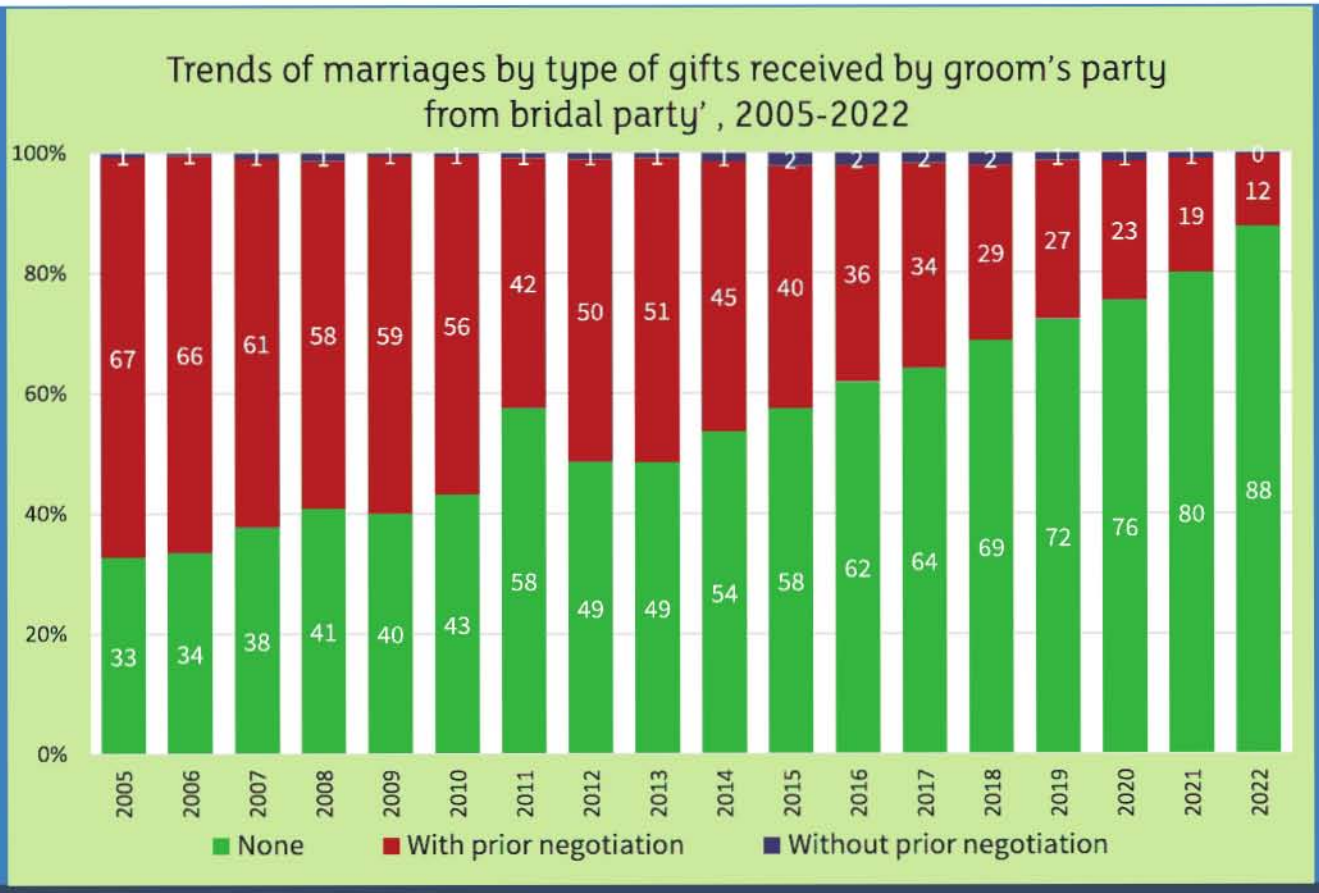
Volume Fifty-Seven

Registration of Health and Demographic Events, 2022

Scientific Report No. 162

June 2026

HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM - MATLAB



icddr,b

HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM-MATLAB

Volume Fifty-Seven

Registration of Health and Demographic Events 2022

Scientific Report No. 162 - June 2026

Health Systems and Population Studies Division, icddr,b
68, Shaheed Tajuddin Ahmed sarani,
Mohakhali, Dhaka 1212, Bangladesh

icddr,b

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Authors: Muhammad Zahirul Haq, Kamrun Naher Koli, Sanjida Alam, Sayed Saidul Alam, Md. Moinuddin Haider, and Syed Manzoor Ahmed Hanifi

Author contributions: Kamrun Naher Koli and Sanjida Alam analyzed the data under the guidance of Md. Moinuddin Haider. Muhammad Zahirul Haq drafted the report. Data management was performed by Sayed Saidul Alam. Syed Manzoor Ahmed Hanifi provided overall guidance.

Cover image: Trends in marriages by type of gifts received by groom's party from bridal party, 2005-2022

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List of abbreviations

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
CMWRA	Currently Married Women of Reproductive Age
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
GAC	Global Affairs Canada
GIS	Geographic Information System
GPS	Global Positioning System
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
NCD	Non-communicable Disease
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
VA	Verbal Autopsy
WHO	World Health Organization

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Matlab HDSS is a founding member of INDEPTH Network (www.indepth-network.org), an international network of HDSS field sites involved in demographic and health research in developing countries since 1998. Matlab HDSS uses the WHO/HMN/LSHTM/INDEPTH Network and the USAID/MEASURE Evaluation Standardized Verbal Autopsy (VA) tools.

Dr. Shehrin Shaila Mahmood, *Scientist*, Prof. Sarah Salway, *Senior Director, HSPSD*, Mamun Ibn Bashar, *Research Investigator* and Md. Uzzal Chowdhury, *Population Health Research Specialist* reviewed the draft and provided valuable comments.

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Executive summary

The Matlab Health and Demographic Surveillance System (HDSS), operated by icddr,b, covers a rural population of 247,754 (mid-2022 population) living in 61,000 households across 142 villages in an area of 184 square kilometers. The HDSS collects demographic events and selected health information through household visits every three months.

The HDSS area is divided into two service areas. In one area, icddr,b provides selected reproductive, maternal, and child health services alongside government services (thereby termed 'icddr,b service area' or 'icddr,b area'). In the other area, usual government services are available (thereby termed 'Government service area' or 'Government area').

This report provides updates on the vital events and selected maternal and child health indicators within the HDSS area for 2022. It also documents the trends in key demographic indicators. Table 1 summarizes key demographic indicators for the 10-year period from 2013 to 2022. Explanations of the findings are beyond the scope of this technical report.

Table 1. Vital statistics for the HDSS population and by service areas, 2013-2022

Indicators	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Population	227,853	230,185	234,360	237,119	239,030	239,562	240,804	246,893	249,554	247,754
Demographic events										
Live birth	4,771	4,968	5,151	5,283	5,298	5,086	5,267	5,498	4,943	5,602
Death	1,528	1,550	1,564	1,604	1,687	1,753	1,812	2,016	2,202	1,790
Marriage	3,260	3,365	3,275	3,360	3,188	3,091	3,358	3,109	3,721	3,979
Divorce	322	383	449	409	465	408	433	359	408	482
In-migration	10,264	10,915	12,083	14,189	12,395	12,019	11,065	14,350	11,759	10,798
Out-migration	10,784	12,484	12,756	14,736	15,230	14,159	12,705	11,532	14,521	15,195
Crude birth rate [A]										
icddr,b area	21.7	22.0	22.3	22.8	22.1	20.7	21.8	22.6	20.6	22.8
Govt. area	20.2	21.1	21.6	21.7	21.8	21.3	21.9	21.9	19.0	22.4
Both areas	20.9	21.6	22.0	22.3	22.0	21.0	21.9	22.3	19.8	22.6
Total fertility rate										
icddr,b area	2.6	2.6	2.7	2.7	2.6	2.5	2.6	2.7	2.5	2.7
Govt. area	2.5	2.6	2.7	2.6	2.6	2.6	2.6	2.7	2.3	2.7
Both areas	2.5	2.6	2.7	2.7	2.6	2.5	2.6	2.7	2.4	2.7
Crude death rate [A]										
icddr,b area	6.7	6.8	6.5	6.7	7.0	7.5	7.2	7.9	8.6	7.0
Govt. area	6.7	6.7	6.9	6.9	7.2	7.2	7.9	8.5	9.1	7.5
Both areas	6.7	6.7	6.7	6.8	7.1	7.3	7.5	8.2	8.8	7.2

Indicators	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Neonatal mortality rate [B]										
icddr,b area	17.3	19.5	18.0	16.7	14.0	15.1	18.9	11.6*	21.2*	12.8*
Govt. area	21.2	25.1	27.9	27.5	20.7	20.3	22.3	21.8	23.1	18.9
Both areas	19.1	22.1	23.1	21.8	17.2	17.7	20.5	16.4*	22.1*	15.7*
Post-neonatal mortality rate [B]										
icddr,b area	5.9	5.7	3.7	5.3	4.0	3.7	6.2	4.8	3.3	3.4
Govt. area	5.4	4.7	5.7	4.0	5.6	4.0	6.4	4.3	4.0	4.9
Both areas	5.7	5.2	4.7	4.7	4.7	3.8	6.3	4.5	3.6	4.1
Infant mortality rate [B]										
icddr,b area	23.1	25.2	22.5	22.1	18.2	19.0	25.0	16.4*	24.5*	16.2*
Govt. area	26.6	29.8	33.6	31.5	26.1	26.8	28.7	26.1	27.1	23.8
Both areas	24.7	27.4	27.8	26.5	22.1	22.8	26.8	20.9	25.7	19.8
Child (1-4yrs) mortality rate [C]										
icddr,b area	2.2	2.3	2.2	2.5	2.0	1.9	1.2	1.9	1.5	1.1
Govt. area	3.1	2.5	1.8	2.3	3.0	1.4	2.5	1.3	2.3	1.3
Both areas	2.6	2.4	2.0	2.4	2.5	1.7	1.8	1.6	1.9	1.2
Under five mortality rate [B]										
icddr,b area	31.6	34.0	31.1	32.0	25.9	27.7	29.8	23.2	30.4	20.3
Govt. area	38.3	39.6	40.5	40.2	37.0	30.9	38.6	31.1	37.3	28.8
Both areas	34.7	36.6	35.6	35.8	31.1	29.2	34.0	26.9	33.6	24.3
Migration rate (both areas) [A]										
In-migration	45.0	47.4	51.6	59.8	51.9	50.2	46.0	58.1	47.1	43.6
Out-migration	47.3	54.2	54.4	62.1	63.7	59.1	52.8	46.7	58.2	61.3
Natural increase rate [A]	14.2	14.8	15.3	15.5	14.9	13.9	14.3	14.1	13.4	15.4
Population growth rate [D]	0.9	1.0	1.8	1.1	0.8	0.3	0.5	2.5	1.1	0.72

[A] per 1000 population;
[B] per 1000 live births;
[C] per 1000 children aged 1-4 years;
[D] per 100; formula used: growth rate = $[\ln(p_t/p_0)/t] \times 100$;
* Large fluctuations are observed in neonatal and infant mortality in the last three years. Explaining the factors affecting this fluctuation needs further investigation.

Note: Definitions of the indicators and their plain language interpretations are provided in the respective chapters.

Chapter 1. Introduction

Since 1963, the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b), initiated as the Cholera Research Laboratory (CRL), has been implementing a health research program 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 program 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 records demographic events, including births, deaths, migrations, internal movements, marriages, divorces, household splits, and headship changes, as well as selected reproductive, maternal, and child health (RMCH) information. In addition to routine demographic and health data collection, the HDSS periodically collects household socio-economic data. Female Community Health Research Workers (CHRWs) visit households in person to collect the data. The activities of CHRWs are supervised by Field Research Supervisors (FRSs), and the quality of the collected information is monitored through independent field data verification.

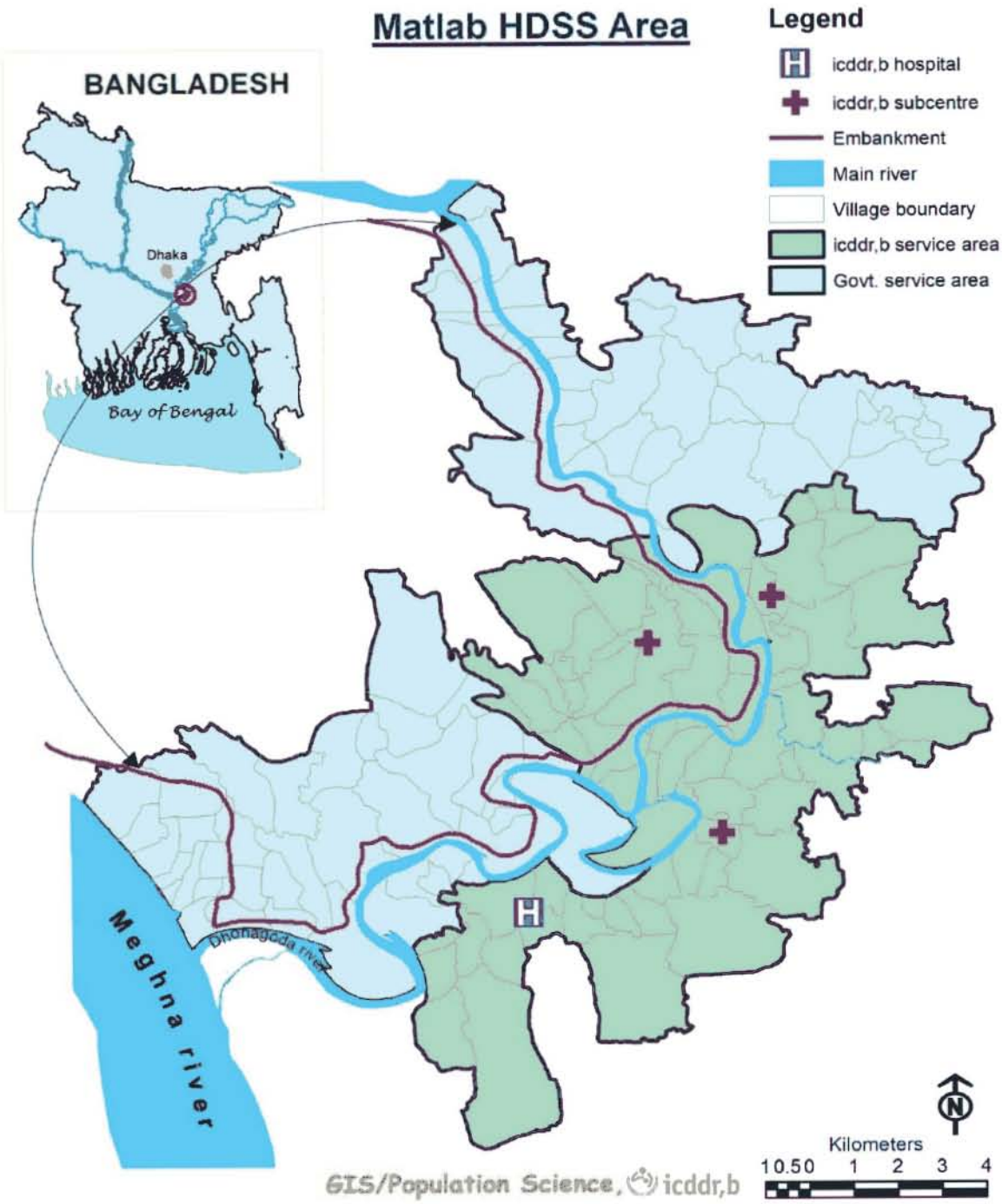
Table 1.1 Timeline of demographic and health data collection, Matlab HDSS

Demographic and health data	Start year
Birth, death, in- and outmigration	1966 (ongoing)
Marriage and divorce	1975 (ongoing)
Reproductive, maternal, and child health information	1978 (ongoing)
Internal movement	1982 (ongoing)
Household splits and household headship change	1993 (ongoing)
Geo-location data	1994 (ongoing)

The HDSS has gone through many changes since its inception. It started with 132 villages in 1966, expanded to 233 villages in 1968, and then reduced to 149 villages in 1977. In 1977, a Maternal and Child Health and Family Planning (MCH-FP) Program was initiated in 70 villages, which were designated as the icddr,b service area (icddr,b area). In the 70 villages, government-provided MCH-FP services were also available. The remaining 79 villages were treated as the Government service area or the Government area, where the government-provided services were available (Figure 1.1).

This report provides descriptive statistics on the 2022 demographics and health status of people registered with the Matlab HDSS (it does not discuss the results).

Figure 1. 1 Map of Matlab HDSS area



Chapter 2. Demographic trends, Matlab HDSS, 1966-2022

Summary

- In the HDSS area, fertility, measured by the total fertility rate (TFR), declined steadily from 1966 through the late 2000s, falling from above 6 to below 3. Since then, it has remained largely unchanged, with small fluctuations between 2.5 and 2.7 in both the icddr,b and government areas. The only exception was during COVID-19 in 2021, when TFR fell to 2.4.
- Under-five and infant mortality also declined during the period. It was above 200 deaths per 1000 live births in the 1960s and dropped below 25 in 2022.
- As expected, life expectancy increased significantly with the decline in under-five mortality. Until the mid-1970s, it remained below 60 years; since then, it has risen steadily. Women's life expectancy exceeded men's in the mid-1980s and remained higher through 2022. In 2022, life expectancy was 74.9 years for women and 71.3 years for men.
- Between 1966 and 2022, the share of under-five deaths among all deaths dropped from 6 in 10 to 1 in 10, while the share of above-60 deaths increased from 2 in 10 to 7 in 10. Causes of death shifted from communicable diseases to non-communicable diseases.
- The mean age at marriage for women increased from 16.5 years in 1975 to 19.7 years in 2009; since then, it has steadily declined, falling to 18.8 years in 2022.

The systematic collection of vital events with dates spanning 57 years provides a unique opportunity to examine demographic trends in the Matlab HDSS. This chapter presents demographic changes in the HDSS area from 1966 to 2022, using selected indicators of fertility, mortality and survival, marriage and divorce, and migration. The HDSS area was divided into icddr,b area and Government area in 1977. So, indicators are reported separately by area from 1978.

Crude birth rate (CBR): Number of live births per 1,000 mid-year inhabitants in a defined area in a year;

Crude death rate (CDR): Number of deaths per 1,000 mid-year inhabitants in a defined area in a year;

Rate of natural increase (RNI): Rate of population change based only on the difference between births and deaths;

Total fertility rate (TFR): Number of children an average woman would have in her lifetime if current birth patterns continue.

Infant mortality rate (IMR): Number of babies who die before reaching 1 year of age, out of every 1,000 live births;

Under-five mortality rate (U5MR): Number of babies who die before reaching 5 years of age, out of every 1,000 live births;

Life expectancy: Average number of years a person is expected to live based on current health and living conditions.

Figure 2. 1 Demographic transitions, Matlab HDSS, 1966-2022

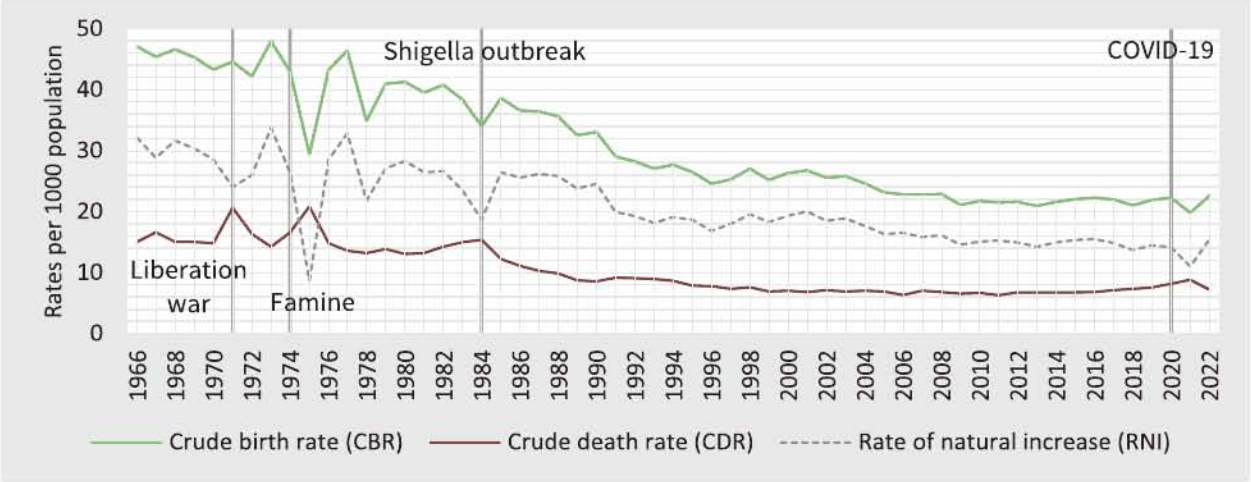


Figure 2. 2 Total fertility rates (TFRs) by service area, Matlab HDSS, 1966-2022

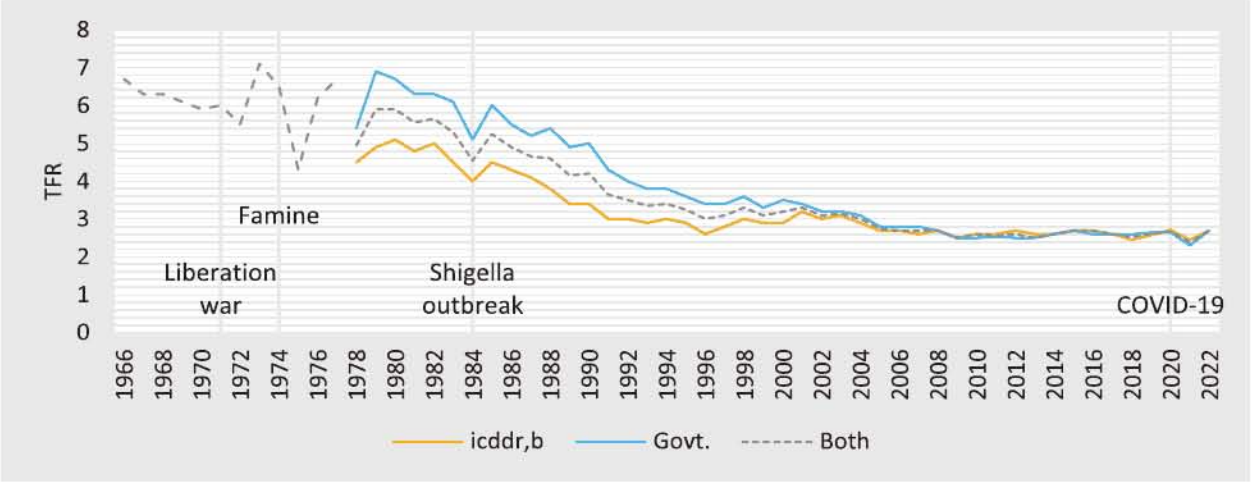


Figure 2. 3 Infant mortality rates by service area, 1966-2022

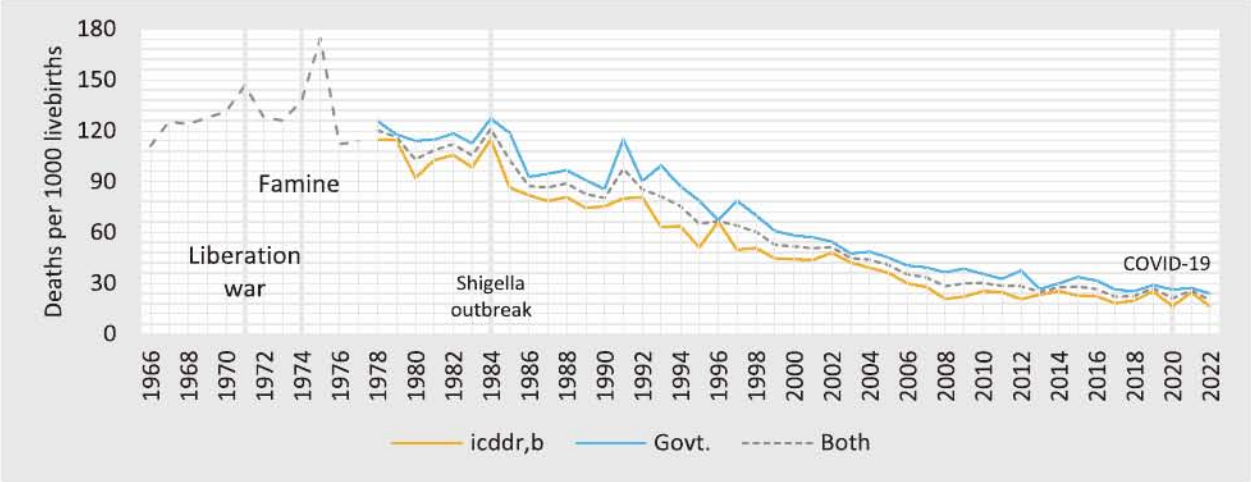


Figure 2. 4 Under-five mortality rates by service area, 1966-2022.

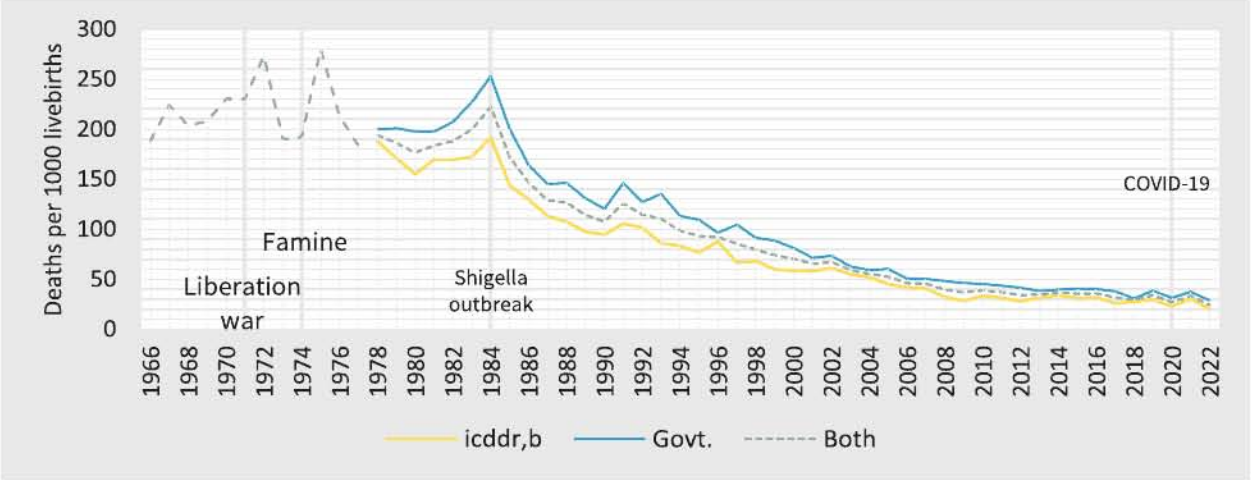


Figure 2. 5 Life expectancy* at birth by sex, 1966-2022

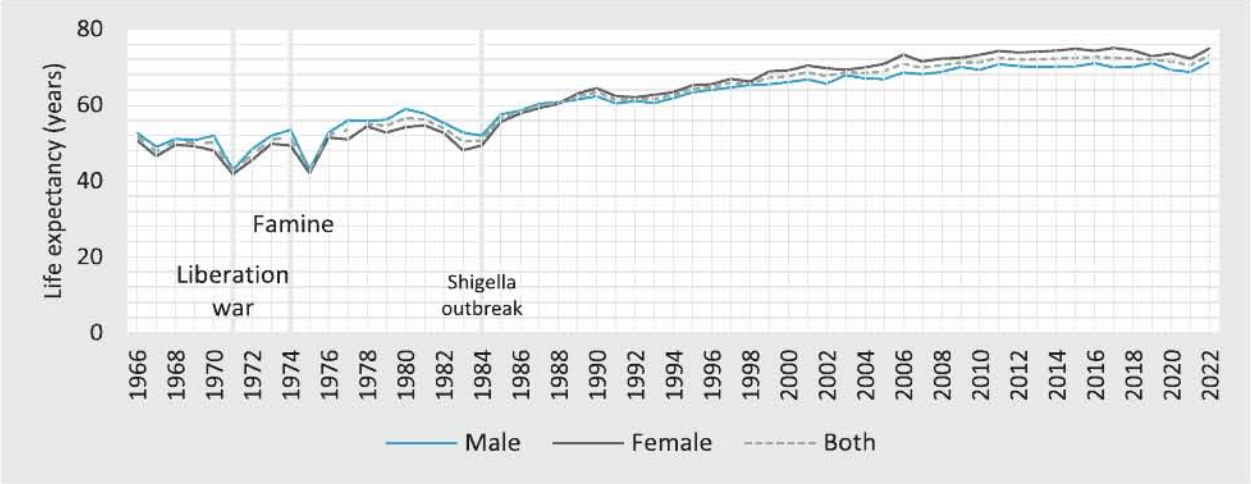


Figure 2. 6 Percent distribution of age at death, 1966-2022

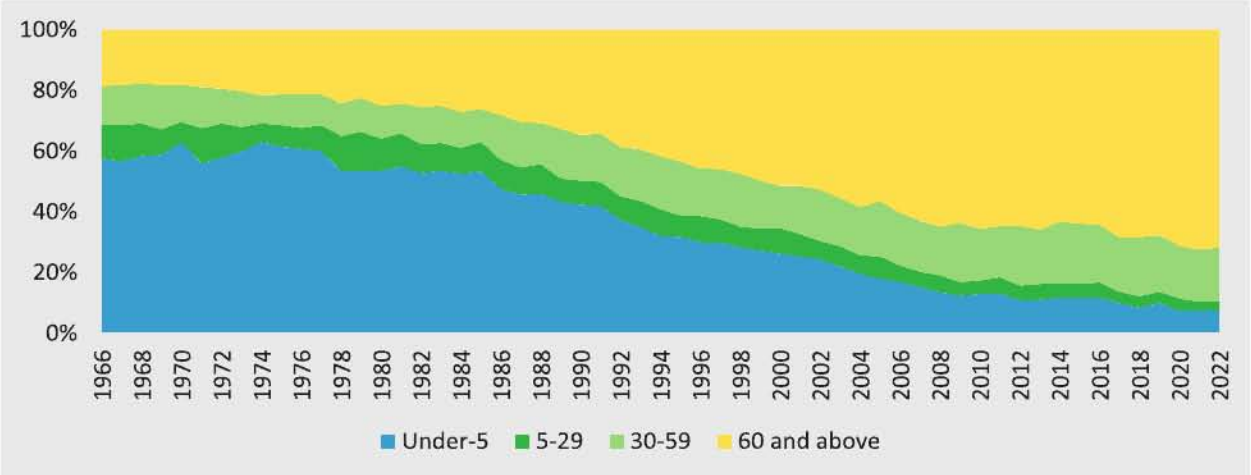
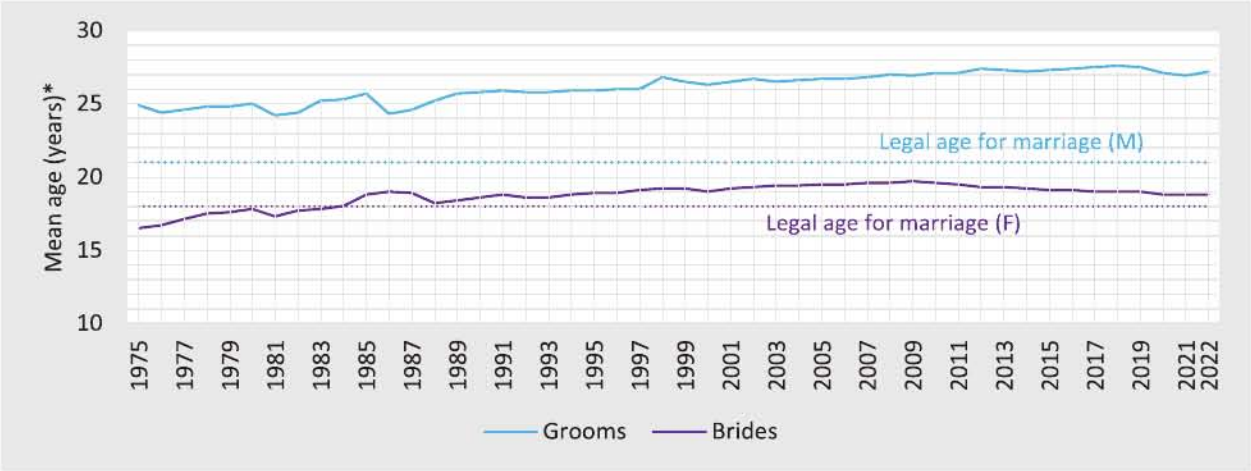


Figure 2. 7 Mean age at first marriage by sex, 1975-2022

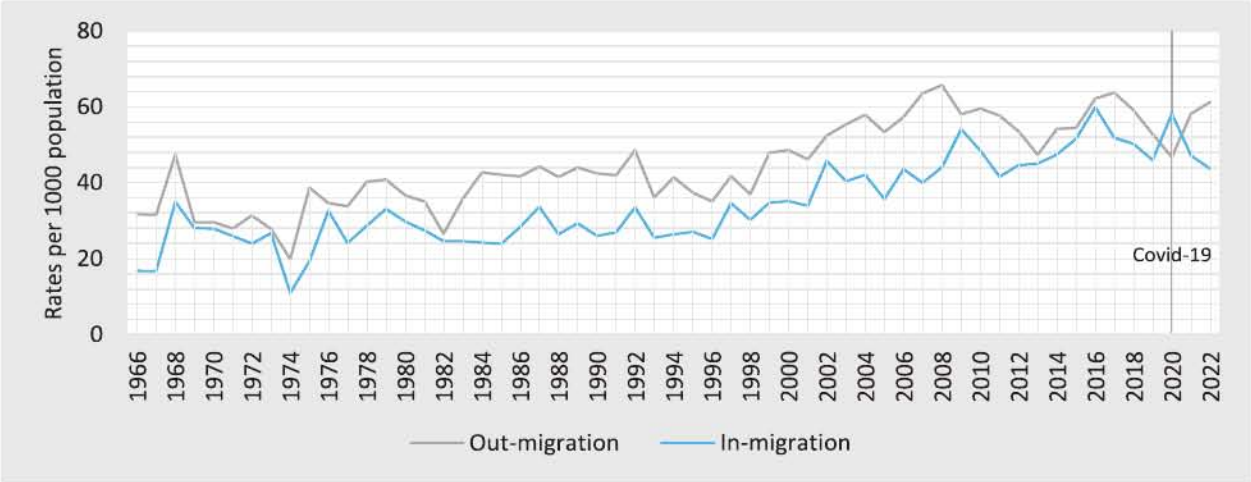


* The y-axis ranges from 10 to 30 rather than 0 to 30 to improve visibility.

Figure 2. 8 Marriage and divorce rates, 1975-2022



Figure 2. 9 In- and out-migration rates, 1966-2022



Chapter 3. Population 2022

Summary

- Mid-year population in the Matlab HDSS in 2022 was 247,754.
- Under-15 children comprised 30% of the population, and elderly people aged 65 years and above comprised 8%.
- Total dependency ratio was 62% (child dependency ratio: 49%; aged dependency ratio: 13%).
- Population sex ratio (male/female x 100) was 83%.

Chapter 3 provides the HDSS population characteristics in 2022 by age, sex, and service area. It also includes the population sex ratio by age, the total dependency ratio (DR), the child dependency ratio, and the aged dependency ratio.

Dependency ratio: Number of dependents (child dependents and aged dependents) on working-age people (aged 15-64 years). Children under 15 years are considered child dependents; people aged 65 years are considered aged dependents; together, they constitute the total dependents.

Child dependency ratio: Number of child dependents on the working-age people.

Aged dependency ratio: Number of aged dependents on the working-age people.

Sex ratio: Number of men per 100 women.

Figure 3. 1 Sex ratio [(male ÷ female) x 100] by service area, 2022

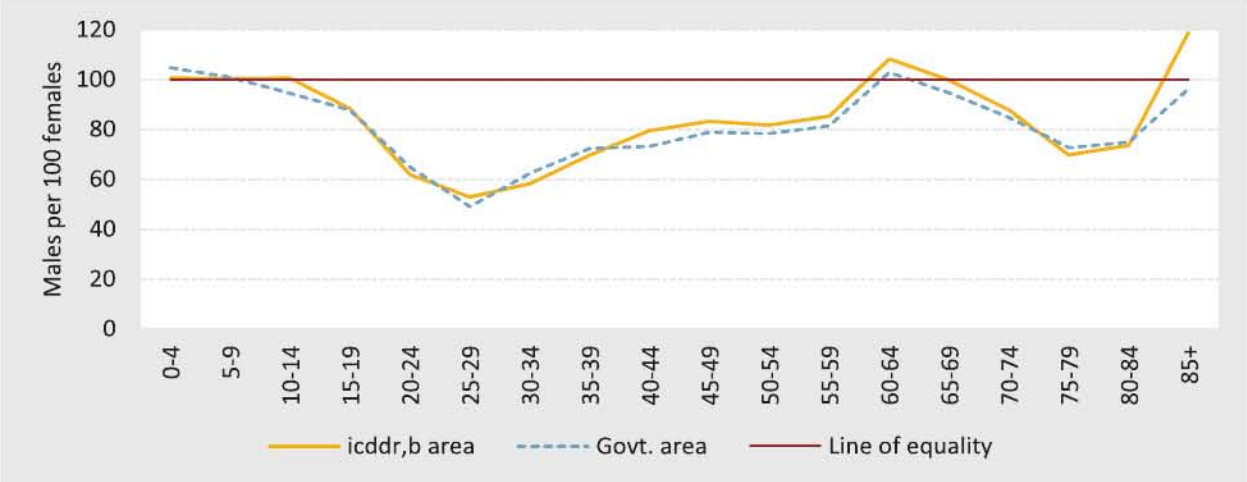


Table 3. 1 Mid-year population by age and sex, population sex ratio, and dependency ratio, 2022

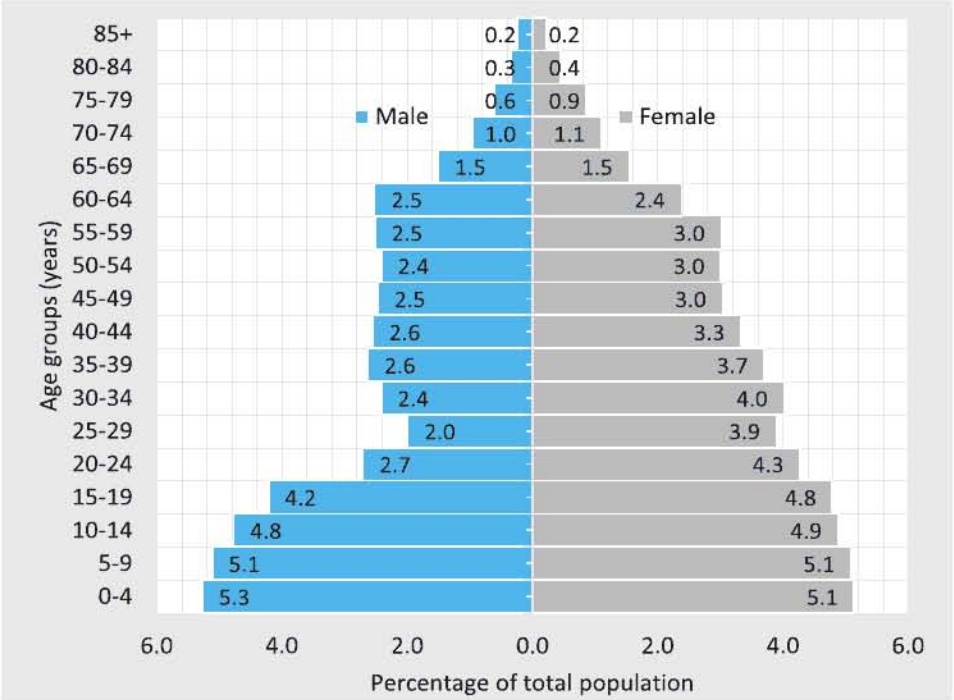
Age groups	Number			Percentage			Sex ratio [M/F]x100	Dependency ratio (DR)
	Both	Male	Female	Both	Male	Female		
All ages	247,754	112,015	135,739	100.0	100.0	100.0	82.5	-
<1 year	5,319	2,677	2,642	2.1	2.4	1.9	101.3	-
1-4 years	20,479	10,382	10,097	8.3	9.3	7.4	102.8	-
1	*4,981*	*2,564*	*2,417*	*2.0*	*2.3*	*1.8*	*106.1*	-
2	*5,151*	*2,606*	*2,545*	*2.1*	*2.3*	*1.9*	*102.4*	-
3	*5,155*	*2,616*	*2,539*	*2.1*	*2.3*	*1.9*	*103.0*	-
4	*5,192*	*2,596*	*2,596*	*2.1*	*2.3*	*1.9*	*100.0*	-
5-9	25,284	12,676	12,608	10.2	11.3	9.3	100.5	-
10-14	23,919	11,813	12,106	9.7	10.5	8.9	97.6	-
15-19	22,312	10,438	11,874	9.0	9.3	8.7	87.9	-
20-24	17,308	6,706	10,602	7.0	6.0	7.8	63.3	-
25-29	14,590	4,929	9,661	5.9	4.4	7.1	51.0	-
30-34	15,948	5,989	9,959	6.4	5.3	7.3	60.1	-
35-39	15,696	6,510	9,186	6.3	5.8	6.8	70.9	-
40-44	14,586	6,320	8,266	5.9	5.6	6.1	76.5	-
45-49	13,647	6,117	7,530	5.5	5.5	5.5	81.2	-
50-54	13,446	5,978	7,468	5.4	5.3	5.5	80.0	-
55-59	13,699	6,229	7,470	5.5	5.6	5.5	83.4	-
60-64	12,154	6,239	5,915	4.9	5.6	4.4	105.5*	-
65-69	7,557	3,725	3,832	3.1	3.3	2.8	97.2	-
70-74	5,085	2,356	2,729	2.1	2.1	2.0	86.3	-
75-79	3,641	1,513	2,128	1.5	1.4	1.6	71.1	-
80-84	1,935	824	1,111	0.8	0.7	0.8	74.2	-
85+	1,149	594	555	0.5	0.5	0.4	107.0	-
Total DR[A]	-	-	-	-	-	-	-	61.5
Child DR [B]	-	-	-	-	-	-	-	*48.9*
Aged DR [C]	-	-	-	-	-	-	-	*12.6*

[A] Total dependency ratio: (P0-14 + P65+)/ (P15-64) × 100.
[B] Child dependency ratio: P0-14/ P15-64 × 100.
[C] Aged dependency ratio: P65+/ P15-64 × 100.
* This irregular pattern has been observed in recent years.

Table 3. 2 Mid-year population by age, sex, and area, 2022

	icddr,b area			Govt. area		
Age groups	Both	Male	Female	Both	Male	Female
All ages	129,915	58,916	70,999	117,839	53,099	64,740
<1 year	2,833	1,423	1,410	2,486	1,254	1,232
1-4 years	10,601	5,313	5,288	9,878	5,069	4,809
1	*2,647*	*1,316*	*1,331*	*2,334*	*1,248*	*1,086*
2	*2,660*	*1,341*	*1,319*	*2,491*	*1,265*	*1,226*
3	*2,658*	*1,331*	*1,327*	*2,497*	*1,285*	*1,212*
4	*2,636*	*1,325*	*1,311*	*2,556*	*1,271*	*1,285*
5-9	13,351	6,688	6,663	11,933	5,988	5,945
10-14	12,581	6,307	6,274	11,338	5,506	5,832
15-19	11,589	5,431	6,158	10,723	5,007	5,716
20-24	8,945	3,418	5,527	8,363	3,288	5,075
25-29	7,848	2,712	5,136	6,742	2,217	4,525
30-34	8,413	3,095	5,318	7,535	2,894	4,641
35-39	8,296	3,405	4,891	7,400	3,105	4,295
40-44	7,689	3,406	4,283	6,897	2,914	3,983
45-49	7,435	3,378	4,057	6,212	2,739	3,473
50-54	7,071	3,178	3,893	6,375	2,800	3,575
55-59	7,239	3,330	3,909	6,460	2,899	3,561
60-64	6,203	3,223	2,980	5,951	3,016	2,935
65-69	3,836	1,915	1,921	3,721	1,810	1,911
70-74	2,562	1,198	1,364	2,523	1,158	1,365
75-79	1,850	760	1,090	1,791	753	1,038
80-84	991	420	571	944	404	540
85+	582	316	266	567	278	289

Figure 3. 2 Population pyramid, Matlab HDSS, 2022



Chapter 4. Mortality 2022

Summary

- Matlab HDSS recorded 1,790 deaths (male: 943; female: 847) in 2022.
- Crude death rate was 7.2 per 1000 population (male: 8.4; female: 6.2).
- Neonatal mortality rate was 16, infant mortality rate was 20, and under-five mortality rate was 42 per 1000 live births.
- Life expectancy at birth was 71 years for males and 75 years for females.

Chapter 4 presents standard mortality and survival indicators, including crude death rate, neonatal, infant, and under-five mortality rates, and life expectancy for 2022.

Crude death rate (CDR): Number of deaths per 1,000 mid-year inhabitants in a defined area in a year;

Early neonatal mortality rate (ENMR): Number of babies who die within 7 days of birth, out of every 1,000 live births;

Neonatal mortality rate (NMR): Number of babies who die before reaching 1 month of age, out of every 1,000 live births;

Infant mortality rate (IMR): Number of babies who die before reaching 1 year of age, out of every 1,000 live births;

Under-five mortality rate (U5MR): Number of babies who die before reaching 5 years of age, out of every 1,000 live births;

Life expectancy: Average number of years a person is expected to live based on current health and living conditions.

Figure 4. 1 Early neonatal rate (ENMR), neonatal mortality rate (NNMR), infant mortality rate (IMR), and under-five mortality rate (U5MR) by area, 2022

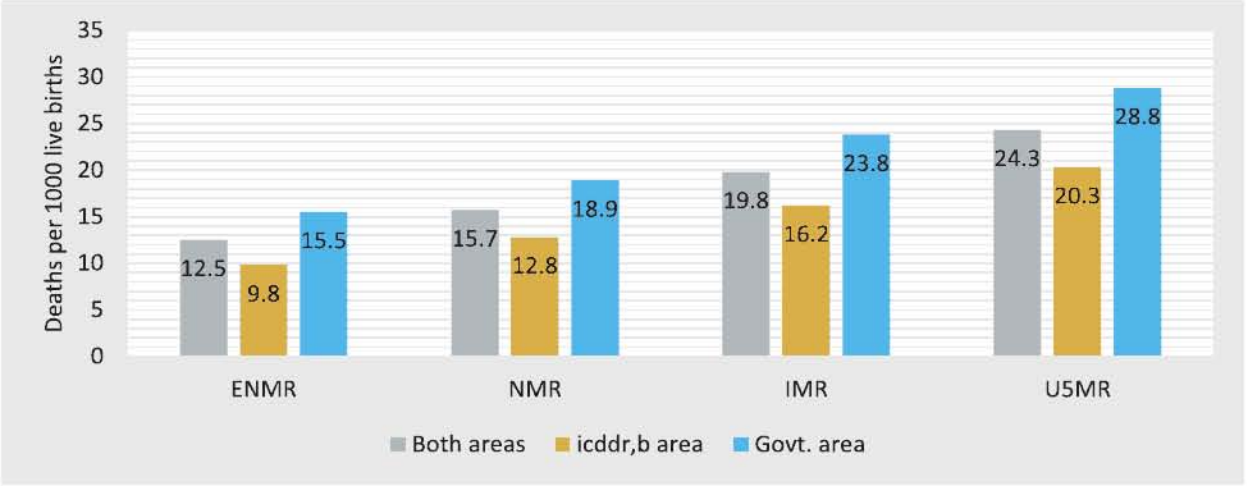


Table 4. 1 Number of deaths by age, sex, and area, 2022

	Both areas			icddr,b area			Govt. area		
Age groups	Both	Male	Female	Both	Male	Female	Both	Male	Female
All ages	1,790	943	847	905	471	434	885	472	413
<1 year	111	62	49	48	26	22	63	36	27
<7 days	*70*	*38*	*32*	*29*	*17*	*12*	*41*	*21*	*20*
7-29 days	*18*	*10*	*8*	*9*	*4*	*5*	*9*	*6*	*3*
1-5 months	*16*	*9*	*7*	*8*	*4*	*4*	*8*	*5*	*3*
6-11 months	*7*	*5*	*2*	*2*	*1*	*1*	*5*	*4*	*1*
1-4 years	25	18	7	12	9	3	13	9	4
1	*10*	*5*	*5*	*4*	*2*	*2*	*6*	*3*	*3*
2	*8*	*8*	*0*	*5*	*5*	*0*	*3*	*3*	*0*
3	*5*	*3*	*2*	*2*	*1*	*1*	*3*	*2*	*1*
4	*2*	*2*	*0*	*1*	*1*	*0*	*1*	*1*	*0*
5-9	7	1	6	3	1	2	4	0	4
10-14	8	2	6	4	1	3	4	1	3
15-19	13	6	7	7	2	5	6	4	2
20-24	14	10	4	7	5	2	7	5	2
25-29	14	6	8	5	2	3	9	4	5
30-34	15	10	5	6	5	1	9	5	4
35-39	25	11	14	13	3	10	12	8	4
40-44	30	13	17	12	5	7	18	8	10
45-49	53	28	25	24	14	10	29	14	15
50-54	78	49	29	43	25	18	35	24	11
55-59	111	62	49	56	28	28	55	34	21
60-64	191	121	70	103	59	44	88	62	26
65-69	193	132	61	110	78	32	83	54	29
70-74	220	107	113	108	51	57	112	56	56
75-79	245	99	146	134	55	79	111	44	67
80-84	207	96	111	92	42	50	115	54	61
85+	230	110	120	118	60	58	112	50	62

Table 4. 2 Age distribution of deaths by sex, and area, 2022

	Both areas			icddr,b area			Govt. area		
Age groups	Both	Male	Female	Both	Male	Female	Both	Male	Female
All ages	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<1 year	6.2	6.6	5.8	5.3	5.5	5.1	7.1	7.6	6.5
<7 days	*3.9*	*4.0*	*3.8*	*3.2*	*3.6*	*2.8*	*4.6*	*4.4*	*4.8*
7-29 days	*1.0*	*1.1*	*0.9*	*1.0*	*0.8*	*1.2*	*1.0*	*1.3*	*0.7*
1-5 months	*0.9*	*1.0*	*0.8*	*0.9*	*0.8*	*0.9*	*0.9*	*1.1*	*0.7*
6-11 months	*0.4*	*0.5*	*0.2*	*0.2*	*0.2*	*0.2*	*0.6*	*0.8*	*0.2*
1-4 years	1.4	1.9	0.8	1.3	1.9	0.7	1.5	1.9	1.0
1	*0.6*	*0.5*	*0.6*	*0.4*	*0.4*	*0.5*	*0.7*	*0.6*	*0.7*
2	*0.4*	*0.8*	*0.0*	*0.6*	*1.1*	*0.0*	*0.3*	*0.6*	*0.0*
3	*0.3*	*0.3*	*0.2*	*0.2*	*0.2*	*0.2*	*0.3*	*0.4*	*0.2*
4	*0.1*	*0.2*	*0.0*	*0.1*	*0.2*	*0.0*	*0.1*	*0.2*	*0.0*
5-9	0.4	0.1	0.7	0.3	0.2	0.5	0.5	0.0	1.0
10-14	0.4	0.2	0.7	0.4	0.2	0.7	0.5	0.2	0.7
15-19	0.7	0.6	0.8	0.8	0.4	1.2	0.7	0.8	0.5
20-24	0.8	1.1	0.5	0.8	1.1	0.5	0.8	1.1	0.5
25-29	0.8	0.6	0.9	0.6	0.4	0.7	1.0	0.8	1.2
30-34	0.8	1.1	0.6	0.7	1.1	0.2	1.0	1.1	1.0
35-39	1.4	1.2	1.7	1.4	0.6	2.3	1.4	1.7	1.0
40-44	1.7	1.4	2.0	1.3	1.1	1.6	2.0	1.7	2.4
45-49	3.0	3.0	3.0	2.7	3.0	2.3	3.3	3.0	3.6
50-54	4.4	5.2	3.4	4.8	5.3	4.1	4.0	5.1	2.7
55-59	6.2	6.6	5.8	6.2	5.9	6.5	6.2	7.2	5.1
60-64	10.7	12.8	8.3	11.4	12.5	10.1	9.9	13.1	6.3
65-69	10.8	14.0	7.2	12.2	16.6	7.4	9.4	11.4	7.0
70-74	12.3	11.3	13.3	11.9	10.8	13.1	12.7	11.9	13.6
75-79	13.7	10.5	17.2	14.8	11.7	18.2	12.5	9.3	16.2
80-84	11.6	10.2	13.1	10.2	8.9	11.5	13.0	11.4	14.8
85+	12.8	11.7	14.2	13.0	12.7	13.4	12.7	10.6	15.0

Table 4. 3 Death rates by age, sex, and area, 2022 (per 1,000 population)

	Both areas			icddr,b area			Govt. area		
Age groups	Both	Male	Female	Both	Male	Female	Both	Male	Female
All ages	7.2	8.4	6.2	7.0	8.0	6.1	7.5	8.9	6.4
<1 year*	19.8	21.8	17.7	16.2	17.3	15.0	23.8	26.7	20.8
*<7 days**	*12.5*	*13.3*	*11.6*	*9.8*	*11.3*	*8.2*	*15.5*	*15.6*	*15.4*
*7-29 days**	*3.2*	*3.5*	*2.9*	*3.0*	*2.7*	*3.4*	*3.4*	*4.4*	*2.3*
*1-5 months**	*2.9*	*3.2*	*2.5*	*2.7*	*2.7*	*2.7*	*3.0*	*3.7*	*2.3*
*6-11 months**	*1.2*	*1.8*	*0.7*	*0.7*	*0.7*	*0.7*	*1.9*	*3.0*	*0.8*
1-4 years	1.2	1.7	0.7	1.1	1.7	0.6	1.3	1.8	0.8
1	*2.0*	*2.0*	*2.1*	*1.5*	*1.5*	*1.5*	*2.6*	*2.4*	*2.8*
2	*1.6*	*3.1*	*0.0*	*1.9*	*3.7*	*0.0*	*1.2*	*2.4*	*0.0*
3	*1.0*	*1.1*	*0.8*	*0.8*	*0.8*	*0.8*	*1.2*	*1.6*	*0.8*
4	*0.4*	*0.8*	*0.0*	*0.4*	*0.8*	*0.0*	*0.4*	*0.8*	*0.0*
5-9	0.3	0.1	0.5	0.2	0.1	0.3	0.3	0.0	0.7
10-14	0.3	0.2	0.5	0.3	0.2	0.5	0.4	0.2	0.5
15-19	0.6	0.6	0.6	0.6	0.4	0.8	0.6	0.8	0.3
20-24	0.8	1.5	0.4	0.8	1.5	0.4	0.8	1.5	0.4
25-29	1.0	1.2	0.8	0.6	0.7	0.6	1.3	1.8	1.1
30-34	0.9	1.7	0.5	0.7	1.6	0.2	1.2	1.7	0.9
35-39	1.6	1.7	1.5	1.6	0.9	2.0	1.6	2.6	0.9
40-44	2.1	2.1	2.1	1.6	1.5	1.6	2.6	2.7	2.5
45-49	3.9	4.6	3.3	3.2	4.1	2.5	4.7	5.1	4.3
50-54	5.8	8.2	3.9	6.1	7.9	4.6	5.5	8.6	3.1
55-59	8.1	10.0	6.6	7.7	8.4	7.2	8.5	11.7	5.9
60-64	15.7	19.4	11.8	16.6	18.3	14.8	14.8	20.6	8.9
65-69	25.5	35.4	15.9	28.7	40.7	16.7	22.3	29.8	15.2
70-74	43.3	45.4	41.4	42.2	42.6	41.8	44.4	48.4	41.0
75-79	67.3	65.4	68.6	72.4	72.4	72.5	62.0	58.4	64.5
80-84	107.0	116.5	99.9	92.8	100.0	87.6	121.8	133.7	113.0
85+	200.2	185.2	216.2	202.7	189.9	218.0	197.5	179.9	214.5

*Rate per 1000 live births

Table 4. 4 Number of deaths by month and age, 2022

	Age at Death					
Months	All ages	<1 month	1-11 months	1-4 years	5-64 years	65+ years
Total	1,790	88	23	25	559	1,095
Jan	219	11	1	0	54	153
Feb	205	7	3	0	50	145
Mar	149	12	2	2	46	87
Apr	106	4	1	1	40	60
May	113	5	2	3	38	65
Jun	107	5	2	4	42	54
Jul	150	6	1	2	46	95
Aug	142	11	2	5	50	74
Sep	122	10	1	1	33	77
Oct	128	2	3	1	46	76
Nov	158	8	2	4	53	91
Dec	191	7	3	2	61	118

Figure 4. 2 Life expectancy at birth by sex, 2022

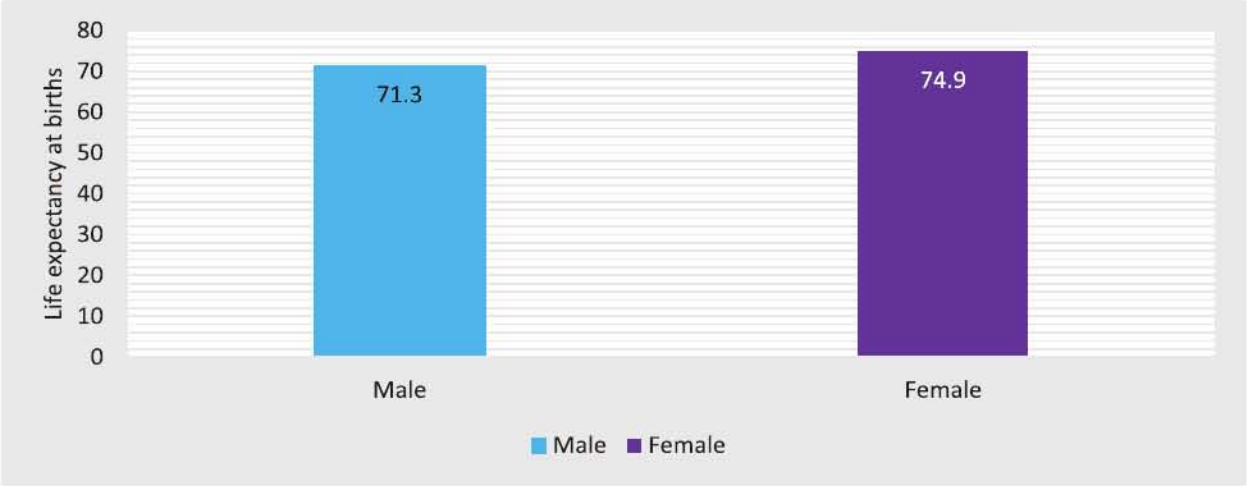


Figure 4. 3 Probability of survival from birth to age(x) by sex, 2022

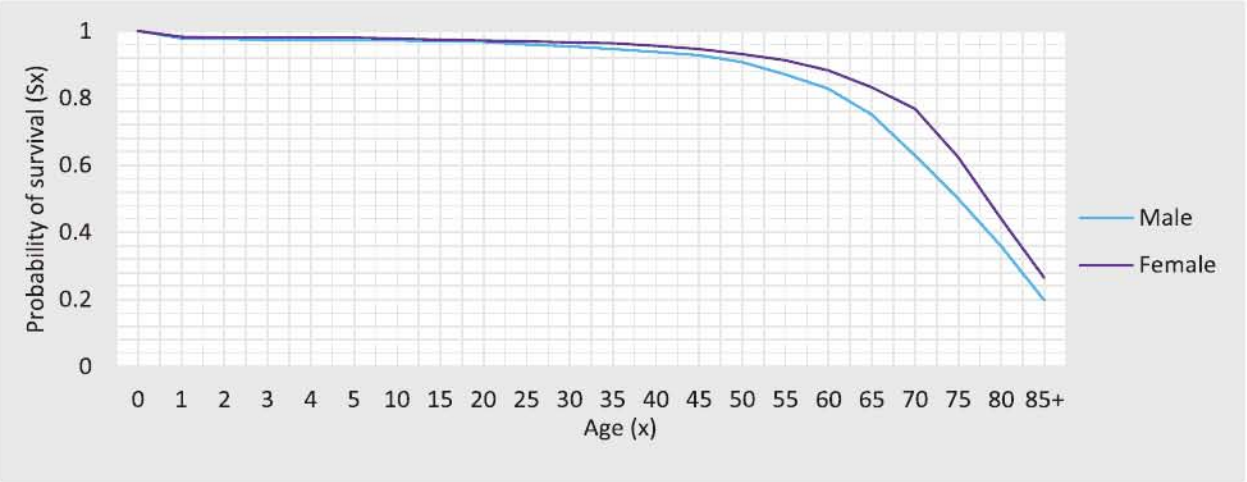
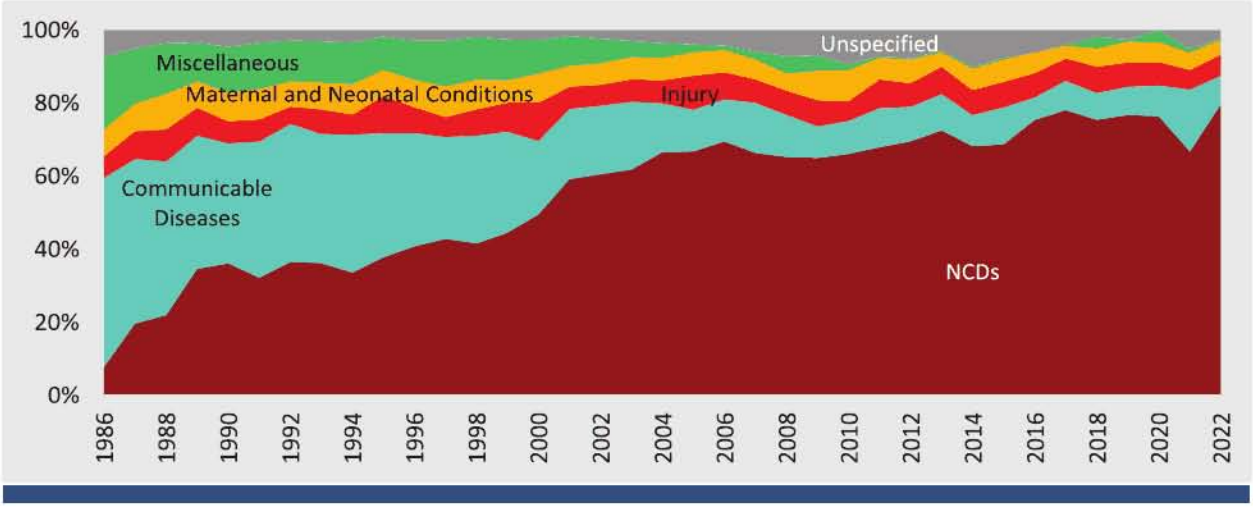


Figure 4. 4 Percent distribution of age-standardized cause-specific death rates, 1986-2022



Chapter 5. Fertility and Maternal Health Care 2022

Summary

- A total of 6,334 women experienced a pregnancy outcome in 2022. The pregnancy outcomes were 5,602 live births, 68 stillbirths, 643 spontaneous abortions, and 89 induced abortions.
- Crude birth rate was 22.6 per 1,000 population, and total fertility rate was 2.7.
- Receiving at least one antenatal care (ANC) consultation was almost universal (98%). Only 60% received the recommended four or more ANC visits (icddr,b area: 84%, Govt. area: 34%). Only 50% of women received an ANC consultation in the first trimester, with a large difference between service areas (icddr,b area: 65%, Govt. area: 33%).
- Facility birth was 87% (icddr,b area: 95%, Govt. area: 88%).
- C-section birth was 61% (icddr,b area: 62%, Govt. area: 60%).

This chapter summarizes pregnancy outcomes and reports the key fertility indicators for 2022. The fertility indicators include crude birth rate, total fertility rate, age-specific fertility rate, general fertility rate, and net reproduction rate. The chapter also includes pregnancy and delivery care (antenatal care, place of birth, birth attendant, and mode of delivery) for live births in 2022.

Crude birth rate (CBR): Number of live births per 1,000 mid-year inhabitants in a defined area in a year;

Age-specific fertility rate (ASFR): Number of live births to women in a specific age group during a given year, per 1,000 women in that same age group;

Total fertility rate (TFR): Number of children an average woman would have in her lifetime if current birth patterns continue.

General fertility rate (GFR): Number of live births occurring among women of reproductive age in a year;

Gross reproduction rate (GRR): Average number of daughters a woman would give birth to during her reproductive lifetime if current age-specific fertility rates remain constant and if she survives throughout her childbearing years.

Net reproduction rate (NRR): Average number of daughters a newborn girl is expected to give birth to during her lifetime, considering both fertility rates and female mortality rates.

Miscarriage: Pregnancy that spontaneously ends before 28 weeks of gestation.

Abortion: Pregnancy that is ended using drugs or surgical intervention before 28 weeks of gestation.

Table 5. 1 Pregnancy outcomes by area, 2022

Pregnancies and pregnancy outcomes	Both areas	icddr,b area	Govt. area
Number of pregnancies by type			
Total pregnancies that ended:	6,334	3,376	2,958
With at least one live birth	5,543	2,922	2,621
With at least one stillbirth	67	38	29
In spontaneous abortion (miscarriage)	639	382	257
In induced termination of pregnancy (induced abortion)	89	37	52
Number of multiple outcome pregnancies by type			
Multiple outcome pregnancies	64	41	23
Twin pregnancies ended with:	62	39	23
1 live birth and 1 still birth	2	1	1
2 live births	56	35	21
2 miscarriages	2	1	1
1 live birth and 1 miscarriage	1	1	0
2 still births	1	1	0
Triplet pregnancies ended with	2	2	0
3 live births	1	1	0
3 miscarriages	1	1	0
Number of pregnancy outcomes by type			
Total outcomes	6,402	3,420	2,982
Live Birth	5,602	2,959	2,643
Still Birth	68	39	29
Miscarriage	643	385	258
Induced Abortion	89	37	52
Pregnancy rates by type			
Pregnancies per 1000 women age 15-19	94.4	95.4	93.3
Rates per 1000 pregnancies			
Live birth	875.1	865.5	886.1
Still birth	10.6	11.3	9.8
Miscarriage	100.9	113.2	86.9
Induced abortion	14.1	11.0	17.6

Note: 9 births to women aged below 15 years & 1 birth to a woman aged above 49 were excluded from the analysis.

Table 5. 2 Number of pregnancy outcomes by month, 2022

		Pregnancy outcomes				Number of live-born children			
Months	Total	Abortion	Miscarriage	Stillbirth	Live birth*	Both	Male	Female	Sex ratio
All	6,402	89	643	68	5,602	5,602	2,843	2,759	1.0
Jan	560	13	56	8	483	483	239	244	1.0
Feb	501	10	50	8	433	433	216	217	1.0
Mar	528	11	76	4	437	437	217	220	1.0
Apr	540	10	60	6	464	464	221	243	0.9
May	458	9	48	6	395	395	208	187	1.1
Jun	494	7	58	4	425	425	224	201	1.1
Jul	445	4	47	2	392	392	205	187	1.1
Aug	530	6	54	4	466	466	212	254	0.8
Sep	545	3	49	7	486	486	255	231	1.1
Oct	599	7	51	8	533	533	278	255	1.1
Nov	610	4	48	5	553	553	307	246	1.2
Dec	592	5	46	6	535	535	261	274	1.0

* For any multiple-birth pregnancy, the outcome is recorded as live birth if at least one of the issues is live-born.

Table 5. 3 Births and fertility rates by age and area, 2022

	Both areas		icddr,b area		Govt. area	
Age groups	Live births	Rate	Live births	Rate	Live births	Rate
All ages	5,602	83.5	2,959	83.7	2,643	83.4
15-19	1,031	86.8	566	91.9	465	81.4
20-24	1,794	169.2	932	168.6	862	169.9
25-29	1,374	142.2	734	142.9	640	141.4
30-34	925	92.9	466	87.6	459	98.9
35-39	388	42.2	215	44.0	173	40.3
40-44	86	10.4	44	10.3	42	10.5
45-49	4	0.5	2	0.5	2	0.6
Crude birth rate (per 1000 pop.)	-	22.6	-	22.8	-	22.4
Total fertility rate (per woman)	-	2.7	-	2.7	-	2.7
General fertility rate (per 1000 women)	-	84	-	84	-	83
Gross reproduction rate (per 1000 women)	-	1,330	-	1,335	-	1,324
Net reproduction rate (per 1000 women)	-	1,299	-	-	-	-

Figure 5. 1 Age-specific fertility rates by service area, 2022



Table 5. 4 Numbers and percentage of live birth pregnancies by d

Place of Delivery	Both areas		icddr,b area		Govt. area	
	Number	Percent	Number	Percent	Number	Percent
Home	745	13.3	160	5.4	585	22.1
icddr,b health facilities						
icddr,b Matlab Hospital	705	12.6	700	23.7	5	0.2
icddr,b Sub-Centre	4	0.1	4	0.1	0	0.0
Government health facilities						
MCWC/District-level Hospital	180	3.2	74	2.5	106	4.0
Upazila Health Complex	313	5.6	101	3.4	212	8.0
Union Health and Family Welfare Center	54	1.0	19	0.6	35	1.3
Community Clinic	7	0.1	2	0.1	5	0.2
Private health facilities	3,587	64.0	1,897	64.1	1,690	63.9
Others	7	0.1	2	0.1	5	0.2
Total	5,602	100.0	2,959	100.0	2,643	100.0

Table 5. 5 Number and percent distribution of live birth by birth attendant and area, 2022

Birth attendant	Both areas		icddr,b area		Govt. area	
	Number	Percent	Number	Percent	Number	Percent
None	38	0.7	12	0.4	26	1.0
Traditional birth attendant (TBA)	370	6.6	101	3.4	269	10.2
Trained TBA	171	3.1	27	0.9	144	5.4
Family Welfare Visitor	270	4.8	141	4.8	129	4.9
Nurse	1,227	21.9	784	26.5	443	16.8
Medical doctor*	3,515	62.7	1,889	63.8	1,626	61.5
Others	11	0.2	5	0.2	6	0.2
Total	5,602	100.0	2,959	100.0	2,643	100.0

* Providers with at least an MBBS

Figure 5. 2 Share (%) of C-section births in facility births by area, 2022

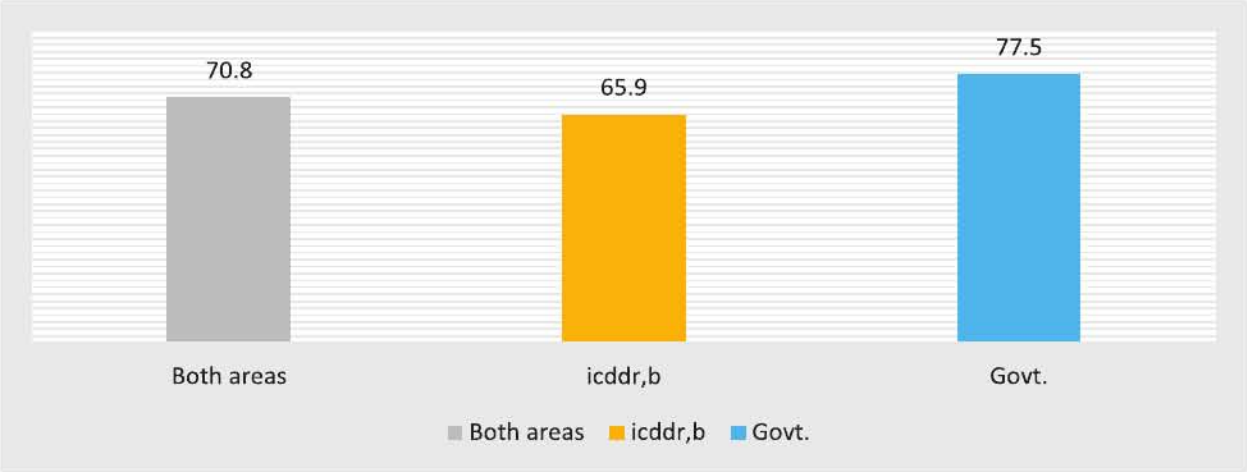


Table 5. 6 Antenatal care (ANC) visits, 2022

	Both areas		icddr,b area		Govt. area	
ANC visits	Number	Percent	Number	Percent	Number	Percent
Number of ANC visits						
None	90	1.6	13	0.4	77	2.9
1	412	7.4	43	1.5	369	14.1
2	803	14.5	126	4.3	677	25.8
3	912	16.5	293	10.0	619	23.6
4+	3,325	60.0	2,447	83.7	878	33.5
Total	5,542	100.0	2,922	100.0	2,620	100.0
First ANC visits by trimesters						
No ANC	90	1.6	13	0.4	77	2.9
In 1st trimester	2747	49.6	1881	64.4	866	33.1
In 2nd trimester	1564	28.2	825	28.2	739	28.2
In 3rd trimester	1141	20.6	203	6.9	938	35.8
Total	5,542	100.0	2,922	100.0	2,620	100.0

Chapter 6. Marriage and Divorce, 2022

Summary

- A total of 3,979 marriages and 482 divorces were recorded in the Matlab HDSS in 2022.
- The median age at first marriage was 27 years for males and 18 years for females.
- The bride's family provided in 11.9% of the marriages.
- 85% of Muslim marriages were registered by the marriage register; it was 46% for divorces.
- The mean duration of marriage at the time of divorce was 42 months.

Chapter 6 provides statistics on marriage and divorce for 2022, including marriage rates, divorce rates, age at marriage, marriage and divorce registration, causes of divorce, and dowry.

> **Dowry:** Gifts in the form of money or any other products provided by the bride's family to the groom's family with prior negotiation.

Table 6. 1 Percent distribution of at marriage by previous marital status, 2022

	Groom					Bride			
Age groups	All	Single	Married	Divorced	Widowed	All	Single	Divorced	Widowed
Number	3,979	3,418	78	374	109	3,979	3,501	419	59
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
10-14	0.0	0.0	0.0	0.0	0.0	4.6	5.2	0.2	0.0
15-17	1.1	1.2	1.3	0.3	0.0	31.3	34.4	9.1	1.7
18-20	5.7	6.3	1.3	1.6	0.0	34.8	37.1	20.2	1.7
18	*1.3*	*1.4*	*1.3*	*0.8*	*0.0*	*14.5*	*15.8*	*5.7*	*1.7*
19	*1.7*	*1.9*	*0.0*	*0.3*	*0.0*	*12.2*	*12.9*	*8.1*	*0.0*
20	*2.7*	*3.0*	*0.0*	*0.5*	*0.0*	*8.1*	*8.4*	*6.4*	*0.0*
21-24	17.8	19.4	12.9	8.5	0.0	17.9	17.0	26.5	6.8
25-29	40.8	44.4	23.1	23.3	1.8	6.2	4.5	19.6	10.2
30-34	23.6	23.4	17.9	30.2	11.0	2.6	1.2	12.6	11.9
35-39	6.1	4.4	9.0	19.3	13.8	1.3	0.3	6.0	25.4
40-44	2.1	0.6	9.0	9.9	16.5	0.7	0.1	3.6	11.9
45-49	1.0	0.2	11.5	3.2	12.8	0.4	0.0	1.4	11.9
50-54	0.7	0.0	6.4	2.1	11.0	0.3	0.0	0.5	13.6
55-59	0.6	0.0	3.8	1.1	16.5	0.1	0.0	0.2	1.7
60-64	0.4	0.0	3.8	0.5	11.0	0.1	0.0	0.0	3.4
65+	0.2	0.0	0.0	0.0	5.5	0.0	0.0	0.0	0.0
Median age*	28.0	27.0	33.0	32.0	47.0	18.0	18.0	24.0	38.0
Mean age*	28.5	27.2	35.8	33.1	48.0	19.8	18.8	25.4	38.8
St. dev.*	6.7	4.6	11.6	7.5	11.8	5.4	3.6	7.4	10.8

*Mean, median, and standard deviation (St. Dev.) were calculated from ungrouped data.

Table 6. 2 Marriage rates by age and sex, 2022

	Male			Female		
Age (years)	Marriages	Population	Rate*	Marriages	Population	Rate*
10 and above	3,979	86,280	46.1	3,979	110,392	36.0
10-14	0	11,813	0.0	183	12,106	15.1
15-19	161	10,438	15.4	2,309	11,874	194.5
15	*4*	*2,230*	*1.8*	*278*	*2,373*	*117.2*
16	*13*	*2,230*	*5.8*	*431*	*2,341*	*184.1*
17	*25*	*2,083*	*12.0*	*535*	*2,335*	*229.1*
18	*53*	*2,024*	*26.2*	*578*	*2,370*	*243.9*
19	*66*	*1,871*	*35.3*	*487*	*2,455*	*198.4*
20-24	812	6,706	121.1	1,031	10,602	97.2
25-29	1,624	4,929	329.5	247	9,661	25.6
25	268	939	285.4	72	1,956	36.8
26	306	947	323.1	59	1,875	31.5
27	391	1,011	386.7	50	1,937	25.8
28	353	1,008	350.2	47	1,968	23.9
29	306	1,024	298.8	19	1,925	9.9
30-34	939	5,989	156.8	102	9,959	10.2
35-39	244	6,510	37.5	51	9,186	5.6
40-44	84	6,320	13.3	27	8,266	3.3
45+	115	33,575	3.4	29	38,738	0.7

*Rates per 1000 population, irrespective of previous marital status

Table 6. 3 Percent distribution of current marital status by age and sex, 2022

Age	Male						Female					
groups	NM	CM	WID	DIV	Total	Number	NM	CM	WID	DIV	Total	Number
0-4	100.0	0.0	0.0	0.0	100.0	13,059	100.0	0.0	0.0	0.0	100.0	12,739
5-9	100.0	0.0	0.0	0.0	100.0	12,676	100.0	0.0	0.0	0.0	100.0	12,608
10-14	100.0	0.0	0.0	0.0	100.0	11,813	96.5	3.3	0.0	0.2	100.0	12,106
15-19	96.1	3.8	0.0	0.1	100.0	10,438	50.8	47.9	0.0	1.3	100.0	11,874
20-24	75.5	23.7	0.0	0.8	100.0	6,706	12.3	85.7	0.2	1.9	100.0	10,602
25-29	34.8	63.5	0.1	1.7	100.0	4,929	2.9	95.1	0.4	1.6	100.0	9,661
30-34	10.5	87.9	0.1	1.5	100.0	5,989	1.3	96.4	1.1	1.2	100.0	9,959
35-39	2.9	95.7	0.1	1.3	100.0	6,510	0.7	95.4	2.4	1.4	100.0	9,186
40-44	1.6	97.1	0.2	1.1	100.0	6,320	0.5	93.8	4.6	1.1	100.0	8,266
45-49	1.0	98.0	0.1	0.9	100.0	6,117	0.3	90.0	8.5	1.2	100.0	7,530
50-54	0.6	98.0	0.7	0.7	100.0	5,978	0.2	83.5	14.9	1.3	100.0	7,468
55-59	0.4	97.7	1.4	0.5	100.0	6,229	0.4	72.7	25.2	1.7	100.0	7,470
60-64	0.3	96.3	2.9	0.4	100.0	6,239	0.2	58.6	39.3	1.9	100.0	5,915
65-69	0.3	93.3	5.9	0.5	100.0	3,725	0.1	41.1	57.4	1.5	100.0	3,832
70-74	0.2	90.7	8.8	0.4	100.0	2,356	0.0	25.6	73.4	1.0	100.0	2,729
75-79	0.3	85.3	14.1	0.3	100.0	1,513	0.0	12.1	86.7	1.1	100.0	2,128
80-84	0.1	78.3	21.4	0.2	100.0	824	0.0	5.4	94.1	0.5	100.0	1,111
85+	0.3	62.0	37.5	0.2	100.0	594	0.4	3.1	96.0	0.5	100.0	555
Total	49.5	48.8	1.2	0.5	100.0	112,015	33.1	55.3	10.6	1.0	100.0	135,739

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

Figure 6. 1 Number of marriages and divorces by months, 2022



Table 6. 4 Duration (in months) of marriages at divorce by age at divorce and sex, 2022

	Male				Female			
Age at divorce (years)	Count	Mean	Median	±SD	Count	Mean	Median	±SD
<20	10	10.8	10.5	8.6	154	13.3	10.0	13.1
20-24	66	20.3	13.5	20.0	165	33.9	24.0	30.3
25-29	128	24.9	13.0	28.4	82	57.8	59.5	40.1
30-34	146	36.1	24.0	34.8	40	74.1	55.5	59.8
35-39	65	61.4	52.0	49.2	23	106.5	120.0	79.9
40-49	54	101.0	71.0	83.5	14	145.4	118.5	97.5
50+	13	64.9	32.0	68.0	4	90.5	94.0	86.7
All ages	482	41.9	22.5	49.7	482	41.9	22.5	49.7

Table 6. 5 Reported causes of divorce by area, 2022

	Both areas		icddr,b area		Govt. area	
Cause of divorce	Number	Percent	Number	Percent	Number	Percent
Dowry	7	1.5	2	0.8	5	2.1
Domestic violence	27	5.6	8	3.3	19	7.9
Husband's affairs	56	11.6	31	12.8	25	10.4
Wife's affairs	100	20.7	59	24.4	41	17.1
Wife maladjustment	148	30.7	69	28.5	79	32.9
Husband addicted	21	4.4	11	4.5	10	4.2
No trace of husband	7	1.5	5	2.1	2	0.8
Appearance not attractive*	17	3.5	8	3.3	9	3.8
Husband disabled	35	7.3	17	7.0	18	7.5
Wife disabled	13	2.7	6	2.5	7	2.9
Others	51	10.6	26	10.7	25	10.4
Total	482	100.0	242	100.0	240	100.0

* In Bangladesh, many marriages happen without the spontaneous consent of the bride or groom. Often, one partner does not admire the appearance of the other partner, and sometimes it ends with divorce.

Figure 6. 2 Percent of marriages with dowry, 2009-2022



Chapter 7. Migration, 2022

Summary

- A total of 10,798 in-migration and 15,195 out-migration events were recorded in 2022.
- In-migration rates were the same for both males and females (44 per 1000 population).
- Out-migration rate was 1.4 times higher for males than for females (72 and 53 per 1000 population, respectively).
- Both in- and out-migration rates are high for men aged 20-50, but they are 15-35 for women.
- Both in- and out-migration rates are higher in the first quarter of each year than at any other time for both men and women.

This chapter provides 2022 updates on in- and out-migration by age, sex, and month of migration.

In-migrant: An individual is classified as an in-migrant if s/he enters the HDSS area from outside the surveillance area and resides there continuously for a minimum period of six months.

Out-migrant: An individual is classified as an out-migrant if s/he leaves the HDSS area and remains outside the surveillance area for a continuous period of at least six months.

Figure 7. 1 In- and out-migration rates by age and sex, 2022

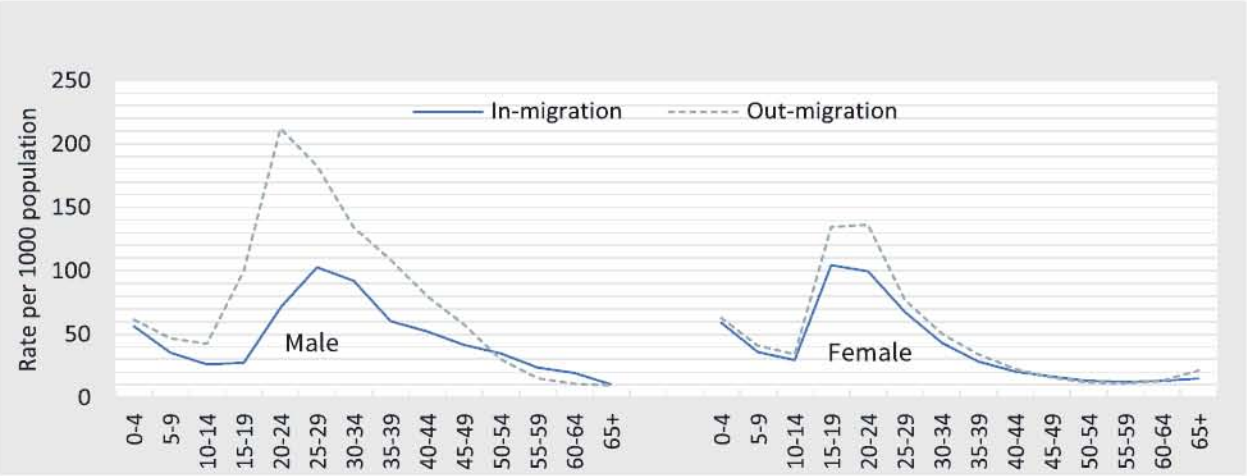
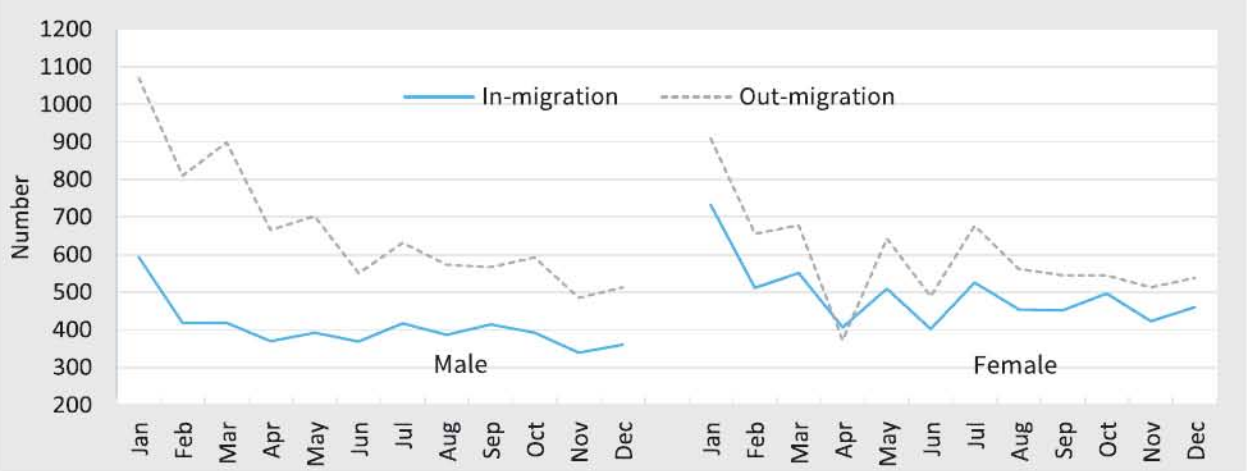


Figure 7. 2 In- and out-migration by sex and calendar months, 2022



Note: Similar monthly migration patterns were also observed in previous years.

Table 7. 1 Age and sex-specific in- and out-migration rates (per 1,000 population), 2022

	Both sexes		Male		Female	
Age groups	In	Out	In	Out	In	Out
All ages	43.6	61.3	43.5	72.0	43.7	52.5
0-4	57.8	62.4	56.4	61.6	59.3	63.2
5-9	35.6	44.0	35.5	46.9	35.8	41.1
10-14	27.9	38.5	26.3	42.6	29.5	34.4
15-19	68.5	118.4	27.5	99.8	104.5	134.7
20-24	88.5	165.8	71.1	212.2	99.5	136.4
25-29	79.4	112.8	102.7	182.6	67.6	77.2
30-34	61.6	81.8	92.2	134.1	43.3	50.4
35-39	41.7	65.2	60.4	108.6	28.5	34.4
40-44	34.3	47.4	52.2	79.9	20.7	22.6
45-49	27.7	34.5	41.5	57.4	16.5	15.9
50-54	22.9	20.2	35.0	30.4	13.3	11.9
55-59	17.6	13.0	23.8	15.3	12.4	11.1
60-64	16.5	12.2	19.7	10.9	13.2	13.5
65+	13.0	16.0	10.5	9.7	15.1	21.4

Table 7. 2 Number of in-and out-migrations by sex and month, 2022

	In-migration			Out-migration		
Months	Both sex	Male	Female	Both sex	Male	Female
All months	10,798	4,871	5,927	15,195	8,064	7,131
Jan	1,327	594	733	1,981	1,071	910
Feb	929	418	511	1,466	810	656
Mar	970	419	551	1,578	899	679
Apr	777	370	407	1,039	666	373
May	902	392	510	1,346	703	643
Jun	771	369	402	1,040	551	489
Jul	943	417	526	1,309	632	677
Aug	841	387	454	1,135	573	562
Sep	866	414	452	1,112	567	545
Oct	889	392	497	1,138	593	545
Nov	762	339	423	999	486	513
Dec	821	360	461	1,052	513	539

Chapter 8. Family Planning, 2007-2022

Summary

- In 2022, the contraceptive prevalence rates were 50% and 44% in the icddr,b and government areas, respectively. A notable increase in the contraceptive prevalence rate was observed in 2022 compared to 2021. Further investigation is needed to explain the change.

- In the icddr,b service area, pill is the predominant method, with a use rate of 19%, followed by injectables (15%); these were 19% and 10%, respectively, in the government area.

This chapter provides contraceptive method use among currently married women of reproductive age (15-49 years) (CMWRA). The analysis includes 52,316 CMWRAs living in the HDSS area as of 31 December 2022. We have also provided CPRs from 2007 to 2021, as reported in previous reports.

Contraceptive prevalence rate (CPR): Defined as "Percentage of currently married women of reproductive age (CMWRA), aged 15-49 years, who use any method of contraception." In this analysis, we included CMWRA living in the HDSS area on December 31, 2022, and classified contraceptive users by the method used, as reported at the most recent HDSS visit.

Table 8. 1. Contraceptive prevalence rate (%) by area, 1987-2022

	Matlab HDSS		Rural	National
Year	icddr,b area	Govt. area	Chattogram	
2007	56.6	43.6	37.4 (BDHS)	55.8 (BDHS)
2008	54.4	41.3	-	-
2009	54.2	42.5	-	-
2010	55.7	43.1	-	62.6 (BMMS)
2011	54.1	43.7	45.2 (BDHS)	61.2 (BDHS)
2012	53.3	42.6	-	-
2013	53.8	42.2	-	-
2014	53.9	41.9	47.8 (BDHS)	62.4 (BDHS)
2015	51.4	40.9	-	-
2016	49.0	38.6	-	62.8 (BMMS)
2017	47.7	36.8	52.2 (BDHS)	61.9 (BDHS)
2018	43.9	35.1	-	-
2019	43.2	35.1	-	-
2020	Incomplete data due to COVID-19 movement restrictions			
2021	43.4	36.3	-	-
2022	50.0	44.1	55.1 (BDHS)	64.0 (BDHS)

CPS: Contraceptive Prevalence Survey; BDHS: Bangladesh Demographic and Health Survey; BMMS: Bangladesh Maternal Health Services and maternal mortality survey.

Note: The Definition of CPR was revised in 2018 to align with other standard sources, such as DHS. New definition: percentage of currently married women of age 15-49 years who use any method of family planning. The definition used until 2017 excluded women who are menopausal and who have had a hysterectomy procedure.

Table 8. 2. Method-specific contraceptive use rate among CMWRA in icddr,b service area by age, 2022

Age groups	Not using	Any method used	Pill	Con-dom	Injec-tables	IUD	Tubec-tomy	NSV	Im-plants	Oth-ers*	No. of women
<20	77.4	22.6	9.0	5.1	6.4	0.2	0.0	0.0	1.5	0.4	1,808
20-24	61.6	38.4	16.3	5.8	12.4	0.2	0.0	0.0	3.1	0.6	4,570
25-29	54.9	45.1	19.4	6.1	14.4	0.4	1.3	0.0	2.5	0.9	4,976
30-34	46.5	53.5	21.1	6.9	16.5	0.6	4.1	0.3	3.1	1.0	5,092
35-39	41.6	58.4	20.9	6.2	18.0	0.6	7.9	0.4	3.1	1.3	4,688
40-44	38.9	61.1	20.0	6.7	16.4	0.5	12	1.1	2.6	1.8	3,997
45-49	40.3	59.7	17.3	5.6	15.5	0.4	13.9	1.6	1.8	3.5	2,703
Total	50.0	50.0	18.6	6.2	14.9	0.5	5.4	0.4	2.7	1.3	27,834
*Others include periodic abstinence, withdrawal, and other traditional methods											

Table 8. 3. Method-specific contraceptive use rate among CMWRA in Govt. service area by age, 2022

Age groups	Not using	Any method used	Pill	Con-dom	Inject-ables	IUD	Tubec-tomy	NSV	Im-plants	Oth-ers*	No of women
<20	80.3	19.7	10.1	5.2	2.6	0.0	0.0	0.0	1.0	0.8	1,528
20-24	68.8	31.2	15.8	5.5	7.0	0.3	0.0	0.0	1.5	1.0	4,085
25-29	59.8	40.2	19.9	5.5	10.2	0.4	1.1	0.1	1.5	1.5	4,327
30-34	52.4	47.6	22.3	5.6	11.7	0.7	3.9	0.2	1.5	1.8	4,519
35-39	45.6	54.4	22.7	5.0	13.6	0.7	8.3	0.4	1.7	1.9	4,138
40-44	44.5	55.5	21.3	4.1	12.8	0.6	10.9	0.6	1.7	3.5	3,611
45-49	52.4	47.6	16.2	3.2	10.5	0.5	11.2	0.5	1.1	4.3	2,274
Total	55.9	44.1	19.4	5.0	10.4	0.5	5.0	0.2	1.5	2.0	24,482
*Others include periodic abstinence, withdrawal, and other traditional methods											

Table 8. 4. Percent distribution of contraception method by area, 2022

Methods	icddr,b area	Govt. area
Pill	37.3	43.9
Condom	12.3	11.3
Injectables	29.8	23.7
IUD	0.9	1.2
Tubectomy	10.8	11.3
NSV	0.9	0.6
Implants	5.4	3.5
Others	2.6	4.6
Total	100.0	100.0
Number of users	27,834	24,482

Chapter 9. Child Immunization, 2001-2022

Summary

- 88% of the children aged 12-23 months received all EPI vaccines in both icddr,b and government areas.
- This low coverage was primarily due to the low coverage of measles-rubella (88%). Coverage of other vaccines ranged from 97% to 98%.

Children included in the analysis: Children aged 12-23 months on 31 December 2022. *[Children who would be 12-23 months on 31 December 2022 if not died or migrated out before the day, irrespective of their vaccination status, were excluded.]*

Table 9. 1. Immunization coverage (%) among children aged 12-23 months, 2001-2022

Vaccination coverage rate of children aged 12-23 months								
	BCG (1 dose)		DPT/Pentavalent (3 doses)		Measles-Rubella (1 dose)		All	
Year	icddr,b area	Govt. area	icddr,b area	Govt. area	icddr,b area	Govt. area	icddr,b area	Govt. area
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	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	97.3	84.9
2006	99.0	97.3	97.6	93.7	95.2	81.7	94.3	80.4
2007 [a]	99.8	99.8	98.8	99	96.3	95.1	96.1	94.7
2008 [a]	97.8	96.3	97.3	95.9	95.1	93.6	94.8	93.6
2009 [a]	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
2020	Incomplete data due to COVID-19 movement restrictions							
2021	99.8	99.9	97.3	97.8	88.1	87.0	88.0	86.9
2022	97.4	97.7	97.3	97.2	88.0	88.5	87.8	88.4

[a] Based on sample data.

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Appendices

Appendix A 1 Abridged life table by sex, Matlab HDSS, 2022

Age	Male				Female			
(years)	$_nq_x$	lx	Lx	e^0_x	$_nq_x$	lx	Lx	e^0_x
0	21.8	100,000	98,147	71.3	17.7	100,000	98,496	74.9
1	2.0	97,820	97,705	71.9	2.1	98,230	98,108	75.2
2	3.1	97,625	97,473	71.1	0.0	98,024	98,024	74.4
3	1.1	97,322	97,269	70.3	0.8	98,024	97,985	73.4
4	0.8	97,215	97,177	69.3	0.0	97,946	97,946	72.4
5	0.5	97,138	485,576	68.4	2.5	97,946	489,164	71.4
10	1.0	97,089	485,222	63.4	2.5	97,701	487,943	66.6
15	3.0	96,992	484,291	58.5	3.0	97,457	486,612	61.8
20	7.5	96,701	481,841	53.7	2.0	97,165	485,378	57.0
25	6.0	95,979	478,570	49.1	4.0	96,971	483,962	52.1
30	8.5	95,404	475,160	44.3	2.5	96,584	482,363	47.3
35	8.5	94,597	471,137	39.7	7.5	96,343	480,053	42.4
40	10.4	93,796	466,718	35.0	10.4	95,622	475,808	37.7
45	22.8	92,816	459,195	30.3	16.4	94,623	469,539	33.0
50	40.2	90,703	445,053	26.0	19.3	93,074	461,213	28.5
55	48.9	87,054	425,388	22.0	32.5	91,275	449,505	24.1
60	92.8	82,800	396,004	18.0	57.4	88,308	429,743	19.8
65	163.3	75,118	346,450	14.5	76.7	83,237	401,287	15.8
70	204.7	62,853	283,427	11.8	188.4	76,857	349,706	11.9
75	282.0	49,986	215,554	9.2	293.7	62,379	267,096	9.1
80	449.3	35,888	138,408	6.8	399.4	44,056	176,117	6.8
85+	1000.0	19,764	106,716	5.4	1000.0	26,462	122,397	4.6

Life table equations

1. $$_nq_x = \frac{_nm_x}{1/_n + {}_nm_x\left[1/_2 + {}^n/_{12} + \left({}_nm_x - \ln C\right)\right]} \quad \text{if } X > 0$$

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

2. $l_0 = 100{,}000$

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

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

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

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

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

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

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

NOTE: Computed using Greville's method, as suggested in: Shryock HS, Siegel JS, et al. (1975).
NOTE: lnC. assumed to be 0.095; separation factors in equation 3 correspond to an infant mortality rate of 50 per 1,000 live births.

Appendix A 2 Abridged life table for icddr,b service area by sex, 2022

	Male				Female			
Age (years)	$_nq_x$	l_x	L_x	e^0_x	$_nq_x$	l_x	L_x	e^0_x
0	17.3	100,000	98,530	72.2	15.0	100,000	98,725	75.0
1	1.5	98,270	98,183	72.5	1.5	98,500	98,413	75.1
2	3.7	98,123	97,942	71.6	0.0	98,352	98,352	74.2
3	0.8	97,760	97,721	70.9	0.8	98,352	98,313	73.2
4	0.8	97,682	97,643	69.9	0.0	98,274	98,274	72.3
5	0.5	97,604	487,908	69.0	1.5	98,274	491,029	71.3
10	1.0	97,555	487,552	64.0	2.5	98,126	490,068	66.4
15	2.0	97,458	486,840	59.1	4.0	97,881	488,507	61.5
20	7.5	97,263	484,639	54.2	2.0	97,491	487,004	56.8
25	3.5	96,536	481,903	49.6	3.0	97,296	485,807	51.9
30	8.0	96,199	479,226	44.7	1.0	97,004	484,798	47.0
35	4.5	95,432	476,172	40.1	10.0	96,907	482,312	42.1
40	7.5	95,003	473,380	35.2	8.0	95,943	477,950	37.5
45	20.3	94,293	467,042	30.5	12.4	95,178	473,161	32.7
50	38.8	92,378	453,584	26.1	22.8	93,995	465,030	28.1
55	41.2	88,795	435,490	22.0	35.4	91,856	451,743	23.7
60	87.7	85,137	408,203	17.8	71.5	88,603	428,231	19.5
65	185.5	77,667	353,950	14.3	80.4	82,266	395,878	15.8
70	193.3	63,261	287,068	12.0	190.0	75,654	343,925	11.9
75	307.4	51,032	216,680	9.2	307.8	61,278	260,128	9.1
80	399.7	35,344	141,260	7.2	359.7	42,419	174,184	7.0
85+	1,000.0	21,218	111,735	5.3	1000.0	27,161	124,590	4.6

Appendix A 3 Abridged life table for Government service area by sex, 2022

	Male				Female			
Age (years)	$_nq_x$	l_x	L_x	e^0_x	$_nq_x$	l_x	L_x	e^0_x
0	26.7	100,000	97,730	70.3	26.7	100,000	97,730	69.7
1	2.4	97,330	97,192	71.3	2.4	97,330	97,192	70.7
2	2.4	97,097	96,980	70.4	2.4	97,097	96,980	69.8
3	1.6	96,864	96,786	69.6	1.6	96,864	96,786	69.0
4	0.8	96,709	96,670	68.7	0.8	96,709	96,670	68.1
5	2.0	96,632	965,504	67.8	11.9	96,632	961,450	67.2
15	4.0	96,439	481,306	57.9	4.0	95,478	476,512	57.9
20	7.5	96,054	478,613	53.1	7.5	95,097	473,845	53.1
25	9.0	95,336	474,708	48.5	9.0	94,386	469,979	48.5
30	8.5	94,481	470,562	43.9	8.5	93,540	465,874	43.9
35	12.9	93,681	465,613	39.3	12.9	92,748	460,975	39.3
40	13.4	92,471	459,490	34.7	13.4	91,550	454,913	34.7
45	25.2	91,230	450,833	30.2	25.2	90,321	446,342	30.2
50	42.2	88,931	435,956	25.9	42.2	88,045	431,613	25.9
55	56.9	85,182	414,622	21.9	56.9	84,333	410,492	21.9
60	98.3	80,330	383,144	18.1	98.3	79,530	379,327	18.1
65	139.2	72,438	338,351	14.7	139.2	71,716	334,981	14.7
70	216.8	62,355	279,292	11.7	216.8	61,734	276,510	11.7
75	255.8	48,837	213,908	9.2	255.8	48,351	211,777	9.2
80	497.0	36,345	135,108	6.5	497.0	35,983	133,762	6.5
85+	1,000.0	18,281	101,617	5.6	1,000.0	18,099	100,605	5.6

Appendix A 4 Male deaths by cause and age, 2022

Causes	All ages	<1 year	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+
Gastroenteritis or colitis	9	1	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	0	0	4
Tuberculosis	16	0	0	0	0	0	0	0	0	0	0	0	2	1	3	2	4	2	0	2
Meningitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis	8	0	0	0	0	0	0	0	0	1	0	1	2	0	2	2	0	0	0	0
Septicemia	15	10	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	1
COVID-19/post-COVID-19 condition	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
EPI related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dengue	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0
Pneumonia	25	2	1	1	0	0	0	0	0	0	0	0	2	3	2	4	3	2	0	5
Maternal deaths	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Birth Asphyxia	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Premature and low birth weight	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neonatal sepsis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cerebral Ischemia (HIE)	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All other neonatal conditions	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Congenital anomalies	12	8	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nutritional deficiencies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malignant neoplasm of lung	30	0	0	0	0	0	0	0	0	1	1	1	1	2	6	5	7	4	2	0
Malignant neoplasm of breast	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Malignant neoplasm of liver	28	0	0	0	0	0	0	0	1	1	0	3	2	2	7	7	3	0	1	1
Malignant neoplasm of uterus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leukemia, unspecified	8	0	0	0	0	0	0	0	0	0	0	2	0	1	2	1	1	0	1	0
Malignant neoplasm of digestive organ (stomach, rectum)	15	0	0	0	0	0	0	0	0	0	0	1	2	0	0	7	1	3	0	1
Other Malignant neoplasm unspecified	44	0	0	0	0	1	0	0	0	1	0	3	6	5	7	9	2	5	4	1
Diabetes	21	0	0	0	0	0	0	0	0	0	0	1	4	0	3	5	2	2	2	2
All other endocrine disorders	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neuro psychiatric	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stroke	194	0	0	0	0	0	0	0	2	1	1	5	4	9	28	19	32	30	25	38

Causes	All ages	<1 year	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+
Other specified disorders of nervous system	4	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1
COPD	54	0	0	0	0	0	0	0	0	0	0	0	1	4	10	4	5	10	12	8
Asthma	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
All other respiratory disease	18	1	0	0	0	0	0	1	0	0	0	1	0	1	1	3	3	1	5	1
Digestive Disease	16	0	0	0	0	1	0	0	0	2	0	0	0	2	1	1	1	3	3	2
Rheumatic heart disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hypertensive heart diseases	6	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	1	1
Hypertensive renal diseases	10	0	0	0	0	0	0	0	0	0	2	0	0	0	1	2	2	0	1	2
Ischemic heart disease	197	0	0	0	0	0	0	1	0	1	6	4	17	20	29	39	20	20	25	15
All other forms of heart disease	19	0	0	0	0	1	0	0	0	0	0	0	0	2	2	3	5	1	2	3
Renal Failure	9	1	0	0	0	0	0	0	2	0	0	0	0	0	2	0	3	0	1	0
Other urinary	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1
Fever of unknown origin	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
Cardiac arrest (symptoms involving circulatory system)	49	0	0	0	0	0	3	0	0	0	1	4	3	1	2	8	6	7	7	7
Symptoms, signs or clinical findings	8	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	2	1	2
All other NCDs	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Transport accidents	14	0	0	0	0	0	4	0	2	1	1	1	0	2	1	1	0	0	1	0
Falls	7	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	1	0	2
Drowning	15	0	11	0	0	0	0	1	0	1	0	0	0	1	0	0	1	0	0	0
Fire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Suicide	8	0	0	0	1	2	0	2	0	1	0	0	1	1	0	0	0	0	0	0
Homicide	3	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0
All other external causes of injury or poisoning	9	0	1	0	0	0	2	1	0	0	0	0	1	1	2	0	0	0	0	1
Sudden infant death	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All other unknown and unspecified caused	19	1	0	0	0	0	0	0	0	0	0	0	0	1	4	3	1	1	2	6

Appendix A 5 Female deaths by cause and age, 2022

Causes	All ages	<1 year	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+ years
Gastroenteritis or colitis	5	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	1
Tuberculosis	4	0	1	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0
Meningitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis	7	0	0	0	0	0	0	1	0	1	0	1	1	0	0	1	1	0	1	0
Septicemia	16	4	0	0	0	0	0	0	0	0	1	1	0	0	1	1	2	3	1	2
COVID 19 and post COVID 19 condition	4	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0
EPI related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dengue	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pneumonia	25	5	0	1	0	0	0	0	0	0	0	2	0	1	0	2	4	1	8	1
Maternal deaths	7	0	0	0	0	1	1	1	1	3	0	0	0	0	0	0	0	0	0	0
Birth Asphyxia	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Premature and low birth weight	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neonatal sepsis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cerebral Ischemia (HIE)	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All other neonatal conditions	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Congenital anomalies	5	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nutritional deficiencies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malignant neoplasm of lung	9	0	0	0	0	0	0	0	0	0	0	0	2	1	2	2	0	1	0	1
Malignant neoplasm of breast	7	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	1	0	2	0
Malignant neoplasm of liver	11	0	0	0	0	0	0	0	0	0	1	2	1	0	0	2	4	0	0	1
Malignant neoplasm of uterus	10	0	0	0	0	0	0	1	0	0	1	1	1	2	1	2	1	0	0	0
Leukemia, unspecified	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0
Malignant neoplasm of digestive organ (stomach, rectum)	11	0	0	0	0	0	0	1	1	0	0	1	2	3	1	1	1	0	0	0
Other Malignant neoplasm unspecified	30	1	0	1	0	0	0	0	1	1	1	4	2	5	4	2	4	2	2	0
Diabetes	26	0	0	0	0	0	0	1	0	0	1	0	3	6	1	3	1	4	1	5
All other endocrine disorders	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neuro psychiatric	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Stroke	227	0	0	0	0	0	0	1	0	1	3	2	2	9	26	11	38	56	29	49

Causes	All ages	<1 year	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+ years
Other specified disorders of nervous system	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
COPD	38	0	0	0	0	0	0	0	0	0	0	1	1	0	3	8	6	9	4	6
Asthma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All other respiratory disease	9	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	4	1	0
Digestive Disease	15	1	0	0	0	0	0	0	0	1	0	1	2	2	1	1	1	3	1	1
Rheumatic heart disease	4	0	0	0	1	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0
Hypertensive heart diseases	12	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	3	2	3
Hypertensive renal diseases	5	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	1	0	0
Ischemic heart disease	127	0	0	0	1	0	0	1	0	1	5	3	8	9	10	13	15	27	27	7
All other forms of heart disease	40	0	0	0	1	1	0	0	0	3	2	0	1	2	0	1	4	7	6	12
Renal Failure	5	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	1	0	0	1
Other urinary	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Fever of unknown origin	6	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	1	2
Cardiac arrest (symptoms involving circulatory system)	51	0	0	0	0	0	0	0	0	0	0	1	2	1	9	5	8	11	7	7
Symptoms, signs or clinical findings	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4	9
All other NCDs	3	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0
Transport accidents	7	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	3	2	0	0
Falls	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	3	7
Drowning	12	0	5	2	0	0	1	0	1	0	0	0	0	0	0	0	1	1	1	0
Fire	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Suicide	7	0	0	0	1	5	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Homicide	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
All other external causes of injury or poisoning	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	1
Sudden infant death	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All other unknown and unspecified caused	24	1	0	0	0	0	1	1	0	1	0	0	0	0	0	1	3	6	6	4

Appendix A 6 Male deaths by cause, age and area, 2022

Cause	All ages		<1		1-4		5-14		15-44		45-64		65-84		85+	
	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA
Communicable/ Infectious diseases																
Gastroenteritis or colitis	8	1	0	1	0	0	0	0	1	0	1	0	2	0	4	0
Tuberculosis	11	5	0	0	0	0	0	0	0	0	4	2	5	3	2	0
Hepatitis	4	4	0	0	0	0	0	0	0	1	4	1	0	2	0	0
Septicemia	5	10	3	7	0	0	0	0	0	0	0	0	2	2	0	1
COVID 19 and post COVID 19 condition	2	1	0	0	0	0	0	0	0	0	0	0	1	1	1	0
Dengue	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0
Pneumonia	16	9	2	0	0	1	1	0	0	0	5	2	4	5	4	1
Maternal and Neonatal Conditions																
Birth Asphyxia	3	7	3	7	0	0	0	0	0	0	0	0	0	0	0	0
Premature and low birth weight	6	2	6	2	0	0	0	0	0	0	0	0	0	0	0	0
Cerebral Ischemia (HIE)	1	4	1	4	0	0	0	0	0	0	0	0	0	0	0	0
All other neonatal conditions	5	7	5	7	0	0	0	0	0	0	0	0	0	0	0	0
Congenital anomalies	4	8	4	4	0	3	0	1	0	0	0	0	0	0	0	0
Non-communicable Diseases																
Malignant neoplasm of lung	20	10	0	0	0	0	0	0	1	1	5	5	14	4	0	0
Malignant neoplasm of breast	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Malignant neoplasm of liver	13	15	0	0	0	0	0	0	0	2	6	8	7	4	0	1
Leukemia, unspecified	4	4	0	0	0	0	0	0	0	0	3	2	1	2	0	0

Cause	All ages		<1		1-4		5-14		15-44		45-64		65-84		85+	
	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA
Malignant neoplasm of digestive organ (stomach, rectum)	11	4	0	0	0	0	0	0	0	0	1	2	9	2	1	0
Other Malignant neoplasm unspecified	27	17	0	0	0	0	0	0	1	1	12	9	14	6	0	1
Diabetes	13	8	0	0	0	0	0	0	0	0	5	3	8	3	0	2
Stroke	92	102	0	0	0	0	0	0	2	2	23	23	47	59	20	18
Other specified disorders of nervous system	1	3	0	0	0	1	0	0	0	1	0	0	1	0	0	1
COPD	24	30	0	0	0	0	0	0	0	0	7	8	12	19	5	3
Asthma	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
All other respiratory disease	8	10	0	1	0	0	0	0	0	1	3	0	5	7	0	1
Digestive Disease	9	7	0	0	0	0	0	0	0	3	1	2	6	2	2	0
Hypertensive heart diseases	4	2	0	0	0	0	0	0	0	0	2	0	1	2	1	0
Hypertensive renal diseases	6	4	0	0	0	0	0	0	1	1	0	1	4	1	1	1
Ischemic heart disease	85	112	0	0	0	0	0	0	2	6	27	43	50	54	6	9
All other forms of heart disease	10	9	0	0	0	0	0	0	0	1	2	2	6	5	2	1
Renal Failure	5	4	1	0	0	0	0	0	1	1	2	0	1	3	0	0
Other urinary	2	1	0	0	0	0	0	0	0	0	1	0	0	1	1	0
Fever of unknown origin	2	1	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Cardiac arrest (symptoms involving circulatory system)	20	29	0	0	0	0	0	0	1	3	3	7	13	15	3	4
Symptoms, signs or clinical findings	7	1	0	0	0	0	0	0	1	0	1	0	4	0	1	1
All other non-communicable disease	1	2	0	1	0	1	0	0	0	0	0	0	1	0	0	0

Cause	All ages		<1		1-4		5-14		15-44		45-64		65-84		85+	
	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA
Injuries and External Causes																
Transport accidents	7	7	0	0	0	0	0	0	4	4	1	3	2	0	0	0
Falls	5	2	0	0	0	0	0	0	0	0	2	1	1	1	2	0
Drowning	9	6	0	0	8	3	0	0	1	1	0	1	0	1	0	0
Suicide	5	3	0	0	0	0	1	0	3	2	1	1	0	0	0	0
Homicide	1	2	0	0	0	0	0	0	0	1	1	1	0	0	0	0
All other external causes of injury or poisoning	5	4	0	0	1	0	0	0	2	1	1	3	0	0	1	0
Miscellaneous																
Sudden infant death	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0
All other unknown and unspecified caused	8	11	1	0	0	0	0	0	0	0	2	3	3	4	2	4

Appendix A 7 Female deaths by cause, age and area, 2022

Cause	All ages		<1		1-4		5-14		15-44		45-64		65-84		85+	
	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA
Communicable/ Infectious diseases																
Gastroenteritis or colitis	5	0	0	0	0	0	0	0	0	0	1	0	3	0	1	0
Tuberculosis	3	1	0	0	1	0	0	0	0	0	2	1	0	0	0	0
Hepatitis	2	5	0	0	0	0	0	0	0	2	1	1	1	2	0	0
Septicemia	7	9	2	2	0	0	0	0	0	1	0	2	4	3	1	1
COVID 19 and post COVID 19 condition	3	1	0	0	0	0	0	0	0	1	1	0	2	0	0	0
Dengue	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Pneumonia	16	9	4	1	0	0	0	1	0	0	2	1	9	6	1	0
Maternal and Neonatal Conditions																
Maternal deaths	6	1	0	0	0	0	0	0	6	1	0	0	0	0	0	0
Birth Asphyxia	3	7	3	7	0	0	0	0	0	0	0	0	0	0	0	0
Premature and low birth weight	6	5	6	5	0	0	0	0	0	0	0	0	0	0	0	0
Cerebral Ischemia (HIE)	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0
All other neonatal conditions	2	5	2	5	0	0	0	0	0	0	0	0	0	0	0	0
Congenital or developmental anomalies	2	3	1	3	0	0	1	0	0	0	0	0	0	0	0	0
Non-communicable Diseases																
Malignant neoplasm of lung	6	3	0	0	0	0	0	0	0	0	4	1	2	1	0	1
Malignant neoplasm of breast	5	2	0	0	0	0	0	0	2	0	1	1	2	1	0	0
Malignant neoplasm of liver	6	5	0	0	0	0	0	0	1	0	0	3	4	2	1	0
Malignant neoplasm of uterus	6	4	0	0	0	0	0	0	0	2	3	2	3	0	0	0
Leukemia, unspecified	1	3	0	0	0	0	0	1	0	0	0	0	1	2	0	0
Malignant neoplasm of digestive organ (stomach, rectum)	3	8	0	0	0	0	0	0	0	2	3	4	0	2	0	0
Other Malignant neoplasm unspecified	13	17	1	0	0	0	0	1	0	3	6	9	6	4	0	0
Diabetes	15	11	0	0	0	0	0	0	2	0	8	2	4	5	1	4
Neuro psychiatric	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Stroke	119	108	0	0	0	0	0	0	4	1	26	13	63	71	26	23
Other specified disorders of nervous system	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0
COPD	22	16	0	0	0	0	0	0	0	0	3	2	16	11	3	3
All other respiratory disease	3	6	0	0	0	0	0	0	0	0	1	2	2	4	0	0
Digestive Disease	7	8	0	1	0	0	0	0	0	1	2	4	4	2	1	0
Rheumatic heart disease	2	2	0	0	0	0	1	0	0	0	1	2	0	0	0	0
Hypertensive heart diseases	5	7	0	0	0	0	0	0	0	0	0	1	4	4	1	2
Hypertensive renal diseases	4	1	0	0	0	0	0	0	0	0	2	1	2	0	0	0

Cause	All ages		<1		1-4		5-14		15-44		45-64		65-84		85+	
	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA	ISA	GSA
Ischemic heart disease	73	54	0	0	0	0	1	0	2	5	20	10	45	37	5	2
All other forms of heart disease	14	26	0	0	0	0	0	1	3	3	1	2	6	12	4	8
Renal Failure	4	1	0	0	0	0	0	0	2	0	0	1	1	0	1	0
Other urinary	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Fever of unknown origin	1	5	0	0	0	0	0	0	0	0	1	1	0	2	0	2
Cardiac arrest (symptoms involving circulatory system)	20	31	0	0	0	0	0	0	0	0	9	4	8	23	3	4
Symptoms, signs or clinical findings	7	8	0	0	0	0	0	0	0	0	0	0	3	3	4	5
All other non-communicable disease	2	1	0	0	0	0	0	1	1	0	0	0	1	0	0	0
Injuries and External Causes																
Transport accidents	3	4	0	0	1	0	0	0	0	0	1	0	1	4	0	0
Falls	10	5	0	0	0	0	0	0	0	0	0	0	6	2	4	3
Drowning	3	9	0	0	1	4	1	1	0	2	0	0	1	2	0	0
Fire	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Suicide	5	2	0	0	0	0	1	0	4	1	0	1	0	0	0	0
Homicide	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
All other external causes of injury or poisoning	3	1	0	0	0	0	0	0	0	0	1	0	2	0	0	1
Miscellaneous																
Sudden infant death	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
All other unknown and unspecified caused	12	12	0	1	0	0	0	0	1	2	0	0	10	6	1	3

Appendix A 8 Marriages and divorces by month, 2022

Month	Marriage		Divorce	
	No.	Percentage	No	Percentage
Jan	288	7.2	40	8.3
Feb	325	8.2	48	10.0
Mar	372	9.3	51	10.6
Apr	186	4.7	20	4.1
May	364	9.1	43	8.9
Jun	279	7.0	32	6.6
Jul	434	10.9	56	11.6
Aug	388	9.8	42	8.7
Sep	369	9.3	41	8.5
Oct	322	8.1	44	9.1
Nov	322	8.1	32	6.6
Dec	330	8.3	33	6.8
Total	3,979	100.0	482	99.8

Appendix A 9 In- and out-migrations by age and sex, 2022

Age groups	In-migration			Out-migration		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	10,798	4,871	5,927	15,195	8,064	7,131
0-4	1,492	736	756	1,609	804	805
5-9	901	450	451	1,112	594	518
10-14	668	311	357	920	503	417
15-19	1,528	287	1,241	2,642	1,042	1,600
20-24	1,532	477	1,055	2,869	1,423	1,446
25-29	1,159	506	653	1,646	900	746
30-34	983	552	431	1,305	803	502
35-39	655	393	262	1,023	707	316
40-44	501	330	171	692	505	187
45-49	378	254	124	471	351	120
50-54	308	209	99	271	182	89
55-59	241	148	93	178	95	83
60-64	201	123	78	148	68	80
65+	251	95	156	309	87	222

Appendix A 10 In-migrations by age, sex and area, 2022

Age groups	icddr,b area			Govt. area		
	Both	Male	Female	Both	Male	Female
All ages	5,312	2,375	2,937	5,486	2,496	2,990
0-4	700	352	348	792	384	408
5-9	463	243	220	438	207	231
10-14	343	162	181	325	149	176
15-19	762	143	619	766	144	622
20-24	764	217	547	768	260	508
25-29	576	257	319	583	249	334
30-34	471	265	206	512	287	225
35-39	311	184	127	344	209	135
40-44	239	152	87	262	178	84
45-49	198	135	63	180	119	61
50-54	147	91	56	161	118	43
55-59	113	70	43	128	78	50
60-64	105	64	41	96	59	37
65+	120	40	80	131	55	76

Appendix A 11 Out-migrations by age, sex and area, 2022

Age groups	icddr,b area			Govt. area		
	Both	Male	Female	Both	Male	Female
All ages	5,312	2,375	2,937	5,486	2,496	2,990
0-4	935	449	486	674	355	319
5-9	580	306	274	532	288	244
10-14	487	250	237	433	253	180
15-19	1,387	547	840	1,255	495	760
20-24	1,444	674	770	1,425	749	676
25-29	848	456	392	798	444	354
30-34	649	389	260	656	414	242
35-39	526	336	190	497	371	126
40-44	392	285	107	300	220	80
45-49	247	183	64	224	168	56
50-54	135	92	43	136	90	46
55-59	91	44	47	87	51	36
60-64	79	34	45	69	34	35
65+	156	47	109	153	40	113

Appendix A 12 Male out-migration by cause of movement and age, 2022

Cause of movement	Total	0-4 years	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
All migrants	8,064	804	594	503	1,042	1,423	900	803	707	505	351	182	95	68	87
Economic or Educational															
Job/ business	4,930	4	2	82	638	1,181	797	689	605	423	287	132	58	23	9
Job completion/ retirement	13	0	0	0	0	3	1	3	4	0	0	0	0	1	1
Education/student lodging	763	9	150	180	247	146	24	2	3	0	1	1	0	0	0
Study completed/interrupted	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Housing/environmental															
Acquired/seeking new land/house	367	3	5	2	5	18	39	58	59	52	37	30	18	16	25
River erosion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marriage/familial															
Marriage	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Separation/divorce/widow	2	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Move/join with spouse/parents	1,763	779	436	236	145	58	20	20	14	11	9	4	5	12	14
Move/join with other relatives	3	1	0	0	0	1	1	0	0	0	0	0	0	0	0
Adoption	6	4	0	1	0	0	0	0	0	0	1	0	0	0	0
Family friction/breakdown	65	2	0	0	3	10	5	11	8	7	6	1	1	3	8
Health or old age care	10	0	0	0	0	0	2	0	0	0	0	0	0	1	7
Legal problems	60	0	0	0	2	3	5	9	9	8	5	8	7	4	0
Corona Pandemic															
Due to COVID-19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other and not stated															
*Others n.e.c**	80	2	1	2	1	3	6	10	4	4	5	6	6	8	22
Unknown or not stated	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0

**n.e.c=not elsewhere classified*

Appendix A 13 Female out-migration by cause of movement and age, 2022

Cause of movement	Total	0-4 years	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
All migrants	7,131	805	518	417	1,600	1,446	746	502	316	187	120	89	83	80	222
All migrants															
Economic or Educational	271	0	0	8	33	57	55	41	38	23	8	3	1	2	2
Job/ business	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Job completion/ retirement	495	17	83	104	138	125	10	10	4	4	0	0	0	0	0
Education/student lodging	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Housing/environmental															
Acquired/seeking new land/house	1,092	3	4	9	150	270	217	150	102	56	29	27	18	21	36
River erosion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marriage/familial															
Marriage	1,365	0	0	57	760	396	86	41	11	7	5	2	0	0	0
Separation/divorce/widow	44	0	0	0	11	12	8	2	3	2	1	1	0	3	1
Move/join with spouse/parents	3,281	776	430	233	421	451	276	219	134	77	62	47	47	32	76
Move/join with other relatives	24	0	1	1	5	2	4	0	0	0	1	0	1	0	9
Adoption	7	5	0	0	0	1	0	0	0	0	0	0	0	0	1
Family friction/breakdown	219	1	0	0	40	62	51	21	16	9	7	1	0	3	8
Health or old age care	53	1	0	0	5	4	5	0	1	0	0	1	5	6	25
Legal problems	9	0	0	0	0	0	1	1	0	2	4	0	0	0	1
Corona Pandemic															
Due to COVID-19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other and not stated															
*Others n.e.c**	269	2	0	4	37	66	32	17	7	7	3	7	11	13	63
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 14 Male in-migration by cause of movement and age, 2022

Cause of movement	Total	0-4 years	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
All migrants	4,871	736	450	311	287	477	506	552	393	330	254	209	148	123	95
Work/ Economic/ Educational															
Acquired/seeking job/set up new business	799	0	0	5	33	118	142	163	104	89	67	41	23	9	5
Job completion/retirement	592	0	0	0	4	36	80	94	74	90	74	56	39	32	13
To acquire education/student lodging	209	6	68	72	46	12	4	1	0	0	0	0	0	0	0
Education completed/interrupted	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Housing/environmental															
Acquired/seeking new land/house	1,114	0	0	7	46	154	179	198	148	96	74	58	50	57	47
River erosion	4	0	0	0	0	0	2	0	1	0	0	0	0	0	1
Marriage/familial															
Marriage	3	0	0	0	0	1	0	0	1	0	0	1	0	0	0
Separation/divorce/widow	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Move or join with spouse/parents	1,701	717	374	208	113	86	37	50	26	25	18	12	10	12	13
Move or join with other relatives	5	0	0	0	2	0	0	0	1	1	0	1	0	0	0
Adoption	11	9	1	0	1	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	49	0	1	1	2	9	9	7	7	3	1	3	3	3	0
Health or old age care	25	0	0	0	0	0	2	1	1	0	3	7	2	1	8
Legal problems	**79**	**0**	**0**	**0**	**1**	**10**	**19**	**15**	**13**	**4**	**8**	**8**	**1**	**0**	**0**
Corona Pandemic															
Due to COVID-19	5	0	0	0	0	1	0	1	1	2	0	0	0	0	0
Other and not stated															
Others n.e.c*	272	4	6	17	38	49	32	22	16	20	9	22	20	9	8
Unknown or not stated	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**n.e.c=not elsewhere classified*

Appendix A 15 Female in-migration by cause of movement and age, 2022

Cause of movement	Total	0-4 years	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
All migrants	5,927	756	451	357	1,241	1,055	653	431	262	171	124	99	93	78	156
Work/ Economic/ Educational															
Acquired/seeking job/set up new business	136	0	0	3	6	22	27	26	20	10	10	7	1	3	1
Job completion/retirement	21	0	0	0	1	2	0	3	3	4	4	3	1	0	0
To acquire education/student lodging	195	5	68	58	39	16	6	3	0	0	0	0	0	0	0
Education completed/interrupted	6	0	1	3	2	0	0	0	0	0	0	0	0	0	0
Housing/environmental															
Acquired/seeking new land/house	1,102	0	0	13	183	239	187	142	80	63	38	37	44	29	47
River erosion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marriage/familial															
Marriage	988	0	0	43	602	242	48	19	17	8	2	5	2	0	0
Separation/divorce/widow	62	0	0	3	16	15	10	5	6	3	0	1	0	2	1
Move or join with spouse/parents	2,915	726	375	225	316	383	292	192	109	73	65	40	37	36	46
Move or join with other relatives	23	2	1	6	2	0	0	1	0	1	1	1	0	0	8
Adoption	28	18	5	0	0	1	1	0	1	1	0	0	0	1	0
Family friction/breakdown	138	0	0	2	28	42	29	16	10	3	1	2	0	2	3
Health or old age care	34	0	0	0	0	6	2	1	1	0	1	1	1	2	19
Legal problems	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
Corona Pandemic															
Due to COVID-19	2	0	0	0	0	0	1	0	0	1	0	0	0	0	0
Other and not stated															
Others n.e.c*	276	5	1	1	46	87	50	23	14	4	2	2	7	3	31
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 16 Male migration by destination or origin, 2022

		Out-migration (number)						In-migration (number)					
		Age groups						Age groups					
Destination/Origin	Rural/Urban	0-14	15-24	25-34	35-44	45+	Total	0-14	15-24	25-34	35-44	45+	Total
Barisal	Rural	12	0	3	4	1	20	15	3	3	6	2	29
	Urban	2	5	5	2	1	15	3	0	4	1	1	9
	Unknown	0	0	0	0	0	0	3	0	0	2	2	7
Chittagong	Rural	657	132	116	99	95	1,099	572	122	122	87	76	979
	Urban	252	163	99	85	76	675	188	88	101	53	67	497
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Dhaka	Rural	20	10	3	3	4	40	30	14	23	3	7	77
	Urban	896	1,043	429	278	324	2,970	627	427	431	252	332	2,069
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Khulna	Rural	2	0	1	0	1	4	6	1	3	2	0	12
	Urban	2	3	1	1	0	7	3	1	1	0	2	7
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Mymensingh	Rural	5	2	0	3	0	10	6	0	3	0	1	10
	Urban	1	1	2	0	1	5	2	2	2	0	0	6
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Rajshahi	Rural	6	1	1	1	0	9	6	3	10	3	0	22
	Urban	7	10	3	5	0	25	2	0	2	2	3	9
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Rangpur	Rural	7	1	0	3	0	11	3	0	6	2	1	12
	Urban	2	3	2	0	0	7	2	1	1	0	0	4
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Sylhet	Rural	3	1	4	0	1	9	11	3	3	3	3	23
	Urban	11	11	6	2	5	35	11	6	3	8	5	33
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Abroad	India	3	6	1	1	4	15	1	3	1	0	1	6
	Asia	0	219	202	140	53	614	0	13	86	62	73	234
	Middle-east	9	810	778	539	204	2,340	6	70	245	224	245	790
	Others	4	44	47	46	13	154	0	7	8	13	8	36
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Total	-	1,901	2,465	1,703	1,212	783	8,064	1,497	764	1,058	723	829	4,871

Appendix A 17 Female migration by destination or origin, 2022

		Out-migration (Number)						In-migration (Number)					
		Age groups						Age groups					
Destination/Origin	Rural/Urban	0-14	15-24	25-34	35-44	45+	Total	0-14	15-24	25-34	35-44	45+	Total
Barisal	Rural	9	17	5	6	1	38	16	8	12	2	3	41
	Urban	3	6	1	3	0	13	2	3	2	1	0	8
	Unknown	0	0	0	0	0	0	2	2	1	0	0	5
Chittagong	Rural	732	1,535	466	147	149	3,029	630	1,397	442	116	133	2,718
	Urban	201	239	154	67	63	724	191	165	125	68	62	611
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Dhaka	Rural	18	66	14	5	7	110	36	71	23	10	8	148
	Urban	708	1,087	534	242	355	2,926	620	578	424	205	312	2,139
	Unknown	0	0	0	0	0	0	0	0	0	1	1	2
Khulna	Rural	3	6	4	1	2	16	4	9	3	2	2	20
	Urban	3	3	0	2	0	8	1	2	3	1	1	8
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Mymensingh	Rural	4	7	5	0	1	17	10	9	4	3	3	29
	Urban	4	4	4	0	0	12	3	6	1	2	0	12
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Rajshahi	Rural	3	4	6	2	0	15	13	13	7	1	1	35
	Urban	5	3	4	1	0	13	6	2	1	2	3	14
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Rangpur	Rural	5	5	3	2	0	15	4	3	5	0	0	12
	Urban	1	4	2	0	0	7	1	5	0	0	0	6
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Sylhet	Rural	9	13	4	1	3	30	7	12	5	1	4	29
	Urban	8	15	8	4	3	38	7	7	9	3	7	33
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Abroad	India	5	6	4	0	3	18	1	0	1	1	2	5
	Asia	0	2	3	0	0	5	1	1	1	1	2	6
	Middle-east	13	19	22	19	3	76	9	3	14	12	5	43
	Others	6	5	5	1	4	21	0	0	1	1	1	3
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Total		1,740	3,046	1,248	503	594	7,131	1,564	2,296	1,084	433	550	5,927

Appendix B Population, Births, and Deaths by village, 2022

Village code	Village name	Population	Births	Deaths	Birth rate	Death rate
All clusters	**Totall**	**247,754**	**5,611**	**1,790**	**22.6**	**7.2**
Cluster 1	**Total**	**50,538**	**1,126**	**312**	**22.3**	**6.2**
A00	Uddamdi	3,507	85	24	24.2	6.8
D00	Charmukandi	3,428	95	25	27.7	7.3
V01	Kadamtali	389	8	5	20.6	12.9
V02	Nilokhi	427	9	6	21.1	14.1
V03	Char Nilokhi	567	7	2	12.3	3.5
V04	Char Pathalia	389	10	3	25.7	7.7
V10	Dhakirgaon	2,574	52	16	20.2	6.2
V11	Nabakalash	3,457	94	13	27.2	3.8
V13	Baburpara	799	19	8	23.8	10.0
V31	Dighaldi	11,062	221	85	20.0	7.7
V32	Mobarakdi	4,018	100	19	24.9	4.7
V60	Suvankardi	1,043	19	5	18.2	4.8
V61	Munsabdi	818	24	5	29.3	6.1
V62	Shilmondi	1,072	29	8	27.1	7.5
V72	Upadi	6,859	181	52	26.4	7.6
W00	Kaladi	10,129	173	36	17.1	3.6
Cluster 2		**49,291**	**1,174**	**383**	**23.8**	**7.8**
F00	Sepoykandi	1,660	32	10	19.3	6.0
H00	Lamchari	1,230	28	8	22.8	6.5
U00	Baispur	9,957	226	86	22.7	8.6
V12	Bhangerpar	996	23	6	23.1	6.0
V14	Enayetnagar	585	14	8	23.9	13.7
V15	Bhati Rasulpur	942	18	9	19.1	9.6
V16	Binandapur	914	24	5	26.3	5.5
V19	Lakshmipur	2,729	56	27	20.5	9.9
V20	Dagorpur	1,658	33	14	19.9	8.4
V21	Khadergaon	534	10	3	18.7	5.6
V22	Beloti	608	11	7	18.1	11.5
V23	Baluchar	653	7	8	10.7	12.3
V24	Machuakhal	3,216	90	26	28.0	8.1
V26	Narayanpur	4,489	107	30	23.8	6.7
V56	Pailpara	1,781	53	17	29.8	9.5
V59	Doshpara	2,875	69	5	24.0	1.7
V82	Dhanarpar	1,947	48	10	24.7	5.1
V83	Padmapal	638	16	7	25.1	11.0
V85	Bhanurpara	587	20	7	34.1	11.9
V87	Hurmaisha	741	20	3	27.0	4.0
VBB	Nagda	5,271	146	49	27.7	9.3
VBC	Naogaon	5,280	123	38	23.3	7.2
Cluster 3		**48,073**	**1,103**	**376**	**22.9**	**7.8**
DX0	Barogaon	3,606	77	23	21.4	6.4
DX1	Naojan	1,471	33	10	22.4	6.8
K00	Shahpur	1,048	38	8	36.3	7.6
L00	Tatkhana	594	16	0	26.9	0.0
M00	Char Nayergaon	186	2	2	10.8	10.8
N00	Aswinpur	2,434	59	22	24.2	9.0

Village code	Village name	Population	Births	Deaths	Birth rate	Death rate
O00	Nayergaon	2,525	43	17	17.0	6.7
P00	Titerkandi	2,062	42	16	20.4	7.8
Q00	Char Shibpur	234	3	2	12.8	8.5
V27	Panchghoria	1,064	19	14	17.9	13.2
V28	Khidirpur	1,764	52	13	29.5	7.4
V30	Harion	664	17	3	25.6	4.5
V39	Gobindapur	252	6	2	23.8	7.9
V40	Masunda	873	18	3	20.6	3.4
V41	Paton	2,258	53	14	23.5	6.2
V42	Adhara (South)	716	16	3	22.3	4.2
V43	Kanachak	1,199	26	6	21.7	5.0
V44	Panchdona	628	22	6	35.0	9.6
V45	Bakchar	1,194	31	12	26.0	10.1
V46	Silinda	423	3	5	7.1	11.8
V47	Tulatali	1,865	49	17	26.3	9.1
V48	Gangkanda	491	11	5	22.4	10.2
V49	Harina Bhabanipur	1,412	31	14	22.0	9.9
V57	Baluchar	1,006	20	11	19.9	10.9
V64	Kawadi	5,171	117	41	22.6	7.9
V68	Sobahan	1,062	29	10	27.3	9.4
V71	Khamarpara	536	17	5	31.7	9.3
V73	Sadardia	828	20	2	24.2	2.4
V74	Ketundi	1,385	29	15	20.9	10.8
V75	Mukundi	318	5	2	15.7	6.3
V76	Chosoi	1,792	41	11	22.9	6.1
V78	Soladana	288	6	1	20.8	3.5
V79	Pitambordi	390	5	2	12.8	5.1
V80	Daribond	1,371	36	13	26.3	9.5
V86	Adhara (North)	1,173	38	11	32.4	9.4
V88	Datikara	607	9	5	14.8	8.2
V90	Narinda	1,241	24	12	19.3	9.7
VBA	Meharon	1,942	40	18	20.6	9.3
Cluster 4		**52,055**	**1,082**	**364**	**20.8**	**7.0**
D28	Bazarkhola	1,039	21	6	20.2	5.8
D29	Kirtonkhola	196	3	0	15.3	0.0
D30	Banuakandi	778	22	5	28.3	6.4
D31	Harina Bazarkhola	1,043	16	6	15.3	5.8
D32	Khalisha	845	16	5	18.9	5.9
D33	Nayanagar	1,005	23	7	22.9	7.0
D34	Saidkharkandi	1,417	24	7	16.9	4.9
D35	Molla Kandi	498	9	2	18.1	4.0
G00	Thatalia	3,542	93	23	26.3	6.5
R00	Nandalalpur	1,580	38	7	24.1	4.4
S00	Tatua	1,036	28	7	27.0	6.8
T00	Amuakanda	1,786	31	14	17.4	7.8
V07	Nayakandi	318	12	2	37.7	6.3
V08	Goalbhar	1,307	28	5	21.4	3.8
V17	Hatighata	1,032	29	7	28.1	6.8
V18	Torkey	4,098	74	32	18.1	7.8
V25	Char Pathalia	1,376	22	9	16.0	6.5
V29	Shibpur (South)	545	7	5	12.8	9.2
V33	Shibpur (North)	545	10	5	18.3	9.2

Village code	Village name	Population	Births	Deaths	Birth rate	Death rate
V34	Satparia	918	20	10	21.8	10.9
V35	Durgapur	3,565	71	26	19.9	7.3
V36	Ludhua	5,693	119	47	20.9	8.3
V38	Galimkha	1,566	22	13	14.0	8.3
V52	Nayakandi	237	2	1	8.4	4.2
V54	Balairkandi	624	14	5	22.4	8.0
V55	Induria	503	11	4	21.9	8.0
V63	Islamabad (East)	2,042	50	26	24.5	12.7
V65	Nayachar	800	17	9	21.2	11.2
V66	Thatalia	698	6	8	8.6	11.5
V67	Majlishpur	635	14	2	22.0	3.1
V81	Sonaterkandi	637	18	5	28.3	7.8
V84	Shahbajkandi	2,316	56	19	24.2	8.2
V89	Islamabad (Middle)	1,556	29	4	18.6	2.6
V97	Dhanagoda	353	3	2	8.5	5.7
V98	Santoshpur	104	3	1	28.8	9.6
V99	Baluakandi	550	13	1	23.6	1.8
VB1	Taltoli	947	19	8	20.1	8.4
VB2	Sree Rayerchar	1,310	36	6	27.5	4.6
VB3	Rayerkandi	3,015	53	13	17.6	4.3
Cluster 5		**47,797**	**1,126**	**355**	**23.6**	**7.4**
B00	Charmasua	1,984	40	15	20.2	7.6
C00	Sarderkandi	4,534	113	34	24.9	7.5
D88	Sankibanga	1,531	46	10	30.0	6.5
D89	Sankibanga Namapara	963	16	9	16.6	9.3
D90	Zahirabad	868	18	6	20.7	6.9
D93	Maizkandi	1,439	36	7	25.0	4.9
D94	Hazipur	1,801	45	3	25.0	1.7
D95	Tapaderpara	652	17	7	26.1	10.7
D96	Sakharipara	1,303	26	17	20.0	13.0
D97	Nayakandi	782	21	10	26.9	12.8
D98	Bara Haldia	3,521	70	29	19.9	8.2
D99	Mandertoli	2,292	53	13	23.1	5.7
J00	Char Harigope	948	24	7	25.3	7.4
V05	Gazipur	3,431	73	27	21.3	7.9
V06	Fatepur	2,749	61	16	22.2	5.8
V09	Naburkandi	1,338	39	14	29.1	10.5
V50	Bakharpur	53	0	0	0.0	0.0
V51	Induriakandi	886	16	3	18.1	3.4
V53	Choto Haldia	2,909	67	33	23.0	11.3
V95	Baluchar	2,660	61	11	22.9	4.1
V96	Rampur (North)	518	8	2	15.4	3.9
VB0	South Rampur	3,816	94	29	24.6	7.6
VB4	Ramdaspur	3,865	111	38	28.7	9.8
VB5	Thakurpara	852	18	5	21.1	5.9
VB6	Sarkerpara	526	14	3	26.6	5.7
VB7	Mirpur	349	15	2	43.0	5.7
VB8	Farazikandi	1,227	24	5	19.6	4.1

Appendix C Geographic Information System (GIS)

GIS has been a very important and powerful tool across many fields of research and planning in recent decades. Research and policy in the fields of social and public health benefit greatly from it. The information is widely available in developed countries. The rapid and significant development of GIS software and the increasing availability of free, high-resolution satellite imagery have expanded the scope of geospatial analysis across research areas. Modern GIS components generate thematic maps, create spatial variables, and perform spatial and temporal analyses with georeferenced data. Any kind of spatial information can be extracted from high-resolution imagery. The facilities have also widened the use of GIS in public health research. Now, researchers use spatial and temporal analyses to explain the temporal and geographical variations in morbidity, mortality, and other public health issues, to target interventions to high-risk areas, and to ensure the efficient use of scarce resources. However, using GIS information in developing countries like Bangladesh remains a challenge to 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,b, 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, geospatial efforts were limited to the area covered by the Matlab Health and Demographic Surveillance System (HDSS); later, these 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 as needed. One of the very important features of the GIS-based Matlab HDSS is that locations can be linked to all bars in the HDSS. Because households in a *bari* are very close to each other, *bari* locations can be used as proxies for household locations within it. The following table shows the different object-oriented structural layers that Matlab HDSS created for spatial analysis.

Groups	Points	Lines	Polygons
Community	Bari (group of households) Community clinics (CC) Family Welfare Centers (FWC) icddr,b and Govt. hospital icddr,b sub-centres Pharmacies and 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
Infrastructures	Mosque Educational institute: ○ Primary and Secondary school ○ College ○ Madrasah	Embankment	Embankment
Others	Bazaar, Bridge, Ditches, and Ponds, etc.		Main river

Appendix D Health intervention in icddr,b area (both general provision and other research studies)

Date	Activity	Block A	Block B	Block C	Block D
Oct 1977	Family planning	X	X	X	X
Mar-78	Tetanus toxoid to pregnant women	X	X	X	X
Jan-79	ORT	X	X	X	X
Dec-81	Tetanus toxoid to all women	X		X	
Dec-85	Tetanus toxoid to all women	X	X	X	X
Mar-82	Measles vaccine	X		X	
Dec-85	Measles vaccine	X	X	X	X
Sep-82	Antenatal care	X		X	
Jan-86	Antenatal care	X	X	X	X
Jan-85	Iron/folic acid in pregnant women	X		X	
Jan-86	Iron/folic acid in pregnant women	X	X	X	X
Mar-86	EPI immunizations (BCG, DPT, Polio)	X	X	X	X
Sep-88	Nutritional rehabilitation	X	X	X	X
Jan-86	Vitamin A distribution	X	X	X	X
Mar-87	Maternity care			X	X
Apr-88	ARI treatment in children		X		X
Jul-91	ARI treatment in children	X	X	X	X
Apr-Dec 1989	Dysentery treatment project		X		X
1997	Sub-Centre delivery			X	
1998	Sub-Centre delivery				X
2000	Sub-Centre delivery		X		
2001	Sub-Centre delivery	X			
2000	Fixed Site Clinics for delivering MCH-FP services			X	X
2001	Fixed Site Clinics for delivering MCH-FP services	X	X		
2001	Maternal and infant Nutrition intervention (MINIMAT)	X	X	X	X
2002	Arsenic in Tube-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 in infants	X	X	X	X
2008	Rota Rix vaccine trial in infants	X	X	X	X
2009	Haemophilus influenzae type B(Hib) vaccine in the form of a pentavalent vaccine	X	X	X	X
2011	Flu Q-QIV (Phase III)	X			
May-12	JE (Japanese encephalitis) vaccine trial	X	X	X	X
Apr-12	FLU D_QIV (Phase III)	X	X		
May-12	OPV vaccine trial	X	X	X	X
Jan-13	Measles-Rubella and Rotavirus Vaccine	X	X	X	X
Mar-13	LAIV Study			X	X
Mar-13	FLU D_QIV (Phase III) Cohort -4	X	X		
Mar-14	FLU D_QIV (Phase III) Cohort-6	X	X		
Jan-15	FLU-15 Trail	X			
Apr-15	OPV Gates Study	X	X	X	X
Jul-15	JEV 07	X	X	X	X
Oct-16	b BIOOPV trial	X	X	X	X
Oct-17	HEV	X	X	X	X
Sep-18	WHO Polio	X	X	X	X

Date	Activity	Block A	Block B	Block C	Block D
Mar-18	KOICA vaccine study conducted in Blocks F and G of Govt. area				
Sep-20	nOPV2 study: A phase II clinical trial of novel OPV in newborns (0- 3 days)	X	X	X	X
Feb-21	TB vaccine study: A phase II / III randomized controlled trial of VPM 1002 in prevention of pulmonary TB recurrence	X	X	X	X
Mar-21	HPV study: Bivalent HPV vaccine (Cecolin) trial (compared to Gardasil) in 9-14-year-old girls	X	X	X	X
Apr-21	Globvac study: A phase IV effectiveness trial of influenza vaccine in protection of pregnant women and children in rural Bangladesh	X	X	X	X
Sep-21	RSV009 vaccine study: A phase III trial of un-adjuvant RSV vaccine in pregnant women and infants born to vaccinated mothers	X	X	X	X
2022	Globvac Influenza vaccine study				
2022	RSV MAT009 study				
2022	Hepatitis E Vaccine study				
2022	Modern MRNA RSV Vaccine study				
2022	Inactivated Salk polio vaccine study				

Appendix E Staff of HDSS-Matlab, 2022

Dr. Md. Al Fazal Khan, Head, Matlab Health Research Centre
Syed Manzoor Ahmed Hanifi, Head, Matlab HDSS

Matlab staff	
Field Supervisory Team	Mahfuza Khanam, CHRW
Md. Taslim Ali, Senior Manager	Khadiza Sultana, CHRW
M. Munirul Alam Bhuiyan, FRO	Jesmin Akhter, CHRW
Mahmud Hasan, FRO	Nusrat Yasmin Rashida, CHRW
Md. Bashiruddin Ahmed, FRO	Meherun Nahar, CHRW
Md. Monirul Hoque, FRS	Runia Akter, CHRW
Sheikh Abdul Jabber, FRS	Fatema Khanam, CHRW
Dilara Akhter, FRS	Radha Rani Das, CHRW
Zakia Parveen, FRS	Delowara Begum, CHRW
Farzana Haque, FRS	Fatema Akter, CHRW
	Kulsuma Akter, CHRW
Data Management	Shefali Akter, CHRW
Monowara Begum, DMO	Asia Akter, CHRW
Meherun Nessa, DMA	Selina Akter, CHRW
	Khodeza Akhter, CHRW
Administration	Shahinoor Begum, CHRW
Md. Anisur Rahman, Admin. Officer	Nargis Akter, CHRW
Mubarok Hossain, DSA	Salma Akter, CHRW
Md. Ahsan Ullah, Attendant	Popy Rani Roy, CHRW
	Afruja Akter, CHRW
Data collectors	Rina Akter, CHRW
Salma Akhter, CHRW	Fatema Akter Kalpana, CHRW
Jahanara Begum, CHRW	Rafia Akter, CHRW
Aparajita Chakraborty, CHRW	Ruma Easmin, CHRW
Rahima Akhter, CHRW	Jahanara Begum, CHRW
Aysha Akter, CHRW	
Dhaka staff	
Research	Programming and Data Management
Md. Moinuddin Haider, Assistant Scientist	Sayed Saidul Alam, Sr. Programmer
Syed Manzoor Ahmed Hanifi, Scientist	Samiran Barua, Data Manager
Administration	Geographic Information System
Kiron Chandra Bala, Admin. Assistant	Muhammad Zahirul Haq, DMS-GIS
Md. Saidul Islam, Doc. Scan. Assistant	



icddr,b