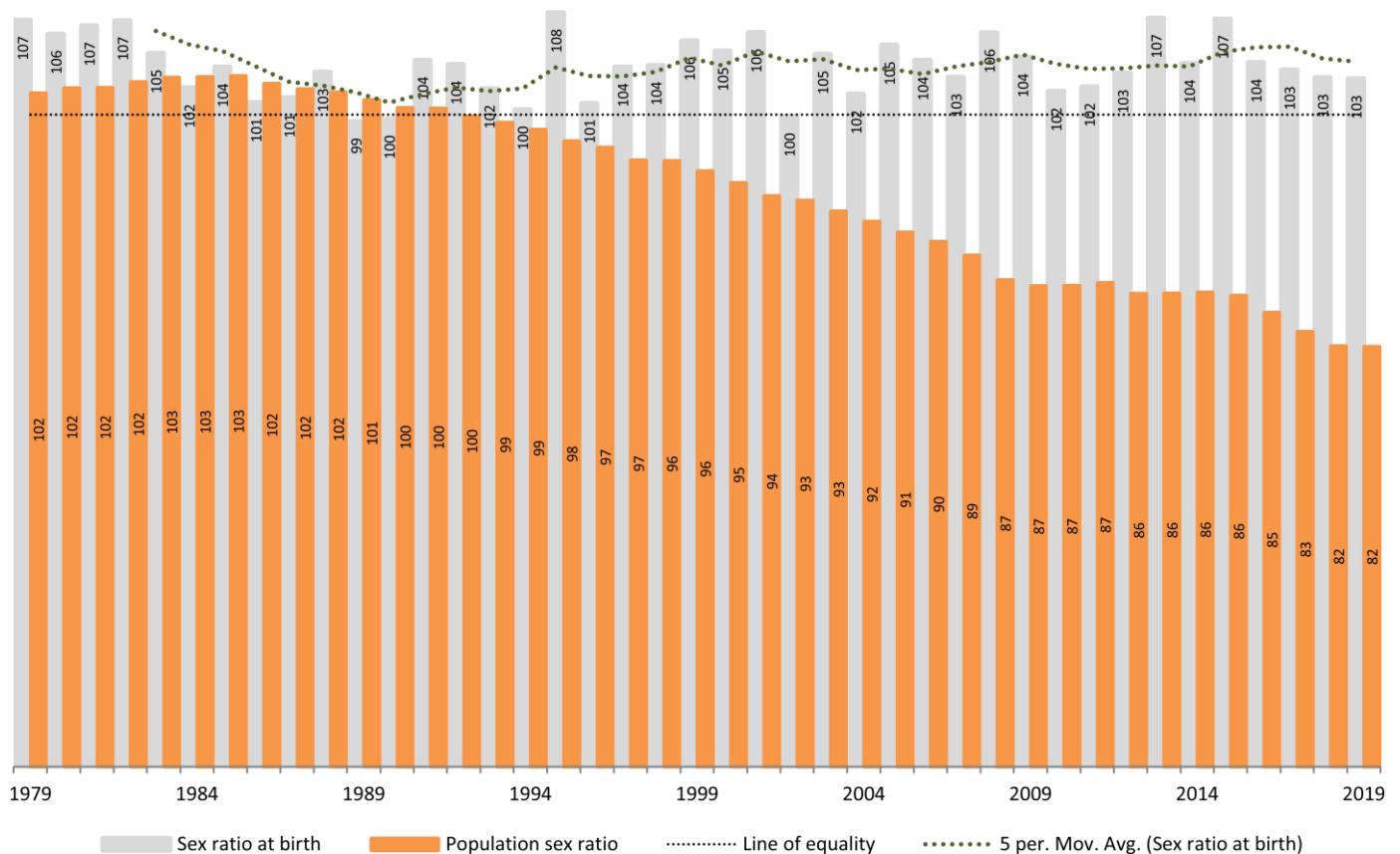


# HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM – MATLAB

Volume Fifty Four  
Registration of Health and Demographic Events 2019

Scientific Report No. 144 – June 2021

Sex ratios (males per 100 females), Matlab HDSS, 1979-2019





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**Volume Fifty Four**

**Registration of Health and Demographic Events 2019**

**Scientific Report No. 144 – June 2021**

**Initiative for Climate Change and Health  
Health Systems and Population Studies Division, icddr,b  
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Mohakhali, Dhaka 1212, Bangladesh**

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## LIST OF ABBREVIATION

ANC	Antenatal Care
AS-MAT	Arsenic in Tub-well Water and Migration
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
Hib	Hemophilus Influenza type B
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
MINIMAT	Maternal and Infant Nutrition Intervention
MR	Measles Rubella
NGO	Non-government Organization
NIPORT	National Institute of Population Research and Training
RKS	Record Keeping System
SAG	Scientific Advisory Group
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 the Health and Demographic Surveillance System (HDSS) site, Matlab, a rural area in Bangladesh, in 2019. The Matlab HDSS is maintained by icddr,b. The surveillance area is divided into two service areas – 1) Government service area and 2) icddr,b service area. Usual government health and family planning services are available in the 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 children under two years of age and women of reproductive age with the collaboration of the Government Health and Family Planning department in addition to usual Government services.

In the surveillance area, the fertility rate in 2019 slightly increased compared to 2018 (21.1 vs 21.9). The total fertility rate (TFR) was 2.6 per woman in 2019 and 2.5 in 2018. YFR was 2.6 in both the service areas. The crude birth rate (CBR) was 21.9 per 1,000 populations in 2019 whereas in 2018 the rate was 21.0. In the icddr,b service area, CBR was 21.8 and in the Government service area CBR was 21.9.

The crude death rate (CDR) was 7.2 per 1,000 population in the icddr,b service area compared to 7.9 in Government service in 2019. The neonatal mortality rate significantly increased from 15.1 in 2018 to 18.9 in 2019 in the icddr,b service area whereas in Government service area it increased from 20.3 to 22.3 in same time period. The infant mortality rate was 25 per 1,000 live births in the icddr,b service area compared to 28.7 in the Government service area. Post-neonatal mortality increased in both icddr,b service area (from 3.7 to 6.2) and in the Government service area (from 4.0 to 6.4) respectively. Under five mortality rate also showed an increase from 27.7 in 2018 to 29.8 in 2019 for the icddr,b service area, and from 30.9 in 2018 to 38.6 in 2019 for Government service area. The annual rate of natural increase in population size was 14.3 per 1,000 in 2019.

The rate of in-migration decreased from 50.2 in 2018 to 46.0 in 2019 per 1,000 populations, and the rate of out-migration also decreased from 59.1 in 2018 to 52.8 in 2019. The overall annual population growth rate was 1.4%. The marriage rate was 13.9 per 1,000 people, and the divorce rate was 1.8 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>.

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 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.

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

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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>

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.

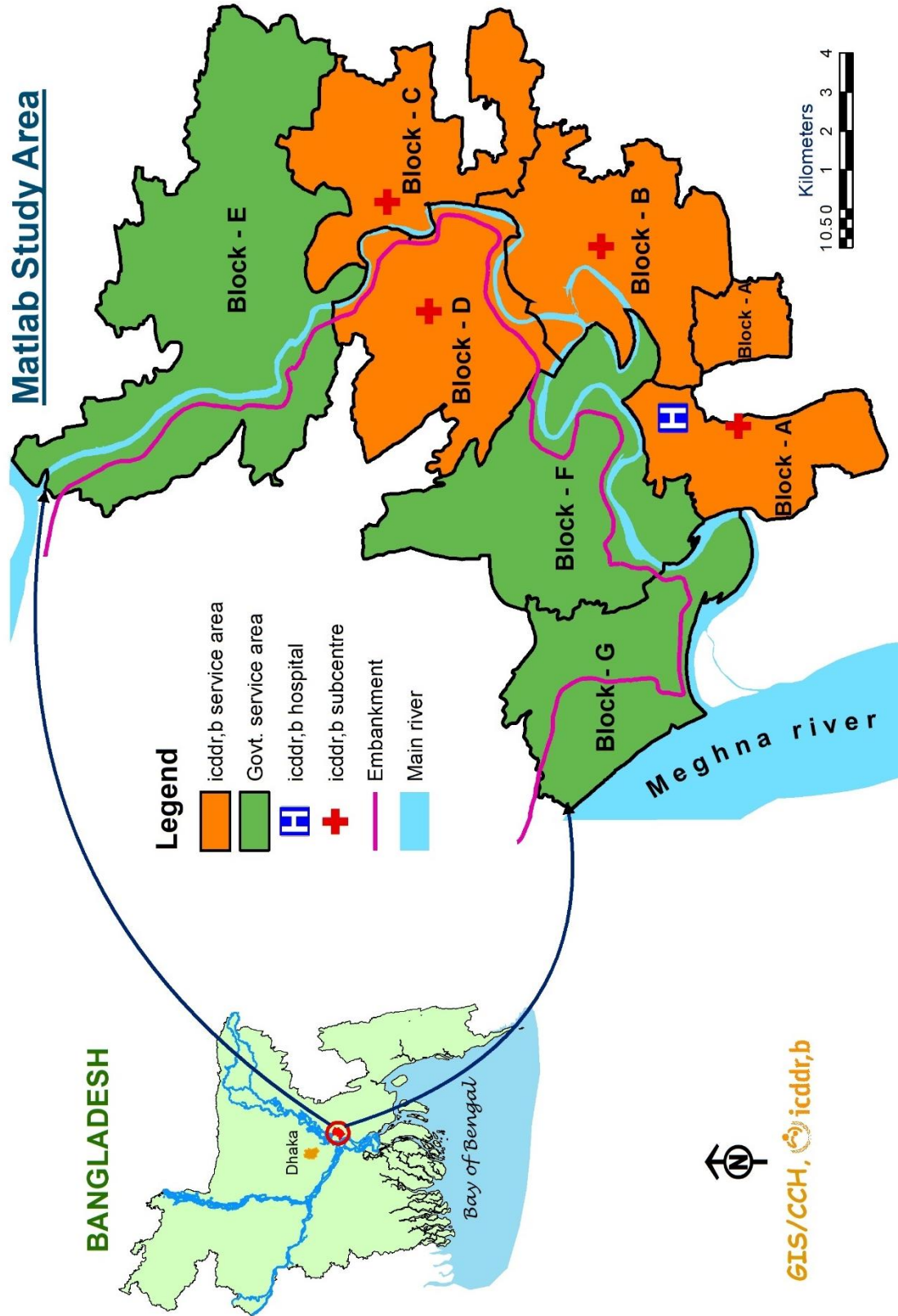
This is the volume fifty four of a series of scientific reports of the Matlab Health and Demographic Surveillance System produced by icddr,b. Data obtained from the Matlab HDSS area in 2019, along with brief notes and explanations of the tables, are presented in this volume.

**Note:**

The Matlab HDSS collects data on pregnancy, pregnancy outcomes, antenatal care, and postnatal care directly from the women's reporting. For temporary absent respondents, CHRWs collect the data in their subsequent visits. At present, the HDSS maintains a 3-monthly visiting cycle. Furthermore, for updating the data of migrants, there is a provision of observing individual's movement for six months to ensure their permanent residency in the new place for both incoming and outgoing populations. This operational definition of migration takes two visits or more to record a migration event. icddr,b postponed the routine household visits of the HDSS from 25 March 2020 to 8 November 2020 to prevent community transmission of COVID-19 infection. During this period, CHRWs continued data collection over mobile phone calls. As a result, it interrupted the updating of some pregnancy and migration-related events. Despite their effort, CHRWs could not capture all events mainly because they lacked access to individual residents over mobile phone calls. In addition, some residents were annoyed to provide data over mobile phone calls in the ongoing traumatic situation caused by the COVID-19 epidemic. Thus, there may be slightly under-reporting in 2019 event counts in this report. However, this slight underreporting is unlikely to affect the rates except for migration significantly.

**We continue event count in subsequent physical visits and will summarize the levels of the 2019 event under-reporting in the following report.**

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

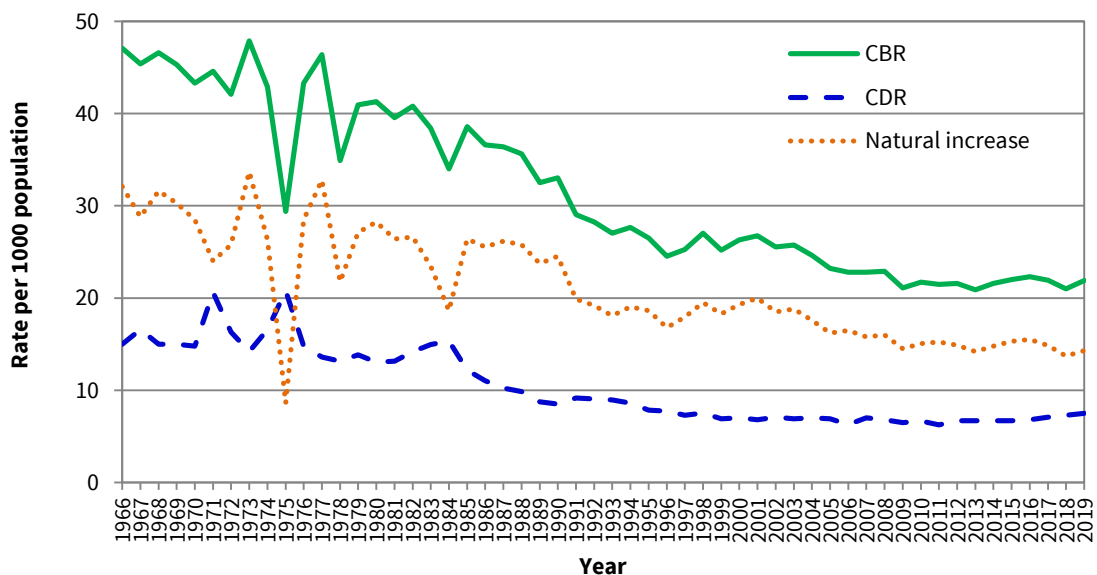


## CHAPTER 2

### DEMOGRAPHIC TRENDS IN MATLAB

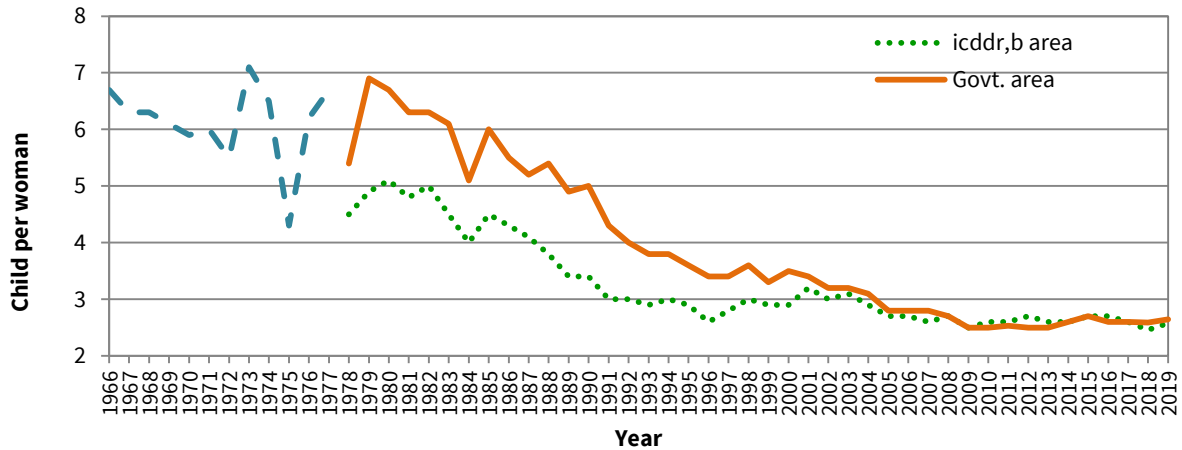
The Matlab HDSS data show the various transitions in the Matlab population over the period 1966-2019. In the early stages of demographic surveillance (the 1960s and 1970s), the Matlab population was characterized by high fertility, high mortality, and high population growth. Apart from a *Shigella* outbreak in 1984 following the Liberation War in 1971 and the famine in 1974, there has been a steady decline in natural increase, fertility, and mortality. Figure 2.1 shows that over the period 1966-2019, crude birth rate (CBR) has dropped by 53.5%, crude death rate (CDR) by 50%, and natural increase by 55.5%. 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, 1966-2019**



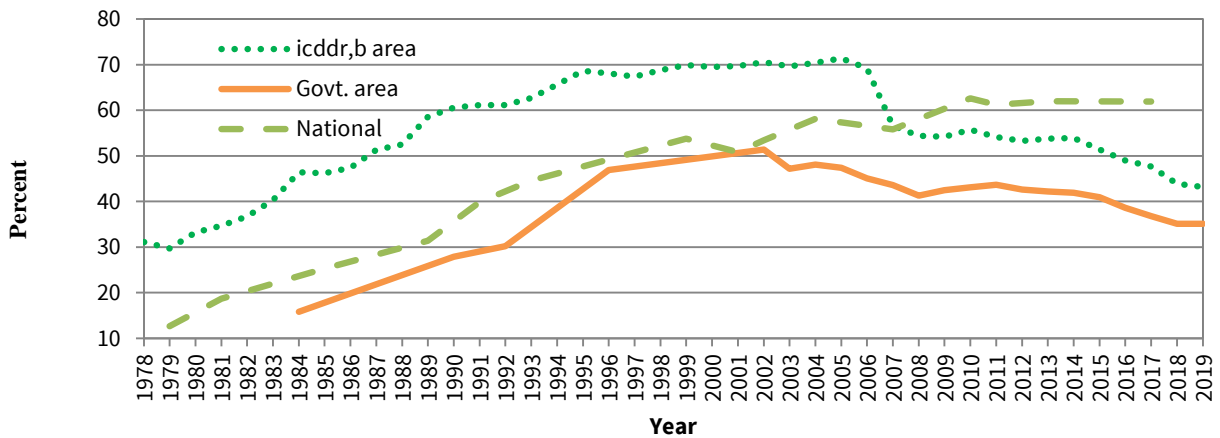
The Matlab health and demographic surveillance area started with a high fertility level of 6.7 children per woman in 1966. The surveillance area reorganized into icddr,b, and Government service areas in 1978, had a total fertility rate (TFR) of 4.5 and 5.4 respectively. The TFRs, since then, remained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

**Figure 2.2 Total fertility rates (TFR) in Matlab by area, 1966-2019**



In icddr,b service area, female CHRWs has been providing contraceptive supplies and advice since the inception of the program in 1978. Through regular household visits and female CHRWs in the icddr,b service area, women provided advice and contraception and monitored the chosen method's continuity until 2000. This method of service provision has dramatically increased women's access to contraceptive services in icddr,b service area and was associated with a high contraceptive prevalence rate (CPR). After 2001, this door-step service delivery system was switched to the fixed-site clinic system. 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 – these rates were above those in Government service area and national figures. From 2007 onward, about two-thirds of the CHRWs were assigned to provide services and a third to carry out the surveillance work in the icddr,b service area. A sudden drop of CPR (56.6) was noticed from 2006 onward, although causes cannot be linked to this change in service provision only. Since then CPR has been on a slight decrease in the icddr,b service area, with the latest rate being 43.2 in 2019 – a figure lower than that of the national-level. In the Government service area, however, CPR was even lower (35.1%) in 2019 (Figure 2.3). Additional studies should be carried out to investigate the factors associated with the decline in CPR in the Government service area.

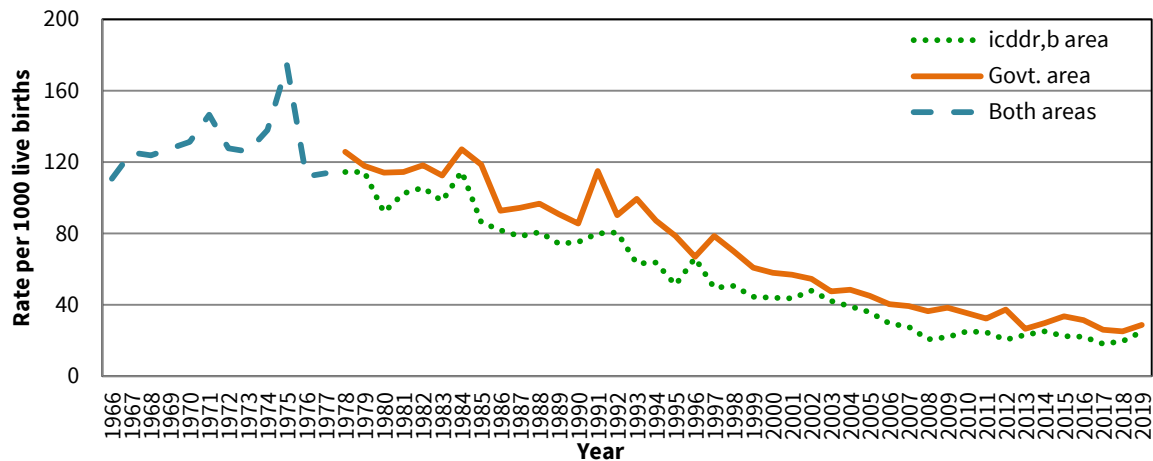
**Figure 2.3 Contraceptive prevalence rates (CPR) in Matlab and Bangladesh, 1978-2019**



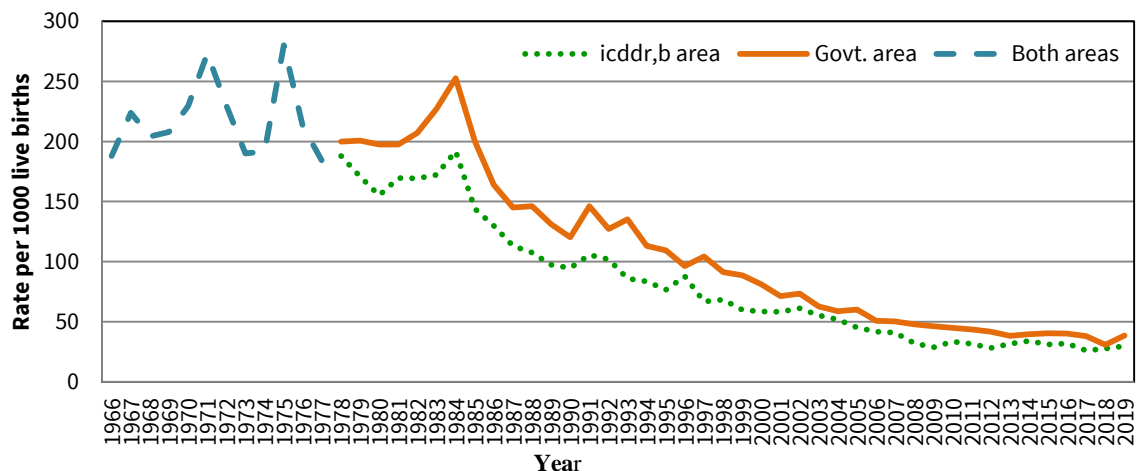


A large part of the decline in mortality in Matlab since the mid-1960s was a result of substantial reductions in infant and child mortality. Figure 2.4 shows that in the icddr,b service area, the infant mortality rate (IMR) fell by 78.2% from 1978-2019. In the Government service area, IMR declined by 77.2% over the same period. During the same period, the under-five mortality rate (U5MR) declined by 82.5% in both areas (Figure 2.5). The famine in 1974 greatly influenced 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, 1966-2019**



**Figure 2.5 Under-five mortality rates (U5MR) in Matlab by area, 1966-2019**



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 increased from 52.6 years in 1966 to 71.0 in 2019, a gain of 18.4 years. For females, the improved life expectancy was even more evident with a gain of nearly 22.1 (from 50.7 to 72.8). This was a result of diminishing gender differences in childhood mortality and maternal mortality (Figure 2.6).

**Figure 2.6 Life expectancy at birth ( $e^0$ ) in Matlab, 1966-2019**

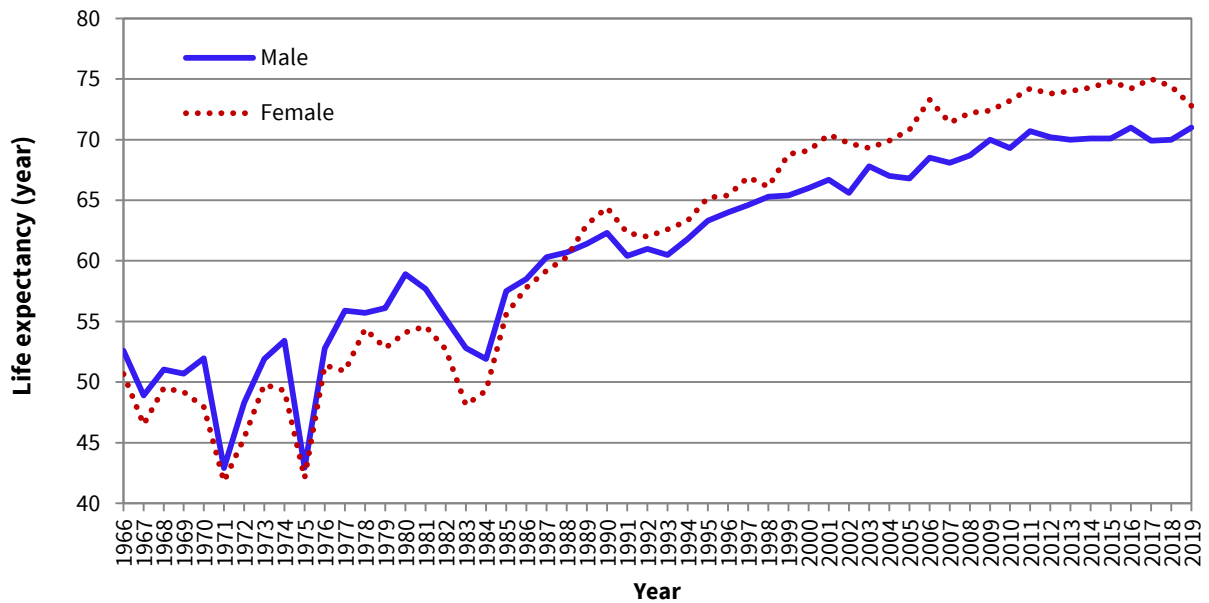
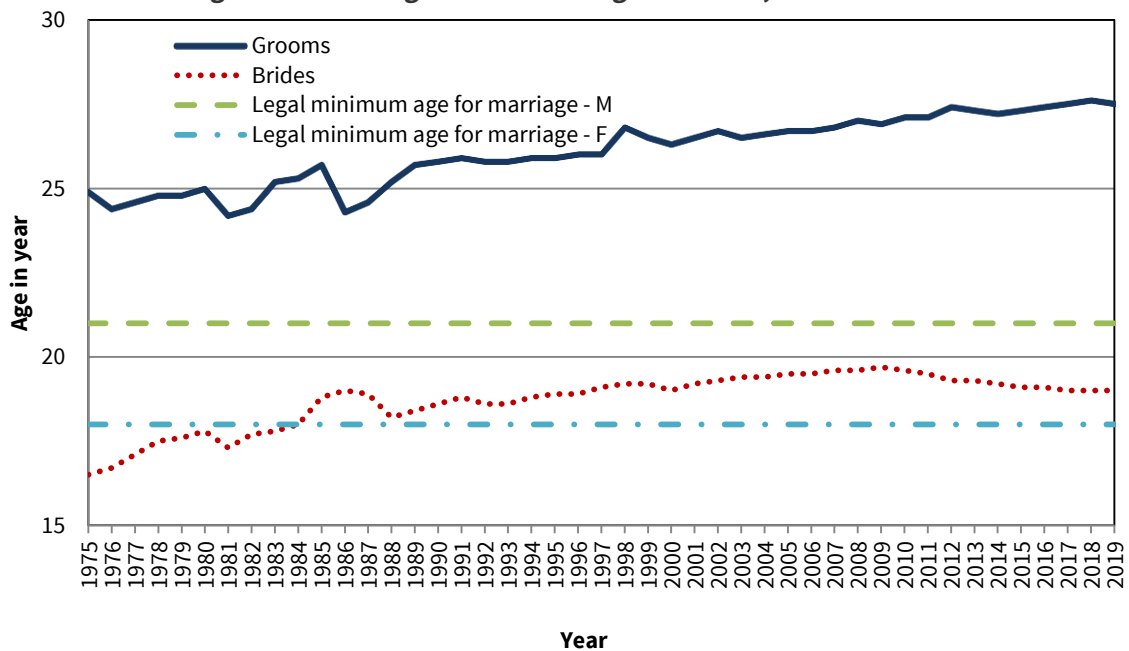


Figure 2.7 shows the trends in mean age at first marriage for brides and grooms in Matlab. The mean age at first marriage has increased in both areas during 1975-2019. The mean age at marriage for females increased by 2.6 years and for males by 2.5 years. The current mean age at first marriage is 28.7 for males and 20.0 years for females. However, the mean age at first marriage for women started to decline after 2009 after reaching its peak at 19.7 years. The reason for the decline in the age of marriage for women needs to be explored further.

**Figure 2.7 Mean age at first marriage in Matlab, 1975-2019**



## CHAPTER 3

### POPULATION CHANGES

The key vital statistics from 2007 through 2019 are summarized in Table 3.1. The mid-year population and the demographic events registered in 2019 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 villages.

In 2019, the crude birth rate slightly increased in both icddr,b and in Government service areas (21.8 and 21.9 respectively) compared to 2018. In icddr,b service area, the crude death rate (CDR) decreased slightly from 7.5 in 2018 to 7.2 in 2019. In the Government service area, CDR increased from 7.2 in 2018 to 7.9 in 2019. Over the decade, the trend of TFR in Matlab HDSS displayed little fluctuation. In 2007, TFR for icddr,b and Government service areas had been 2.6 and 2.8 respectively, with an overall rate of 2.7 for both areas combined. A slight decrease in this rate is noted till 2009 (TFR: 2.5). Currently, the TFR is 2.6 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) significantly increased from 19.0 in 2018 to 25.0 in 2019 in the icddr,b service area, and 26.8 to 28.7 in the Government service area during the same period. In the icddr,b service area, neonatal mortality also increased from 15.1 in 2018 to 18.9 in 2019. A similar increase was also observed in the Government service area from 20.3 in 2018 to 22.3 in 2019. The mortality rate of children aged 1-4 years decreased from 1.9 in 2018 to 1.2 in 2019 in the icddr,b service area and from 1.4 in 2018 to 2.5 in 2019 in the Government service area. Under-five mortality has increased in the icddr,b service area from 27.7 per 1,000 live births in 2018 to 29.8 in 2019. Similarly, in the Government service area, there was an increase in under-five mortality from 30.9 in 2018 to 38.6 in 2019. (Figures 2.4 and 2.5, Chapter 2).

The numbers of in- and out-migrants registered in 2019 were 11,065 and 12,705, respectively, resulting in the in-migration rate of 46.0 and an out-migration rate of 52.8 per thousand population. The net migration rate of -6.8 per 1,000 population means that approximately 7 more persons left the area compared to those who came in the area per thousand population. 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 1978-2019 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 2019, this proportion had fallen to 30.9%. In the Government service area, the change in age structure was almost the 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 31.0% in 2019. On the other hand, the proportion of the elderly population (60

years and over) in the surveillance area increased from 5.6% in 1978 to 11.6% in 2019 due to the decline in both fertility and mortality.

The net population increase was 5.2 per 1,000 in 2019, while it was 2.2 per 1,000 in 2018 – which may be due to the increase in the crude birth rate. A major cause for men being fewer than women in the age group 15-49, as shown in the population pyramid, could be due to a higher out-migration rate among the men in that age group.

**Table 3.1. Vital statistics of icddr,b and Government service areas\*, 2007-2019**

Vital rate (per 1,000)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<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	21.8
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	21.9
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	21.9
<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	2.6
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	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	2.6
<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	7.2
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	7.9
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	7.5
<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	18.9
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	22.3
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	20.5
<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	6.2
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	6.4
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	6.3
<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	25.0
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	28.7
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	26.8
<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	1.2
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	2.5
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	1.8
<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	29.8
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	38.6
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	34.0
<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	14.7
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	14.0
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	14.3
<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	46.0
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	52.8
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	1.4

\*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 2019**

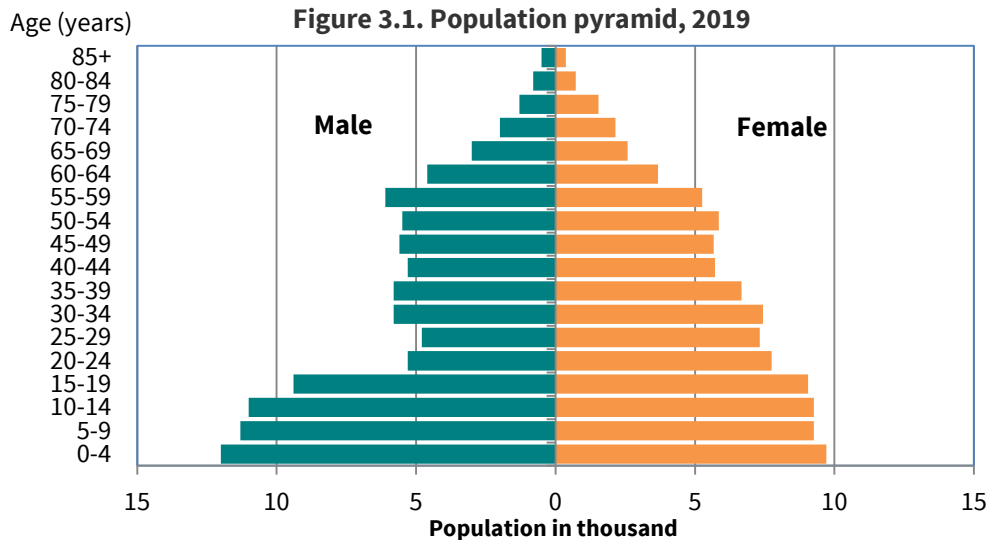
Demographic indicator	Number			Rate per 1,000		
	Total	Male	Female	Total	Male	Female
<b>Total Population</b>						
<b>(30 June 2019)</b>						
icddr,b area	126,156	57,142	69,014	-	-	-
Government area	114,648	51,500	63,148	-	-	-
Both areas	240,804	108,642	132,162	-	-	-
<b>Events registered</b>						
<b>(Jan-Dec 2019)</b>						
<b>Births**</b>						
icddr,b area	2,756	1,371	1,385	21.8	-	-
Government area	2,511	1,301	1,210	21.9	-	-
Both areas	5,267	2,672	2,595	21.9	-	-
<b>Deaths</b>						
<b>Infants*</b>						
icddr,b area	69	52	17	25.9	39.5	12.6
Government area	72	56	16	29.2	44.3	13.3
Both areas	141	108	33	27.5	41.9	12.9
<b>All deaths**</b>						
icddr,b area	906	510	396	7.2	8.9	5.7
Government area	906	456	450	7.9	8.9	7.1
Both areas	1,812	966	846	7.5	8.9	6.4
<b>In-migration**</b>	11,065	5,515	5,550	46.0	50.8	42.0
<b>Out-migration**</b>	12,705	6,116	6,589	52.8	56.3	49.9
<b>Marriage**</b>	3,358	-	-	13.9	-	-
<b>Divorce**</b>	433	-	-	1.8	-	-
<b>Population change</b>						
<b>(Jan-Dec 2019)</b>						
Net migration**	-1,640	-601	-1,039	-6.8	-5.5	-7.9
<b>Natural increase**</b>						
icddr,b area	1,850	861	989	14.7	15.1	14.3
Government area	1,605	845	760	14.0	16.4	12.0
Both areas	3,455	1,706	1,749	14.3	15.7	13.2
<b>Net increase**</b>	1,815	1,105	710	7.5	10.2	5.4

\*Rate per 1000 live births

\*\*Rate per 1000 population

**Table 3.3. Mid-year population by age and sex, and sex ratio, 2019**

Age (Years)	Number			Percentage			Sex ratio $(\frac{M}{F} \times 100)$
	Both sexes	Male	Female	Both sexes	Male	Female	
<b>All ages</b>	240,804	108,642	132,162	<b>100</b>	<b>100</b>	<b>100</b>	<b>82.2</b>
<1 year	5,138	2,582	2,556	2.1	2.4	1.9	<b>101.0</b>
1-4	20,726	10,452	10,274	8.6	9.6	7.8	<b>101.7</b>
1	5,170	2,573	2,597	2.1	2.4	2.0	<b>99.1</b>
2	5,155	2,608	2,547	2.1	2.4	1.9	<b>102.4</b>
3	5,213	2,628	2,585	2.2	2.4	2.0	<b>101.7</b>
4	5,188	2,643	2,545	2.2	2.4	1.9	<b>103.9</b>
5--9	24,517	12,241	24,517	10.2	11.3	18.6	<b>49.9</b>
10-14	24,141	12,241	24,141	10.0	11.3	18.3	<b>50.7</b>
15-19	22,159	11,970	22,159	9.2	11.0	16.8	<b>54.0</b>
20-24	15,997	10,231	15,997	6.6	9.4	12.1	<b>64.0</b>
25-29	14,838	9,672	14,838	6.2	8.9	11.2	<b>65.2</b>
30-34	16,107	9,832	16,107	6.7	9.0	12.2	<b>61.0</b>
35-39	15,099	8,810	15,099	6.3	8.1	11.4	<b>58.3</b>
40-44	13,314	7,563	13,314	5.5	7.0	10.1	<b>56.8</b>
45-49	13,622	7,499	13,622	5.7	6.9	10.3	<b>55.1</b>
50-54	13,728	7,733	13,728	5.7	7.1	10.4	<b>56.3</b>
55-59	13,532	6,951	13,532	5.6	6.4	10.2	<b>51.4</b>
60-64	9,830	4,858	9,830	4.1	4.5	7.4	<b>49.4</b>
65-69	6,659	3,414	6,659	2.8	3.1	5.0	<b>51.3</b>
70-74	5,001	2,838	5,001	2.1	2.6	3.8	<b>56.7</b>
75-79	3,498	2,032	3,498	1.5	1.9	2.6	<b>58.1</b>
80-84	1,847	954	1,847	0.8	0.9	1.4	<b>51.7</b>
85+	1,051	493	1,051	0.4	0.5	0.8	<b>46.9</b>



**Table 3.4. Mid-year population by age, sex, and area, 2019**

Age (years)	icddr,b service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
<b>All ages</b>	<b>126,156</b>	<b>57,142</b>	<b>69,014</b>	<b>114,648</b>	<b>51,500</b>	<b>63,148</b>
<1 year	2667	1315	1352	2471	1267	1204
1-4	10,817	5,495	5,322	9,909	4,957	4,952
1	2,655	1,326	1,329	2,515	1,247	1,268
2	2,669	1,342	1,327	2,486	1,266	1,220
3	2,776	1,449	1,327	2,437	1,179	1,258
4	2,717	1,378	1,339	2,471	1,265	1,206
5-9	12,875	6,447	6,428	11,642	5,829	5,813
10-14	12,607	6,282	6,325	11,534	5,618	5,916
15-19	11,343	5,156	6,187	10,816	5,033	5,783
20-24	8,377	3,003	5,374	7,620	2,763	4,857
25-30	7,946	2,714	5,232	6,892	2,452	4,440
31-34	8,517	3,323	5,194	7,590	2,952	4,638
35-39	8,015	3,374	4,641	7,084	2,915	4,169
40-44	7,258	3,186	4,072	6,056	2,565	3,491
45-49	7,251	3,319	3,932	6,371	2,804	3,567
50-54	7,267	3,194	4,073	6,461	2,801	3,660
55-59	7,023	3,466	3,557	6,509	3,115	3,394
60-64	5,037	2,591	2,446	4,793	2,381	2,412
65-69	3,427	1,677	1,750	3,232	1,568	1,664
70-74	2,532	1,092	1,440	2,469	1,071	1,398
75-79	1,741	742	999	1,757	724	1,033
80-84	924	470	454	923	423	500
85+	532	296	236	519	262	257

### MORTALITY

The age and sex-specific distribution of death was shown in Tables 4.1 and 4.2. Of the 1,812 deaths, 7.8% were infants, 2.1% were children aged 1-4 years, and 67.7% were aged 60 years and above.

Table 4.3 shows mortality rates per 1,000 population by age and sex. Table 4.4 shows the comparable age-sex-specific mortality rates by the icddr,b service area, and the government service area. In 2019, the overall death rates for males and females were 7.7 and 7.4, respectively. The infant mortality rate was 34.1 for males and 20.2 for females per 1,000 live births. It was lower in the icddr,b service area (31.9 and 20.0, respectively) compared to the Government service area (38.7 and 19.1, respectively) for both males and females. 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 life expectancy at birth was 71.0 years for males and 72.8 for females in 2019 compared to 70.0 for males and 74.4 for females in 2018. In most of the age groups, life expectancy was greater for females than males.

The life expectancy at birth was higher for females than males in both areas. In 2019, the gender difference in life expectancy was higher in the icddr,b service area (4.9 years) compared to the Government service area (3.6 years). Life expectancy at most age groups in each area was higher for females than for males (Appendix 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 of January to April, June, and November to December. Neonatal deaths were most frequent in January-February, September-October, and December. Post-neonatal deaths and child deaths, on the other hand, do not have any seasonal pattern. Figure 4.2 shows that the probability of survival for males and females started to differ from age 15 years, with females having a higher probability of survival in later age groups.

Deaths by underlying causes, sex, age, and areas are shown in Appendix A-5 to A-8. Figure 4.1 gives the distribution of age-standardized mortality rates by causes of death (obtained using Verbal Autopsy). The WHO-standard world population age structure was 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, 2019**

Age (years)	Both sexes			Male			Female		
	Number	%	Cumulative %	Number	%	Cumulative %	Number	%	Cumulative %
All ages	1812	100	-	966	100	-	846	100	-
<1 year	141		-	91	-	-	50	-	-
< 7 days	83	4.58	4.58	57	5.9	5.9	26	3.07	3.07
7 - 29 days	26	1.43	6.02	18	1.86	7.76	8	0.95	4.02
1- 5 months	18	0.99	7.01	7	0.72	8.49	11	1.3	5.32
6-11 months	14	0.77	7.78	9	0.93	9.42	5	0.59	5.91
1 – 4 years	38			18		-	20		-
1	20	1.1	8.89	8	0.83	10.25	12	1.42	7.33
2	6	0.33	9.22	3	0.31	10.56	3	0.35	7.68
3	7	0.39	9.6	5	0.52	11.08	2	0.24	7.92
4	5	0.28	9.88	2	0.21	11.28	3	0.35	8.27
5-9	15	0.83	10.71	10	1.04	12.32	5	0.59	8.87
10-14	11	0.61	11.31	9	0.93	13.25	2	0.24	9.1
15-19	16	0.88	12.2	9	0.93	14.18	7	0.83	9.93
20-24	11	0.61	12.8	5	0.52	14.7	6	0.71	10.64
25-29	15	0.83	13.63	7	0.72	15.42	8	0.95	11.58
30-34	13	0.72	14.35	5	0.52	15.94	8	0.95	12.53
35-39	20	1.1	15.45	7	0.72	16.67	13	1.54	14.07
40-44	36	1.99	17.44	20	2.07	18.74	16	1.89	15.96
45-49	54	2.98	20.42	36	3.73	22.46	18	2.13	18.09
50-54	83	4.58	25	40	4.14	26.6	43	5.08	23.17
55-59	132	7.28	32.28	83	8.59	35.2	49	5.79	28.96
60-64	169	9.33	41.61	102	10.56	45.76	67	7.92	36.88
65-69	172	9.49	51.1	107	11.08	56.83	65	7.68	44.56
70-74	213	11.75	62.86	104	10.77	67.6	109	12.88	57.45
75-79	234	12.91	75.77	109	11.28	78.88	125	14.78	72.22
80-84	219	12.09	87.86	101	10.46	89.34	118	13.95	86.17
85+	220	12.14	100	103	10.66	100	117	13.83	100

**Table 4.2. Deaths by age, sex and area, 2019**

Age (years)	icddr,b service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	906	510	396	906	456	450
<1 year	69	42	27	72	49	23
< 7days	40	23	17	43	34	9
7 - 29 days	13	9	4	13	9	4
1- 5 months	7	3	4	11	4	7
6-11 months	9	7	2	5	2	3
1 - 4 years	13	5	8	25	13	12
1	7	2	5	13	6	7
2	3	2	1	3	1	2
3	1	0	1	6	5	1
4	2	1	1	3	1	2
5-9	7	5	2	8	5	3
10-14	4	3	1	7	6	1
15-19	10	5	5	6	4	2
20-24	6	4	2	5	1	4
25-29	8	4	4	7	3	4
30-34	4	2	2	9	3	6
35-39	9	3	6	11	4	7
40-44	21	12	9	15	8	7
45-49	33	21	12	21	15	6
50-54	53	24	29	30	16	14
55-59	74	49	25	58	34	24
60-64	88	55	33	81	47	34
65-69	78	51	27	94	56	38
70-74	108	53	55	105	51	54
75-79	110	63	47	124	46	78
80-84	104	51	53	115	50	65
85+	107	58	49	113	45	68

**Table 4.3. Death rates by age and sex in both areas, 2019 (per 1,000 population)**

<b>Age (years)</b>	<b>Both sexes</b>	<b>Male</b>	<b>Female</b>
All ages	7.5	7.7	7.4
<1 year*	27.4	34.1	20.2
< 7days*	16.2	21.4	10.5
7- 29 days*	5.1	6.7	3.2
1- 5 months*	3.5	2.6	4.5
6-11 months*	2.7	3.4	2.0
1 - 4 years	1.8	1.7	2.0
1	3.9	3.0	4.8
2	1.2	1.1	1.2
3	1.3	1.8	0.8
4	1.0	0.7	1.2
5-9	0.6	0.8	0.4
10-14	0.5	0.7	0.2
15-19	0.7	0.8	0.6
20-24	0.7	0.6	0.8
25-29	1.0	0.9	1.2
30-34	0.8	0.6	1.1
35-39	1.3	0.9	1.8
40-44	2.7	2.8	2.6
45-49	4.0	5.0	2.8
50-54	6.0	5.5	6.7
55-59	9.8	11.8	7.5
60-64	17.2	20.3	14.0
65-69	25.8	31.2	20.1
70-74	42.6	41.1	44.1
75-79	66.9	62.6	71.1
80-84	118.6	109.3	127.8
85+	209.3	193.6	225.4
* Rate per 1,000 live births			

**Table 4.4. Death rates by age, sex, and area, 2019 (per 1,000 population)**

Age (years)	icddr,b area			Government area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	7.2	8.9	5.7	7.9	8.9	7.1
<1 year*	25.9	31.9	20.0	29.1	38.7	19.1
< 7days*	15.0	17.5	12.6	17.4	26.8	7.5
7- 29 days*	4.9	6.8	3.0	5.3	7.1	3.3
1- 5 months*	2.6	2.3	3.0	14.6	3.2	5.8
6-11 months*	3.4	5.3	1.5	3.2	1.6	2.5
1 - 4 years	1.2	0.9	1.5	2.5	2.6	2.4
1	2.6	1.5	3.8	5.2	4.8	5.5
2	1.1	1.5	0.8	1.2	0.8	1.6
3	0.4	0.0	0.8	2.5	4.2	0.8
4	0.7	0.7	0.7	1.2	0.8	1.7
5-9	0.5	0.8	0.3	0.7	0.9	0.5
10-14	0.3	0.5	0.2	0.6	1.1	0.2
15-19	0.9	1.0	0.8	0.6	0.8	0.3
20-24	0.7	1.3	0.4	0.7	0.4	0.8
25-29	1.0	1.5	0.8	1.0	1.2	0.9
30-34	0.5	0.6	0.4	1.2	1.0	1.3
35-39	1.1	0.9	1.3	1.6	1.4	1.7
40-44	2.9	3.8	2.2	2.5	3.1	2.0
45-49	4.6	6.3	3.1	3.3	5.3	1.7
50-54	7.3	7.5	7.1	4.6	5.7	3.8
55-59	10.5	14.1	7.0	8.9	10.9	7.1
60-64	17.5	21.2	13.5	16.9	19.7	14.1
65-69	22.8	30.4	15.4	29.1	35.7	22.8
70-74	42.7	48.5	38.2	42.5	47.6	38.6
75-79	63.2	84.9	47.0	70.6	63.5	75.5
80-84	112.6	108.5	116.7	124.6	118.2	130.0
85+	201.1	195.9	207.6	217.7	171.8	264.6
* Rate per 1,000 live births						

**Table 4.5. Abridged life table by sex, 2019**

Age (years)	Male				Female			
	$nq_x$	$l_x$	$L_x$	$e0_x$	$nq_x$	$l_x$	$L_x$	$e0_x$
0	34.1	100000	97100	71.0	20.2	100000	98280	72.8
1	3.0	96588	96416	72.5	4.8	97977	97701	73.3
2	1.1	96297	96243	71.7	1.2	97510	97451	72.7
3	1.8	96189	96103	70.8	0.8	97393	97353	71.8
4	0.7	96016	95981	69.9	1.2	97313	97254	70.8
5	3.9	95945	478870	69.0	2.1	97195	485493	69.9
10	3.6	95573	477083	64.2	0.9	96986	484737	65.0
15	4.0	95233	475296	59.5	3.2	96902	483789	60.1
20	3.0	94856	473628	54.7	3.9	96589	482070	55.3
25	4.4	94573	471907	49.8	5.8	96209	479763	50.5
30	2.9	94157	470151	45.1	5.3	95652	477103	45.8
35	4.4	93881	468464	40.2	9.1	95150	473743	41.0
40	13.7	93472	464408	35.3	13.1	94280	468544	36.4
45	24.5	92192	455730	30.8	14.0	93042	462198	31.8
50	27.2	89930	443995	26.5	32.8	91736	451720	27.2
55	57.5	87486	425723	22.2	37.0	88730	436042	23.0
60	96.7	82455	393589	18.4	67.7	85448	413755	18.8
65	145.4	74484	346791	15.0	96.0	79664	380387	15.0
70	187.0	63657	289857	12.1	199.6	72014	325650	11.3
75	271.7	51751	224556	9.3	302.9	57637	245405	8.5
80	428.1	37692	147635	6.9	481.2	40178	151232	6.1
85+	1000.0	21554	111330	5.2	1000.0	20844	92461	4.4

**Table 4.6. Deaths by month and age, 2019**

Month	Age at Death					
	All ages	Under 1 month	1-11 months	1-4 years	5-64 years	65 years and above
January	199	11	3	1	58	126
February	175	16	4	1	61	93
March	158	9	4	1	52	92
April	158	7	4	3	57	87
May	128	7	3	8	34	76
June	140	9	0	4	44	83
July	126	6	2	4	36	78
August	124	5	1	5	45	68
September	122	10	4	1	40	67
October	135	11	1	4	45	74
November	146	7	3	1	54	81
December	201	11	3	5	49	133
<b>Total</b>	<b>1,812</b>	<b>109</b>	<b>32</b>	<b>38</b>	<b>575</b>	<b>1,058</b>

Figure 4.1. Percent distribution of age-standardized death rates by cause of deaths, 1986-2019

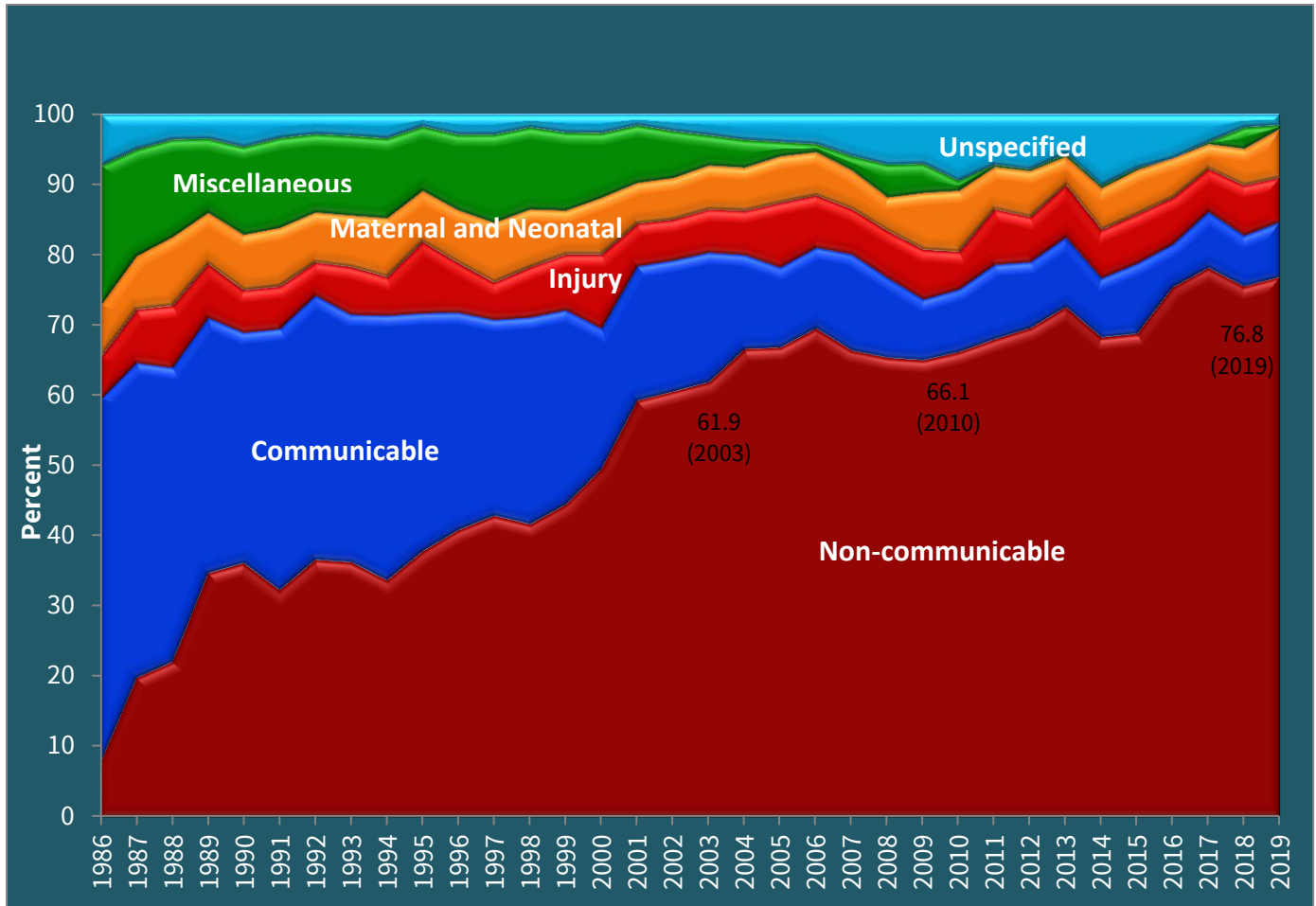
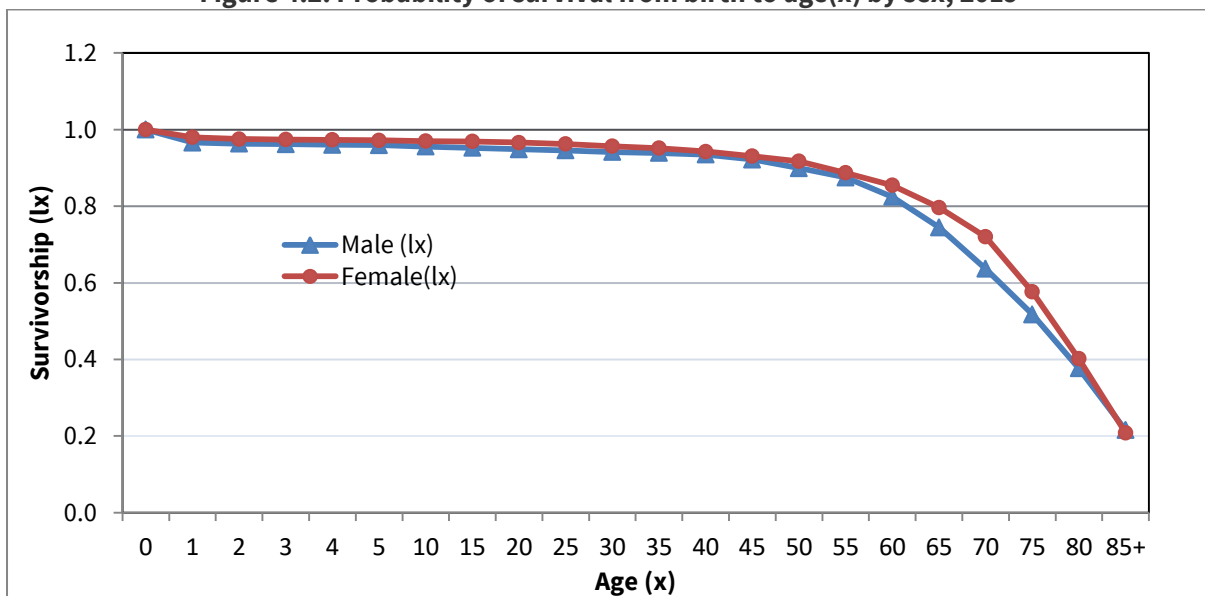


Figure 4.2. Probability of survival from birth to age(x) by sex, 2019



## CHAPTER 5

### FERTILITY

In 2019, there were 5,267 live births in the Matlab HDSS area as the outcomes of 6,042 pregnancies. Table 5.1 shows the number of pregnancies and their outcomes in 2019. Of the pregnancies, 86.1% ended with at least one live birth, a proportion that remained almost the same over the year; pregnancies resulting in fetal wastage are also similar to the previous year. Among the pregnancies resulting in live births, 53 had multiple births. Among the 53 multiple births pregnancies, in 47 cases had two live births, 3 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 the outcome and live births by sex and month of occurrence. The data shows marked seasonal variation of births, peaking in March, July, August, and October to December. The sex ratio at births was 103 males per 100 females; there is no definite trend over the period. Figure 5.1 shows the number of births and deaths by month of occurrence. The number of births peaks in March and July 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 compared to other age groups. 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 a marked variation in the distribution of live birth pregnancies by place of delivery and area. In the icddr,b service area 92.1% birth occurred through institutional delivery accounts, whereas in the Government service area, it was 71.0%. For institutional deliveries in the Government service area, births occurred in private clinic/nursing home (50.6%) and Upazila Health Complex (14.5%) while in icddr,b service area, births occurred in private clinic/nursing homes (50.9%), icddr,b hospital (23.9%), and Upazila health complex (13.4%) respectively.

Table 5.5 shows the distribution of live birth pregnancies by birth attendants and area. In the icddr,b service area, the proportion of deliveries assisted by MBBS doctor were the highest (59.7%) followed by a nurse (27.9%) and Family Welfare Visitor (FWV) (5.1%). Only 15.9% of deliveries were assisted by TBAs. In the Government service area MBBS doctor assisted in 57.1% deliveries. In terms of delivery assistance, trained TBAs assisted in 1.5% and 7.1% deliveries in the icddr,b service area and the Government service area, respectively. Medically trained birth attendants (doctors, nurses or midwives, or family welfare visitors) assisted in 92.7% of the live births in the icddr,b service area compared to 76.1% in the Government service area.

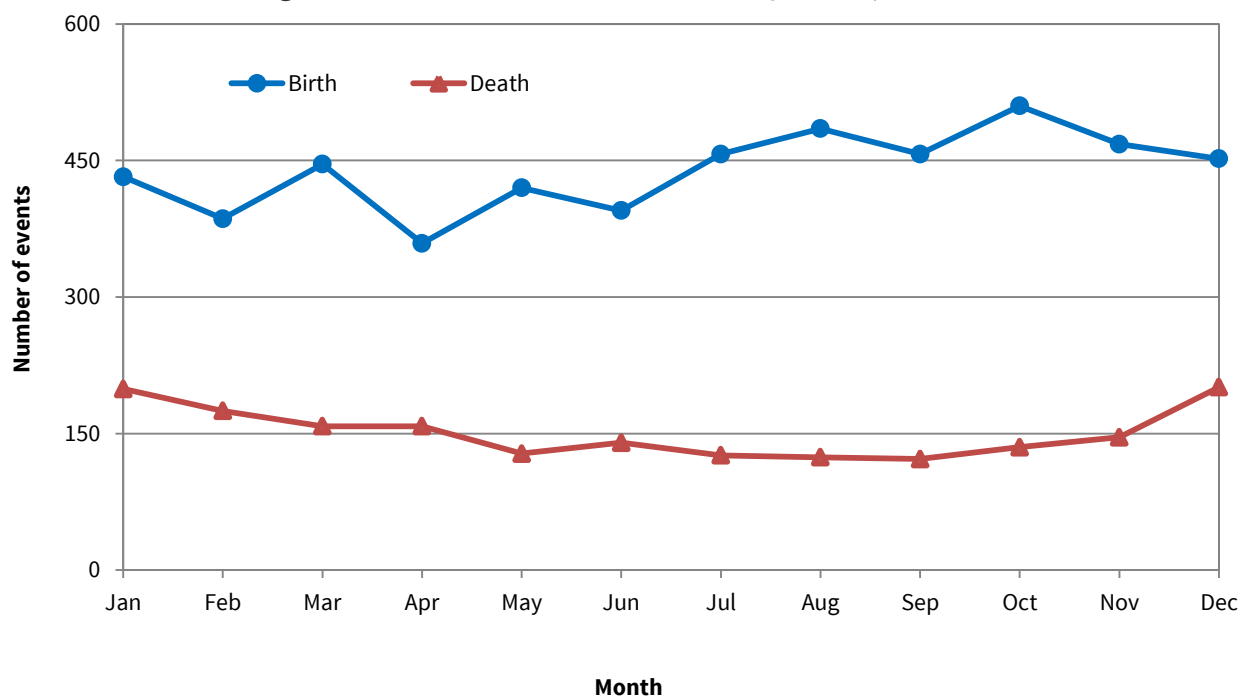
Table 5.6 illustrates the mode of delivery of live births by area. Normal vaginal delivery (including use of drug and saline and/or Episiotomy) accounted for 41.8% and 44.4% in the icddr,b service area and in the Government service area, respectively. The proportion of instrumental deliveries, especially

caesarean were 58.2% and 55.6%, respectively, in the icddr,b service area, and the Government service area.

Till 2015 Matlab HDSS recorded the place of antenatal care (ANC) received by expectant women during different trimesters of pregnancy. Due to WHO recommendation of 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 from 2016.

Table 5.7 shows the percentage distribution of different indicators of ANC coverage by area. In the icddr,b service area, 0.6% of the women didn't receive any ANC during pregnancy compared to 6.4% in the Government service area. On the other hand, over 78.7% of the women received recommended number of ANC (at least 4 visits) at any time of their pregnancy in the service area compared to 30.3% in the Government service area. In terms of timing ANC in icddr,b service area, 88.6% of the expectant mothers sought pregnancy care for the first time within 6 months of pregnancy (53.6% during 1<sup>st</sup> trimester and another 35.0% during 2<sup>nd</sup> trimester) whereas in Government service area this figure was 52.6% (24.5% during 1<sup>st</sup> trimester and 28.1% within 2<sup>nd</sup> trimester).

**Figure 5.1. Number of births and deaths by month, 2019**





**Table 5.1. Results of pregnancy outcomes by area, 2019**

	<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>6042</b>	<b>3169</b>	<b>2873</b>
Pregnancies that:			
Ended with at least one live birth	5,202	2722	2480
Ended with at least one stillbirth	75	37	38
Were miscarried	611	330	281
Were aborted	154	80	74
	<b>Panel A1: Number of multiple outcome pregnancies by type</b>		
Multiple outcome pregnancies	53	22	27
Twin pregnancies	52	21	26
Twin pregnancies that:			
Ended with 2 live births	47	21	26
Ended with 2 stillbirths	1	0	1
Ended with 1 live birth and 1 stillbirth	3	3	0
Were miscarried	2	1	1
Were aborted	0	0	0
Triplet pregnancy	1	0	1
Ended with 1 live birth and 2 stillbirth	1	0	1
Quadruplet pregnancy	0	0	0
	<b>Panel B: Number of pregnancy outcomes by type</b>		
Total outcomes	6127	3213	2,914
Live births	5,267	2,756	2,511
Stillbirths	79	39	40
Miscarriages	621	336	285
Abortions	160	82	78
	<b>Panel C: Pregnancy rates by type</b>		
Pregnancies per 1000 women age 15-49	92.1	91.5	92.8
Rates per 1000 pregnancies:			
Live birth pregnancies	861.0	858.9	863.2
Stillbirth pregnancies	12.4	11.7	13.2
Pregnancies miscarried	101.1	104.1	97.8
Pregnancies aborted	25.5	25.2	25.8
<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>Still birth pregnancy:</b> Pregnancy that ends with at least one stillbirth;			
<b>Note:</b> 6 births to women age below 15 years are excluded from analysis.			

**Table 5.2. Pregnancy outcomes by month, 2019**

Months	Pregnancy outcome					No. of live born children			
	All	Miscarriage		Still birth	Live birth <sup>a</sup>	Both sexes	Male	Female	Sex ratio
All months	<b>6,127</b>	<b>160</b>	<b>621</b>	<b>79</b>	<b>5,267</b>	<b>5,267</b>	<b>2,672</b>	<b>2,595</b>	1.0
Jan	498	10	49	7	432	432	198	234	0.8
Feb	456	11	54	5	386	386	187	199	0.9
Mar	521	13	58	4	446	446	231	215	1.1
Apr	445	15	65	6	359	359	185	174	1.1
May	502	20	61	1	420	420	197	223	0.9
Jun	480	12	63	10	395	395	202	193	1.0
Jul	532	12	56	7	457	457	250	207	1.2
Aug	557	14	48	10	485	485	238	247	1.0
Sep	513	12	38	6	457	457	237	220	1.1
Oct	574	12	44	8	510	510	262	248	1.1
Nov	523	8	40	7	468	468	243	225	1.1
Dec	526	21	45	8	452	452	242	210	1.2

<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  
<sup>\*</sup> Births to women under age 15 (5 counts) & age above 49 (2 count) were excluded from this statistics  
<sup>\*\*</sup> 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, 2019**

Age (years)	Both areas		icddr,b service area		Government service area	
	Births	Rate	Births	Rate	Births	Rate
All ages	<b>5,267</b>	<b>80.3</b>	<b>2,756</b>	<b>79.5</b>	<b>2511</b>	<b>81.1</b>
15-19	903	75.4	482	77.9	421	72.8
20-24	1,633	159.4	850	157.9	783	161.1
25-29	1,343	138.8	734	140.3	609	137.1
30-34	927	94.3	460	88.5	467	100.7
35-39	377	42.8	191	41.1	186	44.6
40-44	71	9.4	34	8.3	37	10.6
45-49	13	1.7	5	1.3	8	2.2
Total fertility rate		2609		2577		2646
General fertility rate		80		80		81
Gross reproduction rate		1504		1270		1303
Net reproduction rate		1447		1251		1227

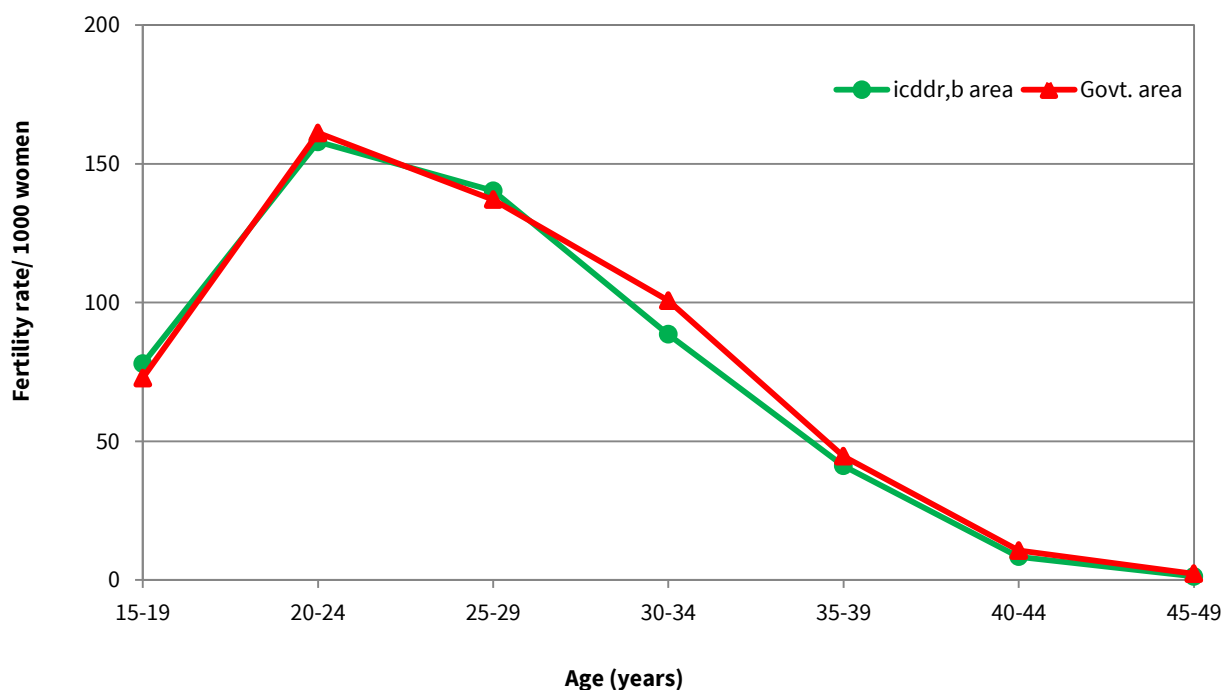
<sup>\*</sup> 4 live births to women under age 15 women age are excluded

**Table 5.4. Percent distribution of pregnancies that ended with live birth by place of delivery by area, 2019**

Place of Delivery	Both areas		icddr,b service area		Govt. service area	
	Number	percent	Number	percent	Number	percent
Home	930	17.9	213	7.8	717	28.9
ICDDR,B sub-centre	17	0.3	16	0.6	1	0.0
ICDDR,B hospital	655	12.6	651	23.9	4	0.2
Upazila health complex	725	13.9	365	13.4	360	14.5
District hospital	171	3.3	80	2.9	91	3.7
Clinic/nursing home	2,639	50.7	1,385	50.9	1,254	50.6
UH & FWC	60	1.2	9	0.3	51	2.1
Others	5	0.1	3	0.1	2	0.1
<b>No. of livebirth</b>	<b>5,202</b>	<b>100</b>	<b>2,722</b>	<b>100</b>	<b>2,480</b>	<b>100</b>

*Source: Birth registration form*  
*Births to mothers under age 15 & age above 49 were excluded from this statistics(4)*

**Figure 5.2. Age-specific fertility rates by area, 2019**



**Table 5.5. Percent distribution of pregnancies that ended with live birth by attendant and area, 2019**

Birth attendant	Both areas		icddr,b service area		Govt. service area	
	Number	percent	Number	percent	Number	percent
TBA	530	10.2	135	5.0	395	15.9
Trained TBA	218	4.2	42	1.5	176	7.1
FWV	282	5.4	138	5.1	144	5.8
Nurse	1,088	20.9	760	27.9	328	13.2
MBBS doctor	3,041	58.5	1,625	59.7	1,416	57.1
Others	14	0.3	6	0.2	8	0.3
None	29	0.6	16	0.6	13	0.5
<b>No. of live birth</b>	<b>5,202</b>	<b>100</b>	<b>2,722</b>	<b>100</b>	<b>2,480</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, 2019**

Mode of Delivery	Both areas		icddr,b service area		Government service area	
	Number	percent	Number	percent	Number	percent
Normal vaginal	2,238	43.0	1,137	41.8	1,101	44.4
Operation (C/S)	2,963	57.0	1,585	58.2	1,378	55.6
Instrumental (forcep & ventose)	1	0.0	0	0.0	1	0.0
<b>No. of live birth</b>	<b>5,202</b>	<b>100</b>	<b>2,722</b>	<b>100</b>	<b>2,480</b>	<b>100</b>

**Table 5.7. Percent distribution of different indicator for ANC visits, 2019**

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

Number of ANC visits:	icddr,b service area	Government service area	Both areas
None	0.6	6.4	3.4
1	1.7	14.2	7.7
2	4.4	26.6	14.9
3	14.6	22.5	18.4
4+	78.7	30.3	55.7
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>median</b>	<b>4</b>	<b>3</b>	<b>4</b>
<b>Number of months pregnant at the time of the first ANC visits</b>			
No ANC	0.6	6.5	3.4
< 4 months	53.6	24.5	39.7
4 - 5 months	35.0	28.1	31.7
6 - 7 months	9.2	29.1	18.7
8 + months	1.6	11.8	6.5
<b>Total</b>	<b>100</b>	<b>100.0</b>	<b>100</b>
<b>Median</b>	<b>3</b>	<b>5</b>	<b>4</b>
<b>Number of women giving live births</b>	<b>2,598</b>	<b>2,511</b>	<b>5,028</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 2019 was 3,358, giving a crude marriage rate of 14 per 1,000 populations. This rate was 12.9 in 2018.

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 28.7 and 20.0 years for all grooms and brides, respectively; 27.5 and 19.0 years for those marrying for the first time—which are almost similar to those of 2018. More than one-third (37.4%) of the brides who are married for the first time aged below 18 years, and 6.7% of the grooms 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 before that date it was consistently below that age.

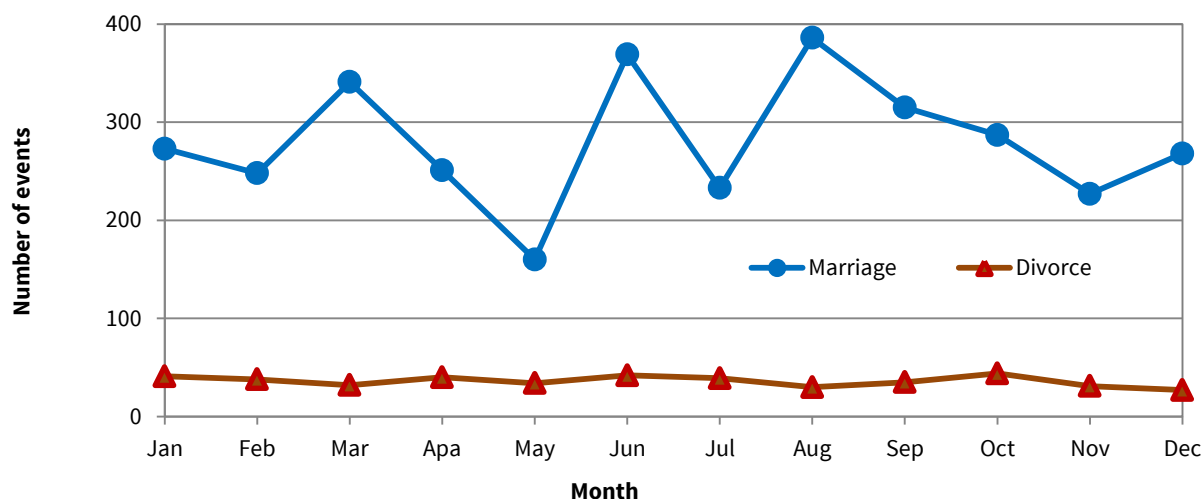
Table 6.3 shows the marriage rates by age and sex. Among males, the marriage rate was 40.3 per 1,000 males aged 10 years and above, and for females, the rate was 31.4 per 1,000 females aged 10 years and above. For females, the highest rate was 222.4 per 1,000 at the age of 18 years, while for males, the highest rate was 295.1 per 1,000 at the age of 27 years. The highest rate of marriage for males decreased to age 27 years in 2019 from 28 years in 2018, but the highest rate of marriage for females was the same to age 18 years in 2019 that of in 2018. Table 6.4 shows the distribution of the current marital status of the study population by age and sex in 2019. Of the total population, 51.0 % were currently married, and it was higher for females than males (53.5% vs. 48.0%). Widows also constituted a higher proportion for females (10.1%) than males (1.3%) - this difference, along with age difference at marriage and life expectancy, may be 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 the bridal party at the time of marriage in 2009-2019. Groom's party received marriage gifts from the bride's family in more than one-fourth 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 the daughter's happiness. The first contract can be regarded as dowry, and its incidence was 26.5% in 2019. The incidence of giving dowry shows a declining trend over time from 2009-2019 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 about 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 the trend in the registration of Muslim marriage and divorce. Marriage registration was 88.3% in 2019, significantly increased with a decreasing trend in recent past years. The 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 408 divorces in 2019 (Appendix A.10), and of them, 221 were divorce of Muslim marriages. 71.9% were registered with Kazi. Table 6.5 shows the mean and median duration 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 44.9 months. Figure 6.1 shows the

distribution of marriages and divorces by month. In 2019 marriages were high in March, June, 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 (27.7%) followed by wife's affairs with other man (18.9%) and husband's affairs with other woman (11.8%).

**Figure 6.1. Number of marriages and divorces by month, 2019**



**Table 6.1 Groom's age at marriage by previous marital status, 2019**

Age (years)	Previous marital status (%)				
	All grooms	Single	Married	Divorced	Widowed
<b>All ages</b>	100.0 (n=3358)	100.0 (n=2870)	100.0 (n=69)	100.0 (n=322)	100.0 (n=97)
10-14	0	0	0	0	0
15-17	0.7	0.8	0	0.3	0.0
18	1.3	1.4	0	0.3	0.0
19	1.7	1.8	1.4	0.6	0.0
20	2.4	2.7	2.9	0.0	0.0
21	2.9	3.2	1.4	0.9	0.0
22-24	13.3	14.8	2.9	5.3	1.0
25-29	41.2	44.9	23.2	23.3	6.2
30-34	25.4	24.9	26.1	34.2	10.3
35-39	6.8	4.6	21.7	20.8	16.5
40-44	1.7	0.7	7.2	5.9	14.4
45-49	1.0	0.1	7.2	4.0	13.4
50-54	0.7	0.0	2.9	2.2	13.4
55-59	0.5	0.0	1.4	0.9	12.4
60-64	0.3	0.0	1.4	0.6	7.2
65+	0.3	0.1	0	0.6	5.2
Median age*	28	28	32	32	45
Mean age*	28.7	27.5	34.1	33.5	45.8
Standard dev.*	6.7	5.1	8.8	7.8	11.3

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

**Table 6.2 Bride's age at marriage by previous marital status, 2019**

Age (years)	All brides	Single	Divorced	Widowed
	100 (n=3358)	100 (n=2892)	100 (n=426)	100 (n=40)
All ages				
10-14	2.8	3.1	0.9	0
15	6.1	6.9	1.2	0
16	10.0	11.3	2.1	0
17	14.3	16.1	3.1	0
18	15.4	17.0	5.9	0
19	11.2	12.0	6.1	2.5
20 - 24	27.2	26.1	35.9	15
25 - 29	7.0	5.4	17.1	20
30 - 34	3.8	1.8	15.5	20
35 - 39	1.3	0.3	6.1	25
40 - 44	0.5	0.0	3.5	5
45 - 49	0.1	0.0	0.9	2.5
50 - 54	0.2	0.0	0.9	5
55 - 59	0.1	0.0	0.5	2.5
60 - 64	0.1	0.0	0.2	2.5
65+	0	0	0	0
Unknown	0	0	0	0
Median age*	19	18	24	32
Mean age*	20	19	25.6	34
Standard dev.*	5.1	3.5	7.7	9.9

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

**Table 6.3 Marriage rates by age and sex, 2019**

Age(years)	Male			Female			
	Marriages	Population	Rate*	Age(years)	Marriages	Population	Rate*
<b>All ages (10+ yrs)</b>	<b>3358</b>	<b>83332</b>	<b>40.3</b>	<b>All ages (10+ yrs)</b>	<b>3358</b>	<b>107,091</b>	<b>31.4</b>
10-14	0	11,900	0.0	10-14	95	12,241	7.8
15-19	121	10,189	11.9	15	204	2,507	81.4
20-24	621	5,766	107.7	16	335	2,528	132.5
25	215	968	222.1	17	480	2,425	197.9
26	246	1,040	236.5	18	516	2,320	222.4
27	270	915	295.1	19	375	2,190	171.2
28	313	1,085	288.5	20-24	914	10,231	89.3
29	341	1,158	294.5	25-29	236	9,672	24.4
30-34	852	6,275	135.8	30-34	126	9,832	12.8
35-39	229	6,289	36.4	35-39	44	8,810	5.0
40-44	58	5,751	10.1	40-44	17	7,563	2.2
45+	92	31,996	2.9	45+	16	36,772	0.4
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, 2019**

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	100	13,099	100	0.0	0.0	0.0	100	12,878
5-9	100	0.0	0.0	0.0	100	12,195	100	0.0	0.0	0.0	100	12,216
10-14	100	0.0	0.0	0.0	100	12,058	98.6	1.4	0.0	0.0	100	12,450
15-19	97.7	2.2	0.0	0.1	100	10,137	60.3	38.0	0.1	1.6	100	12,069
20-24	77.2	21.9	0.0	0.9	100	5,675	13.9	82.9	0.2	3.0	100	10,283
25-29	36.0	62.2	0.1	1.7	100	5,424	3.6	94.0	0.4	2.1	100	9,801
30-34	10.1	88.3	0.1	1.5	100	6,193	1.4	95.5	1.0	2.0	100	9,623
35-39	2.8	95.9	0.2	1.1	100	6,134	0.8	96.0	2.2	1.1	100	8,418
40-44	1.2	97.4	0.3	1.1	100	5,929	0.3	94.0	4.4	1.3	100	7,741
45-49	0.9	97.8	0.5	0.8	100	5,960	0.3	90.5	7.8	1.5	100	7,562
50-54	0.5	98.3	0.7	0.5	100	5,985	0.3	83.7	14.5	1.6	100	7,736
55-59	0.4	97.4	1.8	0.4	100	6,536	0.3	72.1	25.5	2.0	100	6,590
60-64	0.4	95.8	3.3	0.5	100	4,572	0.1	57.9	40.0	2.0	100	4,590
65-69	0.1	93.3	6.1	0.6	100	3,083	0.1	40.9	57.8	1.3	100	3,328
70-74	0.3	89.1	10.0	0.6	100	2,177	0.1	26.3	72.5	1.2	100	2,860
75-79	0.2	84.4	15.1	0.3	100	1,461	0.0	11.8	87.5	0.6	100	1,963
80-84	0.2	75.9	23.5	0.3	100	863	0.1	5.7	94.0	0.2	100	932
85+	0.0	59.3	40.1	0.5	100	549	0.2	1.4	97.8	0.6	100	492
<b>Total</b>	<b>50.2</b>	<b>48.0</b>	<b>1.3</b>	<b>0.5</b>	<b>100</b>	<b>108,030</b>	<b>35.1</b>	<b>53.5</b>	<b>10.1</b>	<b>1.3</b>	<b>100</b>	<b>132,162</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, 2019**

Age at divorce (years)	Male				Female			
	Count	Mean	Median	SD	Count	Mean	Median	SD
< 20	8	9.4	6.5	10.3	123	15.1	16.0	13.8
20 - 24	49	21.6	16.0	21.2	145	31.0	26.0	23.4
25 - 29	131	23.9	18.0	22.9	70	55.0	45.0	44.0
30 - 34	129	35.6	25.0	38.9	44	94.6	96.0	68.0
35 - 39	52	59.8	44.0	48.1	16	100.0	61.0	104.0
40 - 49	37	121.0	108.0	99.5	15	155.0	87.0	140.0
50+	27	99.5	53.0	103.7	20	54.0	6.0	123.0
<b>All ages</b>	<b>433</b>	<b>44.9</b>	<b>24.0</b>	<b>62.0</b>	<b>433</b>	<b>44.0</b>	<b>24.0</b>	<b>62.0</b>

**Table 6.6. Marriages by type of gifts received by grooms' party from bridal party, 2009-2019**

Type of gift received	Year										
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
None	40.1	43.2	57.6	48.5	48.5	53.6	57.5	61.8	64.2	68.7	72.2
Gift without prior negotiation	0.6	0.6	0.9	1.1	0.9	1.4	2.2	2.1	1.8	2.1	1.3
Gift after prior negotiation	59.3	56.2	41.5	50.3	50.6	45.0	40.3	36.0	34.0	29.2	26.5
<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	13.3
Partial	33.7	31.1	22.4	26.8	25.9	24.4	19.0	16.3	14.8	13.5	11.5
Not yet paid*	6.5	6.3	5.8	6.8	5.9	4.5	4.3	4.2	3.5	3.6	3.2

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



**Table 6.7. Registration status of Muslim marriages and divorces, 2004-2019**

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
2019	2676	88.3	221	71.9

**Table 6.8. Causes of divorces by area, Matlab, 2019**

Cause of Divorce	Both areas		icddr,b area		Government area	
	Count	Percent	Count	Percent	Count	Percent
Dowry	5	1.2	3	1.39	2	0.9
Domestic violence	23	5.3	10	4.63	13	6.0
Husbands affairs with other woman	51	11.8	24	11.11	27	12.4
Wife affairs with other man	82	18.9	42	19.44	40	18.4
Wife maladjustment with husband/family	120	27.7	64	29.63	56	25.8
Husband addicted to drug or gambling	24	5.5	11	5.09	13	6.0
No trace of husband	21	4.9	13	6.02	8	3.7
Husband/wife not good looking	14	3.2	6	2.78	8	3.7
Husband mentally/physically disable	28	6.5	13	6.02	15	6.9
Wife mentally/physically disable	19	4.4	8	3.70	11	5.1
Others/unspecified	46	10.6	22	10.19	24	11.1
<b>Total</b>	<b>433</b>	<b>100</b>	<b>216</b>	<b>100</b>	<b>217</b>	<b>100</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 which has permanently moved into the surveillance area. Those who stay in the area continuously for at least six 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 2019, a total of 11,065 persons (5,515 males and 5,550 females) moved into the HDSS area, which represented an annual average in-migration of 50.8 and 42.0 per 1000 population for males and females, respectively. On the other hand, 12,705 persons (6,116 males and 6,589 females) left the HDSS area or, on average 56.3 and 49.9 per 1000 population for both males and females respectively (Table 7.1 and Appendix A.11). In 2019 the highest incidence of in-migration for males was 12.8% in the age group 25-29, and for females was 10.0% in the age group 20-24. The highest out-migration was 14.6% in the age group 20-24 for males and 13.0% for females in age group 15-19. More males out-migrated than females in the age group (20-29). 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 2019. 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 2019 than those in 2018. The net gain of the population due to migration was -6.8 per 1,000 population in 2019; it, was -8.9 per 1,000 population in 2018. 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, June and August is the preferred months 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 areas, females predominantly for marriage and males predominantly for seeking jobs. There is a net loss of both men and women to an 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, 2019**

Age (years)	Both sexes		Male		Female	
	In	Out	In	Out	In	Out
<b>All ages</b>	<b>46.0</b>	52.8	<b>50.8</b>	56.3	<b>42.0</b>	<b>49.9</b>
0 - 4	57.4	59.0	59.0	60.7	55.7	57.3
5-9	36.0	40.4	37.9	43.2	34.1	37.7
10-14	26.9	36.3	27.9	41.1	25.9	31.6
15-19	70.8	114.2	37.9	95.5	98.7	130.2
20-24	93.2	131.5	81.2	146.4	100.0	123.1
25-29	88.3	89.5	128.0	114.6	67.1	76.1
30-34	72.4	64.9	117.5	92.9	43.6	47.0
35-39	50.1	43.5	85.7	69.2	24.6	25.2
40-44	37.0	30.4	61.7	43.6	18.2	20.4
45-49	28.6	25.5	47.4	37.4	13.2	15.7
50-54	21.8	17.9	35.9	21.0	10.9	15.5
55-59	18.6	15.0	23.2	14.1	14.2	15.8
60-64	12.1	13.6	12.5	12.7	11.7	14.6
65+	11.5	17.3	10.0	14.1	12.7	20.1

**Table 7.2. Number of in- and out-migrations by sex and month, 2019**

Month	In-migration			Out-migration		
	Both sexes	Male	Female	Both sexes	Male	Female
<b>All months</b>	<b>11,065</b>	<b>5,515</b>	<b>5,550</b>	<b>12,705</b>	<b>6,116</b>	<b>6,589</b>
Jan	1,356	654	702	1,732	831	901
Feb	964	448	516	1,106	520	586
Mar	950	466	484	1,125	555	570
Apr	968	498	470	1,141	556	585
May	929	462	467	935	489	446
Jun	1,142	553	589	1,227	571	656
Jul	775	400	375	986	520	466
Aug	1,154	547	607	1,317	618	699
Sep	766	381	385	922	410	512
Oct	733	395	338	820	397	423
Nov	648	337	311	685	348	337
Dec	680	374	306	709	301	408

Figure 7.1. In- and out-migrations rates by sex and age in Matlab, 2019

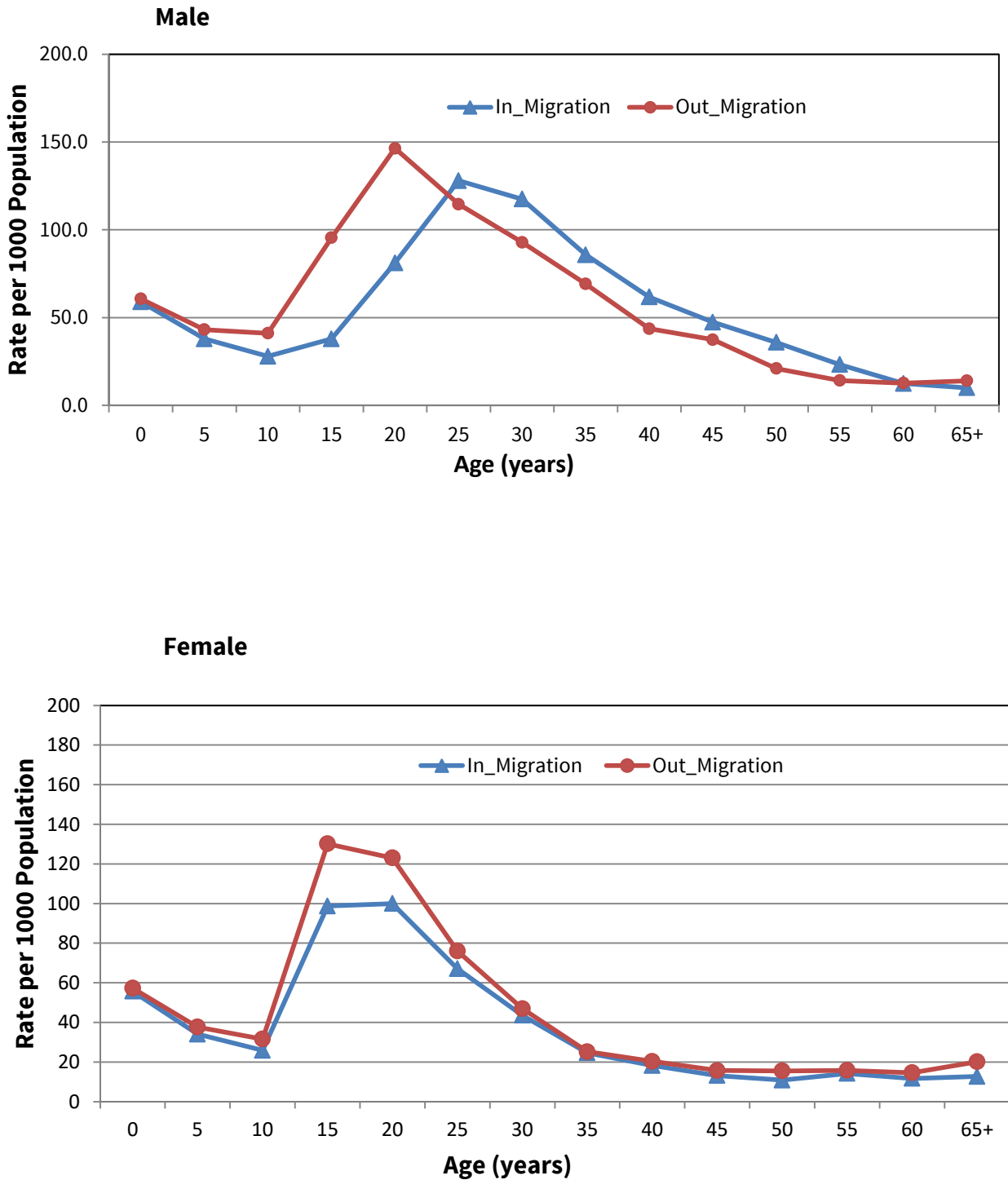
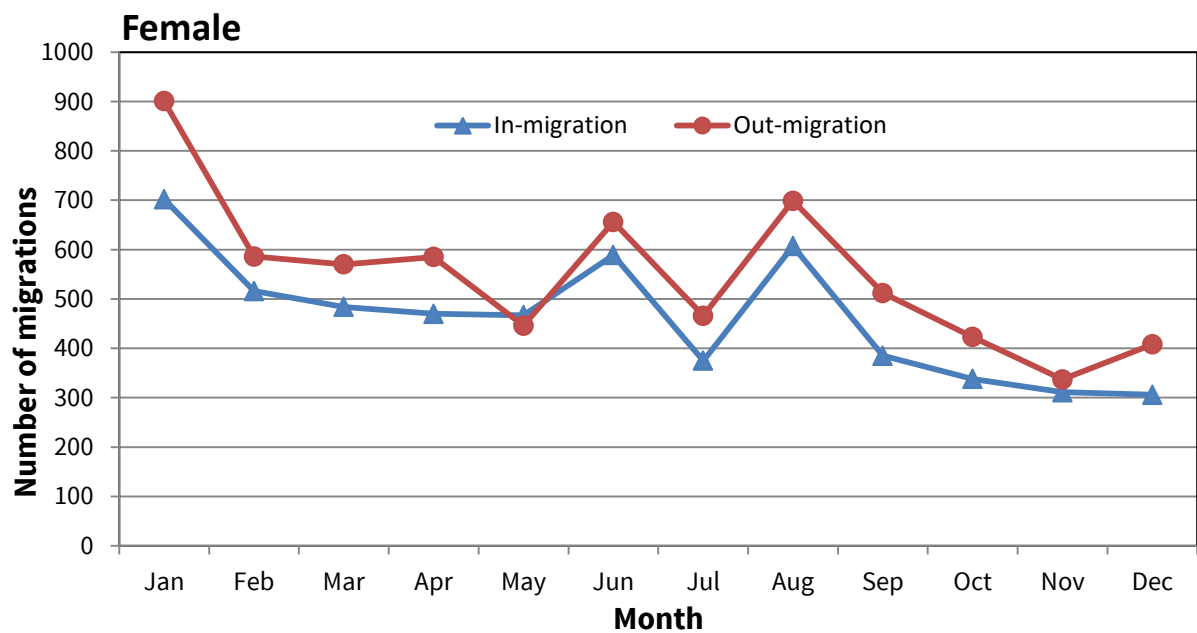
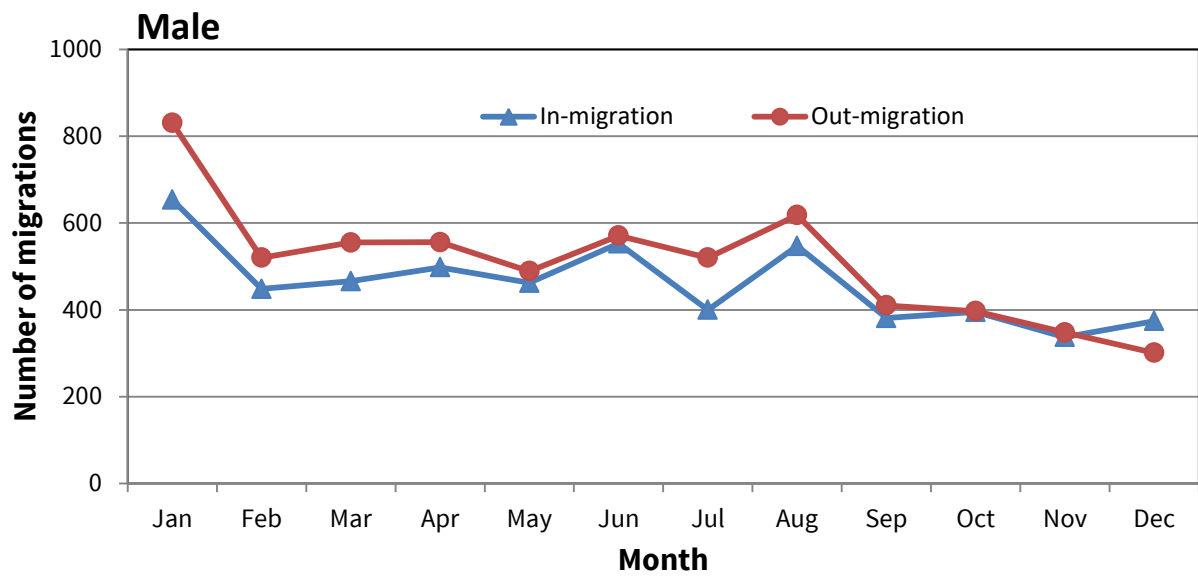


Figure 7.2. Number of in- and out-migrations by sex and month in Matlab, 2019



## CHAPTER 8

### FERTILITY REGULATION

In the icddr,b service area, maternal and child health services such as immunization and family planning (MCH-FP) services have been provided in addition to the Government health service system since 1978. icddr,b's maternal health services include a 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 encourage 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 also provide health services in icddr,b service area. In the Government service area, services are provided by the Government health system and other private and NGO service systems.

The 38 surveillance CHRWs in both icddr,b, and Government service areas record family planning methods used by couples during the current visiting month and the previous month by asking eligible women during their bi-monthly and three monthly (randomly selected half of the area) home visits. In 2019, the contraceptive use rate was 43.2% 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 2019 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, pill (32.6%) is the most widely-used method, followed by injectables (30.5%), tubectomy (13.5%) and condom (12.2%). Changes in the method-mix in the icddr,b service area during 2001-2019 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 the late 40's of women's life. In the icddr,b service area, women aged 20 years and over are more likely to use pill, followed by injectables, 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, 1987-2019**

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	-
2001	69.7	-	-	50.8
2002	70.5	51.4	-	53.4
2003	69.6	47.2	-	-
2004	70.4	48.1	41	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
2014	53.9	41.9	47.8	62.4
2015	51.4	40.9	-	-
2016	49	38.6	-	-
2017	47.7	36.8	-	61.9
2018	43.9	35.1	-	-
2019	43.2	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			
	icddr,b service area, 2019	Government service area, 2019	Rural Chittagong (BDHS 2014)	National (BDHS 2017-18)
Pill	32.6	39.8	43	41
Condom	12.2	9.3	7.2	11.6
Injectables	30.5	24.1	25.7	17.3
IUD	1.1	1.2	1.3	1
Tubectomy	13.5	15.5	5.9	7.8
Vasectomy	1.7	0.9	0.8	1.8
Norplant/Implant	5.7	4.3	2.2	3.4
Others*	2.7	4.9	13.8	16.2
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</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, 2001-2019**

Method	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
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	33.6
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	12.5
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	31.4
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	1.1
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	13.9
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	1.8
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	5.8
<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>	<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, 2019**

Age (years)	Not using	Any method used	Method used								No. of women
			Pill	IUD	Injectables	Condom	Tubectomy	Vasectomy	Others*	Norplant	
<20	81.4	18.6	6.7	0.18	6.6	3.28	0	0.0	0.1	1.7	2,224
20 – 24	68.9	31.1	12.6	0.3	10.3	4.77	0.1	0.0	0.5	2.5	4,342
25 - 29	61.2	38.8	14.4	0.6	13.1	5.88	1.5	0.1	0.7	2.5	4,663
30 - 34	53.3	46.7	17.1	0.6	14.9	5.23	4.6	0.5	1.1	2.8	4,762
35 - 39	45.6	54.4	17.4	0.5	15.7	6.11	9.6	0.9	1.3	2.9	4,175
40 - 44	42.8	57.2	15.3	0.6	15.3	5.8	13.5	1.8	2.4	2.3	3,672
45 - 49	51.6	48.4	10.3	0.3	13.6	4.66	13.0	2.3	2.3	1.8	2,746
<b>Total</b>	<b>56.7</b>	<b>43.3</b>	<b>14.1</b>	<b>0.5</b>	<b>13.2</b>	<b>5.3</b>	<b>5.8</b>	<b>0.7</b>	<b>1.2</b>	<b>2.5</b>	<b>26,584</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, 2019**

Age (years)	Not using	Any method used	Method used								No. of Women
			Pill	IUD	Injectables	Condom	Tubectomy	Vasectomy	Others*	Norplant	
<20	85.3	14.8	7.2	0.0	2.54	3.6	0	0	0.56	0.81	1,300
20 – 24	75.4	24.6	12.1	0.4	6.39	3.5	0.2	0.1	0.88	1.04	3,697
25 - 29	69.1	30.9	15.0	0.2	7.77	4.0	1.2	0.1	1.1	1.53	3,938
30 - 34	61.1	38.9	16.5	0.7	10.13	3.3	4.9	0.4	1.09	2	4,286
35 - 39	53.1	46.9	17.3	0.6	11.37	3.3	9.8	0.5	2.32	1.81	3,836
40 - 44	55.0	45.0	15.1	0.6	10.11	2.8	10.9	0.6	3.2	1.73	3,265
45 - 49	62.7	37.4	10.1	0.2	7.96	1.8	12.1	0.8	3.5	1.13	2,747
<b>Total</b>	<b>64.9</b>	<b>35.1</b>	<b>14.0</b>	<b>0.41</b>	<b>8.45</b>	<b>3.3</b>	<b>5.5</b>	<b>0.3</b>	<b>1.72</b>	<b>1.5</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 the Hemophilus influenza type B (Hib) vaccine in the form of a 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 2019 and the Government service area from 2000 to 2019. In 2019, 99.6% received BCG, 96.0% received three doses of pentavalent and polio and 83.5% received measles-rubella vaccines in icddr,b area and 99.5% received BCG, 95.0% received three doses of pentavalent and polio and 81.2% received measles-rubella (MR) vaccine in Government service area.

We observed a decrease of approximately four percentage points in all vaccine coverage in 2019 compared to 2018. The decline, mainly due to the decrease 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, 1987-2019 and Government service area, 2000-2019**

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
2019	99.6	99.5	96.0	95.0	83.5	81.2	83.3	80.7

\*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 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 area. 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 to explain temporal and geographical variations of morbidity, mortality, and other public health issues, to target interventions to the high-risk areas, and to ensure efficient use of scarce resources. However, using GIS information in developing and underdeveloped 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 a 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 important 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 a proxy for 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, Inoue 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, 2019**

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	<b>42,862</b>	<b>19,559</b>	<b>23,303</b>	<b>35,051</b>	<b>15,808</b>	<b>19,243</b>	<b>25,513</b>	<b>11,576</b>	<b>13,937</b>	<b>22,730</b>	<b>10,199</b>	<b>12,531</b>
<b>Under 1</b>	<b>891</b>	<b>433</b>	<b>458</b>	<b>815</b>	<b>402</b>	<b>413</b>	<b>503</b>	<b>249</b>	<b>254</b>	<b>458</b>	<b>231</b>	<b>227</b>
<b>1 - 4</b>	<b>3,675</b>	<b>1,859</b>	<b>1,816</b>	<b>3,166</b>	<b>1,579</b>	<b>1,587</b>	<b>2,187</b>	<b>1,135</b>	<b>1,052</b>	<b>1,789</b>	<b>922</b>	<b>867</b>
1	887	435	27-Mar	778	402	376	542	278	264	448	211	237
2	924	459	Apr-01	772	375	397	530	275	255	443	233	210
3	887	462	425	876	433	443	563	307	256	450	247	203
4	977	503	474	740	369	371	552	275	277	448	231	217
5-9	4,548	2,299	2,249	3,585	1,758	1,827	2,566	1,301	1,265	2,176	1,089	1,087
10-14	4,310	2,206	2,104	3,550	1,814	1,736	2,503	1,189	1,314	2,244	1,073	1,171
15-19	3,779	1,700	2,079	3,219	1,423	1,796	2,227	1,036	1,191	2,118	997	1,121
20-24	2,932	1,097	1,835	2,417	840	1,577	1,598	550	1,048	1,430	516	914
25-29	2,826	955	1,871	2,276	814	1,462	1,614	538	1,076	1,230	407	823
30-34	3,088	1,178	1,910	2,332	961	1,371	1,690	663	1,027	1,407	521	886
35-39	2,791	1,204	1,587	2,216	958	1,258	1,637	697	940	1,371	515	856
40-44	2,511	1,095	1,416	1,955	855	1,100	1,472	670	802	1,320	566	754
45-49	2,444	1,161	1,283	1,937	856	1,081	1,512	687	825	1,358	615	743
50-54	2,476	1,129	1,347	1,902	821	1,081	1,498	634	864	1,391	610	781
55-59	2,209	1,079	1,130	1,884	933	951	1,440	723	717	1,490	731	759
60-64	1,579	823	756	1,288	657	631	1,127	569	558	1,043	542	501
65-69	1,033	507	526	955	460	495	719	352	367	720	358	362
70-74	821	368	453	664	277	387	541	247	294	506	200	306
75-79	512	232	280	481	193	288	390	177	213	358	140	218
80-84	272	145	127	235	118	117	194	99	95	223	108	115
85+	165	89	76	174	89	85	95	60	35	98	58	40



**Appendix A-1b: Mid-year population in Government service area by age, sex and block, 2019**

Age	Block-E			Block-F			Block-G		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
All ages	40,817	18,372	22,445	37,754	17,095	20,659	36,077	16,033	20,044
<b>Under 1</b>	819	442	377	807	408	399	845	417	428
<b>1 - 4</b>	3519	1775	1744	3229	1589	1640	3161	1593	1568
1	904	445	459	826	420	406	785	382	403
2	867	455	412	820	419	401	799	392	407
3	879	426	453	807	373	434	751	380	371
4	869	449	420	776	377	399	826	439	387
5-9	4,184	2,066	2,118	3,815	1,939	1,876	3,643	1,824	1,819
10-14	4,199	2,041	2,158	3,646	1,796	1,850	3,689	1,781	1,908
15-19	4,027	1,910	2,117	3,426	1,607	1,819	3,363	1,516	1,847
20-24	2,621	928	1,693	2,605	1,039	1,566	2,394	796	1,598
25-29	2,387	833	1,554	2,374	846	1,528	2,131	773	1,358
30-34	2,612	985	1,627	2,570	1,063	1,507	2,408	904	1,504
35-39	2,560	1,028	1,532	2,315	950	1,365	2,209	937	1,272
40-44	2,126	879	1,247	1,969	852	1,117	1,961	834	1,127
45-49	2,317	1,029	1,288	2,127	910	1,217	1,927	865	1,062
50-54	2,373	1,080	1,293	2,095	880	1,215	1,993	841	1,152
55-59	2,354	1,124	1,230	2,180	1,026	1,154	1,975	965	1,010
60-64	1,656	844	812	1,601	843	758	1,536	694	842
65-69	1,193	567	626	1,015	516	499	1,024	485	539
70-74	866	381	485	824	356	468	779	334	445
75-79	572	239	333	613	247	366	572	238	334
80-84	291	145	146	346	140	206	286	138	148
85+	141	76	65	197	88	109	181	98	83

**Appendix A-2a Deaths in icddr,b service area by age, sex and block, 2019**

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	<b>294</b>	<b>166</b>	<b>128</b>	<b>293</b>	<b>165</b>	<b>128</b>	<b>159</b>	<b>88</b>	<b>71</b>	<b>160</b>	<b>91</b>	<b>69</b>
Under 1 year	24	13	11	14	7	7	20	16	4	11	6	5
< 7 days	14	8	6	8	2	6	12	9	3	6	4	2
7-29 days	5	3	2	1	1	0	4	3	1	3	2	1
1- 5 months	3	0	3	1	1	0	2	2	0	1	0	1
6-11 months	2	2	0	4	3	1	2	2	0	1	0	1
1 - 4 years	7	2	5	3	1	2	1	1	0	2	1	1
1	4	1	3	1	0	1	0	0	0	2	1	1
2	2	1	1	0	0	0	1	1	0	0	0	0
3	0	0	0	1	0	1	0	0	0	0	0	0
4	1	0	1	1	1	0	0	0	0	0	0	0
5-9	2	2	0	3	2	1	1	1	0	1	0	1
10-14	2	2	0	2	1	1	0	0	0	0	0	0
15-19	4	1	3	4	2	2	0	0	0	2	2	0
20-24	2	2	0	4	2	2	0	0	0	0	0	0
25-29	3	1	2	4	2	2	0	0	0	1	1	0
30-34	2	2	0	1	0	1	1	0	1	0	0	0
35-39	3	2	1	5	1	4	1	0	1	0	0	0
40-44	9	6	3	6	3	3	3	2	1	3	1	2
45-49	10	8	2	13	9	4	4	2	2	6	2	4
50-54	19	4	15	17	9	8	9	4	5	8	7	1
55-59	23	17	6	31	22	9	11	5	6	9	5	4
60-64	28	13	15	33	25	8	16	11	5	11	6	5
65-69	25	21	4	22	13	9	15	7	8	16	10	6
70-74	41	21	20	27	13	14	22	10	12	18	9	9
75-79	42	22	20	30	17	13	17	11	6	21	13	8
80-84	22	13	9	37	19	18	19	9	10	26	10	16
85+	26	14	12	37	17	20	19	9	10	25	18	7

**Appendix A-2b Deaths in Government service area by age, sex and block, 2019**

Age (years)	BLOCK-E			BLOCK-F			BLOCK-G		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
All ages	324	172	152	291	129	162	291	155	136
Under 1 year	29	19	10	20	13	7	23	17	6
	0			0			0		
< 7 days	14	11	3	15	11	4	14	12	2
7-29 days	7	4	3	1	1	0	5	4	1
1-5 months	7	3	4	2	1	1	2	0	2
6-11 months	1	1	0	2	0	2	2	1	1
	0			0			0		
1-4 years	9	3	6	10	7	3	6	3	3
1	6	2	4	5	3	2	2	1	1
2	1	1	0	0	0	0	2	0	2
3	0	0	0	4	3	1	2	2	0
4	2	0	2	1	1	0	0	0	0
5-9	3	1	2	3	2	1	2	2	0
10-14	0	0	0	3	3	0	4	3	1
15-19	1	1	0	2	1	1	3	2	1
20-24	0	0	0	2	0	2	3	1	2
25-29	3	1	2	4	2	2	0	0	0
30-34	4	1	3	2	1	1	3	1	2
35-39	3	1	2	7	2	5	1	1	0
40-44	2	2	0	4	2	2	9	4	5
45-49	10	7	3	7	4	3	4	4	0
50-54	9	5	4	9	4	5	12	7	5
55-59	24	17	7	16	8	8	18	9	9
60-64	30	18	12	29	15	14	22	14	8
65-69	39	22	17	21	11	10	34	23	11
70-74	45	24	21	35	14	21	25	13	12
75-79	46	15	31	33	8	25	45	23	22
80-84	42	23	19	35	13	22	38	14	24
85+	25	12	13	49	19	30	39	14	25

**Appendix A-3 Abridged life table for icddr,b service area by sex, 2019**

Age (years)	Male				Female			
	nq <sub>x</sub>	l <sub>x</sub>	L <sub>x</sub>	e0 <sub>x</sub>	nq <sub>x</sub>	l <sub>x</sub>	L <sub>x</sub>	e0 <sub>x</sub>
0	31.9	100000	97285	69.7	20.0	100000	98303	74.6
1	1.5	96806	96720	71.0	3.8	98003	97786	75.1
2	1.5	96660	96588	70.1	0.8	97635	97598	74.4
3	0.0	96516	96516	69.2	0.8	97561	97525	73.5
4	0.7	96516	96481	68.2	0.7	97488	97451	72.5
5	3.9	96446	481371	67.3	1.6	97415	486727	71.6
10	2.4	96073	479837	62.5	0.8	97264	486141	66.7
15	4.8	95844	478150	57.7	4.0	97187	485031	61.7
20	6.6	95380	475441	52.9	1.9	96795	483560	57.0
25	7.3	94747	472130	48.3	3.8	96615	482225	52.1
30	3.0	94051	469604	43.6	1.9	96246	480805	47.3
35	4.4	93768	467883	38.7	6.4	96061	478878	42.4
40	18.7	93352	462735	33.9	11.0	95442	474789	37.6
45	31.2	91609	451434	29.5	15.2	94393	468661	33.0
50	36.9	88753	436169	25.4	35.0	92962	457268	28.5
55	68.4	85476	413741	21.2	34.6	89706	441346	24.4
60	101.1	79626	379244	17.6	65.4	86605	419824	20.2
65	141.9	71576	333864	14.3	74.5	80941	390634	16.4
70	217.3	61423	275035	11.2	175.0	74914	343336	12.5
75	350.7	48074	198575	8.6	211.4	61800	277649	9.6
80	425.8	31214	122472	6.9	450.0	48737	187866	6.5
85+	1000.0	17924	91477	5.1	1000.0	26806	129107	4.8

**Appendix A-4 Abridged life table for Government service area by sex, 2019**

Age (years)	Male				Female			
	nq <sub>x</sub>	l <sub>x</sub>	L <sub>x</sub>	e0 <sub>x</sub>	nq <sub>x</sub>	l <sub>x</sub>	L <sub>x</sub>	e0 <sub>x</sub>
0	38.7	100000	96713	69.7	19.1	100000	98376	73.3
1	4.8	96133	95860	71.5	5.5	98090	97771	73.7
2	0.8	95671	95633	70.8	1.6	97550	97470	73.1
3	4.2	95596	95393	69.9	0.8	97390	97351	72.3
4	0.8	95191	95153	69.2	1.7	97312	97232	71.3
5	4.3	95116	474641	68.3	2.6	97151	485180	70.4
10	5.3	94709	472381	63.5	0.8	96901	484316	65.6
15	4.0	94204	470160	58.9	1.7	96819	483710	60.7
20	1.8	93831	468762	54.1	4.1	96652	482343	55.8
25	6.1	93661	466988	49.2	4.5	96254	480275	51.0
30	5.1	93090	464360	44.5	6.4	95822	477685	46.2
35	6.8	92618	461628	39.7	8.4	95204	474183	41.5
40	15.5	91984	456633	34.9	10.0	94408	469865	36.8
45	26.4	90560	447265	30.4	8.4	93465	465522	32.1
50	28.2	88167	435086	26.2	19.0	92682	459353	27.4
55	53.2	85682	417808	21.9	34.8	90925	447299	22.9
60	94.3	81122	387677	18.0	68.2	87762	424849	18.6
65	164.6	73469	338606	14.5	108.4	81774	388046	14.8
70	213.7	61376	275390	11.9	176.9	72912	333837	11.2
75	275.1	48262	208986	9.4	318.4	60017	253086	8.1
80	454.2	34984	134428	7.0	487.1	40907	153269	5.7
85+	1000.0	19094	111171	5.8	1000.0	20982	79299	3.8

Appendix A-5 Male deaths by cause and age, 2019

Cause	All ages	Age at death (years)																		
		<1	1-4	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	5-9	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
<b>Communicable Disease</b>																				
Diarrhoea	5	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	1	1	
Tuberculosis	21	0	0	0	0	0	0	0	0	0	0	1	2	3	4	2	3	3	3	
EPI Related	1	0	0	1	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	1	0	0	0	0	0	0	0	0	
Hepatitis	8	0	0	0	0	0	0	0	1	0	1	0	1	0	3	1	1	0	0	
Respiratory Infections	17	3	1	0	0	0	0	0	1	2	0	3	0	2	1	1	0	0	3	
Septicaemia	18	1	1	0	0	0	0	0	0	0	3	0	1	1	1	2	3	3	2	
All Other Communicable Disease	5	0	0	0	2	0	0	0	0	0	0	1	0	0	0	2	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	
Neonatal condition																				
-Premature and LBW	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-Birth Asphyxia	19	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-Other Neonatal	43	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Nutritional Deficiencies</b>																				
<b>Non-communicable Diseases</b>																				
Malignant neoplasm																				
-Neoplasm	100	1	1	1	1	1	1	0	0	2	4	1	4	15	31	12	10	6	8	
Congenital Malformation																				
-All Non-Malignant Neoplasms	16	14	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	
Endocrine disorder																				
-Diabetes	12	0	0	0	1	0	0	0	0	0	0	1	2	2	1	2	1	1	1	
-Other Endocrine Disorders	3	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	
Neuro-psychiatric																				
Disease of circulatory system	10	1	1	1	0	1	2	0	0	0	0	0	0	2	1	0	0	1	0	
-Hypertensive Diseases	7	0	0	0	0	0	0	0	0	2	0	1	1	0	0	0	1	2	0	
-Ischaemic Heart Diseases	200	0	0	0	1	0	0	1	2	1	10	0	14	26	24	32	23	22	26	
-Pulmonary heart disease and di	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
-Stroke	179	0	0	0	1	0	1	1	1	5	7	0	3	12	15	23	29	28	31	
-Other forms of heart disease	78	0	1	0	0	1	0	1	1	0	1	0	5	8	5	10	10	11	7	
-Other Circulatory System Disease	28	0	0	0	0	0	1	0	0	0	0	0	2	1	4	4	11	2	3	
Respiratory Disease																				
-COPD	60	0	0	0	0	0	0	0	0	4	0	2	4	6	7	9	10	10	8	
-All Other Respiratory Diseases	6	0	0	0	0	0	0	1	0	0	0	0	0	2	1	0	1	0	1	
Digestive Diseases																				
Gentio-urinary disease	28	0	0	0	0	0	0	0	0	3	3	0	3	4	2	3	3	3	1	
-Kidney Diseases	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
-Renal Failure	6	0	0	0	0	0	1	0	0	0	0	0	1	0	0	2	1	1	0	
-Other Urinary	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
All Other Non-Communicable Disease	3	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	
<b>Injuries</b>																				
Unintentional Disease																				
-Transport Accidents	16	0	0	0	0	0	0	1	2	1	0	1	2	1	2	2	1	1	2	
-Falls	8	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	2	0	3	
-Drowning	16	0	10	1	1	0	0	0	1	0	1	0	0	0	0	0	0	2	0	
-Fire	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
-Poisoning	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-Other External Causes of Accident	10	1	2	1	1	0	0	0	0	1	1	0	1	0	0	0	0	2	0	
Intentional injuries																				
-Suicide	5	0	0	2	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	
-Homicide	3	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	
-Other External Causes of Mortality	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
<b>Miscellaneous</b>																				
-Fever of unknown Origin	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	
-Sudden Infant Death	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Unknown/ missing</b>																				
	15	1	0	1	0	0	0	0	0	0	0	0	1	1	1	0	2	3	5	
<b>Total</b>	965	91	18	9	9	5	7	5	7	19	36	10	41	83	102	107	104	108	100	104

COPD=Chronic Obstructive Pulmonary Disease.

Appendix A-6 Female deaths by cause and age, 2019

Cause	Age at death (years)																			
	All ages	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
<b>Communicable Diseases</b>																				
Diarrhoea	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3
Tuberculosis	3	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Meningitis	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0
Respiratory Infections	19	8	0	0	0	1	0	0	0	0	0	0	1	1	1	1	1	0	3	3
Septicaemia	31	1	2	1	0	0	0	0	0	0	1	0	0	1	2	0	3	1	6	13
<b>Maternal and Neonatal Conditions</b>																				
Maternal Deaths	9	0	0	0	0	0	2	1	3	1	0	2	0	0	0	0	0	0	0	0
Neonatal condition																				
-Premature and Low Birth Weight	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Birth Asphyxia	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-All Other Neonatal Conditions	21	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Nutritional Deficiencies</b>																				
1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Non-communicable Diseases</b>																				
Malignant neoplasm																				
-Neoplasm	77	0	2	0	1	0	0	4	1	1	3	7	9	17	14	4	7	6	1	0
-Neoplasms of female	7	0	0	0	0	0	0	0	0	0	1	0	4	2	0	0	0	0	0	0
Congenital Malformation	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Endocrine disorder																				
-Diabetes	16	0	0	0	0	0	0	0	0	1	1	0	0	2	4	1	2	3	1	1
-All Other Endocrine Disorders	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Disease of circulatory system																				
-Heart Diseases	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
-Hypertensive Diseases	9	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	2	1	1	1
-Ischaemic Heart Diseases	103	0	0	0	0	1	1	0	0	2	3	9	8	8	9	21	13	12	16	16
-Pulmonary heart disease and di	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
-Stroke	248	0	0	0	0	0	0	0	1	2	3	6	7	17	21	39	59	51	42	42
-Other forms of heart disease	77	0	1	0	0	1	0	0	1	2	1	3	4	3	11	10	7	21	12	12
-All Other Circulatory System Disease	42	0	0	0	0	0	0	0	0	0	0	2	1	2	7	10	12	6	2	2
Respiratory disease																				
-COPD	26	0	0	0	0	0	0	0	0	0	0	0	2	0	6	1	5	4	3	5
-All Other Respiratory Diseases	4	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	1	0	0
Digestive Diseases																				
23	0	0	0	0	1	1	0	0	2	1	0	5	1	3	3	0	2	1	3	3
SIRS, Infectious Disease																				
1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Dengue																				
1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Gentio-urinary disease																				
-Kidney Diseases																				
1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
-Renal Failure																				
6	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	3	0	0	0
-All Other Non-Communicable Dis																				
2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
<b>Injuries</b>																				
Unintentional injuries																				
-Transport Accidents																				
1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-Falls																				
19	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	2	3	3	8	8
-Drowning																				
21	0	14	2	0	0	0	0	1	1	0	1	0	0	0	0	0	1	1	0	0
-Fire																				
2	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
-All Other External Causes of Accidental injuries																				
3	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
Intentional injuries																				
-Suicide																				
11	0	0	0	1	4	1	1	0	1	1	1	1	0	0	0	0	0	0	0	0
-Homicide																				
1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
-All Other External Causes of Mortality																				
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
<b>Miscellaneous</b>																				
-Fever of unknown Origin																				
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
-Sudden Infant Death																				
1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Unknown/missing</b>																				
32	0	0	0	0	0	0	0	1	0	0	0	1	2	2	3	8	6	8	1	1
<b>Total</b>	<b>847</b>	<b>49</b>	<b>20</b>	<b>5</b>	<b>2</b>	<b>7</b>	<b>6</b>	<b>8</b>	<b>9</b>	<b>12</b>	<b>16</b>	<b>18</b>	<b>44</b>	<b>50</b>	<b>67</b>	<b>64</b>	<b>114</b>	<b>124</b>	<b>120</b>	<b>112</b>

COPD=Chronic obstructive pulmonary disease

**Appendix A-7 Male deaths by cause, age and area, 2019**

Cause	All ages		<1		1-4		5-14		15-44		45-64		65-84		85+	
	Govt.	icddr.jp	Govt.	icddr.jp	Govt.	icddr.jp	Govt.	icddr.jp	Govt.	icddr.jp	Govt.	icddr.jp	Govt.	icddr.jp	Govt.	icddr.jp
	<b>Communicable Diseases</b>															
Diarrhoea	3	2	0	0	0	0	0	0	1	2	0	0	1	1	0	
Tuberculosis	10	11	0	0	0	0	0	0	0	2	4	7	5	1	2	
EPI Related	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	
Meningitis	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
Hepatitis	4	4	0	0	0	0	0	0	1	2	0	1	4	0	0	
Respiratory Infections	10	7	0	3	1	0	0	1	0	6	1	1	1	1	2	
Septicaemia	7	11	1	0	0	1	3	0	0	0	2	2	7	1	1	
All Other Communicable Disease	2	3	0	0	0	0	0	0	1	0	1	1	1	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	
Neonatal condition																
-Premature and LBW	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	
-Birth Asphyxia	11	8	11	8	0	0	0	0	0	0	0	0	0	0	0	
-All Other Neonatal Conditions	27	16	27	16	0	0	0	0	0	0	0	0	0	0	0	
<b>Nutritional Deficiencies</b>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<b>Non-communicable Diseases</b>																
Malignant neoplasm																
-Neoplasm	42	58	1	0	0	1	1	1	3	2	20	34	17	19	0	1
-Neoplasm in female organ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Congenital Malformation	5	11	4	10	0	0	1	1	0	0	0	0	0	0	0	0
All Non-Malignant Neoplasms	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Endocrine disorder																
-Diabetes	7	5	0	0	0	0	0	0	1	3	2	4	1	0	1	
-Other Endocrine Disorders	0	3	0	1	0	0	0	1	0	0	0	0	1	0	0	
Neuro-psychiatric	8	2	0	1	1	0	1	0	2	1	2	0	2	0	0	0
Disease of circulatory system																
-Hypertensive Diseases	3	4	0	0	0	0	0	0	0	2	2	1	2	0	0	
-Ischaemic Heart Diseases	88	112	0	0	0	0	0	0	2	3	31	43	49	54	6	12
-Pulmonary heart disease and di	2	0	0	0	0	0	0	0	0	0	0	1	0	1	0	
-Stroke	84	95	0	0	0	0	0	0	2	7	14	23	51	17	14	
-Other forms of heart disease	42	36	0	0	1	0	0	0	2	1	10	9	20	18	9	8
-All Other Circulatory System Disease	13	15	0	0	0	0	0	0	1	0	2	1	8	13	2	1
Respiratory disease																
-COPD	23	37	0	0	0	0	0	0	0	7	9	14	22	2	6	
-Asthma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-Other Respiratory Diseases	3	3	0	0	0	0	0	0	1	0	1	1	1	0	1	
Digestive Diseases	11	17	0	0	0	0	0	0	1	2	6	6	4	8	0	1
Gentio-urinary disease																
-Kidney Diseases	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	
-Renal Failure	3	3	0	0	0	0	0	0	1	1	0	2	2	0	0	
-Nephritic syndrome																
-Renal tubulo-interstitial diseases																
-Noninflammatory disorder of female genital tract																
-Other Urinary	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
Other Non-Communicable Disease	1	2	0	0	0	0	0	0	0	1	1	0	0	0	0	1
<b>Injuries</b>																
Unintentional injuries																
-Accidents	4	12	0	0	0	0	0	1	2	0	5	3	3	0	2	
-Falls	5	3	0	0	0	0	0	1	1	0	1	2	0	2	1	
-Drowning	11	5	0	0	8	2	0	2	1	0	0	2	0	0	0	
-Fire	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
-Poisoning	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	
-All Other External Causes of																
Accidental injury	5	5	1	0	2	0	1	0	0	2	0	2	1	1	0	0
Intentional Injuries																
-Suicide	2	3	0	0	0	0	2	0	0	3	0	0	0	0	0	
-Homicide	1	2	0	0	0	1	0	0	1	0	0	0	1	0	0	
-All Other External Causes of Mortality	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
<b>Miscellaneous</b>																
-Salinity																
-Fever of unknown Origin	1	2	0	0	0	0	0	0	0	1	1	0	1	0	0	
-Edema of unspecified origin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-Sudden Infant Death	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	
<b>Unknown/ missing</b>	11	4	1	0	0	0	1	0	0	0	2	6	0	3	2	
<b>Total</b>	456	509	49	42	13	5	11	8	23	29	113	149	201	218	46	58

COPD=Chronic obstructive pulmonary disease

Appendix A-8 Female deaths by cause, age, and area, 2019

Cause	All ages		<1		1-4		5-14		15-44		45-64		65-84		85+	
	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b
<b>Communicable Diseases</b>																
Diarrhoea	4	2	2	0	0	0	0	0	0	0	0	0	0	1	2	1
Tuberculosis	3	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0
Meningitis	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0
Respiratory Infections	12	7	5	3	0	0	0	0	0	1	2	0	4	1	1	2
Septicaemia	19	12	1	0	1	1	0	1	0	1	1	2	7	3	9	4
<b>Maternal and Neonatal Conditions</b>																
Maternal Deaths	4	5	0	0	0	0	0	0	3	4	1	1	0	0	0	0
Neonatal condition																
-Premature and LBW	1	3	1	3	0	0	0	0	0	0	0	0	0	0	0	0
-Birth Asphyxia	1	4	1	4	0	0	0	0	0	0	0	0	0	0	0	0
-Other Neonatal Conditions	10	11	10	11	0	0	0	0	0	0	0	0	0	0	0	0
<b>Nutritional Deficiencies</b>																
	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
<b>Non-communicable Diseases</b>																
Malignant neoplasm																
-Neoplasm	43	34	0	0	2	0	0	1	6	3	22	25	13	5	0	0
-Neoplasms of female	4	3	0	0	0	0	0	0	1	0	3	3	0	0	0	0
Congenital Malformation	3	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0
Endocrine disorder																
-Diabetes	6	10	0	0	0	0	0	0	1	1	3	3	2	5	0	1
-All Other Endocrine Disorders	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Disease of circulatory system																
-Heart Diseases	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
-Hypertensive Diseases	4	5	0	0	0	0	0	0	0	0	3	1	1	3	0	1
-Ischaemic Heart Diseases	58	45	0	0	0	0	0	0	2	2	11	17	34	21	11	5
-Pulmonary heart disease	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0
-Stroke	136	112	0	0	0	0	0	0	1	2	17	16	96	74	22	20
-Other forms of heart disease	39	38	0	0	1	0	0	0	2	2	5	6	24	25	7	5
-All Other Circulatory System D	24	18	0	0	0	0	0	0	0	0	2	3	20	15	2	0
Respiratory disease																
-COPD	11	15	0	0	0	0	0	0	0	0	2	6	7	6	2	3
-All Other Respiratory Diseases	1	3	0	0	0	0	0	0	1	0	0	1	0	2	0	0
Digestive Diseases	11	12	0	0	0	0	0	0	4	1	2	7	3	3	2	1
SIRS, Infectious Disease	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Dengue	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Gentio-urinary disease																
-Kidney Diseases	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
-Renal Failure	2	4	0	0	0	0	0	0	0	1	0	0	2	3	0	0
-Other Non-Communicable Disease	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0
<b>Injuries</b>																
Unintentional injuries																
-Transport Accidents	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
-Falls	9	10	0	0	0	0	0	0	2	0	0	1	3	5	4	4
-Drowning	10	11	0	0	7	7	1	1	2	0	0	1	0	2	0	0
-Fire	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0
-Other External Causes of Accidental injuries	2	1	0	1	0	0	0	0	1	0	0	0	1	0	0	0
Intentional injuries																
-Suicide	4	7	0	0	0	0	1	0	2	6	1	1	0	0	0	0
-Homicide	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
- Other External Causes of M	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
<b>Miscellaneous</b>																
-Fever of unknown Origin	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
-Sudden Infant Death	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
<b>Unknown/missing</b>																
	19	13	0	1	0	0	0	0	0	1	1	2	12	7	6	2
<b>Total</b>	<b>450</b>	<b>397</b>	<b>23</b>	<b>27</b>	<b>12</b>	<b>8</b>	<b>4</b>	<b>3</b>	<b>30</b>	<b>28</b>	<b>78</b>	<b>99</b>	<b>233</b>	<b>183</b>	<b>70</b>	<b>49</b>

COPD=Chronic obstructive pulmonary disease



**Appendix A-9a Age-specific fertility rate and indices for icddr,b service area by block, 2019**

Age (years)	Block A		Block B		Block C		Block D	
	Births	Rate	Births	Rate	Births	Rate	Births	Rate
All ages	<b>905</b>	<b>75.5</b>	<b>811</b>	<b>84.1</b>	<b>579</b>	<b>83.8</b>	<b>461</b>	<b>75.6</b>
15-19*	145	69.7	157	87.4	109	91.5	71	63.3
20-24	256	139.5	258	163.6	175	167.0	161	176.1
25-29	250	133.6	204	139.5	162	150.6	118	143.4
30-34	189	99.0	122	89.0	80	77.9	69	77.9
35-39	60	37.8	49	39.0	45	47.9	37	43.2
40-44	5	3.5	18	16.4	7	8.7	4	5.3
45-49**	0	0.0	3	2.8	1	1.2	1	1.3
Total fertility rate		2415.8		2688.14		2723.9		2553.1
General fertility rate		76.5		84.1		84.8		76.6
Gross reproduction rate		1211.9		1431.9		1303.1		1246.1
*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, 2019**

Age (years)	Block E		Block F		Block G	
	Births	Rate	Births	Rate	Births	Rate
All ages	880	79.6	846	83.6	785	80.4
15-19*	161	76.1	125	68.7	135	73.1
20-24	271	160.1	268	171.1	244	152.7
25-29	193	124.2	218	142.7	198	145.8
30-34	166	102.0	155	102.9	146	97.1
35-39	65	42.4	67	49.1	54	42.5
40-44	20	16.0	11	9.8	6	5.3
45-49**	4	3.1	2	1.6	2	1.9
Total fertility rate		2619.6		2729.8		2591.6
General fertility rate		79.6		83.6		80.4
Gross reproduction rate		1256.2		1345.5		1224.8
*Births to mothers under aged 15 were included in this group(6)						

**Appendix A-10. Marriages and divorces by month, 2019**

Month	Marriage		Divorce	
	No.	percentage	No.	percentage
Jan	273	8.1	41	9.5
Feb	248	7.4	38	8.8
Mar	341	10.2	32	7.4
Apr	251	7.5	40	9.2
May	160	4.8	34	7.9
Jun	369	11.0	42	9.7
Jul	233	6.9	39	9.0
Aug	386	11.5	30	6.9
Sep	315	9.4	35	8.1
Oct	287	8.6	44	10.2
Nov	227	6.8	31	7.2
Dec	268	8.0	27	6.2
<b>Total</b>	<b>3,091</b>	<b>100</b>	<b>408</b>	<b>100</b>

**Appendix A-11. In- and out-migrations by age and sex, 2019**

Age (years)	In-migration			Out-migration		
	Both sexes	Male	Female	Both sexes	Male	Female
<b>All ages</b>	<b>11,065</b>	<b>5,515</b>	<b>5,550</b>	<b>12,705</b>	<b>6,116</b>	<b>6,589</b>
0-4	1,484	769	715	1,526	791	735
5-9	882	465	417	991	530	461
10-14	649	332	317	876	489	387
15-19	1,568	386	1,182	2,531	973	1,558
20-24	1,491	468	1,023	2,103	844	1,259
25-29	1,310	661	649	1,328	592	736
30-34	1,166	737	429	1,045	583	462
35-39	756	539	217	657	435	222
40-44	493	355	138	405	251	154
45-49	389	290	99	347	229	118
50-54	299	215	84	246	126	120
55-59	252	153	99	203	93	110
60-64	119	62	57	134	63	71
65+	207	83	124	313	117	196

**Appendix A-12. In-migrations by age, sex, and area, 2019**

Age (years)	icddr,b service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
<b>All ages</b>	<b>5,900</b>	<b>2,924</b>	<b>2,976</b>	<b>5,165</b>	<b>2,591</b>	<b>2,574</b>
0-4	762	398	364	722	371	351
5-9	491	261	230	391	204	187
10-14	363	183	180	286	149	137
15-19	866	218	648	702	168	534
20-24	773	256	517	718	212	506
25-29	689	334	355	621	327	294
30-34	635	389	246	531	348	183
35-39	395	278	117	361	261	100
40-44	260	183	77	233	172	61
45-49	208	152	56	181	138	43
50-54	162	117	45	137	98	39
55-59	133	80	53	119	73	46
60-64	57	28	29	62	34	28
65+	106	47	59	101	36	65

**Appendix A-13. Out-migrations by age, sex, and area, 2019**

Age (years)	icddr,b service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
<b>All ages</b>	<b>6,630</b>	<b>3,149</b>	<b>3,481</b>	<b>6,075</b>	<b>2,967</b>	<b>3,108</b>
0-4	794	410	384	732	381	351
5-9	531	294	237	460	236	224
10-14	447	235	212	429	254	175
15-19	1,349	494	855	1,182	479	703
20-24	1,088	430	658	1,015	414	601
25-29	681	302	379	647	290	357
30-34	523	292	231	522	291	231
35-39	344	216	128	313	219	94
40-44	218	132	86	187	119	68
45-49	200	134	66	147	95	52
50-54	122	57	65	124	69	55
55-59	115	57	58	88	36	52
60-64	62	34	28	72	29	43
65+	156	62	94	157	55	102

Appendix A-14. Male out-migration by cause of movement and age, 2019

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>6,116</b>	<b>791</b>	<b>530</b>	<b>489</b>	<b>973</b>	<b>844</b>	<b>592</b>	<b>583</b>	<b>435</b>	<b>251</b>	<b>229</b>	<b>126</b>	<b>93</b>	<b>63</b>	117
<b>Work/economic/educational</b>															
-acquired/seeking job	3,091	1	4	77	547	670	488	459	330	179	153	89	57	23	14
-job completion/retirement	11	0	0	0	1	1	0	2	1	0	0	1	1	3	1
-to acquire education/student lodging	783	17	163	199	287	90	19	4	3	0	0	0	0	1	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	307	4	4	2	7	12	31	50	42	35	43	17	17	17	26
-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	1,620	765	352	203	117	45	22	23	19	10	14	5	9	8	28
- move or join with other relatives	8	1	1	0	1	1	0	1	1	1	0	0	0	0	1
-adoption	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0
-family friction/breakdown	79	0	2	4	1	11	12	17	11	6	5	6	0	1	3
-health or old age care	9	0	0	0	0	0	0	0	1	0	0	0	0	0	8
<b>Legal problems</b>	99	0	0	0	1	7	13	19	19	16	5	6	6	5	2
<b>Corona Pandemic</b>															
due to COVID-19	2	0	0	0	0	0	0	0	1	0	0	0	0	0	1
<b>Other and not stated</b>															
-others n.e.c.*	102	1	3	4	10	7	7	8	7	4	9	2	3	5	32
-unknown or not stated	2	0	0	0	1	0	0	0	0	0	0	0	0	0	1

\*n.e.c=Not elsewhere classified

Appendix A-15. Female out-migration by cause of movement and age, 2019

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>6,589</b>	<b>735</b>	<b>461</b>	<b>387</b>	<b>1,558</b>	<b>1,259</b>	<b>736</b>	<b>462</b>	<b>222</b>	<b>154</b>	<b>118</b>	<b>120</b>	<b>110</b>	<b>71</b>	<b>196</b>
<b>Work/economic/educational</b>															
-acquired/seeking job	307	1	2	10	62	63	68	41	15	20	13	5	7	0	0
-job completion/retirement	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
-to acquire education/student lodging	486	8	105	136	177	40	11	3	3	1	1	0	0	0	1
-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	945	3	3	5	137	244	192	123	55	42	35	29	36	14	27
-river erosion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Marriage / familial</b>															
-marriage	1,230	0	0	25	678	347	105	53	14	5	1	1	1	0	0
-separation/divorce/widow	34	0	0	0	9	5	2	3	0	2	3	4	2	2	2
-move or join with spouse/parents	2,959	713	347	205	378	400	279	192	113	69	55	61	48	28	71
- move or join with other relatives	15	1	0	0	3	3	0	0	0	0	0	3	1	2	2
-adoption	12	8	2	0	1	0	0	0	0	0	1	0	0	0	0
-family friction/breakdown	262	0	1	2	59	80	53	25	13	8	4	4	1	0	12
-health or old age care	53	1	0	1	9	4	3	1	0	0	0	2	0	8	24
<b>Legal problems</b>	15	0	0	0	0	2	1	2	2	2	3	2	1	0	0
<b>Corona Pandemic</b>															
due to COVID-19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Other and not stated</b>															
-others n.e.c*	269	0	1	3	44	71	22	19	7	5	2	9	12	17	57
-unknown or not stated	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0

\*n.e.c=Not elsewhere classified

**Appendix A-16 Male in-migration by cause of movement and age, 2019**

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>5,515</b>	<b>769</b>	<b>465</b>	<b>332</b>	<b>386</b>	<b>468</b>	<b>661</b>	<b>737</b>	<b>539</b>	<b>355</b>	<b>290</b>	<b>215</b>	<b>153</b>	<b>62</b>	<b>83</b>
<b>Work/economic/educational</b>															
Acquired/seeking job	1,025	0	0	5	60	137	189	223	150	99	67	52	24	10	9
Job completion/retirement	742	0	0	1	7	49	93	132	139	101	85	61	45	16	13
To acquire education	274	9	67	99	71	24	3	0	0	0	1	0	0	0	0
Educ. completed/interrupted	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Housing/environmental</b>															
Acquired/seeking new land/house	1,175	0	0	5	66	127	239	247	151	97	77	65	47	26	28
-river erosion	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<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	1,583	746	392	186	104	52	34	25	12	4	9	2	4	2	11
Move or join with other relatives	8	1	0	3	0	0	0	2	1	0	0	0	0	0	1
Adoption	12	9	2	0	1	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	50	1	0	0	1	12	12	5	6	1	5	4	1	1	1
Health or old age care	39	0	0	0	2	1	5	3	5	3	2	6	7	1	4
<b>Legal problems</b>	101	0	0	0	2	10	21	16	23	15	5	4	3	1	1
<b>Corona Pandemic</b>															
Due to COVID-19	119	0	0	1	0	2	15	38	22	21	13	5	1	1	0
<b>Other and not stated</b>															
Others n.e.c*	385	3	4	32	72	54	49	46	30	14	26	16	21	4	14
Unknown or not stated	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

\*n.e.c=Not elsewhere classified

Appendix A-17 Female in-migration by cause of movement and age, 2019

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>5,550</b>	<b>715</b>	<b>417</b>	<b>317</b>	<b>1,182</b>	<b>1,023</b>	<b>649</b>	<b>429</b>	<b>217</b>	<b>138</b>	<b>99</b>	<b>84</b>	<b>99</b>	<b>57</b>	<b>124</b>
<b>Work/economic/educational</b>															
Acquired/seeking job	139	0	0	4	9	19	34	36	19	5	9	2	1	1	0
Job completion/retirement	33	0	0	0	0	1	6	4	8	6	2	3	0	2	1
To acquire education	264	14	78	95	51	16	5	4	1	0	0	0	0	0	0
Educ. completed/interrupted	2	0	0	1	0	1	0	0	0	0	0	0	0	0	0
<b>Housing/environmental</b>															
Acquired/seeking new land/house	922	0	0	9	159	233	157	86	65	46	37	27	42	26	35
-river erosion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Marriage / familial</b>															
Marriage	792	0	0	21	507	176	43	27	10	5	2	1	0	0	0
Separation/divorce/widow	50	0	0	0	17	17	7	1	1	2	0	3	1	0	1
Move or join with spouse/parents	2,715	673	331	173	318	392	291	211	94	58	43	40	42	18	31
Move or join with other relatives	25	4	2	1	2	1	3	0	0	1	0	1	1	2	7
Adoption	23	18	3	0	0	0	0	1	1	0	0	0	0	0	0
Family friction/breakdown	185	0	0	2	52	51	41	16	7	7	2	1	1	1	4
Health or old age care	34	0	0	1	3	6	2	2	1	0	0	1	5	2	11
<b>Legal problems</b>	6	0	0	0	0	0	2	3	0	0	1	0	0	0	0
<b>Corona Pandemic</b>															
Due to COVID-19	2	0	0	0	0	1	0	1	0	0	0	0	0	0	0
<b>Other and not stated</b>															
Others n.e.c*	358	6	3	10	64	109	58	37	10	8	3	5	6	5	34
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, 2019**

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	7	2	3	3	0	15	13	6	6	4	2	31
	Urban	6	6	0	1	3	16	5	1	4	2	1	13
Chittagong	Rural	680	143	124	92	131	1,170	621	119	148	91	51	1,030
	Urban	254	168	123	73	73	691	183	112	106	82	91	574
Dhaka	Rural	22	12	5	6	8	53	30	4	7	2	2	45
	Urban	784	963	485	251	311	2794	659	504	606	263	318	2350
Khulna	Rural	3	4	0	0	1	8	7	3	6	4	1	21
	Urban	5	7	0	1	0	13	3	1	0	1	0	5
Mymensing	Rural	4	2	2	0	0	8	8	1	2	1	1	13
	Urban	2	4	2	0	3	11	3	0	3	1	4	11
Rajshahi	Rural	9	1	2	2	2	16	2	1	4	1	0	8
	Urban	3	10	5	2	1	21	7	2	2	1	2	14
Rangpur	Rural	2	0	0	0	0	2	2	0	2	0	1	5
	Urban	3	4	2	1	1	11	3	0	4	1	1	9
Sylhet	Rural	2	1	1	0	0	4	5	2	4	1	2	14
	Urban	9	10	2	7	4	32	11	5	5	7	10	38
India		3	1	4	3	4	15	1	1	2	0	4	8
Asia		0	107	89	50	17	263	0	23	137	126	72	358
Middle-east		8	348	304	177	56	893	3	67	331	301	234	936
Others		4	24	22	17	13	80	0	1	16	5	6	28
Unknown		0	0	0	0	0	0	0	1	3	0	0	4
<b>Total</b>		<b>1810</b>	<b>1817</b>	<b>1175</b>	<b>686</b>	<b>628</b>	<b>6116</b>	<b>1566</b>	<b>854</b>	<b>1398</b>	<b>894</b>	<b>803</b>	<b>5515</b>



**Appendix A-19 Female migration by destination or origin, 2019**

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	9	10	6	2	4	31	11	10	7	4	2	34
	Urban	3	4	3	0	1	11	1	4	1	4	2	12
Chattogram	Rural	638	1419	495	131	146	2,829	630	1343	400	104	95	2,572
	Urban	207	252	149	68	71	747	166	158	132	42	73	571
Dhaka	Rural	18	46	22	5	5	96	20	41	20	1	4	86
	Urban	648	1001	471	150	355	2625	565	563	461	166	260	2015
Khulna	Rural	4	5	0	2	3	14	6	11	5	2	4	28
	Urban	4	7	2	1	1	15	1	2	3	0	0	6
Mymensingh	Rural	5	4	2	0	1	12	2	3	2	1	0	8
	Urban	5	4	1	1	1	12	2	2	3	0	0	7
Rajshahi	Rural	3	3	4	3	0	13	5	6	5	0	1	17
	Urban	2	3	1	0	1	7	3	6	1	0	1	11
Rangpur	Rural	4	4	2	0	0	10	2	4	4	1	0	11
	Urban	6	2	2	0	0	10	6	4	4	0	1	15
Sylhet	Rural	2	7	3	0	0	12	8	25	5	1	2	41
	Urban	11	16	4	3	9	43	19	16	8	4	3	50
India		5	7	3	2	5	22	1	0	1	0	0	2
Asia		0	1	1	0	2	4	0	2	6	2	3	13
Middle-east		5	15	21	7	3	51	0	3	9	22	10	44
Other		4	7	6	1	7	25	0	0	1	0	2	3
Unknown		0	0	0	0	0	0	1	2	0	1	0	4
<b>Total</b>		<b>1583</b>	<b>2817</b>	<b>1198</b>	<b>376</b>	<b>615</b>	<b>6589</b>	<b>1449</b>	<b>2205</b>	<b>1078</b>	<b>355</b>	<b>463</b>	<b>5550</b>

## APPENDIX B

### POPULATION, BIRTHS, AND DEATHS BY VILLAGE, 2019

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
<b>icddr,b service area</b>						
D00	Charmukundi	3,198	74	24	23.1	7.5
W00	Kaladi	9,956	148	39	14.9	3.9
V10	Dhakirgaon	2,371	59	9	24.9	3.8
V11	Nabakalash	3,274	75	17	22.9	5.2
V31	Dighaldi	10,799	243	90	22.5	8.3
V32	Mobarakdi	3,916	90	34	23.0	8.7
V60	Suvankardi	992	34	9	34.3	9.1
V61	Munsabdi	711	18	9	25.3	12.7
V62	Shilmondi	1,027	11	8	10.7	7.8
V72	Upadi	6,618	154	56	23.3	8.5
<b>Block A Total</b>		<b>42,862</b>	<b>906</b>	<b>295</b>	<b>21.1</b>	<b>6.9</b>
H00	Lamchari	1,204	30	13	24.9	10.8
V12	Bhangerpar	985	31	7	31.5	7.1
V13	Baburpara	791	11	3	13.9	3.8
V19	Lakshmipur	2,758	61	24	22.1	8.7
V20	Dagorpur	1,581	31	15	19.6	9.5
V21	Khadergaon	546	11	7	20.1	12.8
V22	Beloti	619	12	3	19.4	4.8
V23	Baluchar	669	13	5	19.4	7.5
V24	Machuakhal	3,147	81	26	25.7	8.3
V26	Narayanpur	4,208	93	30	22.1	7.1
V56	Pailpara	1,738	41	21	23.6	12.1
V59	Doshpara	2,607	50	24	19.2	9.2
V82	Dhanarpar	1,963	49	22	25.0	11.2
V83	Padmapal	642	27	2	42.1	3.1
V85	Bhanurpara	575	14	2	24.3	3.5
V87	Hurmaisha	722	13	4	18.0	5.5
VBB	Nagda	5,203	131	36	25.2	6.9
VBC	Naogaon	5,093	112	48	22.0	9.4
<b>Block B Total</b>		<b>35,051</b>	<b>811</b>	<b>292</b>	<b>23.1</b>	<b>8.3</b>
K00	Shahpur	1,042	19	4	18.2	3.8
L00	Tatkhana	577	18	4	31.2	6.9
M00	Char Nayergaon	181	3	0	16.6	0.0
N00	Aswinpur	2,361	58	16	24.6	6.8
O00	Nayergaon	2,412	60	20	24.9	8.3
P00	Titerkandi	2,032	35	15	17.2	7.4
Q00	Char Shibpur	230	5	2	21.7	8.7
V27	Panchghoria	1,084	21	9	19.4	8.3
V28	Khidirpur	1,693	44	13	26.0	7.7
V30	Harion	644	15	4	23.3	6.2
V39	Gobindapur	279	2	3	7.2	10.8
V40	Masunda	824	28	4	34.0	4.9
V41	Paton	2,139	63	9	29.5	4.2
V42	Adhara (South)	749	21	6	28.0	8.0
V44	Panchdona	618	7	6	11.3	9.7
V86	Adhara	1,119	23	4	20.6	3.6
V88	Datikara	574	16	3	27.9	5.2
VBA	Mehron	1,979	37	11	18.7	5.6
DX0	Barogaon	3,548	74	17	20.9	4.8
DX1	Naojan	1,428	31	9	21.7	6.3
<b>Block C Total</b>		<b>25,513</b>	<b>580</b>	<b>159</b>	<b>22.7</b>	<b>6.2</b>

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
R00	Nandalalpur	1,564	34	15	21.7	9.6
S00	Tatua	947	21	3	22.2	3.2
T00	Amuakanda	1,753	46	11	26.2	6.3
V15	Bhati Rasulpur	960	22	7	22.9	7.3
V16	Binandapur	890	18	6	20.2	6.7
V17	Hatighata	986	17	9	17.2	9.1
V18	Torkey	3,925	72	26	18.3	6.6
V25	Char Pathalia	1,290	24	5	18.6	3.9
V29	Shibpur (South)	560	9	5	16.1	8.9
V33	Shibpur (North)	548	8	6	14.6	10.9
V34	Satparia	882	19	11	21.5	12.5
V52	Nayakandi	232	10	3	43.1	12.9
V54	Balairkandi	573	17	5	29.7	8.7
V55	Induria	531	11	3	20.7	5.6
V63	Islamabad (East)	1,969	29	12	14.7	6.1
V67	Majlishpur	604	13	6	21.5	9.9
V81	Sonaterkandi	645	16	1	24.8	1.6
V84	Shahbajkandi	2,297	41	15	17.8	6.5
V89	Islamabad (Middle)	1,574	36	11	22.9	7.0
<b>Block D Total</b>		<b>22,730</b>	<b>463</b>	<b>160</b>	<b>20.4</b>	<b>7.0</b>
<b>icddr,b service area: Total</b>		<b>126,156</b>	<b>2,760</b>	<b>906</b>	<b>21.9</b>	<b>7.2</b>
<b>Government Service Area</b>						
V35	Durgapur	3,495	67	21	19.1	19.1
V38	Galimkha	1,493	23	16	24.9	24.9
V43	Kanachak	1,176	18	12	14	14
V45	Bakchar	1,147	28	11	37.4	37.4
V46	Silinda	396	9	2	23.8	23.8
V47	Tulatali	1,849	38	13	20.2	20.2
V48	Gangkanda	484	5	3	16.7	16.7
V49	Harina Bhabanipur	1,313	31	12	28.3	28.3
V57	Baluchar	952	22	10	14.9	14.9
V64	Kawadi	5,057	113	39	22.7	22.7
V65	Nayachar	785	18	5	22.3	22.3
V66	Thatalia	714	12	8	12.2	12.2
V68	Sobahan	1,017	22	3	20.1	20.1
V71	Khamarpara	494	13	3	24.3	24.3
V73	Sadardia	790	18	4	21.6	21.6
V74	Ketundi	1,389	30	10	20.8	20.8
V75	Mukundi	321	4	2	43.5	43.5
V76	Chosoi	1,796	48	23	19	19
V78	Soladana	264	3	2	25.9	25.9
V79	Pitambordi	418	9	8	24.2	24.2
V80	Daribond	1,344	24	10	22.4	22.4
V90	Narinda	1,295	25	10	25.5	25.5
V97	Dhanagoda	331	12	1	9.3	9.3
V98	Santoshpur	96	3	0	31.3	31.3
V99	Baluakandi	539	15	5	22.2	22.2
VB1	Taltoli	947	20	4	11.2	11.2
VB2	Sree Rayerchar	1,214	28	8	13	13
VB3	Rayerkandi	2,983	81	27	17.5	17.5
D28	Bazarkhola	1,030	21	6	27	27
D29	Kirtonkhola	209	2	2	13.3	13.3
D30	Banuakandi	756	11	2	18.6	18.6
D31	Harina Bazarkhola	1,002	25	5	15.2	15.2
D32	Khalisha	815	16	6	12.5	12.5
D33	Nayanagar	1,010	28	8	20.1	20.1
D34	Saidkharkandi	1,377	28	15	18.6	18.6
D35	Mollah Kandi	519	10	8	17.3	17.3
<b>Block E Total</b>		<b>40,817</b>	<b>880</b>	<b>324</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	3,233	68	23	26.6	10.8
F00	Sepoykandi	1,592	38	20	20.1	6.3
G00	Thatalia	3,356	84	24	23.4	5.5
J00	Char Harigope	946	25	7	26.1	6.3
U00	Baispur	9,635	231	73	19.9	5.4
V01	Kadamtali	389	13	5	10.8	8.1
V02	Nilokhi	428	8	4	13.4	15.7
V03	Char Nilokhi	595	9	3	15.3	8.5
V04	Char Pathalia	413	7	4	14.6	7.3
V05	Gazipur	3,394	64	30	19.6	6.5
V06	Fatepur	2,676	64	16	20.4	8.7
V07	Nayakandi	307	3	2	28.1	3.5
V08	Goalbhar	1,209	27	10	22.9	8.2
V09	Naburkandi	1,250	33	10	28.9	9.6
V14	Enayetnagar	610	15	5	16.2	9.7
V36	Ludhua	5,528	103	36	21.7	8
D99	Mandertoli	2,193	54	19	19.2	8.4
<b>Block F Total</b>		<b>37,754</b>	<b>846</b>	<b>291</b>	<b>21.3</b>	<b>7.3</b>
B00	Charmasua	1,994	51	13	26.1	5
C00	Sarderkandi	4,276	90	32	23.5	5.1
<b>V37**</b>	Charputia	-	-	-	-	-
V50	Bakharpur	46	3	1	20.8	20.8
V51	Induriakandi	830	20	5	16.9	4.8
V53	Chhoto Haldia	2,964	63	26	20.9	7.5
<b>V58**</b>	Mohishmari	-	-	-	-	-
<b>V69**</b>	Naobangha	-	-	-	-	-
<b>V70**</b>	South Joypur	-	-	-	-	-
V95	Baluchar	2,515	54	17	25.1	4.7
V96	Rampur	530	8	4	31.7	9.3
VB4	Ramdaspur	3,816	70	42	21.2	6.6
VB5	Thakurpara	861	24	4	21.1	5.9
VB6	Sarkerpara	551	11	8	28.8	7.2
VB7	Mirpur	324	4	5	18.9	3.2
VB8	Farazikandi	1,221	25	11	17.1	10.6
<b>VB9**</b>	Ramanathgonj	-	-	-	-	-
VB0	South Rampur	3,683	104	22	27	6.9
D88	Sankibhanga	1,469	26	14	20.9	5.4
	Sankibhanga					
D89	Namapara	990	19	6	18.4	8.2
D90	Zahirabad	835	8	5	28.1	6.1
<b>D91**</b>	North Joypur	-	-	-	-	-
<b>D92**</b>	West Joypur	-	-	-	-	-
D93	Maizkandi	1,373	27	10	23.1	8.2
D94	Hazipur	1,749	36	14	26	4.6
D95	Tapaderpara	616	19	6	10.9	9.3
D96	Sakharipara	1,224	30	14	21.8	5
D97	Nayakandi	774	18	5	18.3	10.5
D98	Bara Haldia	3,436	75	27	23.2	7.9
<b>Block G Total</b>		<b>36,077</b>	<b>785</b>	<b>291</b>	<b>23</b>	<b>6.6</b>
<b>Government service area: Total</b>		<b>114,648</b>	<b>2,511</b>	<b>906</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-MATLAB, 2019

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

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

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NOTE: 38 Community Health Research Workers (CHRWs) collect routine HDSS data.

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