HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM – MATLAB

Volume Forty Three
Registration of Health and Demographic Events 2009

Scientific Report No. 114 – March 2011

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KNOWLEDGE FOR
GLOBAL LIFESAVING SOLUTIONS

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Cover page: A Community Health Research Worker (CHRW) is visiting a household for collection of HDSS Surveillance data.

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 WHO/HMN/LSHTM/INDEPTH Network/USAID/MEASURE Evaluation 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 2009. 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 health and family planning services. The ICDDR,B service area is sub-divided into four blocks, where family planning, immunization and limited curative services are provided to under-five children and women of reproductive age.

In the surveillance area as a whole, fertility declined in 2009 compared to 2008. The crude birth rate (CBR) was 21.1 per 1,000 population and total fertility rate (TFR) was 2.5 per woman in 2009, whereas in 2008 the rates were 22.9 and 2.7 respectively. In the ICDDR,B service area, CBR was 21.6 and TFR was 2.5 and in the Government service area, CBR and TFR were 20.5 and 2.5 respectively.

The crude death rate was 6.2 per 1,000 population in the ICDDR,B service area, and in the Government service area it was 6.9 in 2009. The infant mortality rate was 21.9 per 1,000 live births in the ICDDR,B service area, and in the Government service area it was 38.4. The neonatal mortality increased to 16.2 from 15.8 in the ICDDR,B service area and to 33.5 from 26.1 in the Government service area respectively in 2009 from 2008; post-neonatal mortality increased in the ICDDR,B service area (4.9 to 5.7) and decreased in the Government service area (10.4 to 4.9). The mortality rate among children aged less than 5 years has decreased from 32.3 in 2008 in the ICDDR,B service area to 28.6 in 2009, and in the Government service area, the reduction was from 47.9 in 2008 to 46.4 in 2009. The overall rate of natural increase in population size was 14.5 per 1,000 in 2009.

The rate of in-migration increased to 54.1 per 1,000 population in 2009 from 44.0 in 2008, and the rate of out-migration decreased to 58.0 in 2009 from 65.7 in 2008. The overall annual population growth rate was 1.1%. The marriage rate was 14.8 per 1,000 population, and the divorce rate was 94.8 per 1,000 marriages.

CHAPTER 1

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 bi-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 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 collected 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 three 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 2009, along with brief notes and explanations of the tables, are presented in this volume.

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

Figure 1.1 Map of Matlab study area showing ICDDR,B and Government service areas
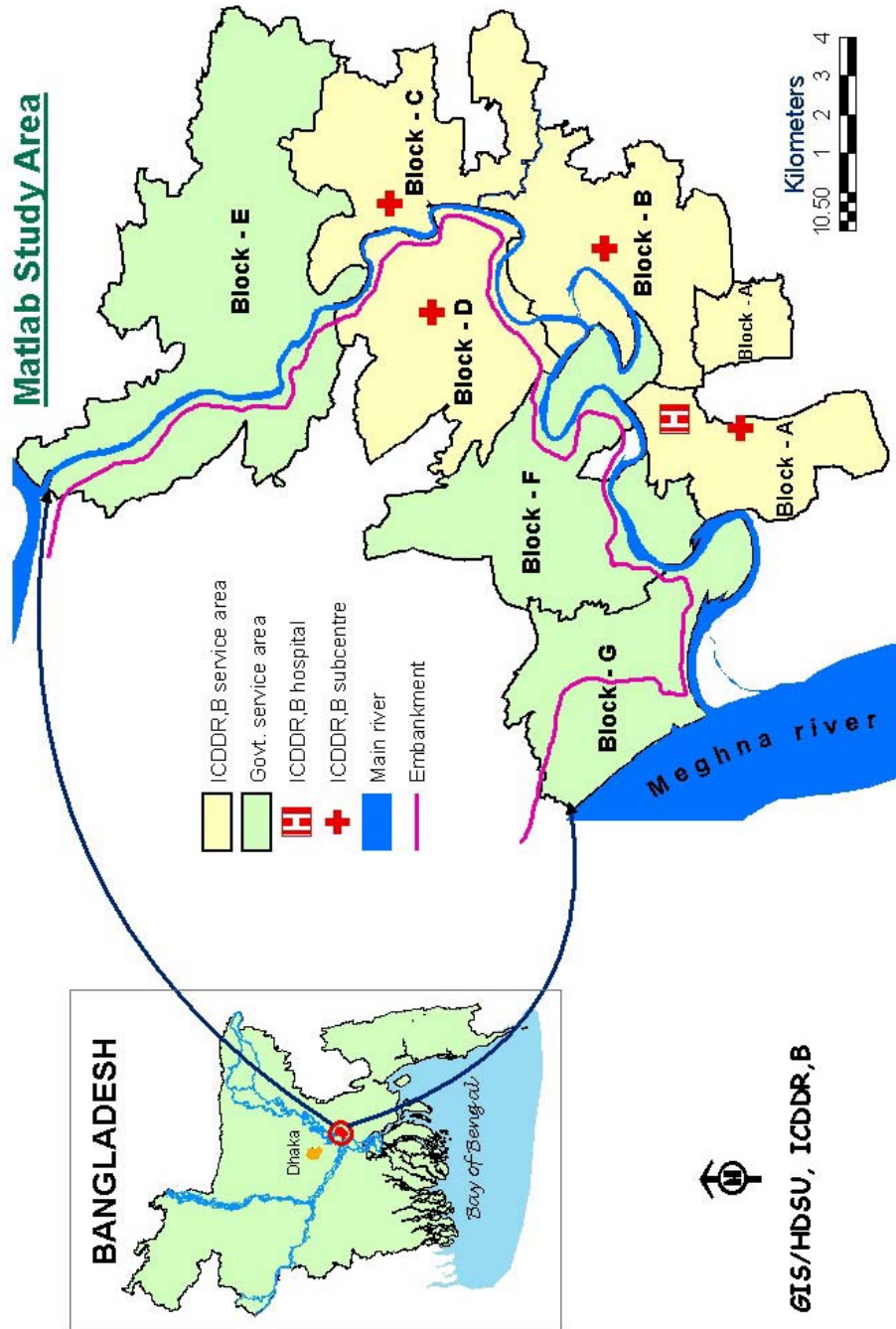
DEMOGRAPHIC TRENDS IN MATLAB

Long term Matlab HDSS data show the various transitions in the Matlab population over the period 1966-2009. 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 1966-2009, crude birth rate (CBR) has dropped by 55%, crude death rate (CDR) by 56%, and natural increase by 54%. 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 1966-2009
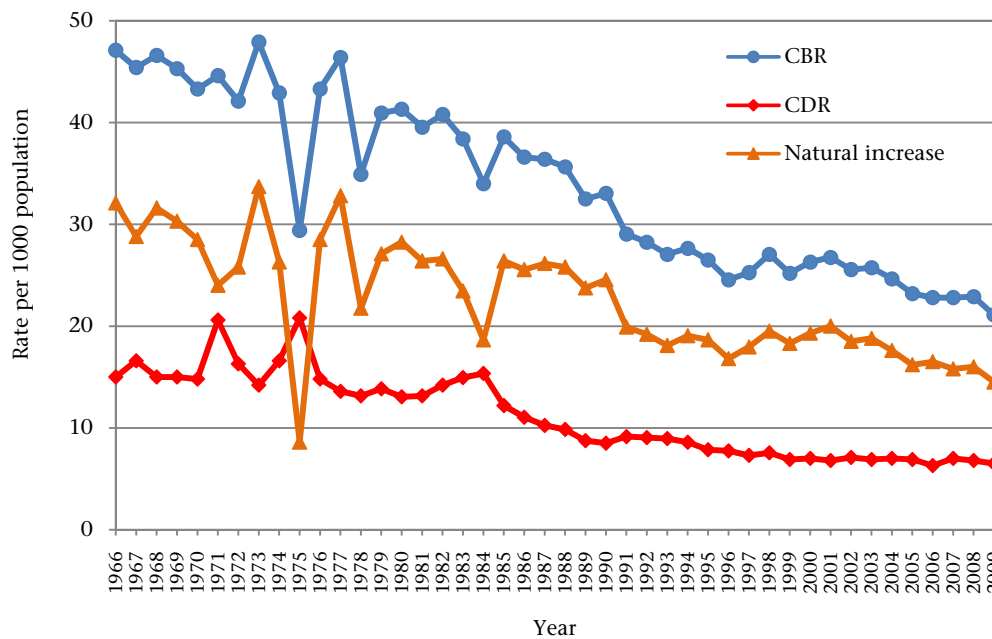
Matlab surveillance area started with a high fertility level of 6.7 children per women in 1966. After re-organization of the surveillance area into ICDDR,B and Government service areas in 1978, total fertility rate (TFR) in ICDDR,B service area remained substantially lower than the Government service area (on average 1.1 child less per woman during 1978-2000). But from 2005, TFR in both areas converged, it is 2.5 children per woman in 2009 (Figure 2.2).

Figure 2.2 Total Fertility Rate (TFR) in Matlab by area, 1966-2009
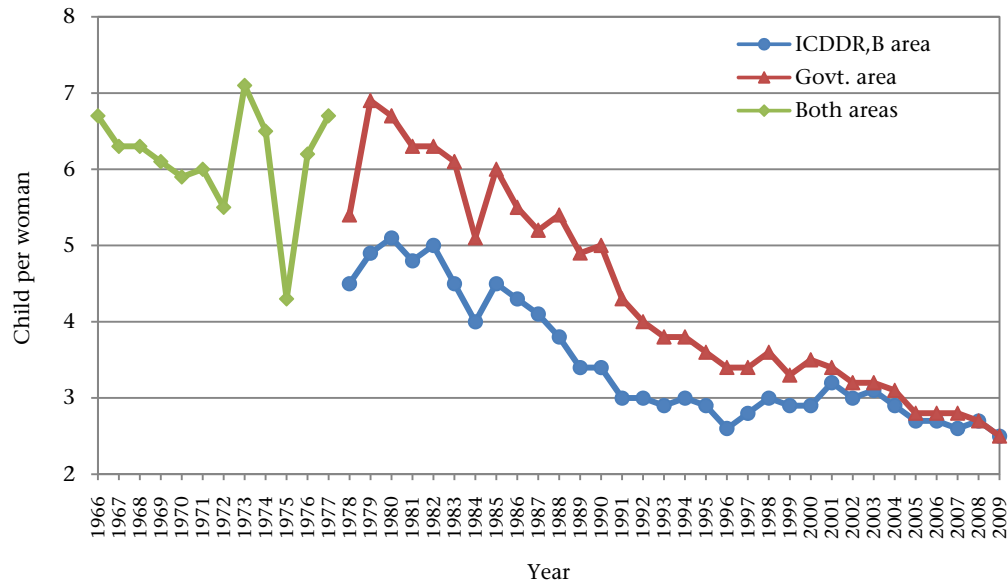
Provision of contraceptive supply and advice has been carried out since the inception of the program by female CHRWs. They visited all households in the ICDDR,B service area on a regular basis and took this opportunity to meet with women in the household to advise and provide contraception and also to monitor the continuity of the chosen method till 2000. This method of service provision has dramatically increased women's access to contraceptive services in Matlab and is associated with a high contraceptive prevalence rate (CPR). From 2001, this home service delivery system has been switched to the fixed-site system. From 2007, half of the CHRWs were assigned to provide services and another half to carry out the surveillance work. CPR increased in the ICDDR,B service area from 33.2 in 1978 to 71.4 in 2005, but has declined since 2007 to 54.2 in 2009 and it is lower than the national level. In the Government service area CPR is even lower than the national level, however, CPR declined from 51.4 in 2002 to 42.5 in 2009 (Figure 2.3).

Figure 2.3 Contraceptive Prevalence Rate (CPR) in Matlab and Bangladesh, 1978-2009
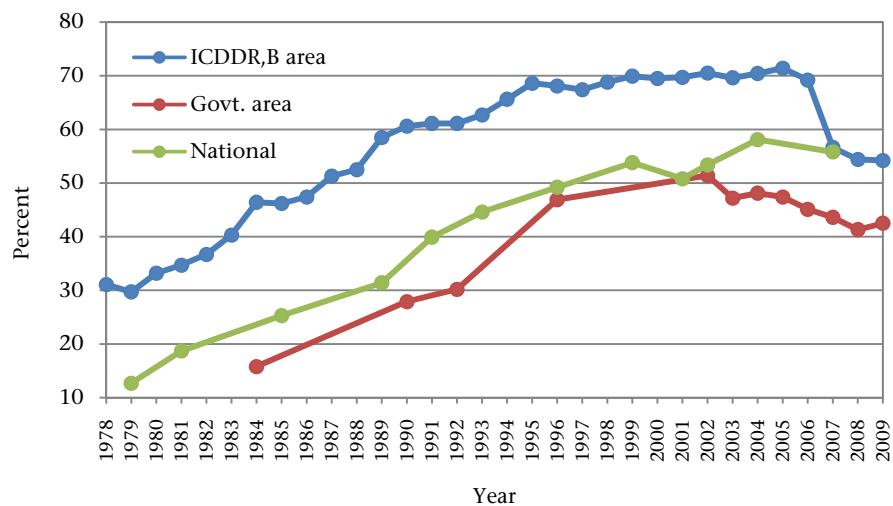
A large part of the decline in mortality in Matlab since the mid 1960s is a result of substantial reductions in infant and child mortality. Figure 2.4 shows that in the areas of Matlab receiving maternal and child health services (the ICDDR,B service area), infant mortality rate (IMR) fell by 80% over the period 1978-2009. In Government service area, IMR declined 69% over the period 1978-2009. Figure 2.5 shows that, during the same period, under-five mortality rate (U5MR) declined by 84% in ICDDR,B service area and 77% 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, 1966-2009
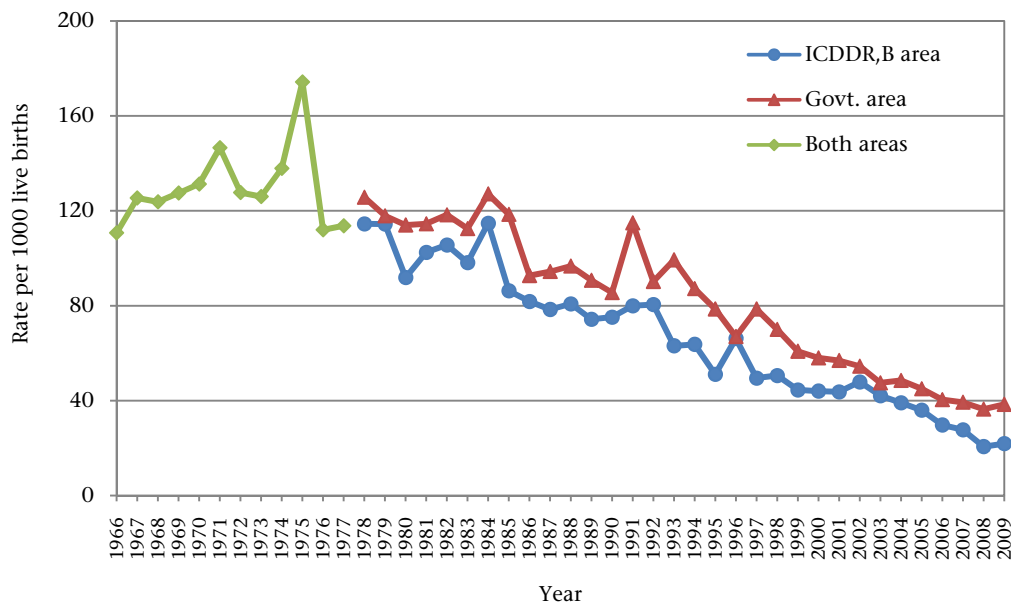
Figure 2.5 Under-five Mortality Rates (U5MR) in Matlab by area, 1966-2009
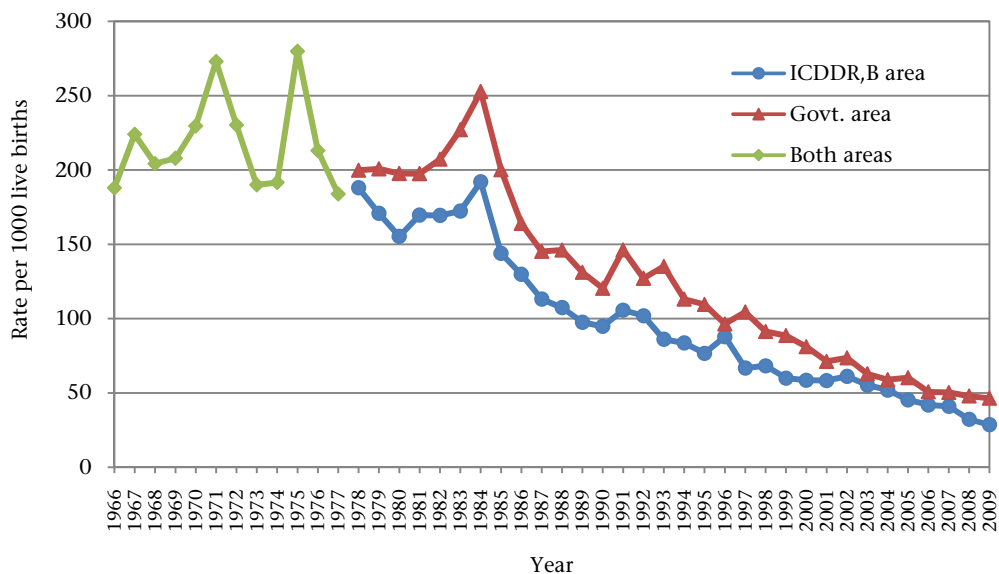
Massive reduction of infant and child mortality has resulted in remarkable improvement in life expectancy at birth over the last 40 years. The life expectancy at birth for males rose from 53 years in 1966 to 70.0 in 2009, a gain of 17.0 years and for women, the improvement is even more evident, from 51 to 72.4, a gain of nearly 21.4 years for diminishing gender difference in childhood mortality and maternal mortality (Figure 2.6).

Figure 2.6 Expectation of life at birth (e^0) in Matlab, 1966-2009
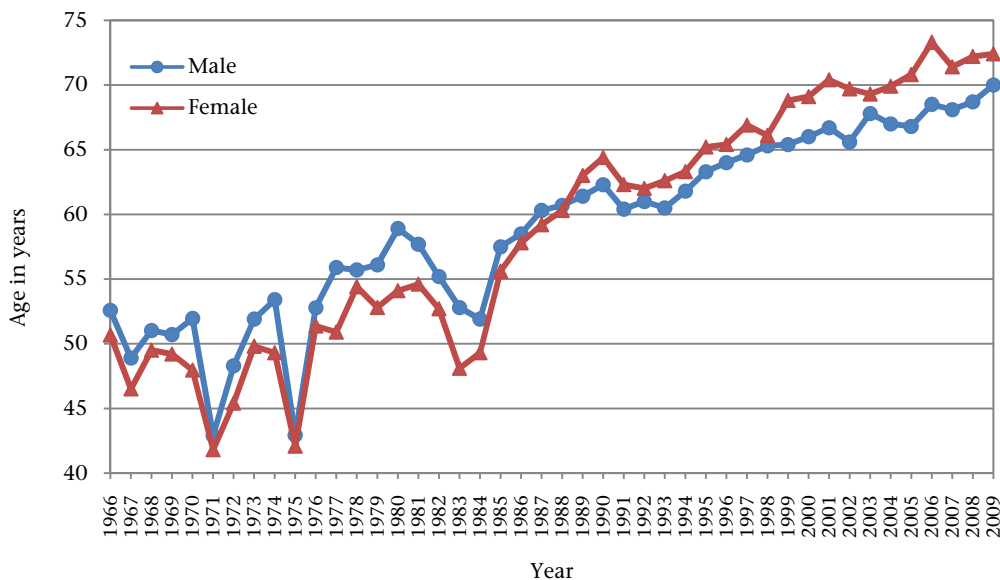
The Figure 2.7 shows the trends in mean age at first marriage for brides and grooms in Matlab. Mean age at first marriage has increased in both areas during 1975-2009. During this period, brides' mean age at marriage increased by 3.8 years and for grooms, it increased by 3.0 years.

Figure 2.7 Mean age at first marriage in Matlab, 1975-2009
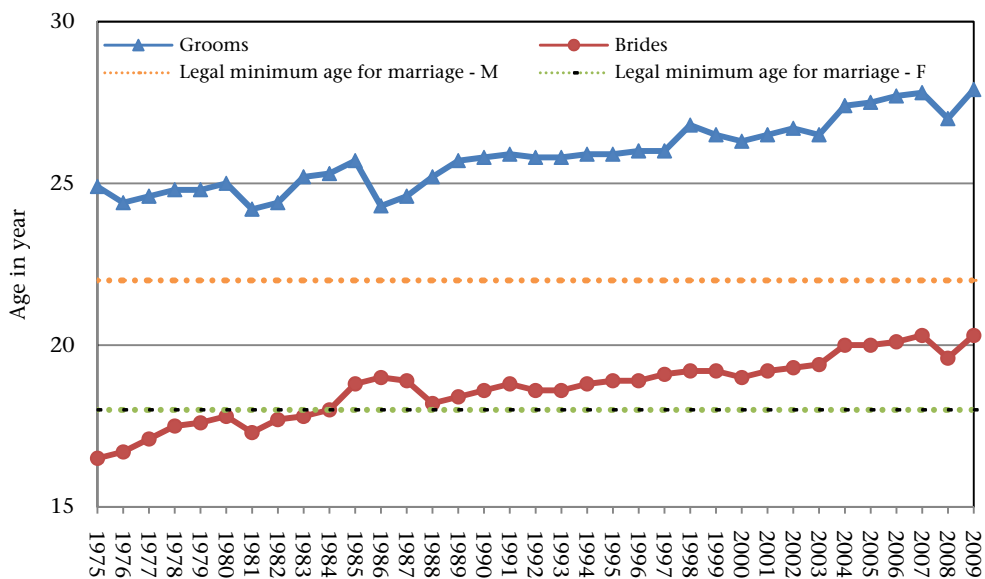
POPULATION CHANGES

The principal vital statistics of the ICDDR,B and Government service areas from 1998 through 2009 are summarized in Table 3.1. The number of mid-year population and the demographic events registered in 2009 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.

In 2009, the crude birth rate decreased to 21.6 in the ICDDR,B service area and to 20.5 in the Government service area from the 2008 level of 23.5 in the ICDDR,B service area and 22.1 in the Government service area respectively.   In the ICDDR,B service area, the crude death rate decreased to 6.2 in 2009 compared to 6.4 in 2008, and in the Government service area it also decreased to 6.9 in 2009 compared to 7.2 in 2008. The TFR decreased to 2.5 in each area in 2009 from 2.7 in 2008 in each area. The trends in the TFR in both areas are illustrated in Figure 2.2 of Chapter 2.

The rate of infant mortality slightly increased to 21.9 in 2009 from 20.6 in 2008 in the ICDDR,B service area, and increased 38.4 in 2009 from 36.4 in 2008 in the Government service area. In the ICDDR,B service area, neonatal mortality also increased to 16.2 in 2009 from 15.8 in 2008, and in the Government service area it increased to 33.5 in 2009 from 26.1 in 2008. There was a decrease in the mortality rate of children aged 1-4 years in the ICDDR,B service area from 3.0 to 1.7, and this also decreased in the Government service area (2.1 compared to 2.9 in 2008). As a result of these changes, mortality of children aged less than 5 years decreased substantially in the ICDDR,B service area from 32.3 per 1,000 live births in 2008 to 28.6 in 2009, also in the Government service area mortality of children aged less than 5 years decreased from 47.9 in 2008 to 46.4 in 2009. The trends in mortality of children aged less than 5 years are illustrated in Figures 2.4 and 2.5 in Chapter 2.

The numbers of in- and out-migrants registered in 2009 were 12,088 and 12,952 respectively, giving an in-migration rate of 54.1, out-migration rate of 58.0 and a net migration rate of 3.9 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 1.1%.

The age-sex distribution of the mid-year population of the Matlab HDSS area 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 1978-2009 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 2009, 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 33.9% in 2009. This difference in age distribution 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 9.4% in 2009 due to the decline in both fertility and mortality. The net population increase was 10.7 per 1,000 in 2009 while it was -5.6 per 1,000 in 2008, due to the increase in the number of in-migrants. A major cause for men being fewer than women in age group 20-44, 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*, 1998-2009

Vital rate (per 1,000)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Crude birth rate												
ICDDR,B area	25.8	24.5	24.9	26.4	25.8	26.4	24.5	23.2	22.9	22.6	23.5	21.6
Government area	28.3	25.9	27.7	27.1	25.3	25.1	24.8	23.1	22.7	23.0	22.1	20.5
Both areas	27.0	25.2	26.3	26.8	25.6	25.7	24.7	23.2	22.8	22.8	22.9	21.1
Total fertility rate**												
ICDDR,B area	3.0	2.9	2.9	3.1	3.0	3.1	2.9	2.7	2.7	2.6	2.7	2.5
Government area	3.6	3.3	3.5	3.4	3.2	3.2	3.1	2.8	2.8	2.8	2.7	2.5
Both areas	3.3	3.1	3.2	3.3	3.1	3.1	3.0	2.8	2.7	2.7	2.7	2.5
Crude death rate												
ICDDR,B area	7.0	6.4	6.8	6.5	6.9	6.8	6.7	6.9	6.3	6.8	6.4	6.2
Government area	8.1	7.4	7.2	7.0	7.3	7.0	7.4	7.0	6.4	7.1	7.2	6.9
Both areas	7.5	6.9	7.0	6.8	7.1	6.9	7.0	6.9	6.3	7.0	6.8	6.5
Neonatal mortality***												
ICDDR,B area	36.8	25.4	32.3	26.4	34.4	31.5	29.6	26.5	23.5	20.3	15.8	16.2
Government area	44.0	38.6	43.6	42.4	36.4	33.8	35.3	35.4	30.1	29.9	26.1	33.5
Both areas	40.5	32.0	38.4	34.7	35.4	32.6	32.5	30.9	26.8	25.1	20.7	24.4
Post-neonatal mortality***												
ICDDR,B area	13.8	19.1	11.8	17.2	13.5	10.6	9.5	9.6	6.2	7.4	4.9	5.7
Government area	26.0	22.2	14.4	14.5	18.1	13.7	13.2	9.6	10.3	9.4	10.4	4.9
Both areas	20.1	20.6	13.2	15.9	15.9	12.1	11.4	9.6	8.2	8.4	7.5	5.3
Infant mortality***												
ICDDR,B area	50.6	44.5	44.0	43.7	47.9	42.1	39.1	36.0	29.7	27.7	20.6	21.9
Government area	70.0	60.8	58.0	56.9	54.5	47.5	48.5	45.0	40.4	39.3	36.4	38.4
Both areas	60.6	52.7	51.6	50.5	51.2	44.8	43.9	40.5	35.0	33.5	28.1	29.8
Child mortality (1-4yrs) #												
ICDDR,B area	4.7	4.1	3.9	3.9	3.5	3.6	3.4	2.4	3.2	3.4	3.0	1.7
Government area	5.8	7.5	6.4	3.8	5.2	4.1	2.7	4.0	2.6	2.8	2.9	2.1
Both areas	5.2	5.8	5.2	3.9	4.4	3.9	3.1	3.2	2.9	3.1	3.0	1.9
Under five mortality***												
ICDDR,B area	68.3	60.0	58.6	58.4	61.1	55.2	51.9	45.3	41.9	41.0	32.3	28.6
Government area	91.3	88.6	81.1	71.2	73.6	62.9	58.9	60.2	50.7	50.3	47.9	46.4
Both areas	80.1	74.4	70.7	65.0	67.5	59.1	55.4	52.8	46.2	45.7	39.7	37.1
Rate of natural increase												
ICDDR,B area	18.8	18.1	18.1	19.9	18.9	19.6	17.8	16.3	16.6	15.8	17.1	15.4
Government area	20.2	18.5	20.5	20.1	18.0	18.0	17.5	16.1	16.3	15.9	14.9	13.7
Both areas	19.5	18.3	19.3	20.0	18.5	18.8	17.6	16.2	16.5	15.8	16.0	14.5
In-migration	30.3	34.8	35.1	34.0	45.7	40.4	42.1	35.7	43.5	40.0	44.0	54.1
Out-migration	36.9	48.0	48.5	46.2	52.4	55.4	57.9	53.3	57.3	63.5	65.7	58.0
Growth (%)	1.3	0.5	0.6	0.8	1.2	0.4	0.2	-0.1	0.3	-0.8	-0.6	1.1

*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, 2009

Demographic indicator	Number			Rate per 1,000		
	Total	Male	Female	Total	Male	Female
Total Population (as of 30 June 2009)						
ICDDR,B service area	114230	53173	61057	-	-	-
Government service area	109055	50612	58443	-	-	-
Both areas	223285	103785	119500	-	-	-
Events registered (Jan-Dec. 2009)						
Births						
ICDDR,B service area	2465	1263	1202	21.6	-	-
Government service area	2240	1139	1101	20.5	-	-
Both areas	4705	2402	2303	21.1	-	-
Deaths						
Infants*						
ICDDR,B service area	54	33	21	21.9	26.1	17.5
Government service area	86	44	42	38.4	38.6	38.1
Both areas	140	77	63	29.8	32.1	27.4
All deaths						
ICDDR,B service area	708	376	332	6.2	7.1	5.4
Government service area	749	391	358	6.9	7.7	6.1
Both areas	1457	767	690	6.5	7.4	5.8
In-migration	12088	5857	6231	54.1	56.4	52.1
Out-migration	12952	6465	6487	58.0	62.3	54.3
Marriage	3312	-	-	14.8	-	-
Divorce**	314	-	-	94.8	-	-
Population change (Jan-Dec. 2009)						
Net migration	-864	-608	-256	-3.9	-5.9	-2.1
Natural increase						
ICDDR,B service area	1757	887	870	15.4	16.7	14.2
Government service area	1491	748	743	13.7	14.8	12.7
Both areas	3248	1635	1613	14.5	15.8	13.5
Net increase	2384	1027	1357	10.7	9.9	11.4

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

Table 3.3. Mid-year population by age and sex, 2009

Age (years)	Number			Percent		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	223285	103785	119500	100.0	100.0	100.0
<1 year	4894	2482	2412	2.2	2.4	2.0
1 – 4	20109	10189	9920	9.0	9.8	8.3
1	*5194*	*2625*	*2569*	*2.3*	*2.5*	*2.1*
2	*4914*	*2480*	*2434*	*2.2*	*2.4*	*2.0*
3	*4958*	*2548*	*2410*	*2.2*	*2.5*	*2.0*
4	*5043*	*2536*	*2507*	*2.3*	*2.4*	*2.1*
5 – 9	26103	13255	12848	11.7	12.8	10.8
10-14	23859	11947	11912	10.7	11.5	10.0
15-19	20764	9909	10855	9.3	9.5	9.1
20-24	18139	7263	10876	8.1	7.0	9.1
25-29	15052	5811	9241	6.7	5.6	7.7
30-34	13251	5415	7836	5.9	5.2	6.6
35-39	13651	5881	7770	6.1	5.7	6.5
40-44	13815	5844	7971	6.2	5.6	6.7
45-49	13995	6722	7273	6.3	6.5	6.1
50-54	10801	5448	5353	4.8	5.2	4.5
55-59	7779	3840	3939	3.5	3.7	3.3
60-64	6726	3014	3712	3.0	2.9	3.1
65-69	5737	2490	3247	2.6	2.4	2.7
70-74	4275	2070	2205	1.9	2.0	1.8
75-79	2497	1232	1265	1.1	1.2	1.1
80-84	1208	631	577	0.5	0.6	0.5
85+	630	342	288	0.3	0.3	0.2

Table 3.4. Mid-year population by age, sex, and area, 2009

Age (years)	ICDDR,B service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	114230	53173	61057	109055	50612	58443
<1 year	2583	1320	1263	2311	1162	1149
1 – 4	10327	5280	5047	9782	4909	4873
1	*2624*	*1349*	*1275*	*2570*	*1276*	*1294*
2	*2549*	*1281*	*1268*	*2365*	*1199*	*1166*
3	*2555*	*1343*	*1212*	*2403*	*1205*	*1198*
4	*2599*	*1307*	*1292*	*2444*	*1229*	*1215*
5 – 9	13190	6587	6603	12913	6668	6245
10-14	11864	5896	5968	11995	6051	5944
15-19	10052	4725	5327	10712	5184	5528
20-24	9280	3689	5591	8859	3574	5285
25-29	7836	3037	4799	7216	2774	4442
30-34	7141	2965	4176	6110	2450	3660
35-39	7180	3143	4037	6471	2738	3733
40-44	7337	3129	4208	6478	2715	3763
45-49	7251	3527	3724	6744	3195	3549
50-54	5538	2852	2686	5263	2596	2667
55-59	3998	1981	2017	3781	1859	1922
60-64	3421	1531	1890	3305	1483	1822
65-69	2902	1303	1599	2835	1187	1648
70-74	2141	1056	1085	2134	1014	1120
75-79	1238	631	607	1259	601	658
80-84	623	336	287	585	295	290
85+	328	185	143	302	157	145

Figure 3.1. Age pyramid of the 2009 mid-year population
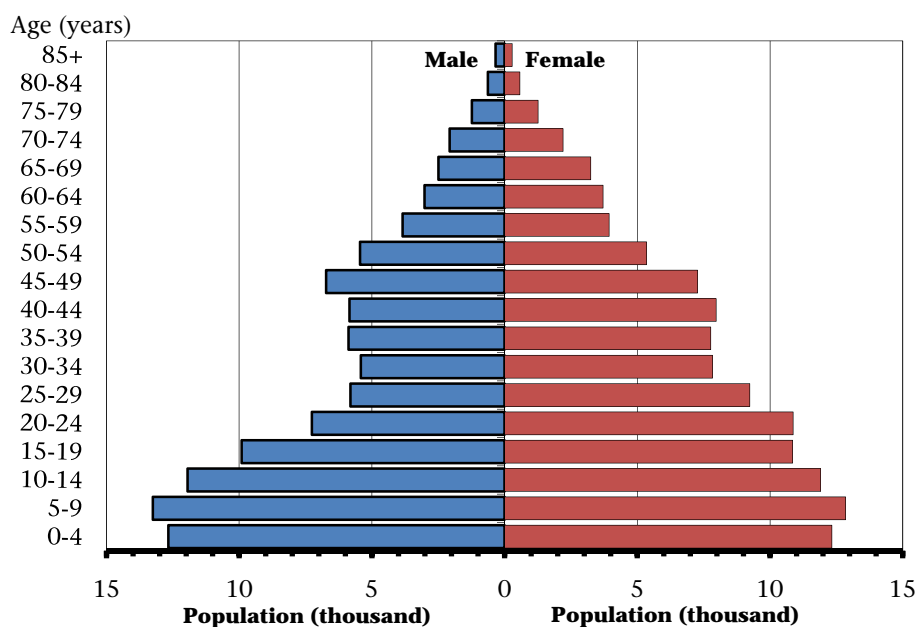
CHAPTER 4

MORTALITY

The distribution of 1,457 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 1,457 deaths, 9.6% were infants, 2.7% were children aged 1-4 years, and 63.7% were aged 60 years and above in 2009.

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 2009, respectively. In 2009, the overall death rates for males and females were 7.4 and 5.8 respectively. Infant mortality rate was 32.1 per 1,000 live births for males and 27.4 for females. It was lower in the ICDDR,B service area (26.1 and 17.5, respectively) than in the Government service area (38.6 and 38.1 respectively), a result of improvements in the neonatal mortality in the ICDDR,B service area. Block-wise deaths in the ICDDR,B service area by age and sex are shown in Appendix A.2.

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 improved substantially in 2009 compared to the 2008 level. It was 70.0 years for males and 72.4 for females in 2009 compared to 68.7 for males and 72.2 for females in 2008. The level of adult (15-59 years) mortality increased as a whole in 2009 compared to 2008. The probability of dying for males aged 15-60 years ($_{45}q_{15}$) was 157.9, and for females it was 116 per 1,000 population in 2009 and in 2008 it was 155.3 and 91.0 for males and females respectively. In most of the age-groups, expectation of life is longer for females than males.

The expectation of life at birth was higher for males and females in the ICDDR,B service area than the Government service area. In 2009, the gender difference in expectation of life was slightly higher in the Government service area (2.6 years) than in the ICDDR,B service area (2.1 years). Expectation of life at most of the age-groups 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 months (December-January,May). Neonatal deaths was most frequent in October. Post-neonatal deaths were higher in January, July and October and child deaths, on the other hand, were highest in June. Figure 4.1 shows that the probability of survival for males and females started to differ from age 25 with females having a higher probability of survival in later age-groups.

Deaths by underlying causes, sex, age, and by areas are shown in Appendix 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 communicable diseases led by respiratory infections, tuberculosis, hepatitis occurred more in males than females in ICDDR,B service area whereas deaths due to respiratory infections, then septicaemia, and diarrhoea occurred more in females than males in Government service area. Prematurity and low birth weight were also important

causes of death, particularly of neonates irrespective of sex and area. Among non-communicable diseases, death rates due to the circulatory system (stroke, ischaemic heart disease and hypertensive disease), neoplasms, asthma, diabetes, and digestive diseases were more prominent in both sexes and in both the areas. 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 most prominent in both the areas. The maternal mortality ratio in the ICDDR,B service area in 2009 was 82% lower than that of Government service area (41 vs. 223 per 100,000 live births).

Table 4.1. Deaths by age and sex in both areas, 2009

Age (years)	Both sexes		Male		Female	
	Number	Cumulative percentage	Number	Cumulative percentage	Number	Cumulative percentage
All ages	1457	-	767	-	690	-
<1 year	140	-	77	-	63	-
<1 month	115	7.9	60	7.8	55	8.0
1- 5 months	19	9.2	14	9.6	5	8.7
6-11 months	6	9.6	3	10.0	3	9.1
1 – 4 years	39	-	17	-	22	-
1	27	11.5	10	11.3	17	11.6
2	4	11.7	2	11.6	2	11.9
3	5	12.1	2	11.9	3	12.3
4	3	12.3	3	12.3	0	12.3
5 – 9	14	13.2	12	13.8	2	12.6
10-14	4	13.5	0	13.8	4	13.2
15-19	17	14.7	8	14.9	9	14.5
20-24	18	15.9	4	15.4	14	16.5
25-29	14	16.9	6	16.2	8	17.7
30-34	16	18.0	6	16.9	10	19.1
35-39	21	19.4	10	18.3	11	20.7
40-44	32	21.6	14	20.1	18	23.3
45-49	50	25.1	32	24.3	18	25.9
50-54	83	30.7	53	31.2	30	30.3
55-59	81	36.3	47	37.3	34	35.2
60-64	101	43.2	62	45.4	39	40.9
65-69	173	55.1	92	57.4	81	52.6
70-74	202	69.0	102	70.7	100	67.1
75-79	197	82.5	99	83.6	98	81.3
80-84	151	92.9	74	93.2	77	92.5
85+	104	100.0	52	100.0	52	100.0

Table 4.2. Deaths by area, age, and sex, 2009

Age (years)	ICDDR,B service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	708	376	332	749	391	358
<1 year	54	33	21	86	44	42
<1 month	*40*	*23*	*17*	*75*	*37*	*38*
1- 5 months	*12*	*8*	*4*	*7*	*6*	*1*
6-11 months	*2*	*2*	*0*	*4*	*1*	*3*
1 – 4 years	18	5	13	21	12	9
1	*14*	*4*	*10*	*13*	*6*	*7*
2	*1*	*0*	*1*	*3*	*2*	*1*
3	*2*	*0*	*2*	*3*	*2*	*1*
4	*1*	*1*	*0*	*2*	*2*	*0*
5 – 9	4	4	0	10	8	2
10-14	0	0	0	4	0	4
15-19	8	5	3	9	3	6
20-24	8	2	6	10	2	8
25-29	5	3	2	9	3	6
30-34	8	3	5	8	3	5
35-39	13	4	9	8	6	2
40-44	19	8	11	13	6	7
45-49	25	15	10	25	17	8
50-54	45	30	15	38	23	15
55-59	39	24	15	42	23	19
60-64	46	28	18	55	34	21
65-69	91	51	40	82	41	41
70-74	100	54	46	102	48	54
75-79	94	46	48	103	53	50
80-84	76	36	40	75	38	37
85+	55	25	30	49	27	22

Table 4.3. Death rates by age and sex in both areas, 2009

Age (years)	Rate per 1,000 population			Rate per 1,000 person-years		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	6.5	7.4	5.8	6.5	7.4	5.8
<1 year*	29.8	32.1	27.4	29.8	32.1	27.4
<1 month	24.4	25.0	23.9	24.4	25.0	23.9
1- 5 months	4.0	5.8	2.2	4.0	5.8	2.2
6-11 months	1.3	1.2	1.3	1.3	1.2	1.3
1 – 4 years	1.9	1.7	2.2	1.9	1.7	2.2
1	5.2	3.8	6.6	5.2	3.8	6.7
2	0.8	0.8	0.8	0.8	0.8	0.8
3	1.0	0.8	1.2	1.0	0.8	1.2
4	0.6	1.2	0.0	0.6	1.2	0.0
5 – 9	0.5	0.9	0.2	0.5	0.9	0.2
10-14	0.2	0.0	0.3	0.2	0.0	0.3
15-19	0.8	0.8	0.8	0.8	0.8	0.8
20-24	1.0	0.6	1.3	1.0	0.5	1.3
25-29	0.9	1.0	0.9	0.9	1.0	0.9
30-34	1.2	1.1	1.3	1.2	1.1	1.3
35-39	1.5	1.7	1.4	1.5	1.7	1.4
40-44	2.3	2.4	2.3	2.3	2.4	2.3
45-49	3.6	4.8	2.5	3.6	4.8	2.5
50-54	7.7	9.7	5.6	7.7	9.7	5.6
55-59	10.4	12.2	8.6	10.4	12.2	8.6
60-64	15.0	20.6	10.5	15.1	20.6	10.5
65-69	30.2	36.9	24.9	29.9	36.6	24.7
70-74	47.3	49.3	45.4	47.3	49.6	45.2
75-79	78.9	80.4	77.5	78.3	79.7	77.0
80-84	125.0	117.3	133.4	125.1	117.8	133.1
85+	165.1	152.0	180.6	164.3	149.1	183.0

*Rate per 1,000 live births

Table 4.4. Death rates by area, age, and sex, 2009
(per 1,000 population)

Age (years)	ICDDR,B service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	6.2	7.1	5.4	6.9	7.7	6.1
<1 year	21.9	26.1	17.5	38.4	38.6	38.1
*<1 month**	*16.2*	*18.2*	*14.1*	*33.5*	*32.5*	*34.5*
*1- 5 months**	*4.9*	*6.3*	*3.3*	*3.1*	*5.3*	*0.9*
*6-11 months**	*0.8*	*1.6*	*0.0*	*1.8*	*0.9*	*2.7*
1 – 4 years	1.7	0.9	2.6	2.1	2.4	1.8
1	*5.3*	*3.0*	*7.8*	*5.1*	*4.7*	*5.4*
2	*0.4*	*0.0*	*0.8*	*1.3*	*1.7*	*0.9*
3	*0.8*	*0.0*	*1.7*	*1.2*	*1.7*	*0.8*
4	*0.4*	*0.8*	*0.0*	*0.8*	*1.6*	*0.0*
5 – 9	0.3	0.6	0.0	0.8	1.2	0.3
10-14	0.0	0.0	0.0	0.3	0.0	0.7
15-19	0.8	1.1	0.6	0.8	0.6	1.1
20-24	0.9	0.5	1.1	1.1	0.6	1.5
25-29	0.6	1.0	0.4	1.2	1.1	1.4
30-34	1.1	1.0	1.2	1.3	1.2	1.4
35-39	1.8	1.3	2.2	1.2	2.2	0.5
40-44	2.6	2.6	2.6	2.0	2.2	1.9
45-49	3.4	4.3	2.7	3.7	5.3	2.3
50-54	8.1	10.5	5.6	7.2	8.9	5.6
55-59	9.8	12.1	7.4	11.1	12.4	9.9
60-64	13.4	18.3	9.5	16.6	22.9	11.5
65-69	31.4	39.1	25.0	28.9	34.5	24.9
70-74	46.7	51.1	42.4	47.8	47.3	48.2
75-79	75.9	72.9	79.1	81.8	88.2	76.0
80-84	122.0	107.1	139.4	128.2	128.8	127.6
85+	167.7	135.1	209.8	162.3	172.0	151.7

*Rate per 1,000 live births

Table 4.5. Abridged life table by sex, 2009

Age (years)	Male $_nq_x$	Male l_x	Male L_x	Male $e0_x$	Female $_nq_x$	Female l_x	Female L_x	Female $e0_x$
0	32.1	100000	97435	70.0	27.4	100000	97812	72.4
1	3.8	96794	96577	71.4	6.6	97264	96886	73.4
2	0.8	96426	96387	70.6	0.8	96623	96583	72.9
3	0.8	96349	96311	69.7	1.2	96544	96483	71.9
4	1.2	96273	96216	68.7	0.0	96423	96423	71.0
5	4.5	96159	479795	67.8	0.8	96423	481944	70.0
10	0.0	95725	478624	63.1	1.7	96348	481370	65.1
15	4.0	95725	477735	58.1	4.1	96187	480017	60.2
20	2.8	95339	476091	53.3	6.4	95789	477527	55.4
25	5.2	95077	474256	48.5	4.3	95174	474923	50.8
30	5.5	94587	471731	43.7	6.4	94763	472425	46.0
35	8.5	94064	468486	38.9	7.1	94160	469269	41.2
40	11.9	93268	463776	34.2	11.2	93496	465056	36.5
45	23.5	92157	455768	29.6	12.3	92446	459603	31.9
50	47.6	89987	439995	25.3	27.7	91308	450696	27.3
55	59.5	85707	416664	21.4	42.3	88782	435196	23.0
60	98.1	80607	384488	17.6	51.3	85026	414996	18.9
65	169.8	72698	334119	14.2	117.8	80666	380957	14.7
70	220.3	60353	269795	11.6	204.5	71162	320930	11.3
75	335.3	47059	196332	9.1	325.3	56608	237678	8.6
80	451.5	31282	120442	7.5	496.3	38195	142060	6.5
85+	1000.0	17157	112841	6.6	1000.0	19237	106542	5.5

Table 4.6. Deaths by month and age, 2009

Months	All ages	Age at death <1 month	Age at death 1-11 months	Age at death 1-4 years	Age at death 5 years and above
January	158	11	3	0	144
February	118	7	3	2	106
March	122	11	3	5	103
April	100	7	2	4	87
May	136	10	1	3	122
June	87	4	2	8	73
July	100	8	2	2	88
August	127	10	1	5	111
September	125	9	3	1	112
October	106	16	2	3	85
November	128	10	3	6	109
December	150	12	0	0	138
Total	1457	115	25	39	1278

Table 4.7. Age-standardized mortality rates by cause of death, 2009
(per 1,000 population)*

Cause of death	Male		Female	
	ICDDR,B area	Government area	ICDDR,B area	Government area
Communicable diseases				
Diarrhoeal	(2.38)	(10.57)	13.48	13.67
Malaria	(1.70)	0.00	0.00	0.00
Tuberculosis	20.26	(7.52)	(5.80)	(3.65)
EPI related death	0.00	0.00	(2.47)	0.00
Meningitis	0.00	(2.63)	(1.43)	0.00
Hepatitis	(6.31)	10.79	(1.88)	(1.75)
Chicken pox	0.00	0.00	0.00	(1.93)
Rabies	(1.32)	0.00	0.00	0.00
Septicaemia	0.00	(7.72)	13.91	18.32
Respiratory infections	30.37	18.32	0.00	23.67
Other communicable	0.00	(2.49)	0.00	(3.27)
Maternal and neonatal conditions				
Maternal death	-	-	(1.47)	(8.48)
Premature and LBW	8.18	13.94	7.13	23.50
Birth asphyxia	13.64	21.69	(4.28)	15.67
Other neonatal	(2.73)	15.49	(4.28)	(7.83)
Nutritional	14.73	17.89	(7.33)	13.92
Non-communicable diseases				
Neoplasm	94.91	85.44	41.24	47.80
Neoplasm in female organ	0.00	0.00	(5.58)	(7.36)
Congenital malformation	6.82	(4.40)	(4.28)	(4.57)
Diabetes	19.17	35.84	35.73	24.41
Other endocrine	0.00	0.00	(2.96)	0.00
Neuro-psychiatric	(5.54)	10.34	0.00	(7.40)
Rheumatic heart disease	0.00	0.00	0.00	0.00
Hypertensive disease	72.98	54.89	65.91	42.13
Ischaemic heart disease	77.15	101.59	56.50	45.08
Stroke	149.19	133.82	199.98	173.35
Other cardiovascular	64.16	59.23	87.66	74.59
COPD**	56.49	47.96	36.18	25.22
Asthma	17.97	27.34	15.45	18.39
Other respiratory	25.54	18.41	(3.66)	(4.36)
Digestive disease	52.18	24.36	19.48	18.75
Renal failure	11.24	14.39	(9.21)	12.94
Other non-communicable	(6.50)	(2.47)	0.00	(10.20)
Accident	18.18	35.07	13.35	31.94
Drowning	11.31	24.77	26.34	14.12
Suicide	(4.71)	(1.64)	12.81	9.75
Homicide	0.00	(2.85)	(3.38)	(1.45)
Miscellaneous causes				
Senility	(3.24)	29.03	(12.59)	15.52
Fever of unknown origin	(5.29)	16.87	(5.61)	(8.10)
Sudden infant death	(1.36)	(1.55)	0.00	0.00
Unknown/missing/unspecified	28.86	72.79	39.86	45.62
Total	834.38	934.10	761.20	778.69

*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, 2009
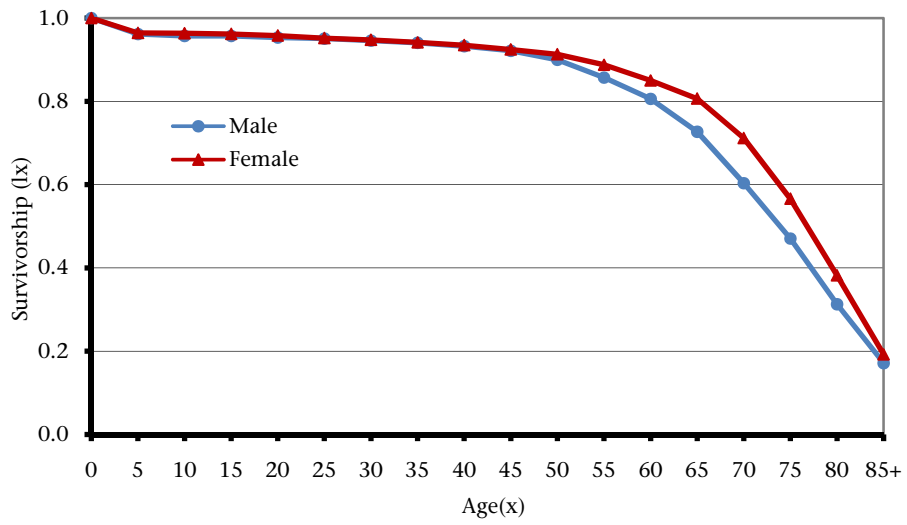
FERTILITY

In 2009, there were 4,705 live births in the Matlab HDSS area as outcomes of 5,568 pregnancy terminations recorded. Table 5.1 shows the number of pregnancy terminations and their outcomes in 2009. In the Matlab HDSS area as a whole, 83.8% 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, 45 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 September-January. The sex ratio of live births was 104 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 both in the ICDDR,B service and Government service areas. 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 77% in the ICDDR,B service area and 24% in the Government service area. More commonly used places for institutional delivery in the Government service area were private clinic/nursing home (10.6%) and Upazila Health Complex (6.1%), and in ICDDR,B service area, ICDDR,B hospital (42.5%) followed by clinic/nursing home (18.6%). Table 5.5 shows the distribution of live births by birth attendants[4] and area. In the ICDDR,B service area, Family Welfare Visitor (FWV) assisted highest number (28.1%) of the live-birth deliveries as opposed to TBAs (58.0%) in the Government service area. The respective figures for trained TBAs were 5.3% and 15.4% in the ICDDR,B service area and Government service area,

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

respectively. Medically trained birth attendants (doctors, nurses or midwives, lady family planning visitors or family welfare visitors) assisted 77.1% of the live birth deliveries in the ICDDR,B service area and 25.8% in the Government service area. In the ICDDR,B service area, assistance was sought more frequently from FWV (28.1%) followed by nurse (26.8%), MBBS doctors (22.2%) whereas in the Government service area, it was from MBBS doctors (12.4%) followed by nurses (9.4%).

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 82.4% in the ICDDR,B service area and 88.2% in the Government service area. Instrumental deliveries, especially caesarean were 17.6% and 11.7% respectively in the ICDDR,B service area and Government service area.

Matlab HDSS recorded pre-natal care received by mothers in different stages of pregnancy in 2009. Table 5.7 shows pre-natal care received by mothers who had a live birth in 2009 in three trimesters by type of service providers. In the ICDDR,B service area, in first trimester 51.3% of the mothers did not receive any pre-natal care as oppose to 89.7% in the Government service area. The respective figures for 2nd and 3rd trimester were 5.2%- 4.1% in the ICDDR,B service area and 41.6%-27.8% in the Government service area. In the ICDDR,B service area, seeking pre-natal care from skilled providers accounts for 48.7% in first trimester and 94.8%-95.9% in second and third trimesters. In this area, providers of pre-natal care are ICDDR,B sub-centres (70.3% and 63.4% in 2nd and 3rd trimesters respectively) and ICDDR,B Matlab hospital (19.8% and 26.2% in 2nd and 3rd trimesters respectively). In the Government service area, skilled providers of prenatal care are private clinics (16.7% and 30.9% in 2nd and 3rd trimesters respectively), community clinics or Health family welfare centres (12.1% and 14.0% in 2nd and 3rd trimesters respectively) and government hospitals (7.1% and 8.2% in 2nd and 3rd trimesters respectively). In this area, others (that include untrained village doctors, herbalists (*kabiraj*) and homeopaths) are most common providers of pre-natal care.

Figure 5.1. Number of births and deaths by month, 2009
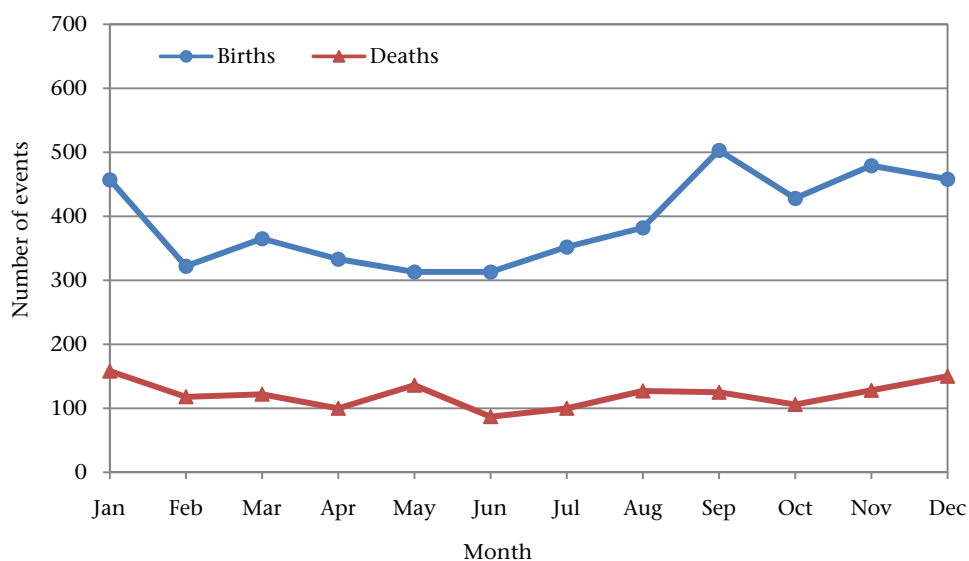
Table 5.1. Numbers and rates of pregnancy outcomes by type and area, 2009

Type of pregnancy outcome	Both areas		ICDDR,B area		Government area	
	Number	Rate	Number	Rate	Number	Rate
Total pregnancies*	5568	90.1	2950	92.6	2618	87.4
Live birth preg.**	4665	837.8	2439	826.8	2226	850.3
Fetal wastage**	903	162.2	511	173.2	392	149.7
Early(miscarriage)***	797	143.1	476	161.4	321	122.6
Induced	265	47.6	121	41.0	144	55.0
Spontaneous	532	95.5	355	120.3	177	67.6
Late (still birth)	106	19.0	35	11.9	71	27.1
Multiple birth pregnancy	45		30		15	
Multiple live birth pregnancy	45		30		15	
Three live births	0		0		0	
Two live births	40		26		14	
One live birth	5		4		1	
Still birth pregnancies	0		0		0	
Three still births	0		0		0	
Two still births	0		0		0	
Miscarriage pregnancies	0		0		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, 2009

| Months | Pregnancy outcome | | | | | No. of live born children | | | |
| | | Miscarriage | | Still | Live | Both | | | |
	All	Induced	Spon.	birth	birth[a]	sexes	Male	Female	Ratio
All months	5568	265	532	106	4665	4705	2402	2303	1.04
January	542	35	44	8	455	457	227	230	0.99
February	401	19	48	13	321	322	167	155	1.08
March	447	29	48	8	362	365	182	183	0.99
April	404	22	48	8	326	333	171	162	1.06
May	379	22	40	5	312	313	159	154	1.03
June	393	33	46	6	308	313	156	157	0.99
July	418	16	45	10	347	352	195	157	1.24
August	449	17	46	6	380	382	195	187	1.04
September	555	15	37	5	498	503	271	232	1.17
October	514	23	48	18	425	428	219	209	1.05
November	553	19	47	12	475	479	231	248	0.93
December	513	15	35	7	456	458	229	229	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, 2009

Age (years)	Both areas		ICDDR,B area		Government area	
	Births	Rate	Births	Rate	Births	Rate
All ages	4705	76.1	2465	77.4	2240	74.8
15-19*	626	57.7	376	70.6	250	45.2
20-24	1630	149.9	839	150.1	791	149.7
25-29	1230	133.1	633	131.9	597	134.4
30-34	748	95.5	398	95.3	350	95.6
35-39	388	49.9	184	45.6	204	54.6
40-44	83	10.4	35	8.3	48	12.8
45-49**	0	0.0	0	0.0	0	0.0
Total fertility rate		2482		2509		2462
General fertility rate		76		77		75
Gross reproduction rate		1215		1223		1210
Net reproduction rate		1154		1179		1132

*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 birth pregnancies by place of delivery by area, 2009

Place of Delivery	Both areas		ICDDR,B area		Government area	
	Number	Percent	Number	Percent	Number	Percent
Home	2259	48.4	570	23.4	1689	75.9
ICDDR,B sub-centre	312	6.7	312	12.8	0	0.0
ICDDR,B hospital	1041	22.3	1036	42.5	5	0.2
Upazila health complex	147	3.2	11	0.5	136	6.1
District hospital	113	2.4	38	1.6	75	3.4
Clinic/nursing home	690	14.8	453	18.6	237	10.6
UH & FWC	66	1.4	9	0.4	57	2.6
Others	37	0.8	10	0.4	27	1.2
Total	**4665**	**100.0**	**2439**	**100.0**	**2226**	**100.0**

Source: Birth registration form

Figure 5.2. Age-specific fertility rates by area, 2009
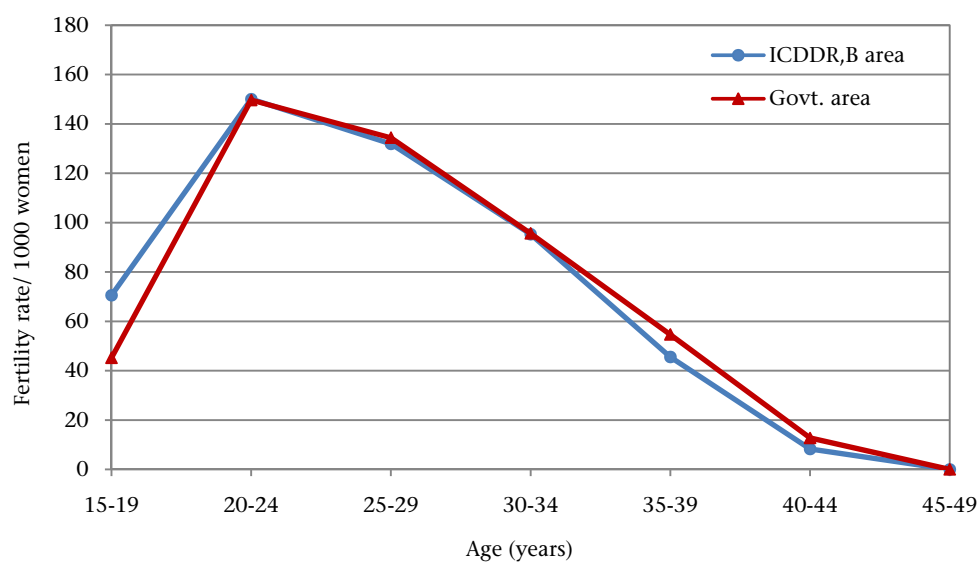
Table 5.5. Distribution of live birth pregnancies attendant by area, 2009

Birth attendant	Both areas		ICDDR,B area		Government area	
	Number	Percent	Number	Percent	Number	Percent
TBA	1701	36.5	409	16.8	1292	58.0
Trained TBA	472	10.1	130	5.3	342	15.4
FWV	776	16.6	686	28.1	90	4.0
Nurse	863	18.5	653	26.8	210	9.4
MBBS doctor	817	17.5	541	22.2	276	12.4
Others	36	0.8	20	0.8	16	0.7
None	0	0.0	0	0.0	0	0.0
Total	**4665**	**100.0**	**2439**	**100.0**	**2226**	**100.0**

TBA=Traditional Birth Attendant
FWV= Family Welfare Visitor

Table 5.6. Distribution of mode of delivery by area, 2009

Mode of Delivery	Both areas		ICDDR,B area		Government area	
	Number	Percent	Number	Percent	Number	Percent
Normal vaginal	3973	85.2	2009	82.4	1964	88.2
Operation (C/S)	690	14.8	430	17.6	260	11.7
Instrumental*	2	0.0	0	0.0	2	0.1
Total	**4665**	**100.0**	**2439**	**100.0**	**2226**	**100.0**

*Using forceps/ventose

Table 5.7. Percentage of prenatal care in different trimester and area, 2009

Source	ICDDR,B area			Government service area		
	1st trimester	2nd trimester	3rd trimester	1st trimester	2nd trimester	3rd trimester
Trained TBA	0.00	0.00	0.00	0.00	0.09	0.18
CC/H &FWC/Sat. Clinic	0.12	0.16	0.21	1.80	12.13	14.02
ICDDR,B Sub-centre	40.71	70.27	63.43	0.00	0.58	0.40
Govt. Hospital/UHC	0.21	0.49	0.45	1.44	7.14	8.22
ICDDR,B Hospital	5.37	19.76	26.24	0.40	0.27	0.45
Chandpur MCWC	0.08	0.21	0.25	0.00	0.13	0.22
Private Clinic	2.21	3.81	5.33	4.40	16.71	30.86
Others	0.00	0.04	0.04	2.25	21.34	17.83
No care	51.29	5.25	4.06	89.71	41.60	27.81
No. of live birth	**2439**	**2439**	**2439**	**2226**	**2226**	**2226**

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 registered. The number of marriages registered in 2009 was 3,312, giving a crude marriage rate of 14.8 per 1,000 population. This rate is slightly increased compared to that of 2008, which was 13.4 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 the increased trend of the percentages of the registration of Muslim marriages registered with Kazi (marriage register) from 2000 that was 85% to 2009, which is 94.6 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 27.0 and 20.2 years for all grooms and brides respectively; 26.8 and 19.7 years for those marrying for the first time—are almost the same as those of 2008. The mean ages at marriage for grooms of ICDDR,B service area are slightly lower than that of Government service area but the mean age of marriage of bridges for both areas are similar. 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 42.3 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 197.8 per 1,000 at the age of 19 years, while for males the highest rate was 239.5 per 1,000 in the age group of 25-29 years. The age group for highest rate of marriage for male in 2009 remained almost unchanged as those of 2008 but the age group for highest rate of marriage for female changed to age 19 years in 2009 from 18 years in 2008. Table 6.4 shows distribution of current marital status of the study population by age and sex in 2009. Of the total population 47.0% were currently married and it was higher for females than males (49.4% vs 44.2%). Widows also constituted higher for females (9.4%) than males (1.1%)- 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 father-in-law at the time of marriage in 2005-2009. Groom's party received marriage gifts from the bride's father in two-thirds of all marriages. Gifts were received under two different contracts: there was a clear negotiation with the bridal party about the 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 59.3% in 2009. Incidence of giving dowry shows a declining trend over time from 2005-2008 which indicates the improvements of social awareness. Dowry was paid in full at the time of marriage for one-fifth of the marriages and partially for one-third of all marriages.

Registration of Muslim marriage shows an increasing trend (Table 6.7). It increased to 94.6% in 2009 from 85% in 2000. 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 314 divorces in 2009 (Appendix A.12) and of them, 77.1%

were registered with Kazi -the marriage register (Table 6.8). 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 45.5 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 2009 but marriages were high in July and December and low in November.

Figure 6.1. Marriages and divorces by month, 2009
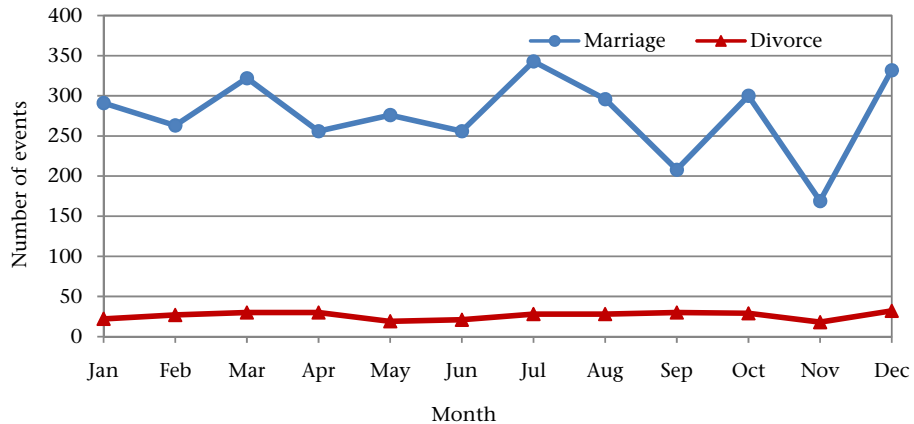
Table 6.1 Groom's age at marriage by previous marital status in ICDDR,B area, 2009

Age (years)	All grooms	Previous marital status (%)			
		Single	Married	Divorced	Widowed
All ages	100 (n=1652)	89.2 (n=1474)	1.3 (n=22)	6.7 (n=110)	2.8 (n=46)
10-14	0.2	0.2	0.0	0.0	0.0
15-19	3.8	4.1	0.0	2.7	0.0
20-24	26.6	28.4	4.5	18.2	0.0
25-29	41.0	43.1	31.8	30.0	4.3
30-34	18.3	18.2	22.7	21.8	8.7
35-39	5.9	4.9	22.7	10.0	21.7
40-44	1.8	0.8	13.6	9.1	8.7
45-49	1.3	0.2	4.5	5.5	26.1
50-54	0.5	0.1	0.0	1.8	13.0
55-59	0.3	0.0	0.0	0.9	8.7
60-64	0.1	0.0	0.0	0.0	2.2
65+	0.2	0.1	0.0	0.0	6.5
Median age*	27.0	27.0	33.0	29.0	46.0
Mean age*	27.0	26.8	32.8	31.0	46.3
Standard deviation*	6.5	4.9	6.4	8.2	11.9
*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, 2009

Age (years)	All grooms	Previous marital status (%)			
		Single	Married	Divorced	Widowed
All ages	100 (n=1660)	86.1 (n=1430)	2.1 (n=35)	9.5 (n=158)	2.2 (n=37)
10-14	0.0	0.0	0.0	0.0	0.0
15-19	3.4	3.8	0.0	1.3	0.0
20-24	23.2	25.3	11.4	11.4	2.7
25-29	43.1	45.9	28.6	29.1	5.4
30-34	19.6	19.3	11.4	24.7	18.9
35-39	6.9	5.0	22.9	19.6	8.1
40-44	1.5	0.5	11.4	7.0	8.1
45-49	1.0	0.0	2.9	6.3	16.2
50-54	0.7	0.0	5.7	0.6	21.6
55-59	0.1	0.0	2.9	0.0	2.7
60-64	0.1	0.0	0.0	0.0	5.4
65+	0.4	0.1	2.9	0.0	10.8
Median age*	27.0	27.0	34.0	31.5	48.0
Mean age*	28.1	27.0	35.6	32.1	46.1
Standard deviation*	6.4	4.6	13.0	7.1	13.3

*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, 2009

Age (years)	All brides	Previous marital status (%)			
		Single	Married	Divorced	Widowed
All ages	100 (n=1652)	91.9 (n=1519)	-	7.0 (n=115)	1.1 (n=18)
10-14	3.3	3.6	-	0.9	0
15-19	51.3	53.9	-	25.2	0.0
20-24	32.4	32.5	-	29.6	44.4
25-29	8.8	8.0	-	17.4	22.2
30-34	2.2	1.7	-	8.7	5.6
35-39	0.9	0.3	-	7.0	11.1
40-44	0.8	0.0	-	8.7	16.7
45-49	0.2	0.1	-	2.6	0.0
50-54	0.0	0.0	-	0.0	0.0
55-59	0.0	0.0	-	0.0	0.0
60-64	0.0	0.0	-	0.0	0.0
65+	0.0	0.0	-	0.0	0.0
Median age*	19.0	19.0	-	23.0	25.5
Mean age*	20.2	19.7	-	26.0	28.5
Standard deviation*	4.7	3.8	-	8.2	8.0

*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, 2009

Age (years)	All brides	Previous marital status (%)			
		Single	Married	Divorced	Widowed
All ages	100 (n=1660)	90.4 (n=1501)	-	8.6 (n=142)	1.0 (n=17)
10-14	2.3	2.6	-	0.0	0.0
15-19	47.6	51.6	-	9.9	5.9
20-24	38.4	37.9	-	45.8	23.5
25-29	8.3	6.8	-	23.9	11.8
30-34	2.0	1.1	-	9.9	17.6
35-39	0.8	0.0	-	7.0	17.6
40-44	0.3	0.0	-	2.8	5.9
45-49	0.1	0.0	-	0.0	11.8
50-54	0.1	0.0	-	0.0	5.9
55-59	0.1	0.0	-	0.7	0.0
60-64	0.0	0.0	-	0.0	0.0
65+	0.0	0.0	-	0.0	0.0
Median age*	20.0	19.0	-	24.0	33.0
Mean age*	20.3	19.7	-	25.7	32.4
Standard deviation*	4.3	3.3	-	6.4	10.4

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

Table 6.3 Marriage rates by age and sex, 2009

Age (years)	Male			Female		
	Marriages	Population	Rate*	Marriages	Population	Rate*
All ages(10+ yrs)	3312	78217	42.3	3312	94660	35.0
10-14	3	11947	0.3	94	11912	7.9
15	2	2303	0.9	131	2261	57.9
16	8	1968	4.1	266	2032	130.9
17	16	2203	7.3	347	2249	154.3
18	39	1956	19.9	416	2242	185.5
19	55	1837	29.9	477	2411	197.8
20-24	824	7263	113.5	1173	10876	107.9
25-29	1392	5811	239.5	284	9241	30.7
30-34	628	5415	116.0	70	7836	8.9
35-39	212	5881	36.0	28	7770	3.6
40-44	54	5844	9.2	18	7971	2.3
45+	79	25789	3.1	8	27859	0.3

* Rates per 1000 population irrespective of previous marital status

Table 6.4. Distribution of current marital status (%) by age and sex, 2009

Age (years)	Male					Female				
	NM	PM	WID	DIV	Total	NM	PM	WID	DIV	Total
0-4	100.0	0.0	0.0	0.0	12671	100.0	0.0	0.0	0.0	12332
5-9	100.0	0.0	0.0	0.0	13255	100.0	0.0	0.0	0.0	12848
10-14	100.0	0.0	0.0	0.0	11947	99.2	0.8	0.0	0.0	11912
15-19	98.1	1.8	0.0	0.0	9909	72.1	27.4	0.0	0.5	10855
20-24	78.1	21.4	0.0	0.5	7263	23.5	74.8	0.1	1.5	10876
25-29	38.6	60.6	0.0	0.8	5811	5.7	92.6	0.5	1.2	9241
30-34	12.4	86.7	0.1	0.8	5415	1.6	96.2	1.1	1.1	7836
35-39	3.5	95.7	0.1	0.7	5881	0.7	95.9	2.4	1.0	7770
40-44	1.0	98.0	0.3	0.7	5844	0.4	93.2	5.1	1.3	7971
45-49	0.6	98.5	0.5	0.3	6722	0.3	87.4	10.4	1.9	7273
50-54	0.4	98.1	1.2	0.2	5448	0.1	78.7	19.3	1.9	5353
55-59	0.2	97.6	1.8	0.4	3840	0.1	66.7	31.6	1.6	3939
60-64	0.3	96.1	3.4	0.2	3014	0.0	52.0	46.6	1.4	3712
65-69	0.1	94.9	4.8	0.1	2490	0.0	35.7	63.2	1.0	3247
70-74	0.1	89.6	10.1	0.2	2070	0.1	20.3	79.1	0.5	2205
75-79	0.2	83.2	16.3	0.3	1232	0.1	9.2	90.1	0.6	1265
80+	0.1	70.8	29.0	0.1	973	0.0	5.5	93.8	0.7	865
All (%)	54.5	44.2	1.1	0.3	100.0	40.3	49.4	9.4	0.8	100.0
Total	56532	45854	1116	283	103785	48161	59082	11252	1005	119500

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

Table 6.5. Duration (months) of all marriages at divorce by age and sex, 2009

Age at divorce (years)	Male				Female			
	No.	Mean	Median	SD	No.	Mean	Median	SD
< 20	6	10.8	12.0	4.7	71	14.2	11.0	13.6
20 - 24	51	21.4	14.0	18.9	137	33.1	27.0	27.0
25 - 29	98	33.2	29.0	27.7	58	56.5	61.0	35.6
30 - 34	74	43.7	30.0	45.3	20	79.6	59.5	56.7
35 - 39	41	66.3	54.0	59.7	14	140.1	164.0	75.6
40 - 49	34	84.4	71.5	80.6	12	129.4	120.0	115.6
50+	10	104.0	89.0	107.1	2	178.5	178.5	156.3
All ages	**314**	**45.5**	**27.5**	**52.3**	**314**	**45.5**	**27.5**	**53.3**

Table 6.6. Marriages by type of gifts received from bridal party (father-in-law) 2005-2009

Type of gift received	Year				
	2005	2006	2007	2008	2009
None	32.7	33.5	37.7	40.9	40.1
Gift without prior negotiation	0.8	0.5	1.0	1.3	0.6
Gift after prior negotiation	66.5	66.0	61.3	57.9	59.3
Gift payment					
Full	19.5	18.6	17.1	15.8	19.1
Partial	39.9	40.4	37.3	34.6	33.7
Not yet paid*	7.1	7.0	6.8	7.5	6.5

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

Table 6.7. Registration status of Muslim marriages, 2000-2009.

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
2008	2442	92.6	196	7.4
2009	2760	94.6	158	5.4

Table 6.8. Registration status of divorces of Muslim marriages, 2000-2009.

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
2008	223	83.2	45	16.8
2009	239	77.1	71	22.9

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. 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 2009, the total of 12,088 persons (5,857 males and 6,231 females) moved into the HDSS area, which represented an annual average in-migration of 5.4% for both males and females of the mid-year population (Tables 7.1 and 7.2). On the other hand, 12,952 persons (6,465 males and 6,487 females) left the HDSS area or on an average 5.8% for both males and females of the mid-year population (Appendix A.13), giving a crude rate of in-migration of 54.1 per 1,000 population, and out-migration rate of 58.0 per 1,000 population. The highest incidence of in-migration for males was 14.2% in the age group 25-29 and for females was 12.0% in the age group 20-24. More males and females out-migrated in the age group 20-24 (14.8% and 13.7%, respectively). More males out-migrated than females in the age group (20-64). 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 87 males per 100 females in 2009. 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 increased and out-migration decreased in 2009 over those of 2008, The net loss of migrants was 3.9 per 1,000 in 2009, whereas it was 21.6 per 1,000 in 2008. 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 migration for both men and women. 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, 2009

Age (years)	Both sexes		Male		Female	
	In	Out	In	Out	In	Out
All ages	54.1	58.0	56.4	62.3	52.1	54.3
0 - 4	74.2	62.2	76.5	62.9	71.9	61.4
5 - 9	45.5	40.9	44.5	42.8	46.5	38.9
10-14	29.7	43.6	28.1	48.5	31.3	38.7
15-19	75.5	116.5	34.7	113.4	112.7	119.2
20-24	108.9	141.4	92.4	148.1	119.9	136.9
25-29	103.0	98.9	141.8	116.8	78.7	87.7
30-34	81.3	65.4	129.6	96.8	47.9	43.6
35-39	54.1	48.4	91.0	72.3	26.1	30.4
40-44	35.8	28.4	59.2	41.9	18.6	18.6
45-49	23.2	18.9	34.5	26.3	12.8	12.1
50-54	19.3	14.7	23.1	16.5	15.3	12.9
55-59	15.0	14.9	19.0	14.6	11.2	15.2
60-64	13.4	15.8	17.9	12.9	9.7	18.0
65+	33.6	43.9	22.1	34.5	42.5	51.1

Table 7.2 In- and out-migration by sex and month, 2009

Months	In-migration			Out-migration		
	Both sexes	Male	Female	Both sexes	Male	Female
All months	12088	5857	6231	12952	6465	6487
January	1451	705	746	1544	749	795
February	1001	481	520	1190	590	600
March	1057	521	536	1136	580	556
April	1075	531	544	1112	575	537
May	970	485	485	1016	505	511
June	948	474	474	1214	639	575
July	830	410	420	1072	531	541
August	1132	565	567	1148	561	587
September	1156	560	596	974	503	471
October	945	439	506	998	528	470
November	887	433	454	710	343	367
December	636	253	383	838	361	477

Figure 7.1. Rates of in- and out-migration by sex and age in Matlab, 2009

(a) Male

(b) Female
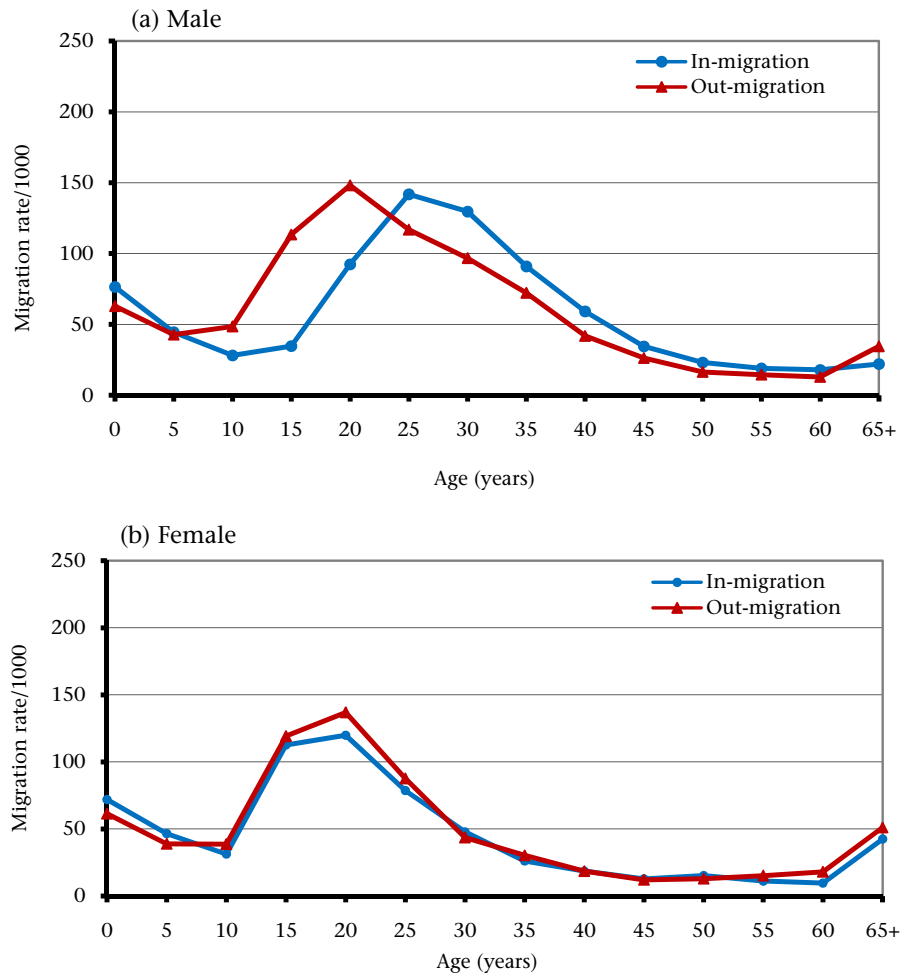
Figure 7.2. Number of in- and out-migrations by sex and month in Matlab, 2009

(a) Male

(b) Female
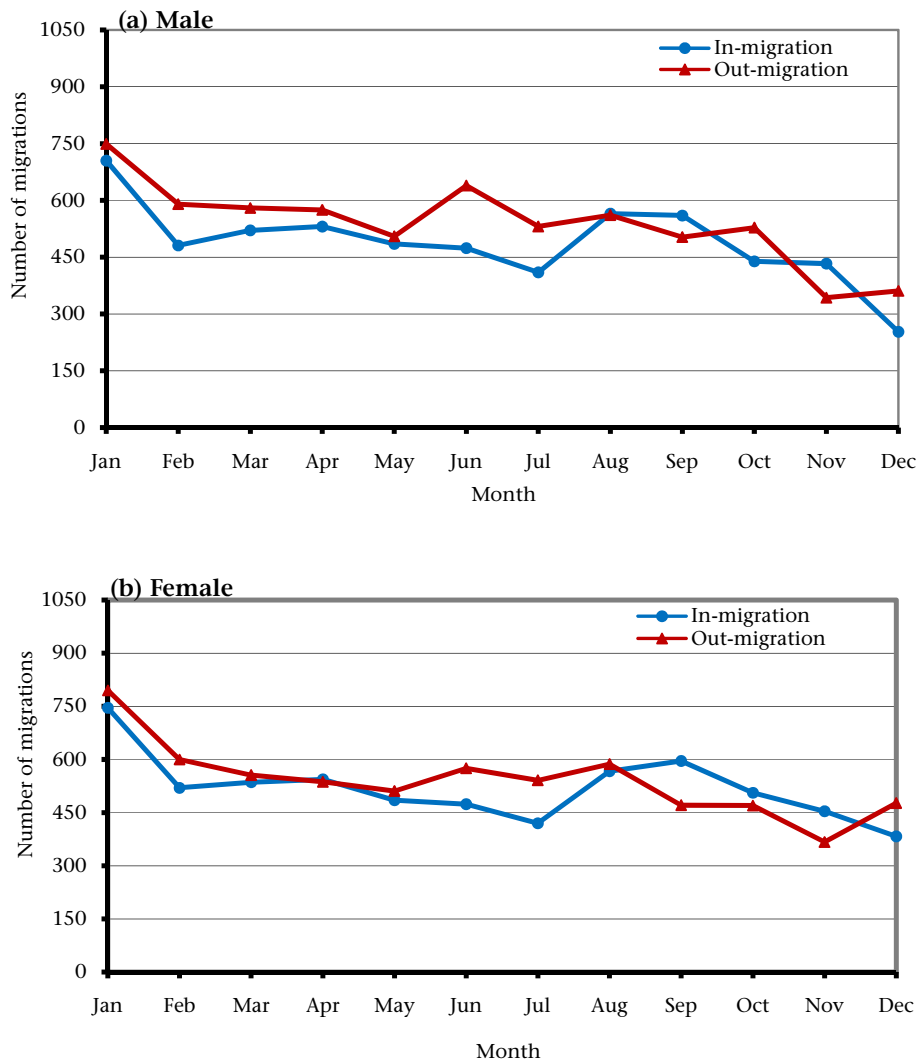
CHAPTER 8

FERTILITY REGULATION

In the ICDDR,B service area, service CHRWs have been providing maternal and child health and family planning (MCH-FP) services including EPI from fixed site clinics since 2007. In case of any complications they refer the patients to ICDDR,B sub-centres. They also 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. The motivation activities are carried out in the ICDDR,B service area only. In the Government service area, services are provided in each union 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 in addition to private and NGO sectors.

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 bimonthly home visits. They during home visits sometimes advise oral pill users to procure pills in timely manner, pregnant women to seek antenatal care and have safe delivery; and parents to immunize children and treat sick children by formally trained providers. In 2009 the contraceptive use rate was 54.2% in the ICDDR,B service area and 42.5% in the Government service area (Table 8.1). Contraceptive use rate in the Government service area is close to the use rate of 43.9% recorded in Chittagong division in 2007. Table 8.2 shows the difference in contraceptive method-mix between the ICDDR,B and Government service areas in 2009 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 are the most widely-used method, followed by pill, condom, and tubectomy. Changes in the method-mix in the ICDDR,B service area during 1995-2009 are shown in Table 8.3. The use of injectables and condom has increased with decreases in use of pill and tubectomy 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, pill, undergo tubectomy or their husbands to use vasectomy, and adopt traditional methods than women aged less than 20 years, whereas in the Government service area (Table 8.5), the pill, then injectable, tubectomy are the most popular method in all age groups except age group 45 years and over. Tubectomy and pill 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, 1983-2009

| Year | Matlab | | National** |
	ICDDR,B area	Government area*	
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
2008	54.4	41.3	-
2009	54.2	42.5	-

*Sources: In-depth and KAP surveys, 1984 & 1990; MDHS 1992; HDSS census 1996 and HDSS 2002-2009.
**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, 2009	Government area, 2009	BMMS 2001	BDHS 2007
Pill	29.6	44.8	51.2	51.3
Condom	9.2	5.3	6.4	8.1
Injectables	45.6	26.2	15.7	12.6
IUD	1.7	1.1	1.6	1.6
Tubectomy	9.2	12.4	10.6	9.0
Vasectomy	1.8	0.4	1.0	1.2
Norplant	0.6	1.6	1.0	1.3
Others*	2.2	8.1	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 area, 1995-2009

Method	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Pill	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	30.6	30.3
Condom	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	9.0	9.5
Injectables	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	47.4	46.6
IUD	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	1.8	1.7
Tubectomy	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	9.0	9.4
Vasectomy	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	1.7	1.9
Norplant	-	-	-	-	-	-	-	-	0.0	0.1	0.3	0.3	0.5	0.5	0.6
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 area, 2009

Age (years)	Not using	Any method used	Method used								No. of eligible women
			Pill	IUD	Injectables	Condom	Tubectomy	Vasectomy	Others*	Norplant	
<20	72.8	27.2	10.6	1.1	12.0	3.3	0.0	0.0	0.1	0.0	1287
20 – 24	59.4	40.6	14.2	1.2	20.6	4.0	0.1	0.0	0.2	0.2	4002
25 - 29	51.0	49.0	17.7	1.1	24.8	3.7	0.8	0.2	0.4	0.3	4383
30 - 34	44.4	55.6	17.5	0.9	26.9	5.3	3.8	0.4	0.6	0.3	3949
35 - 39	36.0	64.0	18.3	0.5	28.7	5.6	8.3	1.3	1.1	0.3	3872
40 - 44	31.5	68.5	16.8	0.9	27.9	7.0	10.2	2.6	2.6	0.6	3657
45 - 49	39.7	60.3	12.1	0.6	23.2	5.3	12.0	2.7	4.0	0.3	2486
Total	45.8	54.2	16.1	0.9	24.7	5.0	5.0	1.0	1.2	0.3	23636

*Others include periodic abstinence, withdrawal, and other traditional methods.

Table 8.5. Method specific contraceptive use rate among currently married women by age in Government service area, 2009

Age (years)	Not using	Any method used	Method used								No. of eligible women
			Pill	IUD	Injectables	Condom	Tubectomy	Vasectomy	Others*	Norplant	
<20	80.1	19.9	11.5	0.2	3.3	4.4	0.0	0.0	0.4	0.0	967
20 – 24	71.3	28.7	16.8	0.3	7.9	2.6	0.1	0.0	0.7	0.0	3543
25 - 29	62.3	37.7	21.3	0.4	10.9	2.0	1.1	0.1	1.1	0.0	4037
30 - 34	54.6	45.4	22.1	0.4	13.4	2.1	4.1	0.1	2.3	0.0	3450
35 - 39	45.8	54.2	22.9	0.7	14.6	2.3	7.9	0.3	4.3	0.0	3539
40 - 44	46.6	53.4	18.4	0.9	14.0	2.1	9.7	0.3	7.0	0.0	3221
45 - 49	55.8	44.2	11.5	0.1	6.6	1.4	14.7	0.6	9.0	0.0	2163
Total	57.5	42.5	19.0	0.5	11.1	2.3	5.3	0.2	3.5	0.0	20920

*Others include periodic abstinence, withdrawal, and other traditional methods.

CHAPTER 9

CHILD MORBIDITY AND HEALTH SERVICE USE

Children suffer mostly from non-immunizable diseases, because immunizable diseases have been brought under control. Diarrhoea and pneumonia are the two leading causes of infant mortality and drowning is the major cause of child mortality in Matlab HDSS area. Five CHRWs were trained to record children's morbidity, using the PDA (Personal Digital Assistant) in February 2008. The households in the HDSS area were divided into 1,349 clusters (each of 35 households, which are visited bi-monthly by a CHRW to record demographic and health events), and each of the 5 CHRWs was given 70 clusters, selected randomly to record childhood morbidity and care in sickness. They asked mothers if their children aged below 5 years had symptoms of diarrhea i.e. three or more loose stools per 24 hours with or without mucus or blood in two weeks preceding the survey date. For recording pneumonia, they asked mothers if their children had symptoms of pneumonia, such as fever, cough, rapid breathing or breathing difficulty and chest in-drawing (or inability to suck the breast) during the last two weeks.

Diarrhoea causes dehydration and oral rehydration solution (ORS) in the most simple and inexpensive tool to combat dehydration. The surveillance CHRWs, during their home visit, provide ORS packets free of cost if they encounter any diarrhoea patients, and refer severe cases to the ICDDR,B sub-centres or hospital in Matlab. If a child had diarrhoea in the preceding two weeks, the mother was asked whether ORS (either packet or home-made sugar, salt and water solution) or IV fluids were administered to prevent dehydration. It may be mentioned that use of ORS or IV for diarrhoea episode includes episodes still continuing on the visit date. For the still-continuing episodes, the CHRWs may have made home visits before ORS or IV was administered (i.e. right-censoring) and thus, ORS or IV use may be under-estimated.

Similarly, if a child had pneumonia during the last two weeks preceding the date of visit, the CHRWs asked mothers about health actions taken to combat pneumonia. They recorded most recent treatment received, particularly type of medicine used and type of health providers consulted.

(a) Prevalence of Morbidity

Table 9.1 shows the prevalence of morbidity by type in past two weeks per 100 children in the ICDDR,B and Government service areas by season. Symptoms in order of prevalence were running nose followed by cough, fever, skin infection, diarrhoeal diseases and pneumonia in either area. Seasonal difference in prevalence was found prominent for running nose followed by cough. They were high in the winter season (November-February) compared to the summer season (May-July) in each area.

(b) Use of ORS and Health Provider Use for Diarrhoea

Table 9.2 shows that uses of ORS (packet or homemade) and zinc tablets among children having diarrhoea in the preceding two weeks were higher in the ICDDR,B service area than the Government service area. Uses were similar across seasons in either area. About half of the

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diarrhea episodes were treated by medicine (pill, capsule or syrup) in each season, but it was 60% in the Government service area in November-February 2010.

There is a marked difference in use of health providers for treating diarrhoea between the ICDDR,B and the Government service areas (Table 9.3). Most common treatment type was the home care followed by untrained, but experienced village doctors (including drug vendors) followed by homeopaths or ayurveda, who are available in most villages around the clock. Home care was slightly higher (45-49%) in each season in the ICDDR,B service area than in the Government service area (35-42%). On the other hand, untrained village doctors were consulted less frequently in ICDDR,B service area than the Government service area. Overall consultation with formally trained providers; doctors and paramedics in any sector was less frequent in either area compared to untrained providers.

(c). Health Provider Use for Treating Pneumonia

Table 9.4 shows the type of treatment providers used for treating pneumonia in the ICDDR,B and the Government service areas in different seasons. The most common source of health care was the untrained village doctor (including pharmacy) followed by home care. Treatment was similar across seasons in each area. Home care and trained providers were more frequently used in the ICDDR,B service area than in the Government service area, where untrained village doctors were visited at a higher rate.

Table 9.1: Two-weekly prevalence (%) of children's morbidities by season and area, Matlab, 2009-2010

Type of morbidity	ICDDR,B service area			Government service area		
	Dec-mar 2009	May-Jul 2009	Nov-Feb 2010	Dec-Mar 2009	May-Jul 2009	Nov-Feb 2010
Diarrhoea	11.0	11.0	9.5	11.3	9.8	9.7
Pneumonia[a]	5.6	3.5	3.9	3.9	3.2	3.6
Fever	30.5	32.9	27.5	25.5	31.2	27.4
Cough	36.8	31.0	35.5	28.0	26.0	32.1
Running nose	68.6	46.5	72.3	72.9	46.5	73.2
Stomachache	3.1	3.2	2.3	2.4	1.6	1.9
Skin infection	15.7	17.9	11.1	13.7	14.1	9.8
Ear infection	2.2	2.5	2.2	1.8	1.3	1.7
Urinary problem	0.4	0.9	0.6	0.2	0.5	0.5
Eye problem	3.1	3.2	2.1	1.8	1.8	1.7
Injury (cut hand or leg)	1.8	1.8	1.4	0.8	1.1	1.0
Injury ((bone fractured or broken)	0.2	0.2	0.3	0.5	0.1	0.2
Asthma/chronic resp. prob.)	0.8	0.8	0.2	0.7	1.7	0.9
Injury (burn)	1.1	0.3	0.4	0.7	0.1	0.4
Measles	4.4	0.2	0.3	5.9	0.3	0.4
Others	4.8	7.3	6.4	2.4	4.7	5.0
Number of <5 children	2036	2110	2400	2124	1758	2344

a refers to cough with either rapid or difficult breathing, or chest indrawing

Table 9.2: Diarrhoea episodes (%) by type of treatment used, season and area, Matlab, 2009-2010

Type of treatment	ICDDR,B area			Government area		
	Dec-Mar 2009	May-Jul 2 009	Nov-Feb 2010	Dec-Mar 2009	May-Jul 2 009	Nov-Feb 2010
Packet ORS	50.7	53.9	45.4	34.3	31.2	31.9
Home made ORS	8.5	9.9	8.4	3.8	10.4	2.1
Intra-venus (I.V) saline	0.0	0.0	0.0	0.0	0.0	0.4
Pill /Capsule / syrup	51.6	50.4	46.3	51.0	50.9	60.4
Zinc tablet	18.8	19.8	17.2	12.6	7.5	10.6
Orthers	16.1	13.4	15.9	18.4	13.9	14.0
# of diarrohea episodes in <5 children	223	232	227	239	173	235

Table 9.3: Diarrhoea episodes (%) by type of treatment providers consulted last in different seasons, Matlab 2009-2010

Type of treatment providers	ICDDR,B area			Government area		
	Dec-Mar 2009	May-Jul2009	Nov-Feb2010	Dec-Mar 2009	May-Jul 2009	Nov-Feb 2010
Home management	48.4	44.8	48.9	40.6	42.2	34.5
Public sector – medical doctor	0.4	0.0	1.3	1.3	0.6	2.1
- paramedic	0.4	0.4	0.4	1.7	1.2	0.4
NGO sector[a] - medical doctor	3.1	2.2	3.5	1.7	0.6	0.9
- paramedic	0.0	1.3	1.3	1.7	1.2	0.0
Private sector - medical doctor	3.6	3.4	2.6	7.5	4.0	6.4
- village doctor/pharmacy	38.1	41.4	33.9	38.1	42.8	48.9
- homeopath/ayurdeva	5.8	6.5	7.9	7.5	7.5	6.8
# of diarrohea episodes in <5 children	223	232	227	239	173	235

[a]includes ICDDR,B doctors and paramedics

Table 9.4: Pneumonia episodes (%) by type of treatment providers consulted last in different seasons, Matlab 2009-2010

Type of treatment providers	ICDDR,B area			Government area		
	Dec-Mar2009	May-Jul2009	Nov-Feb2010	Dec-Mar2009	May-Jul2009	Nov-Feb2010
Home management	28.3	21.9	20.4	22.9	19.3	16.5
Public sector – medical doctor	0.0	1.4	0.0	3.6	10.5	4.7
- paramedic	0.9	1.4	2.2	2.4	0.0	0.0
NGO sector[a] - medical doctor	0.9	16.4	15.1	0.0	0.0	0.0
- paramedic	25.7	9.6	11.8	4.8	1.8	0.0
Private sector - medical doctor	5.3	6.8	10.8	8.4	10.5	27.1
- village doctor/pharmacy	37.2	41.1	36.6	54.2	52.6	45.9
- homeopath/ayurdeva	1.8	1.4	3.2	3.6	5.3	5.9
# of pneumonia episodes in <5 childr en	113	73	93	83	57	85

[a]includes ICDDR,B doctors and paramedics

CHAPTER 10

GEOGRAPHICAL INFORMATION SYSTEM (GIS)

Geographic Information System (GIS) was established in 1994 under the Public Health Sciences Division to provide cartographic, thematic and analytic maps to the investigators of ICDDR,B according to their requirements. Initially, the GIS activities were limited to the Matlab HDSS area, later gradually expanded its activities to other areas in Bangladesh. In 1998, the GIS and RKS joined with DSS under the Health and Demographic Surveillance Unit (HDSU). In Matlab surveillance area, GIS collects spatial data   through Global Positioning System (GPS) surveyors and Field Research Supervisors (FRS). The FRSs are trained in using handheld GPS device and collect geo-coordinates of new baris (cluster of a group of households sharing common yard) and locations of landmarks. Whenever a member gets his/her DSS identification number, (s)he is automatically linked to the geo-reference objects of the Matlab spatial database. The spatially related objects are village and *bari*, and the object types are area and point. Continuous updating is done into the spatial database whenever a new *bari,* new road or health and educational facility is created. The locations of tube-wells, ditches, ponds, health facilities, educational institutes, mosques, etc. are included in the spatial database.

New development of GIS software and satellite images have expanded scope to GIS activities in different fields. Currently GIS generates thematic maps, creates spatial variables and performs spatial and temporal analysis with geo-referenced data. Any kind of spatial information can be extracted from high-resolution imagery. Spatial and temporal analyses generate surfaces and time to see the spatial and temporal relationships with morbidity, mortality and risk factors of morbidity and mortality. This facilitates targeting interventions to the high risk areas and efficient use of scarce resources.

A few examples of thematic maps produced by GIS in recent year are given with brief illustration. Bari location of the surveillance community health research workers are shown in Figure 10.1. The Figure 10.2 shows clusters where under five mortality risk was significantly higher in Matlab, 1998-2002. Distribution of tube-well by depth is shown in the Figure 10.3. Figure 10.4 shows locations of the villages affected (measured with loss of crops, uproot of trees, inundation of fish pond by flood water, damage of walls and/or roof of the dwelling units, presence of flood water in the yard, etc) most in Matlab by cyclone SIDR in 15 November 2007.

Figure 10.1Bari location of Surveillance Community Health Research Workers in Matlab HDSS area, 2007

Figure 10.2. Clusters with high under five mortality risk in Matlab HDSS area, 1998-2002
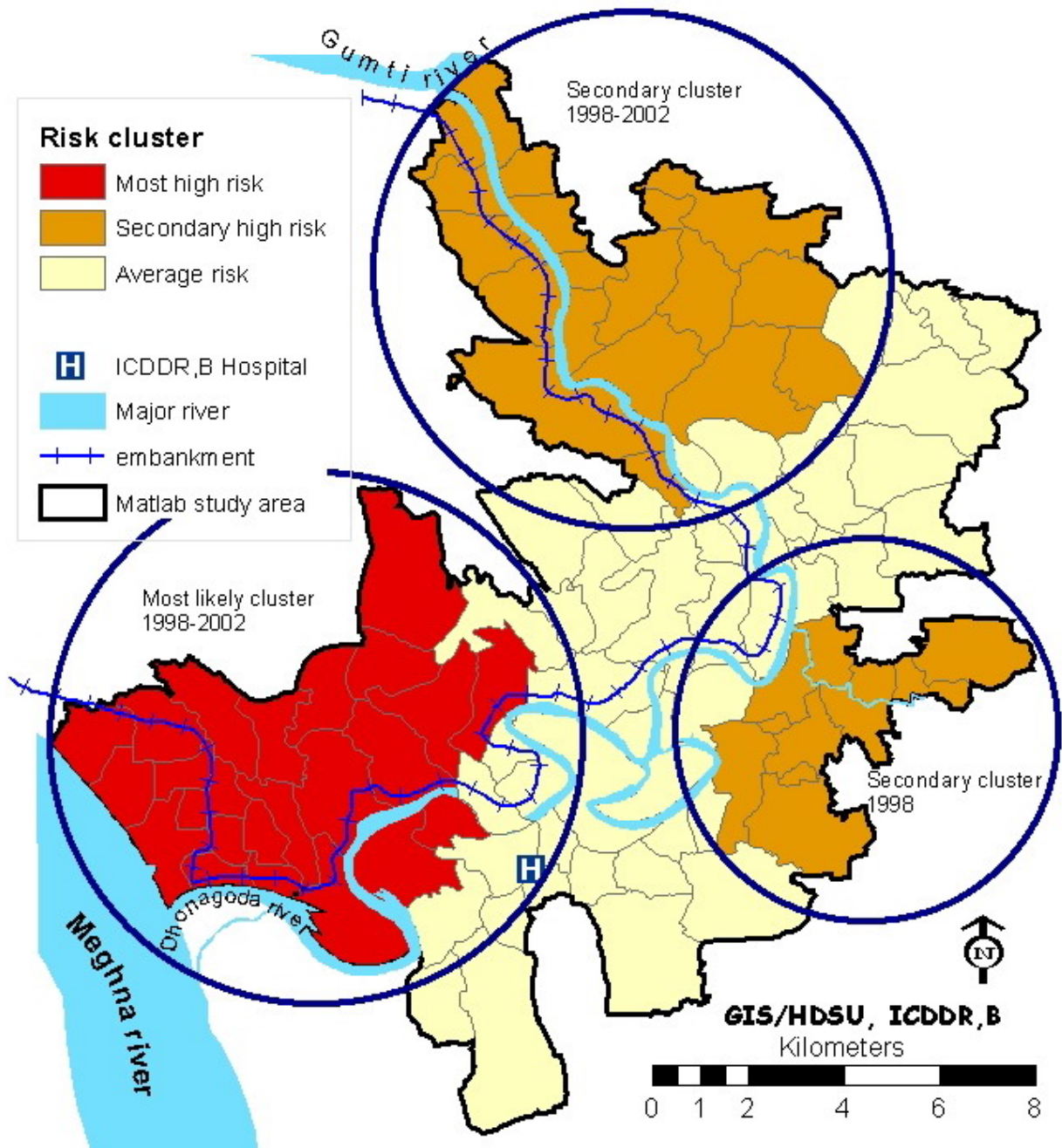
Figure 10.3. Distribution of deep tube-wells by depth in Matlab HDSS area, 2009-2010
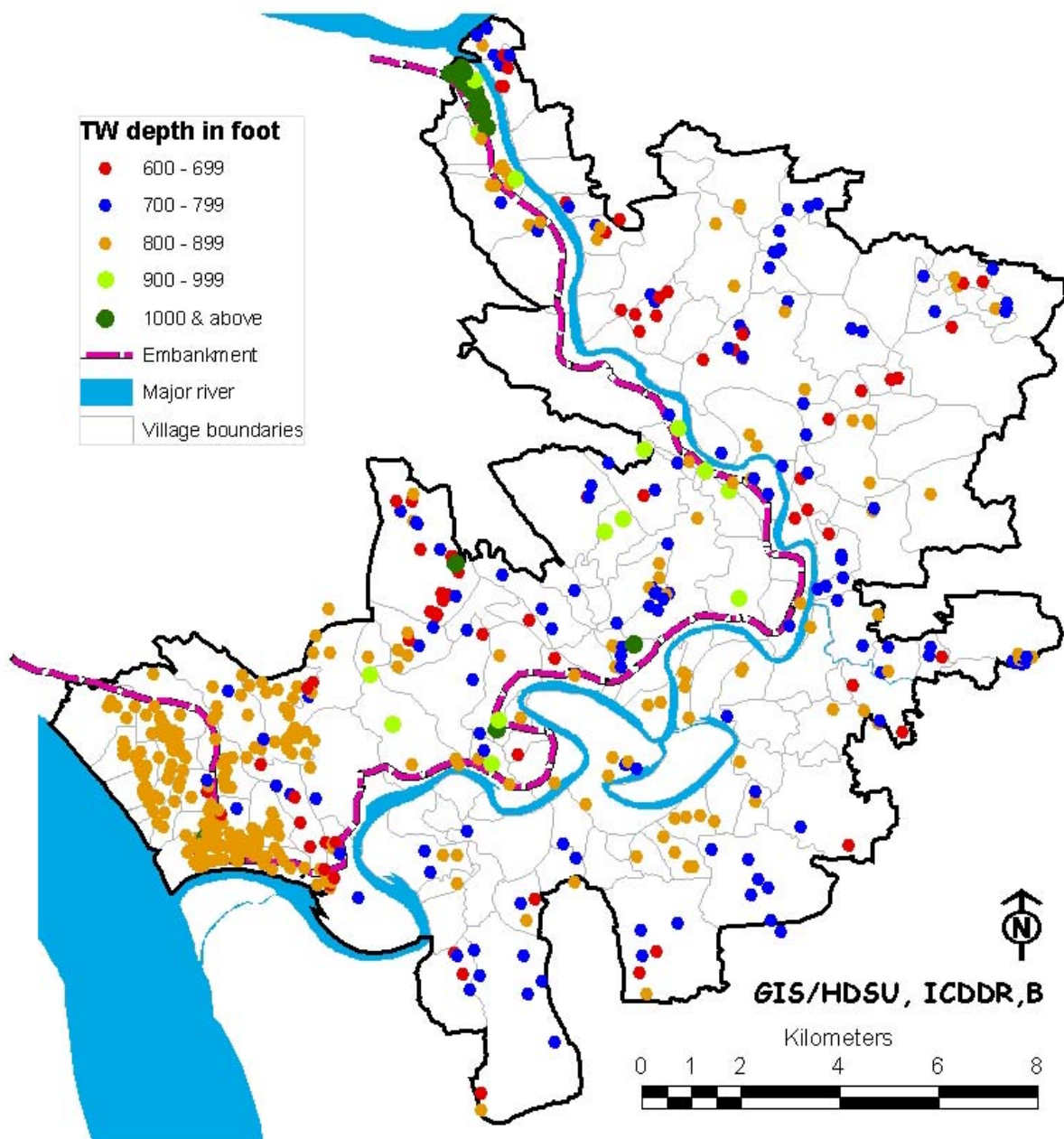
Note: There are another 14000 or more shallow tube-wells functioning in HDSS area

Figure 10.4. Villages in Matlab HDSS area affected[a] by Cyclone SIDR in 15 Nov 2007.
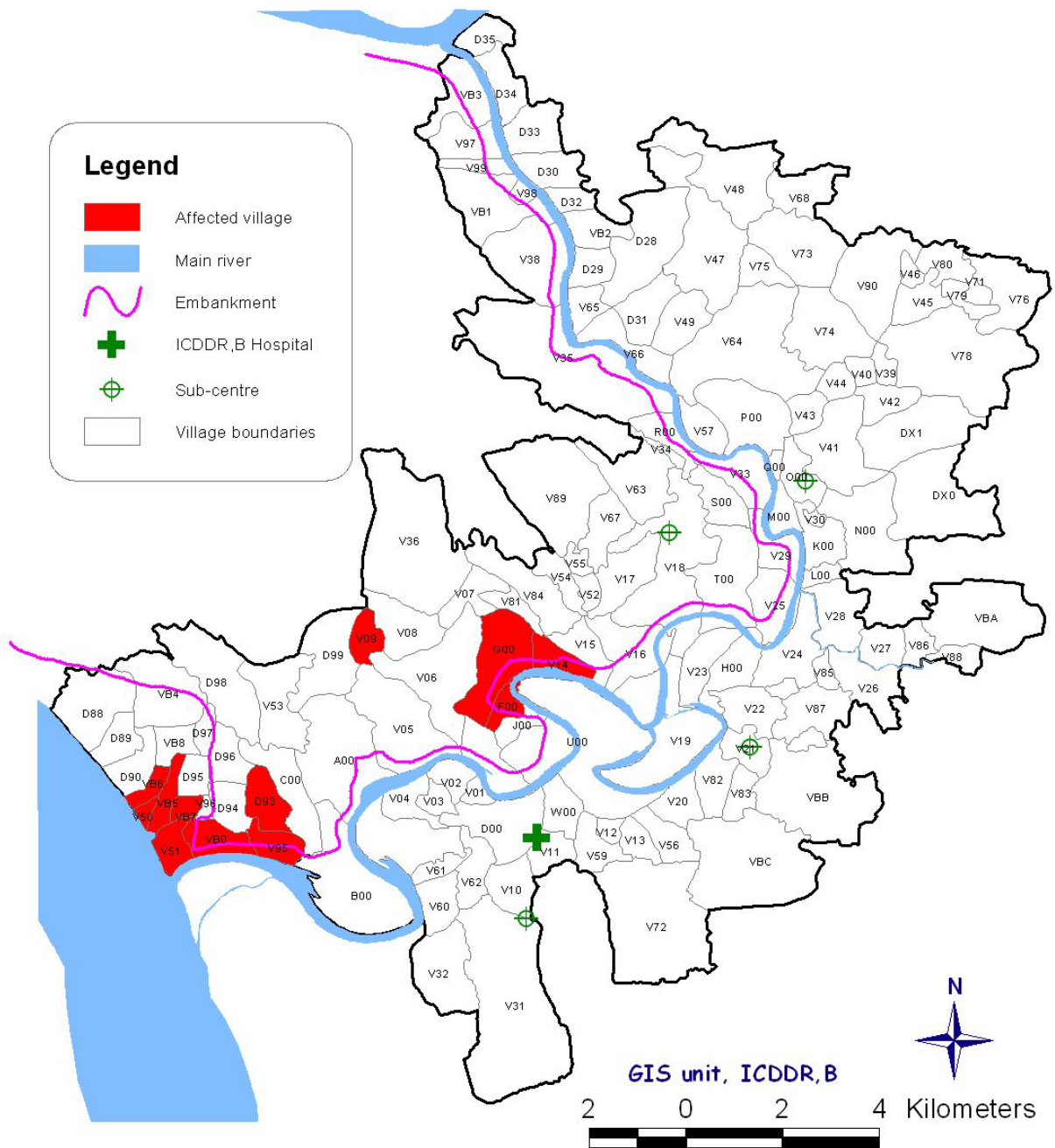
[a]measured with loss of crops, uproot of trees, inundation of fish pond by flood water, damage of walls and/or roof of the dwelling units or presence of flood water in the yard incurred to majority of the households in the village.

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Appendix A-1 Mid-year population in ICDDR,B area by age, sex, and block, 2009

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	36051	16598	19453	31452	14575	16877	24535	11594	12941	22192	10406	11786
Under 1	835	423	412	768	400	368	540	272	268	440	225	215
1 - 4	3327	1751	1576	2880	1493	1387	2165	1066	1099	1955	970	985
1	864	455	409	740	397	343	549	265	284	471	232	239
2	798	418	380	710	363	347	564	268	296	477	232	245
3	845	468	377	696	353	343	521	278	243	493	244	249
4	820	410	410	734	380	354	531	255	276	514	262	252
5 - 9	4194	2071	2123	3786	1899	1887	2660	1333	1327	2550	1284	1266
10-14	3833	1864	1969	3345	1638	1707	2460	1251	1209	2226	1143	1083
15-19	3049	1328	1721	2875	1352	1523	2184	1070	1114	1944	975	969
20-24	2932	1062	1870	2525	1050	1475	2122	900	1222	1701	677	1024
25-29	2534	984	1550	2152	812	1340	1742	708	1034	1408	533	875
30-34	2354	963	1391	1898	752	1146	1543	680	863	1346	570	776
35-39	2343	1030	1313	1915	820	1095	1560	703	857	1362	590	772
40-44	2387	1039	1348	1927	809	1118	1543	639	904	1480	642	838
45-49	2220	1064	1156	1945	951	994	1546	768	778	1540	744	796
50-54	1702	880	822	1435	746	689	1263	640	623	1138	586	552
55-59	1195	610	585	1085	506	579	871	436	435	847	429	418
60-64	1088	499	589	893	378	515	755	357	398	685	297	388
65-69	808	367	441	802	353	449	670	312	358	622	271	351
70-74	622	338	284	565	273	292	456	221	235	498	224	274
75-79	334	159	175	378	198	180	264	140	124	262	134	128
80-84	190	109	81	189	95	94	120	65	55	124	67	57
85+	104	57	47	89	50	39	71	33	38	64	45	19

Appendix A-2 Deaths in ICDDR,B area by age, sex, and block, 2009

Age	Block A Both sexes	Male	Female	Block B Both sexes	Male	Female	Block C Both sexes	Male	Female	Block D Both sexes	Male	Female
All ages	199	109	90	185	94	91	165	85	80	159	88	71
Under 1	18	11	7	17	9	8	11	8	3	8	5	3
<1 month	13	7	6	13	7	6	7	5	2	7	4	3
1- 5 months	4	3	1	4	2	2	3	2	1	1	1	0
6-11 months	1	1	0	0	0	0	1	1	0	0	0	0
1 - 4	5	0	5	6	3	3	2	2	0	5	0	5
1	4	0	4	6	3	3	1	1	0	3	0	3
2	0	0	0	0	0	0	0	0	0	1	0	1
3	1	0	1	0	0	0	0	0	0	1	0	1
4	0	0	0	0	0	0	1	1	0	0	0	0
5 - 9	2	2	0	1	1	0	0	0	0	1	1	0
10-14	0	0	0	0	0	0	0	0	0	0	0	0
15-19	2	2	0	3	1	2	0	0	0	3	2	1
20-24	4	2	2	2	0	2	1	0	1	1	0	1
25-29	0	0	0	2	1	1	2	2	0	1	0	1
30-34	3	0	3	2	1	1	3	2	1	0	0	0
35-39	3	2	1	4	1	3	2	0	2	4	1	3
40-44	6	1	5	3	2	1	5	2	3	5	3	2
45-49	6	5	1	5	4	1	7	3	4	7	3	4
50-54	14	11	3	13	8	5	11	6	5	7	5	2
55-59	10	2	8	13	9	4	10	8	2	6	5	1
60-64	16	9	7	15	10	5	9	4	5	6	5	1
65-69	18	8	10	25	11	14	19	14	5	29	18	11
70-74	28	18	10	19	10	9	24	12	12	29	14	15
75-79	22	12	10	18	6	12	30	14	16	24	14	10
80-84	26	16	10	20	10	10	17	7	10	13	3	10
85+	16	8	8	17	7	10	12	1	11	10	9	1

Appendix A-3 Abridged life table for ICDDR,B area by sex, 2009

Age (years)	Male				Female			
	$_nq_x$	l_x	L_x	$e0_x$	$_nq_x$	l_x	L_x	$e0_x$
0	26.1	100000	97910	71.1	17.5	100000	98602	73.2
1	3.0	97387	97217	72.0	7.8	98253	97800	73.5
2	0.0	97099	97099	71.2	0.8	97485	97447	73.1
3	0.0	97099	97099	70.2	1.6	97408	97328	72.1
4	0.8	97099	97062	69.2	0.0	97248	97248	71.2
5	3.0	97025	484445	68.3	0.0	97248	486239	70.2
10	0.0	96730	483652	63.5	0.0	97248	486239	65.2
15	5.3	96730	482475	58.5	2.8	97248	485609	60.2
20	2.7	96220	480499	53.8	5.4	96974	483676	55.4
25	4.9	95959	478707	48.9	2.1	96455	481814	50.7
30	5.0	95486	476322	44.2	6.0	96254	479948	45.8
35	6.3	95004	473633	39.4	11.1	95680	475951	41.0
40	12.7	94402	469240	34.6	13.0	94619	470257	36.5
45	21.1	93202	461474	30.0	13.3	93389	464072	31.9
50	51.3	91239	445311	25.6	27.6	92143	454839	27.3
55	58.9	86555	420908	21.8	36.6	89603	440425	23.0
60	87.7	81456	390564	18.0	46.6	86328	422301	18.8
65	179.0	74313	339857	14.5	118.1	82306	388642	14.6
70	227.6	61011	271601	12.1	192.5	72584	329524	11.2
75	309.2	47122	199857	9.9	330.8	58613	245229	8.2
80	421.6	32552	128102	8.2	511.9	39221	144056	6.0
85+	1000.0	18827	139322	7.4	1000.0	19144	91251	4.8

Appendix A-4 Abridged life table for Government service area by sex, 2009

Age (years)	Male				Female			
	$_nq_x$	l_x	L_x	$e0_x$	$_nq_x$	l_x	L_x	$e0_x$
0	38.6	100000	96910	68.9	38.1	100000	96948	71.5
1	4.7	96137	95871	70.7	5.4	96185	95879	73.3
2	1.7	95686	95606	70.0	0.9	95666	95625	72.7
3	1.7	95526	95447	69.1	0.8	95584	95544	71.8
4	1.6	95368	95291	68.2	0.0	95505	95505	70.9
5	6.0	95213	474752	67.4	1.6	95505	477171	69.9
10	0.0	94643	473217	62.7	3.4	95352	476021	65.0
15	2.9	94643	472587	57.7	5.4	95031	473972	60.2
20	2.8	94370	471242	52.9	7.5	94517	470942	55.5
25	5.4	94106	469361	48.0	6.7	93804	467565	50.9
30	6.1	93599	466676	43.3	6.8	93173	464400	46.2
35	10.9	93027	462796	38.5	2.7	92538	462120	41.5
40	11.0	92013	457732	33.9	9.3	92291	459482	36.6
45	26.3	91001	449475	29.3	11.2	91436	454814	31.9
50	43.4	88610	434124	25.0	27.8	90411	446246	27.3
55	60.1	84764	411953	21.0	48.3	87901	429639	23.0
60	108.8	79667	377971	17.2	56.1	83654	407347	19.0
65	159.6	71001	328102	14.0	117.5	78959	372952	15.0
70	212.5	59668	267897	11.1	216.0	69680	312232	11.6
75	361.7	46987	192693	8.4	320.1	54626	230109	9.1
80	483.9	29994	112665	6.8	480.5	37140	139875	7.2
85+	1000.0	15481	90020	5.8	1000.0	19294	127167	6.6

Appendix A-5 Male deaths by cause and age, 2009

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	5	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0	1
Malaria	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Tuberculosis	12	0	0	0	0	0	0	0	0	1	0	0	2	1	1	2	1	3	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	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Hepatitis	8	0	0	1	0	0	1	0	0	0	0	1	0	0	0	3	1	1	0	0
Rabies	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Septicaemia	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0
Respiratory infections	23	9	1	0	0	0	0	1	0	0	0	0	0	0	0	2	1	4	3	2
Other communicable	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Maternal and neonatal conditions																				
Maternal death	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neonatal condition																				
-Premature and LBW	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Birth asphyxia	24	24	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	14	0	2	2	0	0	0	0	1	0	0	0	0	0	1	1	1	3	1	2
Non-communicable diseases																				
Malignant neoplasm																				
-Neoplasm	80	0	1	1	0	0	0	1	1	0	1	8	13	12	13	11	9	5	4	0
-Neoplasm in female organ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Congenital malformation	8	7	0	1	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	0	0	1	1	3	2	0	0	3	4	3	4
-Other endocrine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neuro-psychiatric	8	1	0	1	0	1	0	0	0	0	0	1	0	0	1	0	1	2	0	0
Diseases of circulatory system																				
-Rheumatic heart disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Hypertensive disease	51	0	0	0	0	0	0	0	0	0	0	1	2	6	8	9	5	6	9	5
-Ischaemic heart disease	76	0	0	0	0	1	0	0	0	0	5	5	9	8	8	21	7	6	4	2
-Stroke	113	0	0	0	0	0	0	0	0	2	1	3	7	3	13	14	17	24	17	12
-Other cardiovascular	48	0	0	0	0	1	0	0	0	1	0	1	2	0	2	3	11	8	11	8
Respiratory disease																				
-COPD	42	0	0	0	0	0	0	0	0	1	0	0	2	3	6	7	10	6	2	5
-Asthma	19	0	0	0	0	0	0	0	1	0	1	1	0	1	2	4	5	3	1	0
-Other respiratory	19	1	0	0	0	0	0	0	1	0	0	1	1	1	2	2	3	5	2	0
Digestive disease	34	0	0	0	0	2	0	1	1	1	3	2	1	4	2	4	9	3	1	0
Gentio -urinary disease																				
-Renal failure	11	0	0	0	0	1	0	0	0	0	0	1	2	4	0	0	0	2	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 non-communicable	4	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	1	0	0	0
Injuries																				
Unintentional injuries																				
-Accident	24	1	0	1	0	0	0	0	1	1	0	3	4	0	1	2	5	4	0	1
-Drowning	23	1	13	3	0	1	1	0	0	1	0	0	3	0	0	0	0	0	0	0
Intentional injuries																				
-Suicide	3	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0
-Homicide	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous																				
-Senility	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	7
-Fever of unknown origin	10	1	0	0	0	0	1	0	0	1	0	2	0	1	0	0	2	1	1	0
- sudden infant death	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown/missing	41	3	0	1	0	0	1	1	0	0	0	0	1	0	1	6	8	6	11	2
Total	767	77	17	12	0	8	4	6	6	10	14	32	53	47	62	92	102	99	74	52

COPD=Chronic obstructive pulmonary disease, - - = not applicable

Appendix A-6 Female deaths by cause and age, 2009

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	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	2	1	4	1
Malaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuberculosis	5	0	0	0	0	0	0	0	0	1	0	1	2	0	0	0	1	0	0	0
EPI related death	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Meningitis	1	1	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	0	1	0	0	0	0	1	0	0	0	0
Chicken pox	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Rabies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Septicaemia	14	0	1	0	0	0	1	0	0	1	0	0	1	2	1	1	1	2	2	1
Respiratory infections	12	6	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	1	2	0
Other communicable	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Maternal and neonatal conditions																				
Maternal death	6	0	0	0	0	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0
Neonatal condition																				
-Premature and LBW	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Birth asphyxia	13	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Other neonatal	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nutritional	9	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	1	1	2	1
Non-communicable diseases																				
Malignant neoplasm																				
-Neoplasm	42	0	0	0	0	1	2	0	2	1	2	3	6	7	5	4	3	3	1	2
-Neoplasm in female organ	7	0	0	0	0	0	0	0	0	0	1	1	1	0	1	2	1	0	0	0
Congenital malformation	6	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Endocrine disorder																				
-Diabetes	26	0	0	0	0	0	0	1	0	1	3	0	1	1	3	5	2	3	4	2
-Other endocrine	2	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Neuro-psychiatric	4	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Diseases of circulartory sestem																				
-Rheumatic heart disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Hypertensive disease	45	0	0	0	0	0	0	0	0	0	0	0	2	6	3	6	10	9	6	3
-Ischaemic heart disease	46	0	0	0	0	0	0	0	2	0	1	1	3	3	6	14	5	6	2	3
-Stroke	150	0	0	0	0	0	0	0	2	1	3	2	5	4	9	18	31	33	25	17
-Other cardiovascular	64	0	1	0	0	0	0	1	1	0	0	1	2	1	2	3	13	19	14	6
Respiratory disease																				
-COPD	28	0	0	0	0	0	0	1	0	1	1	0	1	3	1	6	7	4	2	1
-Asthma	15	0	0	0	0	0	0	0	0	0	1	1	2	1	0	2	5	1	0	2
-Other respiratory	4	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	1	0	0	0
Digestive disease	21	2	0	0	0	0	0	1	0	1	1	4	3	1	1	4	3	0	0	0
Gentio-urinary disease																				
-Renal failure	10	0	0	0	0	1	1	0	1	0	2	0	0	1	0	1	0	1	1	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	0	1	0	1	0	2	0
Injuries																				
Unintentional injuries																				
-Accident	19	0	2	0	0	0	1	0	0	0	0	1	1	1	1	2	2	2	4	2
-Drowning	22	0	16	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	1	2
Intentional injuries																				
-Suicide	14	0	0	0	0	2	7	2	1	0	1	0	0	0	1	0	0	0	0	0
-Homicide	3	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Miscellaneous																				
-Senility	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6
-Fever of unknown origin	6	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	1	0
-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
Unknown/missing	41	8	0	0	1	1	0	0	0	0	0	2	0	0	2	6	10	6	3	2
Total	690	63	22	2	4	9	14	8	10	11	18	18	30	34	39	81	100	98	77	52

COPD=Chronic obstructive pulmonary disease

Appendix A-7 Male deaths by cause, age, and area, 2009

Causes	All ages		<1		1-4		5-14		15-44		45-64		65-84		85+	
	ICDDR,B	Government	ICDDR,B	Government	ICDDR,B	Government	ICDDR,B	Government	ICDDR,B	Government	ICDDR,B	Government	ICDDR,B	Government	ICDDR,B	Government
Communicable diseases																
Diarrhoeal	1	4	0	0	0	0	0	0	0	0	0	1	1	2	0	1
Malaria	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Tuberculosis	9	3	0	0	0	0	0	0	1	0	4	0	4	3	0	0
EPI related death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meningitis	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Hepatitis	3	5	0	0	0	0	0	1	0	1	1	0	2	3	0	0
Chicken pox	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabies	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Septicaemia	0	3	0	0	0	0	0	0	0	0	0	0	0	3	0	0
Respiratory infections	14	9	4	5	1	0	0	0	1	0	0	0	6	4	2	0
Other communicable	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Maternal and neonatal conditions																
Maternal death	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neonatal condition																
-premature and LBW	6	9	6	9	0	0	0	0	0	0	0	0	0	0	0	0
-birth asphyxia	10	14	10	14	0	0	0	0	0	0	0	0	0	0	0	0
-other neonatal	2	10	2	10	0	0	0	0	0	0	0	0	0	0	0	0
Nutritional	7	7	0	0	1	1	1	1	1	0	0	1	4	2	0	2
Non-communicable diseases																
Malignant neoplasm																
-neoplasm	43	37	0	0	0	1	1	0	2	1	23	23	17	12	0	0
-neoplasm in female organ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Congenital malformation	5	3	5	2	0	0	0	1	0	0	0	0	0	0	0	0
Endocrine disorder																
-diabetes	9	12	0	0	0	0	0	0	0	1	3	3	6	4	0	4
-other endocrine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neuro-psychiatric	3	5	1	0	0	0	0	1	1	0	0	2	1	2	0	0
Diseases of circulatory system																
-rheumatic heart disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-hypertensive disease	29	22	0	0	0	0	0	0	0	0	6	11	19	10	4	1
-ischaemic heart disease	36	40	0	0	0	0	0	0	4	2	13	17	19	19	0	2
-stroke	61	52	0	0	0	0	0	0	1	2	18	8	33	39	9	3
-other cardiovascular	25	23	0	0	0	0	0	0	2	0	0	5	17	16	6	2
Respiratory disease																
-COPD	24	18	0	0	0	0	0	0	0	1	7	4	15	10	2	3
-Asthma	8	11	0	0	0	0	0	0	0	2	2	2	6	7	0	0
-Other respiratory	11	8	0	1	0	0	0	0	1	0	2	3	8	4	0	0
Digestive disease	24	10	0	0	0	0	0	0	5	3	8	1	11	6	0	0
Gentio-urinary disease																
-Renal failure	5	6	0	0	0	0	0	0	0	1	4	3	1	1	0	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	3	1	0	0	0	0	0	0	1	0	0	1	2	0	0	0
Injuries																
Unintentional injuries																
-accident	9	15	1	0	0	0	0	1	1	1	2	6	5	6	0	1
-drowning	7	16	0	1	3	10	1	2	1	2	2	1	0	0	0	0
Intentional injuries																
-suicide	2	1	0	0	0	0	0	0	2	1	0	0	0	0	0	0
-homicide	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Miscellaneous																
-senility	1	8	0	0	0	0	0	0	0	0	0	0	0	2	1	6
-fever of unknown origin	3	7	1	0	0	0	0	0	1	1	1	2	0	4	0	0
-sudden infant death	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Unknown/missing	13	28	2	1	0	0	0	1	0	2	0	2	10	21	1	1
Total	376	391	33	44	5	12	4	8	25	23	97	97	187	180	25	27

Appendix A-8 Female deaths by cause, age, and area, 2009

Causes	All ages		<1		1-4		5-14		15-44		45-64		65-84		85+	
	ICDDR,B	Government	ICDDR,B	Government	ICDDR,B	Government	ICDDR,B	Government	ICDDR,B	Government	ICDDR,B	Government	ICDDR,B	Government	ICDDR,B	Government
Communicable diseases																
Diarrhoeal	5	5	0	0	0	0	0	0	1	0	0	1	3	4	1	0
Malaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuberculosis	3	2	0	0	0	0	0	0	1	0	2	1	0	1	0	0
EPI related death	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Meningitis	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis	1	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0
Chicken pox	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Septicaemia	6	8	0	0	0	1	0	0	1	1	3	1	2	4	0	1
Respiratory infections	0	12	0	6	0	0	0	0	0	1	0	1	0	4	0	0
Other communicable	0	2	0	0	0	0	0	1	0	0	0	0	0	1	0	0
Maternal and neonatal conditions																
Maternal death	1	5	0	0	0	0	0	0	1	5	0	0	0	0	0	0
Neonatal condition																
-premature and LBW	5	15	5	15	0	0	0	0	0	0	0	0	0	0	0	0
-birth asphyxia	3	10	3	10	0	0	0	0	0	0	0	0	0	0	0	0
-other neonatal	3	5	3	5	0	0	0	0	0	0	0	0	0	0	0	0
Nutritional	2	7	0	0	0	0	0	1	0	1	0	0	1	5	1	0
Non-communicable diseases																
Malignant neoplasm																
-neoplasm	20	22	0	0	0	0	0	0	4	4	10	11	5	6	1	1
-neoplasm in female organ	3	4	0	0	0	0	0	0	0	1	3	0	0	3	0	0
Congenital malformation	3	3	3	2	0	1	0	0	0	0	0	0	0	0	0	0
Endocrine disorder																
-diabetes	15	11	0	0	0	0	0	0	2	3	4	1	8	6	1	1
-other endocrine	2	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0
Neuro-psychiatric	0	4	0	0	0	0	0	2	0	0	0	0	0	2	0	0
Diseases of circulatory system																
-rheumatic heart disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-hypertensive disease	27	18	0	0	0	0	0	0	0	0	7	4	18	13	2	1
-ischaemic heart disease	25	21	0	0	0	0	0	0	1	2	6	7	16	11	2	1
-stroke	78	72	0	0	0	0	0	0	4	2	9	11	54	53	11	6
-other cardiovascular	33	31	0	0	0	1	0	0	2	0	2	4	26	23	3	3
Respiratory disease																
-COPD	16	12	0	0	0	0	0	0	2	1	1	4	12	7	1	0
-asthma	8	7	0	0	0	0	0	0	1	0	2	2	5	3	0	2
-other respiratory	2	2	0	0	0	0	0	0	1	0	0	1	1	1	0	0
Digestive disease	11	10	2	0	0	0	0	0	2	1	5	4	2	5	0	0
Gentio-urinary disease																
-renal failure	4	6	0	0	0	0	0	0	2	3	0	1	1	2	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	0	4	0	0	0	0	0	0	0	0	0	1	0	3	0	0
Injuries																
Unintentional injuries																
-accident	6	13	0	0	2	0	0	0	0	1	1	3	3	7	0	2
-drowning	14	8	0	0	10	6	0	0	0	0	1	1	1	1	2	0
Intentional injuries																
-suicide	8	6	0	0	0	0	0	0	7	6	1	0	0	0	0	0
-homicide	2	1	0	0	0	0	0	1	2	0	0	0	0	0	0	0
Miscellaneous																
-senility	3	4	0	0	0	0	0	0	0	0	0	0	0	1	3	3
-fever of unknown origin	2	4	0	0	0	0	0	0	0	0	0	1	2	3	0	0
-sudden infant death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown/missing	19	22	4	4	0	0	0	1	1	0	1	3	12	13	1	1
Total	332	358	21	42	13	9	0	6	36	34	58	63	174	182	30	22

Appendix A-9 Age-specific fertility rate and indices for ICDDR,B area by block, 2009

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	806	77.9	695	80.0	515	76.0	449	74.2
15-19*	139	80.8	101	66.3	80	71.8	56	57.8
20-24	283	151.3	236	160.0	172	140.8	148	144.5
25-29	197	127.1	180	134.3	134	129.6	122	139.4
30-34	115	82.7	119	103.8	86	99.7	78	100.5
35-39	61	46.5	53	48.4	32	37.3	38	49.2
40-44	11	8.2	6	5.4	11	12.2	7	8.4
45-49**	0	0.0	0	0.0	0	0.0	0	0.0
Total fertility rate		2482		2591		2457		2499
General fertility rate		78		80		76		74
Gross reproduction rate		1195		1249		1193		1275

*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, 2009

Age (years)	Total women	Total birth	1	2	3	4	5	6	7	8	9	10+
Both areas												
<15	11912	7	7	0	0	0	0	0	0	0	0	0
15-19	10855	619	578	37	3	0	0	0	1	0	0	0
20-24	10876	1630	912	624	89	3	0	1	0	0	1	0
25-29	9241	1230	232	538	368	78	12	1	0	1	0	0
30-34	7836	748	51	150	298	168	51	25	4	1	0	0
35-39	7770	388	13	39	79	117	75	42	15	6	1	1
40-44	7971	83	1	2	14	19	21	15	5	3	1	2
45-49	7273	0	0	0	0	0	0	0	0	0	0	0
Total		4705	1794	1390	851	385	159	84	25	11	3	3
ICDDR,B service area												
<15	5968	4	4	0	0	0	0	0	0	0	0	0
15-19	5327	372	353	19	0	0	0	0	0	0	0	0
20-24	5591	839	470	321	47	1	0	0	0	0	0	0
25-29	4799	633	111	298	180	37	6	1	0	0	0	0
30-34	4176	398	25	85	173	89	18	8	0	0	0	0
35-39	4037	184	7	22	47	55	28	16	5	3	0	1
40-44	4208	35	1	1	8	7	10	6	0	2	0	0
45-49	3724	0	0	0	0	0	0	0	0	0	0	0
Total		2465	971	746	455	189	62	31	5	5	0	1
Government service area												
<15	5944	3	3	0	0	0	0	0	0	0	0	0
15-19	5528	247	225	18	3	0	0	0	1	0	0	0
20-24	5285	791	442	303	42	2	0	1	0	0	1	0
25-29	4442	597	121	240	188	41	6	0	0	1	0	0
30-34	3660	350	26	65	125	79	33	17	4	1	0	0
35-39	3733	204	6	17	32	62	47	26	10	3	1	0
40-44	3763	48	0	1	6	12	11	9	5	1	1	2
45-49	3549	0	0	0	0	0	0	0	0	0	0	0
Total		2240	823	644	396	196	97	53	20	6	3	2

Appendix A-11 Age-order-specific fertility rates by area, 2009

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	0.0570	0.0532	0.0034	0.0003	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000
20-24	0.1499	0.0839	0.0574	0.0082	0.0003	0.0000	0.0001	0.0000	0.0000	0.0001	0.0000
25-29	0.1331	0.0251	0.0582	0.0398	0.0084	0.0013	0.0001	0.0000	0.0001	0.0000	0.0000
30-34	0.0955	0.0065	0.0191	0.0380	0.0214	0.0065	0.0032	0.0005	0.0001	0.0000	0.0000
35-39	0.0499	0.0017	0.0050	0.0102	0.0151	0.0097	0.0054	0.0019	0.0008	0.0001	0.0001
40-44	0.0104	0.0001	0.0003	0.0018	0.0024	0.0026	0.0019	0.0006	0.0004	0.0001	0.0003
45-49	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.4820**	**0.8555**	**0.7171**	**0.4912**	**0.2380**	**0.1005**	**0.0534**	**0.0158**	**0.0069**	**0.0017**	**0.0019**
ICDDR,B service area											
<15	0.0007	0.0007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15-19	0.0698	0.0663	0.0036	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20-24	0.1501	0.0841	0.0574	0.0084	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-29	0.1319	0.0231	0.0621	0.0375	0.0077	0.0013	0.0002	0.0000	0.0000	0.0000	0.0000
30-34	0.0953	0.0060	0.0204	0.0414	0.0213	0.0043	0.0019	0.0000	0.0000	0.0000	0.0000
35-39	0.0456	0.0017	0.0054	0.0116	0.0136	0.0069	0.0040	0.0012	0.0007	0.0000	0.0002
40-44	0.0083	0.0002	0.0002	0.0019	0.0017	0.0024	0.0014	0.0000	0.0005	0.0000	0.0000
45-49	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.5084**	**0.9104**	**0.7456**	**0.5044**	**0.2224**	**0.0744**	**0.0376**	**0.0062**	**0.0061**	**0.0000**	**0.0012**
Government service area											
<15	0.0005	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15-19	0.0447	0.0407	0.0033	0.0005	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000
20-24	0.1497	0.0836	0.0573	0.0079	0.0004	0.0000	0.0002	0.0000	0.0000	0.0002	0.0000
25-29	0.1344	0.0272	0.0540	0.0423	0.0092	0.0014	0.0000	0.0000	0.0002	0.0000	0.0000
30-34	0.0956	0.0071	0.0178	0.0342	0.0216	0.0090	0.0046	0.0011	0.0003	0.0000	0.0000
35-39	0.0546	0.0016	0.0046	0.0086	0.0166	0.0126	0.0070	0.0027	0.0008	0.0003	0.0000
40-44	0.0128	0.0000	0.0003	0.0016	0.0032	0.0029	0.0024	0.0013	0.0003	0.0003	0.0005
45-49	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.4614**	**0.8040**	**0.6860**	**0.4757**	**0.2550**	**0.1294**	**0.0710**	**0.0264**	**0.0078**	**0.0036**	**0.0027**

Appendix A-12. Marriages and divorces by month, 2009

Month	Marriage		Divorce	
	Number	Percent	Number	Percent
January	291	8.8	22	7.0
February	263	7.9	27	8.6
March	322	9.7	30	9.6
April	256	7.7	30	9.6
May	276	8.3	19	6.1
June	256	7.7	21	6.7
July	343	10.4	28	8.9
August	296	8.9	28	8.9
September	208	6.3	30	9.6
October	300	9.1	29	9.2
November	169	5.1	18	5.7
December	332	10.0	32	10.2
Total	**3312**	**100.0**	**314**	**100.0**

Appendix A-13. In- and out-migrations by age and sex, 2009

Age (years)	In-migration			Out-migration		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	12088	5857	6231	12952	6465	6487
0-4	1856	969	887	1554	797	757
5 - 9	1188	590	598	1067	567	500
10-14	709	336	373	1041	580	461
15-19	1567	344	1223	2418	1124	1294
20-24	1975	671	1304	2565	1076	1489
25-29	1551	824	727	1489	679	810
30-34	1077	702	375	866	524	342
35-39	738	535	203	661	425	236
40-44	494	346	148	393	245	148
45-49	325	232	93	265	177	88
50-54	208	126	82	159	90	69
55-59	117	73	44	116	56	60
60-64	90	54	36	106	39	67
65+	193	55	138	252	86	166

Appendix A-14. In-migrations by age, sex, and area, 2009

Age (years)	ICDDR,B service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	6070	2848	3222	6018	3009	3009
0-4	935	491	444	921	478	443
5 - 9	608	295	313	580	295	285
10-14	354	166	188	355	170	185
15-19	840	145	695	727	199	528
20-24	975	316	659	1000	355	645
25-29	756	399	357	795	425	370
30-34	529	334	195	548	368	180
35-39	369	270	99	369	265	104
40-44	251	175	76	243	171	72
45-49	156	103	53	169	129	40
50-54	111	65	46	97	61	36
55-59	63	43	20	54	30	24
60-64	40	27	13	50	27	23
65+	83	19	64	110	36	74

Appendix A-15. Out-migrations by age, sex, and area, 2009

Age (years)	ICDDR,B service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	6280	3003	3277	6672	3462	3210
0-4	797	415	382	757	382	375
5 - 9	536	273	263	531	294	237
10-14	534	295	239	507	285	222
15-19	1104	457	647	1314	667	647
20-24	1204	449	755	1361	627	734
25-29	693	292	401	796	387	409
30-34	443	265	178	423	259	164
35-39	342	222	120	319	203	116
40-44	209	116	93	184	129	55
45-49	128	92	36	137	85	52
50-54	72	42	30	87	48	39
55-59	48	25	23	68	31	37
60-64	60	24	36	46	15	31
65+	110	36	74	142	50	92

Appendix A.16. Male out-migration by cause of movement and age, 2009

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	6465	797	567	580	1124	1076	679	524	425	245	177	90	56	39	86
Work/economic/educational															
Acquired/seeking job	3396	0	3	144	669	820	557	438	335	185	124	63	31	15	12
Job completion/retirement	20	0	0	1	2	0	2	1	2	2	0	0	3	5	2
To acquire education	717	6	79	182	258	155	30	4	0	1	0	0	0	0	2
Educ. completed/interrupted	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Student lodging	2	0	0	0	0	1	1	0	0	0	0	0	0	0	0
Housing/environmental															
Acquired/seeking new land/house	120	0	0	0	4	4	9	17	21	17	14	9	5	6	14
River erosion	4	0	0	0	0	1	0	0	0	0	1	0	2	0	0
Move as dependent															
Join with/ follow spouse	38	0	0	0	0	1	5	8	6	4	5	3	1	2	3
Join with/follow parents	1602	734	434	219	134	36	19	14	7	4	1	0	0	0	0
Join with child/sibling	166	39	25	15	26	6	7	3	3	1	3	3	3	5	27
Join with other relatives	112	14	21	14	9	6	5	6	10	9	8	3	4	0	3
Marriage / familial															
Marriage	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Separation/divorce/widow	19	0	0	0	3	9	1	2	2	0	1	0	1	0	0
Adoption	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	110	1	1	1	9	25	29	17	12	7	3	0	2	0	3
Health or old age care	20	1	0	0	1	1	0	1	2	1	0	0	0	3	10
Legal problems	62	0	0	0	5	5	5	8	11	8	8	6	1	3	2
Other and not stated															
Others n.e.c.*	70	0	3	4	3	5	7	5	14	6	9	3	3	0	8
Unknown or not stated	3	0	0	0	1	1	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, 2009

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	6487	757	500	461	1294	1489	810	342	236	148	88	69	60	67	166
Work/economic/educational															
Acquired/seeking job	601	0	9	76	203	120	71	34	42	30	7	3	3	1	2
Job completion/retirement	12	0	0	2	1	2	1	3	2	0	1	0	0	0	0
To acquire education	300	9	71	73	83	47	13	4	0	0	0	0	0	0	0
Educ. completed/interrupted	1	0	1	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	64	0	0	0	1	7	14	8	7	6	7	2	5	4	3
River erosion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Move as dependent															
Join with/ follow spouse	1562	0	0	9	162	519	387	182	120	76	38	30	14	17	8
Join with/follow parents	1703	691	376	220	178	140	64	16	11	3	2	0	0	0	2
Join with child/sibling	400	20	30	27	33	51	25	9	7	12	10	20	27	30	99
Join with other relatives	228	25	10	13	19	28	55	39	17	5	8	3	1	1	4
Marriage / familial															
Marriage	1147	0	0	24	542	437	100	27	9	6	1	1	0	0	0
Separation/divorce/widow	111	0	0	3	31	38	13	4	7	3	6	1	2	1	2
Adoption	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	149	0	0	2	21	53	38	7	8	3	5	0	1	1	10
Health or old age care	62	0	2	0	0	9	4	2	1	1	2	4	3	8	26
Legal problems	10	0	0	0	0	2	0	1	1	2	0	2	1	1	0
Other and not stated															
Others n.e.c.*	126	2	1	12	20	36	24	6	4	1	1	3	3	3	10
Unknown or not stated	1	0	0	0	0	0	1	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, 2009

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	5857	969	590	336	344	671	824	702	535	346	232	126	73	54	55
Work/economic/educational															
Acquired/seeking job	898	0	0	14	45	143	216	176	116	96	41	25	13	8	5
Job completion/retirement	1054	0	0	3	44	159	231	218	184	104	55	26	15	12	3
To acquire education	202	3	75	63	35	19	6	0	0	1	0	0	0	0	0
Educ. completed/interrupted	5	0	1	0	2	2	0	0	0	0	0	0	0	0	0
Student lodging	17	0	0	0	6	2	3	2	0	0	3	1	0	0	0
Housing/environmental															
Acquired/seeking new land/house	574	0	0	1	13	85	109	93	80	63	52	26	14	15	23
River erosion	14	0	0	0	0	0	0	3	3	3	3	0	1	0	1
Move as dependent															
Join with/ follow spouse	239	0	0	0	1	22	62	55	30	20	23	13	9	2	2
Join with/follow parents	1731	847	456	210	86	65	35	22	6	3	1	0	0	0	0
Join with child/sibling	162	66	34	14	11	13	6	5	1	0	1	3	0	3	5
Join with other relatives	263	41	20	10	13	38	44	42	30	6	10	5	2	1	1
Marriage / familial															
Marriage	5	0	0	0	0	1	3	0	0	0	1	0	0	0	0
Separation/divorce/widow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Adoption	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	67	0	0	1	5	16	15	9	6	3	5	4	1	1	1
Health or old age care	187	0	0	2	12	25	25	24	22	19	17	16	10	9	6
Legal problems	99	0	0	0	2	9	19	22	23	14	8	1	1	0	0
Other and not stated															
Others n.e.c.*	318	3	4	18	69	69	48	29	31	13	11	5	7	3	8
Unknown or not stated	13	0	0	0	0	3	2	2	3	1	1	1	0	0	0

*n.e.c.=Not elsewhere classified

Appendix A.19. Female in-migration by cause of movement and age, 2009

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	6231	887	598	373	1223	1304	727	375	203	148	93	82	44	36	138
Work/economic/educational															
Acquired/seeking job	225	0	0	21	24	44	51	33	16	16	9	9	1	0	1
Job completion/retirement	91	0	0	5	18	37	15	5	6	1	2	0	0	2	0
To acquire education	211	3	86	67	38	10	3	1	1	1	1	0	0	0	0
Educ. completed/interrupted	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Student lodging	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Housing/environmental															
Acquired/seeking new land/house	180	0	0	0	7	28	29	31	15	12	9	18	10	5	16
River erosion	3	0	0	0	0	0	0	1	0	0	1	1	0	0	0
Move as dependent															
Join with/ follow spouse	1560	0	0	6	290	494	309	176	100	84	41	28	15	10	7
Join with/follow parents	2177	778	430	221	297	277	111	39	16	3	4	0	0	0	1
Join with child/sibling	276	55	49	27	17	21	10	5	2	2	4	7	10	9	58
Join with other relatives	272	33	24	4	30	47	60	30	19	9	7	4	2	1	2
Marriage / familial															
Marriage	612	0	0	7	389	162	32	7	6	6	1	1	0	0	1
Separation/divorce/widow	117	0	0	0	22	39	25	12	6	5	4	3	0	0	1
Adoption	16	15	1	0	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	145	0	2	0	25	52	22	17	7	0	0	3	1	2	14
Health or old age care	101	0	0	0	14	21	18	4	3	4	3	4	2	5	23
Legal problems	2	0	0	0	0	1	0	0	0	1	0	0	0	0	0
Other and not stated															
Others n.e.c.*	241	3	6	14	52	70	42	14	6	4	7	4	3	2	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

Appendix A.20. Male migration by destination or origin, 2009

Destination/Origin	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	101	80	40	21	25	267	68	29	24	30	14	165
	Urban	882	1272	480	240	211	3085	683	549	605	277	224	2338
Chittagong	Rural	673	199	146	126	97	1241	837	172	255	143	93	1500
	Urban	187	159	82	37	37	502	176	85	119	68	44	492
Sylhet	Rural	7	0	1	1	2	11	9	5	7	3	1	25
	Urban	33	26	10	7	9	85	53	28	19	16	24	140
Khulna	Rural	8	3	1	1	0	13	7	1	1	1	0	10
	Urban	15	3	3	3	2	26	12	4	8	3	5	32
Rajshahi	Rural	3	1	0	0	1	5	8	2	8	0	3	21
	Urban	7	5	0	1	2	15	4	1	4	1	2	12
Barisal	Rural	8	3	6	5	1	23	14	4	10	2	2	32
	Urban	4	6	3	0	1	14	11	3	4	2	3	23
India		5	6	4	3	4	22	0	5	2	0	4	11
Asia		2	100	118	36	10	266	2	62	201	140	43	448
Middle-east		8	330	295	182	41	856	7	64	258	192	77	598
Others		1	6	11	7	4	29	4	1	1	3	1	10
Unknown		0	1	3	0	1	5	0	0	0	0	0	0
Total		**1944**	**2200**	**1203**	**670**	**448**	**6465**	**1895**	**1015**	**1526**	**881**	**540**	**5857**

Appendix A.21. Female migration by destination or origin, 2009

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	93	115	56	23	28	315	70	84	46	14	13	227
	Urban	761	1089	484	195	242	2771	660	665	405	144	195	2069
Chittagong	Rural	634	1249	439	118	120	2560	828	1507	470	126	95	3026
	Urban	149	221	112	25	36	543	180	168	112	42	55	557
Sylhet	Rural	2	4	1	2	3	12	9	8	5	1	3	26
	Urban	24	37	13	6	9	89	49	26	21	11	9	116
Khulna	Rural	5	4	3	2	0	14	6	5	5	0	0	16
	Urban	11	8	8	2	4	33	8	4	8	0	7	27
Rajshahi	Rural	1	5	1	1	0	8	15	17	3	3	1	39
	Urban	4	11	3	2	2	22	7	9	5	1	5	27
Barisal	Rural	12	8	7	0	0	27	5	12	7	3	0	27
	Urban	7	6	3	0	0	16	6	7	3	0	1	17
India		7	6	5	2	3	23	2	2	0	1	6	11
Asia		2	2	3	1	0	8	6	7	1	0	0	14
Middle-east		3	11	12	4	1	31	7	6	9	5	1	28
Others		1	6	1	0	2	10	0	0	2	0	2	4
Unknown		2	1	1	1	0	5	0	0	0	0	0	0
Total		**1718**	**2783**	**1152**	**384**	**450**	**6487**	**1858**	**2527**	**1102**	**351**	**393**	**6231**

POPULATION, BIRTHS, AND DEATHS BY VILLAGE, 2009

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
ICDDR,B SERVICE AREA						
D00	Charmukundi	2366	42	8	17.8	3.4
W00	Kaladi	7165	151	28	21.1	3.9
V10	Dhakirgaon	1878	37	13	19.7	6.9
V11	Nabakalash	2840	67	13	23.6	4.6
V31	Dighaldi	9449	228	56	24.1	5.9
V32	Mobarakdi	3379	65	23	19.2	6.8
V60	Suvankardi	990	18	5	18.2	5.1
V61	Munsabdi	698	24	4	34.4	5.7
V62	Shilmondi	994	20	3	20.1	3.0
V72	Upadi	6292	154	46	24.5	7.3
Block A Total		**36051**	**806**	**199**	**22.4**	**5.5**
H00	Lamchari	1256	15	5	11.9	4.0
V12	Bhangerpar	706	18	0	25.5	0.0
V13	Baburpara	715	18	7	25.2	9.8
V19	Lakshmipur	2901	49	16	16.9	5.5
V20	Dagorpur	1380	26	10	18.8	7.2
V21	Khadergaon	576	16	2	27.8	3.5
V22	Beloti	618	11	5	17.8	8.1
V23	Baluchar	679	9	8	13.3	11.8
V24	Machuakhal	3017	57	15	18.9	5.0
V26	Narayanpur	3185	78	18	24.5	5.7
V56	Pailpara	1539	40	11	26.0	7.1
V59	Doshpara	1902	59	9	31.0	4.7
V82	Dhanarpar	1728	35	12	20.3	6.9
V83	Padmapal	621	18	4	29.0	6.4
V85	Bhanurpara	513	12	3	23.4	5.8
V87	Hurmaisha	692	15	2	21.7	2.9
VBB	Nagda	4627	91	30	19.7	6.5
VBC	Naogaon	4797	128	28	26.7	5.8
Block B Total		**31452**	**695**	**185**	**22.1**	**5.9**
K00	Shahpur	982	28	2	28.5	2.0
L00	Tatkhana	568	12	4	21.1	7.0
M00	Char Nayergaon	203	4	0	19.7	0.0
N00	Aswinpur	2205	47	13	21.3	5.9
O00	Nayergaon	2069	51	20	24.6	9.7
P00	Titerkandi	2097	34	10	16.2	4.8
Q00	Char Shibpur	250	5	2	20.0	8.0
V27	Panchghoria	961	22	6	22.9	6.2
V28	Khidirpur	1520	42	9	27.6	5.9
V30	Harion	561	11	5	19.6	8.9
V39	Gobindapur	324	4	1	12.3	3.1
V40	Masunda	819	12	6	14.7	7.3
V41	Paton	1826	31	10	17.0	5.5
V42	Adhara (South)	735	7	4	9.5	5.4
V44	Panchdona	644	14	7	21.7	10.9
V86	Adhara	939	20	8	21.3	8.5
V88	Datikara	543	19	4	35.0	7.4
VBA	Mehron	2250	39	21	17.3	9.3

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
DX0	Barogaon	3616	82	20	22.7	5.5
DX1	Naojan	1423	31	13	21.8	9.1
Block C Total		**24535**	**515**	**165**	**21.0**	**6.7**
R00	Nandalalpur	1458	37	13	25.4	8.9
S00	Tatua	979	27	5	27.6	5.1
T00	Amuakanda	1643	33	9	20.1	5.5
V15	Bhati Rasulpur	784	15	3	19.1	3.8
V16	Binandapur	848	10	5	11.8	5.9
V17	Hatighata	1073	18	8	16.8	7.5
V18	Torkey	3915	88	27	22.5	6.9
V25	Char Pathalia	1272	23	9	18.1	7.1
V29	Shibpur (South)	509	14	2	27.5	3.9
V33	Shibpur (North)	459	10	6	21.8	13.1
V34	Satparia	847	20	6	23.6	7.1
V52	Nayakandi	221	8	2	36.2	9.0
V54	Balairkandi	561	12	6	21.4	10.7
V55	Induria	538	7	1	13.0	1.9
V63	Islamabad (East)	2015	38	20	18.9	9.9
V67	Majlishpur	609	8	7	13.1	11.5
V81	Sonaterkandi	684	10	7	14.6	10.2
V84	Shahbajkandi	2311	35	16	15.1	6.9
V89	Islamabad (Middle)	1466	36	7	24.6	4.8
Block D Total		**22192**	**449**	**159**	**20.2**	**7.2**
ICDDR,B Service Area Total		**114230**	**2465**	**708**	**21.6**	**6.2**
GOVERNMENT SERVICE AREA:						
V35	Durgapur	3714	67	24	18.0	6.5
V38	Galimkha	1492	29	5	19.4	3.4
V43	Kanachak	1108	25	2	22.6	1.8
V45	Bakchar	1052	21	6	20.0	5.7
V46	Silinda	427	11	6	25.8	14.1
V47	Tulatali	1800	33	15	18.3	8.3
V48	Gangkanda	501	17	6	33.9	12.0
V49	Harina Bhabanipur	1223	28	10	22.9	8.2
V57	Baluchar	1093	21	7	19.2	6.4
V64	Kawadi	4703	119	37	25.3	7.9
V65	Nayachar	781	11	6	14.1	7.7
V66	Thatalia	825	15	7	18.2	8.5
V68	Sobahan	998	20	5	20.0	5.0
V71	Khamarpara	499	5	4	10.0	8.0
V73	Sadardia	813	15	6	18.5	7.4
V74	Ketundi	1382	31	13	22.4	9.4
V75	Mukundi	316	8	2	25.3	6.3
V76	Chosoi	1855	33	8	17.8	4.3
V78	Soladana	269	7	0	26.0	0.0
V79	Pitambordi	384	9	5	23.4	13.0
V80	Daribond	1291	25	4	19.4	3.1
V90	Narinda	1256	19	10	15.1	8.0
V97	Dhanagoda	314	4	5	12.7	15.9
V98	Santoshpur	109	0	0	0.0	0.0
V99	Baluakandi	457	7	7	15.3	15.3
VB1	Taltoli	1016	20	9	19.7	8.9
VB2	Sree Rayerchar	1110	25	5	22.5	4.5
VB3	Rayerkandi	2891	49	19	16.9	6.6
D28	Bazarkhola	1130	29	6	25.7	5.3

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
D29	Kirtonkhola	216	9	1	41.7	4.6
D30	Banuakandi	729	12	8	16.5	11.0
D31	Harina Bazarkhola	1063	22	10	20.7	9.4
D32	Khalisha	748	19	3	25.4	4.0
D33	Nayanagar	1005	27	8	26.9	8.0
D34	Saidkharkandi	1245	30	9	24.1	7.2
D35	Mollah Kandi	577	10	2	17.3	3.5
Block E Total		**40392**	**832**	**280**	**20.6**	**6.9**
A00	Uddamdi	3169	67	26	21.1	8.2
F00	Sepoykandi	1473	30	13	20.4	8.8
G00	Thatalia	2977	72	19	24.2	6.4
J00	Char Harigope	722	19	5	26.3	6.9
U00	Baispur	8879	168	57	18.9	6.4
V01	Kadamtali	379	6	4	15.8	10.6
V02	Nilokhi	468	10	1	21.4	2.1
V03	Char Nilokhi	614	15	4	24.4	6.5
V04	Char Pathalia	359	8	2	22.3	5.6
V05	Gazipur	3345	78	24	23.3	7.2
V06	Fatepur	2470	71	20	28.7	8.1
V07	Nayakandi	272	2	5	7.4	18.4
V08	Goalbhar	1168	26	12	22.3	10.3
V09	Naburkandi	1115	12	4	10.8	3.6
V14	Enayetnagar	718	15	7	20.9	9.7
V36	Ludhua	5452	93	40	17.1	7.3
D99	Mandertoli	1997	43	10	21.5	5.0
Block F Total		**35577**	**735**	**253**	**20.7**	**7.1**
B00	Charmasua	1880	38	10	20.2	5.3
C00	Sarderkandi	3915	88	27	22.5	6.9
V37**	Charputia	-	-	-	-	-
V50	Bakharpur	59	3	0	50.8	0.0
V51	Induriakandi	454	7	3	15.4	6.6
V53	Chhoto Haldia	3001	65	16	21.7	5.3
V58**	Mohishmari	-	-	-	-	-
V69**	Naobangha	-	-	-	-	-
V70**	South Joypur	-	-	-	-	-
V95	Baluchar	2282	48	13	21.0	5.7
V96	Rampur	569	11	3	19.3	5.3
VB4	Ramdaspur	3514	66	31	18.8	8.8
VB5	Thakurpara	834	19	2	22.8	2.4
VB6	Sarkerpara	525	10	4	19.0	7.6
VB7	Mirpur	321	4	0	12.5	0.0
VB8	Farazikandi	1315	25	8	19.0	6.1
VB9**	Ramanathgonj	-	-	-	-	-
VB0	South Rampur	2559	50	15	19.5	5.9
D88	Sankibhanga	1494	37	9	24.8	6.0
D89	Sankibhanga Namapara	993	20	6	20.1	6.0
D90	Zahirabad	880	22	6	25.0	6.8
D91**	North Joypur	-	-	-	-	-
D92**	West Joypur	-	-	-	-	-
D93	Maizkandi	1297	20	12	15.4	9.3
D94	Hazipur	1522	32	13	21.0	8.5
D95	Tapaderpara	574	8	3	13.9	5.2
D96	Sakharipara	1179	20	5	17.0	4.2
D97	Nayakandi	704	14	8	19.9	11.4
D98	Bara Haldia	3215	66	22	20.5	6.8
Block G Total		**33086**	**673**	**216**	**20.3**	**6.5**
Government Service Area Total		**109055**	**2240**	**749**	**20.5**	**6.9**

**Lost due to river erosion in 1987

LIFE TABLE EQUATIONS

1. $\quad _nq_x = \dfrac{_nm_x}{1/n + \,_nm_x\left[1/2 + n/12 + \left(_nm_x - \ln C\right)\right]}$ 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 $5 \leq x \leq 80$

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

4. $\quad e_x = \dfrac{T_x}{l_x}$, 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).

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: Source: Ahmed OB, Boschi-Pinto, Lopez AD et al. (2000)
Available online at: http://www.who.int/healthinfo/papaer31.pdf

HEALTH 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
2000			X		
2001		X			
2000	Fixed Site Clinic			X	X
2001		X	X		
2001	Maternal and infant Nutrition intervention (MINIMAT)	X	X	X	X
2002	Arsenic in Tub-well water and mitigation (AS-MAT)	X	X	X	X
2006	Vitamin E and Selinium trial	X	X	X	X
2007	Maternal, Newborn and child health intervention	X	X	X	X
2007	Rota Teq vaccine trial to infant	X	X	X	X
2008	Rota Rix vaccine trial to infant	X	X	X	X

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NOTE: 38 Community Health Research Workers (CHRWs) collect routine HDSS data and 5 CHRWs collect data for special surveys.

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