

# HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM – MATLAB

Volume Forty Six  
Registration of Health and Demographic Events 2012

Scientific Report No. 124 – April 2014





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**Volume Forty Six**

**Registration of Health and Demographic Events 2012**

**Scientific Report No. 124 – April 2014**

**Centre for Population, Urbanization and Climate Change**

**icddr,b**

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## SUMMARY

This report presents the vital registration and maternal and child health data gathered from Matlab, Bangladesh, in 2012. The data were collected by the Health and Demographic Surveillance System of icddr,b. The surveillance area is divided into an icddr,b service area and a Government service area which receives usual government health and family planning services. The icddr,b service area is sub-divided into four blocks, where family planning, immunization and limited curative services are provided to under-five children and women of reproductive age.

In the surveillance area as a whole, fertility was almost the same in 2012 compared to 2011. The crude birth rate (CBR) was 21.6 per 1,000 populations in 2012 whereas in 2011 the rate was 21.5 and total fertility rate (TFR) was 2.6 per woman which was the same in 2012 and 2011. In the icddr,b service area, CBR was 22.6 and TFR was 2.7 and in the Government service area, CBR and TFR were 20.5 and 2.5 respectively.

The crude death rate was 6.6 per 1,000 population in the icddr,b service area, and in the Government service area it was 6.7 in 2012. The infant mortality rate was 20.5 per 1,000 live births in the icddr,b service area, and in the Government service area it was 37.4. The neonatal mortality decreased to 15.6 from 18.2 in the icddr,b service area and increased to 30.3 from 25.5 in the Government service area respectively in 2012 from 2011; post-neonatal mortality decreased in the icddr,b service area (6.3 to 4.9) and increased in the Government service area (6.9 to 7.1). The mortality rate among children aged less than 5 years has decreased from 31.6 in 2011 in the icddr,b service area to 28.0 in 2012, and in the Government service area, the reduction was from 43.6 in 2011 to 41.7 in 2012. The overall rate of natural increase in population size was 14.9 per 1,000 in 2012.

The rate of in-migration increased to 44.6 per 1,000 populations in 2012 from 41.5 in 2011, and the rate of out-migration decreased to 53.5 in 2012 from 57.6 in 2011. The overall annual population growth rate was 0.6%. The marriage rate was 14.5 per 1,000 populations, and the divorce rate was 1.6 per 1,000 populations.



## 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 1998, 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 in their assigned areas bi-monthly since 2007, monthly prior to that. HDSS data were collected using event registration forms since 2011 by using PDA (Personal Data Assistant). 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)<sup>1</sup>, icddr,b Special Publication No. 35 (1994), and 72 (1998)<sup>2</sup>.

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 expanded to Government service area in 2001. 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 service area were transferred to the Government service area.

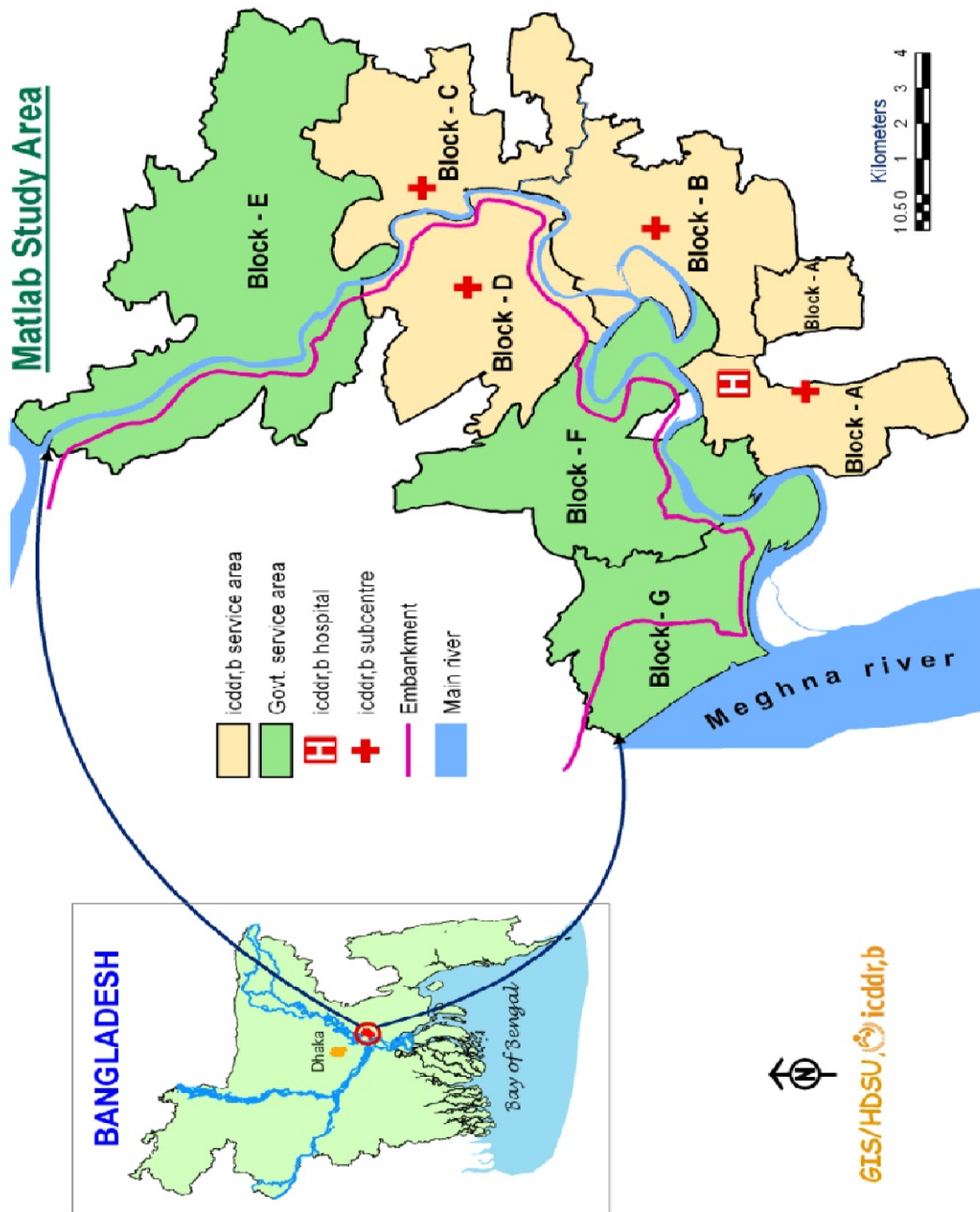
This is the forty sixth volume of a series of scientific reports of the Matlab Health and Demographic Surveillance System produced by icddr,b. Data obtained from the Matlab HDSS area in 2012, along with brief notes and explanations of the tables, are presented in this volume.

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<sup>1</sup> Available online at: <http://www.icddr.org/publication.cfm?classificationID=64&pubID=7869>

<sup>2</sup> Available online at: <http://www.icddr.org/publication.cfm?year=1998&classificationID=64>

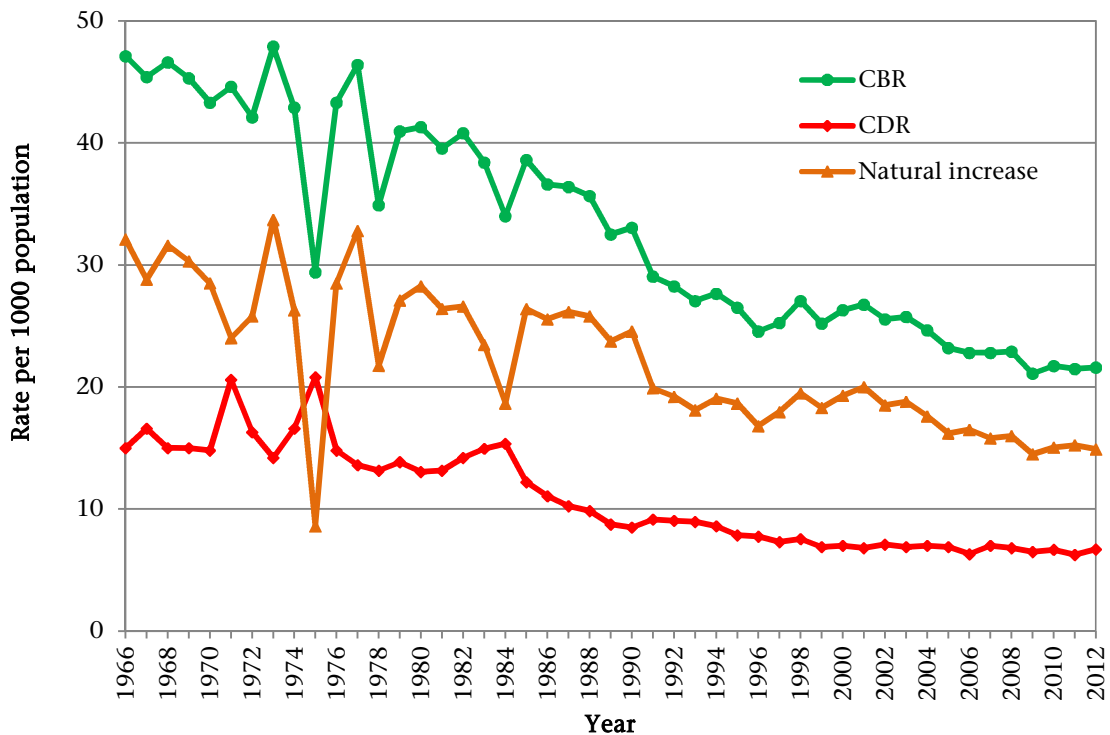
Figure 1.1 Map of Matlab study area showing icddr,b and Government service areas



## DEMOGRAPHIC TRENDS IN MATLAB

Long term Matlab HDSS data show the various transitions in the Matlab population over the period 1966-2012. 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 1966-2012, crude birth rate (CBR) has dropped by 54%, crude death rate (CDR) by 55%, and natural increase by 54%. Fertility in Matlab has remained at a moderate level since the early 1990s, and coupled with gradual declines in mortality, it is evident that Matlab is now at the third stage of the demographic transition.

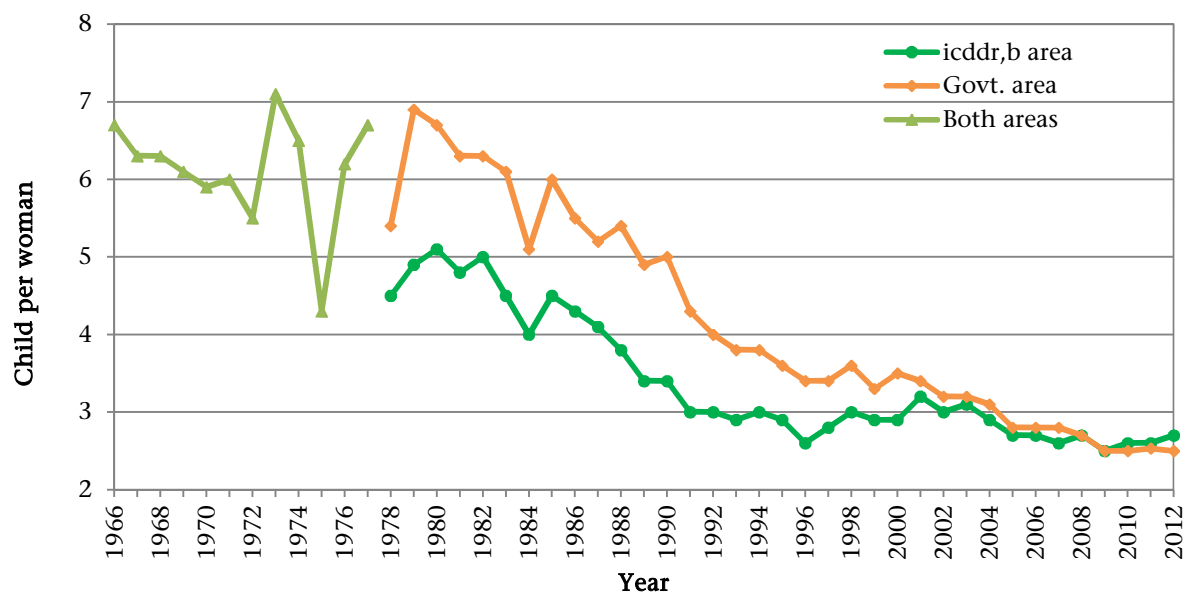
Figure 2.1 Demographic transition in Matlab, 1966-2012



Matlab surveillance area started with a high fertility level of 6.7 children per women in 1966. After re-organization of the surveillance area into icddr,b and Government service areas in 1978, total fertility rate (TFR) in icddr,b service area remained substantially lower than the Government service area (on average 1.1 child less per woman during 1978-2000). But from 2005, TFR in both areas converged. It is 2.7 children per woman in icddr,b service area and 2.5 in Government service area in 2012 (Figure 2.2).

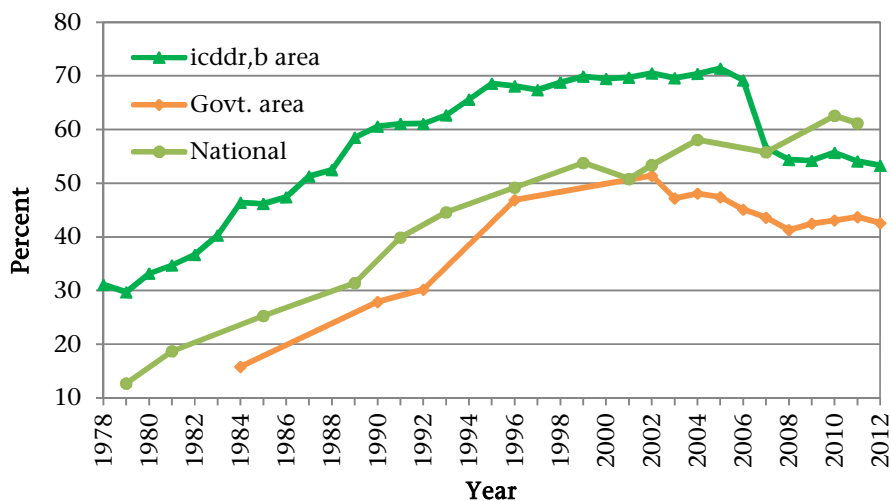


Figure 2.2 Total fertility rate (TFR) in Matlab by area, 1966-2012



Provision of contraceptive supply and advice has been carried out since the inception of the program by female CHRWs. They visited all households in the icddr,b service area on a regular basis and took this opportunity to meet with women in the household to advise and provide contraception and also to monitor the continuity of the chosen method till 2000. This method of service provision has dramatically increased women’s access to contraceptive services in Matlab and is associated with a high contraceptive prevalence rate (CPR). From 2001, this home service delivery system has been switched to the fixed-site system. From 2007, half of the CHRWs were assigned to provide services and another half to carry out the surveillance work. CPR increased in the icddr,b service area from 33.2 in 1978 to 71.4 in 2005, but has declined since 2007 was 56.6 to 53.3 in 2012 and it is lower than the national level. In the Government service area CPR is even lower than the national level, however, CPR declined from 51.4 in 2002 to 42.6 in 2012 (Figure 2.3).

Figure 2.3 Contraceptive prevalence rate (CPR) in Matlab and Bangladesh, 1978-2012



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 82.1% over the period 1978-2012. In Government service area, IMR declined by 70.2% over the period 1978-2012. Figure 2.5 shows that, during the same period, under-five mortality rate (U5MR) declined by 85.1% in icddr,b service area and 79.1% 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, 1966-2012

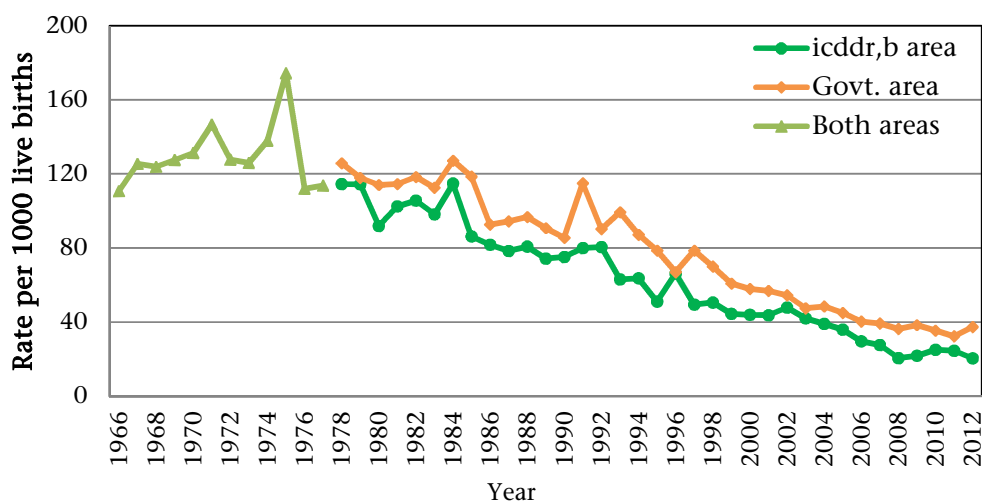
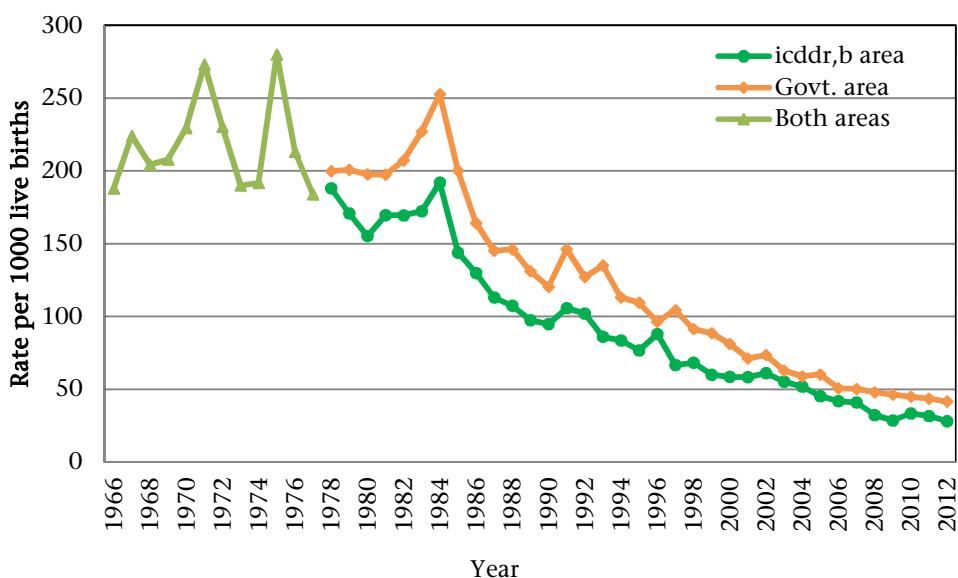


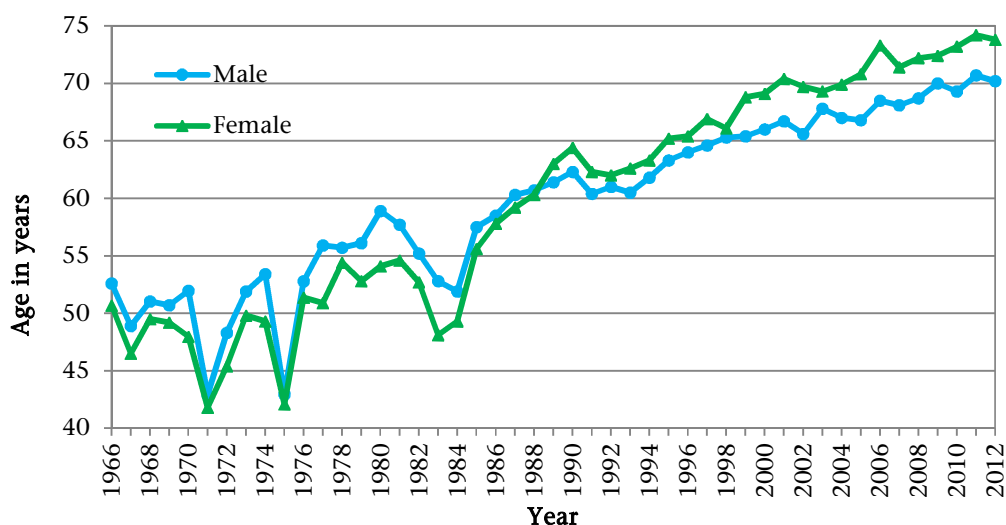
Figure 2.5 Under-five mortality rates (U5MR) in Matlab by area, 1966-2012



Massive reductions of infant and child mortality have resulted in a remarkable improvement in life expectancy at birth over the last 47 years. The life expectancy at birth for males rose from 53 years in 1966 to 70.2 in 2012, a gain of 17.2 years and for females, the improvement is even

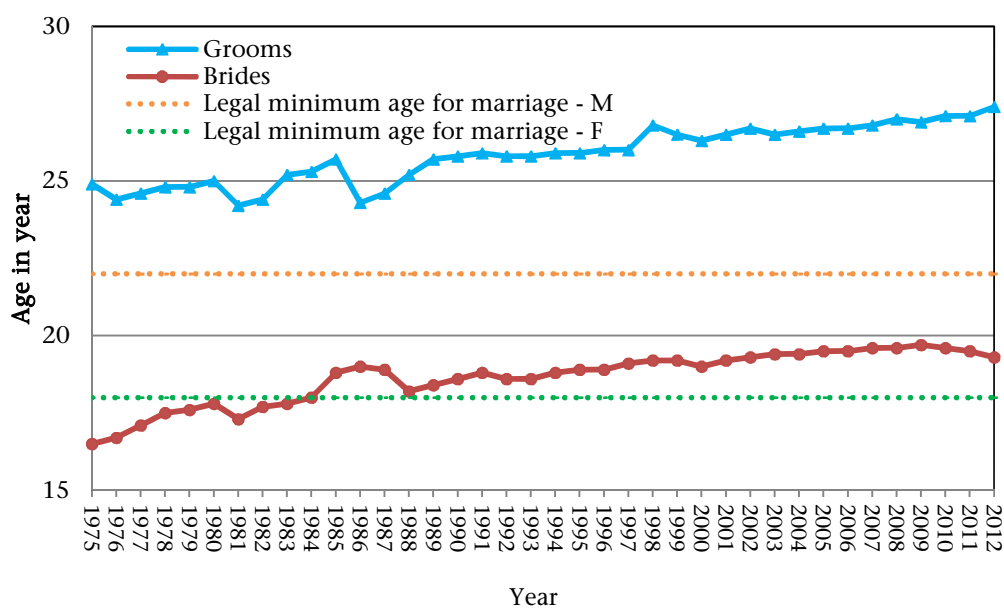
more evident, from 51 to 73.8, a gain of nearly 22.8 years for diminishing gender difference in childhood mortality and maternal mortality (Figure 2.6).

Figure 2.6 Expectation of life at birth ( $e^0$ ) in Matlab, 1966-2012



The Figure 2.7 shows the trends in mean age at first marriage for brides and grooms in Matlab. Mean age at first marriage has increased in both areas during 1975-2012. During this period, brides' mean age at marriage increased by 2.8 years and for grooms, it increased by 2.5 years.

Figure 2.7 Mean age at first marriage in Matlab, 1975-2012



### POPULATION CHANGES

The principal vital statistics of the icddr,b and Government service areas from 2001 through 2012 are summarized in Table 3.1. The mid-year population and the demographic events registered in 2012 in both icddr,b and Government service areas are shown in Table 3.2. Appendix B shows the mid-year population, births, and deaths by village.

In 2012, the crude birth rate slightly increased to 22.6 in the icddr,b service area and decreased to 20.5 in the Government service area from the 2011 level of 21.8 in the icddr,b service area and 21.1 in the Government service area respectively. In the icddr,b service area, the crude death rate increased to 6.6 in 2012 compared to 6.1 in 2011, and in the Government service area it also increased to 6.7 in 2012 compared to 6.4 in 2011. The TFR was 2.7 in year 2012 and 2.6 in 2011 in icddr,b service area but in Government service area it was same as 2.5 in 2012 and 2011. The trends in the TFR in both areas are illustrated in Figure 2.2 of Chapter 2.

The infant mortality rate decreased to 20.5 in 2012 from 24.6 in 2011 in the icddr,b service area, and increased to 37.4 in 2012 from 32.4 in 2011 in the Government service area. In the icddr,b service area, neonatal mortality also decreased to 15.6 in 2012 from 18.2 in 2011, and in the Government service area it increased to 30.3 in 2012 from 25.5 in 2011. There was slightly increase in the mortality rate of children aged 1-4 years in the icddr,b service area from 1.8 to 1.9, and decreased in the Government service area (from 2.9 to 1.1). As a result of these changes, mortality of children aged less than 5 years decreased substantially in the icddr,b service area from 31.6 per 1,000 live births in 2011 to 28.0 in 2012, and in the Government service area mortality of children aged less than 5 years decreased slightly from 43.6 in 2011 to 41.7 in 2012. The trends in mortality of children aged less than 5 years are illustrated in Figures 2.4 and 2.5 in Chapter 2.

The numbers of in- and out-migrants registered in 2012 were 10,071 and 12,077 respectively, giving an in-migration rate of 44.6/1,000, out-migration rate of 53.5 and a net migration rate of 8.9 per 1,000 populations 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 0.6%.

The age-sex distribution of the mid-year population of the Matlab HDSS area is shown in Tables 3.3 and 3.4. Block-wise mid-year population in the icddr,b service area is shown in Appendix A.1. The age-sex distribution of the mid-year population is illustrated by the population pyramid (Figure 3.1). The fertility decline in the surveillance area in the 1978-2012 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 2012, this proportion had fallen to 32.7%. In the Government service area, the change in age distribution was almost same 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 Government service area from 1978 to 2012 in 33.0%. 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 9.9% in 2012 due to the decline in both fertility and mortality. The net population increase was 6.0 per 1,000 in 2012 while it was -0.8 per 1,000 in 2011, due to the increase in the number of in-migrants. A major cause for men being fewer than women in age group 15-49, as shown in the population pyramid, could be higher out-migration rate among the men in that age group.

Table 3.1. Vital statistics of icddr,b and Government service areas\*, 2001-2012

Vital rate (per 1,000)	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Crude birth rate												
icddr,b area	26.4	25.8	26.4	24.5	23.2	22.9	22.6	23.5	21.6	22.0	21.8	22.6
Government area	27.1	25.3	25.1	24.8	23.1	22.7	23.0	22.1	20.5	21.4	21.1	20.5
Both areas	26.8	25.6	25.7	24.7	23.2	22.8	22.8	22.9	21.1	21.7	21.5	21.6
Total fertility rate**												
icddr,b area	3.1	3.0	3.1	2.9	2.7	2.7	2.6	2.7	2.5	2.6	2.6	2.7
Government area	3.4	3.2	3.2	3.1	2.8	2.8	2.8	2.7	2.5	2.5	2.5	2.5
Both areas	3.3	3.1	3.1	3.0	2.8	2.7	2.7	2.7	2.5	2.6	2.6	2.6
Crude death rate												
icddr,b area	6.5	6.9	6.8	6.7	6.9	6.3	6.8	6.4	6.2	6.7	6.1	6.6
Government area	7.0	7.3	7.0	7.4	7.0	6.4	7.1	7.2	6.9	6.7	6.4	6.7
Both areas	6.8	7.1	6.9	7.0	6.9	6.3	7.0	6.8	6.5	6.7	6.2	6.7
Neonatal mortality***												
icddr,b area	26.4	34.4	31.5	29.6	26.5	23.5	20.3	15.8	16.2	18.5	18.2	15.6
Government area	42.4	36.4	33.8	35.3	35.4	30.1	29.9	26.1	33.5	27.3	25.5	30.3
Both areas	34.7	35.4	32.6	32.5	30.9	26.8	25.1	20.7	24.4	22.7	21.7	22.4
Post-neonatal mortality***												
icddr,b area	17.2	13.5	10.6	9.5	9.6	6.2	7.4	4.9	5.7	6.7	6.3	4.9
Government area	14.5	18.1	13.7	13.2	9.6	10.3	9.4	10.4	4.9	8.1	6.9	7.1
Both areas	15.9	15.9	12.1	11.4	9.6	8.2	8.4	7.5	5.3	7.4	6.6	5.9
Infant mortality***												
icddr,b area	43.7	47.9	42.1	39.1	36.0	29.7	27.7	20.6	21.9	25.1	24.6	20.5
Government area	56.9	54.5	47.5	48.5	45.0	40.4	39.3	36.4	38.4	35.4	32.4	37.4
Both areas	50.5	51.2	44.8	43.9	40.5	35.0	33.5	28.1	29.8	30.1	28.3	28.3
Child mortality (1-4yrs) #												
icddr,b area	3.9	3.5	3.6	3.4	2.4	3.2	3.4	3.0	1.7	2.1	1.8	1.9
Government area	3.8	5.2	4.1	2.7	4.0	2.6	2.8	2.9	2.1	2.5	2.9	1.1
Both areas	3.9	4.4	3.9	3.1	3.2	2.9	3.1	3.0	1.9	2.3	2.3	1.5
Under five mortality***												
icddr,b area	58.4	61.1	55.2	51.9	45.3	41.9	41.0	32.3	28.6	33.4	31.6	28.0
Government area	71.2	73.6	62.9	58.9	60.2	50.7	50.3	47.9	46.4	45.0	43.6	41.7
Both areas	65.0	67.5	59.1	55.4	52.8	46.2	45.7	39.7	37.1	39.0	37.4	34.2
Rate of natural increase												
icddr,b area	19.9	18.9	19.6	17.8	16.3	16.6	15.8	17.1	15.4	15.3	15.7	16.0
Government area	20.1	18.0	18.0	17.5	16.1	16.3	15.9	14.9	13.7	14.7	14.8	13.8
Both areas	20.0	18.5	18.8	17.6	16.2	16.5	15.8	16.0	14.5	15.1	15.2	14.9
In-migration	34.0	45.7	40.4	42.1	35.7	43.5	40.0	44.0	54.1	48.5	41.5	44.6
Out-migration	46.2	52.4	55.4	57.9	53.3	57.3	63.5	65.7	58.0	59.5	57.6	53.5
Growth (%)	0.8	1.2	0.4	0.2	-0.1	0.3	-0.8	-0.6	1.1	0.4	-0.1	0.6
*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, 2012**

Demographic indicator	Number			Rate per 1,000		
	Total	Male	Female	Total	Male	Female
Total Population (as of 30 June 2012)						
icddr,b service area	116377	53956	62421	-	-	-
Government service area	109449	50625	58824	-	-	-
Both areas	225826	104581	121245	-	-	-
Events registered (Jan-Dec. 2012)						
Births						
icddr,b service area	2632	1342	1290	22.6	-	-
Government service area	2243	1135	1108	20.5	-	-
Both areas	4875	2477	2398	21.6	-	-
Deaths						
Infants*						
icddr,b service area	54	29	25	20.5	21.6	19.4
Government service area	84	49	35	37.4	43.2	31.6
Both areas	138	78	60	28.3	31.5	25.0
All deaths						
icddr,b service area	773	419	354	6.6	7.8	5.7
Government service area	736	400	336	6.7	7.9	5.7
Both areas	1509	819	690	6.7	7.8	5.7
In-migration	10071	4628	5443	44.6	44.3	44.9
Out-migration	12077	5998	6079	53.5	57.4	50.1
Marriage	3268	-	-	14.5	-	-
Divorce**	368	-	-	1.6	-	-
Population change (Jan-Dec. 2012)						
Net migration	-2006	-1370	-636	-8.9	-13.1	-5.2
Natural increase						
icddr,b service area	1859	923	936	16.0	17.1	15.0
Government service area	1507	735	772	13.8	14.5	13.1
Both areas	3366	1658	1708	14.9	15.9	14.1
Net increase	1360	288	1072	6.0	2.8	8.8
*Rate per 1,000 live births						
**Rate per 1,000 populations						

**Table 3.3. Mid-year population by age and sex, 2012**

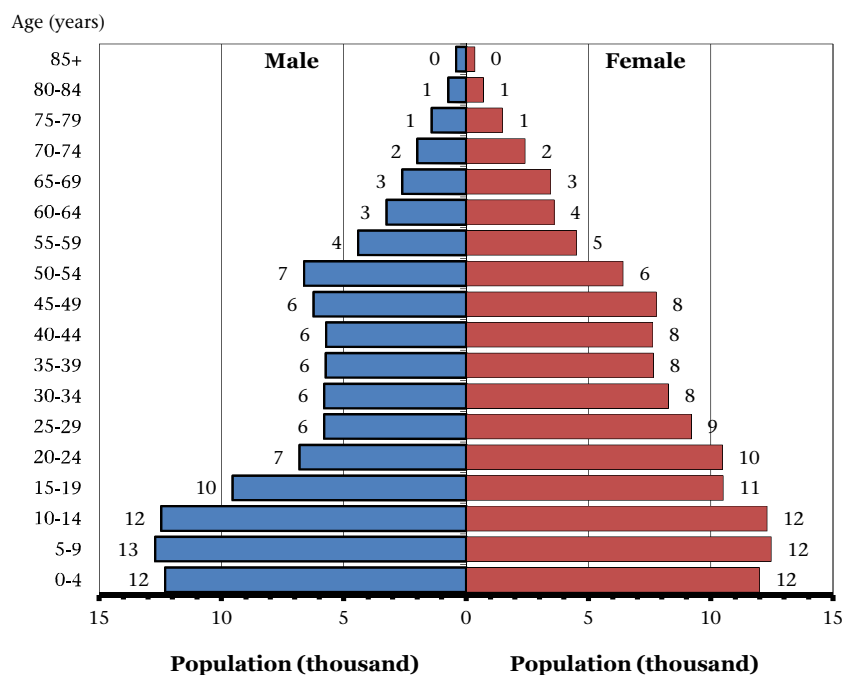
Age (years)	Number			Percent		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	225826	104581	121245	100.0	100.0	100.0
<1 year	5084	2590	2494	2.3	2.5	2.1
1 – 4	19207	9710	9497	8.5	9.3	7.8
1	4736	2388	2348	2.1	2.3	1.9
2	4577	2305	2272	2.0	2.2	1.9
3	4768	2411	2357	2.1	2.3	1.9
4	5126	2606	2520	2.3	2.5	2.1
5 – 9	25192	12715	12477	11.2	12.2	10.3
10-14	24754	12456	12298	11.0	11.9	10.1
15-19	20054	9542	10512	8.9	9.1	8.7
20-24	17285	6805	10480	7.7	6.5	8.6
25-29	15017	5809	9208	6.6	5.6	7.6
30-34	14067	5797	8270	6.2	5.5	6.8
35-39	13406	5743	7663	5.9	5.5	6.3
40-44	13355	5726	7629	5.9	5.5	6.3
45-49	14018	6238	7780	6.2	6.0	6.4
50-54	13046	6633	6413	5.8	6.3	5.3
55-59	8934	4421	4513	4.0	4.2	3.7
60-64	6846	3247	3599	3.0	3.1	3.0
65-69	6061	2605	3456	2.7	2.5	2.9
70-74	4400	1990	2410	1.9	1.9	2.0
75-79	2900	1414	1486	1.3	1.4	1.2
80-84	1433	727	706	0.6	0.7	0.6
85+	767	413	354	0.3	0.4	0.3



Table 3.4. Mid-year population by age, sex, and area, 2012

Age (years)	icddr,b service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	116377	53956	62421	109449	50625	58824
<1 year	2702	1375	1327	2382	1215	1167
1 – 4	9943	5077	4866	9264	4633	4631
1	2405	1227	1178	2331	1161	1170
2	2421	1235	1186	2156	1070	1086
3	2493	1252	1241	2275	1159	1116
4	2624	1363	1261	2502	1243	1259
5 – 9	13003	6552	6451	12189	6163	6026
10-14	12436	6134	6302	12318	6322	5996
15-19	10004	4696	5308	10050	4846	5204
20-24	8742	3359	5383	8543	3446	5097
25-29	7888	3055	4833	7129	2754	4375
30-34	7359	3104	4255	6708	2693	4015
35-39	7261	3130	4131	6145	2613	3532
40-44	7026	3040	3986	6329	2686	3643
45-49	7427	3360	4067	6591	2878	3713
50-54	6715	3453	3262	6331	3180	3151
55-59	4546	2282	2264	4388	2139	2249
60-64	3452	1639	1813	3394	1608	1786
65-69	3056	1328	1728	3005	1277	1728
70-74	2226	1021	1205	2174	969	1205
75-79	1450	742	708	1450	672	778
80-84	721	378	343	712	349	363
85+	420	231	189	347	182	165

Figure 3.1. Age pyramid of the 2012 mid-year population



## CHAPTER 4

### MORTALITY

The distribution of 1,509 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 1,509 deaths, 9.1% were infants, 2.0% were children aged 1-4 years, and 64.7% were aged 60 years and above.

Table 4.3 shows difference in mortality rates per 1000 mid-year population and per 1000 person-years. The age-specific rates did not differ for changing units from mid-year population to person-years. Henceforth, subsequent tables provide rate per 1000 mid-year population. Table 4.4 shows the corresponding age-sex-specific mortality rates for the icddr,b and Government service areas respectively. In 2012, the overall death rates for males and females were 7.8 and 5.7 respectively. Infant mortality rate was 31.5 per 1,000 live births for males and 25.0 for females. It was lower in the icddr,b service area (21.6 and 19.4, respectively) than in the Government service area (43.2 and 31.6 respectively), a result of improvements in the neonatal mortality in the icddr,b service area. Block-wise deaths in the icddr,b service area by age and sex are shown in Appendix A.2.

Table 4.5 shows the abridged life tables for males and females derived from age-sex specific death rates, and the survival ( $l_x$ ) values are plotted in Figure 4.1 (for Life Table Equations see Appendix C). The expectation of life at birth was 70.2 years for males and 73.8 for females in 2012 and 70.7 for males and 74.2 for females in 2011. The level of male adult (15-59 years) mortality increased in 2012 compared to 2011. The probability of dying for males aged 15-59 years ( ${}_{45}q_{15}$ ) was 159.7, and for females it was 107.7 per 1,000 populations in 2012 and in 2011 it was 151.4 and 77.1 for males and females respectively. In most of the age-groups, expectation of life is longer for females than males.

The expectation of life at birth was higher for females than males in both the icddr,b service area and the Government service area. In 2011, the gender difference in expectation of life was lower in the icddr,b service area (2.6 years) than in the Government service area (4.8 years). Expectation of life at most of the age-groups in each area was higher for females than for males (Appendices A.3 and A.4).

Table 4.6 shows the distribution of deaths by age and month of occurrence. Deaths of those aged 5 years and above tend to peak in the months November-March. Neonatal deaths were most frequent in June, July, September, October, and November. Post-neonatal deaths were highest in November and child deaths, on the other hand, were lower in January-March. Figure 4.1 shows that the probability of survival for males and females started to differ from age 45 with females having a higher probability of survival in later age-groups.

Deaths due to communicable diseases led by septicaemia and respiratory infections occurred more in males than females in icddr,b service area and comparable between males and females in the Government service area. Deaths due to hepatitis and tuberculosis occurred more in males than females in each area.

Deaths by underlying causes, sex, age, and by areas are shown in Appendix A.5 – A.8. Table 4.7 gives the age-standardized mortality rates by cause of death (obtained using Verbal Autopsy) and sex and by area, using the WHO-standard world population age structure as shown in Appendix D (WHO, 2000). Deaths due to communicable diseases led by septicaemia and respiratory infections occurred more in males than females in icddr,b service area and no sex difference in Government service area. Deaths due to tuberculosis and hepatitis occurred more in males than females in both the areas. Prematurity and low birth weights 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 other cardiovascular disease), neoplasms, COPD, 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 area.

Table 4.1. Deaths by age and sex in both areas, 2012

Age (years)	Both sexes		Male		Female	
	Number	Cumulative percentage	Number	Cumulative percentage	Number	Cumulative percentage
All ages	1509	-	819	-	690	-
<1 year	138	-	78	-	60	-
<1 month	109	7.2	64	7.8	45	6.5
1- 5 months	24	8.8	11	9.2	13	8.4
6-11 months	5	9.1	3	9.5	2	8.7
1 – 4 years	29	-	15	-	14	-
1	16	10.2	8	10.5	8	9.9
2	3	10.4	1	10.6	2	10.1
3	6	10.8	3	11.0	3	10.6
4	4	11.1	3	11.4	1	10.7
5 – 9	10	11.7	7	12.2	3	11.2
10-14	10	12.4	3	12.6	7	12.2
15-19	11	13.1	5	13.2	6	13.0
20-24	19	14.4	7	14.0	12	14.8
25-29	19	15.6	10	15.3	9	16.1
30-34	10	16.3	4	15.8	6	17.0
35-39	15	17.3	9	16.8	6	17.8
40-44	25	19.0	9	17.9	16	20.1
45-49	70	23.6	35	22.2	35	25.2
50-54	77	28.7	50	28.3	27	29.1
55-59	99	35.3	64	36.1	35	34.2
60-64	105	42.2	68	44.4	37	39.6
65-69	134	51.1	75	53.6	59	48.1
70-74	204	64.6	99	65.7	105	63.3
75-79	250	81.2	123	80.7	127	81.7
80-84	154	91.4	81	90.6	73	92.3
85+	130	100.0	77	100.0	53	100.0

Table 4.2. Deaths by area, age, and sex, 2012

Age (years)	icddr,b service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	773	419	354	736	400	336
<1 year	54	29	25	84	49	35
<1 month	41	26	15	68	38	30
1- 5 months	12	3	9	12	8	4
6-11 months	1	0	1	4	3	1
1 – 4 years	19	9	10	10	6	4
1	11	4	7	5	4	1
2	1	0	1	2	1	1
3	3	2	1	3	1	2
4	4	3	1	0	0	0
5 – 9	4	3	1	6	4	2
10-14	4	0	4	6	3	3
15-19	7	3	4	4	2	2
20-24	8	4	4	11	3	8
25-29	12	6	6	7	4	3
30-34	3	1	2	7	3	4
35-39	5	2	3	10	7	3
40-44	10	2	8	15	7	8
45-49	36	18	18	34	17	17
50-54	47	29	18	30	21	9
55-59	47	30	17	52	34	18
60-64	52	32	20	53	36	17
65-69	75	42	33	59	33	26
70-74	105	53	52	99	46	53
75-79	133	70	63	117	53	64
80-84	78	44	34	76	37	39
85+	74	42	32	56	35	21

Table 4.3. Death rates by age and sex in both areas, 2012

Age (years)	Rate per 1,000 mid-year population			Rate per 1,000 person-years		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	6.7	7.8	5.7	6.7	7.8	5.7
<1 year*	28.3	31.5	25.0	28.3	31.5	25.0
<1 month*	22.4	25.8	18.8	22.4	25.8	18.8
1- 5 months*	4.9	4.4	5.4	4.9	4.4	5.4
6-11 months*	1.0	1.2	0.8	1.0	1.2	0.8
1 – 4 years	1.5	1.5	1.5	1.5	1.5	1.5
1	3.4	3.4	3.4	3.4	3.3	3.4
2	0.7	0.4	0.9	0.7	0.4	0.9
3	1.3	1.2	1.3	1.3	1.2	1.3
4	0.8	1.2	0.4	0.8	1.2	0.4
5 – 9	0.4	0.6	0.2	0.4	0.5	0.2
10-14	0.4	0.2	0.6	0.4	0.2	0.6
15-19	0.5	0.5	0.6	0.5	0.5	0.6
20-24	1.1	1.0	1.1	1.1	1.0	1.1
25-29	1.3	1.7	1.0	1.3	1.7	1.0
30-34	0.7	0.7	0.7	0.7	0.7	0.7
35-39	1.1	1.6	0.8	1.1	1.6	0.8
40-44	1.9	1.6	2.1	1.9	1.6	2.1
45-49	5.0	5.6	4.5	5.0	5.7	4.5
50-54	5.9	7.5	4.2	5.9	7.5	4.2
55-59	11.1	14.5	7.8	11.1	14.5	7.7
60-64	15.3	20.9	10.3	15.3	20.8	10.2
65-69	22.1	28.8	17.1	22.1	28.8	17.1
70-74	46.4	49.7	43.6	45.8	49.1	43.0
75-79	86.2	87.0	85.5	86.4	87.4	85.4
80-84	107.5	111.4	103.4	106.7	110.9	102.4
85+	169.5	186.4	149.7	168.4	184.7	149.3

\*Rate per 1,000 live births

Table 4.4. Death rates by area, age, and sex, 2012  
(per 1,000 population)

Age (years)	icddr,b service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	6.6	7.8	5.7	6.7	7.9	5.7
<1 year	20.5	21.6	19.4	37.4	43.2	31.6
<1 month*	15.6	19.4	11.6	30.3	33.5	27.1
1- 5 months*	4.6	2.2	7.0	5.3	7.0	3.6
6-11 months*	0.4	0.0	0.8	1.8	2.6	0.9
1 – 4 years	1.9	1.8	2.1	1.1	1.3	0.9
1	4.6	3.3	5.9	2.1	3.4	0.9
2	0.4	0.0	0.8	0.9	0.9	0.9
3	1.2	1.6	0.8	1.3	0.9	1.8
4	1.5	2.2	0.8	0.0	0.0	0.0
5 – 9	0.3	0.5	0.2	0.5	0.6	0.3
10-14	0.3	0.0	0.6	0.5	0.5	0.5
15-19	0.7	0.6	0.8	0.4	0.4	0.4
20-24	0.9	1.2	0.7	1.3	0.9	1.6
25-29	1.5	2.0	1.2	1.0	1.5	0.7
30-34	0.4	0.3	0.5	1.0	1.1	1.0
35-39	0.7	0.6	0.7	1.6	2.7	0.8
40-44	1.4	0.7	2.0	2.4	2.6	2.2
45-49	4.8	5.4	4.4	5.2	5.9	4.6
50-54	7.0	8.4	5.5	4.7	6.6	2.9
55-59	10.3	13.1	7.5	11.9	15.9	8.0
60-64	15.1	19.5	11.0	15.6	22.4	9.5
65-69	24.5	31.6	19.1	19.6	25.8	15.0
70-74	47.2	51.9	43.2	45.5	47.5	44.0
75-79	91.7	94.3	89.0	80.7	78.9	82.3
80-84	108.2	116.4	99.1	106.7	106.0	107.4
85+	176.2	181.8	169.3	161.4	192.3	127.3

\*Rate per 1,000 live births

Table 4.5. Abridged life table by sex, 2012

Age (years)	Male				Female			
	$nq_x$	$l_x$	$L_x$	$e0_x$	$nq_x$	$l_x$	$L_x$	$e0_x$
0	31.5	100000	97323	70.2	25.0	100000	97873	73.8
1	3.3	96851	96660	71.4	3.4	97498	97302	74.7
2	0.4	96527	96506	70.7	0.9	97166	97124	73.9
3	1.2	96485	96425	69.7	1.3	97081	97019	73.0
4	1.2	96365	96310	68.8	0.4	96957	96938	72.1
5	2.7	96254	480662	67.9	1.2	96919	484326	71.1
10	1.2	95990	479683	63.1	2.8	96802	483378	66.2
15	2.6	95874	478793	58.1	2.9	96527	482003	61.4
20	5.1	95623	476986	53.3	5.7	96252	479994	56.6
25	8.6	95133	473783	48.5	4.9	95703	477437	51.9
30	3.4	94317	470837	43.9	3.6	95236	475385	47.1
35	7.8	93992	468269	39.1	3.9	94891	473601	42.3
40	7.8	93258	464608	34.4	10.4	94520	470326	37.4
45	27.7	92528	456711	29.6	22.3	93534	462856	32.8
50	37.0	89966	442104	25.4	20.8	91451	452852	28.5
55	70.0	86633	419018	21.2	38.1	89545	439817	24.0
60	99.8	80567	383973	17.6	50.2	86134	420622	19.9
65	134.8	72526	339539	14.3	82.1	81810	393351	15.8
70	222.2	62750	280215	11.1	197.3	75094	340024	11.9
75	357.7	48810	200696	8.6	352.6	60280	248688	9.2
80	434.4	31352	122244	6.9	410.2	39026	154828	7.9
85+	1000.0	17732	95108	5.4	1000.0	23017	153737	6.7

Table 4.6. Deaths by month and age, 2012

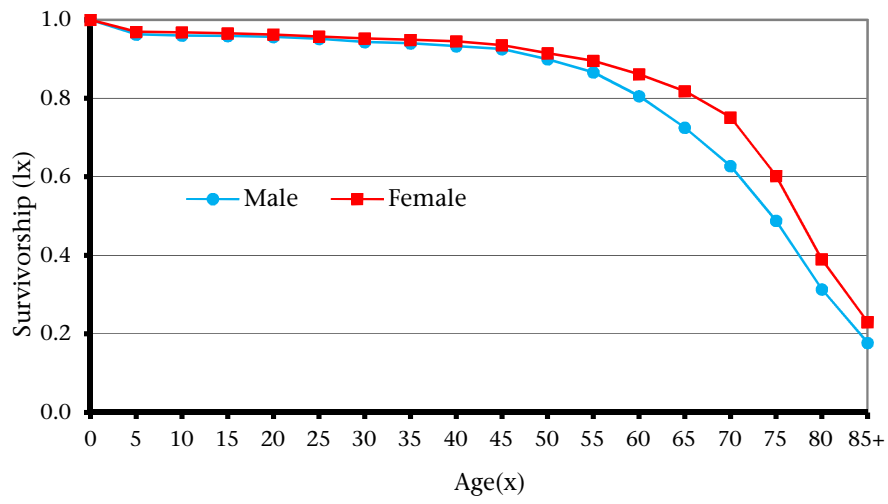
Months	All ages	Age at death			
		<1 month	1-11 months	1-4 years	5 years and above
January	137	5	3	1	128
February	150	8	1	1	140
March	130	7	0	1	122
April	112	9	1	3	99
May	123	9	4	2	108
June	106	10	1	3	92
July	102	10	2	3	87
August	90	8	3	3	76
September	105	10	3	3	89
October	131	12	4	3	112
November	163	12	6	3	142
December	160	9	1	3	147
<b>Total</b>	<b>1509</b>	<b>109</b>	<b>29</b>	<b>29</b>	<b>1342</b>



Table 4.7. Age-standardized mortality rates by cause of death, 2012  
(per 100,000 population)\*

Cause of death	Male		Female	
	icddr,b area	Government area	icddr,b area	Government area
<b>Communicable diseases</b>				
Diarrhoeal	13.00	(2.23)	11.59	11.87
Dysentery	0.00	0.00	0.00	0.00
Tuberculosis	9.89	22.73	(2.03)	0.00
Hepatitis	17.41	10.30	(7.08)	(1.83)
Chicken pox	0.00	0.00	0.00	0.00
Rabies	0.00	0.00	0.00	0.00
Septicaemia	20.38	18.00	35.38	13.63
Respiratory infections	18.46	14.39	8.21	14.05
Other communicable	(2.26)	8.28	0.00	0.00
<b>Maternal and neonatal conditions</b>				
Maternal death	-	-	(3.38)	(7.29)
Premature and LBW	(2.62)	(2.96)	(1.36)	(1.54)
Birth asphyxia	14.40	26.67	6.78	24.68
Other neonatal	15.71	20.74	8.14	18.51
Nutritional	11.41	20.47	19.05	10.65
<b>Non-communicable diseases</b>				
Neoplasm	101.15	73.87	31.24	48.41
Neoplasm in female organ	0.00	0.00	(6.83)	8.96
Congenital malformation	(2.62)	(2.96)	8.23	(4.49)
Diabetes	21.67	14.99	25.08	11.19
Other endocrine	0.00	(1.41)	(3.52)	0.00
Neuro-psychiatric	(3.59)	(7.24)	13.64	(6.89)
Rheumatic heart disease	0.00	(1.36)	(2.95)	0.00
Hypertensive disease	(2.17)	(4.38)	(6.06)	(3.79)
Ischaemic heart disease	135.31	108.92	64.79	79.60
Stroke	219.65	236.65	246.50	192.67
Other cardiovascular	49.30	40.92	42.76	51.85
COPD**	58.91	60.27	27.02	37.28
Asthma	(2.60)	0.00	(1.52)	(1.74)
Other respiratory	12.32	(8.25)	(2.03)	(1.83)
Digestive disease	23.03	42.54	20.64	12.50
Renal failure	13.99	12.74	9.68	(5.32)
Other non-communicable	10.72	(6.66)	(3.30)	0.00
<b>Accident/injury</b>				
Accident	33.44	24.47	28.83	26.83
Drowning	14.57	15.97	8.63	(5.10)
Suicide	(5.03)	(9.71)	7.88	9.88
Homicide	(4.60)	(4.91)	(3.24)	(3.41)
<b>Miscellaneous causes</b>				
Fever of unknown origin	(2.26)	0.00	0.00	(4.22)
Sudden infant death	0.00	0.00	0.00	0.00
<b>Unknown/missing/unspecified</b>				
	28.66	71.58	40.31	50.27
<b>Total</b>	<b>871.11</b>	<b>896.58</b>	<b>707.67</b>	<b>670.24</b>
*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, 2012



## FERTILITY

In 2012, there were 4,875 live births in the Matlab HDSS area as outcomes of 5,681 pregnancy terminations recorded. Table 5.1 shows the number of pregnancy terminations and their outcomes in 2012. In the Matlab HDSS area as a whole, 84.8% of pregnancies resulted in a live birth, a proportion that remains almost the same from year to year; pregnancies resulting in fetal wastage show no definite trend. Among the pregnancies resulting in live births, 62 were multiple births. Among these one had triple live births

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 October, December and January,. The sex ratio of live births was 103 males per 100 females; there is no definite trend over the period. Figure 5.1 shows births and deaths by month of occurrence. Seasonality of births peaks in January, July-August, October to December.

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

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

Table 5.4 shows marked variation in the distribution of live birth pregnancies by place of delivery and area. Institutional delivery accounts for 82% in the icddr,b service area and 38% in the Government service area. More commonly used places for institutional delivery in the Government service area were private clinic/nursing home (27.4%) and Upazila Health Complex (5.6%), and in icddr,b service area, icddr,b hospital and sub-centre (34.5% and 9.6% respectively) followed by private clinic/nursing home (28.6%). Table 5.5 shows the distribution of live birth pregnancies by birth attendants<sup>3</sup> and area. In the icddr,b service area, MBBS doctor assisted was the highest number (34.9%) followed by nurse (34.4%) and Family Welfare Visitor (FWV) (13.6%) of the live-birth deliveries as opposed to TBAs (44.4%), and MBBS doctor (27.2%) in the Government service area. The respective figures for trained TBAs were 5.2% and 15.0% in the icddr,b service area and Government service area, respectively. Medically trained birth attendants (doctors, nurses or midwives, lady family planning visitors or family welfare visitors)

<sup>3</sup> The most qualified attendant was considered if there was more than one in attendance.

assisted 82.9% of the live birth deliveries in the icddr,b service area and 40.3% in the Government service area.

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 67.8% in the icddr,b service area and 75.1% in the Government service area.

Matlab HDSS recorded pre-natal care received by mothers in different stages of pregnancy in 2012. Table 5.7 shows pre-natal care received by mothers who had a live birth in 2012 in three trimesters by type of service providers. In the icddr,b service area, in first trimester 59.4% of the mothers did not receive any pre-natal care as opposed to 86.5% in the Government service area. The respective figures for 2<sup>nd</sup> and 3<sup>rd</sup> trimester were 3.5% and 2.4% in the icddr,b service area and 38.4% & 16.2% in the Government service area. In the icddr,b service area, seeking pre-natal care from skilled providers accounts for 40.4% in first trimester and 96.4%-97.5% in second and third trimesters. In this area, providers of pre-natal care are icddr,b sub-centres (64.8% and 45.5% in 2<sup>nd</sup> and 3<sup>rd</sup> trimesters respectively) and icddr,b Matlab hospital (25.8% and 42.3% in 2<sup>nd</sup> and 3<sup>rd</sup> trimesters respectively). In the Government service area, skilled providers of prenatal care are private clinics (29.5% and 61.6% in 2<sup>nd</sup> and 3<sup>rd</sup> trimesters respectively), community clinics or Health family welfare centres (9.5% and 8.1% in 2<sup>nd</sup> and 3<sup>rd</sup> trimesters respectively) and government hospitals (3.9% and 2.6% in 2<sup>nd</sup> and 3<sup>rd</sup> trimesters respectively). In this area, others (that include untrained village doctors, herbalists (*kabiraj*) and homeopaths) are common providers of pre-natal care.

Figure 5.1. Number of births and deaths by month, 2012

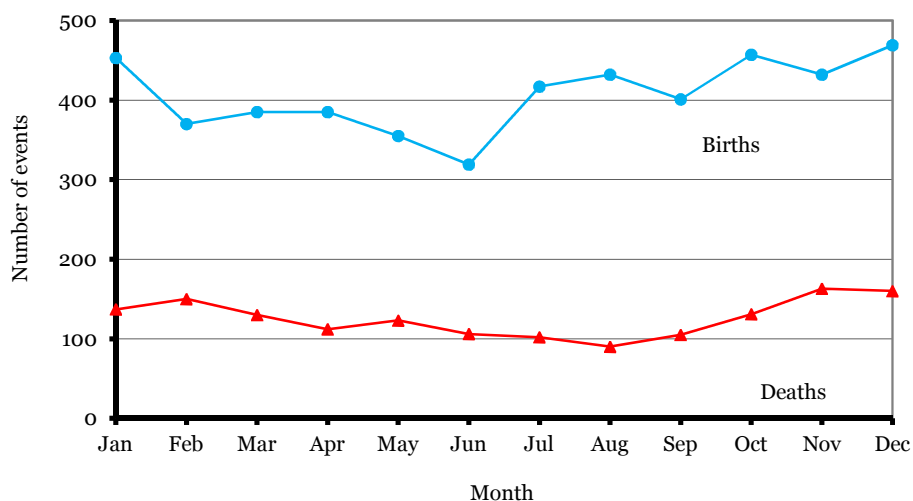


Table 5.1. Numbers and rates of pregnancy outcomes by type and area, 2012.

Type of pregnancy outcome	Both areas		icddr,b area		Government area	
	Number	Rate	Number	Rate	Number	Rate
Total pregnancies*	5681	92.3	2994	93.7	2687	90.8
Live birth preg.**	4818	848.1	2605	870.1	2213	823.6
Fetal wastage**	863	151.9	389	129.9	474	176.4
Early(miscarriage)***	776	136.6	364	121.6	412	153.3
<i>Induced</i>	251	44.2	104	34.7	147	54.7
<i>Spontaneous</i>	525	92.4	260	86.8	265	98.6
Late (still birth)	87	15.3	25	8.4	62	23.1
Multiple birth pregnancy	65		29		36	
Multiple live birth pregnancy	62		29		33	
<i>Three live births</i>	1		0		1	
<i>Two live births</i>	55		27		28	
<i>One live birth</i>	6		2		4	
Still birth pregnancies	1		0		1	
Three still births	0		0		0	
Two still births	1		0		1	
Miscarriage pregnancies	2		0		2	

\*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, 2012

Months	Pregnancy outcome					No. of live born children			
	Miscarriage			Still birth	Live birth <sup>a</sup>	Both sexes	Male	Female	Ratio
	All	Induced	Spon.						
All months	5681	251	525	87	4818	4875	2477	2398	1.03
January	513	21	38	5	449	453	231	222	1.04
February	437	29	34	6	368	370	189	181	1.04
March	465	22	53	10	380	385	202	183	1.10
April	469	30	50	7	382	385	205	180	1.14
May	429	22	46	11	350	355	178	177	1.01
June	390	23	45	6	316	319	171	148	1.16
July	487	16	52	8	411	417	225	192	1.17
August	481	13	36	7	425	432	218	214	1.02
September	460	19	42	4	395	401	199	202	0.99
October	525	17	48	9	451	457	219	238	0.92
November	501	19	43	10	429	432	207	225	0.92
December	524	20	38	4	462	469	233	236	0.99

<sup>a</sup>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, 2012

Age (years)	Both areas		icddr,b area		Government area	
	Births	Rate	Births	Rate	Births	Rate
All ages	4875	79.2	2632	82.3	2243	75.8
15-19*	734	69.8	410	77.2	324	62.3
20-24	1679	160.2	905	168.1	774	151.9
25-29	1255	136.3	670	138.6	585	133.7
30-34	816	98.7	443	104.1	373	92.9
35-39	322	42.0	171	41.4	151	42.8
40-44	69	9.0	33	8.3	36	9.9
45-49**	0	0.0	0	0.0	0	0.0
Total fertility rate		2580		2689		2467
General fertility rate		79		82		76
Gross reproduction rate		1269		1318		1219
Net reproduction rate		1213		1265		1159
*Births to mothers under age 15 were included in this group						
**Births to mothers age 50 and above were included in this group						

Table 5.4. Distribution of live birth pregnancies by place of delivery by area, 2012

Place of Delivery	Both areas		icddr,b area		Government area	
	Number	Percent	Number	Percent	Number	Percent
Home	1833	38.0	463	17.8	1370	61.9
icddr,b sub-centre	249	5.2	249	9.6	0	0.0
icddr,b hospital	903	18.7	900	34.5	3	0.1
Upazila health complex	145	3.0	20	0.8	125	5.6
District hospital	268	5.6	216	8.3	52	2.3
Clinic/nursing home	1351	28.0	745	28.6	606	27.4
Union Health and Family Welfare Centre	56	1.2	4	0.2	52	2.3
Others	13	0.3	8	0.3	5	0.2
<b>Total</b>	<b>4818</b>	<b>100.0</b>	<b>2605</b>	<b>100.0</b>	<b>2213</b>	<b>100.0</b>
Source: Birth registration form						

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Figure 5.2. Age-specific fertility rates by area, 2012

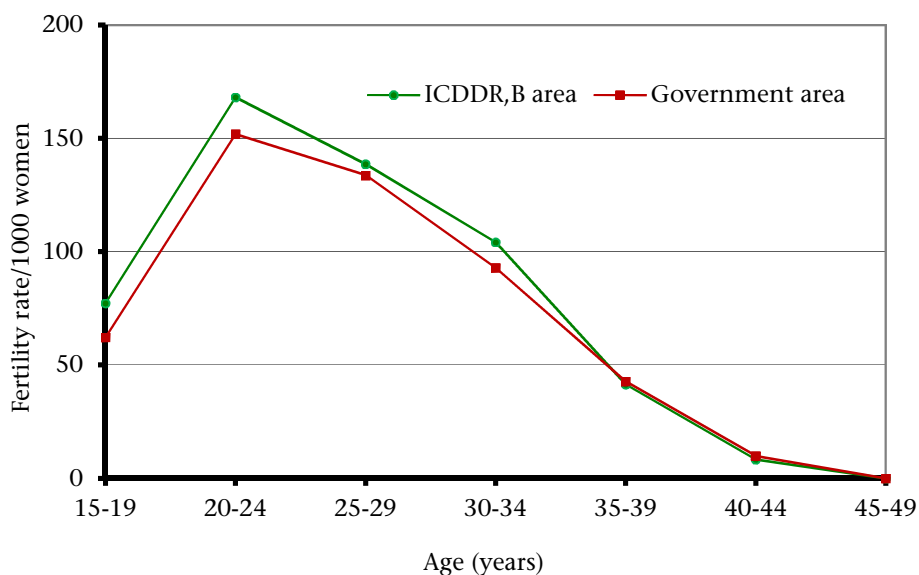


Table 5.5. Distribution of live birth pregnancies attendant by area, 2012

Birth attendant	Both areas		icddr,b area		Government area	
	Number	Percent	Number	Percent	Number	Percent
TBA	1270	26.4	288	11.1	982	44.4
Trained TBA	468	9.7	136	5.2	332	15.0
FWV	433	9.0	355	13.6	78	3.5
Nurse	1109	23.0	897	34.4	212	9.6
MBBS doctor	1511	31.4	909	34.9	602	27.2
Others	26	0.5	19	0.7	7	0.3
None	1	0.0	1	0.0	0	0.0
<b>Total</b>	<b>4818</b>	<b>100.0</b>	<b>2605</b>	<b>100.0</b>	<b>2213</b>	<b>100.0</b>

TBA=Traditional Birth Attendant  
FWV= Family Welfare Visitor

Table 5.6. Distribution of mode of delivery by area, 2012

Mode of Delivery	Both areas		icddr,b area		Government area	
	Number	Percent	Number	Percent	Number	Percent
Normal vaginal	3430	71.2	1767	67.8	1663	75.1
Operation (C/S)	1388	28.8	838	32.2	550	24.9
<b>Total</b>	<b>4818</b>	<b>100.0</b>	<b>2605</b>	<b>100.0</b>	<b>2213</b>	<b>100.0</b>



Table 5.7. Percentage of prenatal care in different trimester and area, 2012

Source	icddr,b service area			Government service area		
	1 <sup>st</sup> trimester	2 <sup>nd</sup> trimester	3 <sup>rd</sup> trimester	1 <sup>st</sup> trimester	2 <sup>nd</sup> trimester	3 <sup>rd</sup> trimester
Trained TBA	0.0	0.0	0.0	0.1	0.1	0.2
CC/H &FWC/Sat. Clinic	0.0	0.0	0.0	1.5	9.5	8.1
icddr,b Sub-centre	34.0	64.8	45.5	0.3	6.1	3.2
Govt. Hospital/UHC	0.3	0.5	0.9	0.8	3.8	2.5
icddr,b Hospital	3.2	25.8	42.3	0.2	0.6	1.1
Chandpur MCWC	0.0	0.1	0.2	0.0	0.1	0.1
Private Clinic	2.9	5.1	8.6	8.8	29.5	61.6
Others	0.2	0.1	0.1	1.8	11.8	7.0
No care	59.4	3.5	2.4	86.5	38.4	16.2
<b>No. of live birth</b>	2605	2605	2605	2213	2213	2213

CC=Community Clinic, H&FWC=Health and Family Welfare Centre, UHC= Upazila Health Complex  
MCWC=Maternal and Child Welfare Clinic

## 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 2012 was 3,268, giving a crude marriage rate of 14.5 per 1,000 populations. This rate is almost same as 2011 which was 14.3.

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 28.3 and 20.0 years for all grooms and brides respectively; 27.4 and 19.3 years for those marrying for the first time—are almost the same as those of 2011. One-third (32.8%) of the brides, who are married for the first time aged below 18 years. 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.

Table 6.3 shows the marriage rates by age and sex. Among males, the marriage rate was 41.1 per 1,000 males aged 10 years and above, and for females the rate was 33.8 per 1,000 females aged 10 years and above. For females, the highest rate was 234.0 per 1,000 at the age of 18 years, while for males the highest rate was 259.9 per 1,000 in the age of 27 years. The age group for the highest rate of marriage for males changed to age 27 years in 2012 from 26 years in 2011, but the age group for the highest rate of marriage for female changed to age 18 years in 2012 from 19 years in 2011. Table 6.4 shows distribution of current marital status of the study population by age and sex in 2012. Of the total population 48.6% were currently married and it was higher for females than males (50.9% vs 45.9%). Widows also constituted a higher proportion for females (9.5%) than males (0.8%)- this difference, along with age-difference at marriage and life expectancy, maybe due to remarriage, which is more common for men than for women.

Table 6.6 shows the distribution of marriages by type of gifts received from bridal party at the time of marriage in 2008-2012. Groom's party received marriage gifts from the bride's father in half of all marriages. Gifts were received under two different contracts: there was a clear negotiation with the bridal party about the gift prior to the marriage or there was no such negotiation, but a gift was given for daughter's happiness. The first contract can be regarded as dowry and its incidence was 50.3% in 2012. Incidence of giving dowry shows a declining trend over time from 2008-2012 which indicates the improvement of social awareness. Dowry was paid in full at the time of marriage for one-sixth of the marriages and partially for one-fourth of all marriages.

The state law requires legal registration of marriages and divorces of Muslims and Christians (no such law exists for Hindus in Bangladesh). Table 6.7 shows registration of Muslim marriage is an increasing trend. It increased to 93.4% in 2012 from 87.7% in 2001. The number of divorces was less than 300 each year during 1998-2001. Since 2002, this figure has been more than 300. In general, the incidence of divorce in Matlab has fallen. HDSS recorded 368 divorces in 2012 (Appendix A.12) and of them, 82.4% were registered with Kazi -the marriage register (Table 6.8). Table 6.5 shows the mean and median durations in months of marriage at divorce by age and sex. The average duration of marriage of all divorcing husbands at the time of divorce was 41.4 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 2012 but marriages were high in March and November and low in April. Table 6.9 shows the distribution of causes of divorce by area

reported by CHRWs. CHRWs interviewed male and female partners (if available) and neighbours to determine the cause of the divorce. Most common cause was wife maladjustment with husband or husband's family (28.8%) followed by wife's affairs with other man (19.8%) and husband's affairs with other woman (12.8%).

Figure 6.1. Marriages and divorces by month, 2012

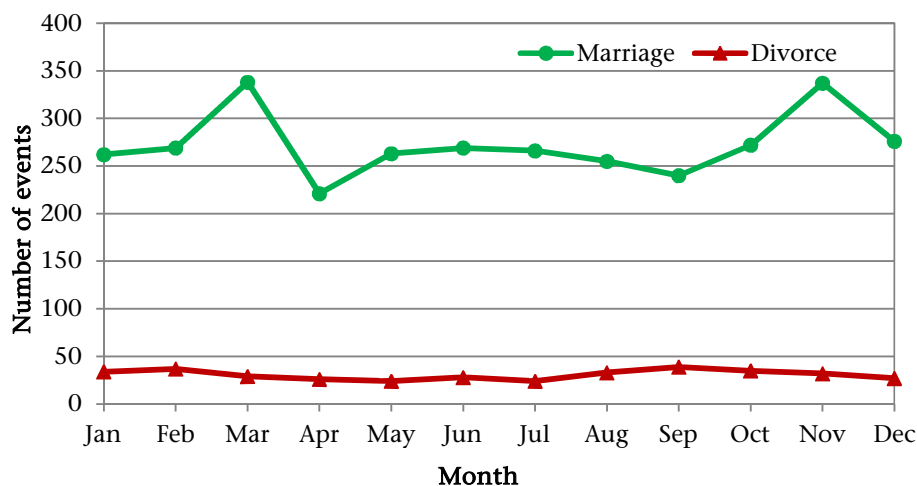


Table 6.1 Groom's age at marriage by previous marital status , 2012

Age (years)	All grooms	Previous marital status (%)			
		Single	Married	Divorced	Widowed
All ages	100 (n=3268)	86.9 (n=2840)	1.9 (n=61)	9.2 (n=300)	2.1 (n=67)
10-14	0.0	0.0	0.0	0.0	0.0
15-19	3.3	3.7	1.6	0.7	0.0
20-21	4.6	5.1	0.0	1.7	1.5
22-24	16.8	18.1	3.3	10.7	3.0
25-29	40.0	42.5	23.0	25.0	16.4
30-34	25.3	25.0	16.4	32.3	17.9
35-39	6.0	4.6	16.4	16.7	9.0
40-44	1.9	0.9	14.8	6.7	9.0
45-49	0.8	0.1	11.5	3.0	10.4
50-54	0.5	0.1	8.2	1.3	9.0
55-59	0.5	0.0	3.3	1.7	13.4
60-64	0.1	0.0	0.0	0.0	6.0
65+	0.2	0.0	1.6	0.3	4.5
Median age*	28.0	27.0	35.0	31.0	41.0
Mean age*	28.3	27.4	37.3	32.0	42.4
Standard deviation*	6.0	4.5	10.2	7.5	13.3

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

Table 6.2 Bride's age at marriage by previous marital status , 2012

Age (years)	All brides	Previous marital status (%)			
		Single	Married	Divorced	Widowed
All ages	100 (n=3268)	89.5 (n=2926)	-	9.4 (n=306)	1.1 (n=3)
10-14	3.5	3.8	-	0.3	0.0
15	5.8	6.5	-	3.6	2.8
16	9.1	9.8	-	1.3	0.0
17	11.5	12.7	-	7.2	2.8
18	14.9	15.9	-	7.5	0.0
19	11.0	11.6	-	19.9	5.6
20-24	31.7	31.7	-	34.0	16.7
25-29	8.8	7.0	-	24.5	22.2
30-34	2.0	0.8	-	11.1	16.7
35-39	0.8	0.3	-	4.2	11.1
40-44	0.4	0.1	-	2.6	11.1
45-49	0.2	0.0	-	1.0	8.3
50-54	0.2	0.0	-	1.0	5.6
55-59	0.0	0.0	-	0.3	0.0
60-64	0.1	0.0	-	0.3	2.8
65+	0.0	0.0	-	0.0	0.0
Median age*	19.0	19.0	-	24.0	31.0
Mean age*	20.0	19.3	-	25.2	33.2
Standard deviation*	4.7	3.5	-	7.3	10.9

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

Table 6.3 Marriage rates by age and sex, 2012

Age (years)	Male			Age (years)	Female		
	Marriages	Population	Rate*		Marriages	Population	Rate*
All ages(10+ yrs)	3268	79566	41.1	All ages(10+ yrs)	3268	96777	33.8
10-14	0	12456	0.0	10-14	113	12298	9.2
15-19	108	9542	11.3	15	191	2207	86.5
20-24	700	6805	102.9	16	298	2124	140.3
25	234	1254	186.6	17	375	2032	184.5
26	297	1248	238.0	18	487	2081	234.0
27	276	1062	259.9	19	361	2068	174.6
28	242	1097	220.6	20-24	1037	10480	99.0
29	257	1148	223.9	25-29	289	9208	31.4
30-34	828	5797	142.8	30-34	64	8270	7.7
35-39	196	5743	34.1	35-39	25	7663	3.3
40-44	61	5726	10.7	40-44	14	7629	1.8
45+	68	27688	2.5	45+	14	30717	0.5
Unknown	1	-	-	Unknown	0	-	-

\* Rates per 1000 population irrespective of previous marital status

Table 6.4. Distribution of current marital status (%) by age and sex, 2012

Age (years)	Male					Female				
	NM	PM	WID	DIV	Total	NM	PM	WID	DIV	Total
0-4	100.0	0.0	0.0	0.0	12300	100.0	0.0	0.0	0.0	11991
5-9	100.0	0.0	0.0	0.0	12714	100.0	0.0	0.0	0.0	12477
10-14	100.0	0.0	0.0	0.0	12456	99.0	1.0	0.0	0.0	12298
15-19	98.5	1.5	0.0	0.0	9542	68.5	30.8	0.0	0.6	10512
20-24	78.5	21.0	0.0	0.4	6805	21.0	77.1	0.1	1.8	10480
25-29	39.0	60.4	0.0	0.6	5809	5.3	92.7	0.3	1.7	9208
30-34	11.7	87.5	0.1	0.7	5797	1.5	96.7	0.8	1.0	8270
35-39	3.2	96.3	0.0	0.4	5743	0.6	96.0	2.3	1.1	7663
40-44	1.3	98.1	0.1	0.6	5726	0.3	94.3	4.3	1.2	7629
45-49	0.5	98.8	0.1	0.5	6238	0.5	88.6	9.2	1.7	7780
50-54	0.4	98.9	0.4	0.3	6633	0.2	80.9	17.0	2.0	6413
55-59	0.4	98.1	1.0	0.5	4421	0.2	69.4	28.6	1.8	4513
60-64	0.1	98.0	1.6	0.2	3247	0.0	53.4	45.0	1.6	3599
65-69	0.3	96.0	3.2	0.5	2605	0.0	38.5	60.2	1.3	3456
70-74	0.1	93.3	6.2	0.4	1990	0.0	23.0	76.1	0.9	2410
75-79	0.1	89.0	10.3	0.6	1414	0.1	12.0	87.2	0.7	1486
80-84	0.0	77.6	21.7	0.7	727	0.3	6.4	92.9	0.4	706
85+	0.5	64.7	33.8	1.0	414	0.3	1.7	97.5	0.6	354
All (%)	53.1	45.9	0.8	0.3	100.0	38.6	50.9	9.5	1.0	100.0
<b>Total</b>	<b>55514</b>	<b>47988</b>	<b>788</b>	<b>291</b>	<b>104581</b>	<b>46792</b>	<b>61763</b>	<b>11535</b>	<b>1155</b>	<b>121245</b>

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

Table 6.5. Duration (months) of all marriages at divorce by age and sex, 2012

Age at divorce (years)	Male				Female			
	No.	Mean	Median	SD	No.	Mean	Median	SD
< 20	1	0	0	.	99	10.5	0.0	14.3
20 - 24	64	13.6	13.0	17.1	144	26.5	26.0	27.4
25 - 29	114	27.8	26.0	29.1	65	57.8	52.0	44.9
30 - 34	94	37.6	26.0	43.8	25	75.4	78.0	53.7
35 - 39	39	66.0	52.0	67.0	15	117.0	117.0	89.4
40 - 49	31	94.8	65.0	87.8	14	172.7	175.5	151.5
50+	23	89.9	26.0	128.0	6	91.0	52.0	94.8
Unknown	2	32.5	32.5	9.2	0	-	-	-
<b>All ages</b>	<b>368</b>	<b>41.4</b>	<b>26.0</b>	<b>59.4</b>	<b>368</b>	<b>41.4</b>	<b>26.0</b>	<b>59.4</b>

Table 6.6. Marriages by type of gifts received by grooms party from bridal party, 2008-2012

Type of gift received	Year				
	2008	2009	2010	2011	2012
None	40.9	40.1	43.2	57.6	48.5
Gift without prior negotiation	1.3	0.6	0.6	0.9	1.1
Gift after prior negotiation	57.9	59.3	56.2	41.5	50.3
<b>Gift payment</b>					
Full	15.8	19.1	18.8	13.2	16.7
Partial	34.6	33.7	31.1	22.4	26.8
Not yet paid*	7.5	6.5	6.3	5.8	6.8

\*Was agreed at the time of marriage but did not pay as yet

Table 6.7. Registration status of Muslim marriages, 2001-2012

Year	Registered with kazi		Not registered	
	Number	Percent	Number	Percent
2001	2486	87.7	348	12.3
2002	2620	87.4	376	12.6
2003	2469	87.3	359	12.7
2004	2483	91.7	224	8.3
2005	2563	91.1	251	8.9
2006	2521	92.5	205	7.5
2007	2726	94.0	175	6.0
2008	2442	92.6	196	7.4
2009	2760	94.6	158	5.4
2010	2643	92.3	221	19.0
2011	2620	93.2	192	6.8
2012	2666	93.4	187	6.6

Table 6.8. Registration status of divorces of Muslim marriages, 2001-2012.

Year	Registered with kazi		Not registered	
	Number	Percent	Number	Percent
2001	179	67.8	85	32.2
2002	243	74.8	82	25.2
2003	239	76.1	75	23.9
2004	230	82.4	49	17.6
2005	243	80.7	58	19.3
2006	270	88.2	36	11.8
2007	278	83.2	56	16.8
2008	223	83.2	45	16.8
2009	239	77.1	71	22.9
2010	319	82.6	67	17.4
2011	302	84.4	56	15.6
2012	299	82.4	64	17.6

Table 6.9. Cause of divorces by area, Matlab, 2012

Cause of Divorce	Both areas		icddr,b area		Government area	
	Number	Percent	Number	Percent	Number	Percent
Dowry	10	2.7	6	3.9	4	1.9
Domestic violence	23	6.3	14	9.0	9	4.2
Husband affairs with other woman	47	12.8	15	9.7	32	15.0
Wife affairs with other man	73	19.8	30	19.4	43	20.2
Wife maladjustment with husband/husband's family	106	28.8	46	29.7	60	28.2
Husband addicted to drugs or gambling	9	2.4	4	2.6	5	2.3
No trace of husband	15	4.1	10	6.5	5	2.3
Husband/wife not good looking	27	7.3	6	3.9	21	9.9
Husband mentally/physically disabled	28	7.6	13	8.4	15	7.0
Wife mentally/physically disabled	10	2.7	3	1.9	7	3.3
Others /unspecified	20	5.4	8	5.2	12	5.6
<b>Total</b>	<b>368</b>	<b>100.0</b>	<b>155</b>	<b>100.0</b>	<b>213</b>	<b>100.0</b>

Source: Divorce registration form

## 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. Exceptions are made if someone move into the area due to marriage or divorce or settlement. These definitions are used in the surveillance area as a whole.

During 2012, the total of 10,071 persons (4,628 males and 5,443 females) moved into the HDSS area, which represented an annual average in-migration of 4.5% for both males and females of the mid-year population. On the other hand, 12,077 persons (5,998 males and 6,079 females) left the HDSS area or on an average 5.4% for both males and females of the mid-year population (Table 7.1 and Appendix A.13), giving a crude rate of in-migration of 44.6 per 1,000 population, and out-migration rate of 53.5 per 1,000 population. The highest incidence of in-migration for males was 10.6% in the age group 25-29 and for females was 11.2% in the age group 15-19. More males and females out-migrated in the age group 20-24 (15.2% and 12.5%, respectively). More males out-migrated than females in the age group (0-54). 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 86 males per 100 females in 2012. More out-migration of working age (15-59) group males compared to females caused a decline in the sex ratio over the period.

In- and out-migration rate increased in 2012 over those of 2011. The net loss of migrants was 8.9 per 1,000 in 2012, whereas it was 16.1 per 1,000 in 2011. Table 7.1 presents the age-specific migration rates, which are illustrated in Figure 7.1. The tables and figures show the bi-modal distribution of age commonly found for migrant populations, with a primary peak of young adults and a secondary peak of young children moving with their parents. Male out-migrants were rather younger than male in-migrants, while for females the pattern of age distribution was more similar. Table 7.2 and Figure 7.2 show the numbers moving in and out by month. January is the preferred month for migration for both men and women. Numbers of in- and out-migration by age, sex, and cause of movement are shown in Appendix A.16 through A.19. Roughly, an equal number of men and women move into and out of rural areas, females predominantly for marriage and males predominantly for seeking jobs. There is a net loss of both men and women to urban area, 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).

Table 7.1. Age and sex-specific migration rates (per 1,000 population) by direction, 2012

Age (years)	Both sexes		Male		Female	
	In	Out	In	Out	In	Out
All ages	44.6	53.5	44.3	57.4	44.9	50.1
0 - 4	64.9	57.6	67.4	59.2	62.4	55.9
5 - 9	38.0	38.7	37.8	39.1	38.2	38.3
10-14	25.4	37.2	23.8	41.7	27.0	32.7
15-19	72.2	103.3	28.2	84.7	112.2	120.1
20-24	89.4	135.8	70.2	152.4	101.9	125.0
25-29	84.8	100.2	106.9	124.1	70.8	85.1
30-34	65.8	68.5	96.6	102.6	44.3	44.6
35-39	41.8	45.3	65.8	67.7	23.8	28.4
40-44	27.3	32.5	46.1	51.3	13.2	18.4
45-49	16.7	19.3	24.4	25.0	10.5	14.8
50-54	15.6	13.9	18.2	15.1	12.8	12.6
55-59	11.0	11.6	14.5	10.4	7.5	12.9
60-64	13.0	13.1	16.6	12.9	9.7	13.3
65+	27.6	34.3	23.4	25.0	30.7	41.4

Table 7.2. In- and out-migration by sex and month, 2012

Months	In-migration			Out-migration		
	Both sexes	Male	Female	Both sexes	Male	Female
All months	10071	4628	5443	12077	5998	6079
January	1381	647	734	1655	812	843
February	932	415	517	1210	621	589
March	802	351	451	1076	571	505
April	816	376	440	1006	544	462
May	870	380	490	1040	533	507
June	813	369	444	978	499	479
July	803	372	431	949	502	447
August	979	485	494	1032	496	536
September	742	362	380	924	454	470
October	892	423	469	802	341	461
November	627	280	347	825	385	440
December	414	168	246	580	240	340



Figure 7.1. Rates of in- and out-migration by sex and age in Matlab, 2012

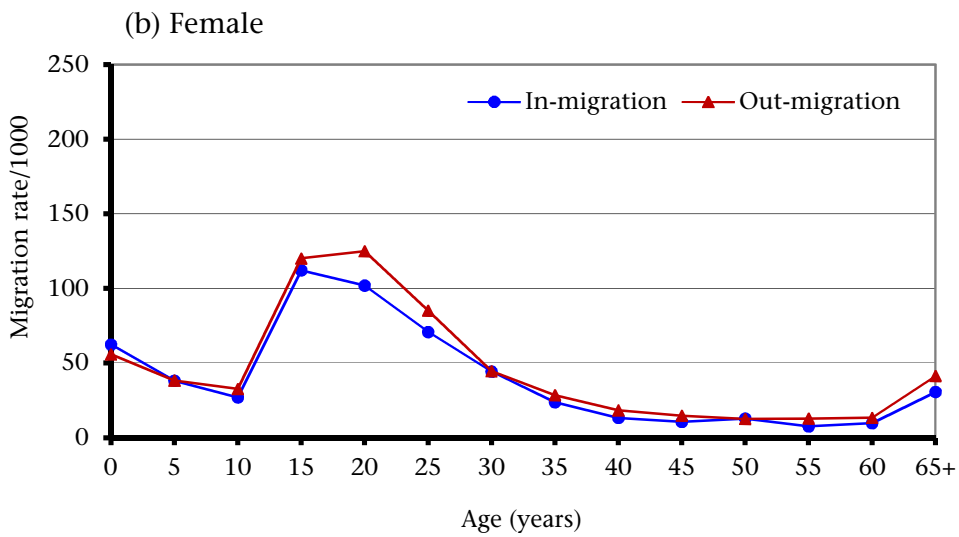
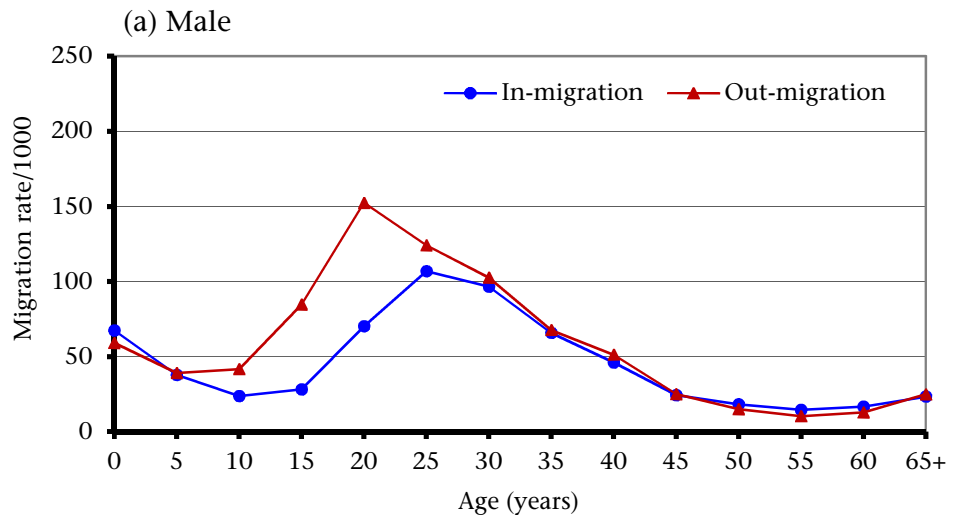
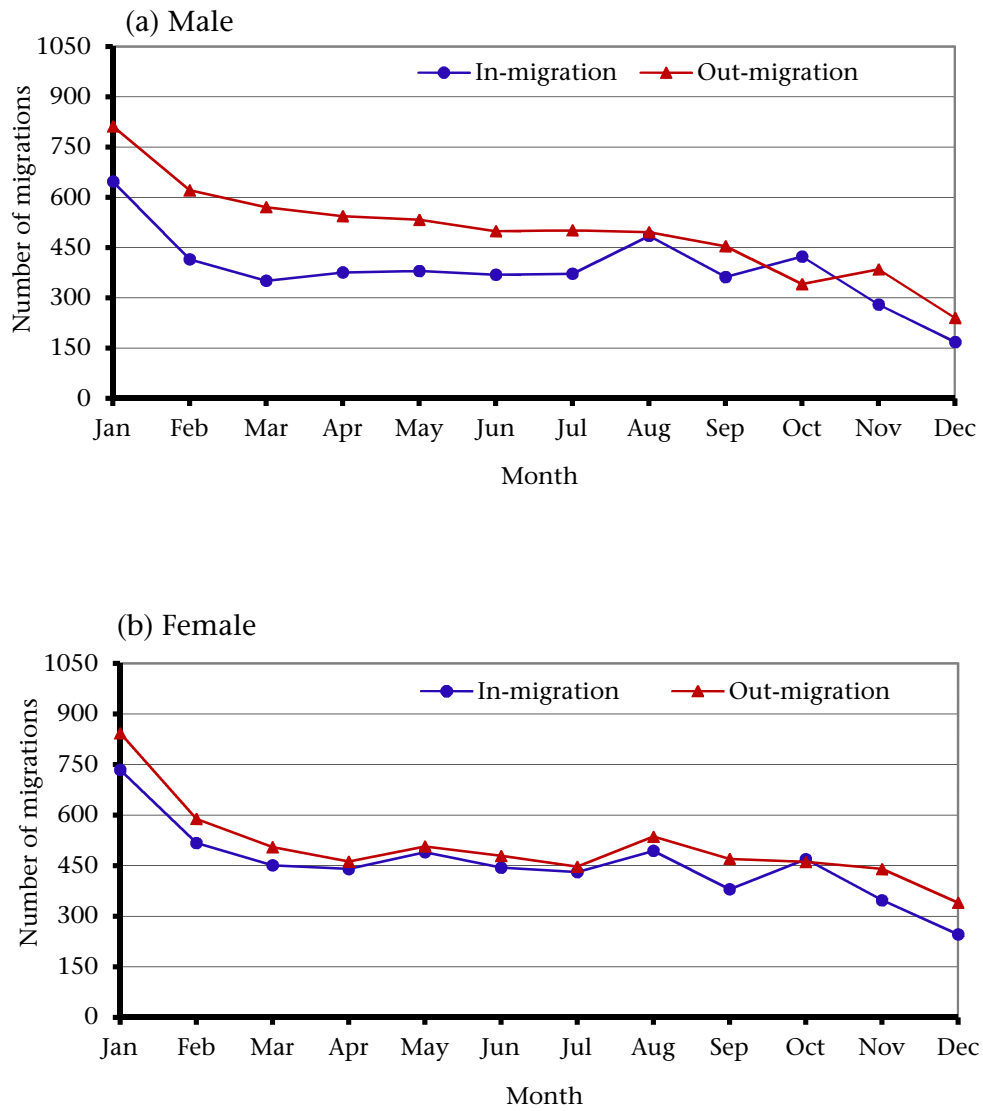


Figure 7.2. Number of in- and out-migrations by sex and month in Matlab, 2012



## CHAPTER 8

### FERTILITY REGULATION

In the icddr,b service area, 41 service CHRWs have been providing maternal and child health and family planning (MCH-FP) services including EPI from fixed site clinics since 2001. In case of any complications they refer the patients to icddr,b sub-centres. They also motivate couples for adopting family planning; advise pregnant women for antenatal care, safe delivery, and use of safe-delivery kit; advise parents for immunization of children; make them aware of symptoms of common childhood morbidity; and advise them to treat sick children by formally trained providers. The motivation activities are carried out in the icddr,b service area only. In the Government service area, services are provided in each union from the Union Health and Family Welfare Centre and 8 Satellite Clinics monthly, and from 24 EPI Centres for vaccinations of children, adolescents, and women of reproductive ages in addition to private and NGO sectors.

The 38 surveillance CHRWs in both icddr,b and Government service areas record family planning methods used by couples in the previous month by asking eligible women about family planning during their bimonthly home visits. During home visits they sometimes give advice to oral pill users to procure pills in timely manner, pregnant women to seek antenatal care and have safe delivery; and parents to immunize children and treat sick children by formally trained providers. In 2012 the contraceptive use rate was 53.3% in the icddr,b service area and 42.6% in the Government service area (Table 8.1). Contraceptive use rate in the Government service area is lower than the use rate of 51.4% recorded in Chittagong division in 2011. Table 8.2 shows the difference in contraceptive method-mix between the icddr,b and Government service areas in 2012 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, tubectomy and condom. Changes in the method-mix in the icddr,b service area during 1998-2012 are shown in Table 8.3. The contraceptive-use rate increases with the increase in women's age in the icddr,b service area (Table 8.4). In the icddr,b service area, women aged 20 years and over are more likely to use injectables, pill, undergo tubectomy or their husbands to use vasectomy whereas in the Government service area (Table 8.5), the pill, then injectables are the most popular method in all age groups except age group 45 years and over. Tubectomy is 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, 1985-2012

Year	Matlab		National**
	icddr,b area	Government area*	
1985	46.2	-	-
1986	47.4	-	25.3
1987	51.3	-	-
1988	52.5	-	-
1989	58.8	-	31.4
1990	60.6	27.9	-
1991	61.1	-	39.9
1992	61.1	30.2	-
1993	62.7	-	44.6
1994	65.6	-	-
1995	68.6	-	-
1996	68.1	46.9	49.2
1997	67.4	-	-
1998	68.8	-	-
1999	69.9	-	53.8
2000	69.5	-	-
2001	69.7	-	50.8
2002	70.5	51.4	53.4
2003	69.6	47.2	-
2004	70.4	48.1	58.1
2005	71.4	47.4	-
2006	69.2	45.1	-
2007	56.6	43.6	55.8
2008	54.4	41.3	-
2009	54.2	42.5	-
2010	55.7	43.1	62.6
2011	54.1	43.7	61.2
2012	53.3	42.6	-

\*Sources: In-depth and KAP surveys, 1984 & 1990; MDHS 1992; HDSS census 1996 and HDSS 2002-2012.  
\*\*Sources: Contraceptive prevalence survey, Bangladesh fertility survey 1989; Bangladesh demographic and health survey 1993-94, 1996-97, 1999-2000, 2004, 2007, 2011; Bangladesh maternal health services and maternal mortality survey 2010.

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

Method	Matlab		National	
	icddr,b area, 2012	Government area, 2012	BMMS 2010	BDHS 2011
Pill	28.7	41.3	49.7	44.5
Condom	9.7	7.0	6.2	9.0
Injectables	44.1	28.8	19.6	18.3
IUD	1.5	1.3	1.0	1.1
Tubectomy	10.3	12.8	6.9	8.2
Vasectomy	2.0	0.6	1.0	2.0
Norplant/Implant	1.4	2.0	1.3	1.8
Others*	2.4	6.3	14.2	15.1
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

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

Table 8.3. Contraceptive method mix\* (%) in the icddr,b service area, 1998-2012

Method	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Pill	29.7	28.7	30.6	31.9	33.3	33.9	32.6	34.1	35.8	34.6	30.6	30.3	30.1	29.0	29.4
Condom	7.1	7.7	9.5	10.8	11.1	11.0	10.9	11.2	10.8	8.6	9.0	9.5	9.2	9.4	9.9
Injectables	50.0	50.4	47.8	45.7	44.5	44.4	45.2	42.7	41.3	43.6	47.4	46.6	46.8	46.4	45.2
IUD	2.3	3.3	2.4	1.9	1.8	1.9	2.4	2.6	2.4	1.9	1.8	1.7	1.8	1.7	1.5
Tubectomy	10.6	9.8	9.1	8.6	7.7	7.2	7.4	7.6	7.9	9.2	9.0	9.4	9.3	10.3	10.5
Vasectomy	0.3	0.1	0.6	1.1	1.5	1.5	1.4	1.4	1.5	1.6	1.7	1.9	1.9	2.1	2.1
Norplant	-	-	-	-	-	0.0	0.1	0.3	0.3	0.5	0.5	0.6	0.9	1.1	1.4
<b>All</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

\*Currently married women using any modern method.

Table 8.4. Method specific contraceptive use rate among currently married women by age in icddr,b service area, 2012

Age (years)	Not using	Any method used	Method used								No. of eligible women
			Pill	IUD	Injectables	Condom	Tubectomy	Vasectomy	Others*	Norplant	
<20	74.7	25.3	10.2	0.2	8.3	5.6	0.0	0.1	0.3	0.7	1350
20 - 24	59.1	40.9	13.4	0.7	21.3	4.3	0.0	0.0	0.4	0.8	4081
25 - 29	52.7	47.3	16.0	0.9	23.3	4.6	1.0	0.2	0.5	0.9	4477
30 - 34	45.5	54.5	17.5	1.0	25.0	4.8	4.2	0.6	0.8	0.7	4189
35 - 39	36.4	63.6	17.1	0.9	27.0	5.7	9.5	1.4	1.5	0.6	4039
40 - 44	33.1	66.9	17.0	0.7	26.8	6.0	10.8	2.7	2.0	0.8	3659
45 - 49	40.1	59.9	11.7	0.6	22.9	6.0	12.0	2.6	3.5	0.5	2933
<b>Total</b>	<b>46.7</b>	<b>53.3</b>	<b>15.3</b>	<b>0.8</b>	<b>23.5</b>	<b>5.2</b>	<b>5.5</b>	<b>1.1</b>	<b>1.3</b>	<b>0.7</b>	<b>24728</b>

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

Table 8.5. Method specific contraceptive use rate among currently married women by age in Government service area, 2012

Age (years)	Not using	Any method used	Method used								No. of eligible women
			Pill	IUD	Injectables	Condom	Tubectomy	Vasectomy	Others*	Norplant	
<20	82.4	17.6	8.5	0.3	3.4	4.3	0.0	0.0	1.1	0.0	1020
20 - 24	71.3	28.8	15.9	0.1	7.3	3.8	0.1	0.1	1.0	0.5	3520
25 - 29	62.7	37.3	18.1	0.4	12.4	3.1	1.2	0.1	1.1	1.0	4054
30 - 34	54.2	45.8	21.0	0.6	14.0	3.2	4.2	0.3	1.5	1.1	3858
35 - 39	46.8	53.2	20.4	0.5	17.2	2.4	8.5	0.4	2.8	1.1	3439
40 - 44	45.1	54.9	18.8	1.0	15.1	2.8	10.8	0.5	5.1	0.8	3280
45 - 49	55.1	44.9	12.0	0.8	9.5	1.9	12.8	0.3	6.9	0.6	2508
<b>Total</b>	<b>57.4</b>	<b>42.6</b>	<b>17.6</b>	<b>0.5</b>	<b>12.3</b>	<b>3.0</b>	<b>5.4</b>	<b>0.3</b>	<b>2.7</b>	<b>0.8</b>	<b>21679</b>

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

### CHILD HEALTH SERVICE USE

#### Immunization

The Community Health Research Workers (CHRWs) started measles vaccination to all children in blocks A&C and blocks B&D in 1982 and 1985 respectively and Rubella vaccination in all blocks from 2012. Vaccination 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 Government service area record only vaccination status either by checking vaccination cards or by asking mothers about vaccination of children if the vaccination card was missing.

The World Health Organization recommends that all children receive a BCG vaccination against tuberculosis; three doses of DPT for the prevention of diphtheria, pertussis and tetanus; hepatitis B; three doses of polio vaccine; and a vaccination against measles before their first birthday. In January 2009, the Bangladesh EPI program introduced hemophilus influenza type B (Hib) vaccine in the form of pentavalent vaccine that included the DPT and hepatitis B vaccines and the new Hib vaccine. By June 2009, the pentavalent vaccine had replaced the DPT and hepatitis B in the EPI program. Therefore, vaccination of children aged 12-23 months is presented to allow comparison of results across the areas.

Table 9.1 shows the rates of coverage of different vaccines among children aged 12-23 months in icddr,b service area from 1987 to 2012 and the Government service area from 2000 to 2012. In 2012, immunization of children was almost universal: 97.4% received BCG, 94.2% received three doses of pentavalent and polio and 86.1% received measles vaccines in icddr,b area and 95.3% received BCG, 89.9% received three doses of pentavalent and polio and 88.0% received measles vaccine in Government service area. The BDHS estimates of immunization coverage were 97.8% for BCG, 93.2% for DPT/penta, 93.4% for polio, and 87.5% for measles in 2011.

**Table 9.1. Immunization coverage (%) among children aged 12-23 months in icddr,b area, 1987-2012 and Government service area, 2000-2012**

Vaccination coverage rate of children aged 12 - 23 months								
Year	BCG (1 dose)		Pentavalent and polio (3 doses)		Measles (1 dose)		All*	
	icddr,b area	Government area	icddr,b area	Government area	icddr,b area	Government area	icddr,b area	Government area
1987	88.4	-	76.1	-	85.2	-	69.3	-
1988	93.3	-	82.8	-	87.9	-	77.2	-
1989	94.6	-	88.4	-	92.0	-	84.0	-
1990	98.7	-	95.7	-	96.4	-	93.8	-
1991	98.6	-	95.6	-	97.0	-	94.1	-
1992	99.1	-	96.9	-	97.8	-	96.0	-
1993	99.5	-	97.6	-	98.1	-	96.6	-
1994	99.5	-	97.7	-	97.0	-	95.7	-
1995	99.3	-	96.8	-	97.0	-	95.0	-
1996	99.5	-	98.0	-	97.9	-	96.7	-
1997	99.3	-	98.5	-	98.0	-	97.3	-
1998	99.2	-	97.7	-	96.1	-	95.4	-
1999	99.0	-	97.7	-	94.8	-	94.1	-
2000 <sup>a</sup>	99.2	73.6	97.7	67.8	95.9	50.2	95.1	48.5
2001	99.1	89.8	98.2	80.0	96.0	74.1	95.4	71.0
2002	99.3	96.7	98.5	90.6	95.7	84.5	95.4	83.1
2003	99.2	97.4	98.5	92.0	95.9	84.3	95.6	83.2
2004	99.3	97.6	98.2	93.1	96.6	86.2	95.9	85.3
2005	99.6	97.9	99.0	94.6	97.8	86.0	97.3	84.9
2006	99.0	97.3	97.6	93.7	95.2	81.7	94.3	80.4
2007 <sup>b</sup>	99.8	99.8	98.8	99.0	96.3	95.1	96.1	94.7
2008 <sup>b</sup>	97.8	96.3	97.3	95.9	95.1	93.6	94.8	93.6
2009 <sup>b</sup>	97.4	97.8	96.7	97.5	95.0	95.6	94.6	95.6
2010	96.6	95.8	93.7	92.4	92.3	91.3	88.6	87.4
2011	95.9	95.1	93.2	92.1	87.0	84.0	86.0	83.1
2012	97.4	95.3	94.2	89.9	86.1	88.0	83.0	82.5

\*Children fully vaccinated (i.e those who received BCG, measles and three doses of pentavalent and polio).  
<sup>a</sup>Immunization coverage rate is about 20% under reported in the Government area due to not checking of vaccination cards during the initial months of 2000.  
<sup>b</sup>Child immunization data are collected on sample basis in 2007-2009

### GEOGRAPHICAL INFORMATION SYSTEM (GIS)

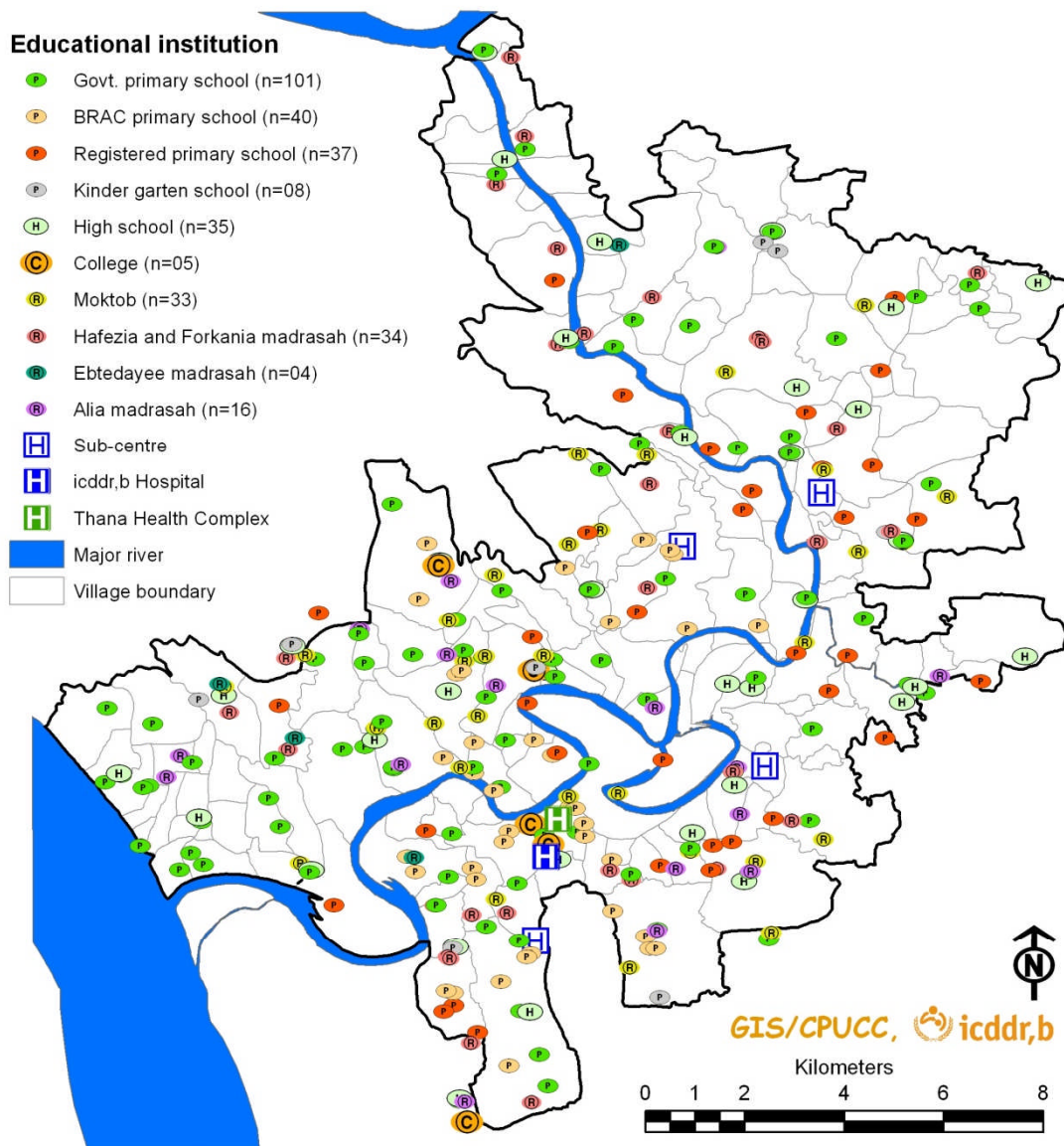
The Geographic Information System (GIS) was established in 1994 under the Public Health Sciences Division to provide cartographic, thematic and analytic maps to the investigators of icddr, according to their requirements. Initially, the GIS activities were limited to the Matlab HDSS area, later gradually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

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

The Figure 10.1 shows the locations of educational institutes of different types in Matlab HDSS area. Number of government and non-government registered schools offering general education is far more than the number of madrasahs (173 versus 54) in the area. The HDSS area houses 8 private KG (Kindergarten) schools, mostly for children of affluent families and 40 BRAC primary schools, mostly for school left-out and drop-out children.



Figure 10.1 Educational institutes in HDSS study area, Matlab



# CHILDREN'S EDUCATION IN MATLAB, BANGLADESH: TRENDS AND DIFFERENTIALS

### Summary

The government of Bangladesh introduced stipends for the primary and secondary education to achieve MDG 2 'universal primary education'. The objective of this chapter is to examine the trends and socioeconomic inequalities in children's education and to assess facilities available for education at home and institutions in Matlab, Bangladesh, where icddr,b maintains the Health and Demographic Surveillance System (HDSS) since 1966.

HDSS in Matlab during its periodic socioeconomic censuses in 1974, 1982, 1996 and 2005, recorded individuals' education and household possessions of durable articles and education of persons aged 5-24 years in 2013. The periodic education data were used to estimate trends in net attendance rates (NARs) in primary and secondary education in children aged 6-10 years and aged 11-17 years respectively by gender and religion; and socioeconomic differentials in NARs in 2013. Data of the education survey 2012 were used to estimate attendance of children aged 6-15 years by type of educational institutes, rates of drop-out and repetition in the same class with reasons and availability of education materials at home and institutions. Bivariate relationships are expressed in NAR and percentage and multivariate relationships are expressed as odds ratios.

NAR in primary education increased from 42.3% in 1974 to 93.3% in 2013 and NAR in secondary education increased from 17.9% in 1974 to 71.2% in 2013 with gender disparity reversed in favour of girls since 2005. NARs in Islamic religious education increased from <1% in 1982 to >6% in 2013. The primary determinants of NAR in secondary education in 2013 were parents' education and household economic condition. Rates of being absent from classes, failing in examinations and repetition in the same classes were quite high.

Bangladesh, Children's education, Inequalities, Parents' education, Household economic status

### INTRODUCTION

Education is not only a human right, but also fundamental to the prospects for economic and social development and to bring about an end to poverty. The government of Bangladesh is a signatory of the Millennium Development Goals (MDGs) including MGD 2 'universal primary education by 2015' (government of Bangladesh 2012). To achieve universal primary education, the government

introduced the policy of compulsory primary education and created a separate division named Primary and Mass Education Division in 1992 to facilitate and formulate planned programme. The government in support of the policy launched the girls' secondary school stipend programme in 1994 and the primary school stipend programme in 2003 to influence parents' decisions in favour of children's education and reduce the gender gap as well as the poor-rich gap in both primary and secondary education (Raynor and Kate 2006). Little is known whether the school stipend programmes have achieved the objectives.

The Bangladesh Demographic and Health Survey 2011 reports increase in attendance rates in primary and secondary education and diminished gender inequalities in recent years (BDHS 2011). The important differentials in children's education are age and sex of the child and social support measured with parents' education and household wealth index (Razzaque and Streatfield 2007) and parents presence at home (Khun 2006). Little is known whether introduction of the school stipend programmes and increase in enrolment rates in primary and secondary education have changed the importance of these differentials, which this chapter will explore.

The educational system in Bangladesh is three-tiered: general (secular modern westernized) education, madrasah (religious) education and technical-vocational education (mostly in urban areas). The Bangladesh Educational Statistics 2009 showed rapid growth in number of madrasahs registered with the government, indicating rapid expansion in religious education (BANBEIS 2009). The madrasah (religious) education often carries many negative images of being backward and outdated. Trends in attendance rates in primary and secondary levels by education system are poorly known. This chapter will provide such rates for a rural area of Bangladesh.

Schools for general education and madrasahs for Islamic religious education are of different types in terms of administrative regulations and the curricula they follow. Schools are of two major types; one is the government and non-government registered schools and follows the national school curriculum; and the other is the private kindergarten schools and follows the British school curriculum in English. The former provide education free of charge. The latter have emerged as a market response to newer demand for better quality of education and are gradually expanding from urban to rural areas. They have better educational environment, scientific teaching methods including audio-visual aids and internet access. They are privately financed and, therefore, are affordable only for the middle and upper middle-class parents.

Madrasahs are of two broad categories; one is called 'aliya' and the other is called 'qawmi'. The aliya madrasah provides Islamic religious education along with the general education as complementary

to each other in the system of education and has been continuing with some modifications according to the demand of the time. Number of aliya madrasahs has grown up in the country over the years and are regulated by the Bangladesh Madrasah Education Board - just like general education. The government provides government grants to the teachers and employees of the non-government registered aliya madrasahs like other non-government schools and colleges.

The qawmi madrasah provides mostly Islamic education and derives its name from its very nature that these madrasahs are run by the community or the people ( Qawm in Arabic), as opposed to the state. They are private charitable organizations and are supported almost exclusively by donations. The private schools receive financial support from the state, but not the qawmi madrasahs. They are regulated by the "Bangladesh Qawmi Madrasah Education Board based in Dhaka" and is the largest federation of Islamic seminaries in Bangladesh. Many privately licensed madrasahs, mostly qawmi take in homeless children and provide them with food, shelter and education. The poorer households are more likely to send their children to a madrasah. There are a few girls' madrasahs (aliya and qawmi) for girl students. Qawmi madrasahs, in particular, are beset with problems, including having an outdated curriculum and madrasah graduates being unable to gain employment as easily as graduates of regular schools.

Population-based information is lacking on type of educational institutes children attend, rates of left-out and drop-out, repetition in the same classes, frequency of absence from class and availability of education materials at home and institutes. Data of the children's education survey 2012 will be used to provide such information and help policy makers to plan remedial actions to address inequalities

#### **METHODS AND DATA**

HDSS in Matlab, Bangladesh conducted socioeconomic censuses in 1974, 1982, 1996 and 2005 to record household possessions of durable articles and individuals' education (type of institution attended and grade completed) and recorded education of persons aged 5-24 years in 2013. The first level of the madrasah education is called '*ebtedayee*' and is equivalent to primary level of general education and is comprised of 5 years of schooling in grades I - V. Normally, the children of 6 years of age begin in class 1 and finish class V then enroll in '*dhakhil*' (secondary level) at the age of 11 years.

Household possessions of durable articles (land, cot, wardrobe, chair and table, quilt, watch, radio, television and bicycle) recorded in 2005 were analysed using the principal components method to calculate an asset score and classify households into quintiles (five categories of 20% each, from poorest to richest). Children's age is usually known by date of birth recorded by HDSS, otherwise it is

estimated interviewing the mothers using calendar of important events. Children's education recorded in 2013 was linked to parents' education, and household asset quintiles examine differentials.

A two-stage random cluster sampling was used to select 1360 households in 170 out of 1349 clusters, each of around 35 households (a field worker usually visits them each working day in HDSS area) for the children's education survey in 2012. Five trained community health research workers (CHRWs) visited the sampled households with a structured questionnaire to collect information on type of educational institutes children attended, reasons for drop-out, repetition in the same class, stipend for education, absence from classes and availability of education materials at home and institute. One field research officer supervised their field activities on a regular basis. The educational institutions were grouped into general schools (government or government registered) with national curriculum, private kindergarten schools, non-formal primary schools, and (government and government registered) aliya madrasah and private licensed qawmi madrasah.

**Data Analysis:** The academic year corresponds to the calendar year January to December. Children's age is calculated at the start of the school year as on 01 January 1974, 1982, 1996, 2005 and 2013). Children's education data were analyzed using bivariate and logistic regression techniques. Bivariate relationships are shown in the form of net attendance ratio (NAR) and percentage and multivariate relationships are shown as odds ratios for age and sex of the child, parents' education, and household asset quintile. The primary NAR is the percentage of the official primary school-age population (children aged 6-10 years) who attend primary schools. The NAR for secondary education is the percentage of the secondary school-age population (i.e., children aged 11-17 years) who attend secondary schools. Logistic regression was used to estimate odds ratios (adjusting for clustering in education of children to the same household, using STATA version 11), controlling simultaneously for the effects of all other variables.

## RESULTS

### **Trends in net attendance rates in primary and secondary education**

Figures 11.1a and 11.1b show the trends in the net attendance rates of boys and girls aged 6-10 and 11-17 years in the primary and secondary education levels respectively in 1974-2013. The attendance rates were lower in 1974 with a large sex difference in favour of boys in 1974. With increases in the attendance rates over the years, the gender disparity gradually diminished in 1996 and reappeared in favour of girls since 2005.

Figure 11.1a: Trends in the net attendance rates of boys and girls aged 6-10 years in primary education in Matlab HDSS area, 1974-2013

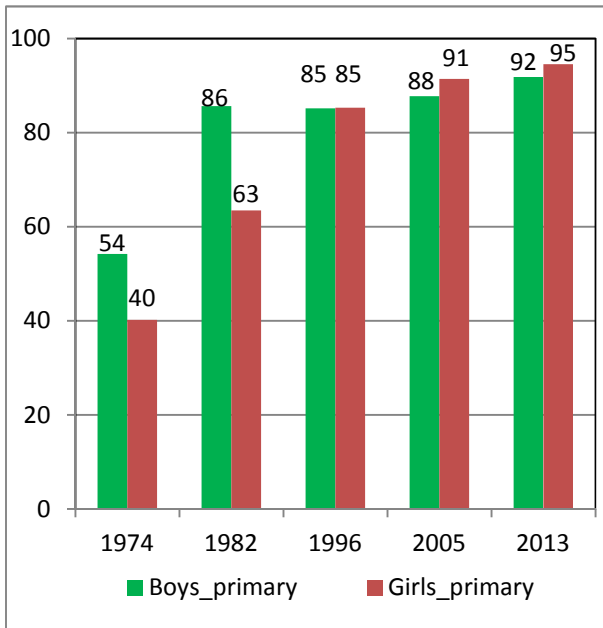


Figure 11.1b: Trends in the net attendance rates of boys and girls aged 11-17 years in secondary education in Matlab HDSS area, 1974-2013

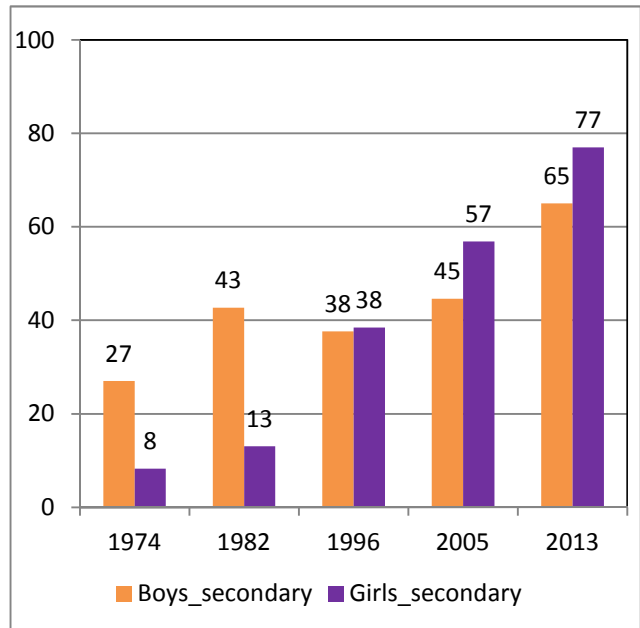


Figure 11.2a: Trends in the net attendance rates of Muslim and non-Muslim children in primary education in Matlab HDSS area, 1974-2013

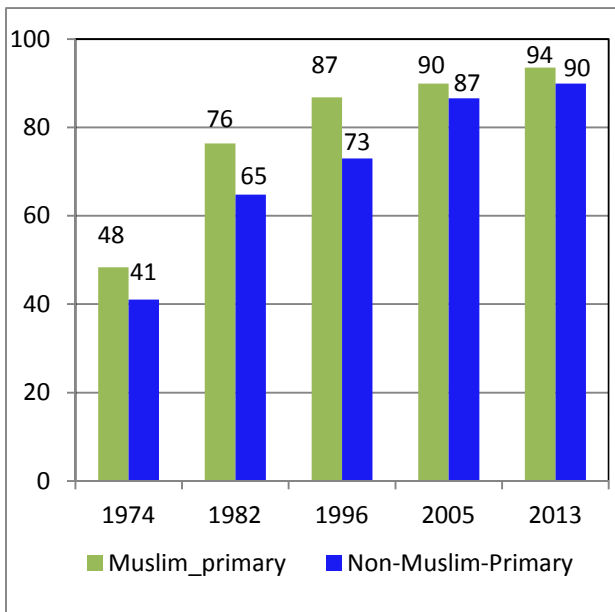
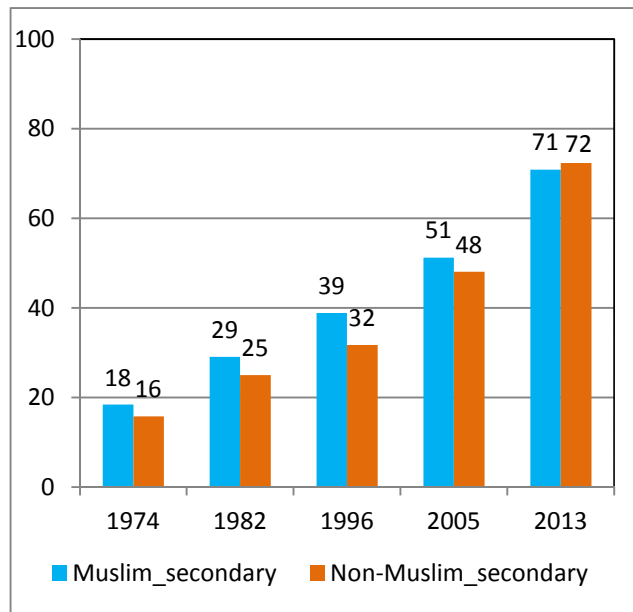


Figure 11.2b: Trends in the net attendance rates of Muslim and non-Muslim children in secondary education in Matlab HDSS area, 1974-2013



The great majority of the population in the study (HDSS) area are Muslims and the rest are the non-Muslims, mostly Hindus with a gradual decline in their proportions over the years. The religious differences in the net attendance rates in the primary and secondary education levels were small in 1974 when overall rates were low. Gradual increase in rates diminished further the differences over the years (Figure 11.2a and figure 11.2b). The religious difference disappeared in net attendance in secondary education in 2013.

### Trends in Islamic religious education

The madrasah (religious) education often carries many negative images of being backward, outdated and preaching extremist ideology. Trends in NARs in primary and secondary education levels among children of Muslims over the years 1974-2013 are shown Table 11.1. With an increase in the overall net attendance rates in primary and secondary levels, the attendance rates in religious schools also increased at faster rates in the last two decades.

**Table 11.1: Trends in religious primary and secondary level education among Muslim children in Matlab HDSS area, 1974-2013**

Year of census	Net attendance rates in primary education among children age 6-10 years			Net attendance rates in secondary education among children age 11-17 years		
	# children	General education	Religious education	# children	General education	Religious education
1974	21492	48.3	0.0	25904	18.4	0.0
1982 <sup>a</sup>	21738	76.3	1.1	28304	29.1	0.8
1996	27064	85.0	1.8	30526	36.8	2.0
2005	24507	85.1	4.8	30206	46.9	4.3
2013	25505	87.2	6.4	30678	64.6	6.3

<sup>a</sup>NARs in the 1982 were lower than NARs in 1974 while the Bangladesh population censuses in 1974 and 1981 reported 1.57 times increase in percent of completing grade 1+ among persons aged 7+ years. NARs in 1982 are estimated by multiplying the NARs in 1974 by 1.57.

### Education Differentials

Education of children recorded by HDSS in 2013 was used for estimating demographic and socioeconomic differentials in not attending (rather than attending, which is too high) in primary and secondary education and the results are shown in Table 11.2. The rate of not attending in primary education was 6.7 % in children aged 6-10 years; and the rate of not attending in secondary education was 28.8% in children aged 11-17 years. The rate of not attending decreased with increase in age suggesting for late attendance in due education level with gender difference against boys in each level.

**Table 11.2: Rates (in %) of not attending in primary and secondary education by demographic and socioeconomic variables in 2013**

Demographic and socioeconomic variables	Not attending in primary education			Not attending in secondary education		
	N	Rate	Odds Ratio <sup>a</sup> (& 95% CI)	N	Rate	Odds Ratio <sup>a</sup> (& 95% CI)
<b>Age of the child:</b>						
6 (11 for secondary edu	4,930	13.2	1	5,274	63.3	1
7 (12	4,932	6.8	0.46** (0.40 - 0.53)	5,128	40.8**	0.33 (0.30 - 0.36)
8 (13	5,141	5.3	0.35** (0.30 - 0.40)	4,723	25.9**	0.14 (0.13 - 0.16)
9 (14	5,352	4.5	0.28** (0.24 - 0.32)	4,924	17.9**	0.08 (0.07 - 0.09)
10 (15-17	5,132	4.6	0.28** (0.24 - 0.33)	12,691	15.3**	0.07 (0.06 - 0.07)
<b>Sex of the child:</b>						
Girl	12,658	5.4	1	16,457	23.0	1
Boy	12,829	8.2	1.58** (1.42 - 1.74)	16,301	35.0	2.06** (1.94 - 2.17)
<b>Mother's education:</b>						
None	4,775	12.2	1	9,871	40.0	1
Primary (I-V)	7,395	6.2	0.48** (0.41 - 0.55)	11,294	28.2	0.53** (0.50 - 0.57)
Secondary (VI+)	11,494	4.3	0.31** (0.26 - 0.36)	8,896	17.0	0.25** (0.22 - 0.27)
Unknown	1,823	10.4	0.72** (0.58 - 0.90)	2,697	31.4	0.73** (0.64 - 0.83)
<b>Father's education:</b>						
None	4,734	9.0	1	7,515	40.3	1
Primary (I-V)	5,852	6.3	0.89 (0.76 - 1.04)	7,350	29.5	0.72** (0.66 - 0.78)
Secondary (VI+)	5,642	4.8	0.92 (0.76 - 1.10)	5,696	18.3	0.52** (0.47 - 0.58)
Unknown	9,259	7.2	1.12 (0.95 - 1.31)	12,197	26.6	0.70** (0.64 - 0.76)
<b>HH asset quintile:</b>						
Lowest	3,844	9.3	1	5,903	41.2	1
Second	3,688	7.0	0.83* (0.69 - 0.99)	5,570	32.9	0.77** (0.71 - 0.85)
Middle	3,650	6.2	0.83 (0.69 - 1.00)	5,564	27.4	0.66** (0.60 - 0.73)
Fourth	3,924	5.0	0.73* (0.60 - 0.89)	5,510	21.0	0.54** (0.48 - 0.59)
Highest	3,380	5.2	0.85 (0.68 - 1.04)	4,368	17.1	0.45** (0.40 - 0.51)
<b>Religious faith:</b>						
Muslim	22,949	6.4	1	29,211	29.1	1
Non-Muslim	2,538	10.1	1.39** (1.19 - 1.61)	3,547	27.6	0.70** (0.63 - 0.77)
All	25,487	6.8		32,758	28.9	

N=number of children at the beginning of the calendar year.

<sup>a</sup>dependent variable was coded 1 if a child was enrolled in primary or secondary education, otherwise it was coded 0. \*P<0.01, \*\*P<0.001 (all odds ratios are adjusted for clustering of children to the same household).



Mother's education was associated with decrease in not attending in primary education, with children benefiting more from mothers' education than from fathers' education and household economic condition. However, father's education, mother's education and household economic conditions are strongly correlated with children attendance in secondary education. The rate of not attending secondary education decreased gradually with increase in levels of parent's education and household asset quintile. Religious difference in attendance rate in primary education was small, but significant. Not attending secondary education was lower in children of non-Muslims.

### **Type of educational institutions attended**

Parents, usually mothers of 1,215 children aged 6-15 years (at the beginning of the calendar year 2012) were asked about type of educational institutions their children last attended. Age distribution shows that 836 children aged 6-10 years and 379 aged 11-15 years. Of them 15 (12 aged 6-10 years and 3 aged 11-15 years) never attended any institution. The main reason was 'yet to admit in an institution for 10 children in the age group 6-10 years, followed by mental (2 children) and physical (3 children) impairments (data not shown).

The percentage distribution of the children by type of educational institutions they attended for few background variables is shown in Table 11.3. The great majority (80.2% in the age 6-10 years and 87.8% in the 11-15 years) attended either government or non-government registered general schools. Only 8% attended religious institutions; 3.5% attended aliya madrasahs and 4.5% attended qawmi madrasahs. Kindergarten school (KG) schools in rural areas usually provide education up to class V. One in ten children aged 6-10 years attended KG schools (10.1%). More boys than girls attended KG schools and madrasahs, particularly qawmi. Attendance in KG schools was more frequent among children of parents with secondary or more education and parents of higher household asset quintiles than it was among children of parents with lower education and lower household asset quintiles. Attendance in madrasah did not vary by levels of parent's education and household asset quintiles.

### **Drop-out/Quit from school**

Among 1200 children who ever attended any institution, 29 attended non-formal educational institutions and were excluded from subsequent analyses of drop-out, failed in examinations or repeated in the same class. Table 11.4 shows that 2.8% (0.6% in the age group 6-10 years and 7.4% in the age group 11-15 years) of the children who ever attended formal educational institutes quit from schooling with main reasons, in parents' opinion, lack of interest in study (1.9%), followed by high educational expenses (0.4%) and physical handicap (0.3%). Two of 170 girls aged 11-15 years dropped-out for marriage.

**Table 11.3: Percentage distribution of the children by type of educational institutes attended for selected background variables**

Background variable	# children	General schools	Kindergarten schools	Non-formal primary	Aliya madrasah	Qawmi madrasah
<b>Age of the child:</b>						
Age 6-10 years	824	80.2	9.9	2.7	2.2	5.0
Age 11-15 years	376	87.8	0.5	1.9	6.4	3.5
<b>Sex of the child:</b>						
Male	617	80.1	8.1	1.9	3.2	6.6
Female	583	85.2	5.8	2.9	3.8	2.2
<b>Maternal education:</b>						
None	326	84.7	3.7	4.3	3.4	4.0
Primary (I-V)	444	85.6	4.3	1.8	3.4	4.9
Secondary (VI+)	425	77.9	12.2	1.6	3.8	4.5
Unknown	5	80.0	20.0	0.0	0.0	0.0
<b>Father's education:</b>						
None	304	86.2	3.6	3.0	2.6	4.6
Primary (I-V)	319	84.0	3.8	3.1	3.8	5.3
Secondary (VI+)	279	81.7	10.0	0.7	4.3	3.2
Unknown	298	78.2	11.1	2.7	3.4	4.7
<b>HH asset quintile:</b>						
Lowest	207	85.0	4.3	2.4	4.3	3.9
Second	186	84.4	2.7	3.8	4.3	4.8
Middle	186	88.2	3.2	2.1	2.1	4.3
Fourth	152	78.3	10.5	2.6	4.6	3.9
Highest	139	82.0	10.8	0.7	2.2	4.3
Unknown	330	79.1	10.0	2.4	3.3	5.2
<b>All children</b>	<b>1200</b>	<b>82.6</b>	<b>7.0</b>	<b>2.4</b>	<b>3.5</b>	<b>4.5</b>

**Ever failed in final examinations**

Parents were asked if the child ever failed in the final examinations of schools or madrasahs. Among children aged 6-10 years attending in primary education 15.7% ever failed in final exams and it was

23.5% among children age 11-15 years attending in the secondary education (Table 11.4). The rate of failure was comparable between boys and girls.

**Table 11.4: Performance of children in primary and secondary education**

Name of the variables	Primary education (age 6-10 years)		Secondary education (age 11-15 years)	
	N=802	%	N=369	%
<b>Quit school with reasons:</b>				
Did quit for any reason	5	0.6	27	7.3
Not interested in study	3	0.4	19	5.1
Expenditure	1	0.1	4	1.1
Physical handicap	1	0.1	2	0.5
Marriage for girls	0	0.0	2	0.5
<b>Ever failed in final examinations:</b>				
Did not fail	678	84.5	283	76.7
Failed	124	15.5	86	23.3
<b>Ever repetition in the same class:</b>				
Never	631	78.7	245	66.4
For failure in exam	80	10.0	69	18.7
Pass, but not promoted	26	3.2	22	6.0
Others: changed school or system	65	8.1	33	8.9
<b>Repetition in classes:</b>				
I	102	12.7	28	7.6
II	36	4.5	25	6.8
III	15	1.9	32	8.7
IV	8	1.0	21	5.7
V	0	0.0	12	3.2
VI+	0	0.0	4	0.5
<b>Received any stipend:</b>				
None	572	71.3	294	79.7
Government	227	28.3	73	19.8
Others	3	0.4	2	0.5
<b>Walking time (mins) to reach school: (Mean±SD)</b>				
	802	13.7±9.8	369	18.9±13.2

### **Repetition in the same class**

Parents were asked about children's ever repetition in the same classes and reasons for repetition and the results are presented in Table 11.4. Rate of ever repetition increased with increase in age; it was 21.3% in the age group 6-10 years and 33.2% in the age group 11-15 years. The main reason for repetition was failure in final examinations (10% in the age group 6-10 years and 18.8% in the age group 11-15 years) followed by change from one type to another type of institutions or transfer from one institute to another of the same type (8.0% in the age group 6-10 years and 8.7% in the age group 11-15 years) and less satisfactory pass in the final exams and parents make the child study repeat in the same class (3.3% in the age 6-10 years and 5.7% in the age 11-15 years). Repetition was more common in class I, followed by class II than in any other higher classes.

### **Stipends for education**

Government has been providing stipend called '*upobirty*' to address social inequalities in primary education since 2003 and girl's secondary education stipend to address gender difference and drop-out of girls in secondary education since 1994. On inquiry about receiving *upobirty*, three in ten (29.7%; mostly *upobirty* 29.4%) children received any kind of stipends in the primary education and it was 18.9% (17.6% from the government) in the secondary education with great gender difference in favour of girls (Table 11.4).

### **Travel time to reach educational institutions**

Pupils in rural areas reach schools or madrasah by walk, and parents were asked about average time usually they required to reach there. Walking time to reach primary educational institutes varies widely; 26.7 % of children age 6-10 years required 5 minutes or less and 13.7% required 30 minutes or more with average being 14.2 minutes (Table 11.4). Number of secondary educational institutions is far less than the number of primary educational institutions (BANBASE 2009); as such time to reach the former type is likely to be longer. The average time to reach by walk was 18.9 minutes for children aged 11-15 years, with 26.7% children walked for 30 minutes or more. The median time to reach was 10 minutes for children age 6-10 years and 18 minutes for children aged 11-15 years.

### **Absent with reasons from school**

Parents were asked about how frequent children were absent from the schools or madrasah in last one year and reasons for being absent. Despite the possibility of error in recalling days of absence over a year, 84.8% of the children aged 6-10 years and 84.6% of the children aged 11-15 years were absent from classes for one day or more in last one year for any reason (Table 11.5). Number of days absent varied widely with mean being 18.4 days  $\pm$  standard deviation of 18.8 days in the age group 6-

10 years and 17.8 days  $\pm$  standard deviation of 18.2 days in the age group 11-15 years. The median days of absent were 14 days in each age group.

The most three common reasons for absence were illness of the child, bad weather and its consequences (heavy rain, flood, storm, road submerge, etc) and visit to the relatives' house for recreation. The other less common reasons were family functions, parents' illness and work in family farm.

**Table 11.5: Absent from class, educational materials available at home and punishment amongst children in primary and secondary education**

Name of the variables	Primary education (age 6-10 years)		Secondary education (age 11-15 years)	
	N=802	%	N=369	%
<b>Absent from class in last year:</b>				
Not absent	122	15.2	58	15.4
Absent for illness	488	60.8	222	60.2
Absent for parents' illness	24	3.0	18	4.9
Absent for work	25	3.1	30	8.1
Absent for heavy rain, flood, bad road	506	63.1	224	60.7
Family functions	81	10.1	46	12.5
Visits for recreation	405	50.5	164	44.4
<b>Materials available for study at home:</b>				
Books	778	99.7	325	100.0
Pen, pencil and writing pad	801	99.9	357	96.8
Pencil box	235	29.3	214	58.0
Table	646	80.6	327	88.6
Chair	637	79.4	320	86.7
School bag	626	78.1	280	75.9
Separate room for living and study	98	12.4	88	24.0
<b>Punishment in last 2 weeks amongst who were present in classes:</b>	N=780	%	N=325	%
None	671	86.0	277	85.2
For absent	23	2.9	8	2.5
For study	74	9.5	36	11.1
For being naughty	23	2.9	7	2.1

### **Availability of educational materials at home**

On inquiry about availability of educational materials that are needed for studying at home, all pupils with few exceptions have text books and writing pads with pen and pencil (Table 11.5). One in five children aged 6-10 years and one in seven children aged 11-15 years do not have tables and chairs to be used for study purpose. One in five children do not have a school bag, three in five do not have a pencil box, and five in six do not have a separate room to sleep and study.

### **Physical punishment**

In the last two weeks, 97.3% of the children aged 6-10 years and 88% aged 11-15 years attended classes. In response to the question on physical punishment child received from teachers in last two weeks, parents reported that 13.4% of the children aged 6-10 years and 14.9% of the children aged 11-15 years got some kinds of punishment from class teachers.

Seven percent got punishment once and the rest got twice or more. The most common reason for punishment was not preparing the lessons given by a teacher (9.1% and 11.1% respectively), followed by absence from classes (2.9% and 2.5%), and being naughty in the class (2.6% and 2.2% respectively).

### **Opinions of teachers on availability of educational facilities in schools and madrasah**

The class teachers of the respective pupils were asked about pupils' performance in annual examinations and facilities available in the institutes, and the results are presented for general schools, KG schools and aliya madrasahs in Table 11.8. One in six pupils failed in final examinations, and one in three got *upobirty*. Infrastructure wise, general schools are better than other institutes, which are either better or comparable in terms of availability of chair and tables in class rooms for teachers; bench (low and high) for pupils to sit; blackboard with chalk and duster for writing; and door and windows and partitioning walls in the class rooms. Only one in four schools have separate toilets for boys and girls, and two in three schools have tube-well for drinking water.

**Policy Relevance:** The net attendance rates in primary and secondary education in 2013 were high (93% and 71% respectively), but the primary determinants of not attending in secondary education are lower parents' education, lower household asset quintiles and being a boy. This finding reveals the need for considering secondary education stipend for boys to keep them in study. Absence from class was very high for sickness and poor road condition in the monsoon season. Economic development is needed to bring sustained improvement in availability of educational materials at home and institute and road communication.

**Table 11.6: Percentage distribution of pupils by teacher's opinions on academic performance and facilities available in the institutions by type of academic institutions**

Opinions on pupils performance and facilities in the institutes	Type of educational institutes				
	# children (n=859)	General schools (n=775)	Kindergarten schools (n=51)	Aliya madrasah (n=21)	Qawmi madrasah (n=12)
<b>Fail in final exams:</b>					
One time	17.0	18.1	0.0	28.6	0.0
Two time	1.9	1.8	0.0	9.5	0.0
<b>Got upobirty/stipend</b>	32.6	35.3	2.0	9.5	25.0
<b>Infrastructure of the institutes</b>					
Pacca (cemented) floor	91.6	95.2	47.1	85.7	58.3
Pacca wall	90.3	95.3	33.3	76.2	33.3
Pacca roof	84.5	90.4	15.7	61.9	33.3
<b>Facilities in institutes</b>					
Chair & table	71.2	70.2	86.3	71.4	75.0
Bench	65.2	64.9	78.4	47.6	58.3
Blackboard	86.7	87.3	86.3	71.4	75.0
Chalk and duster	96.5	96.9	98.0	80.9	91.7
Door & windows	85.3	85.2	94.1	76.2	75.0
Partition wall	82.0	81.5	92.2	76.2	75.0
Toilet for boy	28.6	29.4	9.8	57.1	8.3
Toilet for girl	28.2	28.6	9.8	66.7	8.3
Tube-well	66.5	66.2	58.8	80.9	91.7

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## APPENDIX A

Appendix A-1 Mid-year population in icddr,b service area by age, sex, and block, 2012

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	37454	17195	20259	32054	14799	17255	24329	11413	12916	22540	10549	11991
Under 1	937	483	454	746	359	387	517	279	238	502	254	248
1 - 4	3325	1685	1640	2845	1497	1348	2010	1010	1000	1763	885	878
1	789	371	418	726	381	345	477	261	216	413	214	199
2	842	439	403	650	334	316	497	247	250	432	215	217
3	819	411	408	728	374	354	509	249	260	437	218	219
4	875	464	411	741	408	333	527	253	274	481	238	243
5 - 9	4259	2172	2087	3633	1830	1803	2612	1298	1314	2499	1252	1247
10-14	4045	1953	2092	3555	1762	1793	2454	1233	1221	2382	1186	1196
15-19	3091	1369	1722	2825	1317	1508	2154	1040	1114	1934	970	964
20-24	2844	1022	1822	2405	944	1461	1876	739	1137	1617	654	963
25-29	2609	962	1647	2119	847	1272	1728	708	1020	1432	538	894
30-34	2429	1061	1368	2022	803	1219	1546	674	872	1362	566	796
35-39	2461	1026	1435	1897	785	1112	1488	675	813	1415	644	771
40-44	2287	1009	1278	1878	822	1056	1524	631	893	1337	578	759
45-49	2409	1107	1302	1996	867	1129	1531	704	827	1491	682	809
50-54	2015	1037	978	1797	938	859	1451	749	702	1452	729	723
55-59	1413	709	704	1185	583	602	988	485	503	960	505	455
60-64	1026	493	533	947	440	507	748	368	380	731	338	393
65-69	957	421	536	812	330	482	679	308	371	608	269	339
70-74	611	311	300	616	267	349	500	234	266	499	209	290
75-79	400	205	195	419	215	204	306	159	147	325	163	162
80-84	195	94	101	231	124	107	143	79	64	152	81	71
85+	141	76	65	126	69	57	74	40	34	79	46	33

Appendix A-2 Deaths in icddr,b service area by age, sex, and block, 2012

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	250	135	115	199	109	90	169	89	80	155	86	69
Under 1	18	14	4	14	7	7	12	6	6	10	2	8
<1 month	16	14	2	10	5	5	8	5	3	7	2	5
1- 5 months	2	0	2	3	2	1	4	1	3	3	0	3
6-11 months	0	0	0	1	0	1	0	0	0	0	0	0
1 - 4	7	2	5	3	3	0	5	3	2	4	1	3
1	5	2	3	1	1	0	2	1	1	3	0	3
2	0	0	0	0	0	0	1	0	1	0	0	0
3	1	0	1	0	0	0	2	2	0	0	0	0
4	1	0	1	2	2	0	0	0	0	1	1	0
5 - 9	1	1	0	1	1	0	0	0	0	2	1	1
10-14	1	0	1	1	0	1	2	0	2	0	0	0
15-19	2	1	1	3	2	1	1	0	1	1	0	1
20-24	1	0	1	3	1	2	2	1	1	2	2	0
25-29	5	4	1	2	1	1	3	0	3	2	1	1
30-34	1	0	1	0	0	0	2	1	1	0	0	0
35-39	3	0	3	0	0	0	1	1	0	1	1	0
40-44	3	1	2	1	1	0	5	0	5	1	0	1
45-49	12	7	5	13	6	7	9	3	6	2	2	0
50-54	15	12	3	10	2	8	11	7	4	11	8	3
55-59	16	9	7	16	10	6	8	6	2	7	5	2
60-64	15	11	4	19	10	9	8	5	3	10	6	4
65-69	26	13	13	18	12	6	19	9	10	12	8	4
70-74	35	19	16	23	12	11	22	11	11	25	11	14
75-79	45	19	26	31	17	14	28	20	8	29	14	15
80-84	21	11	10	23	13	10	13	6	7	21	14	7
85+	23	11	12	18	11	7	18	10	8	15	10	5

Appendix A-3 Abridged life table for icddr,b service area by sex, 2012

Age (years)	Male				Female			
	$nq_x$	$l_x$	$L_x$	$e0_x$	$nq_x$	$l_x$	$L_x$	$e0_x$
0	21.6	100000	98163	71.0	19.4	100000	98353	73.6
1	3.3	97839	97651	71.6	5.9	98062	97719	74.1
2	0.0	97521	97521	70.8	0.8	97481	97440	73.5
3	1.6	97521	97443	69.8	0.8	97399	97360	72.6
4	2.2	97365	97258	68.9	0.8	97320	97282	71.7
5	2.3	97151	485243	68.1	0.8	97243	486043	70.7
10	0.0	96929	484643	63.2	3.2	97168	485130	65.8
15	3.2	96929	483931	58.2	3.8	96860	483461	61.0
20	5.9	96620	481776	53.4	3.7	96496	481654	56.2
25	9.8	96046	478064	48.7	6.2	96138	479317	51.4
30	1.6	95107	475182	44.1	2.3	95543	477197	46.7
35	3.2	94954	474071	39.2	3.6	95318	475796	41.8
40	3.3	94651	472538	34.3	10.0	94973	472676	36.9
45	26.5	94340	465926	29.4	21.9	94024	465361	32.3
50	41.2	91844	450445	25.2	27.2	91965	454026	27.9
55	63.8	88061	427221	21.1	36.9	89459	439645	23.7
60	93.4	82445	394192	17.4	53.8	86158	420017	19.5
65	147.1	74748	347702	13.9	91.4	81525	390173	15.4
70	230.7	63752	283312	10.8	195.6	74073	335714	11.7
75	381.7	49045	198447	8.3	364.3	59586	243937	8.9
80	449.0	30324	116971	6.9	396.9	37880	151681	7.6
85+	1000.0	16708	91893	5.5	1000.0	22844	134925	5.9

Appendix A-4 Abridged life table for Government service area by sex, 2012

Age (years)	Male				Female			
	$nq_x$	$l_x$	$L_x$	$e0_x$	$nq_x$	$l_x$	$L_x$	$e0_x$
0	43.2	100000	96330	69.2	31.6	100000	97315	74.0
1	3.4	95683	95489	71.3	0.9	96841	96792	75.4
2	0.9	95354	95309	70.5	0.9	96758	96714	74.4
3	0.9	95265	95224	69.6	1.8	96669	96583	73.5
4	0.0	95182	95182	68.7	0.0	96496	96496	72.6
5	3.2	95182	475202	67.7	1.7	96496	482113	71.6
10	2.4	94874	473852	62.9	2.5	96336	481127	66.7
15	2.1	94649	472797	58.0	1.9	96096	480053	61.9
20	4.3	94454	471325	53.1	7.8	95911	477826	57.0
25	7.2	94044	468650	48.3	3.4	95161	475055	52.4
30	5.6	93363	465620	43.7	5.0	94835	473091	47.6
35	13.3	92844	461370	38.9	4.2	94364	470899	42.8
40	13.0	91608	455304	34.4	10.9	93964	467452	38.0
45	29.1	90422	446012	29.8	22.7	92938	459821	33.4
50	32.5	87787	432325	25.6	14.2	90832	451187	29.1
55	76.6	84932	409463	21.4	39.3	89544	439560	24.5
60	106.3	78424	372530	18.0	46.6	86025	420827	20.4
65	121.8	70084	330308	14.8	72.7	82020	396189	16.3
70	213.1	61548	276252	11.5	199.0	76059	344068	12.3
75	330.1	48434	202732	8.9	341.8	60925	253123	9.7
80	418.2	32444	127988	7.0	422.5	40103	157714	8.5
85+	1000.0	18875	98152	5.2	1000.0	23158	181959	7.9

Appendix A-5 Male deaths by cause and age, 2012

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+
<b>Communicable diseases</b>																				
Diarrhoeal	7	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	2
Dysentery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuberculosis	15	0	0	0	0	0	0	0	0	1	0	2	1	4	2	0	3	1	0	1
Hepatitis	14	0	0	0	0	0	0	0	0	0	2	1	4	4	1	1	0	1	0	0
Chicken pox	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Septicaemia	17	2	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	5	4	4
Respiratory infections	17	4	1	2	1	0	0	0	0	0	0	0	0	1	0	0	0	3	3	2
Other communicable	6	0	2	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0
<b>Maternal and neonatal conditions</b>																				
Maternal death	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neonatal condition																				
-Premature and LBW	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Birth asphyxia	29	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Other neonatal	26	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Nutritional</b>																				
	13	0	0	0	0	1	0	0	0	0	1	0	0	0	1	1	2	2	1	4
<b>Non-communicable diseases</b>																				
Malignant neoplasm																				
-Neoplasm	84	0	0	0	0	2	1	1	0	1	1	10	14	8	11	10	13	10	1	1
-Neoplasm in female organ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Congenital malformation	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Endocrine disorder																				
-Diabetes	16	0	0	0	0	0	0	0	0	0	0	2	1	0	1	2	1	2	5	2
-Other endocrine	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neuro-psychiatric	5	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1
Diseases of circulatory system																				
-Rheumatic heart disease	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Hypertensive disease	3	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0
-Ischaemic heart disease	109	0	0	1	0	0	1	0	1	2	1	2	9	12	17	17	16	14	7	9
-Stroke	197	0	0	0	0	0	0	0	0	0	0	6	8	12	19	26	31	37	31	27
-Other cardiovascular	39	0	0	0	0	0	0	1	0	0	0	4	2	2	2	1	4	8	7	8
Respiratory disease																				
-COPD	53	0	0	0	0	0	0	0	0	0	0	3	1	6	3	6	14	11	4	5
-Asthma	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
-Other respiratory	10	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	2	3	1	0
Digestive disease	31	1	0	0	0	0	0	1	0	0	2	1	5	8	1	3	3	4	2	0
Genitourinary disease																				
-Renal failure	11	0	0	0	0	0	1	1	0	0	0	0	2	1	0	3	0	1	2	
-Nephritis syndrome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other non-communicable	8	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	2	2	0	0
<b>Injuries</b>																				
Unintentional injuries																				
-Accident	26	1	0	0	0	1	1	2	0	4	1	0	2	2	2	1	1	4	4	0
-Drowning	17	1	9	2	0	0	1	2	0	0	0	0	0	0	0	0	0	0	1	1
Intentional injuries																				
-Suicide	6	0	0	0	0	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0
-Homicide	4	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	1	0	0	0
<b>Miscellaneous</b>																				
-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	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
- sudden infant death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Unknown/missing</b>	44	5	1	0	0	0	0	1	0	0	0	1	1	2	3	2	3	11	7	7
<b>Total</b>	<b>819</b>	<b>78</b>	<b>15</b>	<b>7</b>	<b>3</b>	<b>5</b>	<b>7</b>	<b>10</b>	<b>4</b>	<b>9</b>	<b>9</b>	<b>35</b>	<b>50</b>	<b>64</b>	<b>68</b>	<b>75</b>	<b>99</b>	<b>123</b>	<b>81</b>	<b>77</b>

COPD=Chronic obstructive pulmonary disease

Appendix A-6 Female deaths by cause and age, 2012

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+
<b>Communicable diseases</b>																				
Diarrhoeal	12	1	0	0	1	0	0	0	0	0	0	0	0	2	1	4	1	1	1	1
Dysentery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuberculosis	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Hepatitis	5	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	1	0	0
Chicken pox	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Septicaemia	23	2	0	0	0	0	0	0	0	0	0	2	0	0	0	6	5	6	2	2
Respiratory infections	12	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	1
Other communicable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Maternal and neonatal conditions</b>																				
Maternal death	6	0	0	0	0	1	1	3	1	0	0	0	0	0	0	0	0	0	0	0
Neonatal condition																				
-Premature and LBW	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Birth asphyxia	21	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Other neonatal	18	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Nutritional</b>																				
15	2	0	0	0	0	0	0	0	0	1	1	1	0	1	0	3	4	1	1	1
<b>Non-communicable diseases</b>																				
Malignant neoplasm																				
-Neoplasm	44	0	0	1	1	1	2	1	1	1	2	5	6	7	5	5	4	1	1	0
-Neoplasm in female organ	9	0	0	0	0	0	0	0	0	1	1	4	1	0	2	0	0	0	0	0
Congenital malformation	9	5	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Endocrine disorder																				
-Diabetes	18	0	0	0	1	0	0	0	0	0	0	1	0	2	0	2	5	5	0	2
-Other endocrine	2	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0
Neuro-psychiatric	11	0	2	0	0	0	0	0	0	1	0	0	2	2	0	1	0	2	1	0
Diseases of circulatory system																				
-Rheumatic heart disease	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
-Hypertensive disease	5	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	2	0	0	0
-Ischaemic heart disease	74	0	0	0	0	1	0	0	0	1	6	3	5	8	13	13	14	9	1	1
-Stroke	201	0	0	0	0	0	0	0	1	4	5	3	11	11	17	44	51	27	27	27
-Other cardiovascular	43	1	0	0	0	1	0	1	0	2	0	0	2	1	3	8	8	11	5	5
Respiratory disease																				
-COPD	31	0	0	0	0	0	1	0	0	0	0	3	1	0	5	5	9	4	3	3
-Asthma	2	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
-Other respiratory	2	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0
Digestive disease	19	1	0	0	0	1	0	0	1	1	3	3	1	1	4	1	2	0	0	0
Genitourinary disease																				
-Renal failure	9	0	0	1	1	0	1	0	0	1	1	1	0	1	1	1	0	0	0	0
-Nephritis syndrome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Other urinary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other non-communicable	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0
<b>Injuries</b>																				
Unintentional injuries																				
-Accident	26	0	0	0	0	0	1	0	0	2	3	0	0	1	4	3	5	3	4	4
-Drowning	9	1	7	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Intentional injuries																				
-Suicide	11	0	0	0	1	3	4	1	1	0	0	1	0	0	0	0	0	0	0	0
-Homicide	4	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0
<b>Miscellaneous</b>																				
-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	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
-Sudden infant death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Unknown/missing</b>																				
40	1	1	1	0	1	0	1	0	0	1	0	0	1	2	1	3	14	7	6	6
<b>Total</b>	<b>690</b>	<b>60</b>	<b>14</b>	<b>3</b>	<b>7</b>	<b>6</b>	<b>12</b>	<b>9</b>	<b>6</b>	<b>6</b>	<b>16</b>	<b>35</b>	<b>27</b>	<b>35</b>	<b>37</b>	<b>59</b>	<b>105</b>	<b>127</b>	<b>73</b>	<b>53</b>

COPD=Chronic obstructive pulmonary disease

Appendix A-7 Male deaths by cause, age, and area, 2012

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
	<b>Communicable diseases</b>															
Diarrhoeal	6	1	0	0	1	0	0	0	0	0	0	0	3	1	2	0
Dysentery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuberculosis	5	10	0	0	0	0	0	0	0	1	3	6	1	3	1	0
Hepatitis	9	5	0	0	0	0	0	0	1	1	6	4	2	0	0	0
Chicken pox	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Septicaemia	9	8	1	1	0	0	0	0	0	0	0	1	4	6	4	0
Respiratory infections	9	8	0	4	0	1	2	1	0	0	0	1	6	0	1	1
Other communicable	1	5	0	0	0	2	0	1	0	0	1	2	0	0	0	0
<b>Maternal and neonatal conditions</b>																
Maternal death	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neonatal condition																
-premature and LBW	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0
-birth asphyxia	11	18	11	18	0	0	0	0	0	0	0	0	0	0	0	0
-other neonatal	12	14	12	14	0	0	0	0	0	0	0	0	0	0	0	0
<b>Nutritional</b>	5	8	0	0	0	0	0	0	1	1	0	1	2	4	2	2
<b>Non-communicable diseases</b>																
Malignant neoplasm																
-neoplasm	49	35	0	0	0	0	0	0	5	1	22	21	21	13	1	0
-neoplasm in female organ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Congenital malformation	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0
Endocrine disorder																
-diabetes	10	6	0	0	0	0	0	0	0	0	3	1	6	4	1	1
-other endocrine	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Neuro-psychiatric	2	3	0	0	0	0	0	1	0	0	1	0	1	1	0	1
Diseases of circulatory system																
-rheumatic heart disease	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
-hypertensive disease	1	2	0	0	0	0	0	0	1	0	0	1	0	1	0	0
-ischaemic heart disease	64	45	0	0	0	0	0	1	1	4	24	16	36	18	3	6
-stroke	100	97	0	0	0	0	0	0	0	0	23	22	64	61	13	14
-other cardiovascular	22	17	0	0	0	0	0	0	0	1	4	6	12	8	6	2
Respiratory disease																
-COPD	27	26	0	0	0	0	0	0	0	0	5	8	19	16	3	2
-Asthma	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
-Other respiratory	6	4	0	1	1	0	0	0	0	0	1	0	4	3	0	0
Digestive disease	12	19	0	1	0	0	0	0	0	3	8	7	4	8	0	0
Genitourinary disease																
-Renal failure	6	5	0	0	0	0	0	0	1	1	1	2	3	1	1	1
-Nephritis syndrome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Other urinary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other non-communicable	5	3	0	0	0	0	0	0	0	0	0	2	5	1	0	0
<b>Injuries</b>																
Unintentional injuries																
-accident	16	10	1	0	0	0	0	0	3	6	4	2	8	2	0	0
-drowning	9	8	0	1	6	3	1	1	1	2	0	0	1	0	0	1
Intentional injuries																
-suicide	2	4	0	0	0	0	0	0	2	4	0	0	0	0	0	0
-homicide	2	2	0	0	0	0	0	0	1	1	0	1	1	0	0	0
<b>Miscellaneous</b>																
-senility	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-fever of unknown origin	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
-sudden infant death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Unknown/missing</b>	13	31	0	5	1	0	0	0	1	0	3	4	5	18	3	4
<b>Total</b>	<b>419</b>	<b>400</b>	<b>29</b>	<b>49</b>	<b>9</b>	<b>6</b>	<b>3</b>	<b>7</b>	<b>18</b>	<b>26</b>	<b>109</b>	<b>108</b>	<b>209</b>	<b>169</b>	<b>42</b>	<b>35</b>



Appendix A-8 Female deaths by cause, age, and area, 2012

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
	<b>Communicable diseases</b>															
Diarrhoeal	6	6	1	0	0	0	1	0	0	0	1	1	2	5	1	0
Dysentery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuberculosis	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Hepatitis	4	1	0	0	0	0	0	0	0	0	2	0	2	1	0	0
Chicken pox	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Septicaemia	16	7	2	0	0	0	0	0	0	0	1	1	11	6	2	0
Respiratory infections	5	7	2	3	2	0	0	0	0	0	0	0	1	3	0	1
Other communicable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Maternal and neonatal conditions</b>																
Maternal death	2	4	0	0	0	0	0	0	2	4	0	0	0	0	0	0
Neonatal condition																
-premature and LBW	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
-birth asphyxia	5	16	5	16	0	0	0	0	0	0	0	0	0	0	0	0
-other neonatal	6	12	6	12	0	0	0	0	0	0	0	0	0	0	0	0
<b>Nutritional</b>	10	5	1	1	0	0	0	0	1	0	2	1	6	2	0	1
<b>Non-communicable diseases</b>																
Malignant neoplasm																
-neoplasm	17	27	0	0	0	0	0	2	2	6	10	13	5	6	0	0
-neoplasm in female organ	4	5	0	0	0	0	0	0	1	1	3	4	0	0	0	0
Congenital malformation	6	3	4	1	1	1	1	1	0	0	0	0	0	0	0	0
Endocrine disorder																
-diabetes	12	6	0	0	0	0	1	0	0	0	2	1	7	5	2	0
-other endocrine	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
Neuro-psychiatric	7	4	0	0	1	1	0	0	1	0	3	1	2	2	0	0
Diseases of circulatory system																
-rheumatic heart disease	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
-hypertensive disease	3	2	0	0	0	0	0	0	0	0	0	2	3	0	0	0
-ischaemic heart disease	33	41	0	0	0	0	0	0	0	2	11	11	21	28	1	0
-stroke	110	91	0	0	0	0	0	0	1	4	17	13	73	66	19	8
-other cardiovascular	20	23	1	0	0	0	0	0	3	1	0	3	13	17	3	2
Respiratory disease																
-COPD	13	18	0	0	0	0	0	0	1	0	2	2	8	15	2	1
-asthma	1	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0
-other respiratory	1	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0
Digestive disease	12	7	1	0	0	0	0	0	2	1	6	2	3	4	0	0
Genitourinary disease																
-renal failure	6	3	0	0	0	0	1	1	1	1	2	1	2	0	0	0
-Nephritis syndrome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-other urinary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other non-communicable	2	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
<b>Injuries</b>																
Unintentional injuries																
-accident	15	11	0	0	0	0	0	0	3	0	3	1	8	7	1	3
-drowning	6	3	0	1	6	1	0	0	0	0	0	1	0	0	0	0
Intentional injuries																
-suicide	5	6	0	0	0	0	1	0	4	5	0	1	0	0	0	0
-homicide	2	2	0	0	0	0	0	0	2	2	0	0	0	0	0	0
<b>Miscellaneous</b>																
-senility	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-fever of unknown origin	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0
-sudden infant death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Unknown/missing</b>	19	21	1	0	0	1	0	1	2	1	1	2	14	11	1	5
<b>Total</b>	<b>354</b>	<b>336</b>	<b>25</b>	<b>35</b>	<b>10</b>	<b>4</b>	<b>5</b>	<b>5</b>	<b>27</b>	<b>28</b>	<b>73</b>	<b>61</b>	<b>182</b>	<b>182</b>	<b>32</b>	<b>21</b>

Appendix A-9 Age-specific fertility rate and indices for icddr,b service area by block, 2012

Age (years)	Block A		Block B		Block C		Block D	
	Births	Rate	Births	Rate	Births	Rate	Births	Rate
All ages	893	84.5	737	84.2	525	78.6	477	80.1
15-19*	146	84.8	115	76.3	94	84.4	55	57.1
20-24	315	172.9	236	161.5	192	168.9	162	168.2
25-29	205	124.5	186	146.2	144	141.2	135	151.0
30-34	150	109.6	132	108.3	74	84.9	87	109.3
35-39	63	43.9	56	50.4	19	23.4	33	42.8
40-44	14	11.0	12	11.4	2	2.2	5	6.6
45-49**	0	0.0	0	0.0	0	0.0	0	0.0
Total fertility rate		2733		2770		2524		2675
General fertility rate		84		84		79		80
Gross reproduction rate		1344		1394		1202		1290

\*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, 2012

Age (years)	Total women	Total birth	Live birth order									
			1	2	3	4	5	6	7	8	9	10+
<b>Both areas</b>												
<15	12298	4	4	0	0	0	0	0	0	0	0	0
15-19	10512	730	676	51	2	0	0	0	0	0	0	1
20-24	10480	1679	934	662	73	8	0	0	0	0	2	0
25-29	9208	1255	250	598	340	56	5	5	0	0	1	0
30-34	8270	816	63	184	344	168	44	11	2	0	0	0
35-39	7663	322	13	39	107	97	44	17	4	1	0	0
40-44	7629	69	0	3	12	21	18	6	5	2	1	1
45-49	7780	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>4875</b>	<b>1940</b>	<b>1537</b>	<b>878</b>	<b>350</b>	<b>111</b>	<b>39</b>	<b>11</b>	<b>3</b>	<b>4</b>	<b>2</b>
<b>icddr,b service area</b>												
<15	6302	2	2	0	0	0	0	0	0	0	0	0
15-19	5308	408	385	22	0	0	0	0	0	0	0	1
20-24	5383	905	492	376	35	1	0	0	0	0	1	0
25-29	4833	670	130	328	189	19	1	2	0	0	1	0
30-34	4255	443	42	108	196	79	14	4	0	0	0	0
35-39	4131	171	5	19	64	54	24	4	0	1	0	0
40-44	3986	33	0	0	4	14	7	3	3	1	0	1
45-49	4067	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>2632</b>	<b>1056</b>	<b>853</b>	<b>488</b>	<b>167</b>	<b>46</b>	<b>13</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>Government service area</b>												
<15	5996	2	2	0	0	0	0	0	0	0	0	0
15-19	5204	322	291	29	2	0	0	0	0	0	0	0
20-24	5097	774	442	286	38	7	0	0	0	0	1	0
25-29	4375	585	120	270	151	37	4	3	0	0	0	0
30-34	4015	373	21	76	148	89	30	7	2	0	0	0
35-39	3532	151	8	20	43	43	20	13	4	0	0	0
40-44	3643	36	0	3	8	7	11	3	2	1	1	0
45-49	3713	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>2243</b>	<b>884</b>	<b>684</b>	<b>390</b>	<b>183</b>	<b>65</b>	<b>26</b>	<b>8</b>	<b>1</b>	<b>2</b>	<b>0</b>

Appendix A-11 Age-order-specific fertility rates by area, 2012

Age (years)	Total	Live birth order										
		1	2	3	4	5	6	7	8	9	10+	
<b>Both areas</b>												
<15	0.0003	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15-19	0.0694	0.0643	0.0049	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
20-24	0.1602	0.0891	0.0632	0.0070	0.0008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000
25-29	0.1363	0.0272	0.0649	0.0369	0.0061	0.0005	0.0005	0.0000	0.0000	0.0001	0.0000	0.0000
30-34	0.0987	0.0076	0.0222	0.0416	0.0203	0.0053	0.0013	0.0002	0.0000	0.0000	0.0000	0.0000
35-39	0.0420	0.0017	0.0051	0.0140	0.0127	0.0057	0.0022	0.0005	0.0001	0.0000	0.0000	0.0000
40-44	0.0090	0.0000	0.0004	0.0016	0.0028	0.0024	0.0008	0.0007	0.0003	0.0001	0.0001	0.0001
45-49	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>2.5800</b>	<b>0.9511</b>	<b>0.8035</b>	<b>0.5061</b>	<b>0.2129</b>	<b>0.0698</b>	<b>0.0244</b>	<b>0.0071</b>	<b>0.0020</b>	<b>0.0022</b>	<b>0.0011</b>	
<b>icddr,b service area</b>												
<15	0.0003	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15-19	0.0769	0.0725	0.0041	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
20-24	0.1681	0.0914	0.0698	0.0065	0.0002	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000
25-29	0.1386	0.0269	0.0679	0.0391	0.0039	0.0002	0.0004	0.0000	0.0000	0.0002	0.0000	0.0000
30-34	0.1041	0.0099	0.0254	0.0461	0.0186	0.0033	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000
35-39	0.0414	0.0012	0.0046	0.0155	0.0131	0.0058	0.0010	0.0000	0.0002	0.0000	0.0000	0.0000
40-44	0.0083	0.0000	0.0000	0.0010	0.0035	0.0018	0.0008	0.0008	0.0003	0.0000	0.0003	0.0003
45-49	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>2.6886</b>	<b>1.0111</b>	<b>0.8592</b>	<b>0.5408</b>	<b>0.1963</b>	<b>0.0553</b>	<b>0.0154</b>	<b>0.0038</b>	<b>0.0025</b>	<b>0.0020</b>	<b>0.0022</b>	
<b>Government service area</b>												
<15	0.0003	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15-19	0.0619	0.0559	0.0056	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20-24	0.1519	0.0867	0.0561	0.0075	0.0014	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000
25-29	0.1337	0.0274	0.0617	0.0345	0.0085	0.0009	0.0007	0.0000	0.0000	0.0000	0.0000	0.0000
30-34	0.0929	0.0052	0.0189	0.0369	0.0222	0.0075	0.0017	0.0005	0.0000	0.0000	0.0000	0.0000
35-39	0.0428	0.0023	0.0057	0.0122	0.0122	0.0057	0.0037	0.0011	0.0000	0.0000	0.0000	0.0000
40-44	0.0099	0.0000	0.0008	0.0022	0.0019	0.0030	0.0008	0.0005	0.0003	0.0003	0.0000	0.0000
45-49	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>2.4666</b>	<b>0.8895</b>	<b>0.7441</b>	<b>0.4679</b>	<b>0.2305</b>	<b>0.0853</b>	<b>0.0347</b>	<b>0.0109</b>	<b>0.0014</b>	<b>0.0024</b>	<b>0.0000</b>	

Appendix A-12. Marriages and divorces by month, 2012

Month	Marriage		Divorce	
	Number	Percent	Number	Percent
January	262	8.0	34	9.2
February	269	8.2	37	10.1
March	338	10.3	29	7.9
April	221	6.8	26	7.1
May	263	8.0	24	6.5
June	269	8.2	28	7.6
July	266	8.1	24	6.5
August	255	7.8	33	9.0
September	240	7.3	39	10.6
October	272	8.3	35	9.5
November	337	10.3	32	8.7
December	276	8.4	27	7.3
<b>Total</b>	<b>3268</b>	<b>100.0</b>	<b>368</b>	<b>100.0</b>

Appendix A-13. In- and out-migrations by age and sex, 2012

Age (years)	In-migration			Out-migration		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	10071	4628	5443	12077	5998	6079
0-4	1577	829	748	1398	728	670
5 - 9	957	481	476	975	497	478
10-14	628	296	332	922	520	402
15-19	1448	269	1179	2071	808	1263
20-24	1546	478	1068	2347	1037	1310
25-29	1273	621	652	1505	721	784
30-34	926	560	366	964	595	369
35-39	560	378	182	607	389	218
40-44	365	264	101	434	294	140
45-49	234	152	82	271	156	115
50-54	203	121	82	181	100	81
55-59	98	64	34	104	46	58
60-64	89	54	35	90	42	48
65+	167	61	106	208	65	143

Appendix A-14. In-migrations by age, sex, and area, 2012

Age (years)	icddr,b service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	5543	2520	3023	4528	2108	2420
0-4	858	471	387	719	358	361
5 - 9	550	292	258	407	189	218
10-14	340	152	188	288	144	144
15-19	865	141	724	583	128	455
20-24	810	220	590	736	258	478
25-29	669	334	335	604	287	317
30-34	496	294	202	430	266	164
35-39	346	233	113	214	145	69
40-44	206	143	63	159	121	38
45-49	135	86	49	99	66	33
50-54	99	60	39	104	61	43
55-59	46	36	10	52	28	24
60-64	42	25	17	47	29	18
65+	81	33	48	86	28	58

Appendix A-15. Out-migrations by age, sex, and area, 2012

Age (years)	icddr,b service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	6045	2977	3068	6032	3021	3011
0-4	693	355	338	705	373	332
5 - 9	494	259	235	481	238	243
10-14	500	275	225	422	245	177
15-19	1015	364	651	1056	444	612
20-24	1110	500	610	1237	537	700
25-29	715	342	373	790	379	411
30-34	517	310	207	447	285	162
35-39	322	203	119	285	186	99
40-44	233	157	76	201	137	64
45-49	132	72	60	139	84	55
50-54	101	54	47	80	46	34
55-59	58	25	33	46	21	25
60-64	48	22	26	42	20	22
65+	107	39	68	101	26	75

Appendix A-16. Male out-migration by cause of movement and age, 2012

Cause of movement	Age (years)														
	Total	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
All migrants	5998	728	497	520	808	1037	721	595	389	294	156	100	46	42	65
<b>Work/economic/educational</b>															
Acquired/seeking job	3329	0	0	131	525	826	606	498	312	212	114	59	22	18	6
Job completion/retirement	11	0	0	0	0	2	0	3	0	1	0	3	1	0	1
To acquire education	503	6	70	124	153	111	22	4	2	7	1	3	0	0	0
Educ. completed/interrupted	3	0	0	2	0	1	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
<b>Housing/environmental</b>															
Acquired/seeking new land/house	200	0	0	1	1	6	22	29	30	27	21	19	10	16	18
River erosion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Marriage / familial</b>															
Marriage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Separation/divorce/widow	27	0	0	0	5	7	7	3	2	2	0	1	0	0	0
Move or join with spouse/follow parents	1647	712	420	253	108	55	32	15	12	8	7	3	3	3	16
Move or join with other relatives	28	5	3	4	3	3	0	2	4	0	0	1	0	0	3
Adoption	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	86	0	1	0	5	12	15	24	8	10	2	2	3	1	3
Health or old age care	22	1	0	0	1	0	1	0	0	0	1	1	2	3	12
<b>Legal problems</b>	65	0	0	0	2	4	6	8	12	17	8	3	2	0	3
<b>Other and not stated</b>															
Others n.e.c.*	68	0	2	4	5	9	10	9	7	10	2	4	2	1	3
Unknown or not stated	5	0	1	1	0	1	0	0	0	0	0	1	1	0	0

\*n.e.c.=Not elsewhere classified

Appendix A-17. Female out-migration by cause of movement and age, 2012

Cause of movement	Age (years)														
	Total	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
All migrants	6079	670	478	402	1263	1310	784	369	218	140	115	81	58	48	143
<b>Work/economic/educational</b>															
Acquired/seeking job	458	0	3	31	133	106	68	45	33	14	14	6	5	0	0
Job completion/retirement	3	0	0	0	0	0	1	0	1	0	0	0	1	0	0
To acquire education	315	4	62	60	77	51	15	23	12	6	4	0	0	1	0
Educ. completed/interrupted	6	0	2	2	0	1	1	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
<b>Housing/environmental</b>															
Acquired/seeking new land/house	167	0	0	3	7	25	35	26	19	9	10	6	10	3	14
River erosion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Marriage / familial</b>															
Marriage	1049	0	0	39	494	369	114	19	9	2	1	1	0	1	0
Separation/divorce/widow	125	0	0	9	54	32	10	8	3	4	1	2	1	0	1
Move or join with spouse/follow parents	3364	655	403	231	366	592	446	215	118	89	71	51	32	31	64
Move or join with other relatives	41	0	3	6	9	3	3	0	2	1	2	2	1	3	6
Adoption	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	229	2	0	1	46	74	52	16	14	6	3	4	2	0	9
Health or old age care	113	0	0	1	15	23	16	3	0	0	1	2	2	5	45
<b>Legal problems</b>	11	0	0	0	1	1	1	0	3	1	3	0	0	1	0
<b>Other and not stated</b>															
Others n.e.c.*	180	0	5	18	59	32	22	13	3	8	5	6	4	1	4
Unknown or not stated	9	0	0	1	2	1	0	1	1	0	0	1	0	2	0

\*n.e.c.=Not elsewhere classified

Appendix A-18 Male in-migration by cause of movement and age, 2012

Cause of movement	Age (years)														
	Total	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
All migrants	4628	829	481	296	269	478	621	560	378	264	152	121	64	54	61
<b>Work/economic/educational</b>															
Acquired/seeking job	774	0	0	10	59	139	163	159	99	64	27	32	6	11	5
Job completion/retirement	547	0	0	0	6	54	104	115	83	73	40	31	16	13	12
To acquire education	195	4	67	65	35	12	3	4	2	2	1	0	0	0	0
Educ. completed/interrupted	10	0	0	1	0	5	4	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
<b>Housing/environmental</b>															
Acquired/seeking new land/house	720	0	0	1	17	91	163	146	102	76	46	27	18	19	14
River erosion	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
<b>Marriage / familial</b>															
Marriage	0	0	0	0	0	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
Move or join with spouse/follow parents	1837	809	407	207	109	96	87	58	24	12	6	6	4	6	6
Move or join with other relatives	30	6	5	4	2	1	3	3	1	1	0	2	0	0	2
Adoption	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	63	0	1	0	1	16	8	12	10	4	4	1	3	1	2
Health or old age care	91	0	0	0	2	9	14	7	12	5	10	10	6	2	14
<b>Legal problems</b>	77	0	0	0	0	9	23	11	17	9	5	2	1	0	0
<b>Other and not stated</b>															
Others n.e.c.*	270	1	1	8	38	46	47	45	26	18	12	10	10	2	6
Unknown or not stated	5	1	0	0	0	0	2	0	1	0	1	0	0	0	0

\*n.e.c.=Not elsewhere classified



Appendix A-19 Female in-migration by cause of movement and age, 2012

Cause of movement	Age (years)														
	Total	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
All migrants	5443	748	476	332	1179	1068	652	366	182	101	82	82	34	35	106
<b>Work/economic/educational</b>															
Acquired/seeking job	136	0	0	7	12	26	34	23	11	9	4	5	1	3	1
Job completion/retirement	18	0	0	0	1	5	5	2	3	1	0	1	0	0	0
To acquire education	240	9	61	66	41	14	22	14	5	6	1	0	1	0	0
Educ. completed/interrupted	3	0	0	0	2	0	0	1	0	0	0	0	0	0	0
Student lodging	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Housing/environmental</b>															
Acquired/seeking new land/house	218	0	0	1	15	41	31	32	17	12	14	21	11	5	18
River erosion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Marriage / familial</b>															
Marriage	664	0	0	12	449	164	25	7	3	3	1	0	0	0	0
Separation/divorce/widow	95	0	0	1	27	31	20	8	4	0	2	0	0	1	1
Move or join with spouse/follow parents	3527	717	406	221	537	649	428	233	109	58	46	46	16	21	40
Move or join with other relatives	44	9	3	7	9	5	2	1	1	1	1	0	1	0	4
Adoption	13	10	1	1	1	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	164	0	0	3	26	48	38	17	13	4	5	3	1	2	4
Health or old age care	125	0	0	3	20	47	21	5	2	1	0	2	0	2	22
<b>Legal problems</b>	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
<b>Other and not stated</b>															
Others n.e.c.*	187	2	3	9	38	38	25	23	13	5	7	4	3	1	16
Unknown or not stated	8	1	2	1	1	0	1	0	1	1	0	0	0	0	0

\*n.e.c.=Not elsewhere classified

Appendix A-20 Male migration by destination or origin, 2012

Destination /Origin	Rural/urban	Out-migration						In-migration					
		Age (years)						Age (years)					
		0-14	15-24	25-34	35-44	45+	Total	0-14	15-24	25-34	35-44	45+	Total
Dhaka	Rural	22	5	8	4	4	43	40	5	14	5	4	68
	Urban	868	875	462	231	179	2615	691	457	545	260	212	2165
Chittagong	Rural	551	120	118	78	82	949	588	96	147	75	44	950
	Urban	247	182	100	77	36	642	206	76	107	59	55	503
Sylhet	Rural	5	1	3	1	1	11	15	0	2	1	2	20
	Urban	9	19	5	5	3	41	18	6	15	6	8	53
Khulna	Rural	1	0	2	2	1	6	6	1	3	1	1	12
	Urban	5	2	4	1	0	12	6	1	4	2	1	14
Rajshahi	Rural	3	1	3	0	1	8	8	1	4	1	0	14
	Urban	6	4	1	2	4	17	4	1	4	2	2	13
Barisal	Rural	11	4	8	1	2	26	12	2	7	3	0	24
	Urban	5	4	1	1	1	12	5	3	1	1	1	11
India		6	6	1	1	9	23	0	2	1	1	1	5
Asia		1	141	104	37	10	293	2	12	53	35	20	122
Middle-east		2	461	461	223	62	1209	5	82	260	177	99	623
Others		3	20	35	19	14	91	0	2	14	13	2	31
Unknown		0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>1745</b>	<b>1845</b>	<b>1316</b>	<b>683</b>	<b>409</b>	<b>5998</b>	<b>1606</b>	<b>747</b>	<b>1181</b>	<b>642</b>	<b>452</b>	<b>4628</b>

Appendix A-21 Female migration by destination or origin, 2012

Destination /Origin	Rural/urban	Out-migration						In-migration					
		Age (years)						Age (years)					
		0-14	15-24	25-34	35-44	45+	Total	0-14	15-24	25-34	35-44	45+	Total
Dhaka	Rural	33	82	27	7	2	151	33	71	26	4	8	142
	Urban	720	988	528	175	258	2669	650	629	448	132	205	2064
Chittagong	Rural	549	1173	389	99	111	2321	631	1309	353	90	66	2449
	Urban	185	226	159	54	44	668	175	163	136	46	42	562
Sylhet	Rural	5	13	3	0	4	25	9	9	10	0	4	32
	Urban	20	16	9	0	4	49	14	16	8	3	5	46
Khulna	Rural	4	7	1	2	1	15	4	6	3	1	3	17
	Urban	3	3	1	1	1	9	6	4	5	0	1	16
Rajshahi	Rural	3	6	4	1	0	14	12	8	6	0	0	26
	Urban	9	10	3	2	2	26	1	6	4	2	0	13
Barisal	Rural	11	23	7	6	1	48	13	15	7	1	0	36
	Urban	2	7	4	1	1	15	3	2	3	0	1	9
India		3	4	4	1	9	21	1	1	1	0	1	4
Asia		0	1	2	1	1	5	1	0	1	0	0	2
Middle-east		1	11	9	6	2	29	3	8	7	3	1	22
Others		2	3	3	2	4	14	0	0	0	1	2	3
Unknown		0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>1550</b>	<b>2573</b>	<b>1153</b>	<b>358</b>	<b>445</b>	<b>6079</b>	<b>1556</b>	<b>2247</b>	<b>1018</b>	<b>283</b>	<b>339</b>	<b>5443</b>

## APPENDIX B

### POPULATION, BIRTHS, AND DEATHS BY VILLAGE, 2012

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
<b>icddr,b SERVICE AREA</b>						
D00	Charmukundi	2505	79	13	31.5	5.2
W00	Kaladi	7833	159	35	20.3	4.5
V10	Dhakirgaon	1970	43	14	21.8	7.1
V11	Nabakalash	2952	65	13	22.0	4.4
V31	Dighaldi	9683	248	81	25.6	8.4
V32	Mobarakdi	3539	94	26	26.6	7.3
V60	Suvankardi	999	29	7	29.0	7.0
V61	Munsabdi	678	24	6	35.4	8.8
V62	Shilmondi	974	23	6	23.6	6.2
V72	Upadi	6321	129	49	20.4	7.8
<b>Block A Total</b>		<b>37454</b>	<b>893</b>	<b>250</b>	<b>23.8</b>	<b>6.7</b>
H00	Lamchari	1242	21	5	16.9	4.0
V12	Bhangerpar	777	13	4	16.7	5.1
V13	Baburpara	726	23	6	31.7	8.3
V19	Lakshmipur	2883	73	15	25.3	5.2
V20	Dagorpur	1404	32	8	22.8	5.7
V21	Khadergaon	564	13	4	23.0	7.1
V22	Beloti	590	15	3	25.4	5.1
V23	Baluchar	707	5	6	7.1	8.5
V24	Machuakhal	3041	65	23	21.4	7.6
V26	Narayanpur	3287	60	19	18.3	5.8
V56	Pailpara	1646	46	8	27.9	4.9
V59	Doshpara	2161	57	10	26.4	4.6
V82	Dhanarpar	1721	42	14	24.4	8.1
V83	Padmapal	639	18	5	28.2	7.8
V85	Bhanurpara	494	13	3	26.3	6.1
V87	Hurmaisha	703	9	4	12.8	5.7
VBB	Nagda	4603	111	28	24.1	6.1
VBC	Naogaon	4866	121	34	24.9	7.0
<b>Block B Total</b>		<b>32054</b>	<b>737</b>	<b>199</b>	<b>23.0</b>	<b>6.2</b>
K00	Shahpur	988	16	5	16.2	5.1
L00	Tatkhana	558	13	5	23.3	9.0
M00	Char Nayergaon	199	2	1	10.1	5.0
N00	Aswinpur	2124	60	13	28.2	6.1
O00	Nayergaon	2155	46	13	21.3	6.0
P00	Titerkandi	2008	47	15	23.4	7.5
Q00	Char Shibpur	256	9	2	35.2	7.8
V27	Panchghoria	998	24	7	24.0	7.0
V28	Khidirpur	1555	27	10	17.4	6.4
V30	Harion	580	11	1	19.0	1.7
V39	Gobindapur	317	3	2	9.5	6.3
V40	Masunda	796	14	4	17.6	5.0
V41	Paton	1857	42	10	22.6	5.4
V42	Adhara (South)	773	15	4	19.4	5.2
V44	Panchdona	612	9	5	14.7	8.2
V86	Adhara	993	27	10	27.2	10.1
V88	Datikara	553	15	5	27.1	9.0
VBA	Mehron	2192	37	22	16.9	10.0

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
DX0	Barogaon	3389	75	23	22.1	6.8
DX1	Naojan	1426	33	12	23.1	8.4
<b>Block C Total</b>		<b>24329</b>	<b>525</b>	<b>169</b>	<b>21.6</b>	<b>6.9</b>
R00	Nandalalpur	1506	22	11	14.6	7.3
S00	Tatua	985	29	3	29.4	3.0
T00	Amuakanda	1659	35	12	21.1	7.2
V15	Bhati Rasulpur	837	22	10	26.3	11.9
V16	Binandapur	852	27	6	31.7	7.0
V17	Hatighata	1086	17	5	15.7	4.6
V18	Torkey	3980	89	26	22.4	6.5
V25	Char Pathalia	1292	15	12	11.6	9.3
V29	Shibpur (South)	524	11	4	21.0	7.6
V33	Shibpur (North)	452	9	4	19.9	8.8
V34	Satparia	883	19	7	21.5	7.9
V52	Nayakandi	214	2	3	9.3	14.0
V54	Balairkandi	588	7	2	11.9	3.4
V55	Induria	534	11	4	20.6	7.5
V63	Islamabad (East)	2033	39	8	19.2	3.9
V67	Majlishpur	604	20	6	33.1	9.9
V81	Sonaterkandi	672	11	4	16.4	6.0
V84	Shahbajkandi	2272	37	18	16.3	7.9
V89	Islamabad (Middle)	1567	55	10	35.1	6.4
<b>Block D Total</b>		<b>22540</b>	<b>477</b>	<b>155</b>	<b>21.2</b>	<b>6.9</b>
<b>icddr,b Service Area Total</b>		<b>116377</b>	<b>2632</b>	<b>773</b>	<b>22.6</b>	<b>6.6</b>
<b>GOVERNMENT SERVICE AREA:</b>						
V35	Durgapur	3526	65	27	18.4	7.7
V38	Galimkha	1480	23	8	15.5	5.4
V43	Kanachak	1158	30	6	25.9	5.2
V45	Bakchar	1042	16	10	15.4	9.6
V46	Silinda	417	3	0	7.2	0.0
V47	Tulatali	1802	23	10	12.8	5.5
V48	Gangkanda	503	6	7	11.9	13.9
V49	Harina Bhabanipur	1235	32	8	25.9	6.5
V57	Baluchar	1107	13	12	11.7	10.8
V64	Kawadi	4848	113	38	23.3	7.8
V65	Nayachar	783	17	4	21.7	5.1
V66	Thatalia	777	11	6	14.2	7.7
V68	Sobahan	1001	23	11	23.0	11.0
V71	Khamarpara	492	8	5	16.3	10.2
V73	Sardardia	819	21	7	25.6	8.5
V74	Ketundi	1369	31	8	22.6	5.8
V75	Mukundi	327	6	3	18.3	9.2
V76	Chosoi	1820	31	13	17.0	7.1
V78	Soladana	267	5	1	18.7	3.7
V79	Pitambordi	370	5	2	13.5	5.4
V80	Daribond	1322	26	10	19.7	7.6
V90	Narinda	1279	19	8	14.9	6.3
V97	Dhanagoda	321	4	1	12.5	3.1
V98	Santoshpur	105	2	1	19.0	9.5
V99	Baluakandi	469	10	4	21.3	8.5
VB1	Taltoli	957	13	8	13.6	8.4
VB2	Sree Rayerchar	1170	25	9	21.4	7.7
VB3	Rayerkandi	2929	59	24	20.1	8.2
D28	Bazarkhola	1064	27	8	25.4	7.5
D29	Kirtonkhola	213	6	1	28.2	4.7
D30	Banuakandi	729	9	3	12.3	4.1

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
D31	Harina Bazarkhola	999	26	8	26.0	8.0
D32	Khalisha	773	9	4	11.6	5.2
D33	Nayanagar	1047	21	5	20.1	4.8
D34	Saidkharkandi	1276	29	9	22.7	7.1
D35	Mollah Kandi	539	8	1	14.8	1.9
<b>Block E Total</b>		<b>40335</b>	<b>775</b>	<b>290</b>	<b>19.2</b>	<b>7.2</b>
A00	Uddamdi	3188	69	12	21.6	3.8
F00	Sepoykandi	1457	36	18	24.7	12.4
G00	Thatalia	3085	63	16	20.4	5.2
J00	Char Harigope	796	13	3	16.3	3.8
U00	Baispur	9117	221	47	24.2	5.2
V01	Kadamtali	374	6	5	16.0	13.4
V02	Nilokhi	445	8	2	18.0	4.5
V03	Char Nilokhi	610	9	7	14.8	11.5
V04	Char Pathalia	386	3	2	7.8	5.2
V05	Gazipur	3301	62	15	18.8	4.5
V06	Fatepur	2530	60	21	23.7	8.3
V07	Nayakandi	271	7	1	25.8	3.7
V08	Goalbhar	1151	26	8	22.6	7.0
V09	Naburkandi	1156	18	13	15.6	11.2
V14	Enayetnagar	657	15	6	22.8	9.1
V36	Ludhua	5342	107	41	20.0	7.7
D99	Mandertoli	1975	48	12	24.3	6.1
<b>Block F Total</b>		<b>35841</b>	<b>771</b>	<b>229</b>	<b>21.5</b>	<b>6.4</b>
B00	Charmasua	1818	32	11	17.6	6.1
C00	Sarderkandi	3851	89	25	23.1	6.5
V37**	Charputia	-	-	-	-	-
V50	Bakharpur	49	1	1	20.4	20.4
V51	Induriakandi	433	10	2	23.1	4.6
V53	Chhoto Haldia	3026	69	26	22.8	8.6
V58**	Mohishmari	-	-	-	-	-
V69**	Naobangha	-	-	-	-	-
V70**	South Joypur	-	-	-	-	-
V95	Baluchar	2397	45	14	18.8	5.8
V96	Rampur	546	19	8	34.8	14.7
VB4	Ramdaspur	3528	63	29	17.9	8.2
VB5	Thakurpara	815	19	7	23.3	8.6
VB6	Sarkerpara	535	9	1	16.8	1.9
VB7	Mirpur	310	5	1	16.1	3.2
VB8	Farazikandi	1251	21	5	16.8	4.0
VB9**	Ramanathgonj	-	-	-	-	-
VB0	South Rampur	2712	60	13	22.1	4.8
D88	Sankibhanga	1449	25	13	17.3	9.0
D89	Sankibhanga Namapara	973	22	5	22.6	5.1
D90	Zahirabad	885	21	5	23.7	5.6
D91**	North Joypur	-	-	-	-	-
D92**	West Joypur	-	-	-	-	-
D93	Maizkandi	1293	31	7	24.0	5.4
D94	Hazipur	1574	36	8	22.9	5.1
D95	Tapaderpara	649	10	4	15.4	6.2
D96	Sakharipara	1237	26	10	21.0	8.1
D97	Nayakandi	683	16	5	23.4	7.3
D98	Bara Haldia	3259	68	17	20.9	5.2
<b>Block G Total</b>		<b>33273</b>	<b>697</b>	<b>217</b>	<b>20.9</b>	<b>6.5</b>
<b>Government Service Area Total</b>		<b>109449</b>	<b>2243</b>	<b>736</b>	<b>20.5</b>	<b>6.7</b>

\*\*Lost due to river erosion in 1987

## APPENDIX C

### LIFE TABLE EQUATIONS

$$1. \quad {}_nq_x = \frac{{}_n m_x}{1/n + {}_n m_x [1/2 + n/12 + ({}_n m_x - \ln c)]} \quad \text{if } X > 0$$

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

$$2. \quad l_0 = 100,000$$

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

$$3. \quad L_0 = 0.15 l_0 + 0.85 l_1$$

$$L_1 = 0.410 l_1 + 0.590 l_2$$

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

$${}_nL_x = \frac{{}_n d_x}{{}_n m_x}, \text{ for } 5 \leq x \leq 80$$

$${}_nL_{85} = \frac{l_{85}}{{}_n m_{85}}, \text{ for the last age group } 85+$$

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

NOTE: Computed using Greville's method, as suggested in: Shryock HS, Seigel JS, et al. (1975).

NOTE:  $\ln c$  assumed to be 0.095; separation factors in equation 3 correspond to an infant mortality rate of 50 per 1,000 livebirths

## 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
<b>Total</b>	<b>100000</b>	<b>100</b>

NOTE: Source: Ahmed OB, Boschi-Pinto, Lopez AD et al. (2000)

Available online at: <http://www.who.int/healthinfo/paper31.pdf>



## APPENDIX E

### HEALTH INTERVENTIONS IN icddr,b SERVICE AREA

Date	Activity	Blocks			
		A	B	C	D
Oct 1977	Family planning	X	X	X	X
Mar 1978	Tetanus toxoid to pregnant women	X	X	X	X
Jan 1979	ORT	X	X	X	X
Dec 1981	Tetanus toxoid to all women	X		X	
Dec 1985		X	X	X	X
Mar 1982	Measles vaccine	X		X	
Dec 1985		X	X	X	X
Sep 1982	Antenatal care	X		X	
Jan 1986		X	X	X	X
Jan 1985	Iron/folic acid to pregnant women	X		X	
Jan 1986		X	X	X	X
Mar 1986	EPI immunizations (BCG, DPT, Polio)	X	X	X	X
Sep 1988	Nutritional rehabilitation	X	X	X	X
Jan 1986	Vitamin A distribution	X	X	X	X
Mar 1987	Maternity care			X	X
Apr 1988	ARI treatment to children		X		X
Jul 1991		X	X	X	X
Apr-Dec 1989	Dysentery treatment		X		X
1991	Dysentery treatment stopped	-	-	-	-
1997	Sub-centre delivery			X	
1998					X
2000			X		
2001		X			
2000	Fixed Site Clinic			X	X
2001		X	X		
2001	Maternal and infant Nutrition intervention (MINIMAT)	X	X	X	X
2002	Arsenic in Tub-well water and mitigation (AS-MAT)	X	X	X	X
2006	Vitamin E and Selenium trial	X	X	X	X
2007	Maternal, Newborn and child health intervention	X	X	X	X
2007	Rota Teq vaccine trial to infant	X	X	X	X
2008	Rota Rix vaccine trial to infant	X	X	X	X
2011	Flu Q-QIV ( Phase III )	X			
2012	Measles + Robella vaccine trial	X	X	X	X
May 2012	JE (Japanese encephalitis) vaccine trial	X	X	X	X
May 2012	OPV vaccine trial	X	X	X	X
Apr 2012	FLU D_QIV (Phase III)	X	X		

## APPENDIX F

### STAFF OF HDSS, 2012

Peter Kim Streatfield, Ph.D.  
Head, Matlab Health & Demographic Surveillance  
Director, Centre for Population, Urbanization and Climate Change

#### HDSS-Matlab

##### Field Supervisory Team

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Mr. Mahmud Hasan, FRO  
Mr. M. Munirul Alam Bhuiyan, FRO

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Mr. Md. Monirul Hoque, FRS  
Ms. Monowara Begum, FRS  
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Ms. Monowara Begum, DET  
Ms. Delkhorsheda, DET  
Ms. Shilpi Rani Banik, DET  
Ms. Meherun Nessa, DET  
Ms. Nazma Akhter, DET

##### Administraton

Mr. Md. Anisur Rahman, Admin.Assistant  
Mr. Md. Ahsan Ullah, Attendant  
Mr. Mubarak Hossain, DSA

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

#### HDSS-Dhaka

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##### Geographical Information System

Mr. M Zahirul Haq

