

# HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM – MATLAB

Volume Fifty Three  
Registration of Health and Demographic Events 2018

Published articles from studies conducted in icddr,b's Matlab field site, 1999-2018





# HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM – MATLAB

**Volume Fifty Three**

**Registration of Health and Demographic Events 2018**

**Scientific Report No. 141 – May 2020**

**Initiative for Climate Change and Health  
Health Systems and Population Studies Division, icddr,b  
68, Shaheed Tajuddin Ahmed Sarani,  
Mohakhali, Dhaka 1212, Bangladesh**



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

**Report prepared by:**

Muhammad Zahirul Haq  
Md. Moinuddin Haider  
Kaiser Mahmud  
Mamun Ibn Bashar  
Sajal Kumar Saha

Samiran Barua  
Sayed Saidul Alam  
Taslim Ali  
Syed Manzoor Ahmed Hanifi  
Nurul Alam

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GPO Box 128, Dhaka 1000  
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Telephone: 880-2-9827042, 880-2-9827001-10 (10 lines)  
Email: [quamrun@icddr.org](mailto:quamrun@icddr.org), [hanifi@icddr.org](mailto:hanifi@icddr.org)  
URL: <http://www.icddr.org>

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E-mail: [dina.offset@yahoo.com](mailto:dina.offset@yahoo.com)

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## LIST OF ABBREVIATION

BCG	Bacillus Calmette–Guérin
CBR	Crude Birth Rate
CDR	Crude Death Rate
CHRW	Community Health Research Worker
COPD	Chronic Obstructive Pulmonary Disease
CPR	Contraceptive Prevalence Rate
CRL	Cholera Research Laboratory
DPT	Diphtheria, Pertussis and Tetanus
DSS	Demographic Surveillance System
FRS	Field Research Supervisor
FWV	Family Welfare Visitor
GIS	Geographic Information System
GPS	Global Positioning System
GAC	Global Affairs Canada
HDSS	Health and Demographic Surveillance System
IMR	Infant Mortality Rate
INDEPTH	International Network of field sites with continuous Demographic Evaluation of Population and Their Health in developing countries
IUD	Intra-uterine Device
MCH-FP	Maternal and Child Health and Family Planning
NGO	Non-government Organization
RKS	Record Keeping System
Sida	Swedish International Development Cooperation
TBA	Traditional Birth Attendant
TFR	Total Fertility Rate
U5MR	Under-five Mortality Rate
UESD	Utilization of Essential Service Delivery Survey
UKAid	Department of International Development, UK
VA	Verbal Autopsy
WHO	World Health Organization

## SUMMARY

This report presents the vital registration and maternal and child health statistics assembled from Health and Demographic Surveillance System (HDSS) site, Matlab, a rural area in Bangladesh, in 2018. The data were collected by the Matlab HDSS maintained by icddr,b. The surveillance area is divided into two service areas – 1) icddr,b service area and 2) Government service area. Usual government health and family planning services are available in Government service area. 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 with the collaboration of Government Health and Family Planning department. Usual Government services are also available in icddr,b service area.

In the surveillance area as a whole, fertility rate in 2018 slightly decreased to that in 2017. The crude birth rate (CBR) was 21.0 per 1,000 populations in 2018 whereas in 2017 the rate was 22.0. The total fertility rate (TFR) was 2.5 per woman in 2018 and 2.6 in 2017. In the icddr,b service area, CBR was 20.7 and in the Government service area, CBR was 21.3 and TFR was 2.5 in both the services area.

The crude death rate (CDR) was 7.5 per 1,000 population in the icddr,b service area, and in Government service area it was 7.2 in 2018. The infant mortality rate was 19 per 1,000 live births in the icddr,b service area, and in the Government service area it was 26.8. The neonatal mortality rate increased to 15.1 in 2018 from 14.0 in 2017 the icddr,b service area, and decreased to 20.3 from 20.7 in the Government service area in same time period. Post-neonatal mortality decreased in the icddr,b service area (from 4.0 to 3.7) and in the Government service area (from 5.6 to 4.0) respectively. Under five mortality rate has increased from 25.9 in 2017 to 27.7 in 2018 in the icddr,b service area, while in the Government service area, it decreased from 37.0 in 2017 to 30.9 in 2018. The overall rate of natural increase in population size was 13.9 per 1,000 in 2018.

The rate of in-migration decreased to 50.2 per 1,000 populations in 2018 from 51.9 in 2017, and the rate of out-migration also decreased to 59.1 in 2018 from 63.7 in 2017. The overall annual population growth rate was 1.4%. The marriage rate was 12.9 per 1,000 people, and the divorce rate was 1.7 per 1,000 people.

## CHAPTER 1

### INTRODUCTION

Since 1963, the icddr,b, initiated as Cholera Research Laboratory, has been implementing a health research programme in Matlab, Bangladesh. Matlab is located (Longitude = 90.720033 and Latitude = 23.388482) 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 of icddr,b. 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.

Established in 1966, the HDSS has been maintaining the registration of *births, deaths, and migrations*, in addition to carrying out periodical household population and socio-economic censuses. Registration of marital unions and dissolutions began in 1975, internal movement in 1982, and household headship change as well as household dissolution in 1993. Later in 1998, the Record Keeping System (RKS) for routine collection of selected maternal and child health information and Geographic 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), and since 2014 using Galaxy Tabs. 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>.

It has been recommended by the scientific advisory group (SAG) to move from two-monthly cycle to three-monthly cycle the main reason was reducing expenditure. The SAG also advised to conduct a randomized control trial to examine whether moving to the three-monthly cycle somehow affect data quality. So, in July 2018, one half of the HDSS continued two-monthly visiting cycle of CHRWs, and other half started three-monthly visiting cycle. The area for three-monthly cycle was selected randomly. The trial was continued for one and half year, until December 2019. From January 2020, three-monthly cycle has been implemented in all 142 villages. Results of the randomized trial will be available soon.

In October 1977, the surveillance area was reduced from 233 to 149 villages, and a Maternal and Child Health and Family Planning Programme was initiated in 70 villages (icddr,b service area). 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

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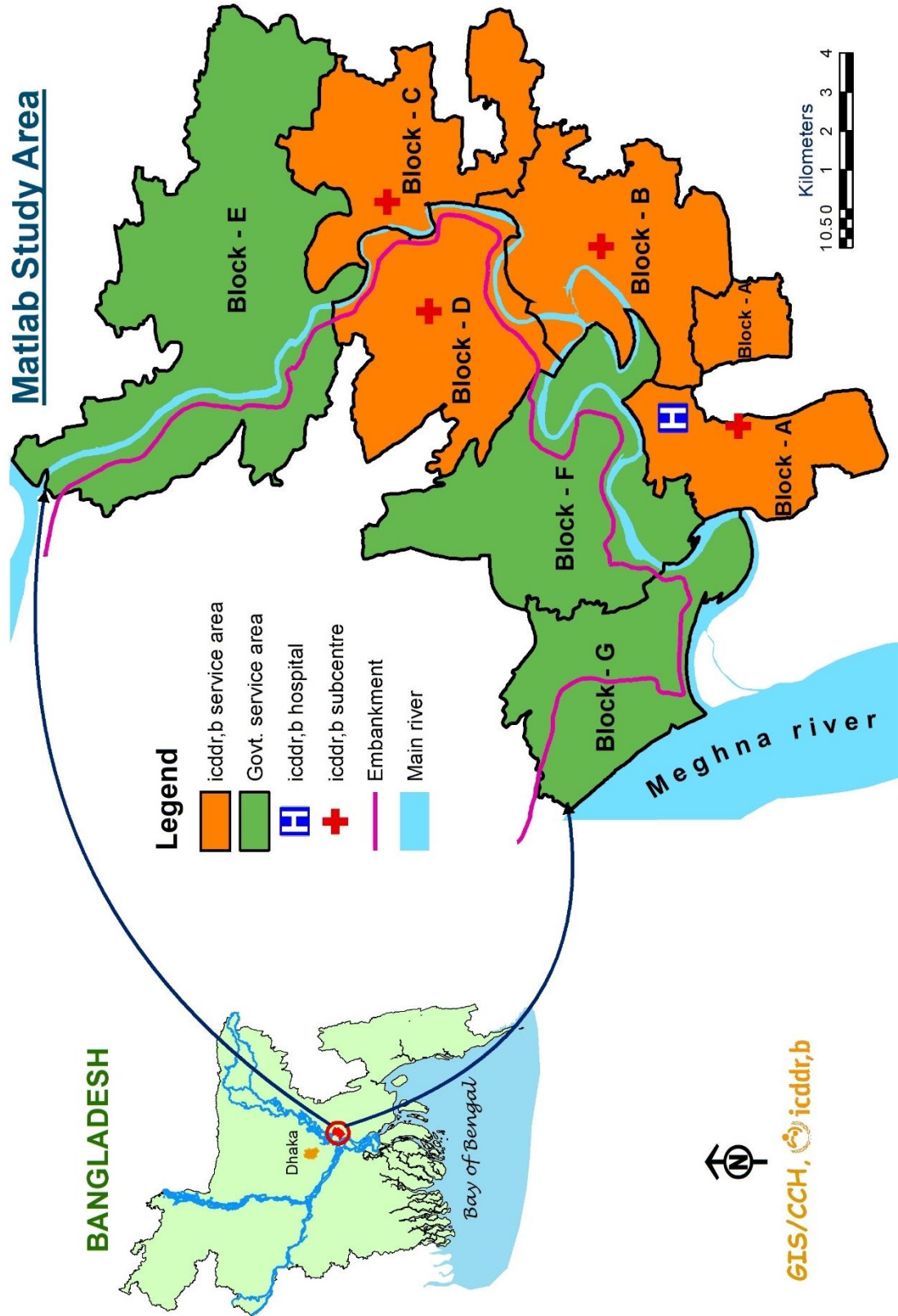
<sup>1</sup> Available online at: <http://dSPACE.icddr.org/jspui/handle/123456789/6350>

<sup>2</sup> Available online at: <http://dSPACE.icddr.org/jspui/handle/123456789/6722>

contraceptives, and administered immunizations to mothers and children in the icddr,b service area. This system of collecting data on child and reproductive health services is known as the Record-Keeping System (RKS), which was later expanded to Government service area in 2000. River erosion devoured 7 villages 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 volume fifty three 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 2018, along with brief notes and explanations of the tables, are presented in this volume.

Figure 1.1.1 Map of Matlab study area showing icddr, b and Government service areas

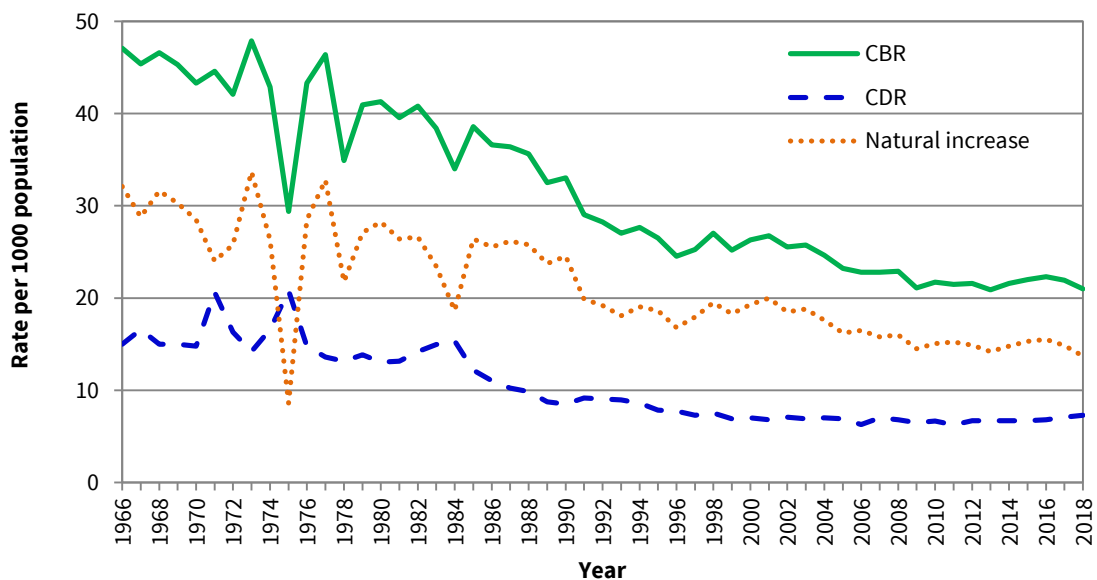


## CHAPTER 2

### DEMOGRAPHIC TRENDS IN MATLAB

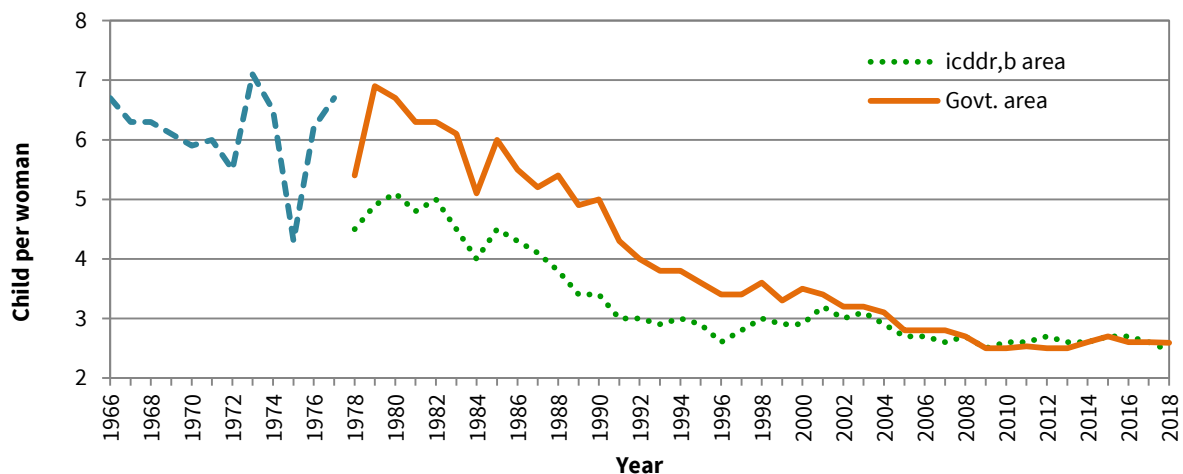
Long term Matlab HDSS data show the various transitions in the Matlab population over the period 1966-2018. In the early stages of demographic surveillance (1960s and 1970s), the Matlab population was characterized by high fertility, high mortality and high population growth. Apart from a Shigella outbreak in 1984 following the Liberation War in 1971 and the famine in 1974, there has been steady decline in natural increase, fertility and mortality to the present. Figure 2.1 shows that over the period 1966-2018, crude birth rate (CBR) has dropped by 55%, crude death rate (CDR) by 51%, and natural increase by 57%. 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 transitions in Matlab, 1966-2018**



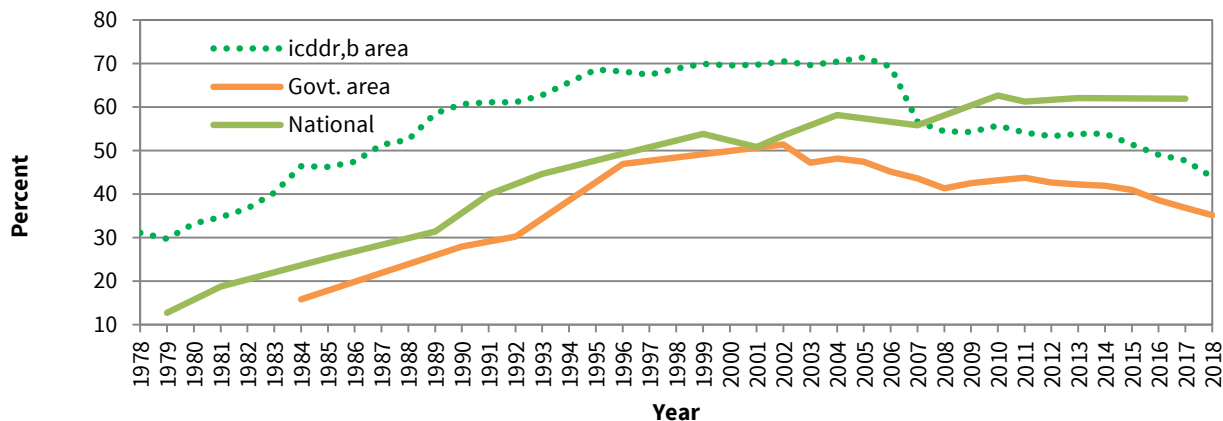
Matlab health and demographic surveillance area started with a high fertility level of 6.7 children per woman in 1966. Reorganized surveillance area into icddr,b and Government service areas in 1978, had total fertility rate (TFR) of 4.5 in icddr,b service area, and 5.4 in govt. service area. The TFRs, since then, remained substantially lower in icddr,b service area until 2000. It is more than a decade that the TFR stalled at around 2.6 in both areas (Figure 2.2).

**Figure 2.2 Total fertility rates (TFR) in Matlab by area, 1966-2018**



Provision of contraceptive supply and advice has been carried out since the inception in 1978 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 icddr,b service area and is associated with a high contraceptive prevalence rate (CPR). From 2001, this door step service delivery system has been switched to the fixed-site clinic system. This implementation retained till the year 2006. During the period between 1978 to 1995, CPR escalated in icddr,b service area ranging from 31.1 to 68.6 and showed little variation up to the year 2006 – lurking above national level figures or those in government service area. From 2007 onward, about two thirds of the CHRWs were assigned to provide services and another one third to carry out the surveillance work in the icddr,b service area. A sudden drop of CPR (56.6) is noticed from this year onward, although causes cannot be linked to this change in service provision. Since then CPR has been on slow decrease in the icddr,b service area with latest rate being 43.9 in 2018 – a figure lower than that of national level. In the Government service area, however, CPR is even lower (35.1%) in 2018 (Figure 2.3). Further study can be carried out to investigate whether absence of husband of married women due to migration is associated with this decline.

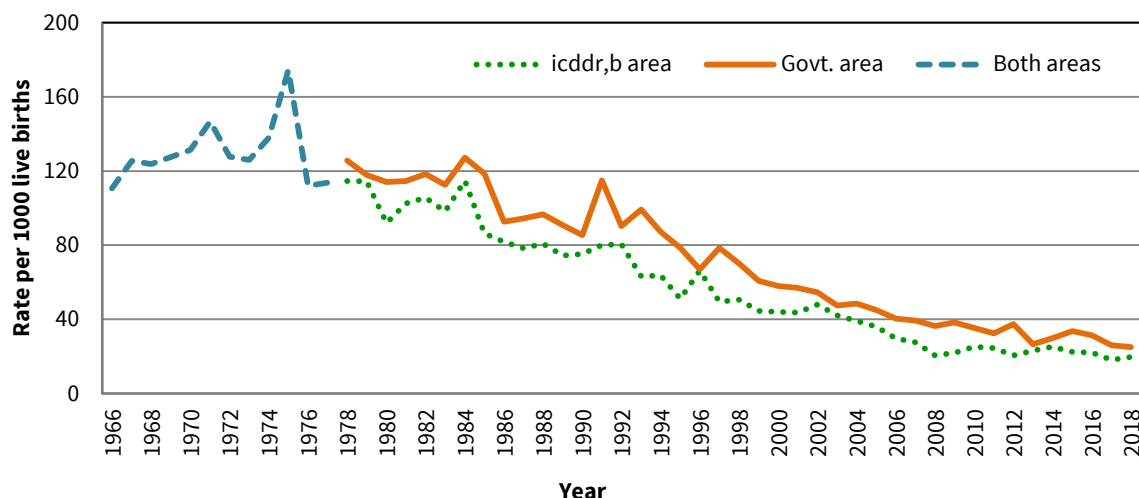
**Figure 2.3 Contraceptive prevalence rates (CPR) in Matlab and Bangladesh, 1978-2018**



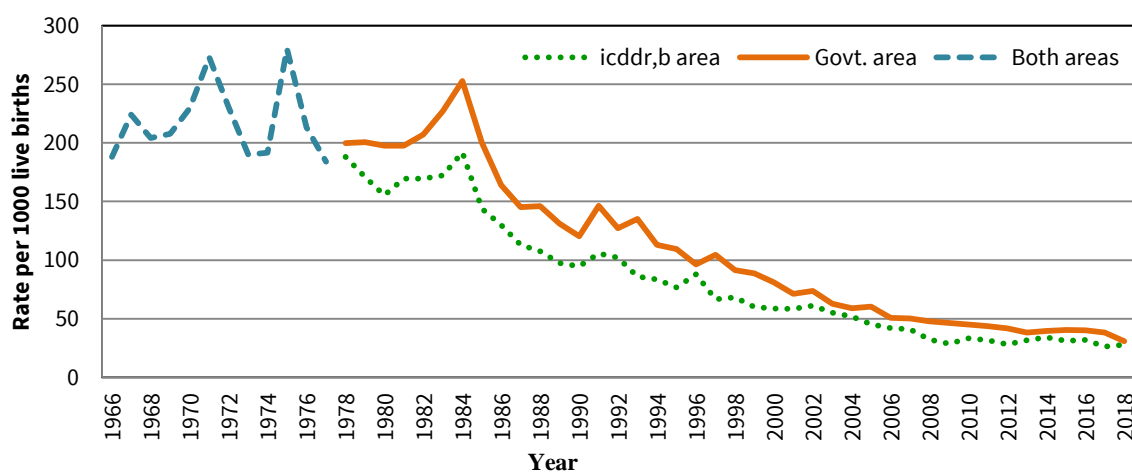


A large part of the decline in mortality in Matlab since the mid-1960s is a result of substantial reductions in infant and child mortality. Figure 2.4 shows that in the icddr,b service area, infant mortality rate (IMR) fell by 83% over the period 1978-2018. In Government service area, IMR declined by 80% over the same period. Figure 2.5 shows that, during the same period, under-five mortality rate (U5MR) declined by 85% in both areas. The famine in 1974 had a great influence on the increase in infant and child mortality followed by the shigella outbreak in 1984.

**Figure 2.4 Infant mortality rates (IMR) in Matlab by area, 1966-2018**

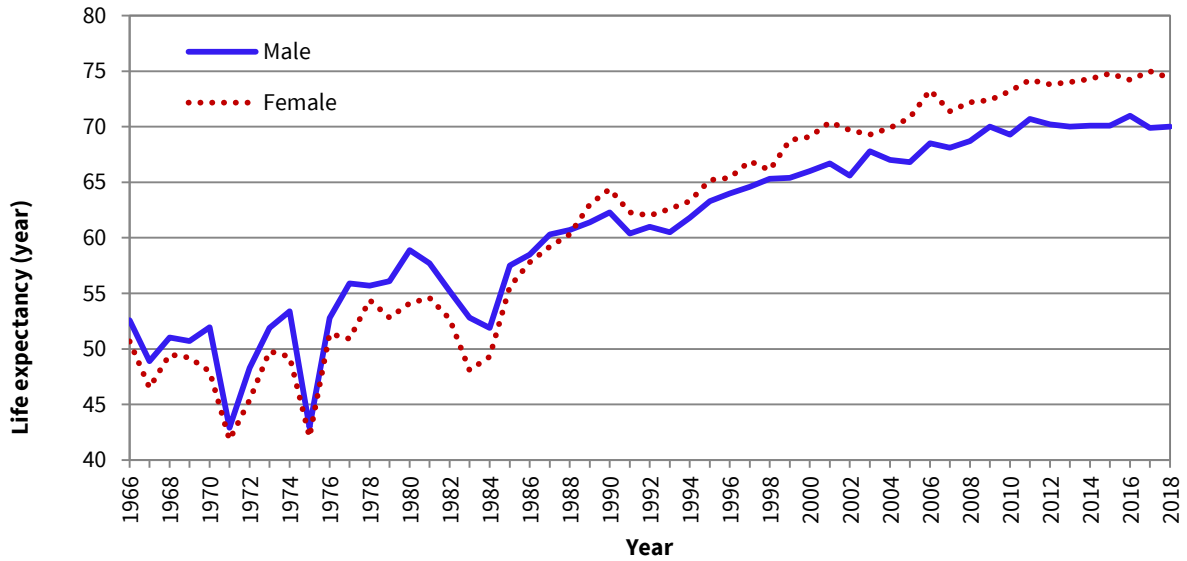


**Figure 2.5 Under-five mortality rates (U5MR) in Matlab by area, 1966-2018**



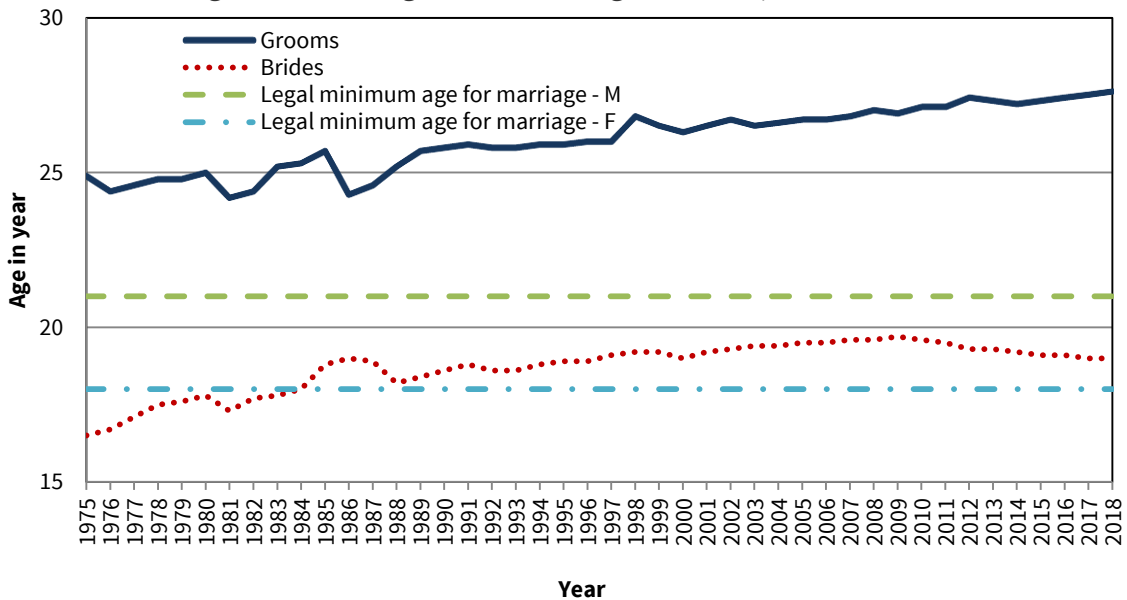
Massive reductions of infant and child mortality have resulted in a remarkable improvement in life expectancy at birth over the last 50 years. The life expectancy at birth for males rose from 52.6 years in 1966 to 70.0 in 2018, a gain of 17.4 years and for females, the improvement is even more evident, from 50.7 to 74.4, a gain of nearly 23.7 years for diminishing gender difference in childhood mortality and maternal mortality (Figure 2.6).

**Figure 2.6 Life expectancy at birth ( $e^0$ ) in Matlab, 1966-2018**



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 1975-2018. During this period, brides' mean age at marriage increased by 2.7 years and for grooms, it increased by 2.5 years. Currently, mean age at first marriage for male is 27.6 years and for female it is 19.0 years. However, mean age at first marriage for women has started to decline after 2009 when it reached its maximum at 19.7 years; it is currently 19.0 years. The area needs further investigation.

**Figure 2.7 Mean age at first marriage in Matlab, 1975-2018**



## CHAPTER 3

### POPULATION CHANGES

The key vital statistics from 2007 through 2018 are summarized in Table 3.1. The mid-year population and the demographic events registered in 2018 for 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 2018, the crude birth rate slightly decreased in icddr,b service area and in Government service area (20.7 and 21.3 respectively) compared to figures from previous year. In icddr,b service area, crude death rate increased slightly from 7.0 in 2017 to 7.5 in 2018. The corresponding figure for government service area remain same as that of previous year, 7.2. Over the decade, trend of TFR in Matlab HDSS displayed little fluctuations. In 2007, TFR for icddr,b and government service areas had been respectively 2.6 and 2.8 with an overall rate of 2.7 for both areas combined. Slight decrease in this rate is noted till 2009 (TFR: 2.5). Currently the TFR is 2.5 in both areas. Trends in the TFR in both areas are illustrated in Figure 2.2 of Chapter 2.

The infant mortality rate (per 1000 live births) slightly increased to 19.0 in 2018 from 18.2 in 2017 in the icddr,b service area, and 26.8 in 2018 from 26.1 in 2017 in the Government service area. In the icddr,b service area, neonatal mortality also slightly increased to 15.1 in 2018 from 14.0 in 2017, and in the Government service area it was reduces to 20.3 in 2018 from 20.7 in 2017. The mortality rate of children aged 1-4 years decreased to 1.9 in 2018 from 2.0 in 2017 in the icddr,b service area and 1.4 in 2018 from 3.0 in 2017 in Government service area. Under-five mortality has increased in the icddr,b service area from 25.9 per 1,000 live births in 2017 to 27.7 in 2018, however, in the Government service area it decreased from 37.0 in 2017 to 30.9 in 2018. The trends in mortality of under-5 year's children are illustrated in Figures 2.4 and 2.5 in Chapter 2.

The numbers of in- and out-migrants registered in 2018 were 12,019 and 14,159 respectively, giving an in-migration rate of 50.2 per 1,000 populations, out-migration rate of 59.1. It results a net migration rate of -8.9 per 1,000 populations meaning that 9 persons/1000 more left the area compare to people came in the area. Out-migrants continued to outnumber in-migrants, thus offsetting the rate of natural increase and keeping the overall annual population growth rate to 1.4%.

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 and Government service area are shown in Appendix A.1a and A.1b respectively. The age-sex distribution of the mid-year population is illustrated by the population pyramid (Figure 3.1). The fertility declines in the surveillance area in the 1978-2018 periods 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 MCH (icddr,b) service project in 1978. By 2018, this proportion had fallen to 31.3%. In the Government service area, the change in age structure was almost same as those in the icddr,b service area, children aged less than 15 years in the Government service area decreased from 43.3% of the total population in

1978 to 31.6% in 2017. 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 10.8% in 2017 due to the decline in both fertility and mortality.

The net population increase was 2.2 per 1,000 in 2018 while it was 3.2 per 1,000 in 2017 - may be due to the decrease in crude birth rate. 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\*, 2007-2018**

<b>Vital rate (per 1,000)</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>Crude birth rate</b>												
icddr,b area	22.6	23.5	21.6	22.0	21.8	22.6	21.7	22.0	22.3	22.8	22.1	20.7
Government area	23.0	22.1	20.5	21.4	21.1	20.5	20.2	21.1	21.6	21.7	21.8	21.3
Both areas	22.8	22.9	21.1	21.7	21.5	21.6	20.9	21.6	22.0	22.3	22.0	21.0
<b>Total fertility rate**</b>												
icddr,b area	2.6	2.7	2.5	2.6	2.6	2.7	2.6	2.6	2.7	2.7	2.6	2.5
Government area	2.8	2.7	2.5	2.5	2.5	2.5	2.5	2.6	2.7	2.6	2.6	2.6
Both areas	2.7	2.7	2.5	2.6	2.6	2.6	2.5	2.6	2.7	2.7	2.6	2.5
<b>Crude death rate</b>												
icddr,b area	6.8	6.4	6.2	6.7	6.1	6.6	6.7	6.8	6.5	6.7	7.0	7.5
Government area	7.1	7.2	6.9	6.7	6.4	6.7	6.7	6.7	6.9	6.9	7.2	7.2
Both areas	7.0	6.8	6.5	6.7	6.2	6.7	6.7	6.7	6.7	6.8	7.1	7.3
<b>Neonatal mortality***</b>												
icddr,b area	20.3	15.8	16.2	18.5	18.2	15.6	17.3	19.5	18.0	16.7	14.0	15.1
Government area	29.9	26.1	33.5	27.3	25.5	30.3	21.2	25.1	27.9	27.5	20.7	20.3
Both areas	25.1	20.7	24.4	22.7	21.7	22.4	19.1	22.1	23.1	21.8	17.2	17.7
<b>Post-neonatal mortality***</b>												
icddr,b area	7.4	4.9	5.7	6.7	6.3	4.9	5.9	5.7	3.7	5.3	4.0	3.7
Government area	9.4	10.4	4.9	8.1	6.9	7.1	5.4	4.7	5.7	4.0	5.6	4.0
Both areas	8.4	7.5	5.3	7.4	6.6	5.9	5.7	5.2	4.7	4.7	4.7	3.8
<b>Infant mortality***</b>												
icddr,b area	27.7	20.6	21.9	25.1	24.6	20.5	23.1	25.2	22.5	22.1	18.2	19.0
Government area	39.3	36.4	38.4	35.4	32.4	37.4	26.6	29.8	33.6	31.5	26.1	26.8
Both areas	33.5	28.1	29.8	30.1	28.3	28.3	24.7	27.4	27.8	26.5	22.1	22.8
<b>Child mortality (1 - 4yrs) #</b>												
icddr,b area	3.4	3.0	1.7	2.1	1.8	1.9	2.2	2.3	2.2	2.5	2.0	1.9
Government area	2.8	2.9	2.1	2.5	2.9	1.1	3.1	2.5	1.8	2.3	3.0	1.4
Both areas	3.1	3.0	1.9	2.3	2.3	1.5	2.6	2.4	2.0	2.4	2.5	1.7
<b>Under five mortality***</b>												
icddr,b area	41.0	32.3	28.6	33.4	31.6	28.0	31.6	34.0	31.1	32.0	25.9	27.7
Government area	50.3	47.9	46.4	45.0	43.6	41.7	38.3	39.6	40.5	40.2	37.0	30.9
Both areas	45.7	39.7	37.1	39.0	37.4	34.2	34.7	36.6	35.6	35.8	31.1	29.2
<b>Rate of natural increase</b>												
icddr,b area	15.8	17.1	15.4	15.3	15.7	16.0	15.0	15.3	15.9	16.1	15.1	13.5
Government area	15.9	14.9	13.7	14.7	14.8	13.8	13.5	14.4	14.7	14.9	14.6	14.4
Both areas	15.8	16.0	14.5	15.1	15.2	14.9	14.2	14.8	15.3	15.5	14.9	13.9
<b>Migration</b>												
In-migration	40.0	44.0	54.1	48.5	41.5	44.6	45.0	47.4	51.6	59.8	51.9	50.2
Out-migration	63.5	65.7	58.0	59.5	57.6	53.5	47.3	54.2	54.4	62.1	63.7	59.1
Growth (%)	-0.8	-0.6	1.1	0.4	-0.1	0.6	1.2	0.8	1.2	1.3	0.3	0.5

\*icddr,b area refers to icddr,b service area and Government area refers to Government service area.

\*\*Per women

\*\*\* Per 1,000 live births

#Per 1,000 children aged 1-4 years

**Table 3.2. Mid-year population, events registered, and population changes, by sex 2018**

Demographic indicator	Number			Rate per 1,000		
	Total	Male	Female	Total	Male	Female
Total Population (30 June 2018)						
icddr,b area	125,220	56,732	68,488	-	-	-
Government area	114,342	51,298	63,044	-	-	-
Both areas	239,562	108,030	131,532	-	-	-
Events registered (Jan-Dec 2018)						
Births**						
icddr,b area	2,626	1,310	1,316	21.0	-	-
Government area	2,460	1,268	1,192	21.5	-	-
Both areas	5,086	2,578	2,508	21.2	-	-
Deaths						
Infants*						
icddr,b area	50	31	19	19.0	23.7	14.4
Government area	66	45	21	26.8	35.5	17.6
Both areas	116	76	40	22.8	29.5	15.9
All deaths**						
icddr,b area	935	509	426	7.5	9.0	6.2
Government area	818	439	379	7.2	8.6	6.0
Both areas	1753	948	805	7.3	8.8	6.1
In-migration**	12,019	5,942	6,077	50.2	55.0	46.2
Out-migration**	14,159	7,379	6,780	59.1	68.3	51.5
Marriage**	3,091	-	-	12.9	-	-
Divorce**	408	-	-	1.7	-	-
Population change (Jan-Dec 2018)						
Net migration**	-2,140	-1,437	-703	-8.9	-13.3	-5.3
Natural increase**						
icddr,b area	1,691	801	890	13.5	14.1	13.0
Government area	1,642	829	813	14.4	16.2	12.9
Both areas	3,333	1,630	1,703	13.9	15.1	12.9
Net increase**	1,193	193	1,000	5.0	1.8	7.6

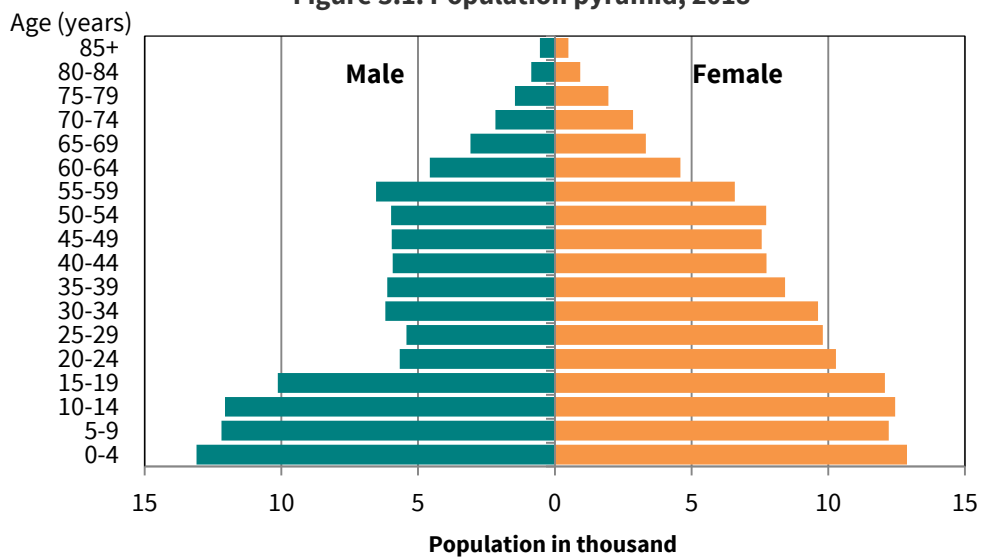
\*Rate per 1000 live births

\*\*Rate per 1000 population

**Table 3.3. Mid-year population by age and sex, and sex ratio, 2018**

Age (Years)	Number			Percentage			Sex ratio ( $\frac{M}{F} \times 100$ )
	Both sexes	Male	Female	Both sexes	Male	Female	
<b>All ages</b>	<b>239,562</b>	<b>108,030</b>	<b>131,532</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>82.1</b>
<1 year	5,224	2,593	2,631	2.2	2.4	2	98.6
1-4	20,753	10,506	10,247	8.7	9.7	7.8	102.5
1	5,222	2,634	2,588	2.2	2.4	2	101.8
2	5,255	2,640	2,615	2.2	2.4	2	101.0
3	5,220	2,671	2,549	2.2	2.5	1.9	104.8
4	5,056	2,561	2,495	2.1	2.4	1.9	102.6
5-9	24,411	12,195	12,216	10.2	11.3	9.3	99.8
10-14	24,508	12,058	12,450	10.2	11.2	9.5	96.9
15-19	22,206	10,137	12,069	9.3	9.4	9.2	84.0
20-24	15,958	5,675	10,283	6.7	5.3	7.8	55.2
25-29	15,225	5,424	9,801	6.4	5	7.5	55.3
30-34	15,816	6,193	9,623	6.6	5.7	7.3	64.4
35-39	14,552	6,134	8,418	6.1	5.7	6.4	72.9
40-44	13,670	5,929	7,741	5.7	5.5	5.9	76.6
45-49	13,522	5,960	7,562	5.6	5.5	5.7	78.8
50-54	13,721	5,985	7,736	5.7	5.5	5.9	77.4
55-59	13,126	6,536	6,590	5.5	6.1	5	99.2
60-64	9,162	4,572	4,590	3.8	4.2	3.5	99.6
65-69	6,411	3,083	3,328	2.7	2.9	2.5	92.6
70-74	5,037	2,177	2,860	2.1	2	2.2	76.1
75-79	3,424	1,461	1,963	1.4	1.4	1.5	74.4
80-84	1,795	863	932	0.7	0.8	0.7	92.6
85+	1,041	549	492	0.4	0.5	0.4	111.6

Figure 3.1. Population pyramid, 2018



**Table 3.4. Mid-year population by age, sex, and area, 2018**

Age (years)	icddr,b service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	125,220	56,732	68,488	114,342	51,298	63,044
<1 year	2,713	1,364	1,349	2,511	1,229	1,282
1-4	10,857	5,502	5,355	9,896	5,004	4,892
1	2,692	1,346	1,346	2,530	1,288	1,242
2	2,803	1,454	1,349	2,452	1,186	1,266
3	2,705	1,373	1,332	2,515	1,298	1,217
4	2,657	1,329	1,328	2,399	1,232	1,167
5-9	12,832	6,440	6,392	11,579	5,755	5,824
10-14	12,673	6,286	6,387	11,835	5,772	6,063
15-19	11,334	5,068	6,266	10,872	5,069	5,803
20-24	8,415	3,000	5,415	7,543	2,675	4,868
25-29	8,095	2,855	5,240	7,130	2,569	4,561
30-34	8,335	3,256	5,079	7,481	2,937	4,544
35-39	7,750	3,315	4,435	6,802	2,819	3,983
40-44	7,459	3,311	4,148	6,211	2,618	3,593
45-49	7,112	3,160	3,952	6,410	2,800	3,610
50-54	7,242	3,188	4,054	6,479	2,797	3,682
55-59	6,830	3,457	3,373	6,296	3,079	3,217
60-64	4,673	2,364	2,309	4,489	2,208	2,281
65-69	3,269	1,595	1,674	3,142	1,488	1,654
70-74	2,513	1,075	1,438	2,524	1,102	1,422
75-79	1,700	743	957	1,724	718	1,006
80-84	885	455	430	910	408	502
85+	533	298	235	508	251	257

### MORTALITY

The age and sex specific distribution of death cases is shown in Tables 4.1 and 4.2. Of the 1,753 deaths, 6.4% were infants, 2.0% were children aged 1-4 years, and 68.4% were aged 60 years and above.

Table 4.3 shows mortality rates per 1000 population by age and sex in both areas. Table 4.4 shows the comparable age-sex-specific mortality rates by icddr,b service area and government service area. In 2018, the overall death rates for males and females were 8.8 and 6.1 respectively. Infant mortality rate was 24.3 per 1,000 live births for males and 18.6 for females. It was lower in the icddr,b service area (19.8 and 17.8, respectively) than in the Government service area (29.3 and 19.5, respectively), a result of improvements in the neonatal mortality in the icddr,b service area. Block-wise deaths in the icddr,b and government service areas by age and sex are shown in Appendix A.2a and A.2b respectively.

Table 4.5 shows the abridged life tables for males and females derived from age-sex specific death rates, and the survival ( $l_x$ ) times are plotted in Figure 4.1 (for Life Table Equations see Appendix C). The expectation of life at birth was 70.0 years for males and 74.4 for females in 2018 and it was 69.9 for males and 75.0 for females in 2017. 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 areas. In 2018, the gender difference in expectation of life was higher in the icddr,b service area (4.2 years) than in the Government service area (-0.1 years). Expectation of life at most of the age-groups in each area was higher for females than for males (Appendices A.3 and A.4).

Table 4.6 shows the distribution of deaths by age and month of occurrence. Deaths of those aged 5-64 years tend to peak in the months January to March, July, and October to December. Neonatal deaths were most frequent in April, June and December. Post-neonatal deaths and child deaths, on the other hand, does not show any seasonal pattern. Figure 4.2 shows that the probability of survival for males and females started to differ from age 15 with females having a higher probability of survival in later age-groups.

Deaths by underlying causes, sex, age, and by areas are shown in Appendix A-5 to A-8. Figure 4.1 gives distribution of age-standardized mortality rates by broad category of cause of death (obtained using Verbal Autopsy). The WHO-standard world population age structure is shown in Appendix D (WHO, 2000).



**Table 4.1. Number of deaths, percent distribution and cumulative percent distribution of deaths by age and sex in both areas, 2018**

Age (years)	Both sexes			Male			Female		
	Number	%	Cumu- lative %	Number	%	Cumu- lative %	Number	%	Cumu- lative %
All ages	1753	100.0	-	948	100.0	-	805	100.0	-
<1 year	112		-	63	-	-	49	-	-
< 7 days	69	3.9	3.9	45	4.7	4.7	24	3.0	3.0
7 - 29 days	23	1.3	5.2	12	1.3	6.0	11	1.4	4.3
1 - 5 months	17	1.0	6.2	6	0.6	6.6	11	1.4	5.7
6-11 months	3	0.2	6.4	0	0.0	6.6	3	0.4	6.1
1 – 4 years	35	-	-	20	-	-	15	-	-
1	16	0.9	7.3	7	0.7	7.4	9	1.1	7.2
2	8	0.5	7.8	5	0.5	7.9	3	0.4	7.6
3	5	0.3	8.0	4	0.4	8.3	1	0.1	7.7
4	6	0.3	8.4	4	0.4	8.8	2	0.2	8.0
5-9	10	0.6	9.0	5	0.5	9.3	5	0.6	8.6
10-14	14	0.8	9.8	8	0.8	10.1	6	0.7	9.3
15-19	16	0.9	10.7	6	0.6	10.8	10	1.2	10.6
20-24	15	0.9	11.5	6	0.6	11.4	9	1.1	11.7
25-29	11	0.6	12.2	7	0.7	12.1	4	0.5	12.2
30-34	16	0.9	13.1	7	0.7	12.9	9	1.1	13.3
35-39	24	1.4	14.4	16	1.7	14.6	8	1.0	14.3
40-44	27	1.5	16.0	19	2.0	16.6	8	1.0	15.3
45-49	55	3.1	19.1	31	3.3	19.8	24	3.0	18.3
50-54	90	5.1	24.2	61	6.4	26.3	29	3.6	21.9
55-59	129	7.4	31.6	79	8.3	34.6	50	6.2	28.1
60-64	161	9.2	40.8	108	11.4	46.0	53	6.6	34.7
65-69	170	9.7	50.5	102	10.8	56.8	68	8.4	43.1
70-74	211	12.0	62.5	106	11.2	67.9	105	13.0	56.1
75-79	251	14.3	76.8	112	11.8	79.7	139	17.3	73.4
80-84	207	11.8	88.6	95	10.0	89.8	112	13.9	87.3
85+	199	11.4	100.0	97	10.2	100.0	102	12.7	100.0

**Table 4.2. Deaths by age, sex and area, 2018**

Age (years)	icddr,b service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	935	509	426	818	439	379
<1 year	51	27	24	61	36	25
< 7days	29	20	9	40	25	15
7 - 29 days	12	4	8	11	8	3
1- 5 months	9	3	6	8	3	5
6-11 months	1	0	1	2	0	2
1 - 4 years	21	14	7	14	6	8
1	11	6	5	5	1	4
2	4	2	2	4	3	1
3	4	4	0	1	0	1
4	2	2	0	4	2	2
5-9	8	3	5	2	2	0
10-14	9	5	4	5	3	2
15-19	8	2	6	8	4	4
20-24	10	4	6	5	2	3
25-29	5	4	1	6	3	3
30-34	6	4	2	10	3	7
35-39	14	10	4	10	6	4
40-44	15	10	5	12	9	3
45-49	36	22	14	19	9	10
50-54	48	34	14	42	27	15
55-59	64	35	29	65	44	21
60-64	85	55	30	76	53	23
65-69	101	59	42	69	43	26
70-74	112	57	55	99	49	50
75-79	137	64	73	114	48	66
80-84	91	48	43	116	47	69
85+	114	52	62	85	45	40

**Table 4.3. Death rates by age and sex in both areas, 2018 (per 1,000 population)**

<b>Age (years)</b>	<b>Both sexes</b>	<b>Male</b>	<b>Female</b>
All ages	7.3	8.8	6.1
<1 year*	21.4	24.3	18.6
< 7days*	13.2	17.4	9.1
7- 29 days*	4.4	4.6	4.2
1- 5 months*	3.3	2.3	4.2
6-11 months*	0.6	0.0	1.1
1 - 4 years	1.7	1.9	1.5
1	3.1	2.7	3.5
2	1.5	1.9	1.1
3	1.0	1.5	0.4
4	1.2	1.6	0.8
5-9	0.4	0.4	0.4
10-14	0.6	0.7	0.5
15-19	0.7	0.6	0.8
20-24	0.9	1.1	0.9
25-29	0.7	1.3	0.4
30-34	1.0	1.1	0.9
35-39	1.6	2.6	1.0
40-44	2.0	3.2	1.0
45-49	4.1	5.2	3.2
50-54	6.6	10.2	3.7
55-59	9.8	12.1	7.6
60-64	17.6	23.6	11.5
65-69	26.5	33.1	20.4
70-74	41.9	48.7	36.7
75-79	73.3	76.7	70.8
80-84	115.3	110.1	120.2
85+	191.2	176.7	207.3
* Rate per 1,000 live births			

**Table 4.4. Death rates by age, sex and area, 2018 (per 1,000 population)**

Age (years)	icddr,b area			Government area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	7.5	9.0	6.2	7.2	8.6	6.0
<1 year*	18.8	19.8	17.8	24.3	29.3	19.5
< 7days*	10.7	14.7	6.7	15.9	20.3	11.7
7 -29 days*	4.4	2.9	5.9	4.4	6.5	2.3
1- 5 months*	3.3	2.2	4.4	3.2	2.4	3.9
6-11 months*	0.4	0.0	0.7	0.8	0.0	1.6
1 - 4 years	1.9	2.5	1.3	1.4	1.2	1.6
1	4.1	4.5	3.7	2.0	0.8	3.2
2	1.4	1.4	1.5	1.6	2.5	0.8
3	1.5	2.9	0.0	0.4	0.0	0.8
4	0.8	1.5	0.0	1.7	1.6	1.7
5-9	0.6	0.5	0.8	0.2	0.3	0.0
10-14	0.7	0.8	0.6	0.4	0.5	0.3
15-19	0.7	0.4	1.0	0.7	0.8	0.7
20-24	1.2	1.3	1.1	0.7	0.7	0.6
25-29	0.6	1.4	0.2	0.8	1.2	0.7
30-34	0.7	1.2	0.4	1.3	1.0	1.5
35-39	1.8	3.0	0.9	1.5	2.1	1.0
40-44	2.0	3.0	1.2	1.9	3.4	0.8
45-49	5.1	7.0	3.5	3.0	3.2	2.8
50-54	6.6	10.7	3.5	6.5	9.7	4.1
55-59	9.4	10.1	8.6	10.3	14.3	6.5
60-64	18.2	23.3	13.0	16.9	24.0	10.1
65-69	30.9	37.0	25.1	22.0	28.9	15.7
70-74	44.6	53.0	38.2	39.2	44.5	35.2
75-79	80.6	86.1	76.3	66.1	66.9	65.6
80-84	102.8	105.5	100.0	127.5	115.2	137.5
85+	213.9	174.5	263.8	167.3	179.3	155.6
* Rate per 1,000 live births						

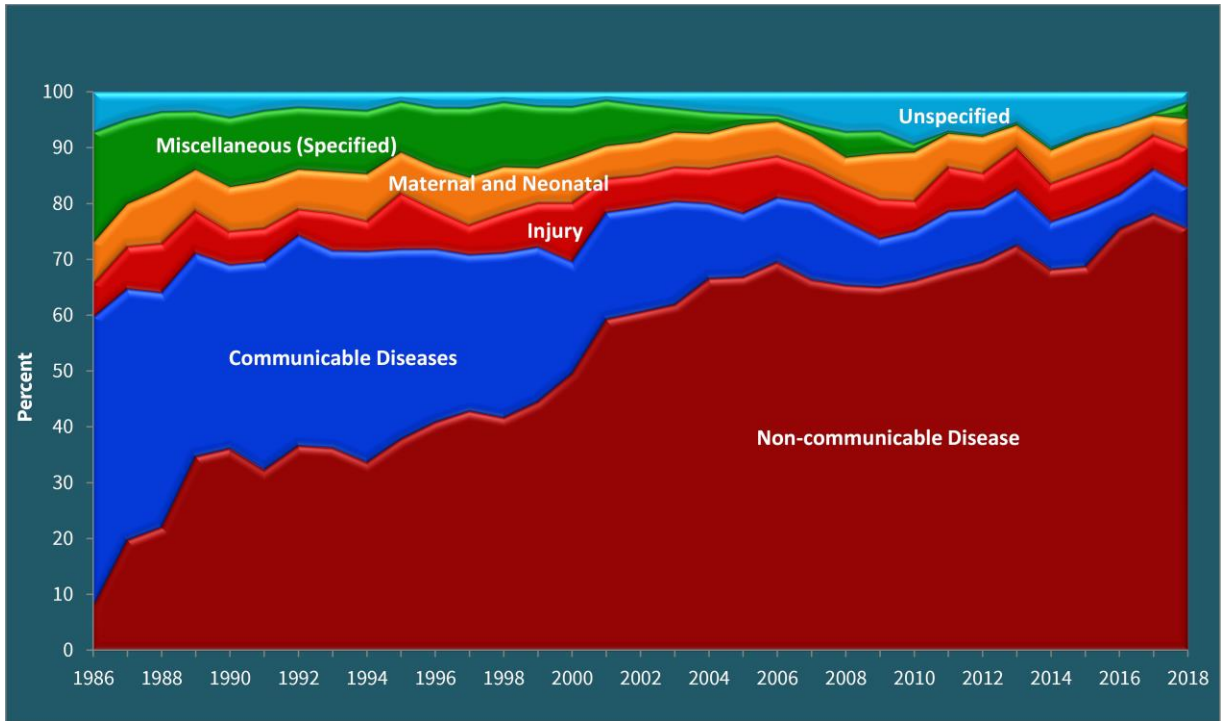
**Table 4.5. Abridged life table by sex, 2018**

Age (years)	Male				Female			
	$nq_x$	$l_x$	$L_x$	$e_x$	$nq_x$	$l_x$	$L_x$	$e_x$
0	24.3	100000	97935	70.0	18.6	100000	98417	74.4
1	2.7	97570	97418	70.7	3.5	98138	97937	74.8
2	1.9	97311	97219	69.9	1.1	97797	97741	74.1
3	1.5	97127	97055	69.0	0.4	97685	97666	73.2
4	1.6	96982	96906	68.1	0.8	97646	97607	72.2
5	2.0	96831	483696	67.2	2.0	97568	487382	71.3
10	3.3	96632	482424	62.4	2.4	97369	486304	66.4
15	3.0	96312	480905	57.6	4.1	97134	484746	61.5
20	5.3	96028	478971	52.7	4.4	96733	482690	56.8
25	6.4	95521	476189	48.0	2.0	96310	481099	52.0
30	5.6	94907	473300	43.3	4.7	96114	479536	47.1
35	13.0	94372	469035	38.5	4.7	95665	477282	42.3
40	15.9	93148	462320	34.0	5.2	95212	474928	37.5
45	25.7	91667	452885	29.5	15.8	94721	470160	32.7
50	49.8	89311	436226	25.2	18.6	93229	462142	28.2
55	58.8	84865	412715	21.4	37.3	91496	449576	23.7
60	111.9	79877	378367	17.5	56.2	88085	428906	19.5
65	153.4	70939	328894	14.4	97.5	83133	396661	15.5
70	217.9	60057	268826	11.5	168.8	75028	345012	11.9
75	322.4	46968	197557	9.0	301.7	62361	265717	8.8
80	430.5	31823	124440	7.1	459.8	43546	166622	6.4
85+	1000.0	18125	102583	5.7	1000.0	23523	113463	4.8

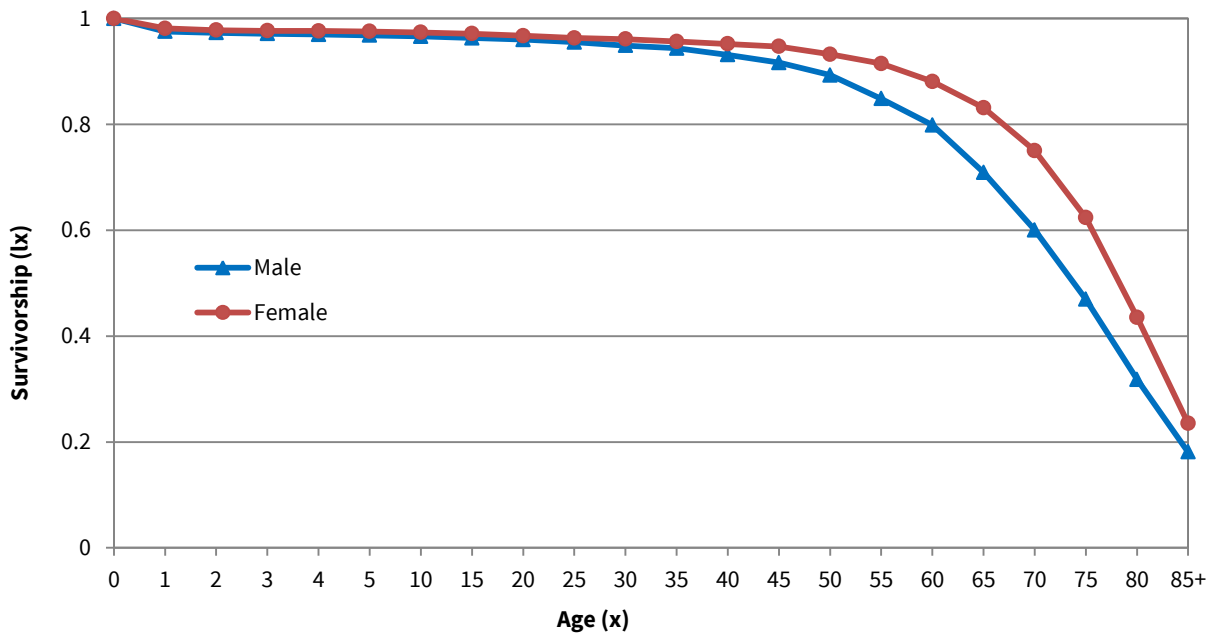
**Table 4.6. Deaths by month and age, 2018**

Month	Age at Death					
	All ages	Under 1 month	1-11 months	1-4 years	5-64 years	65 years and above
January	210	7	1	0	57	145
February	179	6	0	4	50	119
March	131	6	0	2	54	69
April	134	12	4	6	42	70
May	124	6	0	2	41	75
June	138	11	4	5	42	76
July	136	8	2	5	56	65
August	120	8	4	1	37	70
September	117	8	1	2	38	68
October	123	6	1	2	50	64
November	149	5	2	2	48	92
December	192	9	1	4	53	125
<b>Total</b>	<b>1753</b>	<b>92</b>	<b>20</b>	<b>35</b>	<b>568</b>	<b>1038</b>

**Figure 4.1. Percent distribution of age-standardized death rates by cause of deaths, 1986-2018**



**Figure 4.2. Probability of survival from birth to age(x) by sex, 2018**



## CHAPTER 5

### FERTILITY

In 2018, there were 5,086 live births in the Matlab HDSS area as outcomes of 5,864 pregnancies. Table 5.1 shows the number of pregnancies and their outcomes in 2018. Of the pregnancies, 86.8% ended with at least a live birth, a proportion that remains almost the same from year to year; pregnancies' resulting in fetal wastage is also similar to previous year. Among the pregnancies resulting in live births, 55 were multiple births. Among these 49 had two live births, 4 had ended with 1 live birth and 1 stillbirth and were miscarried 2 and others had single live births.

Table 5.2 shows the distribution of pregnancies by outcome and live births by sex and month of occurrence. The data show the usual marked seasonal variation of births, peaking in August, October, November and December. The sex ratio at births was 103 males per 100 females; there is no definite trend over the period. Figure 5.1 shows number of births and deaths by month of occurrence. Seasonality of births peaks in June, August and October to December.

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

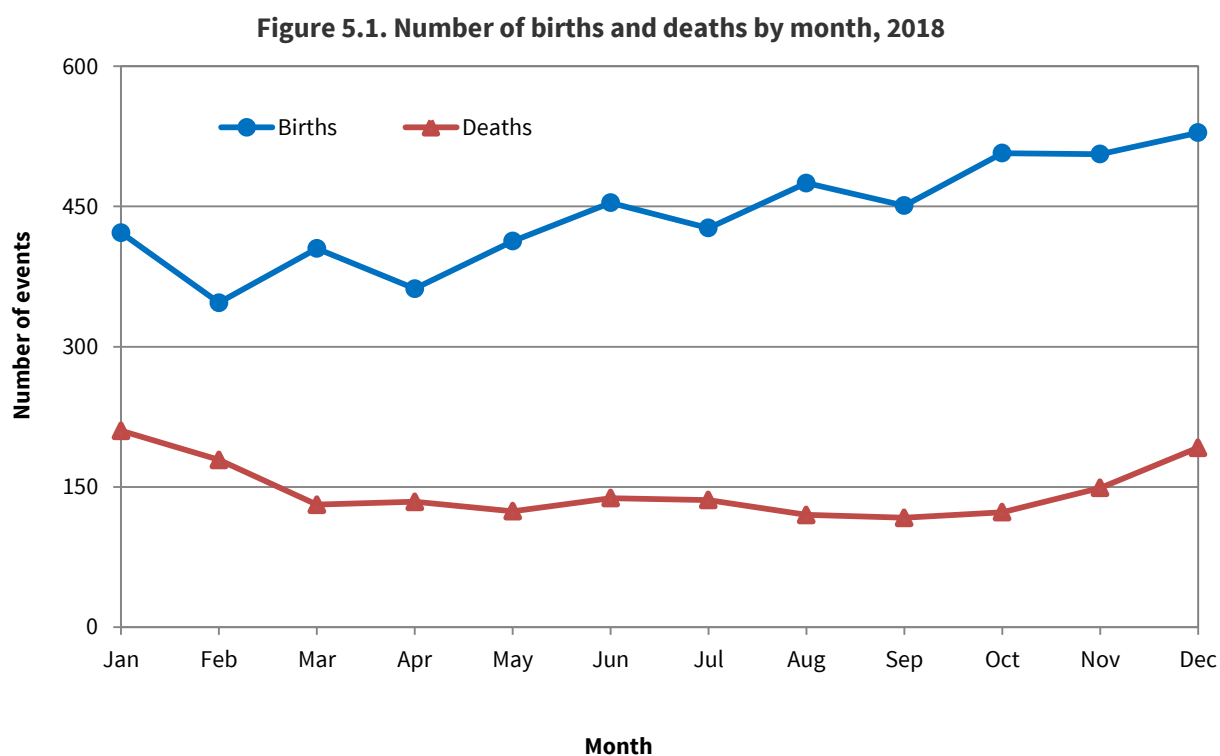
Table 5.4 shows marked variation in the distribution of live birth pregnancies by place of delivery and area. Institutional delivery accounts for 90.5% in the icddr,b service area and 68.6% in the Government service area. More commonly used places for institutional delivery in the Government service area were private clinic/nursing home (48.9%) and Upazila Health Complex (15.4%), and in icddr,b service area, private clinic/nursing home, icddr,b hospital, and Upazila health complex are 43.0%, 26.0% and 16.6% respectively.

Table 5.5 shows the distribution of live birth pregnancies by birth attendants and area. In the icddr,b service area, deliveries assisted by MBBS doctor were the highest (54.3%) followed by nurse (30.5%) and Family Welfare Visitor (FWV) (5.7%) as opposed to TBAs (18.5%), and MBBS doctor also equally high (54.9%) in the Government service area. The respective figures for trained TBAs were 1.6% and 6.9% in the icddr,b service area and Government service area, respectively. Medically trained birth attendants (doctors, nurses or midwives, or family welfare visitors) assisted 90.5% of the live birth deliveries in the icddr,b service area and 73.6% 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 46.8% in the icddr,b service area and 47.2% in the Government service area. Instrumental deliveries, especially caesarean were 53.2% and 52.8% respectively in the icddr,b service area and Government service area.

Till 2015 Matlab HDSS used to record place of antenatal care (ANC) received by expectant women during different trimesters of pregnancy. For WHO recommendation for at least 4 ANC visits: 1<sup>st</sup> visit around 12 weeks, 2<sup>nd</sup> visit between 24-28 weeks, 3<sup>rd</sup> visit at 32 weeks and 4<sup>th</sup> visit at 36 weeks, HDSS starts recording information on providers and gestational ages of each ANC visit during pregnancy since 2016.

Table 5.7 shows the percentage distribution of different indicators of ANC coverage by area and overall. In icddr,b service area, 0.5% of the women didn't receive any ANC care during pregnancy as oppose to 6.3% in Government service area. Over 77.9% of the women received recommended number of ANC (at least 4 visits) at any time of their pregnancy compared to 27.5% in Government service area. The table also shows that, in icddr,b service area, 86.5% of the expectant mothers sought pregnancy care for the first time within 6 months of pregnancy (40% during 1<sup>st</sup> trimester and another 46.5% during 2<sup>nd</sup> trimester). In Government service area, only 22.3% of the women received 1<sup>st</sup> ANC care within 1<sup>st</sup> trimester and another 26.8% within 2<sup>nd</sup> trimester.





**Table 5.1. Results of pregnancy outcomes by area, 2018**

	<u>Both areas</u>	<u>icddr,b service area</u>	<u>Govt. service area</u>
Pregnancies and pregnancy outcomes	<b>Panel A: Number of pregnancies by type</b>		
<b>Total pregnancies</b>	<b>5864</b>	<b>3018</b>	<b>2846</b>
Pregnancies that:			
Ended with at least one live birth	5,037	2602	2435
Ended with at least one stillbirth	89	34	55
Were miscarried	584	324	260
Were aborted	154	58	96
	<b>Panel A1: Number of multiple come pregnancies by type</b>		
Multiple outcome pregnancies	55	26	29
Twin pregnancies	55	26	29
Twin pregnancies that:			
Ended with 2 live births	49	24	25
Ended with 2 stillbirths	0	0	0
Ended with 1 live birth and 1 stillbirth	4	2	2
Were miscarried	2	0	2
Were aborted	0	0	0
Triplet pregnancy	0	0	0
Quadruplet pregnancy	0	0	0
	<b>Panel B: Number of pregnancy outcomes by type</b>		
Total outcomes	5915	3042	2873
Live births	5086	2626	2460
Stillbirths	89	34	55
Miscarriages	586	324	262
Abortions	154	58	96
	<b>Panel C: Pregnancy rates by type</b>		
Pregnancies per 1000 women age 15-49	89.5	87.3	91.9
Rates per 1000 pregnancies:			
Live birth pregnancies	859.6	862.7	856.2
Stillbirth pregnancies	15.2	11.3	19.3
Pregnancies miscarried	99.7	107.4	91.4
Pregnancies aborted	26.3	19.2	33.8
<b>Miscarriage:</b> Pregnancy that is spontaneously ended before 28 weeks of gestation;			
<b>Abortion:</b> Pregnancy that is ended using drugs or surgical intervention before 28 weeks of gestation;			
<b>Live birth pregnancy:</b> Pregnancy that ends with at least one live birth;			
<b>Stillbirth pregnancy:</b> Pregnancy that ends with at least one stillbirth;			
<b>Note:</b> 5 births to women age below 15 years and 2 births to women age above 49 years are excluded from analysis. 27 women who had two pregnancies ended in 2018.			

**Table 5.2. Pregnancy outcomes by month, 2018**

Months	Pregnancy outcome					No. of live born children			
	All	Miscarriage		Still birth	Live birth <sup>a</sup>	Both sexes			Sex ratio
		Induced	Spon			Male	Female		
All months	<b>5,864</b>	<b>154</b>	<b>584</b>	<b>89</b>	<b>5,037</b>	<b>5,086</b>	<b>2,578</b>	<b>2,508</b>	<b>1.03</b>
Jan	499	14	42	7	436	422	208	231	0.90
Feb	352	14	45	9	284	347	150	135	1.11
Mar	455	18	57	8	372	405	180	196	0.92
Apr	452	14	62	7	369	362	166	206	0.81
May	535	18	60	7	450	413	221	237	0.93
Jun	442	6	48	5	383	454	194	194	1.00
Jul	454	18	41	10	385	427	207	182	1.14
Aug	503	12	43	11	437	475	221	218	1.01
Sep	501	7	46	3	445	451	235	214	1.10
Oct	522	12	51	3	456	507	239	222	1.08
Nov	595	16	46	8	525	506	287	242	1.19
Dec	554	5	43	11	495	529	270	231	1.17

<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

\*Births to women under age 15 (5 counts) & age above 49 (2 count) were excluded from this statistics

\*\*4 and 1 live born children had been found for births to women age under 15 and over 49 respectively

**Table 5.3. Age-specific fertility rates (per 1,000 women) and indices by area, 2018**

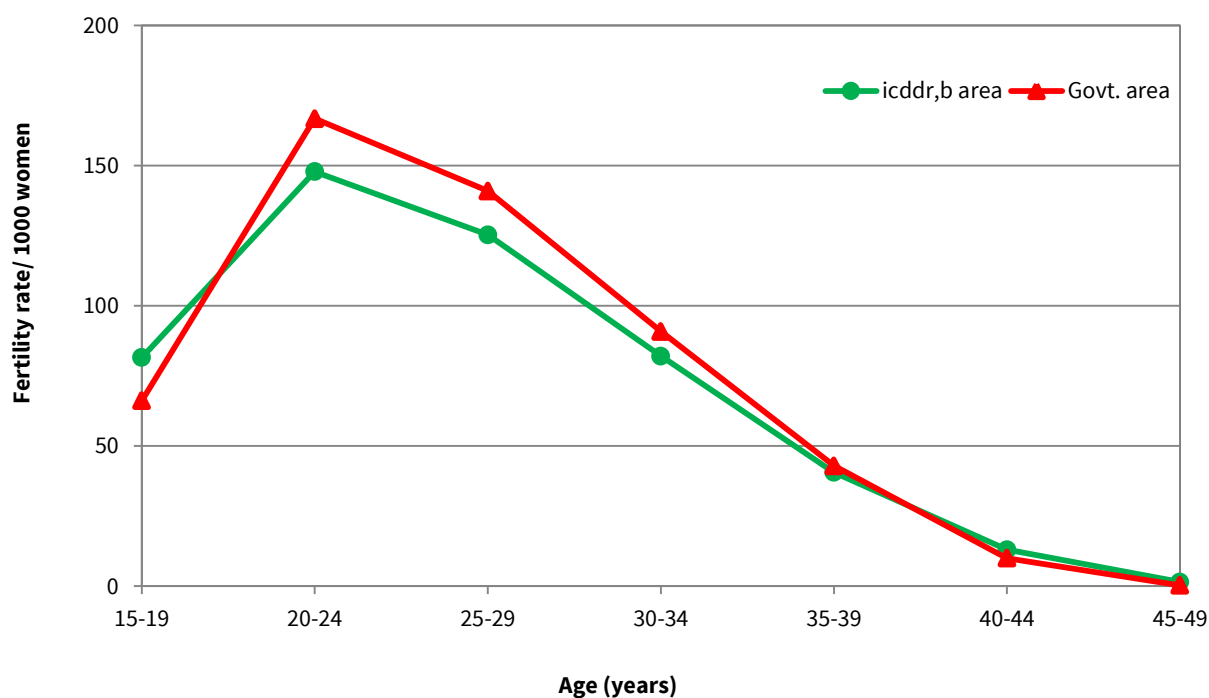
Age (years)	Both areas		icddr,b service area		Government service area	
	Births	Rate	Births	Rate	Births	Rate
All ages	<b>5,086</b>	<b>77.7</b>	<b>2,626</b>	<b>76.0</b>	<b>2,460</b>	<b>79.5</b>
15-19	895	74.2	511	81.6	384	66.2
20-24	1,613	156.9	801	147.9	812	166.8
25-29	1,300	132.6	657	125.4	643	141.0
30-34	830	86.3	417	82.1	413	90.9
35-39	351	41.7	180	40.6	171	42.9
40-44	90	11.6	54	13.0	36	10.0
45-49	7	0.9	6	1.5	1	0.3
Total fertility rate		2521		2460		2590
General fertility rate		78		76		79
Gross reproduction rate		1243		1233		1255
Net reproduction rate		1199		1187		1213

\*4 live births to women under age 15 and 1 to women age above 49 are excluded

**Table 5.4. Percent distribution of pregnancies that ended with live birth by place of delivery by area, 2018**

Place of Delivery	Both areas		icddr,b service area		Govt. service area	
	Number	percent	Number	percent	Number	percent
Home	1,006	20.0	245	9.4	761	31.3
ICDDR,B sub-centre	52	1.0	52	2.0	0	0.0
ICDDR,B hospital	678	13.5	676	26.0	2	0.1
Upazila health complex	809	16.1	433	16.6	376	15.4
District hospital	138	2.7	70	2.7	68	2.8
Clinic/nursing home	2,309	45.8	1,119	43.0	1190	48.9
UH & FWC	39	0.8	4	0.2	35	1.4
Others	6	0.1	3	0.1	3	0.1
<b>No. of live birth</b>	<b>5,037</b>	<b>100</b>	<b>2,602</b>	<b>100</b>	<b>2,435</b>	<b>100</b>
<i>Births to women under age 15 &amp; age above 49 were excluded from this statistics</i>						

**Figure 5.2. Age-specific fertility rates by area, 2018**



**Table 5.5. Percent distribution of pregnancies that ended with live birth by attendant and area, 2018**

Birth attendant	Both areas		icddr,b service area		Government service area	
	Number	percent	Number	percent	Number	percent
TBA	611	12.1	160	6.1	451	18.5
Trained TBA	210	4.2	41	1.6	169	6.9
FWV	292	5.8	148	5.7	144	5.9
Nurse	1,104	21.9	793	30.5	311	12.8
MBBS doctor	2,750	54.6	1,413	54.3	1,337	54.9
Others	22	0.4	12	0.5	10	0.4
None	48	1.0	35	1.3	13	0.5
No. of live birth	<b>5,037</b>	<b>100</b>	<b>2,602</b>	<b>100</b>	<b>2,435</b>	<b>100</b>
<i>TBA=Traditional birth attendant</i>						
<i>FWV= Family welfare visitor</i>						

**Table 5.6. Percent distribution of mode of delivery of live birth by area, 2018**

Mode of Delivery	Both areas		icddr,b service area		Government service area	
	Number	percent	Number	percent	Number	percent
Normal vaginal	2,366	47.0	1,217	46.8	1,149	47.2
Operation (C/S)	2,671	53.0	1,385	53.2	1,286	52.8
No. of live birth	<b>5,037</b>	<b>100</b>	<b>2,602</b>	<b>100</b>	<b>2,435</b>	<b>100</b>

**Table 5.7. Percent distribution of different indicator for ANC visits, 2018**

(number of visit, time of first visit and visit to health facilities at least once in different trimester of pregnancy)

	icddr,b service area	Government service area	Both areas
<b>Number of ANC visits:</b>			
None	0.5	6.3	3.3
1	2.5	18.4	10.2
2	5.9	27.4	16.3
3	13.1	20.3	16.6
4+	77.9	27.5	53.6
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Median</b>	<b>4</b>	<b>2</b>	<b>4</b>
<b>Number of months pregnant at the time of the first ANC visits</b>			
No ANC	0.5	6.3	3.3
< 4 months	40.0	22.3	31.4
4 - 5 months	46.5	26.8	37.0
6 - 7 months	10.8	29.4	19.8
8 + months	2.2	15.2	8.5
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Median</b>	<b>4</b>	<b>5</b>	<b>4</b>
<b>Number of women giving live births</b>	<b>2,602</b>	<b>2,435</b>	<b>5,037</b>

## CHAPTER 6

### MARRIAGE AND DIVORCE

The procedures adopted by the HDSS specify that if either partner in a marriage is resident in the HDSS area, the marriage should be registered. The number of marriages registered in 2018 was 3,091, giving a crude marriage rate of 12.9 per 1,000 populations. This rate was 13.3 in 2017.

Tables 6.1 and 6.2 show the percentage distribution of grooms and brides by age at marriage and previous marital status. The mean ages at marriage were 28.9 and 20.0 years for all grooms and brides respectively; 27.6 and 19.0 years for those marrying for the first time—which are similar to those of 2017. More than one-third (38.7%) of the brides, who are married for the first time aged below 18 years and 6.1% of the grooms who are married the first time aged below 21 years. In general, there has been a long-term gradual rise in age at first marriage of female in Matlab over 18 years for every year since 1985, while prior to that date it was consistently below that age.

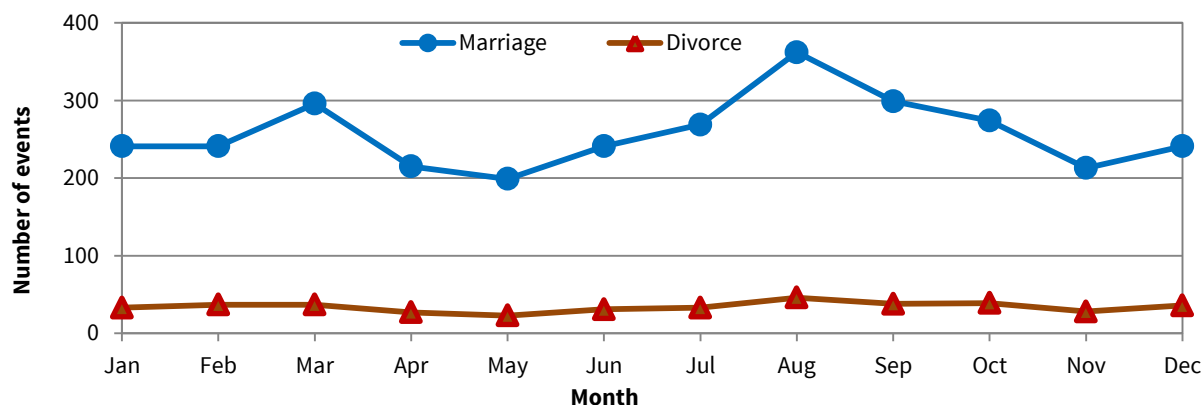
Table 6.3 shows the marriage rates by age and sex. Among males, the marriage rate was 37.4 per 1,000 males aged 10 years and above, and for females the rate was 29.0 per 1,000 females aged 10 years and above. For females, the highest rate was 190.9 per 1,000 at the age of 18 years, while for males the highest rate was 343.6 per 1,000 at the age of 28 years. The highest rate of marriage for males increased to age 28 years in 2018 from 27 years in 2017, but the highest rate of marriage for female was the same to age 18 years in 2018 that of in 2017. Table 6.4 shows distribution of current marital status of the study population by age and sex in 2018. Of the total population 51.4 % were currently married and it was higher for females than males (54.1% vs 48.1%). Widows also constituted a higher proportion for females (9.9%) than males (0.4%) - this difference, along with age-difference at marriage and life expectancy, maybe due to remarriage, which is more common for men than women.

Table 6.6 shows the distribution of marriages by type of gifts received from bridal party at the time of marriage in 2008-2018. Groom's party received marriage gifts from the bride's family 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 29.2% in 2018. Incidence of giving dowry shows a declining trend over time from 2008-2018 which indicates the improvement of social awareness. Dowry was paid in full at the time of marriage for about one-seventh of the marriages and partially for one-seventh 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 trend in registration of Muslim marriage and divorce. Marriage registration was 85.5% in 2018 with a decreasing trend in recent years. Highest registration was 94.6% in 2009. 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 418 divorces in 2018 (Appendix A.10) and of them, 215 were divorce of Muslim marriages. 72.4% were registered with Kazi. 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 43.1 months. Figure 6.1 shows the distribution of marriages and

divorces by month. In 2018 marriages were high in March, August and September. Table 6.8 shows the distribution of causes of divorce by area. CHRWs interviewed male and female partners (if available) and neighbors to determine the cause of the divorce. Most common cause was wife maladjustment with husband or husband's family (34.8%) followed by wife's affairs with other man (16.4%) and husband's affairs with other woman (14.5%).

**Figure 6.1. Number of marriages and divorces by month, 2018**



**Table 6.1 Groom's age at marriage by previous marital status, 2018**

Age (years)	Previous marital status (%)				
	All grooms	Single	Married	Divorced	Widowed
<b>All ages</b>	100.0 (n=3,091)	100.0 (n=2,601)	100.0 (n=71)	100.0 (n=341)	100.0 (n=78)
10-14	0.0	0.0	0.0	0.0	0.0
15-17	0.5	0.6	0.0	0.0	0.0
18	1.0	1.2	0.0	0.3	0.0
19	1.6	1.8	2.8	0.6	0.0
20	2.3	2.5	2.8	1.2	0.0
21	2.8	3.1	1.4	1.8	1.3
22-24	12.6	14.3	2.8	4.1	1.3
25-29	42.5	46.1	26.8	27.9	2.6
30-34	25.0	24.7	19.7	31.7	11.5
35-39	7.1	5.1	16.9	17.6	20.5
40-44	1.7	0.4	11.3	8.2	10.3
45-49	1.0	0.2	7.0	3.8	12.8
50-54	0.5	0.0	4.2	1.2	11.5
55-59	0.5	0.0	1.4	0.9	11.5
60-64	0.2	0.0	1.4	0.3	6.4
65+	0.4	0.1	1.4	0.6	10.3
Median age*	28	28	33	32	46
Mean age*	28.9	27.6	34.8	32.8	46.8
Standard dev.*	6.8	5.1	10.6	7.6	12.6

\*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, 2018**

Age (years)	All brides	Single	Divorced	Widowed
	100.0 (n=3,091)	100.0 (n=2,666)	100.0 (n=400)	100.0 (n=25)
10-14	3.3	3.8	0.5	0.0
15	6.1	7.0	0.5	0.0
16	10.4	11.8	2.0	0.0
17	14.4	16.2	3.0	0.0
18	13.9	15.4	4.8	4.0
19	11.7	12.5	7.3	0.0
20 – 24	26.3	25.4	32.5	24.0
25 – 29	8.9	6.3	25.5	20.0
30 – 34	2.9	1.2	13.3	28.0
35 – 39	1.2	0.4	6.0	4.0
40 – 44	0.5	0.2	2.8	8.0
45 – 49	0.2	0.0	1.0	4.0
50 – 54	0.2	0.0	1.0	8.0
55 – 59	0.0	0.0	0.0	0.0
60 – 64	0.0	0.0	0.0	0.0
65+	0.0	0.0	0.0	0.0
Unknown	0.0	0.0	0.0	0.0
Median age*	19	18	24	30
Mean age*	20.0	19.0	25.7	31.3
Standard dev.*	4.9	3.7	6.9	9.5
*Mean and median ages and standard deviation were calculated from ungrouped age data				

**Table 6.3 Marriage rates by age and sex, 2018**

Age(years)	Male			Female			
	Marriages	Population	Rate*	Age(years)	Marriages	Population	Rate*
All ages(10+ yrs)	3091	82736	37.4	All ages(10+ yrs)	3091	106438	29.0
10-14	0	12,058	0.0	10-14	102	12,450	8.2
15-19	98	10,137	9.7	15	189	2,606	72.5
20-24	548	5,675	96.6	16	322	2,533	127.1
25	188	1,026	183.2	17	444	2,418	183.6
26	212	936	226.5	18	431	2,258	190.9
27	254	1,077	235.8	19	361	2,254	160.2
28	401	1,167	343.6	20-24	812	10,283	79.0
29	259	1,218	212.6	25-29	275	9,801	28.1
30-34	774	6,193	125.0	30-34	91	9,623	9.5
35-39	220	6,134	35.9	35-39	36	8,418	4.3
40-44	54	5,929	9.1	40-44	17	7,741	2.2
45+	83	31,186	2.7	45+	11	36,053	0.3
Unknown	0	-	-	Unknown	0	-	-
*Rates per 1000 population irrespective of previous marital status							

**Table 6.4. Percent distribution of current marital status (%) by age and sex, 2018**

Age (years)	Male						Female					
	NM	PM	WID	DIV	Total	Number	NM	PM	WID	DIV	Total	Number
0-4	100.0	0.0	0.0	0.0	100	13,099	100.0	0.0	0.0	0.0	100	12,878
5-9	100.0	0.0	0.0	0.0	100	12,195	100.0	0.0	0.0	0.0	100	12,216
10-14	100.0	0.0	0.0	0.0	100	12,058	98.0	2.0	0.1	0.0	100	12,450
15-19	97.6	2.4	0.0	0.0	100	10,137	55.9	42.8	1.3	0.0	100	12,069
20-24	75.7	23.6	0.6	0.1	100	5,675	12.1	85.6	2.1	0.2	100	10,283
25-29	33.5	65.1	1.3	0.1	100	5,424	3.6	94.4	1.5	0.4	100	9,801
30-34	8.9	89.8	1.2	0.0	100	6,193	1.2	96.3	1.5	1.0	100	9,623
35-39	2.8	96.1	0.9	0.2	100	6,134	0.8	96.4	0.8	1.9	100	8,418
40-44	1.3	97.7	0.7	0.3	100	5,929	0.3	94.4	1.2	4.1	100	7,741
45-49	0.7	98.2	0.7	0.4	100	5,960	0.3	90.5	1.3	8.0	100	7,562
50-54	0.4	98.3	0.4	0.9	100	5,985	0.3	83.0	1.6	15.0	100	7,736
55-59	0.4	97.7	0.4	1.5	100	6,536	0.3	72.3	1.8	25.6	100	6,590
60-64	0.4	96.2	0.4	3.0	100	4,572	0.1	57.7	1.7	40.4	100	4,590
65-69	0.1	93.6	0.4	5.9	100	3,083	0.0	39.9	1.2	58.8	100	3,328
70-74	0.3	90.1	0.3	9.3	100	2,177	0.1	26.2	1.1	72.6	100	2,860
75-79	0.2	84.7	0.3	14.8	100	1,461	0.1	12.4	0.6	86.9	100	1,963
80-84	0.2	77.9	0.1	21.8	100	863	0.1	5.2	0.6	94.1	100	932
85+	0.0	60.5	0.5	39.0	100	549	0.0	2.4	1.0	96.5	100	492
<b>Total</b>	<b>50.2</b>	<b>48.1</b>	<b>0.4</b>	<b>1.3</b>	<b>100</b>	<b>108030</b>	<b>34.9</b>	<b>54.1</b>	<b>1.0</b>	<b>9.9</b>	<b>100</b>	<b>131532</b>

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

**Table 6.5. Duration (months) of all marriages at divorce by age and sex, 2018**

Age at divorce (years)	Male				Female			
	Count	Mean	Median	SD	Count	Mean	Median	SD
< 20	5	5.4	1.0	7.8	109	15.6	14.0	12.4
20 – 24	36	20.6	16.5	16.0	139	33.4	27.0	27.3
25 – 29	126	28.5	19.5	27.9	77	43.4	36.0	35.2
30 – 34	120	35.5	24.0	35.8	41	90.9	103.0	67.1
35 – 39	64	60.4	41.5	55.1	12	119.0	83.5	93.9
40 – 49	41	85.2	50.0	80.8	19	121.4	142.0	97.4
50+	16	99.5	53.0	103.7	11	38.2	15.0	61.9
<b>All ages</b>	<b>408</b>	<b>43.1</b>	<b>24.0</b>	<b>51.4</b>	<b>408</b>	<b>43.1</b>	<b>24.0</b>	<b>51.4</b>

**Table 6.6. Marriages by type of gifts received by grooms' party from bridal party, 2009-2018**

Type of gift received	Year										
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
None	40.1	43.2	57.6	48.5	48.5	53.6	57.5	61.8	64.2	68.7	
Gift without prior negotiation	0.6	0.6	0.9	1.1	0.9	1.4	2.2	2.1	1.8	2.1	
Gift after prior negotiation	59.3	56.2	41.5	50.3	50.6	45	40.3	36	34.0	29.2	
<b>Gift payment</b>											
Full	19.1	18.8	13.2	16.7	18.8	16.1	16.9	15.5	15.7	14.2	
Partial	33.7	31.1	22.4	26.8	25.9	24.4	19	16.3	14.8	13.5	
Not yet paid*	6.5	6.3	5.8	6.8	5.9	4.5	4.3	4.2	3.5	3.6	

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



**Table 6.7. Registration status of Muslim marriages and divorces, 2004-2018**

Year	Marriage Registered by Kazi		Divorce Registered by Kazi	
	Count	Percent	Count	Percent
2004	2483	91.7	230	82.4
2005	2563	91.1	243	80.7
2006	2521	92.5	270	88.2
2007	2726	94.0	278	83.2
2008	2442	92.6	223	83.2
2009	2760	94.6	239	77.1
2010	2643	92.3	319	82.6
2011	2620	93.2	302	84.4
2012	2666	93.4	299	82.4
2013	2687	94.2	239	76.6
2014	2716	91.5	303	79.9
2015	2604	89.6	363	82.7
2016	2619	87.3	318	79.5
2017	2449	86.2	280	80.0
2018	2353	85.5	215	72.4

**Table 6.8. Causes of divorces by area, Matlab, 2018**

Cause of Divorce	Both areas		icddr,b area		Government area	
	Count	Percent	Count	Percent	Count	Percent
Dowry	5	1.2	2	1.0	3	1.5
Domestic violence	24	5.9	10	4.9	14	6.9
Husbands affairs with another woman	59	14.5	29	14.1	30	14.9
Wife affairs with other man	67	16.4	28	13.6	39	19.3
Wife maladjustment with husband/family	142	34.8	82	39.8	60	29.7
Husband addicted to drug or gambling	17	4.2	7	3.4	10	5.0
No trace of husband	18	4.4	6	2.9	12	5.9
Husband/wife not good looking	14	3.4	10	4.9	4	2.0
Husband mentally/physically disable	26	6.4	13	6.3	13	6.4
Wife mentally/physically disable	9	2.2	7	3.4	2	1.0
Others/unspecified	27	6.6	12	5.8	15	7.4
<b>Total</b>	<b>408</b>	<b>100.0</b>	<b>206</b>	<b>100.0</b>	<b>202</b>	<b>100.0</b>

### 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 and did not come back to the HDSS area within six months of the departure or came in the area but never stayed overnight. 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 moves into the area due to marriage, divorce, schooling, jobs or settlement. These definitions are used in the surveillance area as a whole.

In 2018, a total of 12,019 persons (5,942 males and 6,077 females) moved into the HDSS area, which represented an annual average in-migration of 55.0 and 46.2 per 1000 population for males and females respectively. On the other hand, 14,159 persons (7,379 males and 6,780 females) left the HDSS area or on an average 68.3 and 51.5 per 1000 population for both males and females respectively (Table 7.1 and Appendix A.11). In 2018 the highest incidence of in-migration for males was 12.0% in the age group 30-34 and for females was 20.0% in the age group 15-19. The highest out-migration was in the age group 15-19 for both sex, 16.7% for males and 21.3% for females. More males out-migrated than females in the age group (35-44). The higher out migration of males affected the sex ratio of the population in the area – as the sex ratio decreased from 103 to 82 males per 100 females between 1982 and 2018. 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 rates are lower in 2018 than those of 2017. The net gain of population due to migration was -8.9 per 1,000 population in 2018; it, was 11.9 per 1,000 population in 2017. Table 7.1 presents the age-specific migration rates, which are illustrated in Figure 7.1. The tables and figures show age specific in- and out-migration. Migration among young children mainly indicates that they are moving with their parents. Male out-migrants were younger than male in-migrants. For females the pattern of age distribution was 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.14 through A.17. Roughly, an equal number of men and women move into and out of the rural area, 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 countries is heavily concentrated among out-migrating males aged 15-44 years (Appendix A.18).

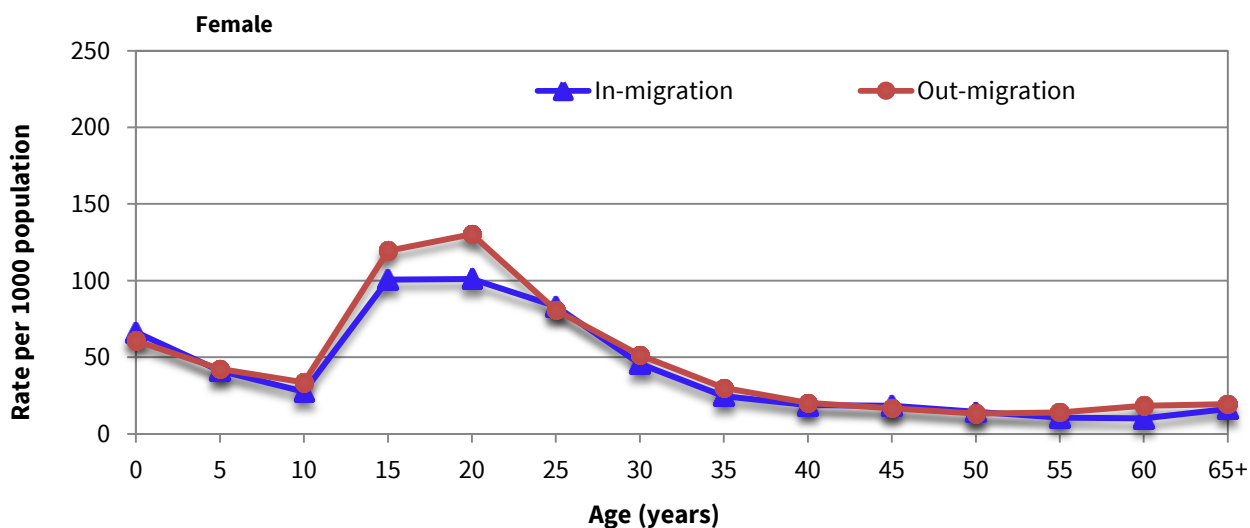
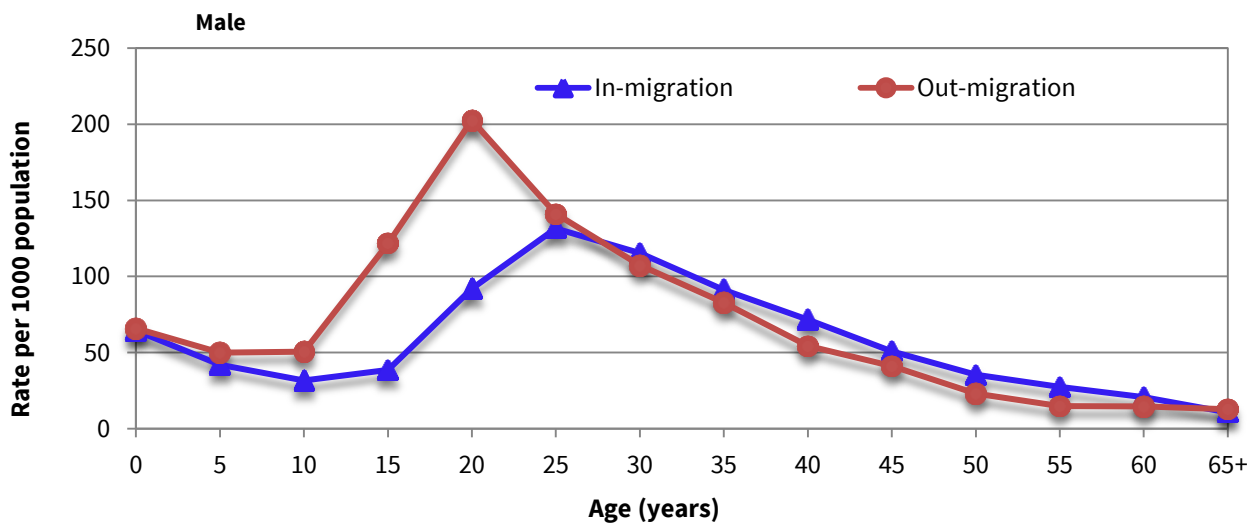
**Table 7.1. Age and sex-specific migration rates (per 1,000 population) by direction, 2018**

Age (years)	Both sexes		Male		Female	
	In	Out	In	Out	In	Out
<b>All ages</b>	<b>50.2</b>	<b>59.1</b>	<b>55.0</b>	<b>68.3</b>	<b>46.2</b>	<b>51.5</b>
0 - 4	65.4	63.4	64.5	66.0	66.2	60.7
5-9	41.6	46.1	42.1	49.9	41.1	42.2
10-14	29.5	41.9	31.6	50.6	27.5	33.5
15-19	72.3	120.5	38.6	121.7	100.6	119.5
20-24	97.8	156.0	92.0	202.6	101.0	130.3
25-29	100.4	102.3	131.6	141.2	83.2	80.8
30-34	73.0	73.2	115.5	107.4	45.7	51.2
35-39	52.7	52.2	91.3	82.8	24.6	29.9
40-44	41.6	35.0	71.7	54.3	18.6	20.2
45-49	32.7	27.4	50.8	41.1	18.4	16.7
50-54	23.5	17.5	35.4	23.1	14.2	13.2
55-59	19.0	14.4	27.4	14.8	10.6	14.0
60-64	15.4	16.5	20.8	14.7	10.0	18.3
65+	13.7	16.4	10.7	12.8	16.3	19.4

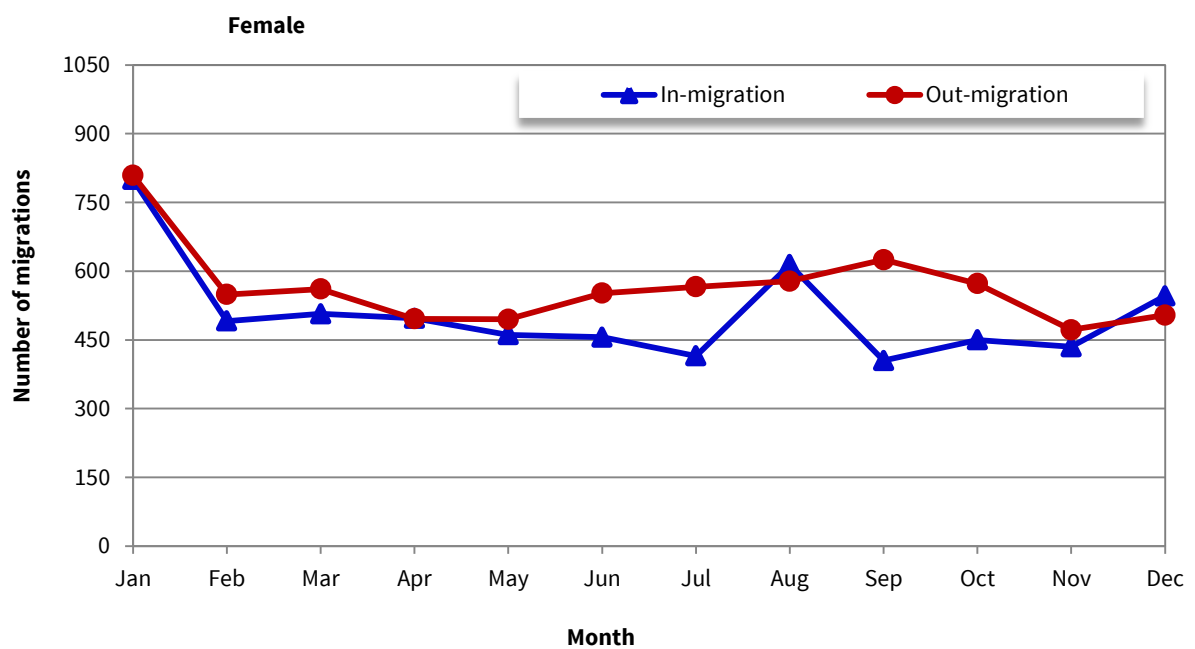
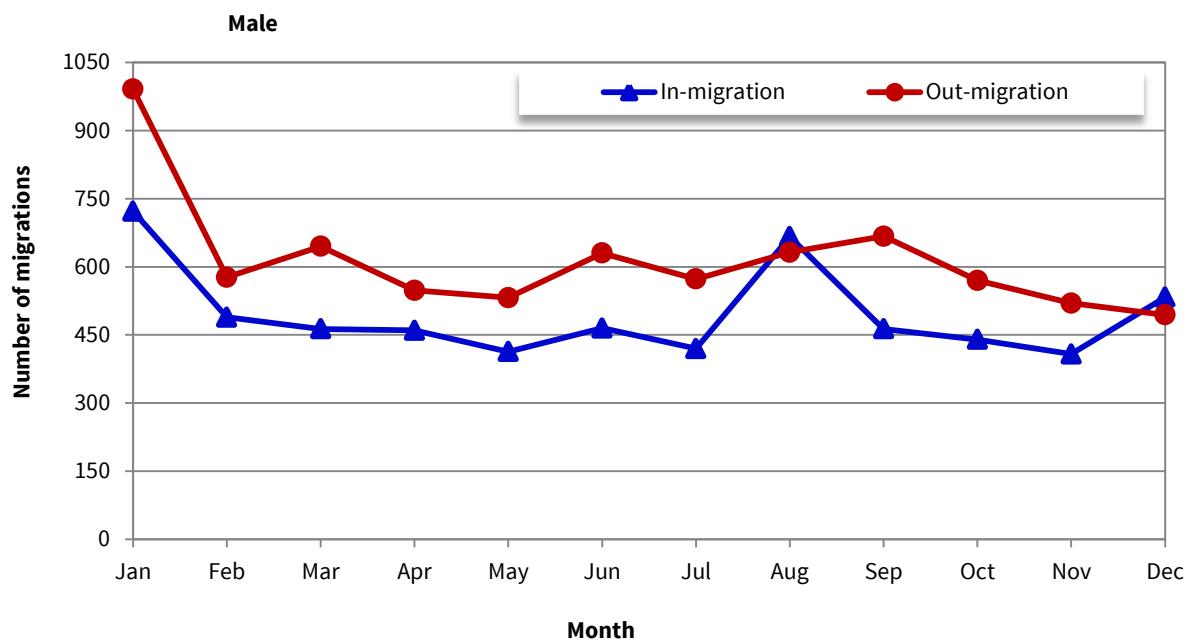
**Table 7.2. Number of in- and out-migrations by sex and month, 2018**

Month	In-migration			Out-migration		
	Both sexes	Male	Female	Both sexes	Male	Female
<b>All months</b>	<b>12,019</b>	<b>5,942</b>	<b>6,077</b>	<b>14,159</b>	<b>7,379</b>	<b>6,780</b>
Jan	1,522	722	800	1,800	991	809
Feb	980	489	491	1,126	577	549
Mar	970	463	507	1,206	645	561
Apr	957	460	497	1,044	548	496
May	874	413	461	1,027	532	495
Jun	921	465	456	1,182	630	552
Jul	835	420	415	1,139	573	566
Aug	1,280	666	614	1,210	632	578
Sep	868	463	405	1,292	667	625
Oct	890	440	450	1,143	570	573
Nov	843	408	435	992	520	472
Dec	1079	533	546	998	494	504

**Figure 7.1. In- and out-migrations rates by sex and age in Matlab, 2018**



**Figure 7.2. Number of in- and out-migrations by sex and month in Matlab, 2018**



## CHAPTER 8

### FERTILITY REGULATION

In the icddr,b service area, maternal and child health services including immunization and, family planning (MCH-FP) services have been being provided through a horizontal health care system with government health service system since 1978. icddr,b's maternal health services include pregnancy test, counseling and care providing for ANC, safe delivery, PNC, contraception, motivating eligible couples for family planning method adoption, and refer mothers and children for complications. Raising awareness of parents about symptoms of common childhood morbidity; and advise them to treat sick children by medically trained providers are also included in icddr,b's service package. Other private and NGO health care facilities and NGO domiciliary health service providers also provide health services in icddr,b service area. In the Government service area, services are provided by Government health system and other private and NGO service system.

The 40 surveillance CHRWs in both icddr,b and Government service areas record family planning methods used by couples during visiting month and the previous month by asking eligible women during their bimonthly home visits. In 2018, the contraceptive use rate was 43.9% in the icddr,b service area and 35.1% in the Government service area (Table 8.1). Table 8.2 shows the difference in contraceptive method-mix between the icddr,b and Government service areas in 2018 and the national level estimates for selected years. At the national level and in the Government service area, the pill is the most widely-used method, followed by injectables and tubectomy, while in the icddr,b service area, injectables is the most widely-used method, followed by pill, tubectomy and condom. Changes in the method-mix in the icddr,b service area during 2001-2018 are shown in Table 8.3. The contraceptive-use rate increases with the increase in women's age in the icddr,b and government service areas (Tables 8.4 and 8.5). It declines in late 40's of women's life. In the icddr,b service area, women aged 20 years and over are more likely to use injectables, followed by pill, undergo tubectomy and their husbands to use vasectomy whereas in the Government service area (Table 8.5), the pill, followed by injectables are the most popular methods 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 prevalence rate (%) among currently married women aged 15-49 years by area, 1987-2018**

Year	Matlab		Rural Chittagong (BDHS)	National**
	icddr,b area	Government area*		
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	-	26.1	44.6
1994	65.6	-	-	-
1995	68.6	-	-	-
1996	68.1	46.9	32.8	49.2
1997	67.4	-	-	-
1998	68.8	-	-	-
1999	69.9	-	-	53.8
2000	69.5	-	38.0	-
2001	69.7	-	-	50.8
2002	70.5	51.4	-	53.4
2003	69.6	47.2	-	-
2004	70.4	48.1	41.0	58.1
2005	71.4	47.4	-	-
2006	69.2	45.1	-	58.1
2007	56.6	43.6	37.4	55.8
2008	54.4	41.3	-	59.5
2009	54.2	42.5	-	-
2010	55.7	43.1	-	62.6
2011	54.1	43.7	45.2	61.2
2012	53.3	42.6	-	-
2013	53.8	42.2	-	62.0
2014	53.9	41.9	47.8	62.4
2015	51.4	40.9	-	-
2016	49.0	38.6	-	-
2017	47.7	36.8	-	61.9
2018	43.9	35.1	-	-

\*Sources: In-depth and KAP surveys, 1984 & 1990; MDHS 1992; HDSS census 1996 and HDSS 2002-2017.

\*\*Sources: Contraceptive prevalence survey, Bangladesh fertility survey 1989; Bangladesh demographic and health survey 1993-94,1996-97,1999-2000,2004,2007,2011,2014, 2017; Bangladesh maternal health services and maternal mortality survey 2010; Utilization of Essential Service Delivery Survey 2006,2008,2013.

**Note:** Definition of CPR has been revised in 2018 to make it comparable with other standard sources like DHS. New definition: percentage of currently married women of age 15-49 years who use any method of family planning. Definition used until 2017 excluded women who are menopausal and who have had hysterectomy procedure.

**Table 8.2. Contraceptive method mix (%) among women age 15-49 years who use any method by different sources and areas**

Method	Matlab		Rural Chittagong (BDHS 2014)	National (BDHS 2017-18)
	icddr,b service area, 2018	Government service area, 2018		
Pill	32.3	38.8	43.0	41.0
Condom	11.6	9.5	7.2	11.6
Injectables	32.2	24.1	25.7	17.3
IUD	1.0	1.3	1.3	1.0
Tubectomy	13.1	15.5	5.9	7.8
Vasectomy	1.7	1.0	0.8	1.8
Norplant/Implant	5.4	4.4	2.2	3.4
Others*	2.8	5.4	13.8	16.2
<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

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

**Table 8.3. Contraceptive method mix (%) among women age 15-49 years who use any method in the icddr,b service area, 2001-2018**

Method	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Pill	31.9	33.3	33.9	32.6	34.1	35.8	34.6	30.6	30.3	30.1	29.0	29.4	30.9	32.3	31.0	30.1	34.4	33.2
Condom	10.8	11.1	11.0	10.9	11.2	10.8	8.6	9.0	9.5	9.2	9.4	9.9	10.0	10.3	10.9	11.0	9.9	11.9
Injectables	45.7	44.5	44.4	45.2	42.7	41.3	43.6	47.4	46.6	46.8	46.4	45.2	41.8	40.1	38.7	38.9	33.5	33.1
IUD	1.9	1.8	1.9	2.4	2.6	2.4	1.9	1.8	1.7	1.8	1.7	1.5	1.4	1.1	1.0	0.9	0.9	1.0
Tubectomy	8.6	7.7	7.2	7.4	7.6	7.9	9.2	9.0	9.4	9.3	10.3	10.5	11.4	11.6	12.3	12.6	14.8	13.5
Vasectomy	1.1	1.5	1.5	1.4	1.4	1.5	1.6	1.7	1.9	1.9	2.1	2.1	2.0	2.0	2.0	1.9	1.6	1.7
Norplant	-	-	0.0	0.1	0.3	0.3	0.5	0.5	0.6	0.9	1.1	1.4	2.5	2.7	4.1	4.6	4.9	5.5
<b>All</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>



**Table 8.4. Method specific contraceptive use rate among currently married women age 15-49 years by age in icddr,b service area, 2018**

Age (years)	Not using	Any method used	Method used								No. of women
			Pill	IUD	Injectables	Condom	Tubectomy	Vasectomy	Others*	Norplant	
<20	80.1	19.9	6.8	0.3	7.5	2.9	0.0	0.0	0.2	2.1	1,501
20 - 24	68.8	31.2	12.4	0.2	11.2	4.6	0.02	0.0	0.6	2.2	4,096
25 - 29	60.6	39.4	15.3	0.5	13.7	5.4	1.3	0.1	0.7	2.5	4,701
30 - 34	54	46.0	15.8	0.5	16.2	5.3	4.1	0.5	1.0	2.5	4,762
35 - 39	46.9	53.1	16.6	0.6	16.1	5.7	9.0	0.9	1.3	3.0	4,248
40 - 44	43.5	56.5	15.3	0.6	15.8	5.6	13.1	1.7	2.3	2.1	3,739
45 - 49	51.7	48.3	10.8	0.3	13.9	4.5	12.5	2.1	2.5	1.7	2,981
<b>Total</b>	<b>56.1</b>	<b>43.9</b>	<b>14.2</b>	<b>0.5</b>	<b>14.1</b>	<b>5.1</b>	<b>5.8</b>	<b>0.7</b>	<b>1.2</b>	<b>2.4</b>	<b>26,028</b>

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

**Table 8.5. Method specific contraceptive use rate among currently married women age 15-49 years by age in Government service area, 2018**

Age (years)	Not using	Any method used	Method used								No. of women
			Pill	IUD	Injectables	Condom	Tubectomy	Vasectomy	Others*	Norplant	
<20	86.7	13.3	5.8	0.0	2.5	3.7	0.0	0.0	0.5	0.8	1,300
20 - 24	76.7	23.3	11.7	0.4	5.9	3.4	0.1	0.03	0.9	0.9	3,697
25 - 29	70.4	29.6	14.3	0.2	7.5	3.8	1.0	0.1	1.1	1.5	3,938
30 - 34	62.2	37.8	15.7	0.6	9.5	3.8	4.5	0.4	1.2	2.2	4,286
35 - 39	53.5	46.5	17	0.6	11.2	3.4	9.3	0.5	2.4	2.0	3,836
40 - 44	54	46	14.9	0.7	10.8	3.2	10.6	0.6	3.6	1.8	3,265
45 - 49	63.6	36.4	9.5	0.3	7.9	1.8	11.6	0.7	3.5	1.1	2,747
<b>Total</b>	<b>64.9</b>	<b>35.1</b>	<b>13.6</b>	<b>0.4</b>	<b>8.5</b>	<b>3.3</b>	<b>5.5</b>	<b>0.4</b>	<b>1.9</b>	<b>1.6</b>	<b>23,069</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. 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.

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 and the new Hib vaccine. By June 2009, the pentavalent vaccine had replaced the DPT and hepatitis B, and by 2012 measles rubella replaced measles 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 2018 and the Government service area from 2000 to 2018. In 2018, 96.7% received BCG, 95.2% received three doses of pentavalent and polio and 83.8% received measles rubella vaccines in icddr,b area and 97.3% received BCG, 93.6% received three doses of pentavalent and polio and 84.0% received measles rubella (MR) vaccine in Government service area.

We observe a rise of approximately six percentage points in all vaccine coverage in 2018 compared to 2017. The improvement, mainly due to the rise in coverage of DPT/Pentavalent and MR, needs further investigation to be explained.

**Table 9.1. Immunization coverage (%) among children aged 12-23 months in icddr,b service area, 1987-2018 and Government service area, 2000-2018**

Vaccination coverage rate of children aged 12 - 23 months								
Year	BCG (1 dose)		DPT/Pentavalent (3 doses)		Measles-Rubela (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
2013	98.1	97.6	94.7	88.5	86.1	81.8	88.3	81.7
2014	98.5	96.6	97.7	93.6	89.0	79.3	88.8	79.2
2015	97.1	97.6	95.1	95.5	86.9	87.9	86.7	87.7
2016	97.5	98.3	96.4	96.9	88.0	89.4	87.6	88.6
2017	96.7	96.8	96.1	94.3	89.2	87.9	88.7	87.9
2018	99.1	99.6	97.7	95.4	87.3	87.4	87.1	85.9

\*Children fully vaccinated (i.e those who received BCG, measles-rubela 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

### GEOGRAPHIC INFORMATION SYSTEM (GIS)

#### Scope of Geographic Information System (GIS) of Matlab HDSS

Geographic information system (GIS) has been a very important and powerful tool in any field of research and planning in recent decades. It is also a strong and useful in social and public health research and policy. GIS information is widely available in developed countries. The rapid and enormous development of the GIS software and the increasing availability of free high-resolution satellite images have expanded the scope of geospatial analysis in any research areas. The modern GIS components generate thematic maps, create spatial variables, and perform spatial and temporal analyses with geo-referenced data. Any kind of spatial information can be extracted from high-resolution imagery. The facilities have widened the GIS application also in the research of public health. Now researchers use spatial and temporal analyses for explaining temporal and geographical variations of morbidity, mortality and other public health issues, for targeting interventions to the high-risk areas and for ensuring efficient use of scarce resources. However, using GIS information in developing and under developed countries like Bangladesh is a challenge till date due to its limited availability.

To enrich the research findings, a Geographic Information System (GIS) was established in 1994 under the Public Health Sciences Division, icddr, to record selected geo-locations. It was a great inclusion to produce cartographic, thematic and analytic maps to enrich public health studies and results. Initially, geo-spatial efforts were limited within the area covered by the Matlab Health and Demographic Surveillance System (HDSS); later its' activities were gradually expanded to other research areas as an essential tool. This chapter describes the GIS based on Matlab HDSS.

Trained Field Research Supervisors and GPS surveyors collected spatial data using handheld Global Positioning System (GPS) device under the supervision of a GIS expert. The geo-locations are periodically updated according to necessity. One of the very importunate features of GIS based of Matlab HDSS is that the locations can be linked with all *baris* in the HDSS. As households in a *bari* are very closed to each other, the *bari* locations can be used as proxy of household locations in it. Table 10.1. shows different object-oriented structural layers that Matlab HDSS created for spatial analysis.

**Table 10.1. Existing Geo-spatial database in different layer within Matlab HDSS area**

	<b>Points</b>	<b>Lines</b>	<b>Polygons</b>
<b>Community</b>	Bari (group of households) Community clinics Family Welfare Centers FWC) Government hospital icddr,b hospital icddr,b sub-centres Pharmacies Tubewells	Road network: -Concretes -Non-concrete Water network: -Main river -River and Channels	Block area Comparison area Intervention area Mauza boundary Union boundary Village boundary
<b>Infrastructures</b>	Mosque Educational institute: -Primary school -Secondary school -College -Madrasah	Embankment	Embankment
<b>Others</b>	Bazaar Bridge Ditches Ponds		Main river

## BIBLIOGRAPHY

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

Bangladesh Bureau of Statistics (2015) Bangladesh Population Census 2011, Zila: Chandpur, Analytical Series Vol. 2, Dhaka: Government of Bangladesh, Ministry of Planning.

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

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

Millennium Development Goals: Bangladesh Progress Report 2012. General Economics Division, Bangladesh Planning Commission, Government of the People's Republic of Bangladesh June 2013. Available with [www.bd.undp.org/content/bangladesh/en/home/.../mdg/publication\\_1](http://www.bd.undp.org/content/bangladesh/en/home/.../mdg/publication_1)

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

National Institute of Population Research and Training (NIPORT), Mitra and Associates, and ICF International. 2016. BDHS (2014) - Bangladesh Demographic and Health Survey 2014. Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPORT, Mitra and Associates, and ICF International.

National Institute of Population Research and Training (NIPORT), Mitra and Associates, and ICF International. 2011. BDHS (2011) - Bangladesh Demographic and Health Survey 2011. Dhaka, Bangladesh, and Calverton, Maryland, USA: NIPORT, Mitra and Associates, and ICF International.

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

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

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

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

## APPENDIX A

**Appendix A-1a Mid-year population in icddr,b service area by age, sex and block, 2018**

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	42262	19240	23022	34862	15701	19161	25533	11642	13891	22563	10149	12414
Under 1	883	440	443	803	413	390	569	298	271	458	213	245
1 - 4	3733	1915	1818	3164	1532	1632	2203	1137	1066	1757	918	839
1	945	473	472	789	380	409	522	266	256	436	227	209
2	900	467	433	874	427	447	584	316	268	445	244	201
3	952	490	462	746	366	380	558	282	276	449	235	214
4	936	485	451	755	359	396	539	273	266	427	212	215
5 - 9	4480	2,238	2,242	3590	1,813	1,777	2568	1,295	1,273	2194	1,094	1,100
10-14	4302	2,184	2,118	3558	1,806	1,752	2518	1,188	1,330	2295	1,108	1,187
15-19	3753	1,648	2,105	3260	1,402	1,858	2229	1,050	1,179	2092	968	1,124
20-24	2938	1,042	1,896	2432	841	1,591	1645	585	1,060	1400	532	868
25-29	2835	1,010	1,825	2274	842	1,432	1674	568	1,106	1312	435	877
30-34	2960	1,107	1,853	2309	956	1,353	1702	698	1,004	1364	495	869
35-39	2688	1,188	1,500	2150	929	1,221	1577	695	882	1335	503	832
40-44	2589	1,139	1,450	1972	854	1,118	1529	692	837	1369	626	743
45-49	2381	1,118	1,263	1894	814	1,080	1535	668	867	1302	560	742
50-54	2423	1,090	1,333	1938	831	1,107	1459	635	824	1422	632	790
55-59	2130	1,081	1049	1829	933	896	1413	732	681	1458	711	747
60-64	1448	726	722	1234	622	612	1038	507	531	953	509	444
65-69	1003	501	502	921	443	478	681	332	349	664	319	345
70-74	807	355	452	666	271	395	529	232	297	511	217	294
75-79	493	230	263	449	181	268	387	181	206	371	151	220
80-84	251	139	112	253	126	127	176	91	85	205	99	106
85+	165	89	76	166	92	74	101	58	43	101	59	42



**Appendix A-1b: Mid-year population in Government service area by age, sex and block, 2018**

Age	Block-E			Block-F			Block-G		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
All ages	41070	18450	22620	37587	17005	20582	35685	15843	19842
Under 1	904	438	466	820	408	412	787	383	404
1 - 4	3557	1805	1752	3220	1604	1616	3119	1595	1524
1	883	465	418	837	430	407	810	393	417
2	896	432	464	809	370	439	747	384	363
3	898	471	427	778	377	401	839	450	389
4	880	437	443	796	427	369	723	368	355
5 - 9	4205	2,067	2,138	3731	1,886	1,845	3643	1,802	1,841
10-14	4396	2,142	2,254	3726	1,814	1,912	3713	1,816	1,897
15-19	3949	1,853	2,096	3514	1,685	1,829	3409	1,531	1,878
20-24	2693	939	1,754	2557	980	1,577	2293	756	1,537
25-29	2445	891	1,554	2433	885	1,548	2252	793	1,459
30-34	2657	1,001	1,656	2520	1,045	1,475	2304	891	1,413
35-39	2413	988	1,425	2231	918	1,313	2158	913	1,245
40-44	2261	931	1,330	2001	863	1,138	1949	824	1,125
45-49	2369	1,040	1,329	2105	909	1,196	1936	851	1,085
50-54	2345	1,080	1,265	2137	873	1,264	1997	844	1,153
55-59	2261	1,107	1,154	2117	1,014	1,103	1918	958	960
60-64	1599	805	794	1472	780	692	1418	623	795
65-69	1137	520	617	1009	510	499	996	458	538
70-74	905	394	511	845	368	477	774	340	434
75-79	540	230	310	619	244	375	565	244	321
80-84	303	148	155	321	125	196	286	135	151
85+	131	71	60	209	94	115	168	86	82

**Appendix A-2a Deaths in icddr,b service area by age, sex and block, 2018**

Age (years)	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	272	149	123	266	147	119	189	104	85	208	109	99
Under 1 year	14	8	6	18	11	7	9	3	6	10	5	5
< 7 days	7	6	1	9	7	2	5	3	2	8	4	4
7-29 days	5	1	4	3	2	1	3	0	3	1	1	0
1-5 months	2	1	1	5	2	3	1	0	1	1	0	1
6-11 months	0	0	0	1	0	1	0	0	0	0	0	0
1-4 years	7	6	1	7	5	2	2	1	1	5	2	3
1	3	2	1	4	2	2	2	1	1	2	1	1
2	1	1	0	1	1	0	0	0	0	2	0	2
3	2	2	0	1	1	0	0	0	0	1	1	0
4	1	1	0	1	1	0	0	0	0	0	0	0
5-9	3	2	1	2	0	2	2	0	2	1	1	0
10-14	5	3	2	1	0	1	2	2	0	1	0	1
15-19	2	0	2	2	0	2	2	0	2	2	2	0
20-24	3	1	2	3	0	3	2	2	0	2	1	1
25-29	1	1	0	0	0	0	1	1	0	3	2	1
30-34	2	2	0	1	1	0	2	1	1	1	0	1
35-39	5	2	3	5	4	1	1	1	0	3	3	0
40-44	3	1	2	9	7	2	1	1	0	2	1	1
45-49	11	7	4	10	6	4	6	5	1	9	4	5
50-54	13	8	5	15	10	5	6	6	0	14	10	4
55-59	22	13	9	18	10	8	11	7	4	13	5	8
60-64	25	14	11	27	19	8	15	9	6	18	13	5
65-69	33	18	15	25	14	11	21	13	8	22	14	8
70-74	30	15	15	30	13	17	27	16	11	25	13	12
75-79	36	17	19	38	20	18	32	12	20	31	15	16
80-84	21	13	8	24	12	12	24	14	10	22	9	13
85+	36	18	18	31	15	16	23	10	13	24	9	15

**Appendix A-2b Deaths in Government service area by age, sex and block, 2018**

Age (years)	BLOCK-E			BLOCK-F			BLOCK-G		
	Both Sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
All ages	308	165	143	275	156	119	235	118	117
Under 1 year	23	17	6	16	9	7	22	10	12
< 7 days	17	12	5	11	7	4	12	6	6
7 -29 days	6	5	1	2	1	1	3	2	1
1- 5 months	0	0	0	3	1	2	5	2	3
6-11 months	0	0	0	0	0	0	2	0	2
1 - 4 years	8	2	6	3	2	1	3	2	1
1	2	0	2	2	1	1	1	0	1
2	3	2	1	1	1	0	0	0	0
3	1	0	1	0	0	0	0	0	0
4	2	0	2	0	0	0	2	2	0
5 - 9	1	1	0	0	0	0	1	1	0
10-14	3	1	2	1	1	0	1	1	0
15-19	2	0	2	1	0	1	5	4	1
20-24	2	1	1	2	1	1	1	0	1
25-29	1	1	0	3	1	2	2	1	1
30-34	2	0	2	3	1	2	5	2	3
35-39	5	3	2	1	0	1	4	3	1
40-44	6	3	3	4	4	0	2	2	0
45-49	9	5	4	5	3	2	5	1	4
50-54	19	15	4	12	7	5	11	5	6
55-59	28	19	9	24	17	7	13	8	5
60-64	30	18	12	28	21	7	18	14	4
65-69	25	15	10	25	18	7	19	10	9
70-74	39	17	22	34	23	11	26	9	17
75-79	43	18	25	33	14	19	38	16	22
80-84	37	16	21	43	14	29	36	17	19
85+	25	13	12	37	20	17	23	12	11

**Appendix A-3 Abridged life table for icddr,b service area by sex, 2018**

Age (years)	Male				Female			
	$nq_x$	$l_x$	$L_x$	$e0_x$	$nq_x$	$l_x$	$L_x$	$e0_x$
0	19.8	100000	98317	69.5	17.8	100000	98488	73.7
1	4.4	98021	97763	69.9	3.7	98221	98006	74.0
2	1.4	97585	97517	69.2	1.5	97857	97784	73.3
3	2.9	97450	97309	68.3	0.0	97712	97712	72.4
4	1.5	97167	97094	67.5	0.0	97712	97712	71.4
5	2.3	97021	484584	66.6	3.9	97712	487680	70.4
10	4.0	96795	483090	61.7	3.1	97330	485950	65.7
15	2.0	96411	481616	57.0	4.8	97026	484062	60.9
20	6.6	96221	479630	52.1	5.5	96562	481582	56.2
25	7.0	95581	476368	47.4	1.0	96029	479933	51.5
30	6.1	94914	473229	42.7	2.0	95937	479251	46.5
35	15.0	94332	468401	38.0	4.5	95748	477750	41.6
40	15.0	92919	461381	33.5	6.0	95318	475268	36.8
45	34.3	91526	450366	29.0	17.6	94745	469879	32.0
50	52.0	88391	431262	24.9	17.1	93080	461719	27.5
55	49.5	83791	409328	21.1	42.1	91486	448483	22.9
60	110.3	79647	377586	17.1	63.1	87630	425279	18.8
65	170.0	70862	325651	13.9	118.5	82104	387624	14.9
70	235.0	58816	260728	11.2	175.3	72379	331680	11.6
75	354.8	44991	185340	8.8	321.1	59693	251291	8.5
80	416.6	29027	114636	7.3	399.7	40524	161963	6.3
85+	1000.0	16933	97041	5.7	1000.0	24328	92212	3.8

**Appendix A-4 Abridged life table for Government service area by sex, 2018**

Age (years)	Male				Female			
	$nq_x$	$l_x$	$L_x$	$e0_x$	$nq_x$	$l_x$	$L_x$	$e0_x$
0	29.3	100000	97510	70.5	19.5	100000	98342	70.4
1	0.8	97071	97026	71.6	3.2	98050	97864	70.8
2	2.5	96995	96873	70.7	0.8	97735	97696	70.0
3	0.0	96750	96750	69.8	0.8	97657	97617	69.1
4	1.6	96750	96672	68.8	1.7	97577	97494	68.1
5	1.7	96593	482581	67.9	0.0	97410	0	67.3
10	2.6	96426	482581	63.1	1.6	97410	486681	67.3
15	3.9	96175	480005	58.2	3.4	97250	485477	62.4
20	3.7	95797	478160	53.4	3.1	96915	483888	57.6
25	5.8	95439	475915	48.6	3.3	96617	482353	52.7
30	5.1	94883	473303	43.9	7.7	96300	479794	47.9
35	10.6	94400	469694	39.1	5.0	95560	476699	43.3
40	17.1	93400	463323	34.5	4.2	95082	474496	38.5
45	16.0	91807	455656	30.0	13.8	94685	470420	33.6
50	47.2	90343	441811	25.5	20.2	93382	462558	29.0
55	69.1	86078	416511	21.6	32.2	91498	450677	24.6
60	113.6	80126	379219	18.0	49.3	88556	432646	20.3
65	135.3	71023	332423	15.0	75.8	84194	406064	16.2
70	200.9	61417	277533	11.9	162.3	77810	359063	12.3
75	287.4	49077	210953	9.3	282.8	65185	280971	9.2
80	445.5	34974	135260	7.0	506.9	46752	172416	6.9
85+	1000.0	19392	108167	5.6	1000.0	23053	148116	6.4

Appendix A-5 Male deaths by cause and age, 2018

Cause	All ages	Age at death (years)																		
		<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	5	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2	1	
Dysentery	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Tuberculosis	21	0	0	0	0	0	0	0	0	1	0	0	2	2	1	8	0	6	0	1
EPI related death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meningitis	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis	7	0	0	0	0	0	0	1	0	0	1	1	0	2	1	0	0	1	0	0
Chicken pox	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Rabies	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Septicaemia	11	1	0	0	0	0	0	0	0	0	0	1	0	2	1	1	0	0	1	4
Respiratory infections	12	1	0	1	0	0	0	0	0	0	1	0	0	2	1	0	1	2	3	
Other communicable	1	1	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neonatal condition																				
-Premature and LBW	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Birth asphyxia	13	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Other neonatal	30	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Nutritional</b>	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	
<b>Non-communicable diseases</b>																				
Malignant neoplasm																				
-Neoplasm	132	0	1	0	1	0	1	1	1	6	4	5	8	17	21	23	23	13	3	4
-Neoplasm in female organ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Congenital malformation	11	8	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Endocrine disorder																				
-Diabetes	15	0	0	0	0	0	0	0	0	1	0	2	2	3	1	3	0	0	1	
-Other endocrine	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Neuro-psychiatric	5	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	1	1	
Diseases of circulatory system																				
-Rheumatic heart disease	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
-Hypertensive disease	8	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	2	2	1	
-Ischaemic heart disease	170	0	0	0	0	1	0	1	1	1	4	8	14	20	26	20	20	23	18	13
-Pulmonary heart disease	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
-Stroke	182	0	0	0	0	0	0	0	0	2	4	12	5	27	14	31	27	30	30	
-Other forms of heart diseases	66	0	1	0	2	1	1	1	0	2	0	5	7	7	8	8	7	7	9	
-All Other Circulatory	29	0	0	0	0	0	0	0	1	0	0	3	2	6	4	3	4	6		
System Diseases																				
Respiratory disease																				
-COPD	47	0	0	0	0	0	0	0	0	0	1	2	3	5	7	5	10	7	7	
-Asthma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-Other respiratory	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	
Digestive disease	42	0	0	0	0	0	1	0	2	0	1	1	7	6	3	2	8	1	4	
Gentio-urinary disease																				
-Renal failure	10	0	0	0	0	0	0	0	0	0	1	1	2	2	2	0	0	2	0	
-Renal tubulo-interstitial diseases	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	
-Other urinary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Other non-communicable	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
<b>Injuries</b>																				
Unintentional injuries																				
-Accident	11	1	1	0	0	0	0	0	1	0	1	2	0	2	1	0	1	1	0	0
-Falls	11	0	0	0	0	0	0	1	0	0	0	0	0	0	2	2	2	2	2	
-Drowning	17	0	11	1	1	1	0	0	1	1	0	0	0	1	0	0	0	0	0	
-All Other Ext. Caus of Acci. Inj	12	0	0	0	2	2	0	1	0	3	0	1	1	1	0	1	0	0	0	
Intentional injuries																				
-Suicide	9	0	0	0	1	1	2	1	1	1	0	0	1	0	0	0	1	0	0	
-Homicide	4	0	0	1	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	
-All Other Ext Caus of Mortality	5	0	0	0	0	0	0	0	0	1	1	1	0	1	1	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	5	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	2	
-Edema of unspecified origin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-Sudden infant death	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-Other miscellaneous	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Unknown/missing</b>	33	3	2	0	0	0	0	0	0	0	1	0	2	0	1	3	3	5	7	6
<b>Total</b>	<b>948</b>	<b>63</b>	<b>20</b>	<b>5</b>	<b>8</b>	<b>6</b>	<b>6</b>	<b>7</b>	<b>7</b>	<b>16</b>	<b>19</b>	<b>31</b>	<b>61</b>	<b>79</b>	<b>108</b>	<b>102</b>	<b>106</b>	<b>112</b>	<b>95</b>	<b>97</b>

COPD=Chronic Obstructive Pulmonary Disease.

**Appendix A-6 Female deaths by cause and age, 2018**

Cause	All ages	Age at death (years)																		
		<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	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	
Dysentery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Tuberculosis	7	0	0	0	0	0	0	0	0	0	1	0	2	0	1	3	0	0	0	
EPI related death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Meningitis	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
Hepatitis	3	0	0	0	0	1	0	0	0	0	0	0	0	1	0	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	
Rabies	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
Septicaemia	30	3	1	1	1	0	0	0	0	0	0	0	0	0	0	3	6	7	8	
Respiratory infections	15	4	2	2	0	0	0	0	0	0	0	0	0	0	1	1	3	2	0	
Other communicable	4	0	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	0	
<b>Maternal and neonatal conditions</b>																				
Maternal death	9	0	0	0	0	0	3	0	3	2	0	1	0	0	0	0	0	0	0	
Neonatal condition																				
-Premature and LBW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-Birth asphyxia	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-Other neonatal	28	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Nutritional</b>																				
	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	
<b>Non-communicable diseases</b>																				
Malignant neoplasm																				
-Neoplasm	51	0	0	0	0	0	0	0	2	1	7	5	8	4	7	8	6	2	1	
-Neoplasm in female organ	9	0	0	0	0	0	0	0	0	0	0	0	3	1	1	2	1	0	0	
Congenital malformation	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Endocrine disorder																				
-Diabetes	10	0	0	0	0	0	1	0	0	0	0	1	1	1	1	2	3	0	0	
-Other endocrine	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Neuro-psychiatric	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	
Diseases of circulatory system																				
-Rheumatic heart disease	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
-Hypertensive disease	5	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	2	0	
-Ischaemic heart disease	119	0	0	0	1	0	0	1	1	2	2	10	9	11	20	16	21	12	13	
-Pulmonary heart disease	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	
-Stroke	199	0	0	0	1	0	0	0	1	1	3	4	8	14	16	31	40	42	38	
-Other forms of heart disease	79	1	0	0	1	2	0	1	0	5	4	7	4	5	7	15	10	17	0	
-All Other Circulatory System Diseases	39	0	0	0	0	0	0	0	0	1	2	0	1	4	3	9	9	3	7	
Respiratory disease																				
-COPD	32	0	0	0	0	0	0	0	0	0	1	3	4	2	4	10	4	4	0	
-Asthma	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
-Other respiratory	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
Digestive disease	25	0	0	0	1	0	0	3	0	1	0	2	0	0	5	4	5	4	0	
Gentio-urinary disease																				
-Renal failure	6	0	0	0	0	0	0	0	0	0	0	2	3	0	1	0	0	0	0	
-Nephritic syndrome	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
-Renal tubulo-interstitial diseases	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
-Noninflammatory disorder of female genital tract	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
-Other urinary	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Other non-communicable	2	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	
<b>Injuries</b>																				
Unintentional injuries																				
-Accident	4	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	
-Falls	12	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	5	0	4	
-Drowning	17	0	8	2	0	0	0	1	0	0	0	0	0	0	1	4	1	0	0	
-Fire	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
-All Other External Causes of Accid. Injury	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	1	1	
Intentional injuries																				
-Suicide	13	0	0	0	2	5	2	2	0	0	0	0	0	0	1	1	0	0	0	
-Homicide	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-All Other External Causes of Mortality	3	0	0	0	0	1	0	0	0	0	0	0	1	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	
-Fever of unknown origin	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	
-Edema of unspecified origin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-Sudden infant death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-Other miscellaneous	45	4	1	0	1	0	0	0	2	1	2	0	0	3	2	4	11	13	1	
Unknown/missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Total</b>	<b>805</b>	<b>49</b>	<b>15</b>	<b>5</b>	<b>6</b>	<b>10</b>	<b>9</b>	<b>4</b>	<b>9</b>	<b>8</b>	<b>8</b>	<b>24</b>	<b>29</b>	<b>50</b>	<b>53</b>	<b>68</b>	<b>105</b>	<b>140</b>	<b>112</b>	<b>101</b>

COPD=Chronic obstructive pulmonary disease.

Appendix A-7 Male deaths by cause, age and area, 2018

Cause	All ages		<1		1-4		5-14		15-44		45-64		65-84		85+	
	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.
<b>Communicable diseases</b>																
Diarrhoeal	3	2	0	0	0	0	0	0	0	0	1	2	1	1	0	0
Dysentery	1	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0
Tuberculosis	12	9	0	0	0	0	0	0	1	4	1	8	6	0	1	0
EPI related death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meningitis	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis	1	6	0	0	0	0	0	0	2	1	3	0	1	0	0	0
Chicken pox	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Rabies	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Septicaemia	7	5	0	1	0	0	1	0	0	2	1	3	1	1	1	2
Respiratory infections	6	5	1	0	0	0	0	0	0	1	3	1	1	3	1	1
Other communicable	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
<b>Maternal and neonatal conditions</b>																
Maternal death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neonatal condition																
-Premature and LBW	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
-Birth asphyxia	4	9	4	9	0	0	0	0	0	0	0	0	0	0	0	0
-Other neonatal	11	19	11	19	0	0	0	0	0	0	0	0	0	0	0	0
<b>Nutritional</b>																
1	2	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0
<b>Non-communicable diseases</b>																
Malignant neoplasm																
-Neoplasm	74	58	0	0	1	0	0	1	10	3	27	24	35	27	1	3
-Neoplasm in female organ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Congenital malformation	9	2	6	2	2	0	1	0	0	0	0	0	0	0	0	0
Endocrine disorder																
-Diabetes	7	8	0	0	0	0	0	0	0	1	3	6	3	1	1	0
-Other endocrine	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Neuro-psychiatric	3	2	0	0	0	0	0	0	1	0	1	0	1	1	0	1
Diseases of circulatory system																
-Rheumatic heart disease	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1
-Hypertensive disease	3	5	0	0	0	0	0	0	0	2	0	1	4	0	1	1
-Ischaemic heart disease	99	71	0	0	0	0	0	0	3	5	40	28	48	33	8	5
-Pulmonary heart disease	2	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
-Stroke	95	87	0	0	0	0	0	0	2	26	22	52	50	17	13	13
-Other forms of heart disease	31	35	0	0	1	0	2	0	4	1	7	12	15	15	2	7
-All Other Circulatory System Diseases	17	12	0	0	0	0	0	0	0	1	2	3	10	7	5	1
Respiratory disease																
-COPD	27	20	0	0	0	0	0	0	0	6	5	18	11	3	4	4
-Asthma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Other respiratory	1	2	0	0	0	0	0	0	0	0	1	1	1	0	0	0
Digestive disease	22	20	0	0	0	0	0	0	2	2	9	11	8	6	3	1
Gentio-urinary disease																
-Renal failure	5	5	0	0	0	0	0	0	0	2	4	3	1	0	0	0
-Renal tubulo-interstitial diseases	2	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
-Other urinary	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Other non-communicable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Injuries</b>																
Unintentional injuries																
-Accident	8	3	1	0	1	0	0	0	2	0	3	2	1	1	0	0
-Falls	8	3	0	0	0	0	0	0	1	0	0	5	3	2	0	0
-Drowning	11	6	0	0	8	3	1	1	2	1	0	1	0	0	0	0
-All Other External Causes of Accidental Injury	7	5	0	0	0	0	1	1	3	3	2	1	1	0	0	0
Intentional injuries																
-Suicide	5	4	0	0	0	0	1	0	3	3	1	0	0	1	0	0
-Homicide	1	3	0	0	0	0	0	1	0	0	1	1	0	1	0	0
-All Other External Causes of Mortality	4	1	0	0	0	0	0	0	2	0	2	1	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	2	3	0	0	0	0	0	0	0	1	0	0	1	1	1	1
-Edema of unspecified origin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Sudden infant death	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
-Other miscellaneous	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown/missing	14	19	1	2	1	1	0	0	0	1	1	2	8	10	3	3
<b>TOTAL</b>	<b>509</b>	<b>439</b>	<b>27</b>	<b>36</b>	<b>14</b>	<b>6</b>	<b>8</b>	<b>5</b>	<b>34</b>	<b>27</b>	<b>146</b>	<b>133</b>	<b>228</b>	<b>187</b>	<b>52</b>	<b>45</b>

COPD=Chronic obstructive pulmonary disease.

Appendix A-8 Female deaths by cause, age, and area, 2018

Cause	All ages		<1		1-4		5-14		15-44		45-64		65-84		85+	
	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.
<b>Communicable diseases</b>																
Diarrhoeal	2	3	0	0	0	0	0	0	0	0	0	0	2	2	0	1
Dysentery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuberculosis	4	3	0	0	0	0	0	0	0	0	2	1	2	2	0	0
EPI related death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meningitis	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Hepatitis	2	1	0	0	0	0	0	0	1	0	0	1	1	0	0	0
Chicken pox	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabies	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Septicaemia	12	16	2	1	2	1	2	0	0	0	0	0	5	11	1	3
Respiratory infections	14	3	2	2	0	0	2	0	0	0	0	0	5	0	5	1
Other communicable	2	2	0	0	0	0	1	0	1	0	0	2	0	0	0	0
<b>Maternal and neonatal conditions</b>																
Maternal death	5	4	0	0	0	0	0	0	4	4	1	0	0	0	0	0
Neonatal condition																
-Premature and LBW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Birth asphyxia	2	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0
-Other neonatal	11	17	11	17	0	0	0	0	0	0	0	0	0	0	0	0
<b>Nutritional</b>	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
<b>Non-communicable diseases</b>																
Malignant neoplasm																
-Neoplasm	26	25	0	0	0	0	0	0	2	1	13	11	11	12	0	1
-Neoplasm in female organ	6	3	0	0	0	0	0	0	0	0	3	1	3	2	0	0
Congenital malformation	4	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0
Endocrine disorder																
-Diabetes	2	8	0	0	0	0	0	0	0	1	0	2	2	5	0	0
-Other endocrine	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Neuro-psychiatric	0	2	0	0	0	0	0	0	0	0	0	1	0	1	0	0
Diseases of circulatory system																
-Rheumatic heart disease	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
-Hypertensive disease	2	3	0	0	0	0	0	0	0	1	1	0	1	2	0	0
-Ischaemic heart disease	76	43	0	0	0	0	0	0	2	3	20	12	43	26	11	2
-Pulmonary heart disease	2	1	0	0	0	0	0	0	0	0	0	0	0	0	2	1
-Stroke	110	89	0	0	0	0	0	0	1	2	21	8	67	62	21	17
-Other forms of heart disease	36	43	1	0	0	0	0	0	2	2	8	12	16	21	9	8
-All Other Circulatory System Diseases	28	11	0	0	0	0	0	0	0	1	5	2	17	7	6	1
Respiratory disease																
-COPD	13	19	0	0	0	0	0	0	0	0	2	6	8	12	3	1
-Asthma	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
-Other respiratory	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Digestive disease	11	14	0	0	0	0	0	0	3	2	1	1	7	11	0	0
Gentio-urinary disease																
-Renal failure	3	3	0	0	0	0	0	0	0	0	2	3	1	0	0	0
-Nephritic Syndrome	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
-Renal tubulo-interstitial diseases	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
-Noninflammatory disorders of female genital tract	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
-Other urinary	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Other non-communicable	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
<b>Injuries</b>																
Unintentional injuries																
-Accident	1	3	0	0	0	2	0	0	0	0	1	1	0	0	0	0
-Falls	4	8	0	0	0	0	0	0	0	0	0	0	2	6	2	2
-Drowning	10	7	0	0	4	4	2	0	1	0	0	0	3	3	0	0
-Fire	0	2	0	0	0	1	0	0	0	0	0	0	0	1	0	0
-All Other External Causes of Accidental Injury	3	2	0	0	0	0	0	1	0	0	0	0	2	1	1	0
Intentional injuries																
-Suicide	5	8	0	0	0	0	1	1	3	6	0	0	1	1	0	0
-Homicide	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-All Other External Causes of Mortality	2	1	0	0	0	0	0	0	1	0	1	0	0	1	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	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0
-Edema of unspecified origin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Sudden infant death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Other miscellaneous	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Unknown/missing</b>	20	25	1	3	1	0	1	0	3	0	2	3	11	19	1	0
<b>TOTAL</b>	<b>426</b>	<b>379</b>	<b>24</b>	<b>25</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>2</b>	<b>24</b>	<b>24</b>	<b>87</b>	<b>69</b>	<b>213</b>	<b>211</b>	<b>62</b>	<b>40</b>

COPD=Chronic obstructive pulmonary disease.



**Appendix A-9a Age-specific fertility rate and indices for icddr,b service area by block, 2018**

Age (years)	Block A		Block B		Block C		Block D	
	Births	Rate	Births	Rate	Births	Rate	Births	Rate
All ages	<b>838</b>	<b>75.0</b>	<b>825</b>	<b>91.0</b>	<b>509</b>	<b>78.9</b>	<b>454</b>	<b>79.9</b>
15-19*	152	92.8	177	120.3	95	104.7	87	97.3
20-24	257	135.5	272	171.0	130	122.6	142	163.6
25-29	220	120.5	192	134.1	136	123.0	109	124.3
30-34	137	73.9	111	82.0	92	91.6	77	88.6
35-39	49	32.7	56	45.9	43	48.8	32	38.5
40-44	22	15.2	15	13.4	12	14.3	5	6.7
45-49**	1	1.0	2	2.3	1	1.5	2	3.3
Total fertility rate		2358.3		2844.8		2533.0		2611.7
General fertility rate		75.0		91.0		78.9		79.9
Gross reproduction rate		1198.8		1406.9		1204.3		1380.6
*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-9b Age-specific fertility rate and indices for Government service area by block, 2018**

Age (years)	Block E		Block F		Block G	
	Births	Rate	Births	Rate	Births	Rate
All ages	842	80.8	800	84.6	818	90.1
15-19*	137	82.4	121	84.8	126	86.1
20-24	285	162.5	245	155.4	282	183.5
25-29	218	140.3	214	138.2	211	144.6
30-34	135	81.5	155	105.1	123	87.0
35-39	53	37.2	54	41.1	64	51.4
40-44	14	10.5	11	9.7	11	9.8
45-49**	0	0.0	0	0.0	1	1.2
Total fertility rate		2572.2		2671.4		2817.9
General fertility rate		80.8		84.6		90.1
Gross reproduction rate		1203.6		1362.4		1405.5
*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. Marriages and divorces by month, 2018**

Month	Marriage		Divorce	
	No.	percentage	No.	percentage
Jan	241	7.8	33	8.1
Feb	241	7.8	37	9.1
Mar	296	9.6	37	9.1
Apr	215	7.0	27	6.6
May	199	6.4	23	5.6
Jun	241	7.8	31	7.6
Jul	269	8.7	33	8.1
Aug	362	11.7	46	11.3
Sep	299	9.7	38	9.3
Oct	274	8.9	39	9.6
Nov	213	6.9	28	6.9
Dec	241	7.8	36	8.8
<b>Total</b>	<b>3,091</b>	<b>100.0</b>	<b>408</b>	<b>100.0</b>

**Appendix A-11. In- and out-migrations by age and sex, 2018**

Age (years)	In-migration			Out-migration		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	12,019	5,942	6,077	14,159	7,379	6,780
0-4	1,698	845	853	1,646	864	782
5 - 9	1,015	513	502	1,125	609	516
10-14	723	381	342	1,027	610	417
15-19	1,605	391	1,214	2,676	1,234	1,442
20-24	1,561	522	1,039	2,490	1,150	1,340
25-29	1,529	714	815	1,558	766	792
30-34	1,155	715	440	1,158	665	493
35-39	767	560	207	760	508	252
40-44	569	425	144	478	322	156
45-49	442	303	139	371	245	126
50-54	322	212	110	240	138	102
55-59	249	179	70	189	97	92
60-64	141	95	46	151	67	84
65+	243	87	156	290	104	186

**Appendix A-12. In-migrations by age, sex, and area, 2018**

Age (years)	icddr,b service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	6,238	3,053	3,185	5,781	2,889	2,892
0-4	839	416	423	859	429	430
5 - 9	526	262	264	489	251	238
10-14	398	199	199	325	182	143
15-19	865	192	673	740	199	541
20-24	810	296	514	751	226	525
25-29	740	331	409	789	383	406
30-34	585	352	233	570	363	207
35-39	395	283	112	372	277	95
40-44	325	238	87	244	187	57
45-49	248	175	73	194	128	66
50-54	166	109	57	156	103	53
55-59	133	93	40	116	86	30
60-64	76	59	17	65	36	29
65+	132	48	84	111	39	72

**Appendix A-13. Out-migrations by age, sex, and area, 2018**

Age (years)	icddr,b service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	7,333	3,768	3,565	6,826	3,611	3,215
0-4	880	466	414	766	398	368
5 - 9	595	325	270	530	284	246
10-14	530	305	225	497	305	192
15-19	1,386	596	790	1,290	638	652
20-24	1,238	569	669	1,252	581	671
25-29	809	383	426	749	383	366
30-34	602	338	264	556	327	229
35-39	393	262	131	367	246	121
40-44	263	175	88	215	147	68
45-49	195	132	63	176	113	63
50-54	133	76	57	107	62	45
55-59	95	54	41	94	43	51
60-64	79	37	42	72	30	42
65+	135	50	85	155	54	101

**Appendix A-14. Male out-migration by cause of movement and age, 2018**

Cause of movement	Total	Age (years)													
		<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
<b>All migrants</b>	<b>7379</b>	<b>864</b>	<b>609</b>	<b>610</b>	<b>1234</b>	<b>1150</b>	<b>766</b>	<b>665</b>	<b>508</b>	<b>322</b>	<b>245</b>	<b>138</b>	<b>97</b>	<b>67</b>	<b>104</b>
<b>Work/economic/educational</b>															
-acquired/seeking job	4000	1	2	93	743	950	638	525	404	252	190	101	55	30	16
-job completion/retirement	3	0	0	0	0	1	1	0	0	0	0	0	1	0	0
-to acquire education/student lodging	1054	20	214	281	382	124	26	4	0	1	0	2	0	0	0
-educ. completed/interrupted	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
<b>Housing/environmental</b>															
-acquired/seeking new land/house	297	4	0	1	3	11	29	69	52	31	31	16	18	10	22
-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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-move or join with spouse/parents	1709	827	388	221	97	43	23	22	22	5	10	8	9	11	23
- move or join with other relatives	8	0	0	1	0	1	0	0	1	1	0	0	1	0	3
-adoption	6	3	2	1	0	0	0	0	0	0	0	0	0	0	0
-family friction/breakdown	89	1	0	2	4	8	20	15	12	9	3	6	4	2	3
-health or old age care	15	0	0	0	0	0	0	0	0	0	0	0	1	2	12
<b>Legal problems</b>	81	0	0	0	2	4	16	13	14	12	6	4	4	6	0
<b>Other and not stated</b>															
-others n.e.c.*	116	8	3	10	3	8	13	17	3	10	5	1	4	6	25
-unknown or not stated	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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

**Appendix A-15. Female out-migration by cause of movement and age, 2018**

Cause of movement	Total	Age (years)													
		<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
<b>All migrants</b>	<b>6780</b>	<b>782</b>	<b>516</b>	<b>417</b>	<b>1,442</b>	<b>1,340</b>	<b>792</b>	<b>493</b>	<b>252</b>	<b>156</b>	<b>126</b>	<b>102</b>	<b>92</b>	<b>84</b>	<b>186</b>
<b>Work/economic/educational</b>															
-acquired/seeking job	405	0	0	20	91	76	74	58	42	18	10	11	4	0	1
-job completion/retirement	5	0	0	1	0	0	0	2	0	1	0	1	0	0	0
-to acquire education/student lodging	549	14	123	153	178	53	9	8	7	3	1	0	0	0	0
-educ. completed/interrupted	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Housing/environmental</b>															
-acquired/seeking new land/house	1013	2	6	10	122	262	202	141	74	50	39	27	26	21	31
-river erosion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Marriage / familial</b>															
-marriage	1,059	0	0	38	553	324	95	33	11	3	0	2	0	0	0
-separation/divorce/widow	48	0	0	0	14	13	5	5	2	4	0	0	2	1	2
-move or join with spouse/parents	3,023	755	384	182	353	444	317	209	91	53	59	51	45	29	51
- move or join with other relatives	18	0	1	0	2	3	2	1	0	0	1	0	2	2	4
-adoption	11	9	0	1	1	0	0	0	0	0	0	0	0	0	0
-family friction/breakdown	246	1	0	4	57	69	51	23	15	11	3	0	2	5	5
-health or old age care	43	0	0	0	3	6	3	0	1	0	1	0	0	4	25
<b>Legal problems</b>	24	0	0	0	0	2	1	2	2	6	4	2	3	2	0
<b>Other and not stated</b>															
-others n.e.c.*	335	1	2	8	68	88	33	11	7	7	8	8	8	20	66
-unknown or not stated	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1

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

**Appendix A-16 Male in-migration by cause of movement and age, 2018**

Cause of movement	Total	Age (years)													
		<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
<b>All migrants</b>	<b>5942</b>	<b>845</b>	<b>513</b>	<b>381</b>	<b>391</b>	<b>522</b>	<b>714</b>	<b>715</b>	<b>560</b>	<b>425</b>	<b>303</b>	<b>212</b>	<b>179</b>	<b>95</b>	<b>87</b>
<b>Work/economic/educational</b>															
-acquired/seeking job	1166	0	0	7	61	158	222	231	177	139	64	55	36	11	5
-job completion/retirement	887	0	0	0	15	52	123	153	151	126	95	68	62	24	18
-to acquire education	342	10	100	116	78	32	5	1	0	0	0	0	0	0	0
-educ. completed/interrupted	11	0	0	4	1	6	0	0	0	0	0	0	0	0	0
<b>Housing/environmental</b>															
-acquired/seeking new land/house	1223	0	0	4	62	135	252	238	159	106	104	45	52	37	29
-river erosion	2	0	0	0	0	0	0	1	0	0	0	0	0	1	0
<b>Marriage / familial</b>															
-marriage	1	0	0	0	0	0	1	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/parents	1655	819	396	219	89	42	27	18	12	11	5	4	3	3	7
- move or join with other relatives	15	1	3	1	1	1	3	1	3	0	0	1	0	0	0
-adoption	11	8	3	0	0	0	0	0	0	0	0	0	0	0	0
-family friction/breakdown	70	0	2	0	3	9	13	13	10	6	1	4	3	2	4
-health or old age care	34	0	0	0	1	2	3	2	1	1	4	7	3	3	7
<b>Legal problems</b>	67	0	0	0	2	5	8	18	11	13	5	2	3	0	0
<b>Other and not stated</b>															
-others n.e.c.*	458	7	9	30	78	80	57	39	36	23	25	26	17	14	17
-unknown or not stated	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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

**Appendix A-17 Female in-migration by cause of movement and age, 2018**

Cause of movement	Total	Age (years)													
		<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
<b>All migrants</b>	<b>6077</b>	<b>853</b>	<b>502</b>	<b>342</b>	<b>1,214</b>	<b>1,039</b>	<b>815</b>	<b>440</b>	<b>207</b>	<b>144</b>	<b>139</b>	<b>110</b>	<b>70</b>	<b>46</b>	<b>156</b>
<b>Work/economic/educational</b>															
-acquired/seeking job	170	0	0	4	9	18	44	36	17	17	16	6	2	1	0
-job completion/retirement	33	0	0	0	2	6	7	3	4	3	6	1	0	0	1
-to acquire education/student lodging	291	13	101	106	52	9	6	3	1	0	0	0	0	0	0
-educ. completed/interrupted	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
<b>Housing/environmental</b>															
-acquired/seeking new land/house	996	0	0	13	185	257	164	100	54	35	38	43	31	27	49
-river erosion	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
<b>Marriage / familial</b>															
-marriage	786	0	0	16	504	174	59	18	8	2	3	2	0	0	0
-separation/divorce/widow	78	0	0	0	22	21	16	7	5	2	4	0	1	0	0
-move or join with spouse/parents	3,015	814	394	191	315	382	370	205	91	67	58	48	27	9	44
- move or join with other relatives	19	1	1	0	2	3	4	2	0	1	0	1	0	0	4
-adoption	18	14	1	2	0	0	0	0	1	0	0	0	0	0	0
-family friction/breakdown	230	0	2	3	54	70	44	28	7	9	6	2	1	0	4
-health or old age care	30	0	0	0	0	7	0	1	0	2	1	0	2	1	16
<b>Legal problems</b>	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
<b>Other and not stated</b>															
-others n.e.c.*	408	11	3	7	69	92	99	37	19	6	7	7	5	8	38
-unknown or not stated	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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

**Appendix A-18 Male migration by destination or origin, 2018**

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
Barisal	Rural	21	3	3	5	6	38	14	3	5	2	1	25
	Urban	3	4	4	4	1	16	3	1	1	2	0	7
Chittagong	Rural	725	138	139	90	88	1,180	703	143	176	88	89	1,199
	Urban	290	217	111	84	85	787	233	97	115	85	86	616
Dhaka	Rural	20	10	4	3	5	42	32	8	11	12	4	67
	Urban	952	1255	558	326	341	3,432	688	547	615	312	321	2,483
Khulna	Rural	5	0	1	1	1	8	4	1	2	2	0	9
	Urban	7	10	4	0	1	22	4	0	2	0	1	7
Mymensingh	Rural	5	0	3	1	0	9	0	1	1	1	0	3
	Urban	3	5	0	1	0	9	1	2	4	0	1	8
Rajshahi	Rural	2	2	1	2	1	8	9	3	7	3	1	23
	Urban	1	8	6	1	0	16	7	2	5	5	1	20
Rangpur	Rural	6	0	2	1	0	9	5	0	2	3	0	10
	Urban	4	4	1	0	1	10	3	0	2	2	2	9
Sylhet	Rural	3	1	3	0	0	7	3	2	3	1	2	11
	Urban	19	16	11	4	8	58	14	10	6	6	10	46
India		8	4	3	4	5	24	2	1	2	1	3	9
Asia		1	310	244	108	26	689	0	30	148	129	84	391
Middle-east		4	366	302	176	74	922	10	58	308	320	264	960
Others		4	31	31	19	8	93	2	4	12	9	5	32
Unknown		0	0	0	0	0	0	2	0	2	2	1	7
<b>Total</b>		<b>2083</b>	<b>2384</b>	<b>1431</b>	<b>830</b>	<b>651</b>	<b>7379</b>	<b>1739</b>	<b>913</b>	<b>1429</b>	<b>985</b>	<b>876</b>	<b>5942</b>



**Appendix A-19 Female migration by destination or origin, 2018**

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
Barisal	Rural	21	8	15	4	4	52	13	7	5	2	0	27
	Urban	6	1	2	2	1	12	4	3	2	1	1	11
Chittagong	Rural	650	1342	448	115	105	2,660	690	1340	504	90	119	2,743
	Urban	235	275	178	49	66	803	198	196	146	54	64	658
Dhaka	Rural	14	50	17	1	4	86	44	56	18	8	3	129
	Urban	739	1025	570	210	381	2,925	682	569	516	164	309	2,240
Khulna	Rural	6	9	3	2	0	20	6	4	5	0	1	16
	Urban	0	5	2	0	1	8	4	5	2	1	1	13
Mymensingh	Rural	6	4	9	0	1	20	4	0	1	1	0	6
	Urban	1	6	0	0	0	7	6	3	2	0	1	12
Rajshahi	Rural	10	10	3	1	0	24	4	7	6	0	1	18
	Urban	3	5	1	0	0	9	6	11	4	2	1	24
Rangpur	Rural	5	3	4	0	0	12	4	8	3	0	0	15
	Urban	2	4	4	1	2	13	6	5	3	2	0	16
Sylhet	Rural	3	5	0	1	1	10	2	15	3	0	0	20
	Urban	9	13	4	6	1	33	9	10	11	6	8	44
India		3	3	2	4	9	21	0	1	1	1	2	5
Asia		0	2	4	4	1	11	0	1	2	2	1	6
Middle-east		2	8	16	7	5	38	8	6	19	15	8	56
Other		0	3	3	1	8	15	1	2	1	1	0	5
Unknown		0	1	0	0	0	1	6	4	1	1	1	13
<b>Total</b>		<b>1715</b>	<b>2782</b>	<b>1285</b>	<b>408</b>	<b>590</b>	<b>6780</b>	<b>1697</b>	<b>2253</b>	<b>1255</b>	<b>351</b>	<b>521</b>	<b>6077</b>

## APPENDIX B

### POPULATION, BIRTHS, AND DEATHS BY VILLAGE, 2018

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
<b>icddr,b service area</b>						
D00	Charmukundi	3,114	77	19	24.7	6.1
W00	Kaladi	9,572	161	20	16.8	2.1
V10	Dhakirgaon	2,364	52	24	22.0	10.2
V11	Nabakalash	3,330	70	66	21.0	19.8
V31	Dighaldi	10,682	191	28	17.9	2.6
V32	Mobarakdi	3,877	73	11	18.8	2.8
V60	Suvankardi	996	23	7	23.1	7.0
V61	Munsabdi	728	15	6	20.6	8.2
V62	Shilmondi	1,004	23	42	22.9	41.8
V72	Upadi	6,595	155	49	23.5	7.4
<b>Block A Total</b>		<b>42262</b>	<b>840</b>	<b>272</b>	<b>19.9</b>	<b>6.4</b>
H00	Lamchari	1,184	21	15	17.7	12.7
V12	Bhangerpar	948	35	7	36.9	7.4
V13	Baburpara	760	24	4	31.6	5.3
V19	Lakshmipur	2,820	57	21	20.2	7.4
V20	Dagorpur	1,555	29	8	18.6	5.1
V21	Khadergaon	571	20	2	35.0	3.5
V22	Beloti	612	11	6	18.0	9.8
V23	Baluchar	685	6	6	8.8	8.8
V24	Machuakhal	3,135	68	26	21.7	8.3
V26	Narayanpur	4,154	96	29	23.1	7.0
V56	Pailpara	1,730	39	14	22.5	8.1
V59	Doshpara	2,584	74	21	28.6	8.1
V82	Dhanarpar	1,943	52	12	26.8	6.2
V83	Padmapal	634	16	3	25.2	4.7
V85	Bhanurpara	560	14	4	25.0	7.1
V87	Hurmaisha	728	13	5	17.9	6.9
VBB	Nagda	5,131	126	43	24.6	8.4
VBC	Naogaon	5,128	124	40	24.2	7.8
<b>Block B Total</b>		<b>34862</b>	<b>825</b>	<b>266</b>	<b>23.7</b>	<b>7.6</b>
K00	Shahpur	1,047	16	6	15.3	5.7
L00	Tatkhana	570	9	0	15.8	0.0
M00	Char Nayergaon	177	5	0	28.2	0.0
N00	Aswinpur	2,334	60	18	25.7	7.7
O00	Nayergaon	2,421	52	20	21.5	8.3
P00	Titerkandi	2,016	27	9	13.4	4.5
Q00	Char Shibpur	240	3	1	12.5	4.2
V27	Panchghoria	1,050	24	14	22.9	13.3
V28	Khidirpur	1,633	33	9	20.2	5.5
V30	Harion	631	15	5	23.8	7.9
V39	Gobindapur	288	3	4	10.4	13.9
V40	Masunda	815	12	10	14.7	12.3
V41	Paton	2,150	50	20	23.3	9.3
V42	Adhara (South)	773	15	5	19.4	6.5
V44	Panchdona	629	16	3	25.4	4.8
V86	Adhara	1,095	24	9	21.9	8.2
V88	Datikara	582	13	2	22.3	3.4
VBA	Mehron	2,073	26	22	12.5	10.6
DX0	Barogaon	3,575	77	21	21.5	5.9
DX1	Naojan	1,434	30	11	20.9	7.7
<b>Block C Total</b>		<b>25533</b>	<b>510</b>	<b>189</b>	<b>20.0</b>	<b>7.4</b>

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
R00	Nandalalpur	1,575	30	18	19.0	19.0
S00	Tatua	932	22	10	23.6	23.6
T00	Amuakanda	1,704	42	16	24.6	24.6
V15	Bhati Rasulpur	949	19	8	20.0	20.0
V16	Binandapur	879	17	7	19.3	19.3
V17	Hatighata	990	14	13	14.1	14.1
V18	Torkey	3,950	83	39	21.0	21.0
V25	Char Pathalia	1,296	19	14	14.7	14.7
V29	Shibpur (South)	548	12	5	21.9	21.9
V33	Shibpur (North)	435	15	3	34.5	34.5
V34	Satparia	877	18	6	20.5	20.5
V52	Nayakandi	230	4	4	17.4	17.4
V54	Balairkandi	562	13	3	23.1	23.1
V55	Induria	539	8	3	14.8	14.8
V63	Islamabad (East)	1,965	36	16	18.3	18.3
V67	Majlishpur	610	13	8	21.3	21.3
V81	Sonaterkandi	650	11	3	16.9	16.9
V84	Shahbajkandi	2,286	50	18	21.9	21.9
V89	Islamabad (Middle)	1,586	28	14	17.7	17.7
<b>Block D Total</b>		<b>22563</b>	<b>454</b>	<b>208</b>	<b>20.1</b>	<b>20.1</b>
<b>icddr,b service area: Total</b>		<b>125220</b>	<b>2629</b>	<b>935</b>	<b>21.0</b>	<b>21.0</b>
<b>Government service area</b>						
V35	Durgapur	3,502	67	20	19.1	19.1
V38	Galimkha	1,526	38	12	24.9	24.9
V43	Kanachak	1,215	17	12	14.0	14.0
V45	Bakchar	1,123	42	9	37.4	37.4
V46	Silinda	420	10	1	23.8	23.8
V47	Tulatali	1,833	37	13	20.2	20.2
V48	Gangkanda	478	8	8	16.7	16.7
V49	Harina Bhabanipur	1,307	37	8	28.3	28.3
V57	Baluchar	1,077	16	7	14.9	14.9
V64	Kawadi	5,055	115	37	22.7	22.7
V65	Nayachar	764	17	5	22.3	22.3
V66	Thatalia	737	9	5	12.2	12.2
V68	Sobahan	994	20	8	20.1	20.1
V71	Khamarpara	493	12	2	24.3	24.3
V73	Sadardia	786	17	6	21.6	21.6
V74	Ketundi	1,393	29	13	20.8	20.8
V75	Mukundi	345	15	3	43.5	43.5
V76	Chosoi	1,787	34	8	19.0	19.0
V78	Soladana	270	7	0	25.9	25.9
V79	Pitambordi	413	10	4	24.2	24.2
V80	Daribond	1,341	30	11	22.4	22.4
V90	Narinda	1,296	33	7	25.5	25.5
V97	Dhanagoda	324	3	5	9.3	9.3
V98	Santoshpur	96	3	0	31.3	31.3
V99	Baluakandi	540	12	4	22.2	22.2
VB1	Taltoli	983	11	9	11.2	11.2
VB2	Sree Rayerchar	1,233	16	16	13.0	13.0
VB3	Rayerkandi	2,978	52	22	17.5	17.5
D28	Bazarkhola	1,037	28	9	27.0	27.0
D29	Kirtonkhola	225	3	2	13.3	13.3
D30	Banuakandi	753	14	6	18.6	18.6
D31	Harina Bazarkhola	989	15	12	15.2	15.2
D32	Khalisha	797	10	3	12.5	12.5
D33	Nayanagar	1,044	21	8	20.1	20.1
D34	Saidkharkandi	1,395	26	7	18.6	18.6
D35	Mollah Kandi	521	9	6	17.3	17.3
<b>Block E Total</b>		<b>41070</b>	<b>843</b>	<b>308</b>	<b>20.5</b>	<b>20.5</b>

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
A00	Uddamdi	3,238	86	35	26.6	10.8
F00	Sepoykandi	1,590	32	10	20.1	6.3
G00	Thatalia	3,247	76	18	23.4	5.5
J00	Char Harigope	958	25	6	26.1	6.3
U00	Baispur	9,689	193	52	19.9	5.4
V01	Kadamtali	372	4	3	10.8	8.1
V02	Nilokhi	447	6	7	13.4	15.7
V03	Char Nilokhi	589	9	5	15.3	8.5
V04	Char Pathalia	410	6	3	14.6	7.3
V05	Gazipur	3,371	66	22	19.6	6.5
V06	Fatepur	2,644	54	23	20.4	8.7
V07	Nayakandi	285	8	1	28.1	3.5
V08	Goalbhar	1,224	28	10	22.9	8.2
V09	Naburkandi	1,247	36	12	28.9	9.6
V14	Enayetnagar	618	10	6	16.2	9.7
V36	Ludhua	5,526	120	44	21.7	8.0
D99	Mandertoli	2,132	41	18	19.2	8.4
<b>Block F Total</b>		<b>37587</b>	<b>800</b>	<b>275</b>	<b>21.3</b>	<b>7.3</b>
B00	Charmasua	1,990	52	10	26.1	5.0
C00	Sarderkandi	4,119	97	21	23.5	5.1
V37**	Charputia	-	-	-	-	-
V50	Bakharpur	48	1	1	20.8	20.8
V51	Induriakandi	827	14	4	16.9	4.8
V53	Chhoto Haldia	2,921	61	22	20.9	7.5
V58**	Mohishmari	-	-	-	-	-
V69**	Naobangha	-	-	-	-	-
V70**	South Joypur	-	-	-	-	-
V95	Baluchar	2,545	64	12	25.1	4.7
V96	Rampur	536	17	5	31.7	9.3
VB4	Ramdaspur	3,767	80	25	21.2	6.6
VB5	Thakurpara	853	18	5	21.1	5.9
VB6	Sarkerpara	556	16	4	28.8	7.2
VB7	Mirpur	317	6	1	18.9	3.2
VB8	Farazikandi	1,227	21	13	17.1	10.6
VB9**	Ramanathgonj	-	-	-	-	-
VB0	South Rampur	3,626	98	25	27.0	6.9
D88	Sankibhanga	1,482	31	8	20.9	5.4
D89	Namapara	976	18	8	18.4	8.2
D90	Zahirabad	819	23	5	28.1	6.1
D91**	North Joypur	-	-	-	-	-
D92**	West Joypur	-	-	-	-	-
D93	Maizkandi	1,342	31	11	23.1	8.2
D94	Hazipur	1,732	45	8	26.0	4.6
D95	Tapaderpara	645	7	6	10.9	9.3
D96	Sakharipara	1,193	26	6	21.8	5.0
D97	Nayakandi	764	14	8	18.3	10.5
D98	Bara Haldia	3,400	79	27	23.2	7.9
<b>Block G Total</b>		<b>35685</b>	<b>819</b>	<b>235</b>	<b>23.0</b>	<b>6.6</b>
<b>Government service area: Total</b>		<b>114342</b>	<b>2462</b>	<b>818</b>	<b>21.5</b>	<b>7.2</b>
*Division by block applies						
**Lost due to river erosion in 1987						

## APPENDIX C

### LIFE TABLE EQUATIONS

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

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

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

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

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

$$L_1 = 0.410 l_1 + 0.590 l_2$$

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

$${}_nL_x = \frac{{}_nd_x}{{}_nm_x}, \text{ for } 5 \leq x \leq 84$$

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

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

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 live births.

## 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 project		X		X
1997	Sub-centre delivery			X	
1998					X
2000			X		
2001		X			
2000	Fixed Site Clinics for delivering on MCH-FP services			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
2005	Introduction of Hepatitis B	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
2009	Hemophilus influenza type B(Hib) vaccine in the form of pentavalent vaccine	X	X	X	X
2011	Flu Q-QIV ( Phase III )	X			
May 2012	JE (Japanese encephalitis) vaccine trial	X	X	X	X
Apr 2012	FLU D_QIV (Phase III)	X	X		
May 2012	OPV vaccine trial	X	X	X	X
January 2013	Measles-Rubella and Rotavirus Vaccine	X	X	X	X
March 2013	LAIV Study			X	X
March 2013	FLU D_QIV (Phase III) Cohort -4	X	X		
March 2014	FLU D_QIV (Phase III) Cohort-6	X	X		
January 2015	FLU-15 Trail	X			
April 2015	OPV Gates Study	X	X	X	X
July 2015	JEV 07	X	X	X	X
October 2016	b BIOOPV trail	X	X	X	X
March 2017	MR	X	X	X	X
October 2017	HEV	X	X	X	X
September 2018	WHO Polio	X	X	X	X
March 2018	KOICA vaccine study conducted in <b>Block-F and G of Government service area</b>				

## APPENDIX F

### STAFF OF HDSS, 2018

**Quamrun Nahar *Ph.D.***

Head, Initiative for Climate Change and Health and Acting Senior Director, Health Systems and Population Studies Division (HSPSD)

#### HDSS-Matlab

##### Field Supervisory Team

Md. Taslim Ali, Senior Manager  
M. Munirul Alam Bhuiyan, FRO  
Mahmud Hasan, FRO  
Md. Bashiruddin Ahmed, FRO  
Md. Monirul Hoque, FRS  
Sheikh Abdul Jabber, FRS  
Dilara Akhter, FRS  
Zakia Parveen, FRS  
Farzana Haque, FRS  
Md. Kamruzzaman, FRS  
Md. Shoriful Islam, FRS

##### Data Management

Monowara Begum, DMO  
Meherun Nessa, DMA

##### Administration

Md. Anisur Rahman, Admin. Officer  
Mubarak Hossain, DSA  
Masud Miah, Attendant  
Md. Ahsan Ullah, Attendant

NOTE: 40 Community Health Research Workers (CHRWs) collect routine HDSS data.

#### HDSS-Dhaka

##### Research

Md. Nurul Alam, *Ph.D.* Head, HDSS  
Md. Moinuddin Haider, R.I.

##### Administration

Md. Emdadul Haque, D.S. Coordinator  
Kiron Chandra Bala, Admin. Assistant  
Md. Saidul Islam, Doc. Scan. Assistant

##### Programming & Data Management

Sajal K. Saha, Sr. Programmer  
Sayed Saidul Alam, Sr. Programmer  
Samiran Barua, Data Manager

##### Geographic Information System

Muhammad Zahirul Haq, DMS-GIS



