HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM – MATLAB

Volume Forty
Registration of Health and Demographic Events 2006

Scientific Report No. 103 – May 2008

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KNOWLEDGE FOR
GLOBAL LIFESAVING SOLUTIONS

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Volume Forty

Registration of Health and Demographic Events 2006

Scientific Report No. 103 – May 2008

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 Matlab Health and Demographic Surveillance System annual reports are available free of charge from the website: http://www.icddrb.org/pub/. The figures provided in Matlab HDSS annual reports are also available online in Matlab Demographic Workbook 1983-2005 (website: http://www.icddrb.org/activity/index.jsp?activityObjectID=2878). The following citation is suggested for this report; this form of citation is also appropriate for previous HDSS annual reports.

ICDDR,B (2008) Health and Demographic Surveillance System–Matlab, v. 40. Registration of health and demographic events 2006, Scientific Report No. 103. Dhaka: ICDDR,B.

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

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Cover page: A Community Health Research Worker (CHRW) is seen counseling mothers, adolescents and under-five children on immunization issues (Photo: Mr. Fakrul Alam, Audio-Visual Unit, ICDDR,B).

ISBN 978-984-551-293-0

Scientific Report No. 103

May 2008

Published by:
International Centre for Diarrhoeal Diseases Research, Bangladesh (ICDDR,B)
GPO Box 128, Dhaka 1000
Mohakhali, Dhaka 1212, Bangladesh
Telephone: 8860523-32 (10 lines); Fax: (880-2)-8826050
Email: msik@icddrb.org
URL: http://www.icddrb.org

Printed by:
Dynamic Printers, Dhaka

ACKNOWLEDGEMENTS

The activity of Matlab Health and Demographic Surveillance System was funded by ICDDR,B and Department for International Development, UK (DFID). ICDDR,B acknowledges with gratitude the commitment of DFID to the Centre's research efforts. ICDDR,B also gratefully acknowledges these donors who provide unrestricted support to the Centre's research efforts: Australian International Development Agency (AusAID), Government of Bangladesh, Canadian International Development Agency (CIDA), Government of the Netherlands, Swedish International Development Cooperative Agency (SIDA), Swiss Agency for Development and Cooperation (SDC), and Department for International Development, UK (DFID).

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

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SUMMARY

This report presents the vital registration and maternal and child health data gathered from Matlab, Bangladesh, in 2006. The data were collected by the Health and Demographic Surveillance System of ICDDR,B. The surveillance area is divided into an ICDDR,B service area and a Government service area which receives usual government services. The ICDDR,B service area is sub-divided into four blocks.

In the surveillance area, as a whole, fertility remained the same in 2006 compared to 2005. The crude birth rate (CBR) was 22.8 per 1,000 population and total fertility rate (TFR) was 2.7 per woman in 2006, almost similar to 2005 rates. In the ICDDR,B service area, CBR was 22.9 and TFR was 2.7 and in the Government service area, CBR and TFR were 22.7 and 2.8 respectively.

The crude death rate was 6.3 per 1,000 population in the ICDDR,B service area, and in the Government service area it was 6.4 in 2006. The infant mortality rate was 29.7 per 1,000 live births in the ICDDR,B service area, and in the Government service area it was 40.4. The neonatal mortality fell in both areas; post-neonatal mortality decreased in the ICDDR,B service area and increased in the Government service area. The mortality rate among children aged less than 5 years has decreased from 45.3 in 2005 in the ICDDR,B service area to 41.9 in 2006, and in the Government service area, the reduction was from 60.2 in 2005 to 50.7 in 2006. The rate of natural increase in population size was 16.5 per 1,000 in 2006.

The rate of in-migration increased to 43.5 per 1,000 population in 2006 from 35.7 in 2005, and the rate of out-migration also increased to 57.3 in 2006 from 53.3 in 2005. The overall annual population growth rate was 0.3%. The marriage rate was 13.9 per 1,000 population, and the divorce rate was 99.2 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.

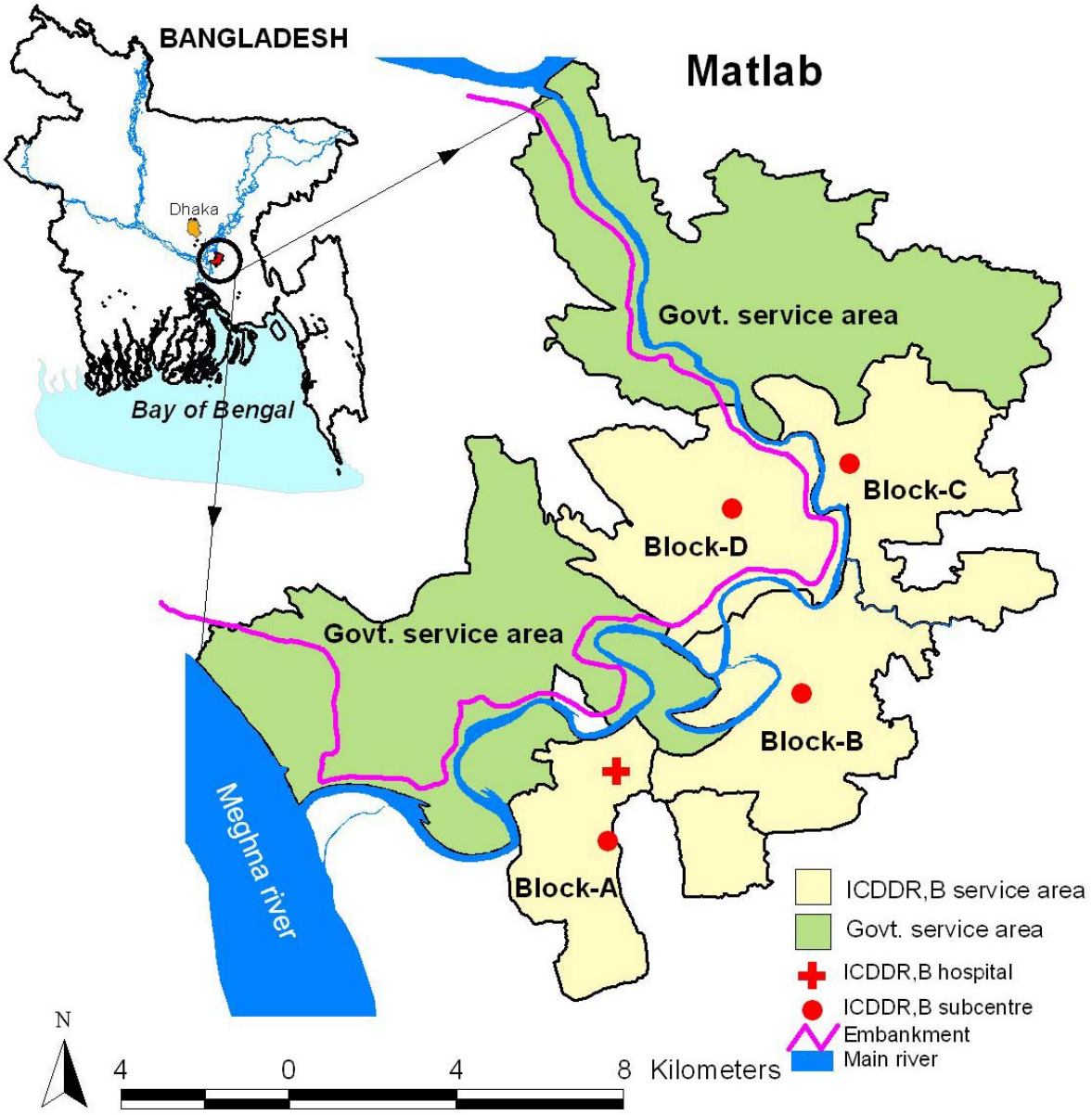
Since 1966, the HDSS has maintained the registration of births, deaths, and migrations, in addition to carrying out periodical censuses. Registration of marital unions and dissolutions began in 1975, internal movement in 1982, and household headship as well as household dissolution in 1993. Later in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

In October 1977, the surveillance area was reduced from 233 to 149 villages, and a Maternal and Child Health and Family Planning (ICDDR,B service) Programme was initiated in 70 villages. The remaining 79 villages were treated as a Government service area (Figure 1.1). Since the introduction of the ICDDR,B service programme, the CHRWs have 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) 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 fortieth 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 2006, along with brief notes and explanations of the tables, are presented in this volume.

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

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

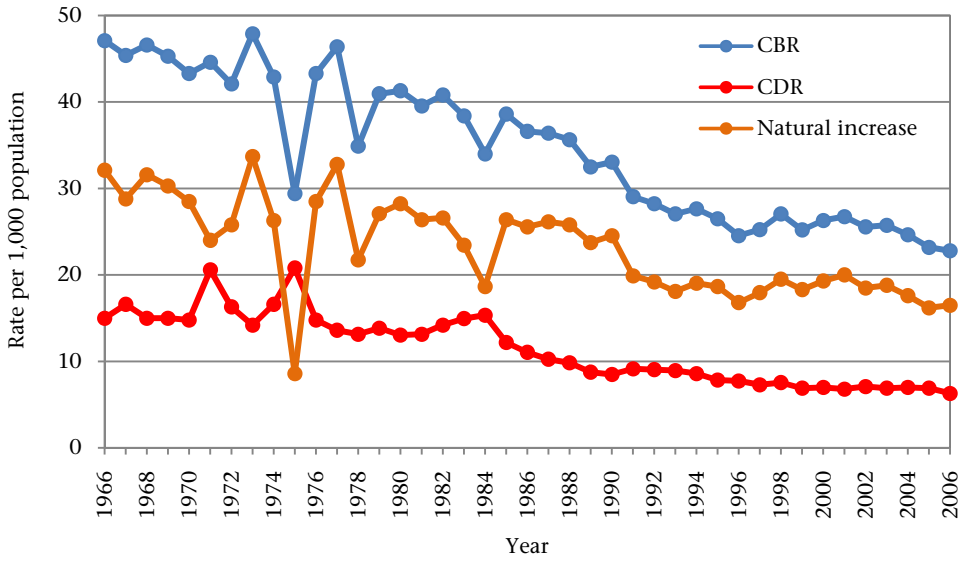


CHAPTER 2

DEMOGRAPHIC TRENDS IN MATLAB

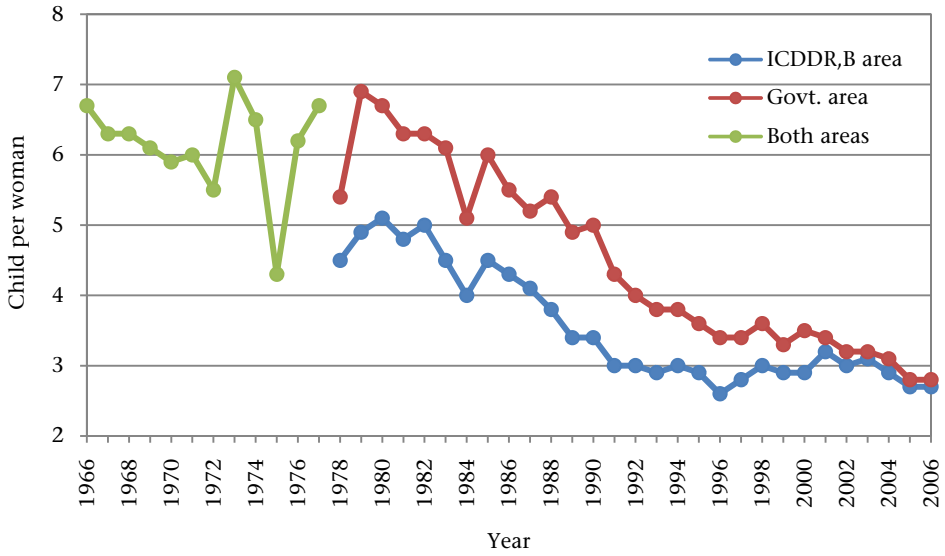
Long term Matlab HDSS data show the various transitions in the Matlab population over the period 1966-2006. In the early stages of demographic surveillance (1960s and 1970s), the Matlab population was characterized by high fertility, high mortality and high population growth. Apart from a shigella outbreak 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 1966-2006, crude birth rate (CBR) has dropped by 52%, crude death rate (CDR) by 58%, and natural increase by 49%. 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 1966-2006



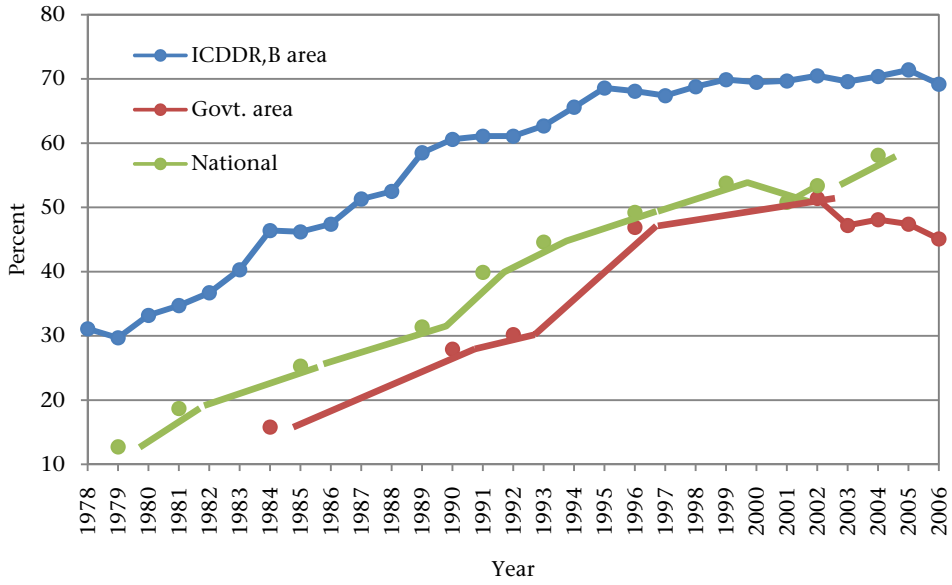
Matlab surveillance area started with a high fertility level of 6.7 children per women in 1966. After re-organization of the surveillance area into ICDDR,B and Government service areas in 1978, total fertility rate (TFR) in ICDDR,B service area remained substantially lower than the Government service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

Figure 2.2 Total Fertility Rate (TFR) in Matlab by area, 1966-2006



Provision of contraceptive advice and contraceptives has been carried out since the inception of the program by female CHRWs. These women visit all households (from 2001, this service delivery system was switched to fixed-site system) in the ICDDR,B service area on a regular basis and take this opportunity to meet with women in the household to advise and provide contraception and also to monitor the suitability of the chosen method. This method of service provision has dramatically increased access of contraceptive services to women in Matlab and is associated with a low rate of contraception discontinuation. During this period, contraceptive prevalence rate (CPR) more than doubled (from 33.2 in 1978 to 69.2 in 2006) in ICDDR,B service area, and has remained substantially higher than national and Government service area level (Figure 2.3).

Figure 2.3 Contraceptive Prevalence Rate (CPR) in Matlab and Bangladesh, 1978-2006



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 73% over the period 1966-2006. In Government service area, IMR declined 64% for the same period. Figure 2.5 shows that, during the same period, under-five mortality rate (U5MR) declined by 78% in ICDDR,B service area and 73% 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, 1966-2006

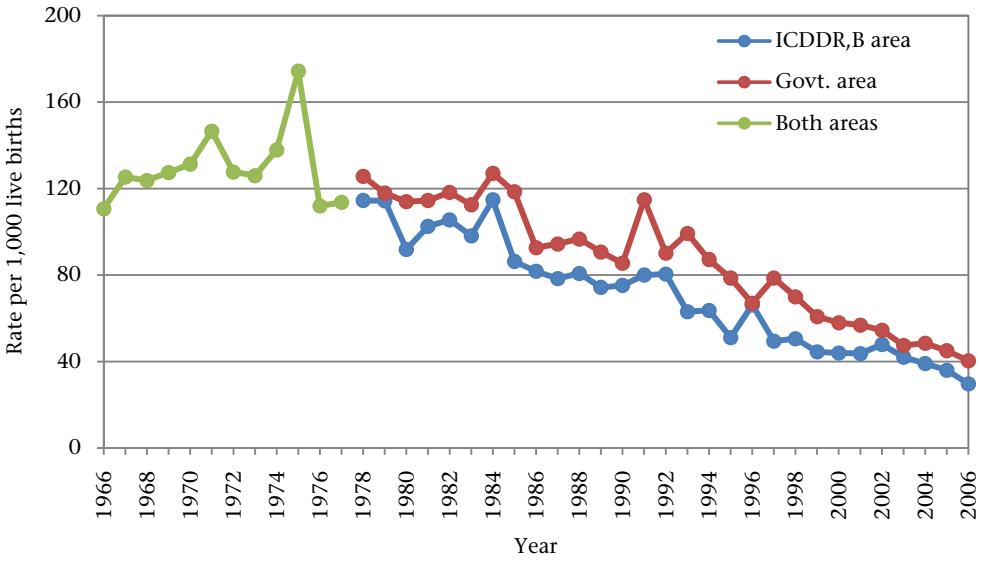
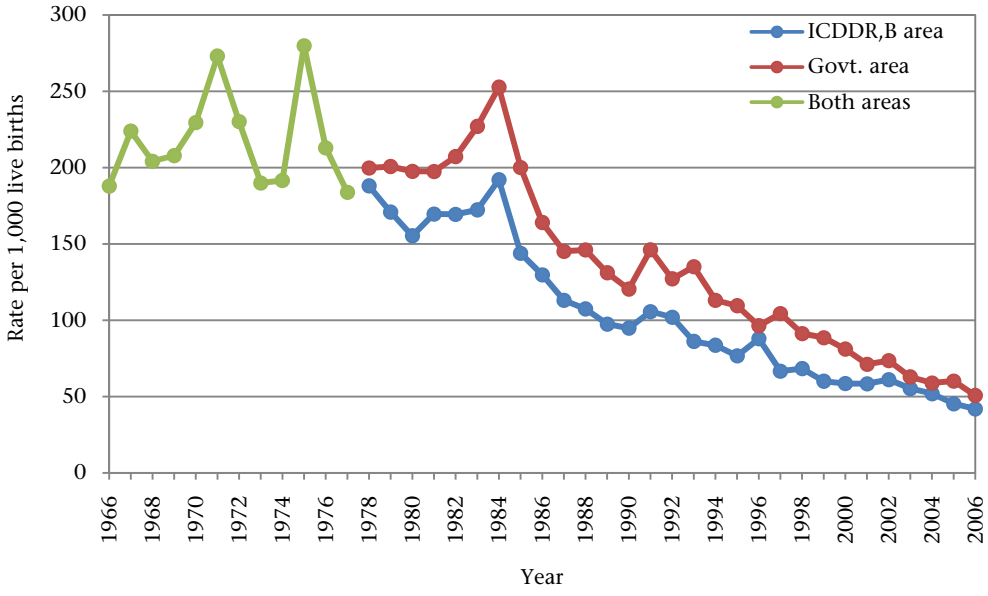
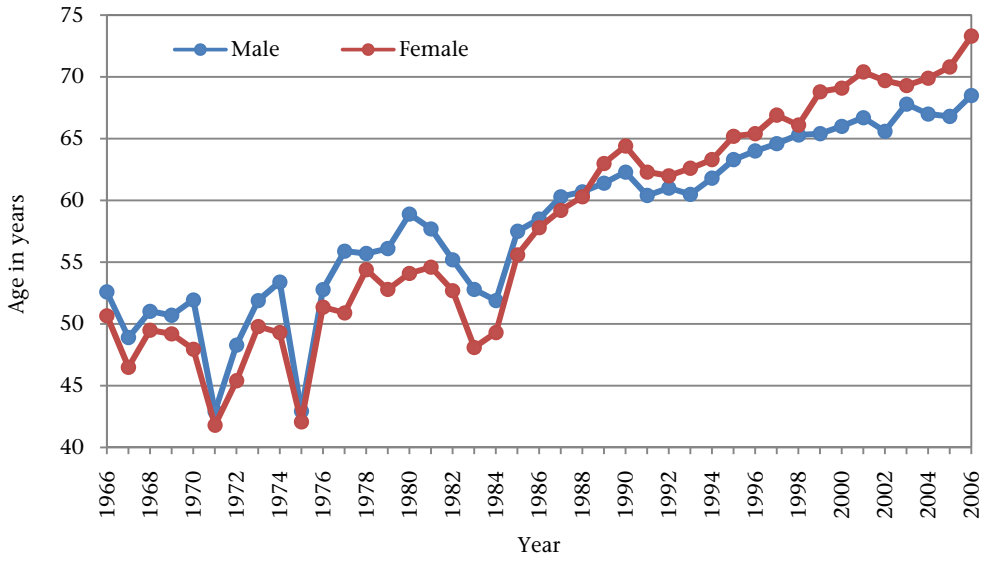


Figure 2.5 Under-five Mortality Rates (U5MR) in Matlab by area, 1966-2006



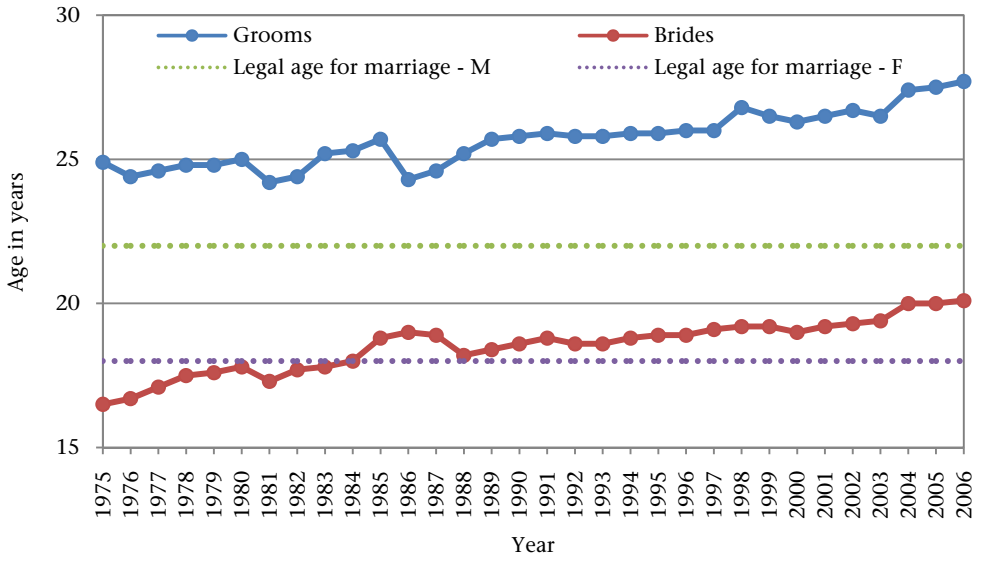
Massive reduction of infant and child mortality has resulted in remarkable improvement in life expectancy at birth during the last 40 years. The life expectancy at birth for males rose from 53 years in 1966 to 68.5 in 2008, a gain of 15.5 years and for women, the improvement is even more evident, from 51 to 73, a gain of 22 years (Figure 2.6).

Figure 2.6 Expectation of life at birth (e^0) in Matlab, 1966-2006



The Figure 2.7 shows the trends in mean age at first marriage for brides and grooms in Matlab. Mean age at first marriage has increased in both areas in 1975-2006. During this period, brides' mean age at marriage increased by 3.6 years and for grooms, it increased by 2.8 years.

Figure 2.7 Mean age at marriage in Matlab, 1975-2006



CHAPTER 3

POPULATION CHANGES

The principal vital statistics of the ICDDR,B and Government service areas from 1995 through 2006 are summarized in Table 3.1. The number of mid-year population and the demographic events registered in 2006 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 2006, the crude birth rate decreased to 22.9 in the ICDDR,B service area and to 22.7 in the Government service area from the 2005 level of 23.2 in the ICDDR,B service area and 23.1 in the Government service area respectively. In the ICDDR,B service area, the crude death rate also decreased to 6.3 in 2006 compared to 6.9 in 2005, and in the Government service area it decreased to 6.4 in 2006 compared to 7.0 in 2005. In both areas, the TFR remained constant at 2.7 in ICDDR,B are and 2.8 in Government service area in 2006 compared to 2005. The trends in the TFR in both areas are illustrated in Figure 2.2 of Chapter 2.

The rate of infant mortality decreased to 29.7 in 2006 from 36.0 in 2005 in the ICDDR,B service area, and 40.4 in 2006 from 45.0 in 2005 in the Government service area. In the ICDDR,B service area, neonatal mortality decreased to 23.5 in 2006 from 26.5 in 2005, and in the Government service area it decreased to 30.1 in 2006 from 35.4 in 2005. There was a decrease in the mortality rate of children aged 1-4 years in the Government service area, but this rate increased in the ICDDR,B service area to 3.2 per 1,000 children (1-4 years) in 2006 compared to 2.4 in 2005. As a result of these changes, mortality of children aged less than 5 years decreased substantially in the Government service area from 60.2 per 1,000 live births in 2005 to 50.7 in 2006, but in the ICDDR,B service area mortality of children aged less than 5 years decreased from 45.3 in 2005 to 41.9 in 2006. The trends in mortality of children aged less than 5 years are illustrated in Figures 2.3 and 2.4 in Chapter 2.

The numbers of in- and out-migrants registered in 2006 were 9,770 and 12,869 respectively, giving an in-migration rate of 43.5, out-migration rate of 57.3 and a net migration rate of 13.8 per 1,000 population leaving the area. Out-migrants continued to outnumber in-migrants, thus offsetting the rate of natural increase and keeping the overall annual population growth rate to 0.3%.

The age-sex distribution of the mid-year population of the Matlab HDSS villages is shown in Tables 3.3 and 3.4. Block-wise mid-year population in the ICDDR,B service area is shown in Appendix A.1. The age-sex distribution of the mid-year population is illustrated by the population pyramid (Figure 3.1). The fertility decline in the surveillance area in the 1978-2006 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 2006, this proportion had fallen to 33.1%. In the Government service area, the change in age distribution was slightly less than that in the ICDDR,B service area – children aged less than 15 years in the Government service area decreased from 43.3% of the total population in 1978 to 34.6% in 2006. 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 9.1% in 2006 due to the decline in both fertility and mortality. The net population increase was 2.7 per 1,000 in 2006 while it was -1.4 per 1,000 in 2005, due to the increase in the number of in-migrants. A possible major cause for men being fewer than women in age group 20-39, 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 areas*, 1995-2006

Vital rate (per 1,000)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Crude birth rate												
ICDDR,B area	25.2	22.4	23.7	25.8	24.5	24.9	26.4	25.8	26.4	24.5	23.2	22.9
Government area	27.8	26.7	26.8	28.3	25.9	27.7	27.1	25.3	25.1	24.8	23.1	22.7
Both areas	26.5	24.5	25.2	27.0	25.2	26.3	26.8	25.6	25.7	24.7	23.2	22.8
Total fertility rate**												
ICDDR,B area	2.9	2.7	2.8	3.0	2.9	2.9	3.1	3.0	3.1	2.9	2.7	2.7
Government area	3.6	3.5	3.4	3.6	3.3	3.5	3.4	3.2	3.2	3.1	2.8	2.8
Both areas	3.2	3.0	3.1	3.3	3.1	3.2	3.3	3.1	3.1	3.0	2.8	2.7
Crude death rate												
ICDDR,B area	7.3	7.6	6.6	7.0	6.4	6.8	6.5	6.9	6.8	6.7	6.9	6.3
Government area	8.4	7.9	8.0	8.1	7.4	7.2	7.0	7.3	7.0	7.4	7.0	6.4
Both areas	7.9	7.7	7.3	7.5	6.9	7.0	6.8	7.1	6.9	7.0	6.9	6.3
Neonatal mortality***												
ICDDR,B area	30.6	39.5	33.1	36.8	25.4	32.3	26.4	34.4	31.5	29.6	26.5	23.5
Government area	50.3	42.1	50.0	44.0	38.6	43.6	42.4	36.4	33.8	35.3	35.4	30.1
Both areas	40.8	40.9	41.9	40.5	32.0	38.4	34.7	35.4	32.6	32.5	30.9	26.8
Post-neonatal mortality***												
ICDDR,B area	20.6	26.6	16.4	13.8	19.1	11.8	17.2	13.5	10.6	9.5	9.6	6.2
Government area	28.3	24.8	28.6	26.0	22.2	14.4	14.5	18.1	13.7	13.2	9.6	10.3
Both areas	24.6	25.7	22.7	20.1	20.6	13.2	15.9	15.9	12.1	11.4	9.6	8.2
Infant mortality***												
ICDDR,B area	51.1	66.2	49.5	50.6	44.5	44.0	43.7	47.9	42.1	39.1	36.0	29.7
Government area	78.6	67.0	78.6	70.0	60.8	58.0	56.9	54.5	47.5	48.5	45.0	40.4
Both areas	65.3	66.6	64.7	60.6	52.7	51.6	50.5	51.2	44.8	43.9	40.5	35.0
Child mortality (1-4yrs) #												
ICDDR,B area	6.7	6.0	4.5	4.7	4.1	3.9	3.9	3.5	3.6	3.4	2.4	3.2
Government area	8.4	8.0	7.0	5.8	7.5	6.4	3.8	5.2	4.1	2.7	4.0	2.6
Both areas	7.6	7.1	5.8	5.2	5.8	5.2	3.9	4.4	3.9	3.1	3.2	2.9
Under five mortality***												
ICDDR,B area	76.7	87.9	66.7	68.3	60.0	58.6	58.4	61.1	55.2	51.9	45.3	41.9
Government area	109.5	96.4	104.4	91.3	88.6	81.1	71.2	73.6	62.9	58.9	60.2	50.7
Both areas	93.8	92.3	86.3	80.1	74.4	70.7	65.0	67.5	59.1	55.4	52.8	46.2
Rate of natural increase												
ICDDR,B area	17.9	14.8	17.1	18.8	18.1	18.1	19.9	18.9	19.6	17.8	16.3	16.6
Government area	19.4	18.8	18.7	20.2	18.5	20.5	20.1	18.0	18.0	17.5	16.1	16.3
Both areas	18.6	16.8	17.9	19.5	18.3	19.3	20.0	18.5	18.8	17.6	16.2	16.5
In-migration	27.0	25.1	34.6	30.3	34.8	35.1	34.0	45.7	40.4	42.1	35.7	43.5
Out-migration	37.4	35.0	41.7	36.9	48.0	48.5	46.2	52.4	55.4	57.9	53.3	57.3
Growth (%)	0.8	0.7	1.1	1.3	0.5	0.6	0.8	1.2	0.4	0.2	-0.1	0.3

*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, 2006

Demographic indicator	Number			Rate per 1,000		
	Total	Male	Female	Total	Male	Female
Total Population (as of 30 June 2006)						
ICDDR,B service area	113128	53725	59403	-	-	-
Government service area	111410	52787	58623	-	-	-
Both areas	224538	106512	118026	-	-	-
Events registered (Jan-Dec. 2006)						
Births						
ICDDR,B service area	2595	1360	1235	22.9	-	-
Government service area	2526	1253	1273	22.7	-	-
Both areas	5121	2613	2508	22.8	-	-
Deaths						
Infants*						
ICDDR,B service area	77	43	34	29.7	31.6	27.5
Government service area	102	60	42	40.4	47.9	33.0
Both areas	179	103	76	35.0	39.4	30.3
All deaths						
ICDDR,B service area	714	390	324	6.3	7.3	5.5
Government service area	710	417	293	6.4	7.9	5.0
Both areas	1424	807	617	6.3	7.6	5.2
In-migration	9770	4572	5198	43.5	42.9	44.0
Out-migration	12869	6662	6207	57.3	62.5	52.6
Marriage	3125	-	-	13.9	-	-
Divorce**	310	-	-	99.2	-	-
Population change (Jan-Dec. 2006)						
Net migration	-3099	-2090	-1009	-13.8	-19.6	-8.5
Natural increase						
ICDDR,B service area	1881	970	911	16.6	18.1	15.3
Government service area	1816	836	980	16.3	15.8	16.7
Both areas	3697	1806	1891	16.5	17.0	16.0
Net increase	598	-284	882	2.7	-2.7	7.5

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

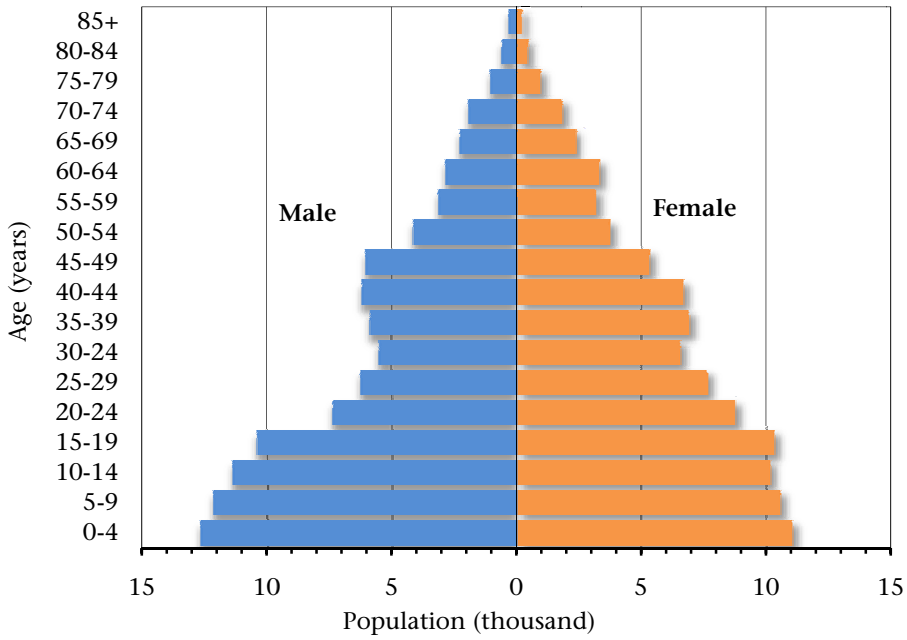
Table 3.3. Mid-year population by age and sex, 2006

Age (years)	Number			Percent		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	224538	106512	118026	100.0	100.0	100.0
<1 year	5102	2629	2473	2.3	2.5	2.1
1 – 4	21379	10854	10525	9.5	10.2	8.9
1	*5203*	*2618*	*2585*	*2.3*	*2.5*	*2.2*
2	*5316*	*2726*	*2590*	*2.4*	*2.6*	*2.2*
3	*5381*	*2725*	*2656*	*2.4*	*2.6*	*2.3*
4	*5479*	*2785*	*2694*	*2.4*	*2.6*	*2.3*
5 – 9	25416	12931	12485	11.3	12.1	10.6
10-14	24116	12117	11999	10.7	11.4	10.2
15-19	23266	11084	12182	10.4	10.4	10.3
20-24	18187	7825	10362	8.1	7.3	8.8
25-29	15647	6652	8995	7.0	6.2	7.6
30-34	13602	5870	7732	6.1	5.5	6.6
35-39	14377	6243	8134	6.4	5.9	6.9
40-44	14467	6594	7873	6.4	6.2	6.7
45-49	12716	6434	6282	5.7	6.0	5.3
50-54	8837	4411	4426	3.9	4.1	3.8
55-59	7088	3337	3751	3.2	3.1	3.2
60-64	6968	3031	3937	3.1	2.8	3.3
65-69	5201	2408	2793	2.3	2.3	2.4
70-74	4173	2038	2135	1.9	1.9	1.8
75-79	2246	1115	1131	1.0	1.0	1.0
80-84	1158	609	549	0.5	0.6	0.5
85+	592	330	262	0.3	0.3	0.2

Table 3.4. Mid-year population by age, sex, and area, 2006

Age (years)	ICDDR,B service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	113128	53725	59403	111410	52787	58623
<1 year	2583	1362	1221	2519	1267	1252
1 – 4	10792	5435	5357	10587	5419	5168
1	*2661*	*1348*	*1313*	*2542*	*1270*	*1272*
2	*2684*	*1374*	*1310*	*2632*	*1352*	*1280*
3	*2686*	*1349*	*1337*	*2695*	*1376*	*1319*
4	*2761*	*1364*	*1397*	*2718*	*1421*	*1297*
5 – 9	12500	6299	6201	12916	6632	6284
10-14	11592	5782	5810	12524	6335	6189
15-19	11025	5263	5762	12241	5821	6420
20-24	9311	3949	5362	8876	3876	5000
25-29	8083	3463	4620	7564	3189	4375
30-34	7281	3203	4078	6321	2667	3654
35-39	7441	3241	4200	6936	3002	3934
40-44	7647	3506	4141	6820	3088	3732
45-49	6517	3365	3152	6199	3069	3130
50-54	4518	2283	2235	4319	2128	2191
55-59	3583	1696	1887	3505	1641	1864
60-64	3536	1554	1982	3432	1477	1955
65-69	2595	1213	1382	2606	1195	1411
70-74	2064	1040	1024	2109	998	1111
75-79	1117	570	547	1129	545	584
80-84	621	316	305	537	293	244
85+	322	185	137	270	145	125

Figure 3.1. Age pyramid of the 2006 mid-year population



CHAPTER 4

MORTALITY

The distribution of 1,424 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 1,424 deaths, 12.6% were infants, 4.4% were of children age 1-4 years, and 60.4% were aged 60 years and above in 2006.

Tables 4.3 and 4.4 show the corresponding age-sex-specific mortality rates for the whole HDSS area and for the ICDDR,B and Government service areas. Block-wise deaths in the ICDDR,B service area by age and sex are shown in Appendix A.2. In 2006, the overall death rates for males and females were 7.6 and 5.2 respectively. Infant mortality rate was 39.4 per 1,000 live births for males and 30.3 for females. It was lower in the ICDDR,B service area than in the Government service area, a result of improvements in the neonatal mortality in the former area. The maternal mortality ratio was 38.8 per 100,000 live births in ICDDR,B service area and 159.6 per 100,000 live births in Government service area.

Table 4.5 shows the abridged life tables for males and females derived from age-sex specific death rates, and the survival (l_x) values are plotted in Figure 4.1 (for Life Table Equations see Appendix C). The expectation of life at birth improved substantially in 2006 compared to the 2005 level. It was 68.5 years for males and 73.3 for females. The level of adult (15-59 years) mortality decreased as a whole in 2006 compared to 2005. The probability of dying for males aged 15-60 years ($_{45}q_{15}$) was 164, and for females it was 89 per 1,000 population in 2006. For all age-groups, expectation of life is longer for females than males.

The expectation of life at birth was a little higher for males in the ICDDR,B service area than the Government service area. In 2006, the gender difference expectation of life was more pronounced in the Government service area (7.0 yrs) than in the ICDDR,B service area (3.0 yrs). Expectation of life at each age in each area was higher for females than for males (Appendices A.3 and A.4).

Table 4.6 shows the distribution of deaths by age and month of occurrence. Deaths of those aged 5 years and above tend to peak in the winter months. Neonatal deaths were also most frequent in September-October. Post-neonatal deaths were higher in January-February and child deaths, on the other hand, were highest in March. Figure 4.1 shows that probability of survival for males and females started to differ from age 40 with males having a lower probability of survival in later age-groups.

Deaths by underlying causes, sex, age, and by areas are shown in Tables 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 were prominent, led by respiratory infections, then septicaemia, tuberculosis and diarrhoea. Deaths due to tuberculosis occurred substantially more among males than among females. 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 more prominent in both the areas. The maternal mortality ratio in the Government service area in 2006 was four-times as much as that of ICDDR,B service area (159.6 vs. 38.8 per 100,000 live births).

Table 4.1. Deaths by age and sex in both areas, 2006

Age (years)	Both sexes		Male		Female	
	Number	Cumulative percentage	Number	Cumulative percentage	Number	Cumulative percentage
All ages	1424	-	807	-	617	-
<1 year	179	-	103	-	76	-
<1 month	137	9.6	84	10.4	53	8.6
1- 5 months	29	11.7	13	12.0	16	11.2
6-11 months	13	12.6	6	12.8	7	12.3
1 – 4 years	62	-	29	-	33	-
1	35	15.0	13	14.4	22	15.9
2	14	16.0	8	15.4	6	16.9
3	7	16.5	4	15.9	3	17.3
4	6	16.9	4	16.4	2	17.7
5 – 9	18	18.2	8	17.3	10	19.3
10-14	9	18.8	5	18.0	4	19.9
15-19	21	20.3	9	19.1	12	21.9
20-24	17	21.5	10	20.3	7	23.0
25-29	12	22.3	4	20.8	8	24.3
30-34	10	23.0	6	21.6	4	25.0
35-39	29	25.1	18	23.8	11	26.7
40-44	38	27.7	25	26.9	13	28.8
45-49	52	31.4	32	30.9	20	32.1
50-54	61	35.7	47	36.7	14	34.4
55-59	56	39.6	33	40.8	23	38.1
60-64	120	48.0	76	50.2	44	45.2
65-69	153	58.8	82	60.3	71	56.7
70-74	193	72.3	91	71.6	102	73.3
75-79	189	85.6	108	85.0	81	86.4
80-84	109	93.3	61	92.6	48	94.2
85+	96	100.0	60	100.0	36	100.0

Table 4.2. Deaths by area, age, and sex, 2006

Age (years)	ICDDR,B service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	714	390	324	710	417	293
<1 year	77	43	34	102	60	42
<1 month	*61*	*37*	*24*	*76*	*47*	*29*
1- 5 months	*9*	*4*	*5*	*20*	*9*	*11*
6-11 months	*7*	*2*	*5*	*6*	*4*	*2*
1 – 4 years	34	14	20	28	15	13
1	*19*	*5*	*14*	*16*	*8*	*8*
2	*10*	*7*	*3*	*4*	*1*	*3*
3	*3*	*2*	*1*	*4*	*2*	*2*
4	*2*	*0*	*2*	*4*	*4*	*0*
5 – 9	10	6	4	8	2	6
10-14	5	2	3	4	3	1
15-19	12	7	5	9	2	7
20-24	8	5	3	9	5	4
25-29	3	2	1	9	2	7
30-34	6	3	3	4	3	1
35-39	14	8	6	15	10	5
40-44	14	8	6	24	17	7
45-49	27	13	14	25	19	6
50-54	34	26	8	27	21	6
55-59	32	16	16	24	17	7
60-64	64	42	22	56	34	22
65-69	74	42	32	79	40	39
70-74	91	40	51	102	51	51
75-79	96	52	44	93	56	37
80-84	56	27	29	53	34	19
85+	57	34	23	39	26	13

Table 4.3. Death rates by age and sex in both areas, 2006

Age (years)	Rate per 1,000 population			Rate per 1,000 person-years		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	6.3	7.6	5.2	6.3	7.6	5.2
<1 year*	35.0	39.4	30.3	35.0	39.4	30.3
*<1 month**	*26.8*	*32.1*	*21.1*	26.8	32.1	21.1
*1- 5 months**	*5.7*	*5.0*	*6.4*	5.7	5.0	6.4
*6-11 months**	*2.5*	*2.3*	*2.8*	2.5	2.3	2.8
1 – 4 years	2.9	2.7	3.1	2.9	2.7	3.1
1	*6.7*	*5.0*	*8.5*	6.7	4.9	8.5
2	*2.6*	*2.9*	*2.3*	2.6	2.9	2.3
3	*1.3*	*1.5*	*1.1*	1.3	1.5	1.1
4	*1.1*	*1.4*	*0.7*	1.1	1.5	0.8
5 – 9	0.7	0.6	0.8	0.7	0.6	0.8
10-14	0.4	0.4	0.3	0.4	0.4	0.3
15-19	0.9	0.8	1.0	0.9	0.8	1.0
20-24	0.9	1.3	0.7	0.9	1.3	0.7
25-29	0.8	0.6	0.9	0.8	0.6	0.9
30-34	0.7	1.0	0.5	0.7	1.0	0.5
35-39	2.0	2.9	1.4	2.0	2.9	1.4
40-44	2.6	3.8	1.7	2.6	3.8	1.6
45-49	4.1	5.0	3.2	4.1	5.0	3.2
50-54	6.9	10.7	3.2	6.9	10.6	3.1
55-59	7.9	9.9	6.1	7.9	9.9	6.2
60-64	17.2	25.1	11.2	17.0	24.7	11.1
65-69	29.4	34.1	25.4	29.5	34.2	25.5
70-74	46.2	44.7	47.8	45.9	44.5	47.3
75-79	84.1	96.9	71.6	84.2	96.7	71.7
80-84	94.1	100.2	87.4	93.6	100.3	86.3
85+	162.2	181.8	137.4	161.3	180.7	136.9

*Rate per 1,000 live births

Table 4.4. Death rates by area, age, and sex, 2006 (per 1,000 population)

Age (years)	ICDDR,B service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	6.3	7.3	5.5	6.4	7.9	5.0
<1 year	29.7	31.6	27.5	40.4	47.9	33.0
*<1 month**	*23.5*	*27.2*	*19.4*	*30.1*	*37.5*	*22.8*
*1- 5 months**	*3.5*	*2.9*	*4.0*	*7.9*	*7.2*	*8.6*
*6-11 months**	*2.7*	*1.5*	*4.0*	*2.4*	*3.2*	*1.6*
1 – 4 years	3.2	2.6	3.7	2.6	2.8	2.5
1	*7.1*	*3.7*	*10.7*	*6.3*	*6.3*	*6.3*
2	*3.7*	*5.1*	*2.3*	*1.5*	*0.7*	*2.3*
3	*1.1*	*1.5*	*0.7*	*1.5*	*1.5*	*1.5*
4	*0.7*	*0.0*	*1.4*	*1.5*	*2.8*	*0.0*
5 – 9	0.8	1.0	0.6	0.6	0.3	1.0
10-14	0.4	0.3	0.5	0.3	0.5	0.2
15-19	1.1	1.3	0.9	0.7	0.3	1.1
20-24	0.9	1.3	0.6	1.0	1.3	0.8
25-29	0.4	0.6	0.2	1.2	0.6	1.6
30-34	0.8	0.9	0.7	0.6	1.1	0.3
35-39	1.9	2.5	1.4	2.2	3.3	1.3
40-44	1.8	2.3	1.4	3.5	5.5	1.9
45-49	4.1	3.9	4.4	4.0	6.2	1.9
50-54	7.5	11.4	3.6	6.3	9.9	2.7
55-59	8.9	9.4	8.5	6.8	10.4	3.8
60-64	18.1	27.0	11.1	16.3	23.0	11.3
65-69	28.5	34.6	23.2	30.3	33.5	27.6
70-74	44.1	38.5	49.8	48.4	51.1	45.9
75-79	85.9	91.2	80.4	82.4	102.8	63.4
80-84	90.2	85.4	95.1	98.7	116.0	77.9
85+	177.0	183.8	167.9	144.4	179.3	104.0

*Rate per 1,000 live births

Table 4.5. Abridged life table by sex, 2006

Age (years)	Male				Female			
	$_nq_x$	l_x	L_x	$e0_x$	$_nq_x$	l_x	L_x	$e0_x$
0	39.4	100000	96847	68.5	30.3	100000	97576	73.3
1	5.0	96058	95777	70.3	8.5	96970	96485	74.6
2	2.9	95582	95442	69.6	2.3	96148	96037	74.2
3	1.5	95302	95232	68.8	1.1	95925	95871	73.4
4	1.4	95162	95094	67.9	0.7	95817	95782	72.4
5	3.1	95026	474453	67.0	4.0	95746	477848	71.5
10	2.1	94732	473212	62.2	1.7	95363	476451	66.8
15	4.1	94537	471803	57.3	4.9	95204	474944	61.9
20	6.4	94154	469387	52.6	3.4	94737	472947	57.2
15	3.0	93554	467124	47.9	4.4	94417	471120	52.4
30	5.1	93273	465270	43.0	2.6	93998	469431	47.6
35	14.3	92798	460921	38.2	6.7	93755	467319	42.7
40	18.8	91469	453373	33.7	8.2	93123	463850	38.0
45	24.6	89750	443647	29.3	15.8	92357	458417	33.3
50	52.0	87543	427138	25.0	15.7	90898	451194	28.8
55	48.3	82992	405643	21.2	30.2	89471	441093	24.2
60	118.4	78981	372890	17.2	54.5	86766	422841	19.8
65	157.5	69631	322123	14.1	119.9	82040	387031	15.8
70	201.7	58661	264970	11.3	214.3	72202	323851	12.6
75	389.8	46830	188447	8.5	304.6	56730	241289	10.4
80	400.2	28577	114172	7.3	359.2	39449	162048	8.8
85+	1000.0	17141	94276	5.5	1000.0	25281	183989	7.3

Table 4.6. Deaths by month and age, 2006

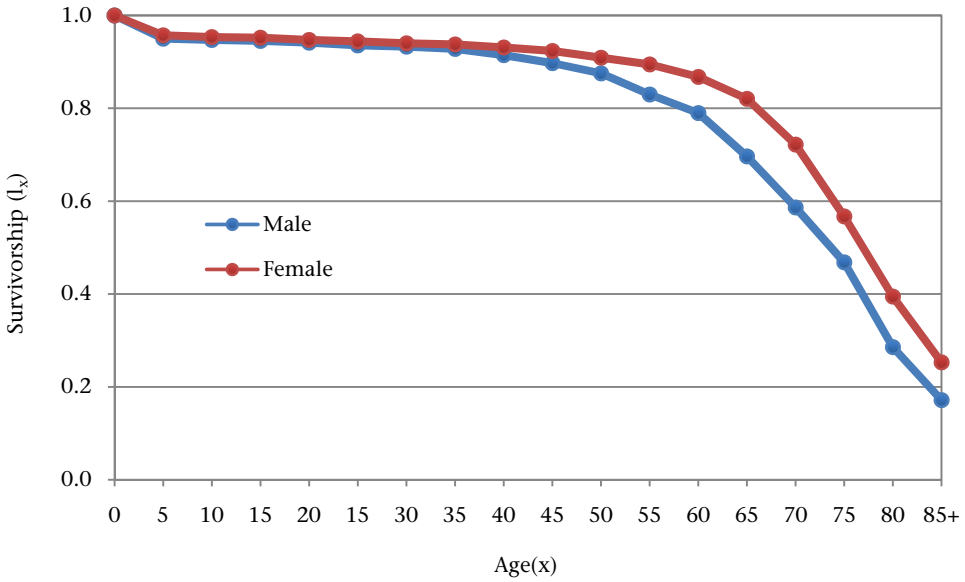
Months	All ages	Age at death			
		<1 month	1-11 months	1-4 years	5 years or above
January	164	12	5	2	145
February	102	9	6	2	85
March	126	11	4	10	101
April	106	8	2	4	92
May	83	2	2	6	73
June	117	12	2	9	94
July	102	14	3	4	81
August	116	11	3	9	93
September	105	15	2	2	86
October	118	23	6	4	85
November	141	11	3	3	124
December	144	9	4	7	124
Total	**1424**	**137**	**42**	**62**	**1183**

Table 4.7. Age-standardized mortality rates by cause of death, 2006 (per 1,000 population)*

Cause of death	Male		Female	
	ICDDR,B area	Government area	ICDDR,B area	Government area
Communicable diseases				
Diarrhoeal	(8.42)	14.53	10.88	(9.77)
Dysentery	(1.29)	(2.75)	0.00	0.00
Tuberculosis	17.67	28.84	(3.81)	(7.53)
EPI related death	0.00	(1.96)	0.00	0.00
Meningitis	(1.38)	0.00	(2.96)	0.00
Hepatitis	0.00	(2.12)	(1.40)	0.00
Chicken pox	(6.96)	0.00	(3.72)	0.00
Septicaemia	26.02	(9.08)	22.28	25.15
Respiratory infections	15.52	41.09	16.68	33.05
Other communicable	(2.08)	(3.66)	(1.47)	0.00
Maternal and neonatal conditions				
Maternal death	-	-	(1.53)	(7.27)
Neonatal condition				
-Premature and LBW	21.15	18.47	17.69	14.38
-Birth asphyxia	13.22	24.15	10.32	10.06
-Other neonatal	7.93	15.63	(2.95)	11.50
Nutritional	(6.31)	(3.56)	15.84	(5.93)
Non-communicable diseases				
Malignant neoplasm				
-Neoplasm	120.30	102.90	32.48	36.30
-Neoplasm in female organ	-	-	19.43	(2.47)
Congenital malformation	(2.64)	0.00	(2.95)	(1.44)
Endocrine disorder				
-Diabetes	39.56	24.24	15.09	(11.07)
-Other endocrine	0.00	0.00	(4.65)	(1.77)
Neuro-psychiatric	(8.34)	(5.26)	(4.91)	(3.12)
Diseases of circulatory system				
-Hypertensive disease	(4.15)	35.05	13.19	13.45
-Ischaemic heart disease	105.25	90.46	50.76	22.43
-Stroke	212.77	249.00	248.94	185.66
-Other cardiovascular	68.39	54.16	61.69	54.19
Respiratory diseases				
-COPD**	38.49	58.50	30.18	24.28
-Asthma	25.02	16.99	15.54	9.87
-Other respiratory	(10.28)	16.91	15.24	(6.57)
Digestive disease	55.18	48.35	36.45	30.92
Genito-urinary diseases				
-Renal failure	14.48	(10.35)	(6.03)	15.70
Other non-communicable	0.00	(4.91)	(3.64)	(1.77)
Injuries				
Unintentional injuries				
-Accident	18.14	29.09	24.83	31.97
-Drowning	14.26	18.88	25.35	14.41
Intentional injuries				
-Suicide	(4.60)	(7.41)	(1.48)	14.28
-Homicide	(1.32)	0.00	0.00	(5.05)
Miscellaneous causes				
-Senility	(2.63)	(4.14)	0.00	0.00
-Fever of unknown origin	(5.01)	(7.41)	(2.17)	(3.87)
-Sudden infant death	0.00	0.00	0.00	(2.88)
Unknown/missing/unspecified	14.16	51.04	10.96	18.28
Total	**892.90**	**1000.89**	**737.47**	**636.39**

*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, 2006



CHAPTER 5

FERTILITY

In 2006, there were 5,121 live births in the Matlab HDSS area as outcomes of 5,962 pregnancy terminations recorded. Table 5.1 shows the number of pregnancy terminations and their outcomes in 2006. The number of live births decreased by 89, or 1.7%, in 2006 compared to 2005. In the Matlab HDSS area as a whole, 86% 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, 41 were multiple births (twins and triplets).

Table 5.2 shows the distribution of pregnancies by outcome, and live births by sex by month of occurrence. The data show the usual marked seasonal variation of births, peaking in August-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 25-49, the fertility rates were higher in the Government service area compared to the ICDDR,B service area. The age-specific fertility rates and related fertility measures for the ICDDR,B service area by blocks are shown in Appendix A.9.

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

Table 5.4 shows marked variation in the distribution of live births by place of delivery and area. Institutional delivery accounts for 58% in the ICDDR,B service area and 13% in the Government service area. More commonly used places for institutional delivery in the Government service area were private clinic/nursing home (4.9%) and District Hospital (3.0%), and in ICDDR,B service area, ICDDR,B hospital (25%) followed by ICDDR,B sub-centres (20%). Table 5.5 shows the distribution of live births by birth attendants[3] and area. In the ICDDR,B service area, TBAs assisted 26% of the live-birth deliveries as opposed to 78% in the Government service area. The respective figures for trained TBAs were 14% and 8%. Medically trained birth attendants

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

(doctors, nurses or midwives, lady family planning visitors or family welfare visitors) assisted 58% of the live birth deliveries in the ICDDR,B and 14% in the Government service area. In the ICDDR,B service area, assistance was sought more frequently from FWV/SHA (45%) followed by doctors (11%) whereas in the Government service area, it was from doctors (7%) followed by nurses (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 91% in the ICDDR,B service area and 94% in the Government service area. Instrumental deliveries, especially caesarean were 9% and 6% respectively in the ICDDR,B and Government service areas.

Matlab HDSS recorded pre-natal care received by mothers in different stages of pregnancy in 2006. Table 5.7 shows pre-natal care received by mothers who had a live birth in 2006 in three trimesters by type of service providers. In the ICDDR,B service area, in first trimester 54% of the mothers did not receive any pre-natal care as oppose to 90% in the Government service area. The representative figures for 2nd and 3rd trimester were 13%-14% in the ICDDR,B service area and 36%-43% in the Government service area. In the ICDDR,B service area, seeking pre-natal care from skilled providers accounts for 46% in first trimester and 86%-87% in second and third trimesters. In this area, providers of pre-natal care are ICDDR,B sub-centres (69% and 64% in 2nd and 3rd trimesters respectively) and ICDDR,B Matlab hospital (14% and 16% in 2nd and 3rd trimesters respectively). In the Government service area, skilled providers of prenatal care are private clinics (7% and 14% in 2nd and 3rd trimesters respectively), community clinics or family welfare centres (7% and 8% in 2nd and 3rd trimesters respectively) and government hospitals (3% and 5% 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, 2006

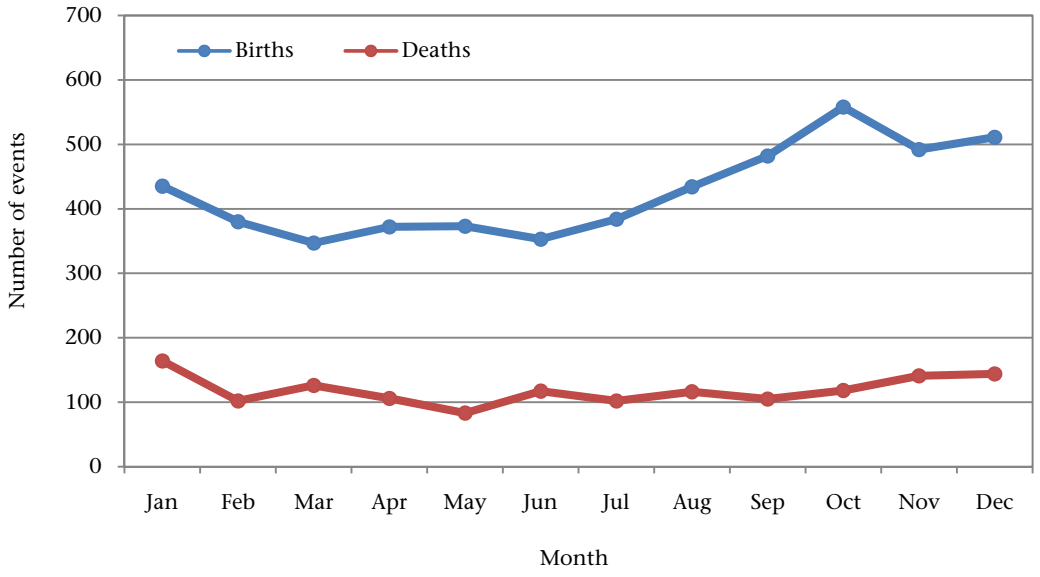


Table 5.1. Numbers and rates of pregnancy outcomes by type and area, 2006

Type of pregnancy outcome	Both areas		ICDDR,B area		Government area	
	Number	Rate	Number	Rate	Number	Rate
Total pregnancies*	5962	96.8	2971	94.9	2991	98.9
Live birth preg.**	5080	852.1	2574	866.4	2506	837.8
Fetal wastage**	882	147.9	397	133.7	485	162.2
Early(miscarriage)***	720	120.8	320	107.7	400	133.7
Induced	276	46.3	104	35.0	172	57.5
Spontaneous	444	74.5	216	72.7	228	76.2
Late (still birth)	162	27.2	77	25.9	85	28.4
Multiple birth pregnancy	44		23		21	
Multiple live birth pregnancy	41		21		20	
Three live births	0		0		0	
Two live births	41		21		20	
One live birth	0		0		0	
Still birth pregnancies	1		0		1	
Three still births	0		0		0	
Two still births	1		0		1	
Miscarriage pregnancies	2		2		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, 2006

Months	Pregnancy outcome					No. of live born children			
		Miscarriage		Still	Live	Both			
	All	Induced	Spon.	birth	birth[a]	sexes	Male	Female	Ratio
All months	5962	276	444	162	5080	5121	2613	2508	1.04
January	500	14	37	17	432	435	230	205	1.12
February	447	20	40	9	378	380	193	187	1.03
March	426	33	37	11	345	347	175	172	1.02
April	458	30	47	10	371	372	210	162	1.30
May	457	33	42	11	371	373	178	195	0.91
June	420	22	37	10	351	353	186	167	1.11
July	448	23	34	13	378	384	190	194	0.98
August	507	18	38	19	432	434	227	207	1.10
September	557	17	42	17	481	482	252	230	1.10
October	618	26	22	17	553	558	286	272	1.05
November	555	23	28	15	489	492	220	272	0.81
December	569	17	40	13	499	511	266	245	1.09

[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, 2006

Age (years)	Both areas		ICDDR,B area		Government area	
	Births	Rate	Births	Rate	Births	Rate
All ages	5121	83.2	2595	82.9	2526	83.5
15-19*	712	58.4	380	65.9	332	51.7
20-24	1650	159.2	866	161.5	784	156.8
25-29	1405	156.2	682	147.6	723	165.3
30-34	819	105.9	408	100.0	411	112.5
35-39	434	53.4	216	51.4	218	55.4
40-44	95	12.1	41	9.9	54	14.5
45-49**	6	1.0	2	0.6	4	1.3
Total fertility rate		2731		2685		2787
General fertility rate		83		83		84
Gross reproduction rate		1337		1278		1405
Net reproduction rate		1260		1208		1320

*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 place of delivery by area, 2006

Place of Delivery	Both areas		ICDDR,B area		Government area	
	Number	Percent	Number	Percent	Number	Percent
Home	3270	64.4	1088	42.3	2182	87.1
ICDDR,B sub-centre	521	10.3	517	20.1	4	0.2
ICDDR,B hospital	651	12.8	644	25.0	7	0.3
Upazila health complex	79	1.6	14	0.5	65	2.6
District hospital	142	2.8	66	2.6	76	3.0
Clinic/nursing home	342	6.7	219	8.5	123	4.9
UH & FWC	49	1.0	3	0.1	46	1.8
Others	26	0.5	23	0.9	3	0.1
Total	**5080**	**100.0**	**2574**	**100.0**	**2506**	**100.0**

Source: Birth registration form

Figure5.2. Age-specific fertility rates by area, 2006

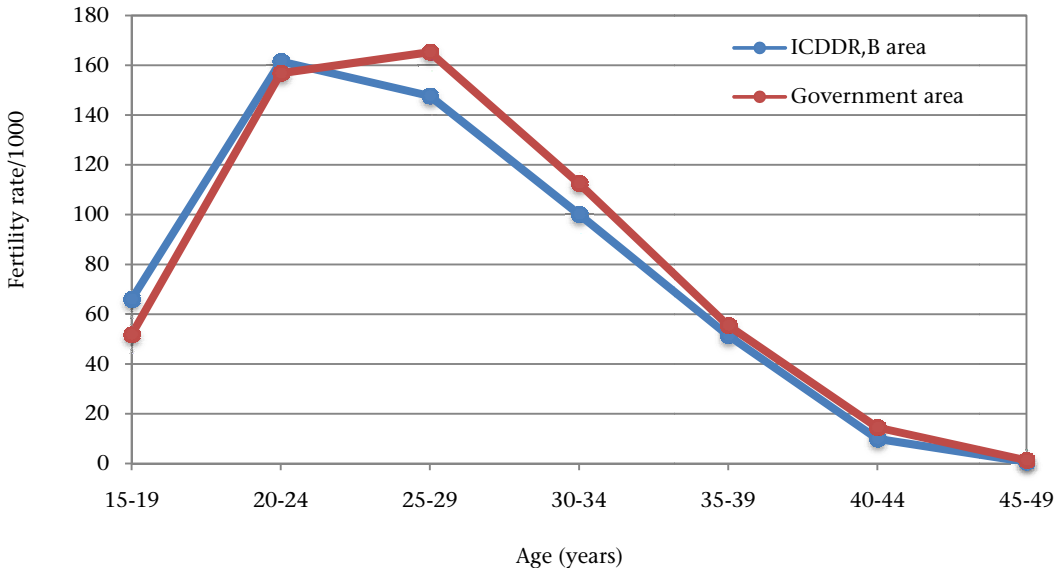


Table 5.5. Distribution of birth attendant by area, 2006

Birth attendant	Both areas		ICDDR,B area		Government area	
	Number	Percent	Number	Percent	Number	Percent
TBA	2635	51.9	668	26.0	1967	78.5
Trained TBA	554	10.9	362	14.1	192	7.7
FWV/ SHA	1228	24.2	1159	45.0	69	2.8
Nurse	151	3.0	51	2.0	100	4.0
MBBS doctor	451	8.9	276	10.7	175	7.0
Others	57	1.1	55	2.1	2	0.1
None	4	0.1	3	0.1	1	0.0
Total	**5080**	**100.0**	**2574**	**100.0**	**2506**	**100.0**

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

Table 5.6. Distribution of mode of delivery by area, 2006

Mode of Delivery	Both areas		ICDDR,B area		Government area	
	Number	Percent	Number	Percent	Number	Percent
Normal vaginal	4683	92.2	2333	90.6	2350	93.8
Operation (C/S)	371	7.3	220	8.5	151	6.0
Instrumental*	26	0.5	21	0.8	5	0.2
Total	**5080**	**100.0**	**2574**	**100.0**	**2506**	**100.0**

*Using forceps/ventose

Table 5.7. Percentage of prenatal care in different trimester and area, 2006

Source	ICDDR,B area			Government service area		
	1st trimester	2nd trimester	3rd trimester	1st trimester	2nd trimester	3rd trimester
Trained TBA	0.00	0.04	0.19	0.00	0.56	0.16
CC/FWC/Sat. Clinic	0.35	2.21	2.80	0.64	6.78	7.74
ICDDR,B Sub-centre	40.05	68.84	64.22	0.04	0.76	0.52
Govt. Hospital/UHC	0.23	0.47	0.78	0.64	2.99	5.39
ICDDR,B Hospital	4.93	14.26	15.85	0.00	0.16	0.80
Chandpur MCWC	0.16	0.16	0.27	0.12	0.20	0.48
Private Clinic	0.51	1.17	1.79	1.56	6.90	13.65
Others	0.23	0.12	0.19	7.06	45.45	28.09
No care	53.54	12.74	13.91	89.94	36.19	43.18
No. of live birth	**2574**	**2574**	**2574**	**2506**	**2506**	**2506**

CHAPTER 6

MARRIAGE AND DIVORCE

The procedures adopted by the HDSS specify that if either partner in a marriage is resident in the HDSS area, the marriage should be registered. The number of marriages registered in 2006 was 3,125, giving a crude marriage rate of 13.9 per 1,000 population. This rate is similar to that of 2005, which was 14.0. A state law requires legal registration of marriage and divorce of Muslims and Christians (no such law exists for Hindus in Bangladesh). Table 6.7 shows that 85%-92% of the Muslim marriages in 2000-2006 solemnise with Kazi (marriage registrar) usually in the brides' home.

Tables 6.1 and 6.2 show the distribution of grooms and brides by age at marriage and previous marital status. The mean ages at marriage were 27.7 and 20.1 for all grooms and brides respectively; 26.7 and 19.5 for those marrying for the first time—are almost the same as those of 2005. 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 (Figure 6.2).

Table 6.3 shows the marriage rates by age and sex. Among males, the marriage rate was 38.8 per 1,000 males aged 10 years and above, and for females the rate was 33.7 per 1,000 females aged 10 years and above. For females, the highest rate was 183.0 per 1,000 at the age of 18 years, while for males the highest rate was 185.7 in the age group of 25-29 years. Table 6.4 shows distribution of current marital status of the study population by age and sex in 2006. Of the total population 44.0% were currently married, and it was higher for females than for males (39.8 vs 47.8%). Widows constituted 9.4% for females and 1.7% for males – this difference, along with age-difference at marriage and life expectancy, may be due to remarriage, which is more common for men than for women.

Table 6.6 shows distribution of marriages by type of gifts received from father-in-law at the time of marriage in 2002-2006. Groom's party received marriage gifts from the father-in-law in two-thirds of all marriages. Gifts were received under two different contracts: there was a clear negotiation with bridal party about gift prior to the marriage or there was no such negotiation, but gift was given for daughter's happiness. The first contract can be regarded as dowry and its incidence was 66%. Incidence of giving dowry did not show any declining trend in 2002-2006. Dowry was paid in full at the time of marriage for one-fifth of the marriages and partially for two-fifths of all marriages.

The number of divorces was more than 500 each year during 1978-1981. Since 1981, this figure has been less than 500. In general, the incidence of divorce in Matlab has fallen. HDSS recorded 310 divorces in 2006 (Appendix A.12) and of them, 88.2 percent were registered with courts. Table 6.5 shows the mean and median durations in months of marriage at divorce by age and sex. The average duration of marriage of all divorcing husbands at the time of divorce was 38.1 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 2006 but marriages were high in month of March and low in December.

Figure 6.1. Marriages and divorces by month, 2006

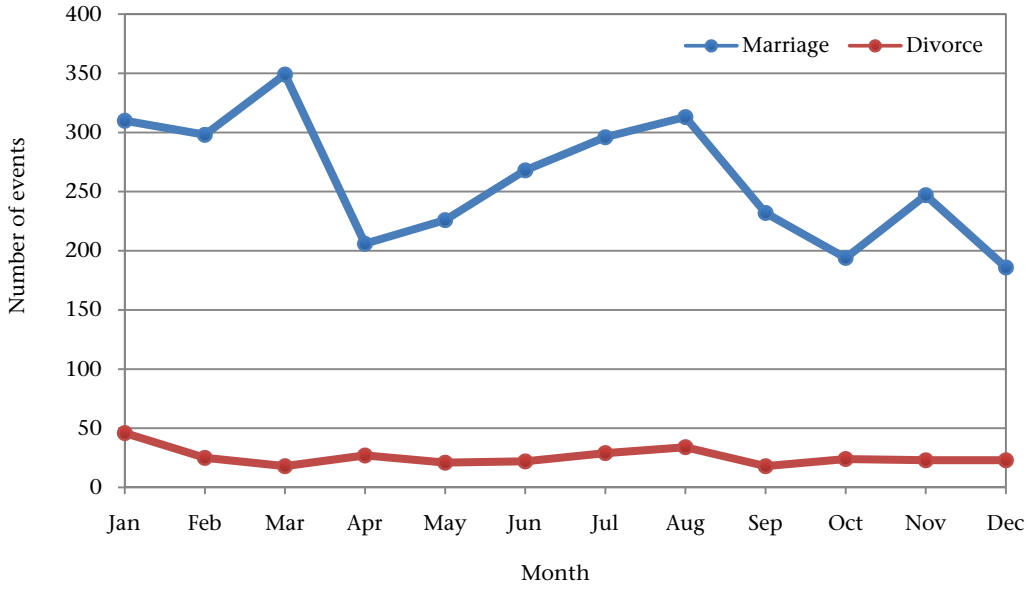


Table 6.1 Groom's age at marriage by previous marital status, 2006

Age (years)	All grooms	Previous marital status (%)			
		Single	Married	Divorced	Widowed
All ages	100.0 (n=3125)	87.2 (n=2726)	3.0 (n=94)	7.1 (n=222)	2.7 (n=83)
10-14	0.1	0.1	0.0	0.0	0.0
15-19	5.1	5.6	0.0	2.3	1.2
20-24	24.7	26.5	6.4	19.4	0.0
25-29	39.5	42.1	23.4	26.1	9.6
30-34	19.5	19.1	26.6	23.4	14.5
35-39	7.1	5.8	17.0	18.0	8.4
40-44	1.8	0.7	13.8	5.9	14.5
45-49	0.9	0.1	7.4	1.8	18.1
50-54	0.4	0.0	3.2	0.9	9.6
55-59	0.2	0.0	0.0	0.5	4.8
60-64	0.3	0.0	1.1	0.5	7.2
65+	0.5	0.0	1.1	1.4	12.0
Unknown	0.0	0.0	0.0	0.0	0.0
Median age*	27.0	26.0	33.5	30.0	45.0
Mean age*	27.7	26.7	34.9	30.9	46.1
Standard deviation*	6.7	4.8	8.8	8.6	13.8

*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, 2006

Age (years)	All brides	Previous marital status (%)			
		Single	Married	Divorced	Widowed
All ages	100.0 (n=3125)	91.6 (n=2863)	-	7.5 (n=234)	0.9 (n=28)
10-14	3.2	3.4	-	0.9	0.0
15-19	50.9	54.2	-	15.8	7.1
20-24	33.4	33.8	-	30.3	21.4
25-29	8.9	7.3	-	27.8	17.9
30-34	1.8	1.0	-	9.0	14.3
35-39	0.9	0.2	-	7.7	14.3
40-44	0.6	0.1	-	5.1	17.9
45-49	0.2	0.0	-	1.3	7.1
50-54	0.1	0.0	-	1.3	0.0
55-59	0.0	0.0	-	0.4	0.0
60-64	0.0	0.0	-	0.4	0.0
65+	0.0	0.0	-	0.0	0.0
Unknown	0.0	0.0	-	0.0	0.0
Median age*	19.0	19.0	-	25.0	30.0
Mean age*	20.1	19.5	-	26.7	31.3
Standard deviation*	4.6	3.5	-	8.1	8.7

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

Table 6.3 Marriage rates by age and sex, 2006

Age (years)	Male			Female		
	Marriages	Population	Rate*	Marriages	Population	Rate*
All ages(10+ yrs)	3125	80528	38.8	3125	92858	33.7
10-14	3	12117	0.2	99	11999	8.3
15	2	2577	0.8	141	2817	50.1
16	8	2433	3.3	233	2539	91.8
17	22	2351	9.4	393	2461	159.7
18	58	2301	25.2	451	2465	183.0
19	68	1852	36.7	372	2215	167.9
20-24	772	7825	98.7	1045	10362	100.8
25-29	1235	6652	185.7	279	8995	31.0
30-34	610	5870	103.9	55	7732	7.1
35-39	221	6243	35.4	28	8134	3.4
40-44	57	6594	8.6	19	7873	2.4
45+	69	23713	2.9	10	25266	0.4

* Rates per 1000 population irrespective of previous marital status

Table 6.4. Distribution of current marital status (%) by age and sex, 2006

Age (years)	Male					Female				
	NM	PM	WID	DIV	Total	NM	PM	WID	DIV	Total
0-4	100.0	0.0	0.0	0.0	13483	99.9	0.0	0.0	0.0	12998
5-9	100.0	0.0	0.0	0.0	12931	100.0	0.0	0.0	0.0	12485
10-14	99.9	0.0	0.0	0.0	12117	99.1	0.9	0.0	0.0	11999
15-19	97.9	2.0	0.0	0.1	11084	73.2	26.2	0.0	0.6	12182
20-24	77.8	20.6	0.1	1.5	7825	24.3	74.4	0.1	1.2	10362
25-29	39.6	56.0	0.3	4.0	6652	6.1	92.2	0.4	1.2	8995
30-34	13.6	79.0	0.7	6.6	5870	1.5	96.1	1.3	1.1	7732
35-39	3.6	86.5	1.2	8.7	6243	0.6	95.7	2.5	1.2	8134
40-44	1.1	86.6	2.0	10.4	6594	0.4	91.9	5.8	1.9	7873
45-49	0.6	87.0	2.9	9.5	6434	0.2	86.1	11.7	2.0	6282
50-54	0.3	90.8	3.5	5.4	4411	0.1	76.9	21.1	1.8	4426
55-59	0.2	92.2	4.4	3.2	3337	0.1	63.3	35.1	1.6	3751
60-64	0.3	91.4	6.0	2.3	3031	0.0	50.1	48.8	1.1	3937
65-69	0.1	91.3	7.0	1.6	2408	0.1	32.7	66.4	0.8	2793
70-74	0.0	88.1	10.6	1.3	2038	0.0	18.5	80.8	0.6	2135
75-79	0.2	83.3	15.9	0.6	1115	0.1	10.9	88.7	0.4	1131
80-84	0.0	74.1	24.5	1.5	609	0.0	6.2	93.4	0.4	549
85+	0.3	63.0	36.4	0.3	330	0.0	1.1	98.1	0.8	262
All (%)	55.6	39.8	1.7	2.9	100.0	42.0	47.8	9.4	0.8	100.0
Total	**59271**	**42349**	**1774**	**3118**	**106512**	**49573**	**56383**	**11078**	**992**	**118026**

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

Table 6.5. Duration (months) of all marriages at divorce by age and sex, 2006

Age at divorce (years)	Male				Female			
	No.	Mean	Median	SD	No.	Mean	Median	SD
< 20	7	10.7	10.0	6.2	102	15.0	10.0	16.5
20 - 24	51	20.5	15.0	14.9	100	31.0	24.0	25.3
25 - 29	99	28.7	18.0	27.1	56	48.9	37.5	38.8
30 - 34	65	33.7	24.0	34.5	29	73.9	75.0	48.9
35 - 39	48	50.3	33.5	42.5	13	120.5	112.0	88.9
40 - 49	28	80.9	66.5	73.3	9	75.4	44.0	102.7
50+	12	81.9	35.0	105.4	1	52.0	52.0	0.0
All ages	**310**	**38.1**	**23.0**	**44.9**	**310**	**38.1**	**23.0**	**44.9**

Table 6.6. Marriages by type of gifts received from father-in-law 2002-2006

Type of gift received	Year				
	2002	2003	2004	2005	2006
None	32.9	32.9	35.0	32.7	33.5
Gift without prior negotiation	1.9	2.3	1.5	0.8	0.5
Gift after prior negotiation	65.2	64.8	63.5	66.5	66.0
Gift payment					
Full	NA	NA	20.2	19.5	18.6
Partial	NA	NA	39.7	39.9	40.4
Not yet paid*	NA	NA	3.6	7.1	7.0

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

Table 6.7. Registration status of Muslim marriages, 2000-2006.

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

Table 6.8. Registration status of divorces of Muslim marriages, 2000-2006.

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

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 2006, 9,770 persons (4,572 males and 5,198 females) moved into the HDSS area, which represented an annual average in-migration of 4.4 percent for both males and females of the mid-year population. On the other hand, 12,869 persons (6,662 males and 6,207 females) left the HDSS area or on an average 5.7 percent for both males and females of the mid-year population (Appendix A.13), giving a crude rate of in-migration of 43.5 per 1000 population, and out-migration rate of 57.3 per 1000 population. The highest incidence of in-migration for males was 9 percent in the age group 25-29 and for females was 10 percent in the age group 20-24. More males out-migrated than females in the age group (25-54). 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 90 males per 100 females in 2006. More out-migration of working age (15-59) group males to females caused a decline in the sex ratio over the period.

Both in-migration and out-migration rates increased over those of 2005. The net loss of migrants was 13.8 per 1,000 in 2006, whereas it was 17.6 per 1,000 in 2004. 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. 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, 2006

Age (years)	Both sexes		Male		Female	
	In	Out	In	Out	In	Out
All ages	43.5	57.3	42.9	62.5	44.0	52.6
0 - 4	60.1	55.3	60.0	54.9	60.2	55.8
5 - 9	36.7	36.3	38.0	36.6	35.4	36.0
10-14	27.1	43.0	24.3	46.3	30.0	39.7
15-19	62.1	116.0	32.0	109.3	89.4	122.2
20-24	89.3	133.9	73.2	149.5	101.4	122.1
25-29	79.4	99.8	93.1	123.3	69.4	82.5
30-34	56.2	65.6	81.6	93.7	37.0	44.2
35-39	35.8	45.4	55.1	72.7	20.9	24.3
40-44	23.4	28.2	37.3	42.8	11.7	16.0
45-49	17.5	20.2	24.7	26.3	10.2	14.0
50-54	13.0	17.0	16.8	22.2	9.3	11.7
55-59	11.1	12.7	12.3	10.5	10.1	14.7
60-64	10.6	12.2	12.9	11.2	8.9	13.0
65+	33.3	41.0	20.3	27.0	44.4	53.0

Table 7.2 In- and out-migration by sex and month, 2006

Months	In-migration			Out-migration		
	Both sexes	Male	Female	Both sexes	Male	Female
All months	9770	4572	5198	12869	6662	6207
January	1596	744	852	1654	817	837
February	893	411	482	1355	722	633
March	854	392	462	1200	603	597
April	750	350	400	1082	563	519
May	684	320	364	948	480	468
June	641	303	338	1148	607	541
July	629	286	343	1001	506	495
August	794	363	431	1090	559	531
September	710	341	369	876	468	408
October	763	359	404	814	411	403
November	647	317	330	996	553	443
December	809	386	423	705	373	332

Figure 7.1. Rates of in- and out-migration by sex and age, 2006

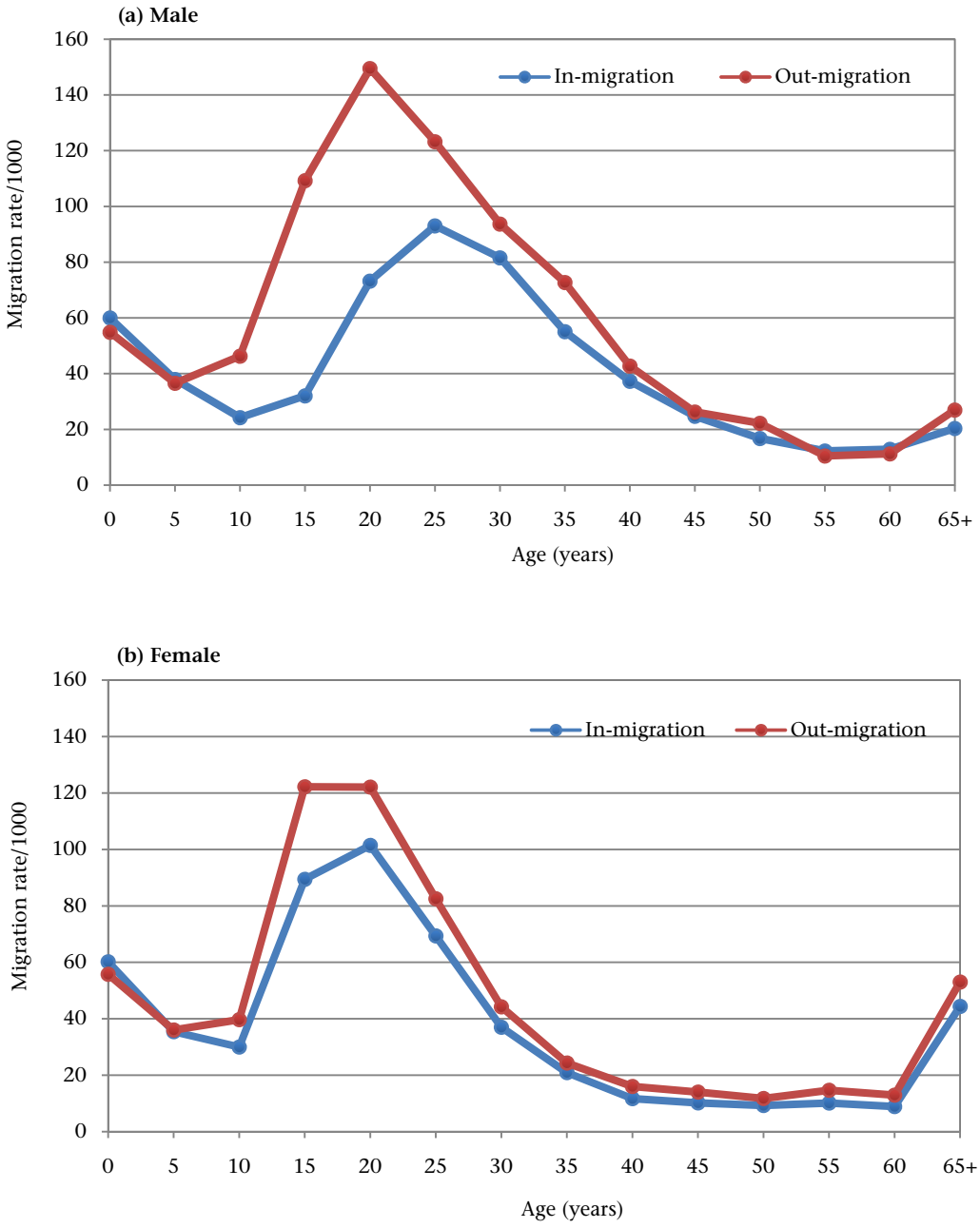
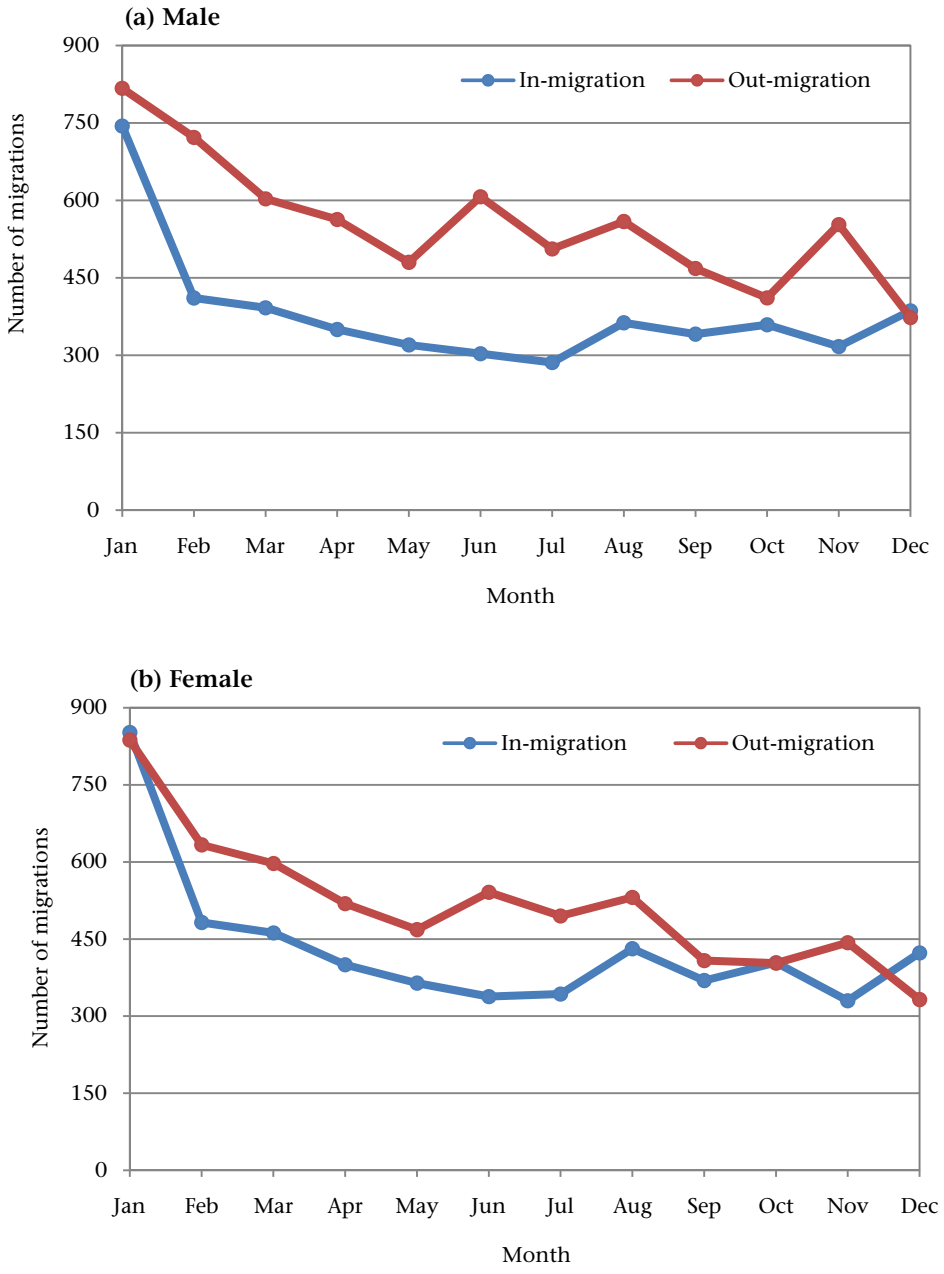


Figure 7.2. Number of in- and out-migrations by sex and month, 2006



CHAPTER 8

FERTILITY REGULATION

In the ICDDR,B service area, the CHRWs have been providing maternal and child health and family planning (MCH-FP) services including EPI from fixed-sites (usually in one room of their houses) since 2001 and maintain records of MCH-FP services they provide. They also refer the patients to ICDDR,B sub-centres. In the Government service area, services are provided from the Union Health and Family Welfare Centre and 8 Satellite Clinics monthly, and from 24 EPI Centres for vaccinations of children, adolescents, and women of reproductive ages.

The CHRWs in both ICDDR,B and Government service areas record family planning methods used by couples in the previous month by asking eligible women about family planning during their monthly home visits. 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 by CHRWs are only carried out in the ICDDR,B service area.

In 2006 contraceptive use rate was 69.2% in the ICDDR,B service area and 45.1% in the Government service area (Table 8.1). Contraceptive use rate in the Government service area was much lower than the national level use rate of 58.1% recorded in 2004. Table 8.2 shows the difference in contraceptive method-mix between the ICDDR,B and Government service areas in 2006 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 1992-2006 are shown in Table 8.3. The use of pill and condom has increased with decreases in use of tubectomy and injectables over the years. The contraceptive-use rate increases with the increase in women's age in the ICDDR,B service area (Table 8.4). In the ICDDR,B service area, women aged 20 years and over are more likely to use injectables, 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 is the most popular method in all age groups except age group 45 years and over. Tubectomy and traditional methods are more popular in the age group 40 years and over.

Table 8.1. Contraceptive use rate (%) of currently married women aged 15-49 years by area, 1982-2006

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

*Sources: In-depth and KAP surveys, 1984 & 1990; MDHS 1992; HDSS census 1996 and HDSS 2002-2006.
**Sources: Contraceptive prevalence survey, Bangladesh fertility survey 1989; Bangladesh demographic and health survey 1993-94,1996-97, 1999-2000,2004; 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, 2006	Government area, 2006	BMMS 2001	BDHS 2004
Pill	34.8	51.3	51.2	45.1
Condom	10.4	4.6	6.4	7.2
Injectables	40.1	19.6	15.7	16.7
IUD	2.4	1.0	1.6	1.0
Tubectomy	7.6	12.0	10.6	9.0
Vasectomy	1.4	0.4	1.0	1.0
Norplant	0.3	2.0	1.0	1.4
Others*	3.0	9.1	12.5	18.6
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, 1992-2006

Method	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Pill	27.3	28.1	25.7	25.8	25.4	26.0	29.7	28.7	30.6	31.9	33.3	33.9	32.6	34.1	35.8
Condom	2.7	3.2	3.9	4.7	6.2	7.7	7.1	7.7	9.5	10.8	11.1	11.0	10.9	11.2	10.8
Injectables	51.4	50.2	52.9	54.3	54.4	53.1	50.0	50.4	47.8	45.7	44.5	44.4	45.2	42.7	41.3
IUD	3.6	3.6	3.1	2.7	2.2	1.8	2.3	3.3	2.4	1.9	1.8	1.9	2.4	2.6	2.4
Tubectomy	14.5	14.5	14.0	12.2	11.5	11.1	10.6	9.8	9.1	8.6	7.7	7.2	7.4	7.6	7.9
Vasectomy	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.1	0.6	1.1	1.5	1.5	1.4	1.4	1.5
Foam	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Norplant	-	-	-	-	-	-	-	-	-	-	-	0.0	0.1	0.3	0.3
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, 2006

Age (years)	Not using	Any method used	Method used								No. of eligible women
			Pill	IUD	Injectables	Condom	Tubectomy	Vasectomy	Others*	Norplant	
Less 20	55.8	44.2	22.7	1.0	14.0	6.4	0.0	0.1	0.0	0.0	1196
20 – 24	44.1	55.9	24.4	3.2	22.6	5.4	0.0	0.0	0.3	0.1	3712
25 - 29	38.0	62.0	24.2	2.2	27.6	6.7	0.5	0.2	0.5	0.2	3978
30 - 34	29.9	70.1	25.7	1.6	31.8	6.7	3.1	0.6	0.5	0.2	4084
35 - 39	23.5	76.5	25.0	1.2	32.3	8.1	6.6	1.5	1.6	0.2	3801
40 - 44	18.0	82.0	23.6	0.9	31.0	8.9	10.3	2.5	4.4	0.4	3691
45 - 49**	18.7	81.3	20.6	0.6	24.0	8.2	17.8	1.8	8.2	0.1	2440
Total	**30.8**	**69.2**	**24.1**	**1.6**	**27.8**	**7.2**	**5.3**	**1.0**	**2.1**	**0.2**	**22902**

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

Table 8.5. Method specific contraceptive use rate among currently married women by age in Government service area, 2006

Age (years)	Not using	Any method used	Method used								No. of eligible women
			Pill	IUD	Injectables	Condom	Tubectomy	Vasectomy	Others*	Norplant	
Less 20	76.7	23.3	14.9	0.2	2.6	4.2	0.0	0.0	1.4	0.0	1229
20 – 24	68.7	31.3	20.9	0.5	5.7	2.6	0.1	0.0	0.9	0.0	3558
25 - 29	60.1	39.9	26.1	0.4	8.7	1.9	0.4	0.1	1.6	0.0	3802
30 - 34	50.3	49.7	28.7	0.6	11.9	1.7	3.0	0.1	2.4	0.0	3674
35 - 39	44.9	55.1	26.9	0.4	12.8	2.1	6.3	0.1	4.9	0.0	3487
40 - 44	44.0	56.0	21.4	0.4	9.2	1.9	12.1	0.5	9.7	0.0	3340
45 - 49**	51.5	48.5	12.7	0.3	5.4	1.2	19.3	0.6	8.5	0.0	2056
Total	**54.9**	**45.1**	**23.1**	**0.4**	**8.8**	**2.1**	**5.4**	**0.2**	**4.1**	**0.0**	**21146**

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

CHAPTER 9

USE OF MATERNAL & CHILD HEALTH (MCH) SERVICES

Immunization

The Community Health Research Workers (CHRWs) started providing tetanus toxoid (TT) vaccination to all women of reproductive age in blocks A and C in 1981 and in blocks B and D in 1985 of the ICDDR,B service area (see Figure 1 for map of Matlab ICDDR,B and Government services areas). Measles vaccination to all children started in blocks A and C and blocks B and D in 1982 and 1985, respectively. Vaccinations for DPT and polio started in 1986 in all four blocks (Appendix E). From the beginning of these interventions, vaccination records have been maintained by CHRWs in the ICDDR,B service area. The Record Keeping System (RKS) was started in ICDDR,B and Government services areas in 1977 and 2000, respectively. In contrast, the CHRWs in the Government service area record only vaccination status either by checking the vaccination card or by asking mothers about vaccination of children if the vaccination card was missing. For full protection of newborns against tetanus, it is recommended that pregnant women receive two doses of tetanus toxoid (TT). However, if a woman has been vaccinated during her previous pregnancy, she may require only one booster dose during her subsequent pregnancy. A woman requires 5 doses of TT for life-long protection. The rate of TT coverage is presented in Table 9.1 for women whose latest pregnancies terminated in a live birth.

The World Health Organization (WHO) recommends that all children receive a BCG vaccination against tuberculosis; three doses of DPT vaccine for the prevention of diphtheria, pertussis (whooping cough), and tetanus; three doses of polio vaccine; and a vaccination against measles before their first birthday. Therefore, vaccination of children aged 12-23 months is presented to allow comparison of results across the area.

Table 9.1 shows the rates of coverage of different vaccines among women who had a live birth and among children aged 12-23 months in the ICDDR,B service area from 1987 to 2006 and in the Government service area from 2000 to 2006. In 2006, the coverage of TT with at least two doses was 97.0% in the ICDDR,B service area and 86.4% in the Government service area. According to the Bangladesh Demographic and Health Survey (BDHS) the national coverage of TT with two or more doses in 2004 was 64%. In the ICDDR,B service area, in 2006, immunization of children was universal: 99.0% received BCG, 97.6% received three doses of DPT and polio, and 95.2% received measles vaccines. These rates are higher than the estimates of 97.3% for BCG, 93.7% for DPT and polio and 81.7% for measles in the Government service area. The BDHS estimates of immunization coverage were 93% for BCG, 81% for DPT, 82% for polio, and 76% for measles in 2004.

Table 9.1. Immunization coverage (%) among pregnant mothers and children aged 12-23 months in ICDDR,B area, 1987-2006 and Government service area,2000-2006

Year	TT* coverage during last pregnancy of women giving live birth		Vaccination coverage rate of children aged 12 - 23 months							
			BCG (1 dose)		DPT and polio (3 doses)		Measles (1 dose)		All**	
	ICDDR,B area	Govt. area	ICDDR,B area	Govt. area	ICDDR,B area	Govt. area	ICDDR,B area	Govt. area	ICDDR,B area	Govt. area
1987	86.1	-	88.4	-	76.1	-	85.2	-	69.3	-
1988	89.7	-	93.3	-	82.8	-	87.9	-	77.2	-
1989	91.3	-	94.6	-	88.4	-	92.0	-	84.0	-
1990	95.3	-	98.7	-	95.7	-	96.4	-	93.8	-
1991	97.1	-	98.6	-	95.6	-	97.0	-	94.1	-
1992	98.6	-	99.1	-	96.9	-	97.8	-	96.0	-
1993	98.8	-	99.5	-	97.6	-	98.1	-	96.6	-
1994	99.3	-	99.5	-	97.7	-	97.0	-	95.7	-
1995	98.8	-	99.3	-	96.8	-	97.0	-	95.0	-
1996	99.3	-	99.5	-	98.0	-	97.9	-	96.7	-
1997	98.6	-	99.3	-	98.5	-	98.0	-	97.3	-
1998	98.3	-	99.2	-	97.7	-	96.1	-	95.4	-
1999	97.7	-	99.0	-	97.7	-	94.8	-	94.1	-
2000[a]	97.0	-	99.2	73.6	97.7	67.8	95.9	50.2	95.1	48.5
2001	98.1	-	99.1	89.8	98.2	80.0	96.0	74.1	95.4	71.0
2002	97.1	60.7	99.3	96.7	98.5	90.6	95.7	84.5	95.4	83.1
2003	98.6	78.1	99.2	97.4	98.5	92.0	95.9	84.3	95.6	83.2
2004	98.4	88.8	99.3	97.6	98.2	93.1	96.6	86.2	95.9	85.3
2005	98.7	89.2	99.6	97.9	99.0	94.6	97.8	86.0	97.3	84.9
2006	97.0	86.4	99.0	97.3	97.6	93.7	95.2	81.7	94.3	80.4

*At least two doses received during the last pregnancy that terminated in live birth.
**Children fully vaccinated (i.e those who received BCG, measles and three doses of DPT and polio).
[a]Immunization coverage rate is about 20% underreported in the Government service area due to not checking of vaccination cards during the initial months of 2000.

Child Morbidity and Health Service Use

The CHRWs in the ICDDR,B service area have long experience in recording child health information. For example, they asked mothers if their children had symptoms of diarrhoea, i.e. three or more loose stools per 24 hours with or without mucus or blood in 24 hours preceding the date of monthly visit. An episode was termed bloody diarrhoea if blood was present in the stool, otherwise it was termed watery diarrhoea. For recording pneumonia, they asked mothers if their children had symptoms of pneumonia, such as rapid breathing or breathing difficulty and chest indrawing (or inability to suck the breast if child is aged less than 2 months) in the preceding one week. An episode of pneumonia was termed severe if chest indrawing was present in addition to other symptoms, otherwise it was termed simply pneumonia.

Oral rehydration solution (ORS) is the most simple and inexpensive tool to combat dehydration caused by diarrhoea. The CHRWs in the ICDDR,B service area, during their home visits, advise caretakers to get ORS packets from *bari* mothers (who act as ORS depot holders) free of charge if they encounter any diarrhoea patients, advise to get treatment for minor illnesses of women and children from fixed site clinics, and refer severe illnesses to the ICDDR,B sub-centres or hospital in Matlab. In the Government service area, CHRWs deliver ORS packets as needed during their routine household visits. If a child had diarrhoea in the preceding 24 hours, the mother was asked whether ORS (either packets 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. However, they do not record additional fluids given from a green coconut or rice water to combat dehydration. Similarly, if a child had pneumonia in the past month, the CHRWs asked mothers about health actions taken to combat pneumonia. They record the most recent treatment taken, particularly type of medicine used and type of health providers consulted. As mentioned before, treatment taken against pneumonia may also be under-estimated because of right-censoring (home visit before use of health service).

(a) Prevalence of Diarrhoea and Use of ORS and Health Providers

Table 9.2 shows the prevalence of diarrhoea in the past 24 hours per 100 children in the ICDDR,B and Government service areas in 2006. The overall prevalence of diarrhoea was 1.7% and 1.2% in the ICDDR,B service area and in the Government service area respectively. The prevalence of diarrhoea was highest in the age group of 6-11 months in both the areas and higher for boys than for girls in ICDDR,B service area. BDHS (2004) reports that two-weekly prevalence of diarrhoea in under-five children was 7.5%, and it was higher for boys than for girls and highest in the age group 12-23 months.

Table 9.3 shows that overall use of ORS for children having watery or bloody diarrhoea in the preceding 24 hours was similar (58%) in the ICDDR,B and the Government service area. The longer the duration of diarrhoeal episodes, the higher was the use of ORS in ICDDR,B area. Younger children (aged less than 6 months) were given ORS less often than older children. Neither sex of the child nor mother's education is highly related to the use of ORS to manage diarrhoea in Government service area, but 2006 data shows that mothers with no education are less likely to use ORS to manage diarrhoea in ICDDR,B service area.

There is a marked difference in use of health providers for treating diarrhoea between the ICDDR,B and the Government service areas (Table 9.4). In both areas, parents adopt home-treatment at a higher rate for watery diarrhoea than for bloody diarrhoea, and consult untrained village doctors more often for bloody diarrhoea than for watery diarrhoea for treatment. They consult traditional healers and untrained village doctors, who are available in most villages around the clock, less frequently for both watery and bloody diarrhoea in the ICDDR,B service area than in the Government service area. They consult ICDDR,B field workers more frequently for watery diarrhoea than for bloody diarrhoea and they do so even more frequently in the ICDDR,B service area than in the Government service area. Young children (6-23 months old) are taken to health providers at a higher rate than older children in the Government service area, but not in the ICDDR,B service area. The difference in management of diarrhoea may be the impact of the provision of the better quality health services in the ICDDR,B service area compared with the Government service area.

Table 9.2. Prevalence* (%) of Childhood diarrhoea in past 24 hours by child's characteristics and area, 2006

Characteristics	Watery diarrhoea		Bloody diarrhoea		Either		
	ICDDR,B area	Govt. area	ICDDR,B area	Govt. area	ICDDR,B area	Govt. area	BDHS 2004
Child's age (months)							
<6	1.1	0.8	0.1	0.1	1.2	0.9	3.9
6-11	3.3	1.9	0.3	0.3	3.6	2.2	12.1
12-23	2.4	1.5	0.2	0.2	2.5	1.7	12.5
24-35	1.6	1.1	0.2	0.2	1.8	1.4	7.7
36-47	1.1	0.7	0.1	0.2	1.2	0.9	4.9
48-59	0.7	0.6	0.1	0.1	0.8	0.7	4.8
Sex							
Male	1.7	1.1	0.1	0.2	1.9	1.2	7.7
Female	1.4	1.1	0.2	0.2	1.6	1.2	7.3
Mother's education							
No education	2.3	1.5	0.3	0.3	2.7	1.8	7.6
Primary incomplete	1.3	0.8	0.1	0.2	1.4	1.0	9.0
Primary complete	1.5	1.1	0.1	0.2	1.6	1.3	6.6
Secondary+	1.4	1.0	0.1	0.1	1.6	1.1	6.5
All (%)	1.6	1.1	0.2	0.2	1.7	1.2	7.5
# diarrhoea episodes* **	**2514**	**1671**	**251**	**272**	**2765**	**1943**	**486**

*Whether or not diarrhoea episodes started or ended within 24 hours.
**Percentage of children experiencing diarrhoea in past two weeks irrespective of date of onset.
*** Equivalent to number of 24-hour periods of observation in which children had had diarrhoea.
BDHS=Bangladesh demographic and health survey

Table 9.3. Distribution (%) of diarrhoea episodes among under five children who had diarroea in last 24 hours by use of ORS* and IV-saline, child's characteristics, and area, 2006

Illness and child's characteristics	ICDDR,B service area				Government service area			
	No ORS	Homemade ORS	Packet ORS	IV saline	No ORS	Homemade ORS	Packet ORS	IV saline
Types of diarrhoea								
Watery	57.5	0.5	41.6	0.4	56.7	3.6	39.6	0.1
Bloody	58.6	0.4	40.6	0.4	65.4	3.7	30.5	0.4
Duration of diarrhoea (days)								
1-3	64.8	0.4	34.5	0.3	57.8	3.8	38.2	0.2
4-6	48.1	0.9	50.4	0.5	57.8	3.8	38.4	0.0
7+	45.1	0.2	54.1	0.6	59.1	2.5	38.4	0.0
Child's age (months)								
<6	75.7	0.6	23.7	0.0	74.4	0.8	24.8	0.0
6-11	53.2	0.7	45.8	0.4	57.7	0.9	41.1	0.3
12-23	55.8	0.2	43.5	0.5	50.8	3.5	45.5	0.2
24-35	59.9	0.5	39.0	0.5	60.1	5.6	34.3	0.0
36-47	57.3	0.5	41.9	0.3	64.1	4.5	31.0	0.3
48-59	55.6	0.4	43.7	0.4	54.2	4.4	41.3	0.0
Sex								
Male	56.8	0.5	42.3	0.4	58.0	3.2	38.5	0.2
Female	58.5	0.4	40.7	0.4	57.9	4.0	38.0	0.1
Mother's education								
No education	61.7	0.3	37.4	0.7	58.7	3.4	37.7	0.2
Primary incomplete	56.3	0.3	42.8	0.6	57.2	3.7	39.1	0.0
Primary complete	54.6	1.0	44.1	0.3	59.9	3.4	36.7	0.0
Secondary+	56.4	0.5	42.9	0.2	56.9	3.8	39.1	0.2
All (%)	57.6	0.5	41.6	0.4	58.0	3.6	38.3	0.2
# diarrhoea episodes**	**1592**	**13**	**1149**	**11**	**1126**	**70**	**744**	**3**

*Oral rehydration solution (ORS) used during illness
**Equivalent to number of 24-hour periods of observation in which children had had diarrhoea

Table 9.4. Distribution (%) of treatment of diarrhoea episodes among under five children by type of treatment providers, illness and child's characteristics, and area, 2006

Illness and child's characteristics	ICDDR,B service area					Government service area				
	Home treatment	Traditional healer	Village doctor	Hospital	CHRW	Home treatment	Traditional healer	Village doctor	Hospital	Govt. health worker
Types of diarrhoea										
Watery	46.4	1.6	22.3	1.6	28.2	42.3	2.4	22.8	2.5	30.1
Bloody	37.1	3.2	40.6	2.0	17.1	31.6	4.4	45.6	2.9	15.4
Child's age (months)										
<6	46.2	7.5	33.5	0.0	12.7	45.6	10.4	26.4	1.6	16.0
6-11	37.1	2.4	31.8	2.2	26.6	36.3	5.1	29.7	3.6	25.2
12-23	45.3	1.1	23.9	2.0	27.6	35.3	1.7	25.8	3.5	33.8
24-35	49.1	1.0	20.7	1.7	27.4	44.1	0.7	27.8	1.6	25.8
36-47	50.6	0.8	17.6	0.8	30.2	47.9	1.4	21.7	2.4	26.6
48-59	47.9	1.1	17.6	1.1	32.2	42.2	2.7	22.7	0.9	31.6
Sex										
Male	43.7	2.0	26.1	1.7	26.5	40.3	2.4	27.4	2.0	27.9
Female	47.6	1.3	21.5	1.5	28.1	41.3	2.9	24.5	3.0	28.3
Mother's education										
No education	49.3	2.3	21.4	1.2	25.9	44.4	2.8	20.4	2.2	30.2
Primary incomplete	48.1	0.6	18.8	1.9	30.6	39.5	3.3	20.6	2.9	33.7
Primary complete	44.1	1.3	23.1	0.5	31.1	41.2	2.5	25.5	2.5	28.3
Secondary+	43.2	1.8	27.0	2.1	26.0	38.8	2.5	31.1	2.6	25.0
All (%)	45.5	1.7	23.9	1.6	27.2	40.8	2.7	26.0	2.5	28.0
# diarrhoea episodes*	**1259**	**47**	**662**	**44**	**753**	**792**	**52**	**505**	**49**	**545**

*Equivalent to number of 24-hour periods of observation in which children had had diarrhoea

(b) Prevalence of Pneumonia and Service Uptake

Table 9.5 shows the weekly prevalence of pneumonia per 100 children by illness and child's characteristics in 2006 in the ICDDR,B and the Government service areas. The prevalence was 1.0% in the ICDDR,B service area and 0.5% in the Government service area. The prevalence was higher for children aged less than 24 months than for children aged 24-59 months. Also it was higher for boys than for girls. In ICDDR,B service area, prevalence of pneumonia was markedly higher among the children for mothers with no education. Compared to the two-weekly prevalence (20.8%) of pneumonia in children in BDHS 2004, weekly prevalence of pneumonia in HDSS area was much lower. One of the possible reasons for serious underestimation in HDSS is asking mothers about pneumonia compared to the BDHS 2004 which asks for symptoms of pneumonia prevalent in the past two weeks.

Table 9.6 shows the type of medicine used to combat pneumonia in the ICDDR,B and the Government service areas by illness and child's characteristics. Antibiotics are more frequently used in the ICDDR,B service area than in the Government service area, and they are more frequently used for younger children than older children in the ICDDR,B service area only. Boys with pneumonia are treated by antibiotics at a higher rate than girls with pneumonia in Government service area, whereas the scenario was opposite in ICDDR,B service area. Use of antibiotics to manage pneumonia steadily increased with mothers education in both the areas.

Table 9.7 shows the treatment pattern of pneumonia by illness and child's characteristics in the ICDDR,B and the Government service areas. The provision of high quality services and severity of illness trigger choice of health providers. In the ICDDR,B service area, pneumonia episodes are treated more often by field workers (mostly ICDDR,B CHRWs) followed by village doctors and in the Government service area treated by village doctors, followed by Government health workers. Severe pneumonia episodes are particularly treated in hospitals and by untrained village doctors in both the areas. The results suggest that parents bypassed field workers for treatment of severe pneumonia.

The age of the child also influences choice of treatment provider to combat pneumonia. In ICDDR,B service area, infants less than 6 months of age with pneumonia are more likely to be taken to hospitals or health centres than their older counterparts. Sex of the child and mothers' education are not highly related to choice of treatment providers for children with pneumonia.

Table 9.5. Prevalence* (%) of pneumonia among under five children by child's characteristics and area, 2006

Child's characteristics	Pneumonia		Severe pneumonia		Either		
	ICDDR,B area	Govt. area	ICDDR,B area	Govt. area	ICDDR,B area	Govt. area	BDHS 2004**
Child's age (months)							
<6	0.9	0.8	0.2	1.0	1.1	1.8	28.3
6-11	1.5	0.9	0.1	0.3	1.6	1.1	29.5
12-23	1.5	0.5	0.1	0.1	1.6	0.7	24.9
24-35	1.0	0.3	0.1	0.1	1.1	0.4	20.0
36-47	0.6	0.2	0.1	0.0	0.7	0.2	15.7
48-59	0.3	0.1	0.0	0.0	0.4	0.1	14.9
Sex							
Male	1.0	0.4	0.1	0.2	1.1	0.6	22.0
Female	0.8	0.3	0.1	0.1	0.9	0.5	19.6
Mother's education							
No education	1.6	0.5	0.2	0.2	1.8	0.8	21.0
Primary incomplete	0.7	0.3	0.1	0.1	0.8	0.4	25.2
Primary complete	0.9	0.4	0.0	0.2	0.9	0.6	18.9
Secondary+	0.7	0.3	0.1	0.2	0.8	0.5	18.0
All (%)	0.9	0.4	0.1	0.2	1.0	0.5	20.8
# pneumonia episodes* **	**1443**	**588**	**153**	**271**	**1596**	**859**	**1350****

*Percentage of child-months with reported pneumonia irrespective of date of onset
**Prevalence in previous two-weeks
*** Prevalence in previous one-week
BDHS=Bangladesh demographic and health survey

Table 9.6. Distribution (%) of childhood pneumonia by type of medicine used, illness and child's characteristics, and area, 2006

Illness and child's characteristics	ICDDR,B service area			Government service area		
	Antibiotics	Other drugs	No drugs	Antibiotics	Other drugs	No drugs
Types of pneumonia						
Mild	86.5	3.8	9.7	68.4	13.9	17.7
Severe	90.2	3.3	6.5	81.5	10.7	7.7
Child's age (months)						
<6	95.8	1.2	3.0	78.2	10.5	11.3
6-11	92.0	3.2	4.8	78.6	9.2	12.1
12-23	91.7	2.4	5.9	74.9	11.6	13.5
24-35	83.8	4.3	11.9	71.2	10.8	18.0
36-47	76.5	7.5	15.9	53.6	26.1	20.3
48-59	71.3	5.2	23.5	35.7	33.3	31.0
Sex						
Male	85.6	4.3	10.1	74.7	11.4	13.9
Female	88.5	3.0	8.5	69.4	15.1	15.4
Mother's education						
No education	81.2	4.6	14.2	67.3	17.1	15.6
Primary incomplete	85.5	3.2	11.3	70.8	16.7	12.5
Primary complete	89.0	3.5	7.5	73.8	9.8	16.5
Secondary+	90.6	3.4	6.0	75.3	11.1	13.7
All (%)	86.8	3.8	9.4	72.5	12.9	14.6
# pneumonia episodes*	**1386**	**60**	**150**	**623**	**111**	**125**

* Prevalence in previous one-week

Table 9.7. Distribution (%) of pneumonia episodes among under five children by type of treatment providers, illness and child's characteristics, and area, 2006

Illness and child's characteristics	ICDDR,B service area					Government service area				
	Home treatment	Traditional healer	Village doctor	Hospital	CHRW	Home treatment	Traditional healer	Village doctor	Hospital	Govt. health worker
Types of pneumonia										
Mild	7.4	1.4	22.3	2.1	66.8	14.5	2.7	59.7	9.4	13.8
Severe	4.6	0.0	36.6	45.1	13.7	4.4	7.0	51.7	22.1	14.8
Child's age (months)										
<6	2.4	0.6	17.0	18.2	61.8	5.4	9.7	58.0	14.4	12.5
6-11	3.6	2.0	23.2	6.4	64.8	8.1	3.5	57.2	16.8	14.5
12-23	4.8	0.4	21.8	5.9	67.1	11.1	1.4	60.4	12.6	14.5
24-35	8.4	1.7	23.8	4.1	62.0	17.1	0.9	57.7	9.9	14.4
36-47	11.9	0.9	30.1	3.5	53.5	20.3	0.0	52.2	14.5	13.0
48-59	18.3	3.5	29.6	1.7	47.0	31.0	0.0	42.9	4.8	21.4
Sex										
Male	7.3	1.6	25.6	6.3	59.2	11.2	3.7	58.9	13.8	12.4
Female	6.9	0.9	21.2	6.1	65.0	11.4	4.6	54.6	12.9	16.6
Mother's education										
No education	11.0	2.0	19.6	6.0	61.4	13.3	5.7	57.8	13.3	10.0
Primary incomp.	9.1	0.0	21.0	6.5	63.4	10.4	3.1	59.4	9.4	17.7
Primary complete	5.3	1.3	20.6	5.3	67.5	12.8	3.0	54.9	12.8	16.5
Secondary+	4.4	1.0	28.4	6.6	59.5	9.8	3.9	57.2	14.7	14.4
All (%)	7.1	1.3	23.7	6.2	61.7	11.3	4.1	57.2	13.4	14.1
# pneumonia episodes*	**114**	**20**	**378**	**99**	**985**	**97**	**35**	**491**	**115**	**121**

* Prevalence in previous one-week

CHAPTER 10

GEOGRAPHICAL INFORMATION SYSTEM (GIS)

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

Due to new development of software and satellite images, there will be large scope to expand GIS activities in different fields. GIS unit currently generates thematic maps, creates spatial variables and performs spatial analysis with georeferenced data. Spatial analysis can generate surfaces to see the spatial and temporal relationship in space. Any kind of spatial information can be extracted from high-resolution imagery and it can help researchers to visualize spatial relationship among diseases. Population distribution, clustering of population, disease patterns, can be visualized using GIS tools and it can facilitate research according to the needs of the researcher more efficiently and effectively.

In Matlab surveillance area, GIS data are collected periodically through GPS surveyors and Field Research Supervisors (FRS). The FRSs are trained in using handheld Global Positioning System (GPS) device and collect coordinates of new baris, tubewells, health and other infrastructures, and landmark locations. Figure 10.1 shows that baris were more densely clustered in the southern part of Matlab surveillance area compared to the northern part. Health infrastructures like ICDDR,B hospital and sub-centres, Government and NGO health centres (including nutrition centres run by NGOs) and pharmacies are also sparsely located (Figure 10.2) in the northern part of surveillance area, which mostly comprised of cultivable lands.

High concentration of arsenic in ground water has become a serious public health problem in Bangladesh and the location of Matlab is ideal for the sedimentation process to produce arsenic laden soil, since it is situated near the confluence of the Meghna and Ganges Rivers. Around 98% of the Matlab inhabitants depend on tubewells as the water source for drinking, cooking and washing, which are contaminated with high level of arsenic contamination. Figure 10.3 shows that most of the tubewells located in south-west and eastern parts of Matlab study area pump water have an arsenic concentration of 50 µg/L or more.

Figure 10.1. Bari locations in Matlab study area, 2005-06 update

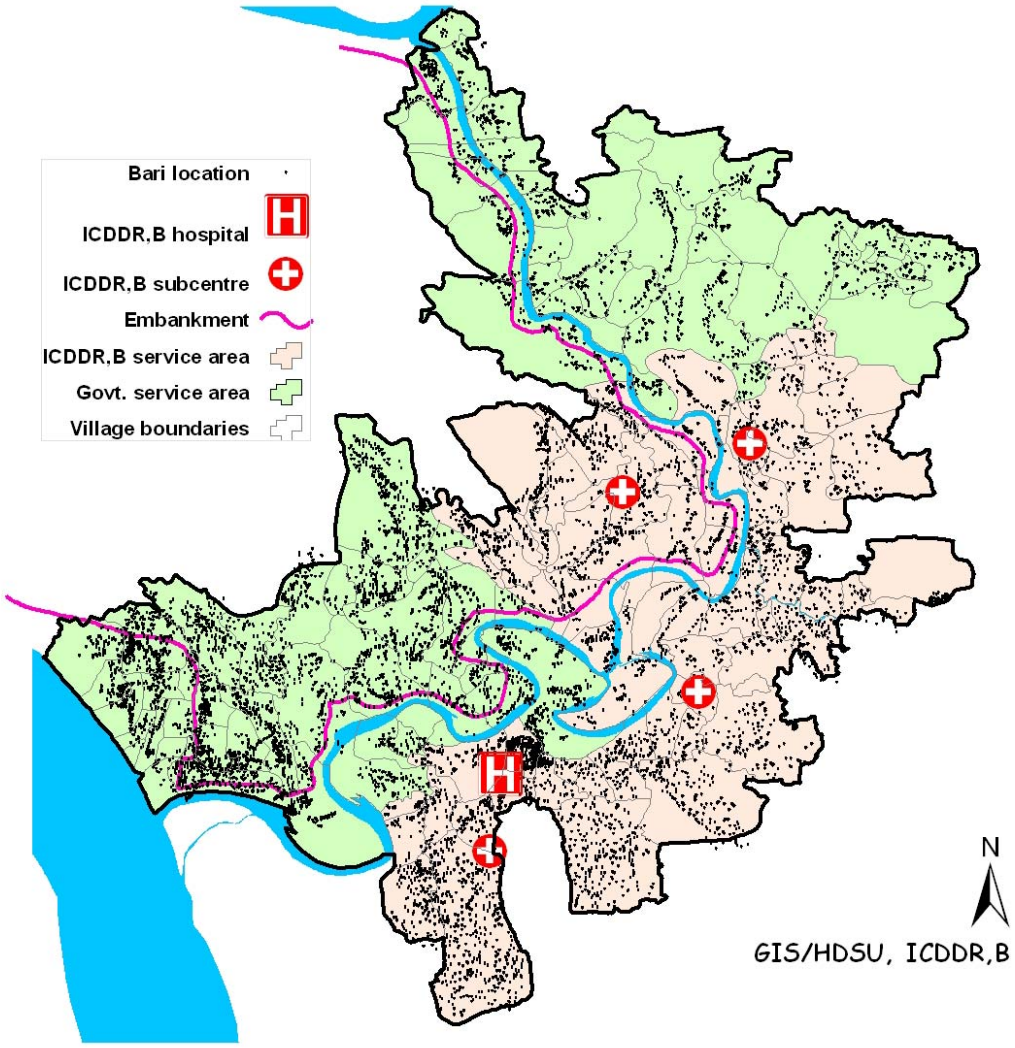


Figure 10.2. Health infrastructures in Matlab study area, 2005-06 update

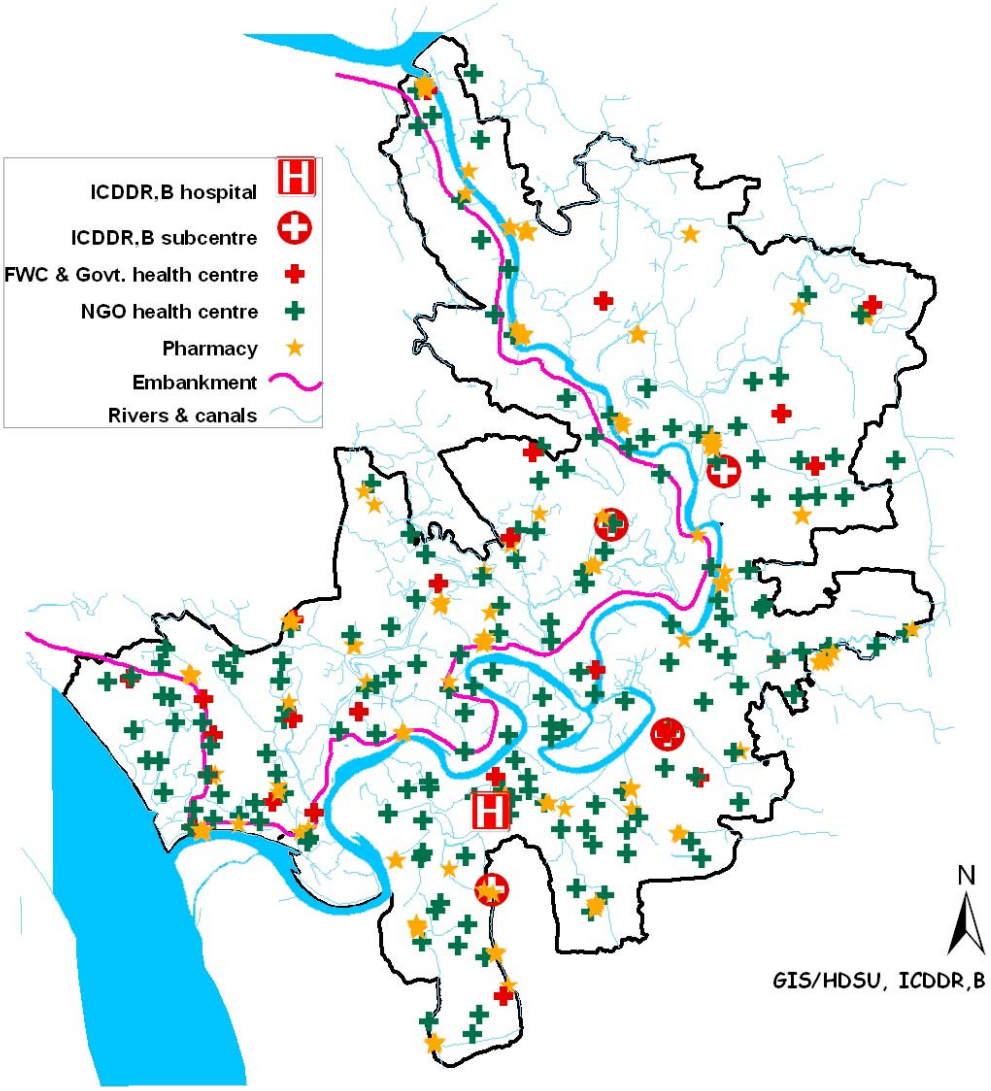
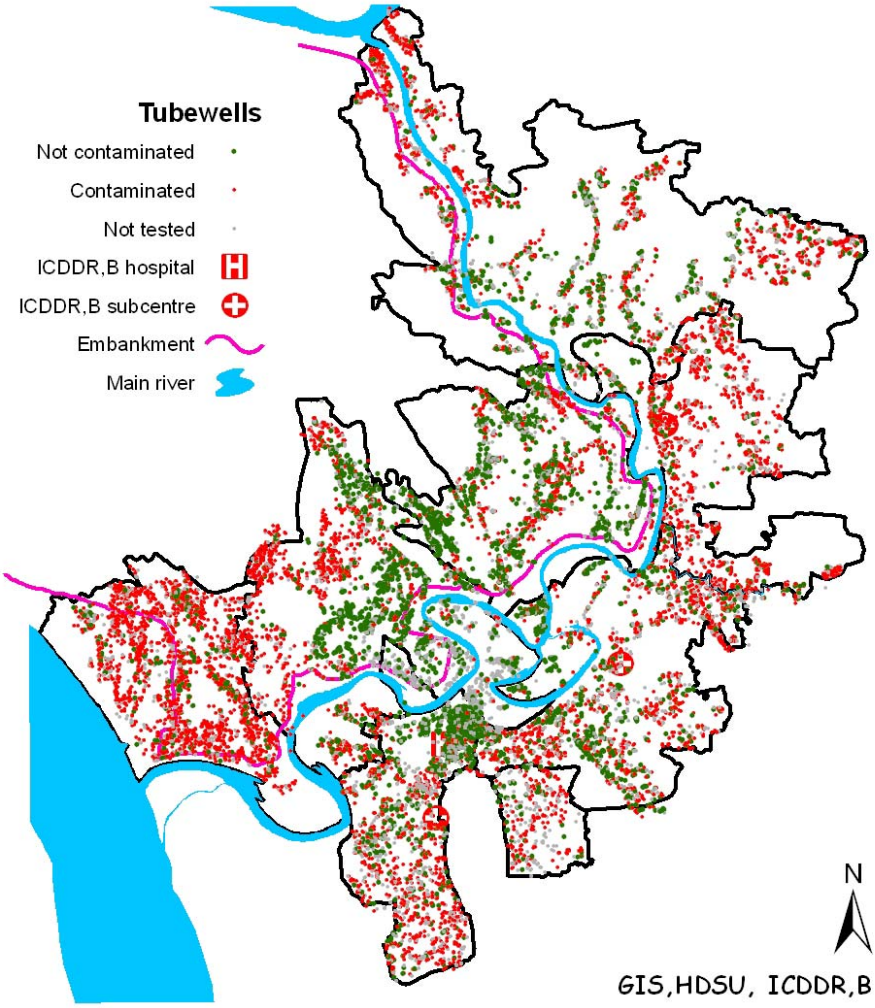


Figure 10.3. Arsenic contamination in tubewell water in Matlab study area, 2005-06 update



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APPENDIX A

Appendix A-1 Mid-year population in ICDDR,B area by age, sex, and block, 2006

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	35014	16345	18669	30964	14545	16419	24756	12071	12685	22394	10764	11630
Under 1	838	453	385	711	367	344	529	291	238	505	251	254
1 - 4	3338	1670	1668	3095	1559	1536	2258	1134	1124	2101	1072	1029
1	*827*	*415*	*412*	*764*	*400*	*364*	*560*	*273*	*287*	*510*	*260*	*250*
2	*855*	*450*	*405*	*763*	*392*	*371*	*547*	*259*	*288*	*519*	*273*	*246*
3	*810*	*387*	*423*	*742*	*359*	*383*	*596*	*319*	*277*	*538*	*284*	*254*
4	*846*	*418*	*428*	*826*	*408*	*418*	*555*	*283*	*272*	*534*	*255*	*279*
5 - 9	4040	2031	2009	3498	1741	1757	2579	1300	1279	2383	1227	1156
10-14	3666	1806	1860	3296	1621	1675	2404	1239	1165	2226	1116	1110
15-19	3373	1491	1882	3115	1521	1594	2422	1204	1218	2115	1047	1068
20-24	2798	1086	1712	2520	1095	1425	2270	1035	1235	1723	733	990
25-29	2515	1011	1504	2118	852	1266	1881	913	968	1569	687	882
30-34	2266	963	1303	1930	831	1099	1646	775	871	1439	634	805
35-39	2358	1034	1324	1974	851	1123	1639	704	935	1470	652	818
40-44	2400	1086	1314	2041	898	1143	1648	791	857	1558	731	827
45-49	2013	1050	963	1669	857	812	1461	745	716	1374	713	661
50-54	1337	678	659	1194	581	613	1007	518	489	980	506	474
55-59	1109	533	576	969	456	513	793	377	416	712	330	382
60-64	1074	488	586	933	383	550	781	346	435	748	337	411
65-69	723	368	355	736	332	404	551	255	296	585	258	327
70-74	566	284	282	571	286	285	484	242	242	443	228	215
75-79	310	156	154	328	168	160	212	116	96	267	130	137
80-84	185	103	82	178	87	91	131	58	73	127	68	59
85+	105	54	51	88	59	29	60	28	32	69	44	25

Appendix A-2 Deaths in ICDDR,B area by age, sex, and block, 2006

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	203	118	85	201	112	89	168	85	83	142	75	67
Under 1	16	8	8	28	18	10	23	12	11	10	5	5
<1 month	*16*	*8*	*8*	*22*	*14*	*8*	*16*	*11*	*5*	*7*	*4*	*3*
1- 5 months	*0*	*0*	*0*	*3*	*2*	*1*	*4*	*1*	*3*	*2*	*1*	*1*
6-11 months	*0*	*0*	*0*	*3*	*2*	*1*	*3*	*0*	*3*	*1*	*0*	*1*
1 - 4	14	7	7	10	5	5	6	2	4	4	0	4
1	*8*	*2*	*6*	*3*	*2*	*1*	*4*	*1*	*3*	*4*	*0*	*4*
2	*4*	*4*	*0*	*5*	*3*	*2*	*1*	*0*	*1*	*0*	*0*	*0*
3	*2*	*1*	*1*	*0*	*0*	*0*	*1*	*1*	*0*	*0*	*0*	*0*
4	*0*	*0*	*0*	*2*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*0*
5 - 9	7	4	3	1	1	0	2	1	1	0	0	0
10-14	3	1	2	2	1	1	0	0	0	0	0	0
15-19	3	2	1	3	1	2	3	1	2	3	3	0
20-24	2	2	0	1	1	0	2	0	2	3	2	1
25-29	0	0	0	1	0	1	2	2	0	0	0	0
30-34	2	2	0	1	0	1	2	1	1	1	0	1
35-39	4	3	1	0	0	0	7	3	4	3	2	1
40-44	2	0	2	6	4	2	5	3	2	1	1	0
45-49	7	4	3	8	3	5	6	3	3	6	3	3
50-54	8	8	0	9	6	3	13	8	5	4	4	0
55-59	8	5	3	12	6	6	9	4	5	3	1	2
60-64	19	9	10	16	12	4	10	7	3	19	14	5
65-69	21	15	6	20	11	9	16	7	9	17	9	8
70-74	27	17	10	19	5	14	23	12	11	22	6	16
75-79	28	15	13	28	14	14	15	9	6	25	14	11
80-84	16	6	10	18	11	7	11	5	6	11	5	6
85+	16	10	6	18	13	5	13	5	8	10	6	4

Appendix A-3 Abridged life table for ICDDR,B area by sex, 2006

Age (years)	Male				Female			
	$_nq_x$	l_x	L_x	$e0_x$	$_nq_x$	l_x	L_x	$e0_x$
0	31.6	100000	97471	69.5	27.5	100000	97798	72.5
1	3.7	96838	96627	70.7	10.6	97247	96638	73.6
2	5.1	96480	96235	70.0	2.3	96215	96105	73.3
3	1.5	95989	95918	69.4	0.7	95995	95960	72.5
4	0.0	95847	95847	68.5	1.4	95924	95855	71.6
5	4.8	95847	478186	67.5	3.2	95786	478221	70.7
10	1.7	95392	476579	62.8	2.6	95478	476822	65.9
15	6.6	95227	474679	57.9	4.3	95232	475208	61.0
20	6.3	94596	471601	53.2	2.8	94819	473486	56.3
15	2.9	93998	469368	48.6	1.1	94554	472537	51.4
30	4.7	93727	467627	43.7	3.7	94452	471462	46.5
35	12.3	93289	463805	38.9	7.1	94105	468982	41.7
40	11.3	92144	458310	34.3	7.2	93435	465622	36.9
45	19.1	91099	451464	29.7	22.0	92761	459090	32.2
50	55.5	89355	435244	25.2	17.8	90722	449889	27.9
55	46.2	84398	412944	21.5	41.6	89111	436961	23.3
60	127.0	80502	378392	17.5	54.1	85406	416287	19.2
65	160.0	70275	324685	14.6	109.8	80785	383080	15.1
70	176.2	59033	270391	11.9	222.4	71915	321101	11.7
75	371.6	48633	198123	8.9	335.5	55923	233273	9.3
80	352.5	30559	126078	7.6	384.1	37159	150109	7.7
85+	1000.0	19787	107662	5.4	1000.0	22886	136321	6.0

Appendix A-4 Abridged life table for Government service area by sex, 2006

Age (years)	Male				Female			
	$_nq_x$	l_x	L_x	$e0_x$	$_nq_x$	l_x	L_x	$e0_x$
0	47.9	100000	96169	67.4	33.0	100000	97361	74.4
1	6.3	95211	94859	69.8	6.3	96701	96343	76.0
2	0.7	94614	94579	69.2	2.3	96094	95982	75.5
3	1.5	94544	94475	68.3	1.5	95869	95797	74.6
4	2.8	94406	94274	67.4	0.0	95724	95724	73.7
5	1.5	94141	470378	66.5	4.8	95724	477570	72.7
10	2.4	93999	469483	61.6	0.8	95268	476164	68.1
15	1.7	93777	468513	56.8	5.4	95191	474763	63.1
20	6.4	93616	466691	51.9	4.0	94674	472497	58.5
15	3.1	93014	464398	47.2	8.0	94296	469745	53.7
30	5.6	92723	462414	42.3	1.4	93544	467426	49.1
35	16.5	92202	457493	37.6	6.3	93416	465716	44.2
40	27.2	90678	447690	33.1	9.3	92824	462122	39.4
45	30.5	88214	434837	29.0	9.5	91957	457763	34.8
50	48.2	85522	418027	24.8	13.6	91080	452539	30.1
55	50.6	81396	397416	20.9	18.6	89841	445340	25.5
60	109.2	77279	366567	16.9	54.8	88168	429599	20.9
65	155.1	68841	318889	13.7	129.7	83334	391158	16.9
70	227.5	58167	258962	10.7	206.8	72522	326657	14.1
75	408.2	44934	178515	8.1	274.5	57527	249205	12.1
80	448.0	26591	102652	6.9	326.7	41739	175093	10.7
85+	1000.0	14679	81863	5.6	1000.0	28104	270233	9.6

Appendix A-5 Male deaths by cause and age, 2006

Causes	All ages	Age at death																		
		<1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Communicable diseases																				
Diarrhoeal	10	3	0	0	1	0	0	0	0	0	0	0	2	0	1	1	0	0	0	2
Dysentery	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Tuberculosis	18	0	0	0	0	0	0	0	0	1	0	0	3	1	3	5	1	1	2	1
EPI related death	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Meningitis	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Chicken pox	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Septicaemia	15	1	1	0	0	1	0	0	0	0	0	1	1	0	0	3	1	3	2	1
Respiratory infections	29	13	3	1	0	0	0	0	0	0	0	1	0	0	2	0	2	3	1	3
Other communicable	3	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0
Maternal and neonatal conditions																				
Maternal death	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neonatal condition																				
-Premature and LBW	29	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Birth asphyxia	27	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Other neonatal	17	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nutritional	5	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1
Non-communicable diseases																				
Malignant neoplasm																				
-Neoplasm	91	0	0	2	1	0	1	1	2	5	4	5	8	7	11	10	16	11	1	6
-Neoplasm in female organ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Congenital malformation	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Endocrine disorder																				
-Diabetes	26	0	0	1	0	0	2	0	0	0	1	1	2	2	2	2	3	7	2	1
-Other endocrine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neuro-psychiatric	6	0	1	0	0	0	0	0	0	1	0	0	0	1	0	1	1	1	0	0
Diseases of circulartory sestem																				
-Hypertensive disease	15	0	0	0	0	0	0	0	0	0	0	1	2	1	2	2	1	3	3	0
-Ischaemic heart disease	80	0	0	0	0	0	1	0	1	2	7	6	10	5	10	14	9	7	6	2
-Stroke	173	0	0	0	0	1	0	0	0	1	1	3	5	8	21	23	33	32	21	24
-Other cardiovascular	46	1	0	0	2	0	1	0	0	0	2	1	3	1	2	7	2	11	3	10
Respiratory disease																				
-COPD	37	0	0	0	0	1	0	0	0	0	1	2	1	1	5	2	5	11	4	4
-Asthma	17	1	0	0	0	0	0	0	1	0	0	1	0	2	2	1	3	3	3	0
-Other respiratory	10	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	0	4	1
Digestive disease	45	3	0	0	0	2	1	0	1	2	1	4	4	1	8	6	5	3	4	0
Genito-urinary disease																				
-Renal failure	10	0	0	0	0	0	0	0	0	1	1	0	1	1	3	0	1	1	0	1
Other non-communicable	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
Injuries																				
Unintentional injuries																				
-Accident	21	0	1	1	0	3	0	2	0	2	3	1	1	2	0	1	0	1	3	0
-Drowning	24	0	20	2	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
Intentional injuries																				
-Suicide	5	0	0	0	0	0	0	1	0	2	0	0	1	0	1	0	0	0	0	0
-Homicide	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous																				
-Senility	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
-Fever of unknown origin	5	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	1	1	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/unspecified	28	5	1	0	0	0	1	0	0	0	2	2	1	0	2	1	3	7	1	2
Total	**807**	**103**	**29**	**8**	**5**	**9**	**10**	**4**	**6**	**18**	**25**	**32**	**47**	**33**	**76**	**82**	**91**	**108**	**61**	**60**

COPD=Chronic obstructive pulmonary disease

Appendix A-6 Female deaths by cause and age, 2006

Causes	All ages	Age at death																		
		<1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Communicable diseases																				
Diarrhoeal	9	1	1	0	0	0	1	0	0	0	0	0	1	0	1	1	1	0	1	1
Dysentery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuberculosis	6	0	0	0	0	0	0	0	0	2	0	2	0	0	1	0	1	0	0	0
EPI related death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meningitis	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chicken pox	2	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Septicaemia	21	1	3	2	0	0	1	0	0	0	1	0	0	0	1	2	4	3	0	3
Respiratory infections	24	12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	2	2	2
Other communicable	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maternal and neonatal conditions																				
Maternal death	5	0	0	0	0	0	1	2	0	2	0	0	0	0	0	0	0	0	0	0
Neonatal condition																				
-Premature and LBW	22	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Birth asphyxia	14	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Other neonatal	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nutritional	9	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	2
Non-communicable diseases																				
Malignant neoplasm																				
-Neoplasm	34	0	1	3	1	2	0	1	1	1	1	2	2	4	4	4	4	2	1	0
-Neoplasm in female organ	10	0	0	0	0	0	0	0	0	0	0	4	1	2	1	0	1	0	1	0
Congenital malformation	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Endocrine disorder																				
-Diabetes	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	5	0
-Other endocrine	3	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0
Neuro-psychiatric	4	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0
Diseases of circulartory sestem																				
-Hypertensive disease	12	0	0	0	0	0	0	0	0	0	1	0	1	0	3	1	2	3	1	0
-Ischaemic heart disease	30	0	0	0	0	1	0	0	0	1	0	1	0	4	3	5	5	6	2	2
-Stroke	171	0	0	0	0	0	1	0	1	1	1	2	4	5	12	33	40	34	23	14
-Other cardiovascular	44	2	1	0	0	0	0	0	0	0	2	0	1	0	3	4	11	8	7	5
Respiratory disease																				
-COPD	24	0	0	0	0	1	0	0	1	0	1	1	0	1	4	4	5	4	1	1
-Asthma	11	0	0	0	0	0	0	0	0	0	0	0	0	3	2	1	2	3	0	0
-Other respiratory	10	1	0	0	0	0	0	0	0	1	0	1	0	1	0	0	3	3	0	0
Digestive disease	31	0	0	0	0	2	0	1	1	1	1	2	2	0	4	6	4	4	3	0
Genito-urinary disease																				
-Renal failure	9	0	0	0	0	0	0	0	0	1	0	3	1	2	0	1	0	0	0	1
Other non-communicable	3	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0
Injuries																				
Unintentional injuries																				
-Accident	21	0	2	0	1	0	0	0	0	0	0	1	0	0	0	2	5	5	0	5
-Drowning	28	1	19	3	0	0	0	1	0	1	1	0	0	0	1	1	0	0	0	0
Intentional injuries																				
-Suicide	10	0	0	0	0	5	2	1	0	0	1	0	0	0	0	1	0	0	0	0
-Homicide	3	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous																				
-Senility	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Fever of unknown origin	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	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/unspecified	16	3	2	0	1	0	1	0	0	0	0	0	0	1	3	2	2	0	1	0
Total	**617**	**76**	**33**	**10**	**4**	**12**	**7**	**8**	**4**	**11**	**13**	**20**	**14**	**23**	**44**	**71**	**102**	**81**	**48**	**36**

COPD=Chronic obstructive pulmonary disease

Appendix A-7 Male deaths by cause, age, and area, 2006

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	4	6	1	2	0	0	1	0	0	0	1	2	0	1	1	1
Dysentery	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0
Tuberculosis	7	11	0	0	0	0	0	0	0	1	4	3	2	7	1	0
EPI related death	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Meningitis	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Hepatitis	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Chicken pox	3	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0
Septicaemia	11	4	1	0	0	1	0	0	1	0	2	0	6	3	1	0
Respiratory infections	7	22	2	11	0	3	1	0	0	0	1	2	1	5	2	1
Other communicable	1	2	0	0	0	0	0	0	1	1	0	0	0	1	0	0
Maternal and neonatal conditions																
Maternal death	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neonatal condition																
-Premature and LBW	16	13	16	13	0	0	0	0	0	0	0	0	0	0	0	0
-Birth asphyxia	10	17	10	17	0	0	0	0	0	0	0	0	0	0	0	0
-Other neonatal	6	11	6	11	0	0	0	0	0	0	0	0	0	0	0	0
Nutritional	3	2	0	0	1	0	0	1	0	0	1	0	0	1	1	0
Non-communicable diseases																
Malignant neoplasm																
-Neoplasm	51	40	0	0	0	0	2	1	4	9	18	13	25	13	2	4
-Neoplasm in female organ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Congenital malformation	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Endocrine disorder																
-Diabetes	16	10	0	0	0	0	1	0	1	2	4	3	9	5	1	0
-Other endocrine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neuro-psychiatric	4	2	0	0	1	0	0	0	1	0	1	0	1	2	0	0
Diseases of circulartory sestem																
-Hypertensive disease	2	13	0	0	0	0	0	0	0	0	2	4	0	9	0	0
-Ischaemic heart disease	43	37	0	0	0	0	0	0	3	8	18	13	21	15	1	1
-Stroke	82	91	0	0	0	0	0	0	3	0	14	23	51	58	14	10
-Other cardiovascular	26	20	1	0	0	0	1	1	1	2	4	3	12	11	7	3
Respiratory disease																
-COPD	15	22	0	0	0	0	0	0	1	1	5	4	7	15	2	2
-Asthma	10	7	0	1	0	0	0	0	0	1	4	1	6	4	0	0
-Other respiratory	4	6	0	0	0	0	0	0	0	1	0	2	4	2	0	1
Digestive disease	26	19	2	1	0	0	0	0	6	1	11	6	7	11	0	0
Genito-urinary disease																
-Renal failure	6	4	0	0	0	0	0	0	2	0	1	4	2	0	1	0
Other non-communicable	0	2	0	0	0	0	0	0	0	1	0	0	0	1	0	0
Injuries																
Unintentional injuries																
-Accident	9	12	0	0	1	0	0	1	6	4	1	3	1	4	0	0
-Drowning	11	13	0	0	10	10	1	1	0	1	0	1	0	0	0	0
Intentional injuries																
-Suicide	2	3	0	0	0	0	0	0	1	2	1	1	0	0	0	0
-Homicide	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous																
-Senility	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
-Fever of unknown origin	2	3	0	0	0	0	0	0	0	1	1	0	1	2	0	0
-sudden infant death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown/missing/unspecified	7	21	1	4	0	1	0	0	1	2	3	2	2	10	0	2
Total	**390**	**417**	**43**	**60**	**14**	**15**	**8**	**5**	**33**	**39**	**97**	**91**	**161**	**181**	**34**	**26**

COPD=Chronic obstructive pulmonary disease

Appendix A-8 Female deaths by cause, age, and area, 2006

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	4	1	0	0	1	0	0	0	1	2	0	2	1	0	1
Dysentery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuberculosis	2	4	0	0	0	0	0	0	0	2	2	1	0	1	0	0
EPI related death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meningitis	2	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
Hepatitis	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Chicken pox	2	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
Septicaemia	9	12	0	1	2	1	1	1	0	2	1	0	3	6	2	1
Respiratory infections	8	16	4	8	1	0	0	0	0	0	0	0	2	7	1	1
Other communicable	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Maternal and neonatal conditions																
Maternal death	1	4	0	0	0	0	0	0	1	4	0	0	0	0	0	0
Neonatal condition																
-premature and LBW	12	10	12	10	0	0	0	0	0	0	0	0	0	0	0	0
-birth asphyxia	7	7	7	7	0	0	0	0	0	0	0	0	0	0	0	0
-other neonatal	2	8	2	8	0	0	0	0	0	0	0	0	0	0	0	0
Nutritional	6	3	1	0	1	0	0	1	0	0	0	0	2	2	2	0
Non-communicable diseases																
Malignant neoplasm																
-neoplasm	16	18	0	0	0	1	3	1	2	4	5	7	6	5	0	0
-neoplasm in female organ	9	1	0	0	0	0	0	0	0	0	7	1	2	0	0	0
Congenital malformation	2	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0
Endocrine disorder																
-diabetes	6	3	0	0	0	0	0	0	0	0	0	0	6	3	0	0
-other endocrine	2	1	0	0	0	0	0	0	0	1	1	0	1	0	0	0
Neuro-psychiatric	2	2	0	0	0	1	0	0	0	1	0	0	2	0	0	0
Diseases of circulatory system																
-hypertensive disease	6	6	0	0	0	0	0	0	1	0	2	2	3	4	0	0
-ischaemic heart disease	20	10	0	0	0	0	0	0	0	2	6	2	12	6	2	0
-stroke	95	76	0	0	0	0	0	0	3	1	12	11	70	60	10	4
-other cardiovascular	25	19	2	0	1	0	0	0	1	1	2	2	16	14	3	2
Respiratory disease																
-COPD	13	11	0	0	0	0	0	0	3	0	3	3	6	8	1	0
-asthma	6	5	0	0	0	0	0	0	0	0	3	2	3	3	0	0
-other respiratory	7	3	0	1	0	0	0	0	1	0	2	0	4	2	0	0
Digestive disease	17	14	0	0	0	0	0	0	5	1	5	3	7	10	0	0
Genito-urinary disease																
-renal failure	3	6	0	0	0	0	0	0	1	0	2	4	0	1	0	1
Other non-communicable	2	1	1	0	0	0	0	0	0	1	0	0	1	0	0	0
Injuries																
Unintentional injuries																
-accident	10	11	0	0	1	1	1	0	0	0	1	0	5	7	2	3
-drowning	18	10	1	0	13	6	0	3	3	0	1	0	0	1	0	0
Intentional injuries																
-suicide	1	9	0	0	0	0	0	0	1	8	0	0	0	1	0	0
-homicide	0	3	0	1	0	0	0	0	0	2	0	0	0	0	0	0
Miscellaneous																
-senility	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-fever of unknown origin	1	2	0	0	0	0	0	0	0	0	0	1	1	1	0	0
-sudden infant death	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Unknown/missing/unspecified	5	11	0	3	0	2	0	1	1	0	2	2	2	3	0	0
Total	**324**	**293**	**34**	**42**	**20**	**13**	**7**	**7**	**24**	**31**	**60**	**41**	**156**	**146**	**23**	**13**

COPD=Chronic obstructive pulmonary disease

Appendix A-9 Age-specific fertility rate and indices for ICDDR,B area by block, 2006

Age (years)	Block A		Block B		Block C		Block D	
	Births	Rate	Births	Rate	Births	Rate	Births	Rate
All ages	796	79.6	754	89.1	562	82.6	483	79.8
15-19	144	76.5	102	64.0	73	59.9	61	57.1
20-24	259	151.3	240	168.4	209	169.2	158	159.6
25-29	193	128.3	205	161.9	141	145.7	143	162.1
30-34	127	97.5	114	103.7	92	105.6	75	93.2
35-39	62	46.8	77	68.6	40	42.8	37	45.2
40-44	11	8.4	15	13.1	7	8.2	8	9.7
45-49	0	0.0	1	1.2	0	0.0	1	1.5
Total fertility rate		2544		2905		2657		2642
General fertility rate		80		89		83		80
Gross reproduction rate		1179		1333		1300		1340

*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, 2006

Age (years)	Total women	Total birth	Live birth order									
			1	2	3	4	5	6	7	8	9	10+
Both areas												
<15	11999	6	6	0	0	0	0	0	0	0	0	0
15-19	12182	706	647	55	4	0	0	0	0	0	0	0
20-24	10362	1650	889	651	97	12	1	0	0	0	0	0
25-29	8995	1405	230	539	451	143	33	8	0	0	0	1
30-34	7732	819	41	131	297	225	98	23	4	0	0	0
35-39	8134	434	12	36	83	109	97	65	24	6	1	1
40-44	7873	95	3	6	14	15	17	15	15	7	3	0
45-49	6282	6	0	0	0	1	0	2	1	1	1	0
Total		**5121**	**1828**	**1418**	**946**	**505**	**246**	**113**	**44**	**14**	**5**	**2**
ICDDR,B service area												
<15	5810	5	5	0	0	0	0	0	0	0	0	0
15-19	5762	375	351	22	2	0	0	0	0	0	0	0
20-24	5362	866	482	333	47	4	0	0	0	0	0	0
25-29	4620	682	122	288	205	56	11	0	0	0	0	0
30-34	4078	408	27	78	155	103	34	10	1	0	0	0
35-39	4200	216	6	19	49	55	47	23	13	3	1	0
40-44	4141	41	1	4	7	10	7	4	4	3	1	0
45-49	3152	2	0	0	0	0	0	2	0	0	0	0
Total		**2595**	**994**	**744**	**465**	**228**	**99**	**39**	**18**	**6**	**2**	**0**
Government service area												
<15	6189	1	1	0	0	0	0	0	0	0	0	0
15-19	6420	331	296	33	2	0	0	0	0	0	0	0
20-24	5000	784	407	318	50	8	1	0	0	0	0	0
25-29	4375	723	108	251	246	87	22	8	0	0	0	1
30-34	3654	411	14	53	142	122	64	13	3	0	0	0
35-39	3934	218	6	17	34	54	50	42	11	3	0	1
40-44	3732	54	2	2	7	5	10	11	11	4	2	0
45-49	3130	4	0	0	0	1	0	0	1	1	1	0
Total		**2526**	**834**	**674**	**481**	**277**	**147**	**74**	**26**	**8**	**3**	**2**

Appendix A-11 Age-order-specific fertility rates by area, 2006

Age (years)	Total	Live birth order									
		1	2	3	4	5	6	7	8	9	10+
Both areas											
<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	0.0580	0.0531	0.0045	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20-24	0.1592	0.0858	0.0628	0.0094	0.0012	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
25-29	0.1562	0.0256	0.0599	0.0501	0.0159	0.0037	0.0009	0.0000	0.0000	0.0000	0.0001
30-34	0.1059	0.0053	0.0169	0.0384	0.0291	0.0127	0.0030	0.0005	0.0000	0.0000	0.0000
35-39	0.0534	0.0015	0.0044	0.0102	0.0134	0.0119	0.0080	0.0030	0.0007	0.0001	0.0001
40-44	0.0121	0.0004	0.0008	0.0018	0.0019	0.0022	0.0019	0.0019	0.0009	0.0004	0.0000
45-49	0.0010	0.0000	0.0000	0.0000	0.0002	0.0000	0.0003	0.0002	0.0002	0.0002	0.0000
Total	**2.7309**	**0.8607**	**0.7470**	**0.5511**	**0.3081**	**0.1526**	**0.0704**	**0.0277**	**0.0089**	**0.0033**	**0.0012**
ICDDR,B service area											
<15	0.0009	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15-19	0.0651	0.0609	0.0038	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20-24	0.1615	0.0899	0.0621	0.0088	0.0007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25-29	0.1476	0.0264	0.0623	0.0444	0.0121	0.0024	0.0000	0.0002	0.0000	0.0000	0.0000
30-34	0.1000	0.0066	0.0191	0.0380	0.0253	0.0083	0.0025	0.0002	0.0000	0.0000	0.0000
35-39	0.0514	0.0014	0.0045	0.0117	0.0131	0.0112	0.0055	0.0031	0.0007	0.0002	0.0000
40-44	0.0099	0.0002	0.0010	0.0017	0.0024	0.0017	0.0010	0.0010	0.0007	0.0002	0.0000
45-49	0.0006	0.0000	0.0000	0.0000	0.0000	0.0000	0.0006	0.0000	0.0000	0.0000	0.0000
Total	**2.6854**	**0.9318**	**0.7644**	**0.5243**	**0.2682**	**0.1180**	**0.0476**	**0.0226**	**0.0072**	**0.0024**	**0.0000**
Government service area											
<15	0.0002	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15-19	0.0516	0.0461	0.0051	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20-24	0.1568	0.0814	0.0636	0.0100	0.0016	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
25-29	0.1653	0.0247	0.0574	0.0562	0.0199	0.0050	0.0018	0.0000	0.0000	0.0000	0.0002
30-34	0.1125	0.0038	0.0145	0.0389	0.0334	0.0175	0.0036	0.0008	0.0000	0.0000	0.0000
35-39	0.0554	0.0015	0.0043	0.0086	0.0137	0.0127	0.0107	0.0028	0.0008	0.0000	0.0003
40-44	0.0145	0.0005	0.0005	0.0019	0.0013	0.0027	0.0029	0.0029	0.0011	0.0005	0.0000
45-49	0.0013	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0003	0.0003	0.0003	0.0000
Total	**2.7871**	**0.7912**	**0.7274**	**0.5796**	**0.3513**	**0.1907**	**0.0950**	**0.0344**	**0.0108**	**0.0043**	**0.0024**

Appendix A-12. Marriages and divorces by month, 2006.

Month	Marriage		Divorce	
	Number	Percent	Number	Percent
January	310	9.9	46	14.8
February	298	9.5	25	8.1
March	349	11.2	18	5.8
April	206	6.6	27	8.7
May	226	7.2	21	6.8
June	268	8.6	22	7.1
July	296	9.5	29	9.4
August	313	10.0	34	11.0
September	232	7.4	18	5.8
October	194	6.2	24	7.7
November	247	7.9	23	7.4
December	186	6.0	23	7.4
Total	**3125**	**100.0**	**310**	**100.0**

Appendix A-13. In- and out-migrations by age and sex, 2006

Age (years)	In-migration			Out-migration		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	9770	4572	5198	12869	6662	6207
0-4	1591	809	782	1465	740	725
5 - 9	933	491	442	923	473	450
10-14	654	294	360	1037	561	476
15-19	1444	355	1089	2700	1211	1489
20-24	1624	573	1051	2435	1170	1265
25-29	1243	619	624	1562	820	742
30-34	765	479	286	892	550	342
35-39	514	344	170	652	454	198
40-44	338	246	92	408	282	126
45-49	223	159	64	257	169	88
50-54	115	74	41	150	98	52
55-59	79	41	38	90	35	55
60-64	74	39	35	85	34	51
65+	173	49	124	213	65	148

Appendix A-14. In-migrations by age, sex, and area, 2006

Age (years)	ICDDR,B service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	5058	2294	2764	4712	2278	2434
0-4	834	432	402	757	377	380
5 - 9	513	267	246	420	224	196
10-14	329	144	185	325	150	175
15-19	737	135	602	707	220	487
20-24	816	268	548	808	305	503
25-29	633	303	330	610	316	294
30-34	440	269	171	325	210	115
35-39	286	186	100	228	158	70
40-44	154	113	41	184	133	51
45-49	110	81	29	113	78	35
50-54	55	33	22	60	41	19
55-59	38	20	18	41	21	20
60-64	34	19	15	40	20	20
65+	79	24	55	94	25	69

Appendix A-15. Out-migrations by age, sex, and area, 2006

Age (years)	ICDDR,B service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	5743	2871	2872	7126	3791	3335
0-4	673	324	349	792	416	376
5 - 9	431	223	208	492	250	242
10-14	463	259	204	574	302	272
15-19	1126	457	669	1574	754	820
20-24	1041	464	577	1394	706	688
25-29	725	360	365	837	460	377
30-34	428	254	174	464	296	168
35-39	301	215	86	351	239	112
40-44	183	127	56	225	155	70
45-49	124	74	50	133	95	38
50-54	72	48	24	78	50	28
55-59	32	12	20	58	23	35
60-64	46	21	25	39	13	26
65+	98	33	65	115	32	83

Appendix A.16. Male out-migration by cause of movement and age, 2006

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	6662	740	473	561	1211	1170	820	550	454	282	169	98	35	34	65
Work/economic/educational															
Acquired/seeking job	3795	0	3	119	746	938	685	457	370	239	126	61	24	16	11
Job completion/retirement	33	0	0	3	4	2	5	5	3	2	1	1	2	3	2
To acquire education	639	2	78	168	244	110	25	5	2	3	2	0	0	0	0
Educ. completed/interrupted	2	0	0	0	1	0	1	0	0	0	0	0	0	0	0
Student lodging	10	0	0	2	4	2	0	0	1	1	0	0	0	0	0
Housing/environmental															
Acquired/seeking new land/house	115	0	0	0	1	4	15	26	22	6	13	12	1	5	10
River erosion	5	0	0	0	0	1	0	1	1	1	0	0	0	0	1
Move as dependent															
Join with/ follow spouse	5	0	0	0	1	0	1	0	2	0	0	0	0	1	0
Join with/follow parents	1515	695	356	212	137	61	31	12	9	2	0	0	0	0	0
Join with child/sibling	166	17	18	24	39	17	8	2	1	1	3	3	3	4	26
Join with other relatives	145	23	17	13	13	4	8	13	14	13	8	9	3	1	6
Marriage / familial															
Marriage	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Separation/divorce/widow	13	0	1	1	3	5	0	0	1	1	1	0	0	0	0
Adoption	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	87	0	0	4	9	16	24	15	8	3	2	1	1	1	3
Health or old age care	14	0	0	0	1	1	3	0	1	1	0	1	0	1	5
Legal problems	54	0	0	1	1	6	7	7	13	9	5	4	1	0	0
Other and not stated															
Others n.e.c.*	60	2	0	14	7	3	7	7	5	0	7	5	0	2	1
Unknown or not stated	2	0	0	0	0	0	0	0	1	0	1	0	0	0	0

*n.e.c.=Not elsewhere classified

Appendix A.17. Female out-migration by cause of movement and age, 2006

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	6207	725	450	476	1489	1265	742	342	198	126	88	52	55	51	148
Work/economic/educational															
Acquired/seeking job	795	0	7	91	352	153	88	40	33	20	6	1	4	0	0
Job completion/retirement	11	0	0	4	2	1	0	0	1	2	1	0	0	0	0
To acquire education	251	10	52	69	80	28	6	3	3	0	0	0	0	0	0
Educ. completed/interrupted	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
Student lodging	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Housing/environmental															
Acquired/seeking new land/house	54	0	0	0	6	5	6	10	5	8	2	2	5	1	4
River erosion	5	0	0	0	0	0	0	2	1	1	0	0	0	0	1
Move as dependent															
Join with/ follow spouse	1506	0	0	3	236	465	366	193	98	66	39	17	8	6	9
Join with/follow parents	1624	670	352	201	188	103	66	19	7	7	0	2	1	2	6
Join with child/sibling	433	14	23	38	76	45	29	8	7	9	20	18	23	32	91
Join with other relatives	201	21	13	25	17	24	29	22	18	5	10	5	3	1	8
Marriage / familial															
Marriage	969	0	0	30	459	351	95	23	4	6	0	1	0	0	0
Separation/divorce/widow	88	0	0	1	30	24	10	5	5	0	6	0	3	3	1
Adoption	9	8	1	0	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	135	0	0	3	22	47	23	10	10	1	3	3	4	2	7
Health or old age care	37	0	0	1	4	6	6	1	2	0	0	1	3	0	13
Legal problems	3	0	0	0	0	0	1	1	1	0	0	0	0	0	0
Other and not stated															
Others n.e.c.*	84	2	2	8	17	13	17	5	3	1	1	2	1	4	8
Unknown or not stated	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*n.e.c.=Not elsewhere classified

Appendix A.18. Male in-migration by cause of movement and age, 2006

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	4572	809	491	294	355	573	619	479	344	246	159	74	41	39	49
Work/economic/educational															
Acquired/seeking job	762	0	0	12	53	119	180	164	101	62	35	20	6	7	3
Job completion/retirement	656	0	0	4	43	136	120	104	80	72	46	20	10	9	12
To acquire education	247	7	80	86	49	21	3	1	0	0	0	0	0	0	0
Educ. completed/interrupted	18	0	2	8	6	2	0	0	0	0	0	0	0	0	0
Student lodging	21	0	1	2	8	2	5	1	0	1	0	0	1	0	0
Housing/environmental															
Acquired/seeking new land/house	302	0	0	0	12	26	58	57	49	40	24	10	9	9	8
River erosion	6	0	0	0	0	0	1	1	2	1	1	0	0	0	0
Move as dependent															
Join with/ follow spouse	275	0	0	0	0	39	67	54	44	25	27	10	6	1	2
Join with/follow parents	1555	726	350	152	112	103	63	31	11	6	1	0	0	0	0
Join with child/sibling	146	31	37	14	13	13	7	4	4	2	1	1	1	3	15
Join with other relatives	205	38	14	8	4	22	30	29	25	15	9	4	4	3	0
Marriage / familial															
Marriage	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Separation/divorce/widow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Adoption	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	62	0	0	1	1	10	25	7	9	4	3	1	0	0	1
Health or old age care	119	0	0	0	15	27	24	8	8	8	4	8	3	7	7
Legal problems	36	0	0	0	0	5	11	7	6	5	2	0	0	0	0
Other and not stated															
Others n.e.c.*	156	3	7	7	38	48	24	11	5	5	6	0	1	0	1
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.19. Female in-migration by cause of movement and age, 2006

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	5198	782	442	360	1089	1051	624	286	170	92	64	41	38	35	124
Work/economic/educational															
Acquired/seeking job	162	0	0	22	24	39	27	20	13	5	4	3	2	2	1
Job completion/retirement	90	0	0	5	28	24	12	7	7	4	3	0	0	0	0
To acquire education	222	5	72	90	41	12	0	1	1	0	0	0	0	0	0
Educ. completed/interrupted	5	0	1	4	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	140	0	0	1	2	23	34	19	12	8	8	5	6	6	16
River erosion	2	0	0	1	0	0	1	0	0	0	0	0	0	0	0
Move as dependent															
Join with/ follow spouse	1327	0	0	8	272	394	309	130	83	56	34	17	8	6	10
Join with/follow parents	1792	675	319	173	254	216	92	39	14	4	0	2	0	0	4
Join with child/sibling	229	26	25	23	26	18	7	3	1	2	3	6	11	16	62
Join with other relatives	251	57	20	10	35	41	42	23	13	2	3	0	2	1	2
Marriage / familial															
Marriage	506	0	0	8	301	153	31	5	4	2	0	1	1	0	0
Separation/divorce/widow	146	0	0	1	33	43	28	14	8	7	3	4	2	1	2
Adoption	20	17	3	0	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	90	0	0	2	14	37	15	10	4	0	3	1	1	1	2
Health or old age care	68	0	0	2	16	19	6	5	2	0	1	1	2	2	12
Legal problems	2	0	0	0	1	0	0	0	0	0	1	0	0	0	0
Other and not stated															
Others n.e.c.*	146	2	2	10	42	32	20	10	8	2	1	1	3	0	13
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, 2006

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	127	124	60	33	19	363	69	52	45	18	11	195
	Urban	775	1302	475	242	185	2979	594	538	459	239	169	1999
Chittagong	Rural	605	236	193	115	79	1228	690	176	242	124	60	1292
	Urban	155	160	75	43	34	467	128	68	100	39	38	373
Sylhet	Rural	20	16	7	4	2	49	15	9	9	10	7	50
	Urban	25	54	20	11	5	115	34	19	36	12	11	112
Khulna	Rural	4	5	2	1	1	13	11	2	6	2	2	23
	Urban	7	8	7	1	5	28	7	3	5	3	4	22
Rajshahi	Rural	5	2	0	1	2	10	6	3	5	2	1	17
	Urban	5	7	4	1	1	18	10	4	6	2	2	24
Barisal	Rural	5	2	9	4	0	20	15	1	9	3	1	29
	Urban	9	5	3	2	3	22	3	3	2	1	0	9
India		18	8	3	6	9	44	5	3	7	2	4	21
Asia		1	109	152	81	18	361	0	6	43	37	12	98
Middle-east		9	336	355	186	36	922	7	40	123	96	39	305
Others		1	3	3	5	1	13	0	1	1	0	1	3
Unknown		3	4	2	0	1	10	0	0	0	0	0	0
Total		**1774**	**2381**	**1370**	**736**	**401**	**6662**	**1594**	**928**	**1098**	**590**	**362**	**4572**

Appendix A.21. Female migration by destination or origin, 2006

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	114	192	53	19	19	397	699	1287	385	93	87	2551
	Urban	732	1079	447	169	199	2626	564	515	329	119	146	1673
Chittagong	Rural	584	1131	432	89	111	2347	74	117	49	7	13	260
	Urban	136	226	88	27	35	512	132	155	89	20	24	420
Sylhet	Rural	12	19	8	1	2	42	22	8	8	4	7	49
	Urban	13	25	9	3	4	54	34	16	14	3	9	76
Khulna	Rural	0	6	0	0	0	6	12	6	8	1	4	31
	Urban	7	12	3	2	6	30	3	2	4	3	3	15
Rajshahi	Rural	4	4	3	1	0	12	6	6	2	2	3	19
	Urban	6	9	4	0	0	19	7	8	3	2	1	21
Barisal	Rural	12	14	3	0	0	29	11	4	6	2	0	23
	Urban	8	6	4	2	2	22	5	6	2	0	0	13
India		17	8	11	4	11	51	4	4	2	0	5	15
Asia		0	2	1	0	1	4	5	2	2	1	0	10
Middle-east		3	17	16	5	1	42	6	4	7	5	0	22
Others		0	2	2	1	2	7	0	0	0	0	0	0
Unknown		3	2	0	1	1	7	0	0	0	0	0	0
Total		**1651**	**2754**	**1084**	**324**	**394**	**6207**	**1584**	**2140**	**910**	**262**	**302**	**5198**

APPENDIX B

POPULATION, BIRTHS, AND DEATHS BY VILLAGE, 2006

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
ICDDR,B SERVICE AREA:						
D00	Charmukundi	2484	49	17	19.7	6.8
W00	Kaladi	6371	127	20	19.9	3.1
V10	Dhakirgaon	1798	40	11	22.2	6.1
V11	Nabakalash	2665	67	19	25.1	7.1
V31	Dighaldi	9433	191	48	20.2	5.1
V32	Mobarakdi	3332	99	19	29.7	5.7
V60	Suvankardi	987	18	6	18.2	6.1
V61	Munsabdi	678	15	5	22.1	7.4
V62	Shilmondi	924	24	6	26.0	6.5
V72	Upadi	6342	166	52	26.2	8.2
Block A Total		**35014**	**796**	**203**	**22.7**	**5.8**
H00	Lamchari	1239	29	7	23.4	5.6
V12	Bhangerpar	674	16	1	23.7	1.5
V13	Baburpara	710	15	6	21.1	8.5
V19	Lakshmipur	2934	83	23	28.3	7.8
V20	Dagorpur	1332	37	8	27.8	6.0
V21	Khadergaon	552	16	5	29.0	9.1
V22	Beloti	634	15	3	23.7	4.7
V23	Baluchar	635	10	7	15.7	11.0
V24	Machuakhal	2942	81	18	27.5	6.1
V26	Narayanpur	3052	62	15	20.3	4.9
V56	Pailpara	1511	33	15	21.8	9.9
V59	Doshpara	1702	44	7	25.9	4.1
V82	Dhanarpar	1748	35	10	20.0	5.7
V83	Padmapal	613	20	1	32.6	1.6
V85	Bhanurpara	516	18	2	34.9	3.9
V87	Hurmaisha	689	12	6	17.4	8.7
VBB	Nagda	4556	113	28	24.8	6.1
VBC	Naogaon	4925	115	39	23.4	7.9
Block B Total		**30964**	**754**	**201**	**24.4**	**6.5**
K00	Shahpur	954	22	6	23.1	6.3
L00	Tatkhana	587	17	2	29.0	3.4
M00	Char Nayergaon	203	6	0	29.6	0.0
N00	Aswinpur	2199	47	19	21.4	8.6
O00	Nayergaon	1952	44	12	22.5	6.1
P00	Titerkandi	2137	45	12	21.1	5.6
Q00	Char Shibpur	261	4	1	15.3	3.8
V27	Panchghoria	974	23	3	23.6	3.1
V28	Khidirpur	1559	41	16	26.3	10.3
V30	Harion	546	17	4	31.1	7.3
V39	Gobindapur	346	4	1	11.6	2.9
V40	Masunda	802	21	8	26.2	10.0
V41	Paton	1857	47	14	25.3	7.5
V42	Adhara (South)	765	13	9	17.0	11.8
V44	Panchdona	623	7	5	11.2	8.0
V86	Adhara	946	24	9	25.4	9.5
V88	Datikara	531	10	5	18.8	9.4
VBA	Mehron	2483	46	14	18.5	5.6

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
DX0	Barogaon	3655	88	21	24.1	5.7
DX1	Naojan	1376	36	7	26.2	5.1
Block C Total		**24756**	**562**	**168**	**22.7**	**6.8**
R00	Nandalalpur	1449	32	8	22.1	5.5
S00	Tatua	939	16	9	17.0	9.6
T00	Amuakanda	1676	39	7	23.3	4.2
V15	Bhati Rasulpur	761	19	12	25.0	15.8
V16	Binandapur	868	20	6	23.0	6.9
V17	Hatighata	1079	22	4	20.4	3.7
V18	Torkey	3953	82	19	20.7	4.8
V25	Char Pathalia	1361	17	8	12.5	5.9
V29	Shibpur (South)	491	5	4	10.2	8.1
V33	Shibpur (North)	447	9	7	20.1	15.7
V34	Satparia	810	18	4	22.2	4.9
V52	Nayakandi	216	6	3	27.8	13.9
V54	Balairkandi	600	11	4	18.3	6.7
V55	Induria	533	13	7	24.4	13.1
V63	Islamabad (East)	2114	49	9	23.2	4.3
V67	Majlishpur	604	10	6	16.6	9.9
V81	Sonaterkandi	703	24	1	34.1	1.4
V84	Shahbajkandi	2323	52	18	22.4	7.7
V89	Islamabad (Middle)	1467	39	6	26.6	4.1
Block D Total		**22394**	**483**	**142**	**21.6**	**6.3**
ICDDR,B area Total		**113128**	**2595**	**714**	**22.9**	**6.3**
GOVERNMENT SERVICE AREA:						
A00	Uddamdi	3251	69	14	21.2	4.3
B00	Charmasua	2038	47	17	23.1	8.3
C00	Sarderkandi	3987	89	21	22.3	5.3
F00	Sepoykandi	1464	36	9	24.6	6.1
G00	Thatalia	2970	74	23	24.9	7.7
J00	Char Harigope	745	19	4	25.5	5.4
U00	Baispur	8830	208	52	23.6	5.9
V01	Kadamtali	379	6	1	15.8	2.6
V02	Nilokhi	503	10	4	19.9	8.0
V03	Char Nilokhi	623	14	5	22.5	8.0
V04	Char Pathalia	338	14	1	41.4	3.0
V05	Gazipur	3333	76	27	22.8	8.1
V06	Fatepur	2438	52	22	21.3	9.0
V07	Nayakandi	300	9	7	30.0	23.3
V08	Goalbhar	1174	27	7	23.0	6.0
V09	Naburkandi	1209	31	13	25.6	10.8
V14	Enayetnagar	771	16	7	20.8	9.1
V35	Durgapur	3731	87	21	23.3	5.6
V36	Ludhua	5605	123	40	21.9	7.1
V37**	Charputia	-	-	-	-	-
V38	Galimkha	1571	28	6	17.8	3.8
V43	Kanachak	1031	34	7	33.0	6.8
V45	Bakchar	1101	36	3	32.7	2.7
V46	Silinda	403	5	0	12.4	0.0
V47	Tulatali	1795	30	11	16.7	6.1
V48	Gangkanda	568	16	1	28.2	1.8
V49	Harina Bhabanipur	1245	23	10	18.5	8.0
V50	Bakharpur	55	0	0	0.0	0.0
V51	Induriakandi	525	14	3	26.7	5.7
V53	Chhoto Haldia	3040	67	21	22.0	6.9
V57	Baluchar	1066	18	5	16.9	4.7
V58**	Mohishmari	-	-	-	-	-

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
V64	Kawadi	4619	109	33	23.6	7.1
V65	Nayachar	804	19	3	23.6	3.7
V66	Thatalia	846	21	5	24.8	5.9
V68	Sobahan	1041	25	8	24.0	7.7
V69**	Naobangha	-	-	-	-	-
V70**	South Joypur	-	-	-	-	-
V71	Khamarpara	505	13	2	25.7	4.0
V73	Sadardia	844	18	5	21.3	5.9
V74	Ketundi	1434	34	12	23.7	8.4
V75	Mukundi	323	7	0	21.7	0.0
V76	Chosoi	1843	47	12	25.5	6.5
V78	Soladana	237	4	3	16.9	12.7
V79	Pitambordi	363	9	5	24.8	13.8
V80	Daribond	1258	35	8	27.8	6.4
V90	Narinda	1249	23	10	18.4	8.0
V95	Baluchar	2275	55	13	24.2	5.7
V96	Rampur	669	10	0	14.9	0.0
V97	Dhanagoda	338	8	3	23.7	8.9
V98	Santoshpur	125	2	0	16.0	0.0
V99	Baluakandi	520	9	4	17.3	7.7
VB1	Taltoli	1059	14	5	13.2	4.7
VB2	Sree Rayerchar	1156	31	7	26.8	6.1
VB3	Rayerkandi	3015	64	21	21.2	7.0
VB4	Ramdaspur	3610	87	31	24.1	8.6
VB5	Thakurpara	834	15	5	18.0	6.0
VB6	Sarkerpara	530	10	4	18.9	7.5
VB7	Mirpur	313	4	1	12.8	3.2
VB8	Farazikandi	1347	34	7	25.2	5.2
VB9**	Ramanathgonj	-	-	-	-	-
VB0	South Rampur	2792	57	11	20.4	3.9
D28	Bazarkhola	1128	26	5	23.0	4.4
D29	Kirtonkhola	209	2	2	9.6	9.6
D30	Banuakandi	791	25	6	31.6	7.6
D31	Harina Bazarkhola	1099	21	6	19.1	5.5
D32	Khalisha	789	12	6	15.2	7.6
D33	Nayanagar	1087	27	14	24.8	12.9
D34	Saidkharkandi	1389	37	6	26.6	4.3
D35	Mollah Kandi	627	14	0	22.3	0.0
D88	Sankibhanga	1490	39	8	26.2	5.4
D89	Sankibhanga Namapara	1143	31	4	27.1	3.5
D90	Zahirabad	958	16	2	16.7	2.1
D91**	North Joypur	-	-	-	-	-
D92**	West Joypur	-	-	-	-	-
D93	Maizkandi	1334	38	5	28.5	3.7
D94	Hazipur	1504	31	6	20.6	4.0
D95	Tapaderpara	563	12	5	21.3	8.9
D96	Sakharipara	1116	31	6	27.8	5.4
D97	Nayakandi	738	18	8	24.4	10.8
D98	Bara Haldia	3379	63	26	18.6	7.7
D99	Mandertoli	2028	41	15	20.2	7.4
Government service area Total		**111410**	**2526**	**710**	**22.7**	**6.4**

*Division by block applies only to the ICDDR,B area
**Lost due to river erosion in 1987

APPENDIX C

LIFE TABLE EQUATIONS

1. ${}_nq_x = \frac{{}_nm_x}{1/n + {}_nm_x\left[1/2 + n/12 + \left({}_nm_x - \ln C\right)\right]}$ 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. $L_0 = 0.20\, l_0 + 0.80\, l_1$

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

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

   ${}_nL_x = \frac{{}_nd_x}{{}_nm_x}$, for $5 \leq x \leq 80$

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

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

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

NOTE: lnC assumed to be 0.095; separation factors in equation 3 correspond to an infant mortality rate of 50.

APPENDIX D

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**

Source: Age standardization of rates: A new WHO standard (2000)
Available at: www.who.int/whosis/statistics/discussion_papers/pdf/paper31.pdf

APPENDIX E

MCH INTERVENTIONS IN ICDDR,B SERVICE AREA

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

APPENDIX F

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KNOWLEDGE FOR
GLOBAL LIFESAVING SOLUTIONS