory system (stroke, ischaemic heart disease and hypertensive disease), then

neoplasm, followed by COPD and digestive diseases. Among communicable diseases, most deaths occurred due to respiratory infections, followed by septicaemia. Deaths due to tuberculosis occurred substantially more among males than among females. Prematurity and low birth weight remained as important causes of death, particularly of neonates irrespective of sex and area. Accidents and drowning were the major causes of death in the injury category, irrespective of sex and areas. Among the miscellaneous causes, fever of unknown origin followed by senility, were more prominent in both the areas. The maternal mortality ratio in the Government service area in 2007 was 26% higher than that of ICDDR,B service area (197 vs. 156 per 100,000 live births).

Table 4.1. Deaths by age and sex in both areas, 2007

Age (years)	Both sexes		Male		Female	
	Number	Cumulative percentage	Number	Cumulative percentage	Number	Cumulative percentage
All ages	1558	-	836	-	722	-
<1 year	171	-	91	-	80	-
<1 month	128	8.2	74	8.9	54	7.5
1- 5 months	32	10.3	12	10.3	20	10.2
6-11 months	11	11.0	5	10.9	6	11.1
1 – 4 years	65	-	35	-	30	-
1	40	13.5	20	13.3	20	13.9
2	9	14.1	5	13.9	4	14.4
3	6	14.5	3	14.2	3	14.8
4	10	15.1	7	15.1	3	15.2
5 – 9	24	16.7	16	17.0	8	16.3
10-14	15	17.7	8	17.9	7	17.3
15-19	18	18.8	8	18.9	10	18.7
20-24	10	19.4	3	19.3	7	19.7
25-29	12	20.2	7	20.1	5	20.4
30-34	21	21.6	10	21.3	11	21.9
35-39	29	23.4	14	23.0	15	24.0
40-44	26	25.1	14	24.6	12	25.6
45-49	48	28.2	28	28.0	20	28.4
50-54	62	32.2	44	33.3	18	30.9
55-59	76	37.0	55	39.8	21	33.8
60-64	134	45.6	82	49.6	52	41.0
65-69	164	56.2	83	59.6	81	52.2
70-74	233	71.1	117	73.6	116	68.3
75-79	198	83.8	91	84.4	107	83.1
80-84	136	92.6	63	92.0	73	93.2
85+	116	100.0	67	100.0	49	100.0

Table 4.2. Deaths by area, age, and sex, 2007

Age (years)	ICDDR,B service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	769	413	356	789	423	366
<1 year	71	38	33	100	53	47
<1 month	*52*	*31*	*21*	*76*	*43*	*33*
1- 5 months	*12*	*4*	*8*	*20*	*8*	*12*
6-11 months	*7*	*3*	*4*	*4*	*2*	*2*
1 – 4 years	36	18	18	29	17	12
1	*23*	*12*	*11*	*17*	*8*	*9*
2	*7*	*3*	*4*	*2*	*2*	*0*
3	*2*	*0*	*2*	*4*	*3*	*1*
4	*4*	*3*	*1*	*6*	*4*	*2*
5 – 9	11	7	4	13	9	4
10-14	6	3	3	9	5	4
15-19	6	3	3	12	5	7
20-24	6	2	4	4	1	3
25-29	9	6	3	3	1	2
30-34	6	3	3	15	7	8
35-39	11	6	5	18	8	10
40-44	13	6	7	13	8	5
45-49	28	16	12	20	12	8
50-54	34	23	11	28	21	7
55-59	35	28	7	41	27	14
60-64	71	46	25	63	36	27
65-69	86	39	47	78	44	34
70-74	113	56	57	120	61	59
75-79	95	48	47	103	43	60
80-84	70	29	41	66	34	32
85+	62	36	26	54	31	23

Table 4.3. Death rates by age and sex in both areas, 2007

Age (years)	Rate per 1,000 population			Rate per 1,000 person-years		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	7.0	7.9	6.1	6.9	7.9	6.1
<1 year*	33.5	35.1	31.8	33.5	35.1	31.8
*<1 month**	25.1	28.5	21.5	25.1	28.5	21.5
*1- 5 months**	6.3	4.6	8.0	6.3	4.6	8.0
*6-11 months**	2.2	1.9	2.4	2.2	1.9	2.4
1 – 4 years	3.1	3.3	2.9	3.1	3.3	2.9
1	7.9	7.7	8.1	7.9	7.7	8.2
2	1.8	1.9	1.6	1.7	1.9	1.6
3	1.1	1.1	1.2	1.1	1.1	1.2
4	1.9	2.6	1.1	1.9	2.6	1.1
5 – 9	0.9	1.2	0.6	0.9	1.2	0.6
10-14	0.6	0.7	0.6	0.6	0.7	0.6
15-19	0.8	0.8	0.9	0.8	0.7	0.9
20-24	0.5	0.4	0.7	0.5	0.4	0.7
25-29	0.8	1.1	0.6	0.8	1.1	0.6
30-34	1.5	1.7	1.4	1.5	1.7	1.4
35-39	2.1	2.4	1.9	2.1	2.4	1.9
40-44	1.8	2.2	1.5	1.8	2.2	1.5
45-49	3.6	4.1	3.0	3.6	4.1	3.0
50-54	6.7	9.6	3.8	6.7	9.6	3.8
55-59	10.3	15.7	5.5	10.3	15.6	5.4
60-64	19.4	27.3	13.3	19.5	27.3	13.4
65-69	30.2	33.5	27.4	29.8	33.1	27.0
70-74	56.6	58.9	54.3	56.8	59.1	54.6
75-79	84.4	77.8	90.9	83.4	77.0	89.8
80-84	124.4	112.1	137.5	123.8	111.1	137.2
85+	190.5	201.2	177.5	188.3	197.7	176.8

*Rate per 1,000 live births

Table 4.4. Death rates by area, age, and sex, 2007
(per 1,000 population)

Age (years)	ICDDR,B service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	6.8	7.7	5.9	7.1	8.1	6.3
<1 year	27.7	29.1	26.3	39.3	41.2	37.4
*<1 month**	*20.3*	*23.7*	*16.7*	*29.9*	*33.4*	*26.3*
*1- 5 months**	*4.7*	*3.1*	*6.4*	*7.9*	*6.2*	*9.6*
*6-11 months**	*2.7*	*2.3*	*3.2*	*1.6*	*1.6*	*1.6*
1 – 4 years	3.4	3.3	3.5	2.8	3.3	2.4
1	*8.9*	*8.9*	*9.0*	*6.9*	*6.5*	*7.3*
2	*2.7*	*2.2*	*3.1*	*0.8*	*1.6*	*0.0*
3	*0.7*	*0.0*	*1.5*	*1.5*	*2.2*	*0.8*
4	*1.5*	*2.2*	*0.8*	*2.2*	*2.9*	*1.5*
5 – 9	0.9	1.1	0.6	1.0	1.3	0.6
10-14	0.5	0.5	0.5	0.7	0.8	0.7
15-19	0.6	0.6	0.5	1.0	0.9	1.2
20-24	0.6	0.5	0.7	0.5	0.3	0.6
25-29	1.1	1.9	0.7	0.4	0.3	0.5
30-34	0.8	0.9	0.7	2.3	2.6	2.2
35-39	1.5	1.9	1.2	2.7	2.8	2.6
40-44	1.7	1.8	1.7	1.9	2.7	1.3
45-49	4.1	4.5	3.6	3.1	3.7	2.5
50-54	7.2	9.7	4.7	6.2	9.5	3.0
55-59	9.4	15.8	3.6	11.2	15.5	7.3
60-64	20.3	29.9	12.8	18.4	24.6	13.8
65-69	31.1	30.9	31.4	29.2	36.2	23.4
70-74	55.1	54.0	56.3	58.0	64.3	52.6
75-79	81.3	80.9	81.6	87.5	74.7	99.8
80-84	117.6	99.3	135.3	132.5	125.9	140.4
85+	190.2	193.5	185.7	190.8	210.9	169.1

*Rate per 1,000 live births

Table 4.5. Abridged life table by sex, 2007

Age (years)	Male				Female			
	$_nq_x$	l_x	L_x	$e0_x$	$_nq_x$	l_x	L_x	$e0_x$
0	35.1	100000	97192	68.1	31.8	100000	97453	71.4
1	7.7	96491	96053	69.5	8.1	96817	96354	72.7
2	1.9	95748	95656	69.1	1.6	96033	95957	72.3
3	1.1	95565	95512	68.2	1.2	95880	95824	71.4
4	2.6	95460	95337	67.3	1.1	95768	95714	70.5
5	6.0	95214	474745	66.4	3.1	95659	477603	69.6
10	3.3	94639	472471	61.8	2.9	95358	476151	64.8
15	3.8	94325	470808	57.0	4.3	95080	474467	60.0
20	1.9	93971	469436	52.2	3.3	94674	472649	55.2
15	5.7	93790	467724	47.3	2.8	94360	471194	50.4
30	8.3	93258	464504	42.6	6.9	94096	468983	45.5
35	11.8	92483	459900	37.9	9.4	93446	465202	40.8
40	10.9	91393	454662	33.3	7.5	92566	461240	36.2
45	20.5	90395	447686	28.7	15.1	91876	456167	31.4
50	46.9	88539	433047	24.2	19.0	90485	448449	26.9
55	75.6	84384	407034	20.3	27.0	88764	438287	22.3
60	128.3	78008	366428	16.7	64.6	86372	418864	17.9
65	155.0	67999	315000	13.8	128.8	80794	379417	13.9
70	257.9	57461	251375	10.8	240.1	70387	311108	10.6
75	326.6	42644	178902	8.7	370.6	53484	218033	8.1
80	436.4	28718	111808	6.7	507.0	33662	124137	6.5
85+	1000.0	16184	80437	5.0	1000.0	16596	93482	5.6

Table 4.6. Deaths by month and age, 2007

Months	All ages	Age at death			
		<1 month	1-11 months	1-4 years	5 years or above
January	174	12	5	5	152
February	132	13	4	6	109
March	118	4	4	6	104
April	91	6	5	5	75
May	123	8	5	4	106
June	137	8	5	6	118
July	109	9	1	9	90
August	114	10	2	8	94
September	111	13	0	4	94
October	137	16	1	7	113
November	123	12	2	3	106
December	189	17	9	2	161
Total	1558	128	43	65	1322

Table 4.7. Age-standardized mortality rates by cause of death, 2007
(per 100,000 population)*

Cause of death	Male		Female	
	ICDDR,B area	Government area	ICDDR,B area	Government area
Communicable diseases				
Diarrhoeal	(4.49)	12.90	(7.63)	12.74
Dysentery	0.00	(3.66)	0.00	(2.50)
Tuberculosis	(6.84)	18.27	(1.89)	(6.52)
Meningitis	0.00	0.00	(4.14)	0.00
Hepatitis	0.00	(5.03)	(4.47)	(8.94)
Chicken pox	0.00	(2.81)	0.00	0.00
Rabies	0.00	(6.14)	0.00	(1.90)
Septicaemia	12.54	16.19	11.71	34.27
Respiratory infections	12.61	31.01	19.96	37.67
Other communicable	(7.14)	(3.91)	(2.17)	(2.05)
Maternal and neonatal conditions				
Maternal death	-	-	(6.22)	8.43
Premature and LBW	14.04	10.28	(5.71)	25.80
Birth asphyxia	14.04	29.36	7.14	10.62
Other neonatal	12.64	11.75	9.99	7.59
Nutritional	17.08	26.59	23.48	23.13
Non-communicable diseases				
Neoplasm	120.11	103.12	32.56	38.91
Neoplasm in female organ	-	-	22.75	18.54
Congenital malformation	(1.40)	(5.70)	(1.43)	(6.07)
Diabetes	31.02	26.12	25.46	22.53
Other endocrine	0.00	0.00	(2.17)	(5.80)
Neuro-psychiatric	(3.56)	16.68	(4.97)	(4.46)
Rheumatic heart disease	2.45	0.00	0.00	4.10
Hypertensive disease	20.99	17.12	22.30	24.12
Ischaemic heart disease	115.18	83.48	53.89	29.60
Stroke	188.75	198.68	260.54	224.31
Other cardiovascular	77.62	78.67	67.86	56.88
COPD**	69.15	73.08	25.41	36.79
Asthma	14.67	21.65	(6.67)	(10.27)
Other respiratory	13.33	27.60	(1.89)	16.69
Digestive disease	53.02	33.72	26.94	26.82
Renal failure	16.71	11.67	13.29	9.00
Other non-communicable	0.00	(7.20)	(9.16)	0.00
Accident	44.52	43.52	32.83	24.69
Drowning	20.70	15.84	19.92	15.66
Suicide	0.00	11.05	(4.76)	9.59
Homicide	0.00	0.00	(1.74)	0.00
Miscellaneous causes				
Senility	(3.23)	(4.08)	(13.43)	(8.36)
Fever of unknown origin	12.25	11.96	(6.57)	(10.30)
Sudden infant death	0.00	0.00	(5.71)	(3.04)
Unknown/missing/unspecified	37.94	58.56	40.00	51.88
Total	**948.01**	**1027.42**	**806.77**	**840.59**

*Age distribution of standard population is given in Appendix D
** Chronic obstructive pulmonary disease
() Less than 5 deaths

Figure 4.1. Probability of survival from birth to age(x) by sex, 2007
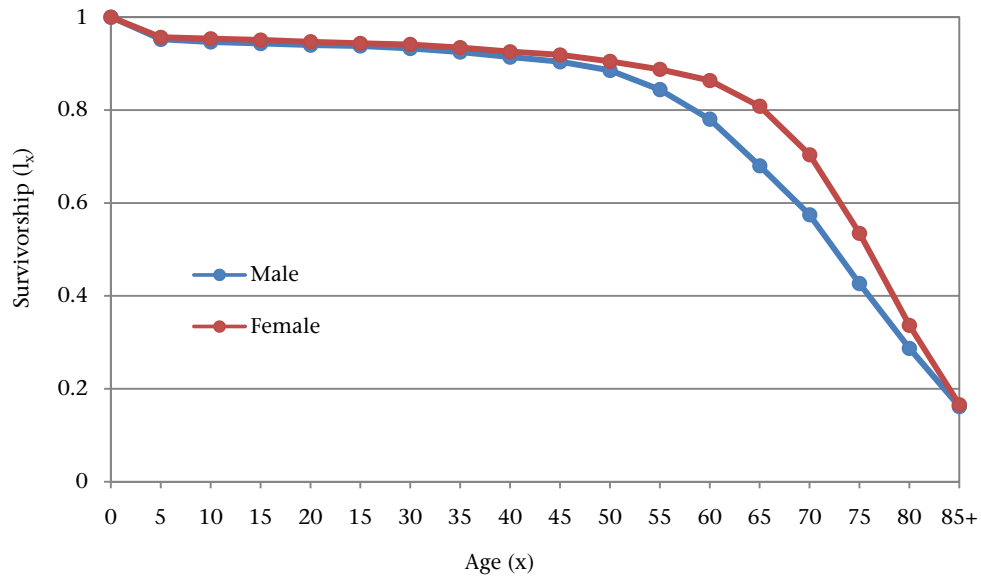
CHAPTER 5

FERTILITY

In 2007, there were 5,106 live births recorded as outcomes of 5,980 pregnancy terminations in the Matlab HDSS area. Table 5.1 shows the number of pregnancy terminations and their outcomes in 2007. In the Matlab HDSS area as a whole, 85% of pregnancies resulted in a live birth, a proportion that remains almost the same from year to year; pregnancies resulting in fetal wastage show no definite trend. Among the pregnancies resulting in live births, 62 were multiple births (twins and triplets).

Table 5.2 shows the distribution of pregnancies by outcome, and live births by sex by month of occurrence. The data show the usual marked seasonal variation of births, peaking in August-December. The sex ratio of live births was 103 males per 100 females; there is no definite trend over the period. Figure 5.1 shows births and deaths by month of occurrence. Seasonality of births corresponds to the peak season of natural growth of population in the area.

Table 5.3 shows the age-specific fertility rates for the study area, together with the total fertility rate, general fertility rate, and gross and net reproduction rates. Figure 5.2 shows the age-specific fertility rates for both ICDDR,B and Government service areas. In the age groups 20-34, the fertility rates were higher in the Government service area compared to the ICDDR,B service area. The age-specific fertility rates and related fertility measures for the ICDDR,B service area by blocks are shown in Appendix A.9.

The breakdown of age-specific fertility rate by birth order facilitates a more detailed and sensitive analysis of fertility trends and differentials. Thus the totals of the order-specific rates represent the components by birth order of the TFR. In the same way TFR represents the average number of children that would be borne by a woman if she goes through life having children at the current age-specific rates, so the total for birth order N represents the proportion of women who would have at least N children. Thus, the tables (Appendices A.10 and A.11) highlight the differences between the ICDDR,B service area and the Government service area. There used to be wider difference between the two areas for birth above order 1, but now the gap is getting narrower.

Table 5.4 shows marked variation in the distribution of live births by place of delivery and area. Institutional delivery accounts for 58% in the ICDDR,B service area and 17% in the Government service area. More commonly used places for institutional delivery in the Government service area were private clinic/nursing home (7.9%) and District Hospital (3.5%), and in ICDDR,B service area, ICDDR,B hospital (22.7%) followed by ICDDR,B sub-centres (16.6%). Table 5.5 shows the distribution of live births by birth attendants[4] and area. In the ICDDR,B service area, TBAs assisted 31.9% of the live-birth deliveries as opposed to 72% in the Government service area. The respective figures for trained TBAs were 34.7% and 11.4%. Medically trained birth attendants (doctors, nurses or midwives, lady family planning visitors or family welfare visitors)

---

[4] The most qualified attendant was considered if there was more than one in attendance.

assisted 32.5% of the live birth deliveries in the ICDDR,B and 16.5% in the Government service area. In the ICDDR,B service area, medically-trained assistance was sought more frequently from MBBS doctors (14%) followed by FWV/SHA (13.1%) whereas in the Government service area, it was from MBBS doctors (9.7%) followed by nurses (5.2%).

Table 5.6 illustrates the mode of delivery of live births by area. Normal vaginal delivery (including use of drug and saline and/or Episiotomy) accounted for 87% in the ICDDR,B service area and 91% in the Government service area. Instrumental deliveries, especially caesarean were 11.8% and 8.7% respectively in the ICDDR,B and Government service areas.

Matlab HDSS recorded pre-natal care received by mothers in different stages of pregnancy in 2007. Table 5.7 shows pre-natal care received by mothers who had a live birth in 2007 in three trimesters by type of service providers. In the ICDDR,B service area, in first trimester 71% of the mothers did not receive any pre-natal care as oppose to 92% in the Government service area. The respective figures for 2nd and 3rd trimester were 17%-12% in the ICDDR,B service area and 46%-44% in the Government service area. In the ICDDR,B service area, seeking pre-natal care from skilled providers accounts for 28% in first trimester and 80%-83% in second and third trimesters. In this area, providers of pre-natal care are ICDDR,B sub-centres (64% in each of the 2nd and 3rd trimesters) and ICDDR,B Matlab hospital (14% and 17% in 2nd and 3rd trimesters respectively). In the Government service area, skilled providers of prenatal care are private clinics (11% and 19% in 2nd and 3rd trimesters respectively), community clinics or family welfare centres (9% and 10% in 2nd and 3rd trimesters respectively) and government hospitals (4% and 6% in 2nd and 3rd trimesters respectively). In this area, others (that include untrained village doctors, herbalists [*kabiraj*] and homeopaths) are most common (31% and 20% in 2nd and 3rd trimesters respectively) providers of pre-natal care.

Figure 5.1. Number of births and deaths by month, 2007
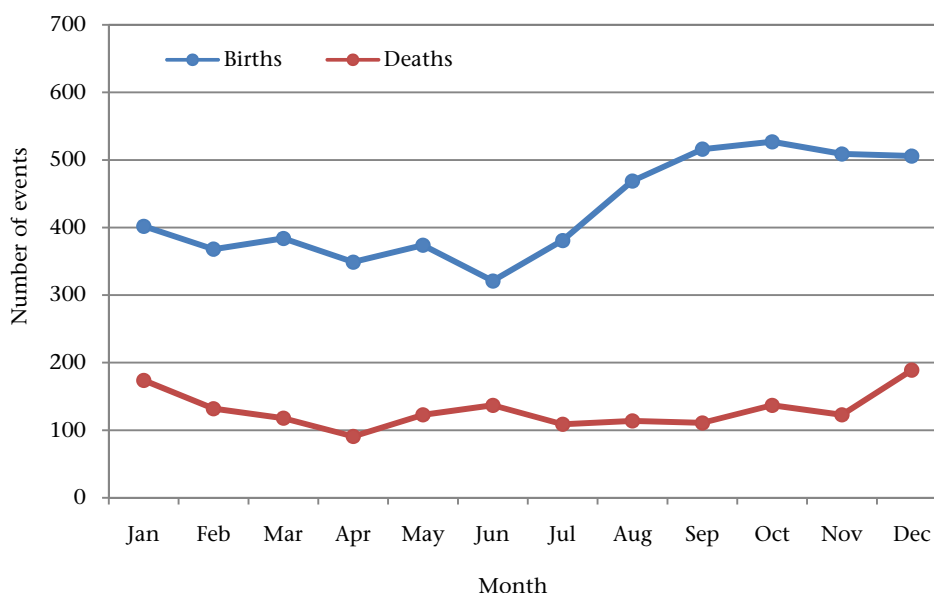
Type of pregnancy outcome	Both areas		ICDDR,B area		Government area	
	Number	Rate	Number	Rate	Number	Rate
Total pregnancies*	5980	97.1	3045	96.6	2935	97.7
Live birth pregnancies**	5055	845.3	2538	833.5	2517	857.6
Fetal wastage**	925	154.7	507	166.5	418	142.4
Early(miscarriage)***	779	130.3	448	147.1	331	112.8
Induced	274	45.8	123	40.4	151	51.4
Spontaneous	505	84.4	325	106.7	180	61.3
Late (still birth)	146	24.4	59	19.4	87	29.6
Multiple birth pregnancy	64		30		34	
Multiple live birth pregnancy	62		29		33	
Three live births	0		0		0	
Two live births	51		26		25	
One live birth	11		3		8	
Still birth pregnancies	1		0		1	
Three still births	0		0		0	
Two still births	1		0		1	
Miscarriage pregnancies	1		1		0	

*Rate per 1000 women of age 15-49 years (GFR)
**Rate per 1000 total pregnancies
***Less than 28 weeks

Table 5.2. Pregnancy outcomes by month, 2007

Months	Pregnancy outcome				No. of live born children			
		Miscarriage		Still	Live	Both			
	All	Induced	Sponta-neous	birth	birth[a]	sexes	Male	Female	Ratio
All months	5980	274	505	146	5055	5106	2593	2513	1.03
January	467	21	33	13	400	402	199	203	0.98
February	418	15	30	9	364	368	191	177	1.08
March	463	29	43	11	380	384	179	205	0.87
April	432	26	52	9	345	349	176	173	1.02
May	452	26	37	17	372	374	198	176	1.13
June	418	31	57	11	319	321	182	139	1.31
July	460	27	50	7	376	381	199	182	1.09
August	558	32	51	12	463	469	244	225	1.08
September	591	19	45	20	507	516	251	265	0.95
October	592	15	43	11	523	527	272	255	1.07
November	573	19	37	14	503	509	249	260	0.96
December	556	14	27	12	503	506	253	253	1.00

[a]For any multiple birth pregnancy, the outcome is recorded as live birth, if at least one of the issue is live born

Table 5.3. Age-specific fertility rates (per 1,000 women) and indices by area, 2007

Age (years)	Both areas		ICDDR,B area		Government area	
	Births	Rate	Births	Rate	Births	Rate
All ages	5106	82.9	2564	81.3	2542	84.6
15-19*	688	58.9	382	68.0	306	50.4
20-24	1677	159.1	827	151.4	850	167.4
25-29	1380	154.7	679	147.5	701	162.5
30-34	847	106.7	419	99.1	428	115.4
35-39	420	53.0	216	52.2	204	53.8
40-44	88	11.0	39	9.4	49	12.7
45-49**	6	0.9	2	0.6	4	1.2
Total fertility rate		2721		2641		2817
General fertility rate		83		81		85
Gross reproduction rate		1339		1295		1392
Net reproduction rate		1261		1226		1303

*Births to mothers under age 15 were included in this group
**Births to mothers age 50 and above were included in this group

Table 5.4. Distribution of live births by place of delivery and area, 2007

Place of Delivery	Both areas		ICDDR,B area		Government area	
	Number	Percent	Number	Percent	Number	Percent
Home	3167	62.7	1071	42.2	2096	83.3
ICDDR,B sub-centre	425	8.4	421	16.6	4	0.2
ICDDR,B hospital	576	11.4	576	22.7	0	0.0
Upazila health complex	98	1.9	18	0.7	80	3.2
District hospital	217	4.3	128	5.0	89	3.5
Clinic/nursing home	477	9.4	279	11.0	198	7.9
UH & FWC	42	0.8	3	0.1	39	1.5
Others	53	1.0	42	1.7	11	0.4
Total	5055	100.0	2538	100.0	2517	100.0

Source: Birth registration form

Figure 5.2. Age-specific fertility rates by area, 2007
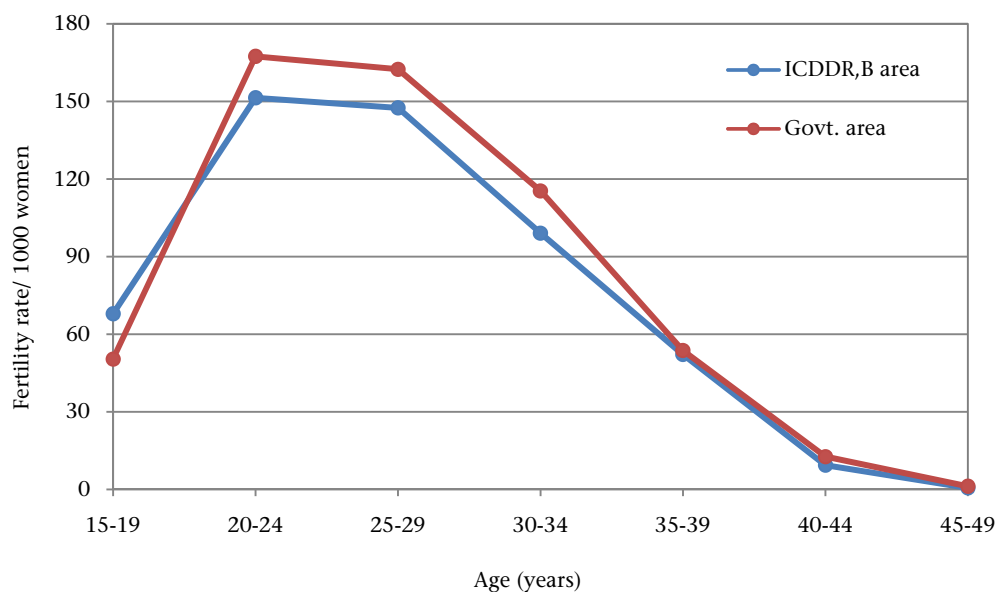
Table 5.5. Distribution of live birth attendant by area, 2007

Birth attendant	Both areas		ICDDR,B area		Government area	
	Number	Percent	Number	Percent	Number	Percent
TBA	2621	51.8	809	31.9	1812	72.0
Trained TBA	1167	23.1	881	34.7	286	11.4
FWV/ SHA	374	7.4	333	13.1	41	1.6
Nurse	266	5.3	136	5.4	130	5.2
MBBS doctor	599	11.8	356	14.0	243	9.7
Others	11	0.2	10	0.4	1	0.0
None	17	0.3	13	0.5	4	0.2
Total	**5055**	**100.0**	**2538**	**100.0**	**2517**	**100.0**

TBA=Traditional birth attendant
FWV= Family welfare visitor
SHA=Senior Health Assistant

Table 5.6. Distribution of mode of delivery by area, 2007

Mode of Delivery	Both areas		ICDDR,B area		Government area	
	Number	Percent	Number	Percent	Number	Percent
Normal vaginal	4497	89.0	2207	87.0	2290	91.0
Operation (C/S)	517	10.2	299	11.8	218	8.7
Instrumental*	41	0.8	32	1.3	9	0.4
Total	**5055**	**100.0**	**2538**	**100.0**	**2517**	**100.0**

*Using forceps/ventose

Table 5.7. Percentage of prenatal care in different trimester and area, 2007

Source	ICDDR,B area			Government service area		
	1st trimester	2nd trimester	3rd trimester	1st trimester	2nd trimester	3rd trimester
Trained TBA	0.0	0.0	0.0	0.1	0.1	0.4
CC/FWC/Sat. Clinic	0.1	0.5	0.6	1.0	8.8	9.9
ICDDR,B Sub-centre	24.9	64.3	64.3	0.1	0.1	0.2
Govt. Hospital/UHC	0.4	1.8	1.3	0.7	3.6	5.7
ICDDR,B Hospital	2.2	13.6	16.8	0.0	0.1	0.2
Chandpur MCWC	0.0	0.0	0.3	0.0	0.3	0.3
Private Clinic	1.3	2.4	4.4	2.6	10.7	19.2
Others	0.1	0.2	0.2	3.8	30.8	20.3
No care	71.0	17.2	12.1	91.7	45.6	43.9
No. of live birth	**2538**	**2538**	**2538**	**2517**	**2517**	**2517**

CHAPTER 6

MARRIAGE AND DIVORCE

The procedures adopted by the HDSS specify that if either partner in a marriage is resident in the HDSS area, the marriage should be solemnized. The number of marriages registered in 2007 was 3,263, giving a crude marriage rate of 14.6 per 1,000 population. This rate is slightly higher than that of 2006, which was 13.9 per 1,000 population. The state law requires legal registration of marriage and divorce of Muslims and Christians (no such law exists for Hindus in Bangladesh). Table 6.7 shows that 85-94% of the Muslim marriages in 2000-2007 was registered with Kazi (marriage registrar), which usually took place in the brides' home.

Tables 6.1, 6.1a, 6.2, and 6.2a show the distribution of grooms and brides by age at marriage and previous marital status in the ICDDR,B and Government service areas. The mean ages at marriage in the ICDDR,B service area were 27.8 and 20.2 for all grooms and brides respectively; 26.8 and 19.5 for those marrying for the first time—are almost the same as those of 2006. The rates are similar in the Government service area also. In general there has been a long-term gradual rise in age at marriage of female in Matlab: the mean age for females has been over 18 years for every year since 1985, while prior to that date it was consistently below that age (Tables 6.2 and 6.2a).

Table 6.3 shows the marriage rates by age and sex. Among males, the marriage rate was 41.2 per 1,000 males aged 10 years and above, and for females the rate was 35.0 per 1,000 females aged 10 years and above. For females, the highest rate was 179.8 per 1,000 at the age of 18 years, while for males the highest rate was 212.1 in the age group of 25-29 years. Table 6.4 shows distribution of current marital status of the study population by age and sex in 2007. Of the total population 46.1% were currently married, and it was higher for females than for males (48.4% vs 39.8%). Widows constituted 9.4% for females and 0.7% for males – this difference, along with age-difference at marriage and life expectancy, may be due to remarriage, which is more common for men than for women.

Table 6.6 shows distribution of marriages by type of gifts received from bridal party, usually the father-in-law, at the time of marriage in 2003-2007. Groom's party received marriage gifts from the father-in-law in nearly two-thirds of all marriages. Gifts were received under two different contracts: there was a clear negotiation with bridal party about gift prior to the marriage or there was no such negotiation, but gift was given for daughter's happiness. The first contract can be regarded as dowry and its incidence was 61.3%. Incidence of giving dowry did not show any declining trend in 2003-2007. Dowry was paid in full at the time of marriage for one-fifth of the marriages and partially for two-fifths of all marriages.

The number of divorces was more than 500 each year during 1978-1981. Since 1981, this figure has been less than 500. In general, the incidence of divorce in Matlab has fallen. HDSS recorded 339 divorces in 2007 (Appendix A.12) and of them, 83.2 percent were registered with courts. Table 6.5 shows the mean and median durations in months of marriage at divorce by age and sex. The average duration of marriage of all divorcing husbands at the time of divorce was 36.5

months. Figure 6.1 shows the distribution of marriages and divorces by month. There has been no strong seasonal pattern for marriages or divorces in 2007 but marriages were high in month of January and low in September.

Figure 6.1. Marriages and divorces by month in Matlab, 2007
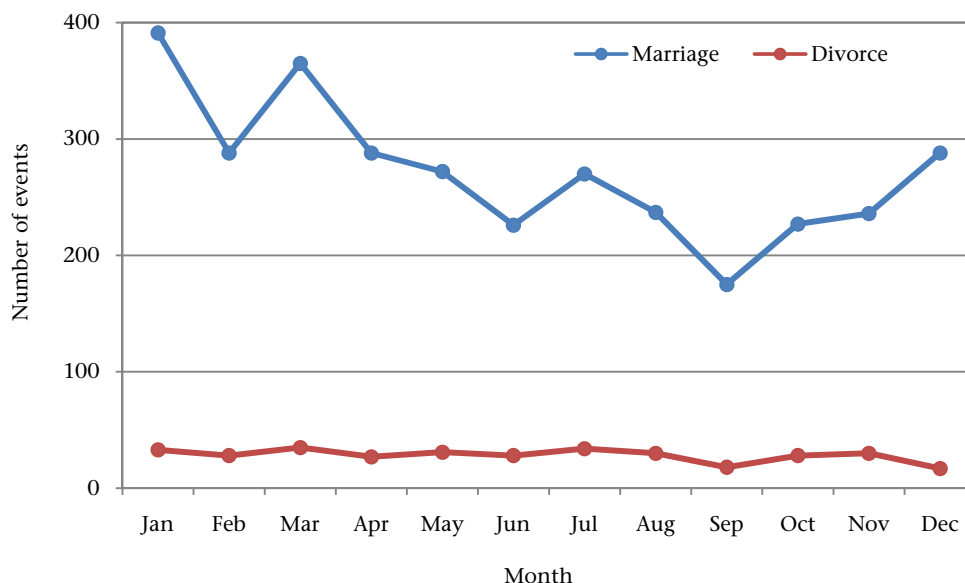
Table 6.1 Groom's age at marriage by previous marital status in ICDDR,B service area, 2007

Age (years)	All grooms	Previous marital status (%)			
		Single	Married	Divorced	Widowed
All ages	100 (n=1638)	88.0 (n=1442)	3.0 (n=49)	6.8 (n=112)	2.1 (n=35)
10-14	0.1	0.1	0	0	0
15-19	5.1	5.6	0	2.7	0.0
20-24	24.9	26.9	6.1	15.2	0
25-29	37.6	39.9	20.4	24.1	8.6
30-34	20.8	20.6	20.4	26.8	11.4
35-39	7.0	5.5	20.4	20.5	2.9
40-44	2.0	0.8	12.2	5.4	22.9
45-49	1.2	0.3	12.2	0.9	22.9
50-54	0.5	0.0	2.0	0.0	20.0
55-59	0.3	0.0	2.04	1.8	5.7
60-64	0.3	0.0	4.08	1.8	2.9
65+	0.1	0.0	0.0	0.9	2.9
Unknown	0.2	0.2	0	0	0
Median age*	27.0	26.0	36.0	30.0	46.0
Mean age*	27.8	26.8	36.6	31.7	46.1
Standard deviation*	6.4	4.9	9.3	8.8	10.4

*Mean and median ages and standard deviation were calculated from ungrouped age data

Table 6.1a Groom's age at marriage by previous marital status in Government service area, 2007

Age (years)	All grooms	Previous marital status (%)			
		Single	Married	Divorced	Widowed
All ages	100.0 (n=1625)	87.3 (n=1418)	2.0 (n=32)	7.7 (n=125)	3.1 (n=50)
10-14	0.1	0.1	0	0	0
15-19	4.3	4.9	0	0.8	0
20-24	24.1	25.2	12.5	22.4	4.0
25-29	42.5	45.1	15.6	30.4	16.0
30-34	19.4	19.6	12.5	22.4	10.0
35-39	5.9	4.5	25.0	14.4	12.0
40-44	1.3	0.4	6.3	3.2	20.0
45-49	1.1	0.0	12.5	4.8	16.0
50-54	0.3	0	9.4	0	4.0
55-59	0.4	0	0	0.8	10.0
60-64	0.2	0	3.1	0	4.0
65+	0.1	0	0	0	4.0
Unknown	0.4	0.3	3.1	0.8	0
Median age*	27.0	27.0	36.0	29.0	41.5
Mean age*	27.7	26.8	36.7	30.3	42.2
Standard deviation*	6.1	4.5	10.4	6.9	13.2

*Mean and median ages and standard deviation were calculated from ungrouped age data

Table 6.2 Bride's age at marriage by previous marital status in ICDDR,B area, 2007

Age (years)	All brides	Previous marital status (%)			
		Single	Married	Divorced	Widowed
All ages	100 (n=1638)	91.7 (n=1502)	-	7.4 (n=122)	0.9 (n=14)
10-14	3.6	3.9	-	0.0	0
15-19	50.9	54.3	-	14.8	0.0
20-24	31.2	31.5	-	29.5	14.3
25-29	9.8	8.3	-	27.9	14.3
30-34	2.6	1.5	-	15.6	7.1
35-39	1.1	0.3	-	9.0	21.4
40-44	0.4	0.0	-	1.6	28.6
45-49	0.2	0	-	1.6	7.1
50-54	0.1	0	-	0.0	7.1
55-59	0.0	0	-	0.0	0
60-64	0.0	0	-	0.0	0
65+	0	0	-	0	0
Unknown	0.1	0.1	-	0	0
Median age*	19.0	19.0	-	26.0	38.5
Mean age*	20.2	19.5	-	26.3	36.9
Standard deviation*	4.7	3.7	-	6.5	9.4

*Mean and median ages and standard deviation were calculated from ungrouped age data

Table 6.2a Bride's age at marriage by previous marital status in Government service area, 2007

Age (years)	All brides	Previous marital status (%)			
		Single	Married	Divorced	Widowed
All ages	100 (n=1625)	90.8 (n=1475)	-	8.2 (n=134)	1.0 (n=16)
10-14	2.9	3.1	-	0.7	0.0
15-19	50.7	54.3	-	16.4	6.3
20-24	32.8	33.2	-	31.3	12.5
25-29	9.6	8.3	-	22.4	25.0
30-34	1.7	0.7	-	11.2	6.3
35-39	1.0	0.3	-	7.5	18.8
40-44	0.7	0.1	-	7.5	6.3
45-49	0.2	0.1	-	0.7	12.5
50-54	0.1	0.0	-	0.0	6.3
55-59	0.1	0.0	-	1.5	0.0
60-64	0.1	0.0	-	0.7	6.3
65+	0.0	0.0	-	0	0.0
Unknown	0.0	0.0	-	0.0	0.0
Median age*	19.0	19.0	-	25.0	34.0
Mean age*	20.3	19.6	-	27.0	34.9
Standard deviation*	5.1	3.6	-	9.1	11.9

*Mean and median ages and standard deviation were calculated from ungrouped age data

Table 6.3 Marriage rates by age and sex, 2007

Age (years)	Male			Female		
	Marriages	Population	Rate*	Marriages	Population	Rate*
All ages(10+ yrs)	3263	79260	41.2	3263	93105	35.0
10-14	2	12017	0.2	106	12007	8.8
15	1	2120	0.5	147	2146	68.5
16	7	2398	2.9	275	2352	116.9
17	20	2149	9.3	382	2304	165.8
18	45	2070	21.7	446	2480	179.8
19	81	1908	42.5	408	2401	169.9
20-24	799	7777	102.7	1044	10541	99.0
25-29	1307	6162	212.1	317	8919	35.5
30-34	656	5992	109.5	70	7936	8.8
35-39	210	5905	35.6	35	7931	4.4
40-44	53	6379	8.3	18	8013	2.2
45+	73	24383	3.0	13	26075	0.5
Unknown	9	-	-	2	-	-

* Rates per 1000 population irrespective of previous marital status

Table 6.4. Distribution of current marital status (%) by age and sex, 2007

Age (years)	Male					Female				
	NM	PM	WID	DIV	Total	NM	PM	WID	DIV	Total
0-4	100.0	0.0	0.0	0.0	13156	100.0	0.0	0.0	0.0	12625
5-9	100.0	0.0	0.0	0.0	13210	100.0	0.0	0.0	0.0	12683
10-14	100.0	0.0	0.0	0.0	12017	99.0	1.0	0.0	0.0	12007
15-19	97.8	2.2	0.0	0.0	10645	71.4	27.9	0.0	0.7	11683
20-24	78.1	21.5	0.0	0.3	7777	25.3	73.2	0.1	1.3	10541
25-29	40.3	59.0	0.0	0.6	6162	5.6	92.9	0.4	1.1	8919
30-34	13.8	85.5	0.0	0.6	5992	1.7	95.8	1.4	1.1	7936
35-39	3.3	96.0	0.0	0.6	5905	0.5	95.9	2.4	1.1	7931
40-44	1.0	98.5	0.0	0.5	6379	0.5	92.1	5.7	1.7	8013
45-49	0.5	99.0	0.2	0.2	6754	0.2	86.6	11.2	2.0	6559
50-54	0.4	98.6	0.6	0.4	4586	0.1	78.1	19.9	1.8	4692
55-59	0.2	98.6	0.9	0.3	3511	0.1	63.8	34.6	1.6	3847
60-64	0.2	97.3	2.1	0.4	3002	0.0	49.8	48.9	1.4	3905
65-69	0.2	96.0	3.4	0.4	2481	0.1	33.8	65.4	0.8	2953
70-74	0.1	92.6	6.6	0.6	1985	0.1	18.8	80.5	0.7	2135
75-79	0.2	86.1	13.1	0.6	1169	0.1	9.8	89.8	0.3	1177
80-84	0.0	77.8	21.4	0.9	562	0.0	6.4	93.2	0.4	531
85+	0.3	67.6	30.9	1.2	333	0.0	1.8	97.5	0.7	276
All (%)	55.4	43.6	0.7	0.3	100.0	41.3	48.4	9.4	0.9	100.0
Total	58516	46104	734	272	105626	48951	57257	11189	1016	118413

NM=Never married, PM=Presently married, WID=Widowed, DIV=Divorced

Table 6.5. Duration (months) of all marriages at divorce by age and sex, 2007

Age at divorce (years)	Male				Female			
	No.	Mean	Median	SD	No.	Mean	Median	SD
< 20	13	10.8	7.0	10.0	88	16.0	12.5	13.1
20 - 24	64	21.3	16.0	16.8	145	28.1	24.0	23.0
25 - 29	90	27.4	18.5	26.3	61	57.2	52.0	40.4
30 - 34	81	32.6	24.0	29.1	20	72.7	58.0	59.6
35 - 39	46	61.6	52.0	51.1	15	64.7	48.0	56.6
40 - 49	31	71.7	60.0	57.4	7	110.6	120.0	76.3
50+	14	50.4	43.0	42.0	3	63.0	72.0	26.7
All ages	339	36.5	24.0	38.1	339	36.5	24.0	38.1

Table 6.6. Marriages by type of dowry received from bridal party (father-in-law) 2003-2007

Type of gift received	Year				
	2003	2004	2005	2006	2007
None	32.9	35.0	32.7	33.5	37.7
Gift without prior negotiation	2.3	1.5	0.8	0.5	1.0
Gift after prior negotiation	64.8	63.5	66.5	66.0	61.3
Gift payment					
Full	NA	20.2	19.5	18.6	17.9
Partial	NA	39.7	39.9	40.4	39.0
Not yet paid*	NA	3.6	7.1	7.0	7.1

NA=Not available
*Was agreed at the time of marriage but did not pay as yet

Table 6.7. Registration status of Muslim marriages, 2000-2007.

Year	Registered with kazi		Not registered	
	Number	Percent	Number	Percent
2000	2457	85.0	434	15.0
2001	2486	87.7	348	12.3
2002	2620	87.4	376	12.6
2003	2469	87.3	359	12.7
2004	2483	91.7	224	8.3
2005	2563	91.1	251	8.9
2006	2521	92.5	205	7.5
2007	2726	94.0	175	6.0

Table 6.8. Registration status of divorces of Muslim marriages, 2000-2007.

Year	Registered with kazi		Not registered	
	Number	Percent	Number	Percent
2000	195	67.2	95	32.8
2001	179	67.8	85	32.2
2002	243	74.8	82	25.2
2003	239	76.1	75	23.9
2004	230	82.4	49	17.6
2005	243	80.7	58	19.3
2006	270	88.2	36	11.8
2007	278	83.2	56	16.8

CHAPTER 7

MIGRATION

An out-migrant is defined as a person originally listed on a Matlab HDSS census as a resident, or a person who became a resident by birth or immigration, who subsequently moved out of the Matlab surveillance area permanently (or at least for six months). Likewise, an in-migrant is an individual neither recorded in the last census nor born or lived in the Matlab HDSS area after the census who has permanently moved into the surveillance area. Those who stay in the area continuously for at least 6 months in a year, or come home at least once a month to stay overnight, are treated as permanent residents. These definitions are used in the surveillance area as a whole.

During 2007, 8,953 persons (4,185 males and 4,768 females) moved into the HDSS area, which represented an annual average in-migration of 4.0% for both males and females of the mid-year population. On the other hand, 14,235 persons (7,749 males and 6,486 females) left the HDSS area or on an average 6.4% for both males and females of the mid-year population (Appendix A.13), giving a crude rate of in-migration of 40.0 per 1000 population, and out-migration rate of 63.5 per 1000 population. The highest incidence of in-migration for males was 8.8% in the age group 25-29 and for females was 9.2 percent in the age group 15-19. More males out-migrated than females in the age group (15-59). The consequence of the out migration of more males than females, particularly to urban areas is that the sex ratio of the population of the area has decreased from 103 in 1982 to 89 males per 100 females in 2007. More out-migration of working age (15-59) group males to females caused a decline in the sex ratio over the period.

In-migration rate in 2007 decreased over those of 2006, whereas out-migration rates increased compared with 2006 level. The net loss of migrants was 23.6 per 1,000 in 2007, whereas it was 13.8 per 1,000 in 2006. Table 7.1 presents the age-specific migration rates, which are illustrated in Figure 7.1. The tables and figures show the bi-modal distribution of age commonly found for migrant populations, with a primary peak of young adults and a secondary peak of young children moving with their parents. Male out-migrants were rather younger than male in-migrants, while for females the pattern of age distribution was more similar. Table 7.2 and Figure 7.2 show the numbers moving in and out by month. January is the preferred month for both in- and out-migration. Numbers of in- and out-migration by age, sex, and cause of movement are shown in Appendix A.16 through A.19. Roughly, an equal number of men and women move into and out of rural areas, females predominantly for marriage and males predominantly for seeking jobs. There is a net loss of both men and women to urban Dhaka, primarily of young adults. Migration to the Middle East and other Asian locations is heavily concentrated among out-migrating males aged 15-44 years (Appendices A.20 and A.21).

Table 7.1 Age and sex-specific migration rates (per 1,000 population) by direction, 2007

Age (years)	Both sexes		Male		Female	
	In	Out	In	Out	In	Out
All ages	40.0	63.5	39.6	73.4	40.3	54.8
0 - 4	54.0	62.0	53.0	61.0	55.0	63.0
5 - 9	31.2	40.2	31.5	42.2	31.0	38.1
10-14	23.9	42.3	22.5	43.3	25.2	41.4
15-19	63.6	116.6	32.1	108.6	92.2	123.9
20-24	78.8	147.8	63.0	180.0	90.5	124.1
25-29	71.5	122.1	87.6	174.5	60.3	86.0
30-34	53.6	85.4	80.9	127.5	32.9	53.6
35-39	35.8	56.9	56.4	96.7	20.4	27.2
40-44	22.5	40.6	32.9	66.6	14.2	20.0
45-49	17.7	23.3	24.4	31.8	10.7	14.5
50-54	15.4	17.8	21.4	24.6	9.6	11.1
55-59	13.6	13.2	17.1	16.2	10.4	10.4
60-64	9.1	14.0	10.3	11.0	8.2	16.4
65+	24.5	35.9	19.3	23.8	28.8	46.1

Table 7.2 In- and out-migration by sex and month, 2007

Months	In-migration			Out-migration		
	Both sexes	Male	Female	Both sexes	Male	Female
All months	8953	4185	4768	14235	7749	6486
January	1028	466	562	1477	720	757
February	811	403	408	1379	696	683
March	775	336	439	1197	590	607
April	659	299	360	1020	552	468
May	497	233	264	1017	550	467
June	716	313	403	1227	693	534
July	617	291	326	1179	649	530
August	905	432	473	1239	709	530
September	723	363	360	1093	634	459
October	811	391	420	1325	774	551
November	646	292	354	933	564	369
December	765	366	399	1149	618	531

Figure 7.1. Rates of in- and out-migration by sex and age in Matlab, 2007

(a) Male

(b) Female
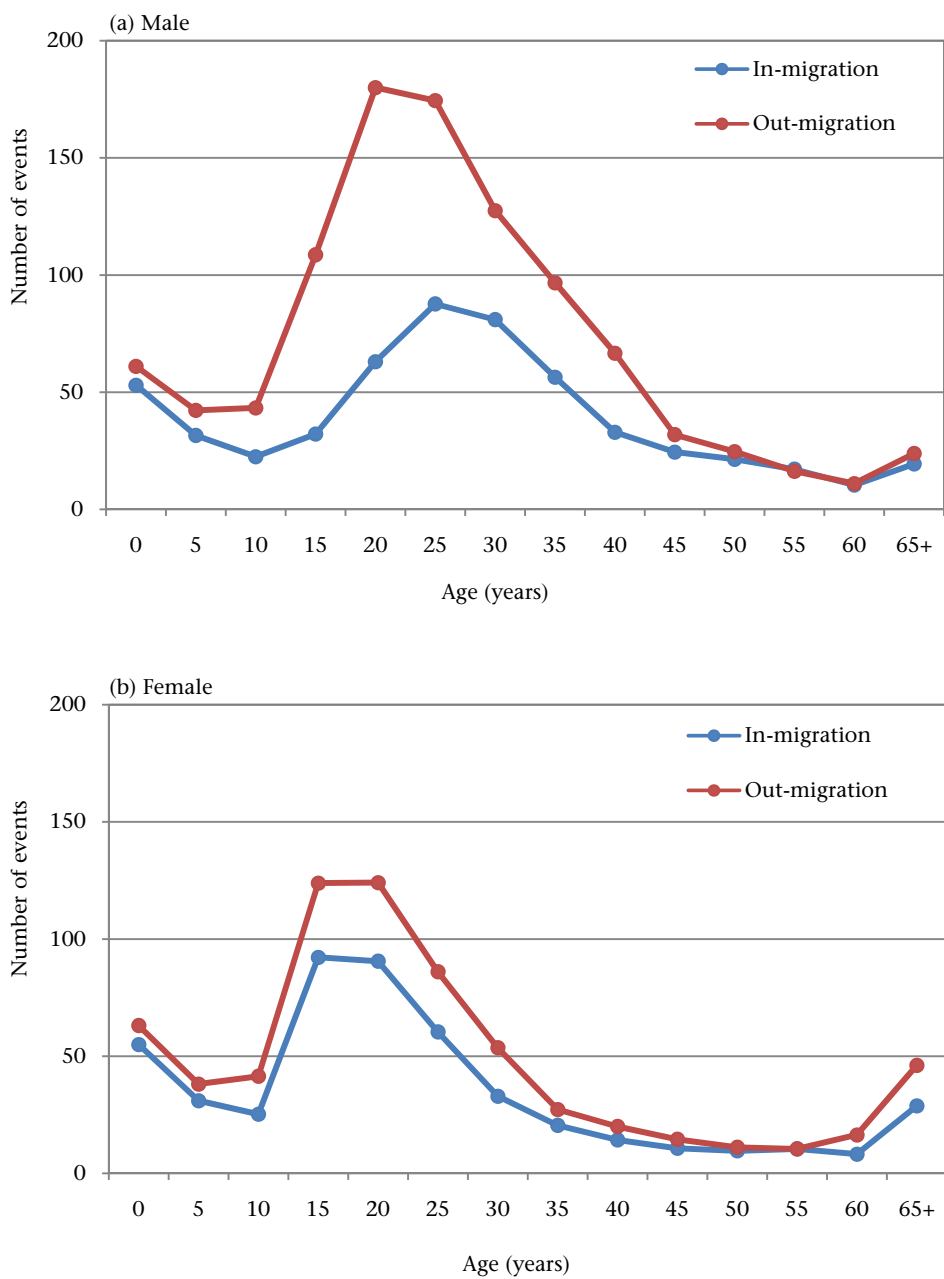
Figure 7.2. Number of in- and out-migrations by sex and month in Matlab, 2007

(a) Male

(b) Female
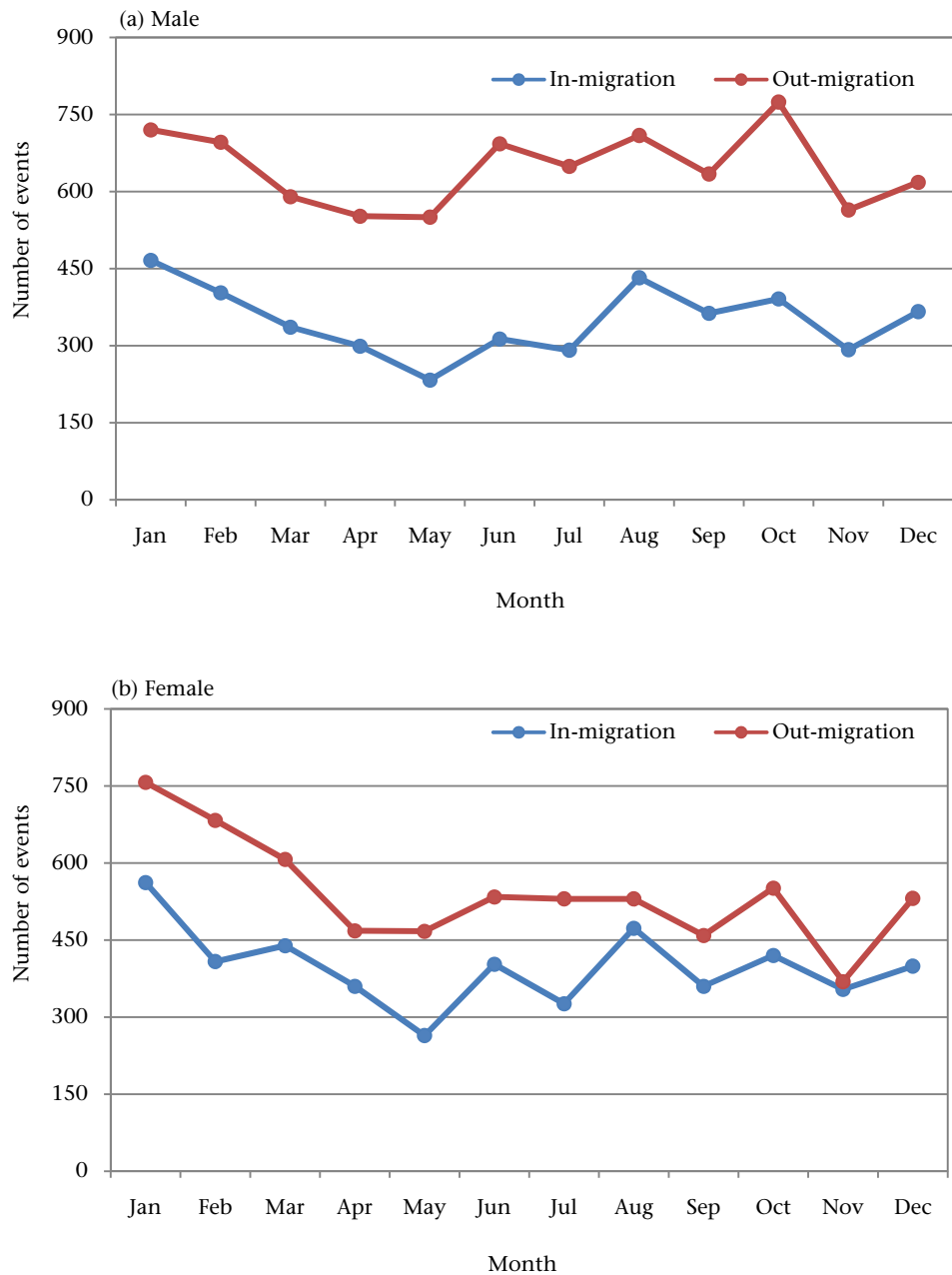
CHAPTER 8

FERTILITY REGULATION

In the ICDDR,B service area, the service CHRWs have been providing maternal and child health and family planning (MCH-FP) services including EPI from fixed-sites (usually in one room of their houses) since 2001 and maintain records of MCH-FP services they provide. They also refer the patients to ICDDR,B sub-centres, motivate couples for adopting family planning; advise pregnant women for antenatal care, safe delivery, and use of safe-delivery kit; advise parents for immunization of children; make them aware of symptoms of common childhood morbidity; and advise them to treat sick children by formally trained providers. In the Government service area, services are provided from the Union Health and Family Welfare Centre and 8 Satellite Clinics monthly, and from 24 EPI Centres for vaccinations of children, adolescents, and women of reproductive ages.

The surveillance CHRWs in both ICDDR,B and Government service areas record family planning methods used by couples in the previous month by asking eligible women about family planning during their monthly home visits. In 2007 contraceptive use rate was 56.6% in the ICDDR,B service area and 43.6% in the Government service area (Table 8.1). Contraceptive use rate in the Government service area was much lower than the national level use rate of 55.8% recorded in 2007. The service and surveillance data show that contraceptive use rate in ICDDR,B service area dramatically declined in 2007 compared to 69.2% in 2006. The reasons behind this decline could be relocation of service points due to increase of coverage by the service CHRWs and hence users' access to FP services was disrupted temporarily. Furthermore, service CHRWs are currently involved with MNCH activities in addition to their usual workload, and remain unavailable in the fixed sites during afternoons for FP services delivery. Data from national sources (BDHS 2007) also indicate that in 2006-2007, shortage in injectables supply from government sources was resulted decline in national CPR level also.

Table 8.2 shows the difference in contraceptive method-mix between the ICDDR,B and Government service areas in 2007 and the national-level estimates for selected years. At the national level and in the Government service area, the pill is the most widely-used method, followed by injectables and tubectomy, while in the ICDDR,B service area, injectables is the most widely-used method, followed by pill, tubectomy, and condom. Changes in the method-mix in the ICDDR,B service area during 1993-2007 are shown in Table 8.3. The use of pill and condom has increased with decreases in use of tubectomy and injectables over the years. The contraceptive-use rate increases with the increase in women's age in the ICDDR,B service area (Table 8.4). In the ICDDR,B service area, women aged 20 years and over are more likely to use injectables, pills or IUD, or undergo tubectomy, or adopt norplants than women aged less than 20 years, whereas in the Government service area (Table 8.5), the pill is the most popular method in all age groups except in age group 45 years and over. Tubectomy and traditional methods are more popular in the age group 40 years and over.

Table 8.1. Contraceptive use rate (%) of currently married women aged 15-49 years by area, 1982-2007

| Year | Matlab | | National** |
	ICDDR,B area	Government area*	
1982	36.7	-	-
1983	40.3	-	19.1
1984	46.4	15.8	-
1985	46.2	-	-
1986	47.4	-	25.3
1987	51.3	-	-
1988	52.5	-	-
1989	58.8	-	31.4
1990	60.6	27.9	-
1991	61.1	-	39.9
1992	61.1	30.2	-
1993	62.7	-	44.6
1994	65.6	-	-
1995	68.6	-	-
1996	68.1	46.9	49.2
1997	67.4	-	-
1998	68.8	-	-
1999	69.9	-	53.8
2000	69.5	-	-
2001	69.7	-	50.8
2002	70.5	51.4	53.4
2003	69.6	47.2	-
2004	70.4	48.1	58.1
2005	71.4	47.4	-
2006	69.2	45.1	-
2007	56.6	43.6	55.8

*Sources: In-depth and KAP surveys, 1984 & 1990; MDHS 1992; HDSS census 1996 and HDSS 2002-2007.
**Sources: Contraceptive prevalence survey, Bangladesh fertility survey 1989; Bangladesh demographic and health survey 1993-94,1996-97, 1999-2000,2004, 2007; Bangladesh maternal health services and maternal mortality survey 2001, Bangladesh Bureau of Statistics

Table 8.2. Contraceptive method mix (%) in different surveys and areas

| Method | Matlab | | National | |
	ICDDR,B area, 2007	Government area, 2007	BMMS 2001	BDHS 2007
Pill	33.6	52.5	51.2	51.1
Condom	8.4	4.3	6.4	8.1
Injectables	42.4	18.2	15.7	12.5
IUD	1.8	1.1	1.6	1.6
Tubectomy	8.9	12.4	10.6	9.0
Vasectomy	1.6	0.4	1.0	1.2
Norplant	0.5	2.2	1.0	1.2
Others*	2.8	9.0	12.5	14.9
Total	**100.0**	**100.0**	**100.0**	**100.0**

BDHS=Bangladesh demographic and health survey
BMMS=Bangladesh maternal health services and maternal mortality survey
*Others include periodic abstinence, withdrawal, and other traditional methods

Table 8.3. Contraceptive method mix* (%) in the ICDDR,B service area, 1992-2007

Method	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Pill	28.1	25.7	25.8	25.4	26.0	29.7	28.7	30.6	31.9	33.3	33.9	32.6	34.1	35.8	34.6
Condom	3.2	3.9	4.7	6.2	7.7	7.1	7.7	9.5	10.8	11.1	11.0	10.9	11.2	10.8	8.6
Injectables	50.2	52.9	54.3	54.4	53.1	50.0	50.4	47.8	45.7	44.5	44.4	45.2	42.7	41.3	43.6
IUD	3.6	3.1	2.7	2.2	1.8	2.3	3.3	2.4	1.9	1.8	1.9	2.4	2.6	2.4	1.9
Tubectomy	14.5	14.0	12.2	11.5	11.1	10.6	9.8	9.1	8.6	7.7	7.2	7.4	7.6	7.9	9.2
Vasectomy	0.4	0.4	0.3	0.3	0.3	0.3	0.1	0.6	1.1	1.5	1.5	1.4	1.4	1.5	1.6
Foam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Norplant	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.3	0.3	0.5
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

*Currently married women using any modern method.

Table 8.4. Method specific contraceptive use rate among currently married women by age in ICDDR,B service area, 2007

Age (years)	Not using	Any method used	Method used								No. of eligible women
			Pill	IUD	Injectables	Condom	Tubectomy	Vasectomy	Others*	Norplant	
<20	73.2	26.8	11.4	0.7	11.6	2.9	0.0	0.0	0.2	0.0	1304
20 – 24	57.3	42.7	18.9	1.3	19.3	2.8	0.1	0.0	0.2	0.1	3747
25 - 29	49.7	50.3	20.2	1.4	23.2	4.2	0.6	0.0	0.4	0.3	4173
30 - 34	41.3	58.7	20.8	1.2	27.1	4.7	3.4	0.5	0.6	0.4	4141
35 - 39	33.8	66.2	21.0	0.9	28.5	5.8	6.7	1.4	1.6	0.3	3918
40 - 44	28.8	71.2	19.8	0.8	28.0	6.5	10.4	2.4	2.8	0.4	3590
45 - 49**	36.3	63.7	14.1	0.5	21.0	5.4	14.7	1.8	6.0	0.2	2601
Total	**43.4**	**56.6**	**19.0**	**1.0**	**24.0**	**4.7**	**5.0**	**0.9**	**1.6**	**0.3**	**23474**

*Others include periodic abstinence, withdrawal, and other traditional methods.
**Currently married women aged 50 and above were included in this group

Table 8.5. Method specific contraceptive use rate among currently married women by age in Government service area, 2007

Age (years)	Not using	Any method used	Method used								No. of eligible women
			Pill	IUD	Injectables	Condom	Tubectomy	Vasectomy	Others*	Norplant	
<20	79.7	20.3	14.1	0.2	2.3	3.0	0.0	0.0	0.8	0.0	1103
20 – 24	69.9	30.1	21.1	0.3	5.1	2.1	0.1	0.0	0.8	0.0	3447
25 - 29	63.8	36.2	24.1	0.5	7.4	1.7	0.5	0.1	1.0	0.0	3937
30 - 34	52.5	47.5	28.5	0.6	9.9	1.8	3.2	0.1	2.3	0.0	3588
35 - 39	44.8	55.2	27.8	0.7	11.7	2.0	6.4	0.2	4.8	0.0	3612
40 - 44	44.0	56.0	21.7	0.5	9.6	1.9	11.9	0.3	9.1	0.0	3280
45 - 49**	54.6	45.4	12.3	0.3	4.2	1.0	17.5	0.6	8.9	0.0	2180
Total	**56.4**	**43.6**	**22.9**	**0.5**	**7.9**	**1.9**	**5.4**	**0.2**	**3.9**	**0.0**	**21147**

*Others include periodic abstinence, withdrawal, and other traditional methods.
**Currently married women aged 50 and above were included in this group

CHAPTER 9

GEOGRAPHICAL INFORMATION SYSTEM (GIS)

Geographic Information System (GIS) component was established in 1994 under the Public Health Sciences Division (former Community Health Division) to provide cartographic and thematic maps to all other researchers at the Centre. Initially, the GIS unit dealt with Matlab spatial data, then gradually expanded its area to all over Bangladesh. It provides thematic maps to all other projects according to their requirements. Subsequently, the GIS unit aggregated with RKS and DSS under the Health and Demographic Surveillance Unit (HDSU) in 1998. Whenever a member gets his DSS identification, (s)he is automatically linked to the corresponding geo-references objects of the Matlab GIS. The spatially related objects are village and *bari* (cluster of a group of households), and the object types are area and points. Periodic updating is done into the spatial databases incorporating new *bari,* roads or facilities. The locations of tubewells, ditches, ponds, health facilities, educational institutes etc. are included in our spatial database for the study area.

Due to new development of software and satellite images, there will be large scope to expand GIS activities in different fields. GIS unit currently generates thematic maps, creates spatial variables and performs spatial analysis with georeferenced data. Spatial analysis can generate surfaces to see the spatial and temporal relationship in space. Any kind of spatial information can be extracted from high-resolution imagery and it can help researchers to visualize spatial relationship among diseases. Population distribution, and clustering of morbidity and mortality and risk factors, can be visualized using GIS tools and it can facilitate research according to the needs of the researcher more efficiently and effectively. Figures 9.1 shows the elevation map of entire Bangladesh, which illustrates that most of the south-west region of this country is within 6 meters from the sea-level. Figure 9.2 shows that the map of villages in Matlab surveillance area by its socio-economic status – it illustrates that in terms of average asset scores of the households, villages situated in south and south-west region of the surveillance area are poorer than the rest of the area.

In Matlab surveillance area, GIS data are collected periodically through GPS surveyors and Field Research Supervisors (FRS). The FRSs are trained in using handheld Global Positioning System (GPS) device to collect coordinates of new baris, tubewells, health and other infrastructures, and landmark locations. High concentration of arsenic in ground water has become a serious public health problem in Bangladesh and the location of Matlab is ideal for the sedimentation process to produce arsenic laden soil, since it is situated near the confluence of the Meghna and Ganges Rivers. Around 98% of the Matlab inhabitants depend on tubewells as the water source for drinking, cooking and washing, which are contaminated with high level of arsenic contamination. Figure 9.3 shows that most of the tubewells located in south-west and eastern parts of Matlab study area pump water have an arsenic concentration of 50 μg/L or more. Figure 9.4 mapped the Matlab surveillance area by cholera attack rate per 1,000 population. It shows that the villages situated in the southern part of the surveillance area is more cholera-prone than the northern ones.

Figure 9.1. Elevation map of Bangladesh
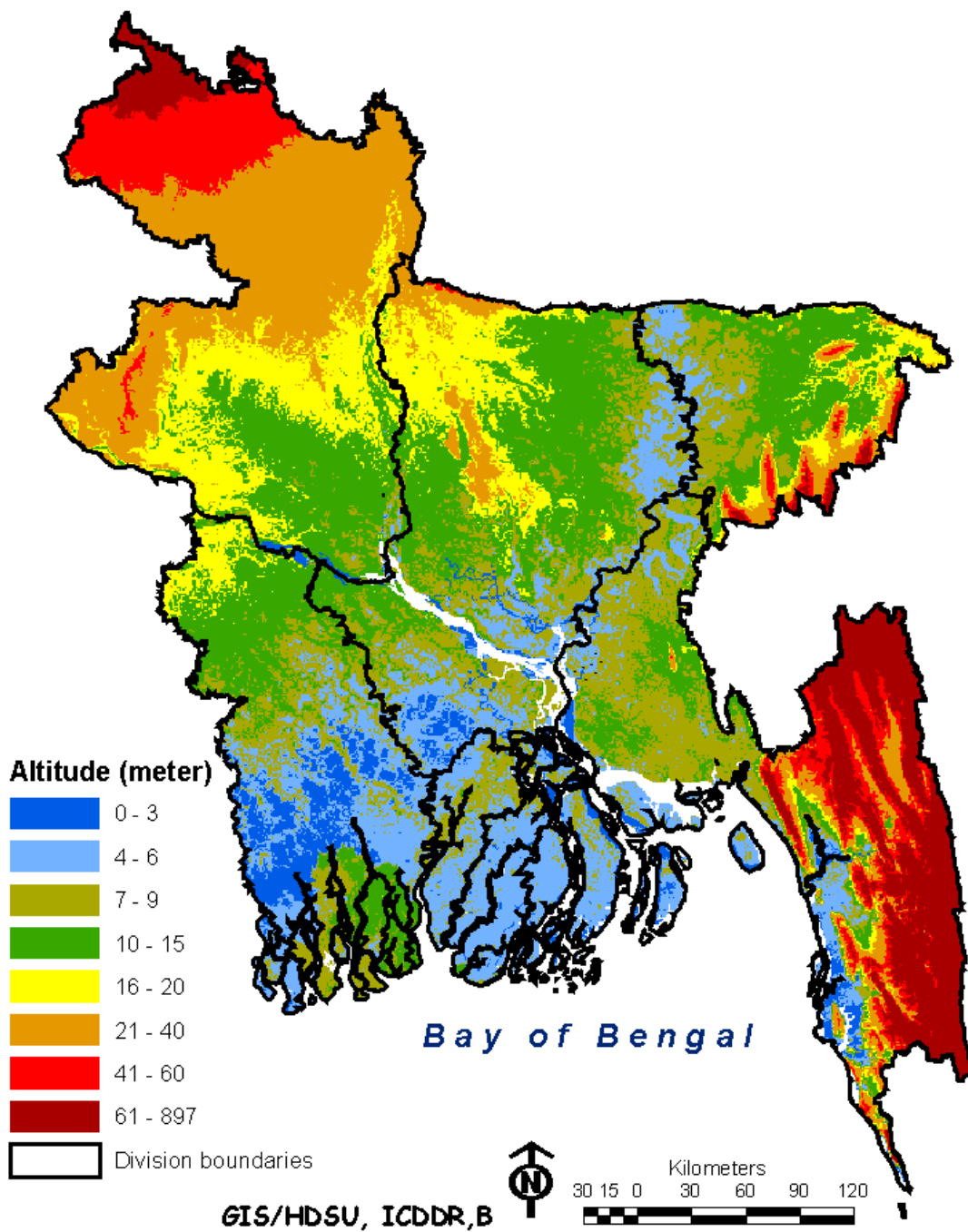
Figure 9.2. Asset score by villages in Matlab study area, 2005
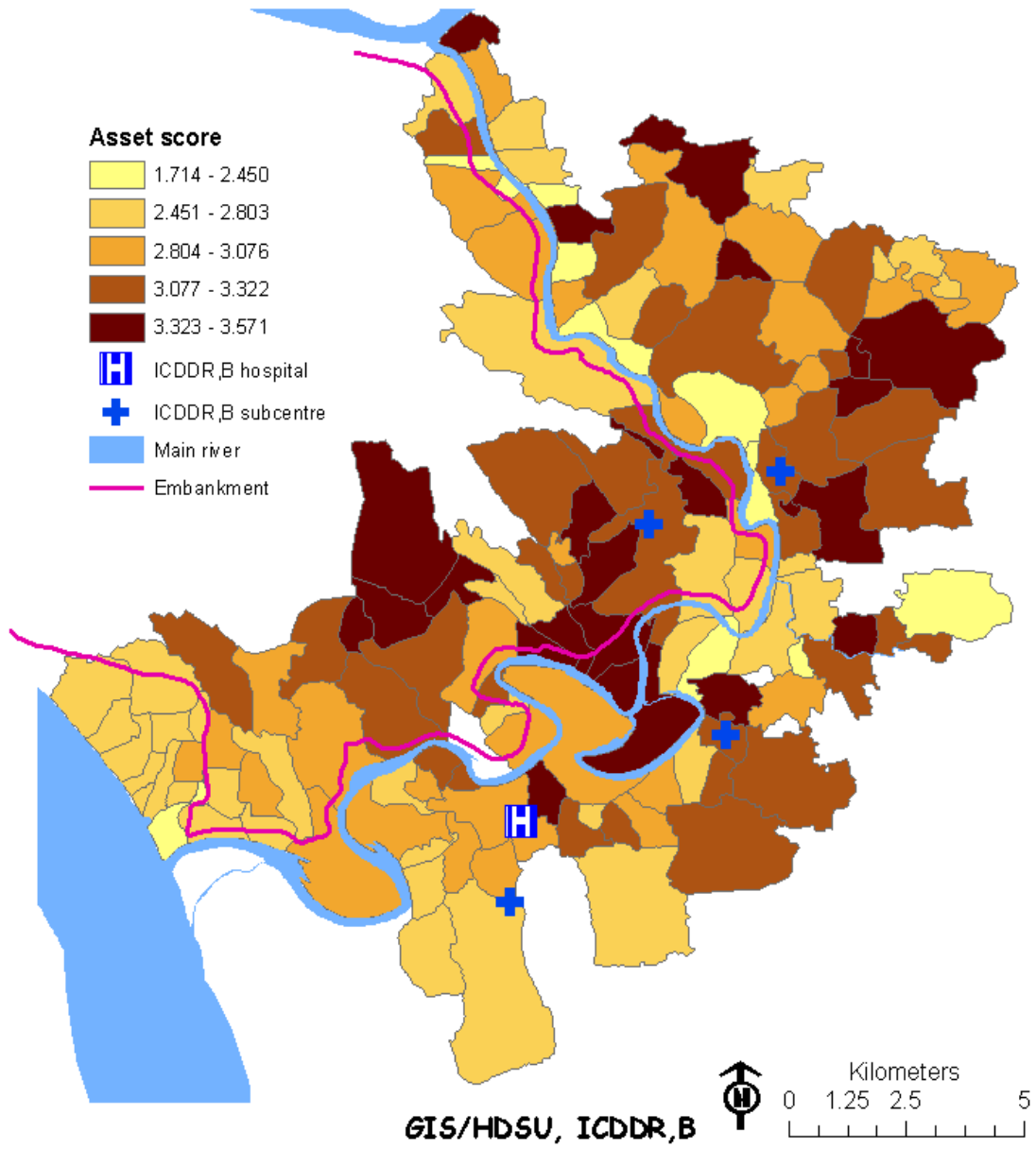
Figure 9.3. Arsenic contamination in tubewell water in Matlab study area, 2007 update
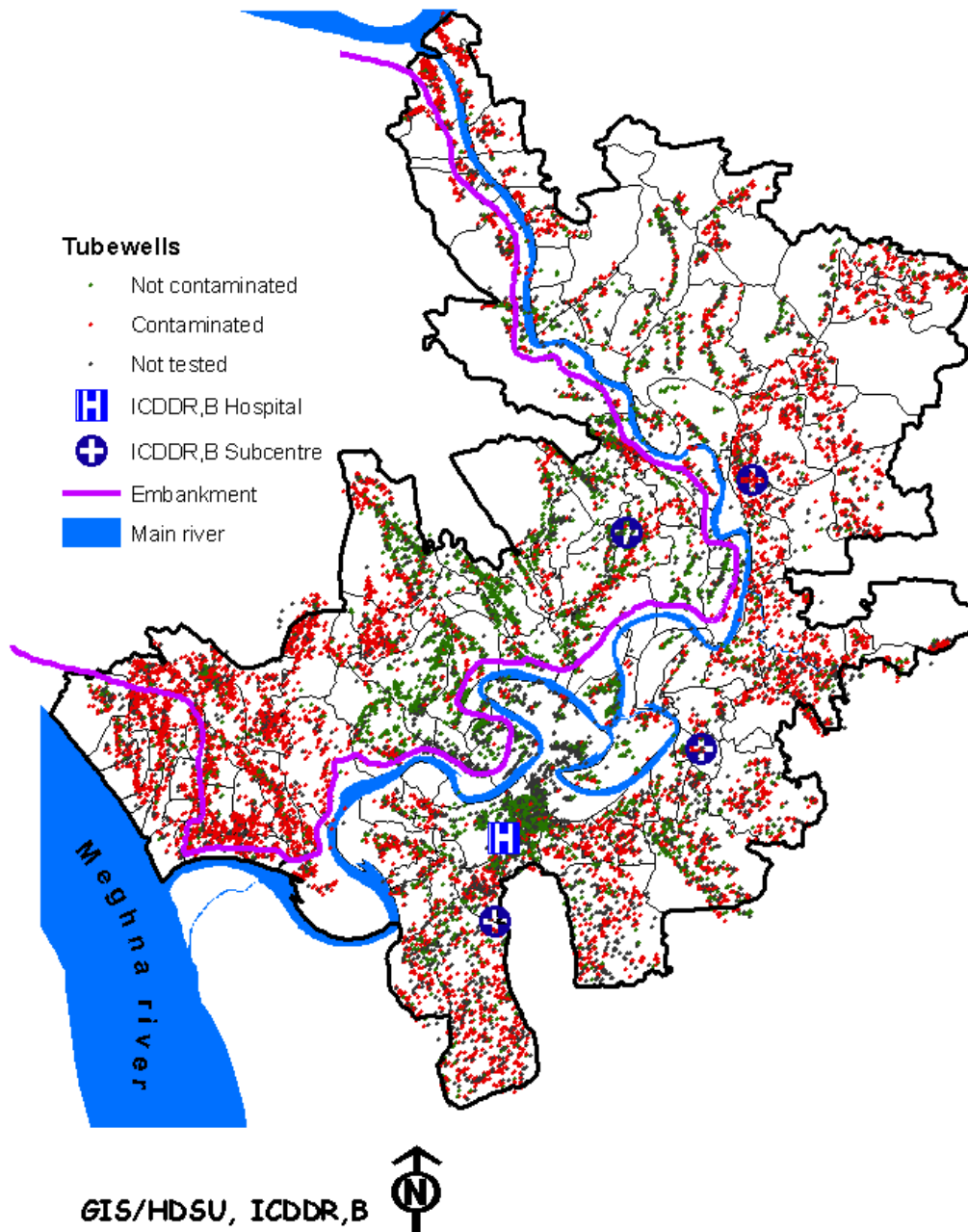
Figure 9.4. Cholera attack rate by village in Matlab study area, 2001-2007

Cholera rate/1000 popn
- Cholera free villages
- 0.01 to 1
- 1 to 2
- 2 and above
- H ICDDR,B hospital
- + ICDDR,B subcentre
- Main river
- Embankment

GIS/HDSU, ICDDR,B

Kilometers
0   1.25   2.5   5
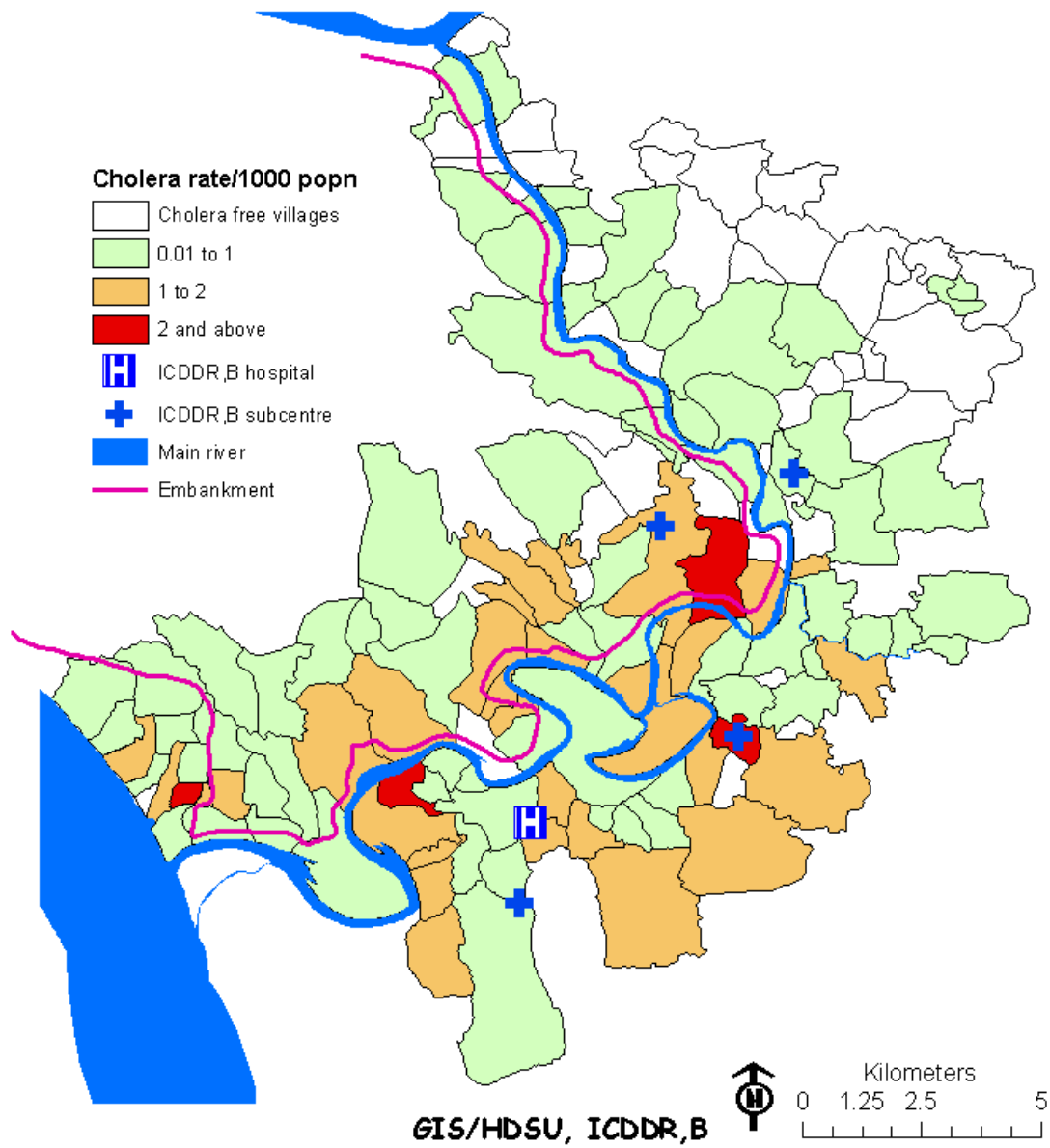
BIBLIOGRAPHY

Ahmed OB, Boschi-Pinto C, Lopez AD, Murray CJL, Lozano R, Inove M (2000) Age standardization of rates: A new WHO standard, GPE Discussion Paper Series, No. 31, Geneva: WHO.

Bangladesh Bureau of Statistics (2007) Bangladesh Population Census 2001, Zila: Chandpur, Analytical Series Vol. 2, Dhaka: Government of Bangladesh, Ministry of Planning.

Becker S, A Razzaque & AM Sarder (1982) Demographic Surveillance System- Matlab Census update, 1978, Vol. 8, Dhaka: ICDDR,B.

BRAC and ICDDR,B (1994) Baseline Survey Matlab, 1992, Final Report, Socio-economic Development and Health: A joint BRAC-ICDDR, B Research Project.

D'Souza S (1981) A population laboratory for studying disease process and mortality - the demographic surveillance system, Matlab, Bangladesh", Special Publication, No. 13, Dhaka: ICDDR,B.

ICDDR,B (2006) Health and Demographic Surveillance System-Matlab, volume 36, Registration of health and demographic events 2003, Scientific Report No. 92, Dhaka: ICDDR,B.

Mitra SN, MN Ali, S Islam, AR Cross and T Saha (1994) Bangladesh Demographic and Health Survey, 1993~94, Dhaka, Bangladesh and Calverton, Maryland: NIPORT, Mitra and Associates and Macro International Inc.

Nahar L, AM Sarder, JK van Ginneken and MKA Khan (1996) Demographic Surveillance System-Matlab: Volume 26, 1993 Population Census, Scientific Report No. 78, Dhaka: ICDDR,B.

National Institute of Population Research and Training, Mitra and Associates, and ORC Macro (2006) Bangladesh Demographic and Health Survey 2004, Dhaka, Bangladesh and Calverton, Maryland: NIPORT, Mitra and Associates and ORC Macro.

National Institute of Population Research and Training, Mitra and Associates, and ORC Macro (2008) Bangladesh Demographic and Health Survey 2007: Preliminary Findings, Dhaka, Bangladesh and Calverton, Maryland: NIPORT, Mitra and Associates and ORC Macro.

Razzaque A, L Nahar, AM Sarder, JK van Ginneken and MA Kashem Shaikh (1998) Demographic Surveillance System-Matlab: Volume Twenty Nine, 1996 Socio-economic Census, Scientific Report No. 83, Dhaka: ICDDR,B.

Ruzicka LT and AKMA Chowdhury (1978) Demographic Surveillance System-Matlab: Volume Two, Census 1974, Scientific Report No. 10, Dhaka: Cholera Research Laboratory.

Shryock HS, Seigel JS, et al. (1975) The methods and materials of demography (revised), v. II. Washington DC: Bureau of the Census: 414, 444-5.

Appendix A-1 Mid-year population in ICDDR,B service area by age, sex, and block, 2007

Age	Block A			Block B			Block C			Block D		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
All ages	35205	16385	18820	31323	14652	16671	24843	11982	12861	22289	10601	11688
Under 1	750	394	356	743	383	360	575	271	304	475	234	241
1 - 4	3315	1719	1596	2981	1515	1466	2232	1138	1094	2044	1052	992
1	*840*	*462*	*378*	*706*	*360*	*346*	*538*	*292*	*246*	*492*	*240*	*252*
2	*811*	*416*	*395*	*747*	*392*	*355*	*556*	*271*	*285*	*509*	*261*	*248*
3	*853*	*454*	*399*	*779*	*397*	*382*	*549*	*258*	*291*	*517*	*275*	*242*
4	*811*	*387*	*424*	*749*	*366*	*383*	*589*	*317*	*272*	*526*	*276*	*250*
5 - 9	4169	2088	2081	3677	1829	1848	2609	1318	1291	2470	1250	1220
10-14	3715	1835	1880	3341	1639	1702	2457	1257	1200	2241	1126	1115
15-19	3271	1435	1836	2958	1421	1537	2333	1125	1208	2032	998	1034
20-24	2804	1054	1750	2649	1172	1477	2282	1034	1248	1706	717	989
25-29	2384	960	1424	2163	843	1320	1825	833	992	1458	590	868
30-34	2428	1017	1411	1947	818	1129	1679	792	887	1466	665	801
35-39	2292	983	1309	1940	836	1104	1626	697	929	1374	580	794
40-44	2405	1087	1318	2035	876	1159	1608	755	853	1530	701	829
45-49	2077	1073	1004	1796	935	861	1514	775	739	1461	744	717
50-54	1466	737	729	1205	590	615	1050	524	526	1005	524	481
55-59	1111	548	563	1002	463	539	823	404	419	768	357	411
60-64	1086	482	604	925	389	536	780	353	427	701	313	388
65-69	756	379	377	761	330	431	603	279	324	641	276	365
70-74	562	285	277	594	296	298	440	226	214	454	230	224
75-79	328	158	170	343	180	163	225	117	108	273	138	135
80-84	178	97	81	172	80	92	122	54	68	123	61	62
85+	108	54	54	91	57	34	60	30	30	67	45	22

Appendix A-2 Deaths in ICDDR,B service area by age, sex, and block, 2007

Age	Block A			Block B			Block C			Block D		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
All ages	202	121	81	203	105	98	181	82	99	183	105	78
Under 1	29	20	9	14	7	7	17	6	11	11	5	6
<1 month	*20*	*16*	*4*	*12*	*7*	*5*	*12*	*4*	*8*	*8*	*4*	*4*
1- 5 months	*6*	*3*	*3*	*1*	*0*	*1*	*3*	*1*	*2*	*2*	*0*	*2*
6-11 months	*3*	*1*	*2*	*1*	*0*	*1*	*2*	*1*	*1*	*1*	*1*	*0*
1 - 4	7	3	4	14	4	10	8	6	2	7	5	2
1	*4*	*1*	*3*	*8*	*2*	*6*	*4*	*4*	*0*	*7*	*5*	*2*
2	*2*	*1*	*1*	*4*	*1*	*3*	*1*	*1*	*0*	*0*	*0*	*0*
3	*0*	*0*	*0*	*1*	*0*	*1*	*1*	*0*	*1*	*0*	*0*	*0*
4	*1*	*1*	*0*	*1*	*1*	*0*	*2*	*1*	*1*	*0*	*0*	*0*
5 - 9	3	3	0	3	2	1	5	2	3	0	0	0
10-14	3	1	2	2	1	1	0	0	0	1	1	0
15-19	2	1	1	2	1	1	1	1	0	1	0	1
20-24	1	1	0	3	1	2	2	0	2	0	0	0
25-29	3	2	1	2	2	0	3	2	1	1	0	1
30-34	0	0	0	0	0	0	4	2	2	2	1	1
35-39	3	1	2	2	0	2	2	2	0	4	3	1
40-44	4	3	1	5	1	4	1	0	1	3	2	1
45-49	6	5	1	8	3	5	8	3	5	6	5	1
50-54	10	7	3	7	5	2	7	4	3	10	7	3
55-59	9	7	2	11	8	3	8	8	0	7	5	2
60-64	17	10	7	9	7	2	22	10	12	23	19	4
65-69	22	12	10	25	9	16	25	9	16	14	9	5
70-74	35	20	15	31	18	13	22	7	15	25	11	14
75-79	16	11	5	31	17	14	22	11	11	26	9	17
80-84	14	5	9	17	6	11	15	6	9	24	12	12
85+	18	9	9	17	13	4	9	3	6	18	11	7

Appendix A-3 Abridged life table for ICDDR,B service area by sex, 2007

Age (years)	Male				Female			
	nq_x	l_x	L_x	$e0_x$	nq_x	l_x	L_x	$e0_x$
0	29.1	100000	97674	68.8	26.3	100000	97900	71.8
1	8.8	97093	96587	69.8	9.0	97375	96860	72.8
2	2.2	96236	96128	69.5	3.1	96502	96352	72.4
3	0.0	96021	96021	68.6	1.5	96202	96128	71.6
4	2.2	96021	95914	67.6	0.8	96055	96019	70.7
5	5.4	95807	477846	66.8	3.1	95983	479230	69.8
10	2.6	95291	475894	62.1	2.5	95685	477867	65.0
15	3.0	95047	474578	57.3	2.7	95442	476625	60.2
20	2.5	94761	473259	52.4	3.7	95188	475137	55.3
15	9.3	94523	470598	47.6	3.3	94840	473488	50.5
30	4.5	93648	467259	43.0	3.5	94531	471885	45.7
35	9.6	93222	464037	38.2	6.0	94196	469674	40.8
40	8.7	92323	459754	33.5	8.4	93629	466334	36.1
45	22.4	91516	452832	28.8	17.9	92844	460377	31.3
50	47.4	89462	437471	24.4	23.1	91180	451023	26.9
55	76.2	85225	410964	20.4	18.0	89070	441654	22.4
60	139.8	78732	367642	16.9	62.1	87470	424702	17.8
65	143.8	67729	315600	14.2	146.1	82039	381814	13.8
70	238.9	57991	256508	11.2	247.6	70051	308289	10.7
75	337.3	44139	183914	8.9	339.5	52704	219288	8.4
80	397.5	29252	117086	7.1	501.3	34811	128964	6.4
85+	1000.0	17624	91057	5.2	1000.0	17361	93480	5.4

Appendix A-4 Abridged life table for Government service area by sex, 2007

Age (years)	Male				Female			
	nq_x	l_x	L_x	$e0_x$	nq_x	l_x	L_x	$e0_x$
0	41.2	100000	96703	67.3	37.4	100000	97006	70.9
1	6.5	95879	95514	69.2	7.2	96258	95847	72.6
2	1.6	95260	95185	68.6	0.0	95561	95561	72.2
3	2.2	95109	95004	67.7	0.8	95561	95523	71.2
4	2.9	94899	94761	66.9	1.5	95485	95412	70.2
5	6.7	94622	471656	66.1	3.2	95339	475991	69.3
10	4.1	93991	469078	61.5	3.3	95034	474453	64.5
15	4.4	93610	467101	56.8	5.8	94723	472360	59.8
20	1.3	93198	465708	52.0	3.0	94178	470251	55.1
15	1.7	93075	465013	47.1	2.3	93900	469001	50.2
30	12.9	92917	461823	42.1	10.7	93683	466095	45.3
35	14.1	91720	455604	37.7	13.1	92677	460586	40.8
40	13.4	90422	449309	33.2	6.5	91464	455955	36.3
45	18.4	89208	442241	28.6	12.3	90872	451786	31.5
50	46.5	87563	428370	24.1	14.8	89756	445704	26.9
55	74.9	83495	402871	20.1	35.9	88423	434751	22.3
60	116.2	77240	365086	16.5	67.1	85245	412899	18.0
65	166.5	68268	314324	13.3	110.7	79528	376947	14.1
70	278.1	56904	245964	10.5	233.3	70726	313829	10.5
75	315.4	41077	173546	8.5	399.1	54223	216789	7.9
80	475.9	28122	106285	6.3	514.4	32580	119416	6.5
85+	1000.0	14737	69884	4.7	1000.0	15820	93544	5.9

Appendix A-5 Male deaths by cause and age, 2007

Causes	All ages	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Communicable diseases																				
Diarrhoeal	9	4	0	1	0	0	0	0	0	1	0	0	0	0	0	0	2	0	1	0
Dysentery	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Tuberculosis	10	0	0	0	0	0	0	0	0	1	0	0	2	2	1	0	3	0	1	0
EPI related death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meningitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
Chicken pox	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Rabies	3	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
Septicaemia	13	3	0	0	0	1	0	0	1	0	0	1	0	1	1	1	1	2	1	0
Respiratory infections	20	6	3	0	1	0	0	0	0	0	0	0	0	0	2	0	2	2	1	3
Other communicable	6	2	0	1	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0
Maternal and neonatal conditions																				
Maternal death	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neonatal condition																				
-Premature and LBW	17	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Birth asphyxia	30	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Other neonatal	17	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nutritional	17	1	0	1	0	0	0	0	0	0	1	0	0	1	0	1	4	3	3	2
Non-communicable diseases																				
Malignant neoplasm																				
-Neoplasm	93	0	1	1	0	1	2	2	1	5	2	1	6	8	18	17	15	9	4	0
-Neoplasm in female organ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Congenital malformation	5	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Endocrine disorder																				
-Diabetes	23	0	0	0	0	0	0	0	0	0	1	2	1	2	3	1	5	5	1	2
-Other endocrine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neuro-psychiatric	9	1	2	0	0	0	0	0	0	0	0	1	1	3	0	0	0	0	0	1
Diseases of circulartory sestem																				
-Rheumatic heart disease	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
-Hypertensive disease	15	0	0	0	0	0	0	0	0	0	0	0	2	1	1	1	5	2	1	2
-Ischaemic heart disease	84	0	0	0	0	0	0	0	2	1	3	11	9	9	13	15	7	11	2	1
-Stroke	143	0	0	0	0	0	0	0	0	0	1	4	8	7	18	11	27	24	18	25
-Other cardiovascular	58	0	0	0	0	0	0	0	1	0	2	4	1	4	2	13	7	3	13	8
Respiartory disease																				
-COPD	54	0	0	0	1	0	0	0	1	0	1	1	0	5	4	4	11	14	7	5
-Asthma	15	0	1	0	0	0	0	0	0	0	0	0	0	1	2	2	3	5	1	0
-Other respiratory	15	0	0	0	1	0	0	0	0	0	1	0	1	1	0	2	2	2	2	3
Digestive disease	36	0	0	1	0	0	0	1	0	3	0	2	4	4	9	1	7	2	1	1
Gentio-urinary disease																				
-Renal failure	12	1	0	1	0	1	1	0	0	0	0	0	1	1	0	3	0	1	0	2
-Nephritic syndrome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Other urinary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other non-communicable	3	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0
Injuries																				
Unintentional injuries																				
-Accident	39	1	1	4	2	4	0	1	1	2	0	0	2	0	6	2	5	2	2	4
-Drowning	27	0	25	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Intentional injuries																				
-Suicide	5	0	0	0	1	1	0	0	2	0	0	0	0	0	1	0	0	0	0	0
-Homicide	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous																				
-Senility	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
-Fever of unknown origin	10	0	0	1	1	0	0	0	0	0	1	1	0	1	0	1	1	0	1	2
-Edema of unspecified origin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-sudden infant death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Other miscellaneous	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown/missing	40	4	1	2	1	0	0	2	0	0	0	0	3	3	0	7	6	4	3	4
Total	836	91	35	16	8	8	3	7	10	14	14	28	44	55	82	83	117	91	63	67

COPD=Chronic obstructive pulmonary disease

Appendix A-6 Female deaths by cause and age, 2007

Causes	All ages	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Communicable diseases																				
Diarrhoeal	10	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	1	0
Dysentery	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Tuberculosis	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0
EPI related death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meningitis	3	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis	6	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	1	0
Chicken pox	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabies	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Septicaemia	19	2	1	1	1	0	0	0	0	1	0	0	1	0	1	2	2	3	1	3
Respiratory infections	25	7	5	0	0	0	0	0	0	0	0	0	0	0	0	3	2	2	1	5
Other communicable	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0
Maternal and neonatal conditions																				
Maternal death	9	0	0	0	0	1	5	1	0	2	0	0	0	0	0	0	0	0	0	0
Neonatal condition																				
-Premature and LBW	21	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Birth asphyxia	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Other neonatal	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nutritional	18	2	2	1	0	0	0	0	0	0	0	0	0	0	0	1	1	3	8	0
Non-communicable diseases																				
Malignant neoplasm																				
-Neoplasm	34	1	0	1	1	0	0	1	3	1	1	1	4	2	7	3	3	3	1	1
-Neoplasm in female organ	19	0	0	0	0	1	0	0	1	4	0	6	1	0	1	1	1	0	2	1
Congenital malformation	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Endocrine disorder																				
-Diabetes	21	0	0	0	0	0	0	0	1	0	3	0	0	1	2	5	4	3	1	1
-Other endocrine	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Neuro-psychiatric	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	1	0
Diseases of circulartory sestem																				
-Rheumatic heart disease	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
-Hypertensive disease	17	0	0	0	0	0	0	0	0	0	0	2	0	1	0	2	3	4	2	3
-Ischaemic heart disease	37	0	0	0	0	0	0	1	0	2	2	0	2	1	0	8	10	8	3	0
-Stroke	195	0	0	0	0	0	0	0	0	0	1	1	6	4	19	32	49	45	22	16
-Other cardiovascular	48	0	0	0	0	0	0	0	0	2	1	2	0	1	3	6	10	9	8	6
Respiratory disease																				
-COPD	26	0	0	0	0	0	0	0	0	0	0	0	1	2	6	4	2	7	4	0
-Asthma	7	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	2	2	0
-Other respiratory	8	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	3	1	1	0
Digestive disease	27	2	0	1	1	1	0	1	1	0	0	0	3	1	2	4	2	5	2	1
Gentio-urinary disease																				
-Renal failure	11	0	1	0	1	1	0	1	0	1	0	2	0	1	0	2	0	0	0	1
-Nephritic syndrome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Other urinary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other non-communicable	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0
Injuries																				
Unintentional injuries																				
-Accident	23	2	0	1	0	0	0	0	1	0	0	1	0	1	2	0	3	6	4	2
-Drowning	24	0	17	2	1	1	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0
Intentional injuries																				
-Suicide	9	0	0	0	0	4	2	0	0	1	1	0	0	0	0	1	0	0	0	0
-Homicide	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Miscellaneous																				
-Senility	6	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	3
-Fever of unknown origin	6	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	2
-Edema of unspecified origin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Sudden infant death	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Other miscellaneous	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown/missing	36	2	0	0	2	1	0	0	1	0	2	1	0	1	2	3	6	5	4	6
Total	**722**	**80**	**30**	**8**	**7**	**10**	**7**	**5**	**11**	**15**	**12**	**20**	**18**	**21**	**52**	**81**	**116**	**107**	**73**	**49**

COPD=Chronic obstructive pulmonary disease

Appendix A-7 Male deaths by cause, age, and area, 2007

Causes	All ages ICDDR,B	All ages Government	<1 ICDDR,B	<1 Government	1-4 ICDDR,B	1-4 Government	5-14 ICDDR,B	5-14 Government	15-44 ICDDR,B	15-44 Government	45-64 ICDDR,B	45-64 Government	65-84 ICDDR,B	65-84 Government	85+ ICDDR,B	85+ Government
Communicable diseases																
Diarrhoeal	2	7	1	3	0	0	0	1	0	1	0	0	1	2	0	0
Dysentery	0	2	0	0	0	1	0	0	0	0	0	0	0	1	0	0
Tuberculosis	3	7	0	0	0	0	0	0	0	1	1	4	2	2	0	0
Meningitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis	0	2	0	0	0	0	0	0	0	1	0	0	0	1	0	0
Chicken pox	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Rabies	0	3	0	0	0	0	0	1	0	0	0	1	0	1	0	0
Septicaemia	6	7	1	2	0	0	0	0	1	1	1	2	3	2	0	0
Respiratory infections	7	13	2	4	2	1	1	0	0	0	0	2	1	4	1	2
Other communicable	4	2	1	1	0	0	1	0	0	0	1	1	1	0	0	0
Maternal and neonatal conditions																
Maternal death	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neonatal condition																
-premature and LBW	10	7	10	7	0	0	0	0	0	0	0	0	0	0	0	0
-birth asphyxia	10	20	10	20	0	0	0	0	0	0	0	0	0	0	0	0
-other neonatal	9	8	9	8	0	0	0	0	0	0	0	0	0	0	0	0
Nutritional	7	10	1	0	0	0	0	1	0	1	1	0	4	7	1	1
Non-communicable diseases																
Malignant neoplasm																
-neoplasm	51	42	0	0	0	1	0	1	10	3	15	18	26	19	0	0
-neoplasm in female organ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Congenital malformation	1	4	1	3	0	0	0	1	0	0	0	0	0	0	0	0
Endocrine disorder																
-diabetes	13	10	0	0	0	0	0	0	0	1	4	4	8	4	1	1
-other endocrine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neuro-psychiatric	2	7	0	1	1	1	0	0	0	0	1	4	0	0	0	1
Diseases of circulatory system																
-rheumatic heart disease	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
-hypertensive disease	8	7	0	0	0	0	0	0	0	0	2	2	4	5	2	0
-ischaemic heart disease	50	34	0	0	0	0	0	0	4	2	28	14	17	18	1	0
-stroke	74	69	0	0	0	0	0	0	0	1	20	17	40	40	14	11
-other cardiovascular	29	29	0	0	0	0	0	0	1	2	6	5	16	20	6	2
Respiratory disease																
-COPD	27	27	0	0	0	0	0	1	2	0	7	3	17	19	1	4
-Asthma	6	9	0	0	0	1	0	0	0	0	2	1	4	7	0	0
-Other respiratory	5	10	0	0	0	0	0	1	0	1	0	2	4	4	1	2
Digestive disease	23	13	0	0	0	0	1	0	2	2	14	5	6	5	0	1
Gentio-urinary disease																
-Renal failure	7	5	0	1	0	0	1	0	0	2	2	0	3	1	1	1
-Nephritic syndrome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Other urinary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other non-communicable	0	3	0	0	0	0	0	0	0	1	0	1	0	1	0	0
Injuries																
Unintentional injuries																
-accident	20	19	1	0	0	1	3	3	2	6	3	5	8	3	3	1
-drowning	16	11	0	0	15	10	1	0	0	0	0	1	0	0	0	0
Intentional injuries																
-suicide	0	5	0	0	0	0	0	1	0	3	0	1	0	0	0	0
-homicide	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous																
-senility	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
-fever of unknown origin	5	5	0	0	0	0	0	2	1	0	1	1	2	1	1	1
-sudden infant death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown/missing	16	24	1	3	0	1	2	1	2	0	4	2	5	15	2	2
Total	413	423	38	53	18	17	10	14	26	30	113	96	172	182	36	31

Appendix A-8 Female deaths by cause, age, and area, 2007

Causes	All ages ICDDR,B	All ages Government	<1 ICDDR,B	<1 Government	1-4 ICDDR,B	1-4 Government	5-14 ICDDR,B	5-14 Government	15-44 ICDDR,B	15-44 Government	45-64 ICDDR,B	45-64 Government	65-84 ICDDR,B	65-84 Government	85+ ICDDR,B	85+ Government
Communicable diseases																
Diarrhoeal	4	6	2	1	0	1	0	0	0	0	0	0	2	4	0	0
Dysentery	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Tuberculosis	1	3	0	0	0	0	0	0	0	0	1	0	0	3	0	0
Meningitis	3	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0
Hepatitis	2	4	0	2	0	0	0	0	0	0	1	0	1	2	0	0
Chicken pox	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabies	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Septicaemia	5	14	0	2	1	0	1	1	0	1	0	2	2	6	1	2
Respiratory infections	10	15	3	4	3	2	0	0	0	0	0	0	3	5	1	4
Other communicable	1	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0
Maternal and neonatal conditions																
Maternal death	4	5	0	0	0	0	0	0	4	5	0	0	0	0	0	0
Neonatal condition																
-premature and LBW	4	17	4	17	0	0	0	0	0	0	0	0	0	0	0	0
-birth asphyxia	5	7	5	7	0	0	0	0	0	0	0	0	0	0	0	0
-other neonatal	7	5	7	5	0	0	0	0	0	0	0	0	0	0	0	0
Nutritional	10	8	2	0	1	1	0	1	0	0	0	0	7	6	0	0
Non-communicable diseases																
Malignant neoplasm																
-neoplasm	16	18	1	0	0	0	0	2	4	2	7	7	4	6	0	1
-neoplasm in female organ	10	9	0	0	0	0	0	0	1	5	5	3	3	1	1	0
Congenital malformation	1	4	1	4	0	0	0	0	0	0	0	0	0	0	0	0
Endocrine disorder																
-diabetes	12	9	0	0	0	0	0	0	2	2	1	2	9	4	0	1
-other endocrine	1	2	0	0	0	1	0	0	0	0	0	0	1	0	0	1
Neuro-psychiatric	2	2	0	0	0	0	0	0	0	0	0	1	2	1	0	0
Diseases of circulatory system																
-rheumatic heart disease	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0
-hypertensive disease	8	9	0	0	0	0	0	0	0	0	1	2	5	6	2	1
-ischaemic heart disease	24	13	0	0	0	0	0	0	2	3	2	1	20	9	0	0
-stroke	104	91	0	0	0	0	0	0	1	0	16	14	77	71	10	6
-other cardiovascular	26	22	0	0	0	0	0	0	1	2	2	4	20	13	3	3
Respiratory disease																
-COPD	11	15	0	0	0	0	0	0	0	0	3	6	8	9	0	0
-asthma	3	4	0	0	0	0	0	0	0	0	2	1	1	3	0	0
-other respiratory	1	7	0	0	0	0	0	0	0	0	1	1	0	6	0	0
Digestive disease	14	13	1	1	0	0	2	0	1	2	5	5	5	5	0	0
Gentio-urinary disease																
-renal failure	6	5	0	0	1	0	0	1	2	1	1	2	1	1	1	0
-Nephritic syndrome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-other urinary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other non-communicable	4	0	0	0	0	0	0	0	0	0	1	0	3	0	0	0
Injuries																
Unintentional injuries																
-accident	14	9	2	0	0	0	1	0	0	1	2	2	8	5	1	1
-drowning	13	11	0	0	10	7	1	2	0	2	0	0	2	0	0	0
Intentional injuries																
-suicide	3	6	0	0	0	0	0	0	3	5	0	0	0	1	0	0
-homicide	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Miscellaneous																
-senility	4	2	0	0	0	0	0	0	0	0	1	0	1	1	2	1
-fever of unknown origin	3	3	0	0	1	0	0	0	0	0	0	1	2	2	0	0
-sudden infant death	4	2	4	2	0	0	0	0	0	0	0	0	0	0	0	0
Unknown/missing	15	21	0	2	0	0	1	1	3	1	3	1	4	14	4	2
Total	356	366	33	47	18	12	7	8	25	35	55	56	192	185	26	23

Appendix A-9 Age-specific fertility rate and indices for ICDDR,B service area by block, 2007

Age (years)	Block A Births	Block A Rate	Block B Births	Block B Rate	Block C Births	Block C Rate	Block D Births	Block D Rate
All ages	765	76.1	762	88.7	571	83.3	466	77.3
15-19*	118	64.3	102	66.4	102	84.4	60	58.0
20-24	243	138.9	236	159.8	190	152.2	158	159.8
25-29	200	140.4	198	150.0	152	153.2	129	148.6
30-34	130	92.1	146	129.3	70	78.9	73	91.1
35-39	60	45.8	67	60.7	52	56.0	37	46.6
40-44	14	10.6	11	9.5	5	5.9	9	10.9
45-49**	0	0.0	2	2.3	0	0.0	0	0.0
Total fertility rate		2461		2890		2653		2575
General fertility rate		76		89		83		77
Gross reproduction rate		1177		1361		1380		1299

*Births to mothers under aged <15 were included in this group
**Births to mothers aged 50 and above were included in this group

Appendix A-10 Births by mothers' age, live birth order and area, 2007

Age (years)	Total women	Total birth	1	2	3	4	5	6	7	8	9	10+
Both areas												
<15	12007	7	7	0	0	0	0	0	0	0	0	0
15-19	11683	681	621	54	6	0	0	0	0	0	0	0
20-24	10541	1677	836	710	116	13	2	0	0	0	0	0
25-29	8919	1380	233	579	430	110	21	4	3	0	0	0
30-34	7936	847	36	136	313	238	99	15	8	2	0	0
35-39	7931	420	7	25	98	127	84	50	19	6	2	2
40-44	8013	88	0	3	14	18	18	17	9	7	1	1
45-49	6559	6	0	0	0	3	1	0	2	0	0	0
Total		5106	1740	1507	977	509	225	86	41	15	3	3
ICDDR,B service area												
<15	5897	5	5	0	0	0	0	0	0	0	0	0
15-19	5615	377	349	25	3	0	0	0	0	0	0	0
20-24	5464	827	409	363	47	8	0	0	0	0	0	0
25-29	4604	679	130	313	181	48	6	1	0	0	0	0
30-34	4228	419	16	72	171	114	39	6	1	0	0	0
35-39	4136	216	2	16	55	74	37	20	7	2	2	1
40-44	4159	39	0	1	11	9	6	5	4	1	1	1
45-49	3321	2	0	0	0	1	0	0	1	0	0	0
Total		2564	911	790	468	254	88	32	13	3	3	2
Government service area												
<15	6110	2	2	0	0	0	0	0	0	0	0	0
15-19	6068	304	272	29	3	0	0	0	0	0	0	0
20-24	5077	850	427	347	69	5	2	0	0	0	0	0
25-29	4315	701	103	266	249	62	15	3	3	0	0	0
30-34	3708	428	20	64	142	124	60	9	7	2	0	0
35-39	3795	204	5	9	43	53	47	30	12	4	0	1
40-44	3854	49	0	2	3	9	12	12	5	6	0	0
45-49	3238	4	0	0	0	2	1	0	1	0	0	0
Total		2542	829	717	509	255	137	54	28	12	0	1

Appendix A-11 Age-order-specific fertility rates by area, 2007

Age (years)	Total	Live birth order									
		1	2	3	4	5	6	7	8	9	10+
Both areas											
<15	0.0006	0.0006	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15-19	0.0583	0.0532	0.0046	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20-24	0.1591	0.0793	0.0674	0.0110	0.0012	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
25-29	0.1547	0.0261	0.0649	0.0482	0.0123	0.0024	0.0004	0.0003	0.0000	0.0000	0.0000
30-34	0.1067	0.0045	0.0171	0.0394	0.0300	0.0125	0.0019	0.0010	0.0003	0.0000	0.0000
35-39	0.0530	0.0009	0.0032	0.0124	0.0160	0.0106	0.0063	0.0024	0.0008	0.0003	0.0003
40-44	0.0110	0.0000	0.0004	0.0017	0.0022	0.0022	0.0021	0.0011	0.0009	0.0001	0.0001
45-49	0.0009	0.0000	0.0000	0.0000	0.0005	0.0002	0.0000	0.0003	0.0000	0.0000	0.0000
Total	**2.7214**	**0.8229**	**0.7878**	**0.5664**	**0.3114**	**0.1400**	**0.0538**	**0.0258**	**0.0094**	**0.0019**	**0.0019**
ICDDR,B service area											
<15	0.0008	0.0008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15-19	0.0671	0.0622	0.0045	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20-24	0.1514	0.0749	0.0664	0.0086	0.0015	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-29	0.1475	0.0282	0.0680	0.0393	0.0104	0.0013	0.0002	0.0002	0.0000	0.0000	0.0000
30-34	0.0991	0.0038	0.0170	0.0404	0.0270	0.0092	0.0014	0.0002	0.0000	0.0000	0.0000
35-39	0.0522	0.0005	0.0039	0.0133	0.0179	0.0089	0.0048	0.0017	0.0005	0.0005	0.0002
40-44	0.0094	0.0000	0.0002	0.0026	0.0022	0.0014	0.0012	0.0010	0.0002	0.0002	0.0002
45-49	0.0006	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0003	0.0000	0.0000	0.0000
Total	**2.6406**	**0.8518**	**0.8000**	**0.5242**	**0.2960**	**0.1046**	**0.0384**	**0.0170**	**0.0036**	**0.0036**	**0.0024**
Government service area											
<15	0.0003	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15-19	0.0501	0.0448	0.0048	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20-24	0.1674	0.0841	0.0683	0.0136	0.0010	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000
25-29	0.1625	0.0239	0.0616	0.0577	0.0144	0.0035	0.0007	0.0007	0.0000	0.0000	0.0000
30-34	0.1154	0.0054	0.0173	0.0383	0.0334	0.0162	0.0024	0.0019	0.0005	0.0000	0.0000
35-39	0.0538	0.0013	0.0024	0.0113	0.0140	0.0124	0.0079	0.0032	0.0011	0.0000	0.0003
40-44	0.0127	0.0000	0.0005	0.0008	0.0023	0.0031	0.0031	0.0013	0.0016	0.0000	0.0000
45-49	0.0012	0.0000	0.0000	0.0000	0.0006	0.0003	0.0000	0.0003	0.0000	0.0000	0.0000
Total	**2.8172**	**0.7992**	**0.7746**	**0.6110**	**0.3286**	**0.1793**	**0.0707**	**0.0368**	**0.0158**	**0.0000**	**0.0013**

Appendix A-12. Marriages and divorces by month, 2007.

Month	Marriage		Divorce	
	Number	Percent	Number	Percent
January	391	12.0	33	9.7
February	288	8.8	28	8.3
March	365	11.2	35	10.3
April	288	8.8	27	8.0
May	272	8.3	31	9.1
June	226	6.9	28	8.3
July	270	8.3	34	10.0
August	237	7.3	30	8.8
September	175	5.4	18	5.3
October	227	7.0	28	8.3
November	236	7.2	30	8.8
December	288	8.8	17	5.0
Total	**3263**	**100.0**	**339**	**100.0**

Appendix A-13. In- and out-migrations by age and sex, 2007

Age (years)	In-migration			Out-migration		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	8953	4185	4768	14235	7749	6486
0-4	1391	697	694	1599	803	796
5 - 9	809	416	393	1041	558	483
10-14	573	270	303	1017	520	497
15-19	1419	342	1077	2603	1156	1447
20-24	1444	490	954	2708	1400	1308
25-29	1078	540	538	1842	1075	767
30-34	746	485	261	1189	764	425
35-39	495	333	162	787	571	216
40-44	324	210	114	585	425	160
45-49	235	165	70	310	215	95
50-54	143	98	45	165	113	52
55-59	100	60	40	97	57	40
60-64	63	31	32	97	33	64
65+	133	48	85	195	59	136

Appendix A-14. In-migrations by age, sex, and area, 2007

Age (years)	ICDDR,B service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	4840	2154	2686	4113	2031	2082
0-4	783	378	405	608	319	289
5 - 9	425	217	208	384	199	185
10-14	312	139	173	261	131	130
15-19	790	156	634	629	186	443
20-24	759	224	535	685	266	419
25-29	584	283	301	494	257	237
30-34	419	267	152	327	218	109
35-39	262	175	87	233	158	75
40-44	175	117	58	149	93	56
45-49	122	83	39	113	82	31
50-54	66	45	21	77	53	24
55-59	49	28	21	51	32	19
60-64	31	17	14	32	14	18
65+	63	25	38	70	23	47

Appendix A-15. Out-migrations by age, sex, and area, 2007

Age (years)	ICDDR,B service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	6994	3699	3295	7241	4050	3191
0-4	870	421	449	729	382	347
5 - 9	503	269	234	538	289	249
10-14	463	237	226	554	283	271
15-19	1197	499	698	1406	657	749
20-24	1335	662	673	1373	738	635
25-29	905	506	399	937	569	368
30-34	634	394	240	555	370	185
35-39	394	282	112	393	289	104
40-44	293	213	80	292	212	80
45-49	141	92	49	169	123	46
50-54	72	46	26	93	67	26
55-59	52	34	18	45	23	22
60-64	41	13	28	56	20	36
65+	94	31	63	101	28	73

Cause of movement	Total	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
								Age (years)							
All migrants	7749	803	558	520	1156	1400	1075	764	571	425	215	113	57	33	59
Work/economic/educational															
Acquired/seeking job	4771	0	5	111	739	1184	948	668	492	348	156	68	23	14	15
Job completion/retirement	30	0	1	3	1	5	4	2	2	2	2	2	6	0	0
To acquire education	517	0	73	125	212	80	20	4	1	1	0	1	0	0	0
Educ. completed/interrupted	3	0	0	0	1	1	0	0	1	0	0	0	0	0	0
Student lodging	3	0	0	0	1	1	1	0	0	0	0	0	0	0	0
Housing/environmental															
Acquired/seeking new land/house	193	0	0	0	7	8	19	26	30	25	26	15	12	7	18
River erosion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Move as dependent															
Join with/ follow spouse	27	0	0	0	1	0	3	4	3	4	2	5	3	1	1
Join with/follow parents	1726	763	444	241	142	72	33	13	11	3	3	1	0	0	0
Join with child/sibling	153	21	20	21	24	16	10	3	3	4	2	2	7	3	17
Join with other relatives	90	14	11	10	8	2	3	7	6	11	6	6	1	4	1
Marriage / familial															
Marriage	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Separation/divorce/widow	14	0	0	0	1	6	4	2	0	0	0	1	0	0	0
Adoption	5	4	1	0	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	57	0	0	0	4	16	10	13	5	7	2	0	0	0	0
Health or old age care	13	0	1	3	0	1	2	1	0	0	0	1	0	0	4
Legal problems	85	0	0	0	2	2	11	15	11	18	11	10	3	1	1
Other and not stated															
Others n.e.c.*	59	1	2	6	12	6	6	6	5	2	5	1	2	3	2
Unknown or not stated	2	0	0	0	1	0	1	0	0	0	0	0	0	0	0

*n.e.c.=Not elsewhere classified

Appendix A.17. Female out-migration by cause of movement and age, 2007

Cause of movement	Total	Age (years)													
		<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
All migrants	6486	796	483	497	1447	1308	767	425	216	160	95	52	40	64	136
Work/economic/educational															
Acquired/seeking job	672	0	8	83	272	136	81	41	22	15	9	4	1	0	0
Job completion/retirement	7	0	0	4	1	1	0	0	0	0	0	1	0	0	0
To acquire education	222	0	51	56	64	34	7	9	0	0	1	0	0	0	0
Educ. completed/interrupted	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Student lodging	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Housing/environmental															
Acquired/seeking new land/house	63	0	0	0	9	6	11	8	10	4	4	1	3	0	7
River erosion	3	0	0	0	0	0	0	1	0	0	1	0	0	0	1
Move as dependent															
Join with/ follow spouse	1609	0	0	8	195	464	358	250	131	99	53	18	11	13	9
Join with/follow parents	1831	740	390	244	204	124	88	30	6	2	1	2	0	0	0
Join with child/sibling	409	20	14	33	80	44	14	14	6	17	8	18	17	41	83
Join with other relatives	240	26	17	19	30	39	43	24	14	8	8	4	0	4	4
Marriage / familial															
Marriage	1069	0	0	36	525	361	104	26	11	5	1	0	0	0	0
Separation/divorce/widow	67	0	0	0	16	27	12	4	3	1	2	0	1	0	1
Adoption	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	138	0	1	1	29	45	28	11	7	3	2	0	3	3	5
Health or old age care	47	1	0	2	1	6	3	3	1	3	1	0	3	0	23
Legal problems	11	0	0	1	0	0	3	2	3	0	1	1	0	0	0
Other and not stated															
Others n.e.c.*	89	0	2	10	21	21	15	2	2	3	3	3	1	3	3
Unknown or not stated	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*n.e.c.=Not elsewhere classified

Appendix A.18. Male in-migration by cause of movement and age, 2007

Cause of movement	Total	Age (years)													
		<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
All migrants	4185	697	416	270	342	490	540	485	333	210	165	98	60	31	48
Work/economic/educational															
Acquired/seeking job	619	0	0	13	43	93	133	115	82	51	40	20	16	9	4
Job completion/retirement	694	0	0	4	44	104	113	142	103	64	55	26	18	10	11
To acquire education	158	0	39	54	49	13	3	0	0	0	0	0	0	0	0
Educ. completed/interrupted	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
Student lodging	10	0	0	1	3	2	0	0	1	1	1	1	0	0	0
Housing/environmental															
Acquired/seeking new land/house	325	0	0	0	12	51	76	43	43	27	22	25	12	3	11
River erosion	5	0	0	0	0	1	0	2	0	0	2	0	0	0	0
Move as dependent															
Join with/ follow spouse	241	0	0	0	4	25	46	59	45	28	19	6	2	3	4
Join with/follow parents	1309	589	332	169	90	69	35	18	5	1	1	0	0	0	0
Join with child/sibling	115	45	23	6	15	9	3	4	1	0	0	1	0	0	8
Join with other relatives	298	50	17	5	20	38	58	53	27	18	9	1	0	1	1
Marriage / familial															
Marriage	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Separation/divorce/widow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Adoption	9	8	1	0	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	32	0	0	3	4	7	6	2	6	0	0	1	1	1	1
Health or old age care	122	0	0	1	8	22	22	18	9	6	8	13	6	3	6
Legal problems	43	0	0	0	0	3	12	15	5	4	2	1	1	0	0
Other and not stated															
Others n.e.c.*	202	5	4	12	49	53	33	14	6	10	6	3	4	1	2
Unknown or not stated	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*n.e.c.=Not elsewhere classified

Appendix A.19. Female in-migration by cause of movement and age, 2007

Cause of movement	Total	Age (years)													
		<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
All migrants	4768	694	393	303	1077	954	538	261	162	114	70	45	40	32	85
Work/economic/educational															
Acquired/seeking job	191	0	1	28	20	44	44	21	13	6	4	4	2	3	1
Job completion/retirement	78	0	0	5	23	22	7	5	7	4	4	1	0	0	0
To acquire education	169	6	59	71	27	5	0	1	0	0	0	0	0	0	0
Educ. completed/interrupted	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0
Student lodging	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Housing/environmental															
Acquired/seeking new land/house	141	0	0	0	5	25	20	16	12	14	8	12	7	10	12
River erosion	5	0	0	0	1	2	1	0	1	0	0	0	0	0	0
Move as dependent															
Join with/ follow spouse	1113	0	0	6	235	316	218	124	79	57	39	20	10	4	5
Join with/follow parents	1702	617	288	149	268	217	109	36	11	3	0	1	1	0	2
Join with child/sibling	186	17	16	19	28	28	10	4	6	4	3	3	5	8	35
Join with other relatives	225	34	25	13	32	39	32	18	13	5	1	1	6	2	4
Marriage / familial															
Marriage	537	0	0	3	341	142	30	7	8	4	0	0	1	1	0
Separation/divorce/widow	87	0	0	0	31	29	11	6	1	4	3	1	0	0	1
Adoption	19	18	1	0	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	87	0	0	0	23	28	20	6	1	3	3	0	1	0	2
Health or old age care	63	0	0	1	13	17	8	2	4	4	1	0	3	1	9
Legal problems	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0
Other and not stated															
Others n.e.c.*	161	2	2	8	29	40	28	15	4	6	4	2	4	3	14
Unknown or not stated	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*n.e.c.=Not elsewhere classified

Destination	Rural/urban	Out-migration						In-migration					
		Age (years)						Age (years)					
		0-14	15-24	25-34	35-44	45+	Total	0-14	15-24	25-34	35-44	45+	Total
Dhaka	Rural	294	279	143	73	60	849	107	48	59	41	21	276
	Urban	689	885	362	197	130	2263	476	457	440	194	161	1728
Chittagong	Rural	676	268	177	125	116	1362	588	153	158	94	63	1056
	Urban	116	132	67	40	27	382	141	87	88	37	47	400
Sylhet	Rural	15	9	9	4	6	43	10	8	6	1	4	29
	Urban	28	30	18	9	6	91	23	29	20	12	16	100
Khulna	Rural	5	6	1	3	2	17	3	5	1	3	2	14
	Urban	8	3	1	1	2	15	1	2	2	3	7	15
Rajshahi	Rural	6	4	4	1	0	15	4	0	1	0	0	5
	Urban	10	3	3	3	3	22	6	2	2	2	4	16
Barisal	Rural	6	1	2	2	1	12	11	1	5	0	0	17
	Urban	8	5	8	2	1	24	4	1	4	0	1	10
India		8	10	4	2	8	32	5	2	2	5	3	17
Asia		2	525	612	337	70	1546	2	8	54	38	18	120
Middle-east		9	386	401	191	43	1030	2	29	182	111	55	379
Others		0	9	25	6	1	41	0	0	1	2	0	3
Unknown		1	1	2	0	1	5	0	0	0	0	0	0
Total		**1881**	**2556**	**1839**	**996**	**477**	**7749**	**1383**	**832**	**1025**	**543**	**402**	**4185**

Appendix A.21. Female migration by destination or origin, 2007

Destination	Rural/urban	Out-migration						In-migration					
		Age (years)						Age (years)					
		0-14	15-24	25-34	35-44	45+	Total	0-14	15-24	25-34	35-44	45+	Total
Dhaka	Rural	231	350	162	69	64	876	102	108	64	15	20	309
	Urban	608	840	409	143	159	2159	488	469	275	122	124	1478
Chittagong	Rural	726	1248	501	127	105	2707	588	1238	341	92	55	2314
	Urban	119	215	64	19	39	456	125	139	76	28	41	409
Sylhet	Rural	16	14	7	3	2	42	16	11	5	5	5	42
	Urban	16	24	10	0	3	53	27	25	12	4	13	81
Khulna	Rural	7	9	4	0	2	22	0	5	0	1	2	8
	Urban	7	8	4	2	3	24	2	5	2	1	3	13
Rajshahi	Rural	4	7	2	0	2	15	4	4	4	0	0	12
	Urban	9	8	2	2	1	22	11	3	4	1	2	21
Barisal	Rural	5	7	1	1	0	14	11	8	4	1	0	24
	Urban	7	6	8	0	0	21	4	5	2	0	0	11
India		9	5	2	7	4	27	9	6	2	2	4	23
Asia		2	5	5	2	0	14	3	2	2	1	0	8
Middle-east		9	6	10	1	2	28	0	3	6	3	2	14
Others		0	3	1	0	1	5	0	0	0	0	1	1
Unknown		1	0	0	0	0	1	0	0	0	0	0	0
Total		**1776**	**2755**	**1192**	**376**	**387**	**6486**	**1390**	**2031**	**799**	**276**	**272**	**4768**

POPULATION, BIRTHS, AND DEATHS BY VILLAGE, 2007

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
ICDDR,B SERVICE AREA						
D00	Charmukundi	2422	45	16	18.6	6.6
W00	Kaladi	6645	132	29	19.9	4.4
V10	Dhakirgaon	1784	40	7	22.4	3.9
V11	Nabakalash	2698	64	9	23.7	3.3
V31	Dighaldi	9466	217	53	22.9	5.6
V32	Mobarakdi	3316	74	23	22.3	6.9
V60	Suvankardi	980	22	6	22.4	6.1
V61	Munsabdi	672	13	5	19.3	7.4
V62	Shilmondi	972	12	7	12.3	7.2
V72	Upadi	6250	146	47	23.4	7.5
Block A Total		**35205**	**765**	**202**	**21.7**	**5.7**
H00	Lamchari	1258	18	10	14.3	7.9
V12	Bhangerpar	676	18	8	26.6	11.8
V13	Baburpara	725	19	6	26.2	8.3
V19	Lakshmipur	2947	84	25	28.5	8.5
V20	Dagorpur	1352	24	9	17.8	6.7
V21	Khadergaon	563	20	3	35.5	5.3
V22	Beloti	618	20	6	32.4	9.7
V23	Baluchar	652	6	2	9.2	3.1
V24	Machuakhal	3009	82	11	27.3	3.7
V26	Narayanpur	3106	77	21	24.8	6.8
V56	Pailpara	1575	30	9	19.0	5.7
V59	Doshpara	1794	37	10	20.6	5.6
V82	Dhanarpar	1752	45	12	25.7	6.8
V83	Padmapal	617	16	9	25.9	14.6
V85	Bhanurpara	511	9	3	17.6	5.9
V87	Hurmaisha	686	14	3	20.4	4.4
VBB	Nagda	4577	112	25	24.5	5.5
VBC	Naogaon	4905	131	31	26.7	6.3
Block B Total		**31323**	**762**	**203**	**24.3**	**6.5**
K00	Shahpur	948	24	6	25.3	6.3
L00	Tatkhana	584	16	5	27.4	8.6
M00	Char Nayergaon	208	4	3	19.2	14.4
N00	Aswinpur	2201	51	15	23.2	6.8
O00	Nayergaon	2041	54	8	26.5	3.9
P00	Titerkandi	2170	45	21	20.7	9.7
Q00	Char Shibpur	257	6	3	23.3	11.7
V27	Panchghoria	975	25	6	25.6	6.2
V28	Khidirpur	1571	29	11	18.5	7.0
V30	Harion	565	11	4	19.5	7.1
V39	Gobindapur	324	10	3	30.9	9.3
V40	Masunda	822	18	2	21.9	2.4
V41	Paton	1834	37	13	20.2	7.1
V42	Adhara (South)	763	21	2	27.5	2.6
V44	Panchdona	643	13	2	20.2	3.1
V86	Adhara	951	25	7	26.3	7.4
V88	Datikara	542	9	9	16.6	16.6
VBA	Mehron	2399	44	24	18.3	10.0

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
DX0	Barogaon	3647	95	26	26.0	7.1
DX1	Naojan	1398	34	11	24.3	7.9
Block C Total		**24843**	**571**	**181**	**23.0**	**7.3**
R00	Nandalalpur	1469	28	11	19.1	7.5
S00	Tatua	947	18	7	19.0	7.4
T00	Amuakanda	1635	39	13	23.9	8.0
V15	Bhati Rasulpur	733	18	6	24.6	8.2
V16	Binandapur	867	25	16	28.8	18.5
V17	Hatighata	1072	32	9	29.9	8.4
V18	Torkey	3865	75	24	19.4	6.2
V25	Char Pathalia	1329	26	8	19.6	6.0
V29	Shibpur (South)	502	10	3	19.9	6.0
V33	Shibpur (North)	453	12	4	26.5	8.8
V34	Satparia	840	21	7	25.0	8.3
V52	Nayakandi	215	9	4	41.9	18.6
V54	Balairkandi	585	6	7	10.3	12.0
V55	Induria	529	10	5	18.9	9.5
V63	Islamabad (East)	2100	39	14	18.6	6.7
V67	Majlishpur	622	17	7	27.3	11.3
V81	Sonaterkandi	716	9	9	12.6	12.6
V84	Shahbajkandi	2319	46	18	19.8	7.8
V89	Islamabad (Middle)	1491	26	11	17.4	7.4
Block D Total		**22289**	**466**	**183**	**20.9**	**8.2**
ICDDR,B Service Area Total		**113660**	**2564**	**769**	**22.6**	**6.8**
GOVERNMENT SERVICE AREA:						
V35	Durgapur	3652	78	20	21.4	5.5
V37**	Charputia	-	-	-	-	-
V38	Galimkha	1560	29	13	18.6	8.3
V43	Kanachak	1062	29	14	27.3	13.2
V45	Bakchar	1113	20	7	18.0	6.3
V46	Silinda	411	12	2	29.2	4.9
V47	Tulatali	1792	45	15	25.1	8.4
V48	Gangkanda	558	15	7	26.9	12.5
V49	Harina Bhabanipur	1214	30	7	24.7	5.8
V57	Baluchar	1075	33	8	30.7	7.4
V58**	Mohishmari	-	-	-	-	-
V64	Kawadi	4644	128	40	27.6	8.6
V65	Nayachar	791	24	8	30.3	10.1
V66	Thatalia	838	21	3	25.1	3.6
V68	Sobahan	1033	27	7	26.1	6.8
V69**	Naobangha	-	-	-	-	-
V70**	South Joypur	-	-	-	-	-
V71	Khamarpara	500	8	2	16.0	4.0
V73	Sadardia	822	19	6	23.1	7.3
V74	Ketundi	1407	27	9	19.2	6.4
V75	Mukundi	314	5	1	15.9	3.2
V76	Chosoi	1843	51	14	27.7	7.6
V78	Soladana	250	9	1	36.0	4.0
V79	Pitambordi	345	11	3	31.9	8.7
V80	Daribond	1231	31	9	25.2	7.3
V90	Narinda	1254	26	5	20.7	4.0
V97	Dhanagoda	334	9	1	26.9	3.0
V98	Santoshpur	117	0	0	0.0	0.0
V99	Baluakandi	503	7	4	13.9	8.0
VB1	Taltoli	1016	13	6	12.8	5.9
VB2	Sree Rayerchar	1120	22	7	19.6	6.3

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
VB3	Rayerkandi	2942	61	23	20.7	7.8
D28	Bazarkhola	1145	31	10	27.1	8.7
D29	Kirtonkhola	221	6	1	27.1	4.5
D30	Banuakandi	774	15	5	19.4	6.5
D31	Harina Bazarkhola	1076	22	9	20.4	8.4
D32	Khalisha	789	16	1	20.3	1.3
D33	Nayanagar	1097	16	10	14.6	9.1
D34	Saidkharkandi	1328	28	13	21.1	9.8
D35	Mollah Kandi	618	8	5	12.9	8.1
Block E Total		**40789**	**932**	**296**	**22.8**	**7.3**
A00	Uddamdi	3173	73	16	23.0	5.0
F00	Sepoykandi	1469	28	9	19.1	6.1
G00	Thatalia	2992	74	24	24.7	8.0
J00	Char Harigope	744	18	8	24.2	10.8
U00	Baispur	8830	229	60	25.9	6.8
V01	Kadamtali	373	9	4	24.1	10.7
V02	Nilokhi	490	10	3	20.4	6.1
V03	Char Nilokhi	614	8	6	13.0	9.8
V04	Char Pathalia	364	5	3	13.7	8.2
V05	Gazipur	3318	66	20	19.9	6.0
V06	Fatepur	2433	62	20	25.5	8.2
V07	Nayakandi	282	4	2	14.2	7.1
V08	Goalbhar	1157	29	10	25.1	8.6
V09	Naburkandi	1186	21	11	17.7	9.3
V14	Enayetnagar	767	16	4	20.9	5.2
V36	Ludhua	5578	115	42	20.6	7.5
D99	Mandertoli	1975	31	16	15.7	8.1
Block F Total		**35745**	**798**	**258**	**22.3**	**7.2**
B00	Charmasua	2004	43	17	21.5	8.5
C00	Sarderkandi	3989	96	30	24.1	7.5
V50	Bakharpur	56	3	1	53.6	17.9
V51	Induriakandi	518	11	5	21.2	9.7
V53	Chhoto Haldia	3063	77	27	25.1	8.8
V95	Baluchar	2298	60	12	26.1	5.2
V96	Rampur	541	15	4	27.7	7.4
VB4	Ramdaspur	3590	80	23	22.3	6.4
VB5	Thakurpara	854	26	6	30.4	7.0
VB6	Sarkerpara	522	12	4	23.0	7.7
VB7	Mirpur	328	12	3	36.6	9.1
VB8	Farazikandi	1323	22	9	16.6	6.8
VB9**	Ramanathgonj	-	-	-	-	-
VB0	South Rampur	2559	78	18	30.5	7.0
D88	Sankibhanga	1499	50	15	33.4	10.0
D89	Sankibhanga Namapara	1135	25	2	22.0	1.8
D90	Zahirabad	933	22	5	23.6	5.4
D91**	North Joypur	-	-	-	-	-
D92**	West Joypur	-	-	-	-	-
D93	Maizkandi	1337	34	9	25.4	6.7
D94	Hazipur	1536	34	11	22.1	7.2
D95	Tapaderpara	569	13	3	22.8	5.3
D96	Sakharipara	1129	25	10	22.1	8.9
D97	Nayakandi	730	15	4	20.5	5.5
D98	Bara Haldia	3332	59	17	17.7	5.1
Block G Total		**33845**	**812**	**235**	**24.0**	**6.9**
Government Service Area Total		**110379**	**2542**	**789**	**23.0**	**7.1**

**Lost due to river erosion in 1987

LIFE TABLE EQUATIONS

1. $_nq_x = \dfrac{_nm_x}{1/n + _nm_x \left[1/2 + n/12 + \left(_nm_x - \ln C \right) \right]}$ if $X > 0$

   q_0 = Infant death rate per 1,000 live births.

2. $l_0 = 100,000$

   $l_x = \left(1 - _nq_{x-n} \right) l_{x-n}$

3. $L_0 = 0.20\, l_0 + 0.80\, l_1$

   $L_1 = 0.410\, l_1 + 0.590\, l_2$

   $L_i = \dfrac{1}{2}\left(l_i + l_{i+1} \right)$, for i=2, 3, 4

   $_nL_x = \dfrac{_nd_x}{_nm_x}$, for $5 \le x \le 80$

   $_\infty L_{85} = \dfrac{l_{85}}{_\infty m_{85}}$, for the last age group 85+

4. $e_x = \dfrac{T_x}{l_x}$, where $T_x = \sum_{y=x}^{\infty} L_y$

NOTE: Computed using Greville's method, as suggested in: Shryock HS, Seigel JS, et al. (1975) The methods and materials of demography (revised), v. II. Washington DC: Bureau of the Census: 414, 444-5.

NOTE: lnC assumed to be 0.095; separation factors in equation 3 correspond to an infant mortality rate of 50 per 1,000 live births.

WHO STANDARD WORLD POPULATION

Age group (years)	World population	Percentage
0	1800	1.8
1-4	7000	7.0
5-9	8700	8.7
10-14	8600	8.6
15-19	8500	8.5
20-24	8200	8.2
25-29	7900	7.9
30-34	7600	7.6
35-39	7200	7.2
40-44	6600	6.6
45-49	6000	6.0
50-54	5400	5.4
55-59	4600	4.6
60-64	3700	3.7
65-69	3000	3.0
70-74	2200	2.2
75-79	1500	1.5
80-84	900	0.9
85+	600	0.6
Total	**100000**	**100**

NOTE: The standard population as suggested in: Ahmed OB, Boschi-Pinto C, Lopez AD, Murray CJL, Lozano R, Inove M (2000) Age standardization of rates: A new WHO standard, GPE Discussion Paper Series No. 31, World Health Organization.
Available online at: http://www.who.int/healthinfo/papaer31.pdf

MCH INTERVENTIONS IN ICDDR,B SERVICE AREA

Date	Activity	Blocks			
		A	B	C	D
Oct 1977	Family planning	X	X	X	X
Mar 1978	Tetanus toxoid to pregnant women	X	X	X	X
Jan 1979	ORT	X	X	X	X
Dec 1981	Tetanus toxoid to all women	X		X	
Dec 1985		X	X	X	X
Mar 1982	Measles vaccine	X		X	
Dec 1985		X	X	X	X
Sep 1982	Antenatal care	X		X	
Jan 1986		X	X	X	X
Jan 1985	Iron/folic acid to pregnant women	X		X	
Jan 1986		X	X	X	X
Mar 1986	EPI immunizations (BCG, DPT, Polio)	X	X	X	X
Sep 1988	Nutritional rehabilitation	X	X	X	X
Jan 1986	Vitamin A distribution	X	X	X	X
Mar 1987	Maternity care			X	X
Apr 1988	ARI treatment to children		X		X
Jul 1991		X	X	X	X
Apr-Dec 1989	Dysentery treatment		X		X
1991	Dysentery treatment stopped	-	-	-	-
1997	Sub-centre delivery			X	
1998				X	X
2000			X	X	X
2001		X	X	X	X
2000	Fixed Site Clinic			X	X
2001		X	X	X	X

STAFF OF HDSU, 2007

Peter Kim Streatfield, Ph.D.
Head, Health & Demographic Surveillance Unit

HDSU-Matlab

Field Supervisory Staff
Mr. Md. Taslim Ali, Senior Manager
Mr. Md. Aftekharuzzaman, FRO
Mr. Md. Nazrul Islam, FRO
Mr. M. Munirul Alam Bhuiyan, FRO

Mr. Golam Hossain, FRS
Mr. Nasir Ahmed, FRS
Mr. Alfaz U. Ahmed Chowdhury, FRS
Mr. Md. Sadiquzzaman, FRS
Mr. Shah Mostafa Kamal, FRS
Mr. Sheikh Abdul Jabber, FRS
Mr. Md. Monirul Hoque, FRS
Ms. Monowara Begum, FRS
Mr. Md. Bashiruddin Ahmed, FRS
Ms. Dilara Akhter, FRS

Quality Control Team
Ms. Farzana Haque, FRA
Ms. Zakia Parveen, FRA

Programming & Data Management
Mr. Syed M. Shalauddin, Sr. Programmer
Mr. Samiran Barua, Programmer
Ms. Monowara Begum, DET
Ms. Delkhorsheda, DET
Ms. Shilpi Rani Banik, DET
Ms. Meherun Nessa, DET
Ms. Nazma Akhter, DET

Administrative Staff
Mr. Md. Anisur Rahman, Admin. Assistant
Mr. Md. Ahsan Ullah, Attendant
Mr. Mubarok Hossain, Attendant

NOTE: Besides these, 38 Community Health Research Workers (CHRWs) contributed to the HDSS data collection.

HDSU-Dhaka

Research Staff
Dr. Abdur Razzaque
Dr. Md. Nurul Alam
Dr. Masuma Akter Khanam
Mr. Karar Zunaid Ahsan
Mr. Ali Ahmed

Programming & Data Management
Mr. Sajal K. Saha
Mr. AHM Golam Mustafa
Mr. Md. Harun-ur-Rashid, SFRO
Ms. Rahima Mazhar
Mr. Md. Mahfuzur Rahman
Mr. ABM Delwar Hossain

Administrative Staff
Mr. Sentu B. Gomes
Mr. Kiron C. Bala
Mr. Md. Arifur Rahim

Geographical Information System
Mr. M Zahirul Haq