

HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM - MATLAB

Volume Fifty-Six

Registration of Health and
Demographic Events, 2021

Scientific Report No. 150
November 2023





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Scientific Report No. 150 – November 2023

Population Science

**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, Md. Mehedi Hasan, Md. Tazvir Amin, Sayed Saidul Alam, Samiran Barua, Md. Moinuddin Haider, and Syed Manzoor Ahmed Hanifi

Author contribution: Md. Mehedi Hasan analyzed the data under the guidance of Md. Moinuddin Haider. Md. Mehedi Hasan, Md. Tazvir Amin and Muhammad Zahirul Haq drafted the report. Data management was done by Sayed Saidul Alam and Samiran Barua. Md. Moinuddin Haider and Syed Manzoor Ahmed Hanifi provided overall guidance.

Cover page: Four generations living together in the HDSS area according to existing surveillance data. Photograph used with permission.

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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
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
GSA	Government Service Area
HDSS	Health and Demographic Surveillance System
Hib	Haemophilus 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
ISA	icddr,b Service Area
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 Agency
TBA	Traditional Birth Attendant
TFR	Total Fertility Rate
U5MR	Under-five Mortality Rate
UESD	Utilization of Essential Service Delivery Survey
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 WHO/HMN/LSHTM/INDEPTH Network and USAID/MEASURE Evaluation Standardized Verbal Autopsy (VA) tools.

Dr. Mohammad Yunus, *Emeritus Scientist*, Dr. Nurul Alam, *Emeritus Scientist*, Dr. Md. Al Fazal Khan, *Head, Matlab HRC* and Dr. Sarah Salway, *Senior Director, HSPSD* reviewed the draft and provided valuable comments.

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Executive Summary

The Matlab Health and Demographic Surveillance System (HDSS) covers 250,000 rural population living in 61,000 households in 142 villages in an area of 184 square kilometers. The population is divided into two areas, one served by icddr,b community health services and the other by government services. This report provides the HDSS updates of vital events and selected maternal and child health indicators in 2021. It documents the trends in key demographic indicators. The table below summarizes key demographic indicators from 2012-2021.

Summary table: Vital statistics for the whole HDSS population and by icddr,b and government service areas, 2012-2021

Indicators	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Population ('000)	225.8	227.9	230.2	234.4	237.1	239.0	239.6	240.8	246.9	249.6
Demographic events										
Birth	4875	4771	4968	5151	5283	5298	5086	5267	5498	4943
Death	1509	1528	1550	1564	1604	1687	1753	1812	2016	2202
Marriage	3268	3260	3365	3275	3360	3188	3091	3358	3109	3721
Divorce	368	322	383	449	409	465	408	433	359	408
In-migration	10071	10264	10915	12083	14189	12395	12019	11065	14350	11759
Out-migration	12077	10784	12484	12756	14736	15230	14159	12705	11532	14521
Crude birth rate^A										
icddr,b area	22.6	21.7	22.0	22.3	22.8	22.1	20.7	21.8	22.6	20.6
Government area	20.5	20.2	21.1	21.6	21.7	21.8	21.3	21.9	21.9	19.0
Both areas	21.6	20.9	21.6	22.0	22.3	22.0	21.0	21.9	22.3	19.8
Total fertility rate										
icddr,b area	2.7	2.6	2.6	2.7	2.7	2.6	2.5	2.6	2.7	2.5
Government area	2.5	2.5	2.6	2.7	2.6	2.6	2.6	2.6	2.7	2.3
Both areas	2.6	2.5	2.6	2.7	2.7	2.6	2.5	2.6	2.7	2.4
Crude death rate^A										
icddr,b area	6.6	6.7	6.8	6.5	6.7	7.0	7.5	7.2	7.9	8.6
Government area	6.7	6.7	6.7	6.9	6.9	7.2	7.2	7.9	8.5	9.1
Both areas	6.7	6.7	6.7	6.7	6.8	7.1	7.3	7.5	8.2	8.8
Neonatal mortality^B										
icddr,b area	15.6	17.3	19.5	18.0	16.7	14.0	15.1	18.9	11.6	21.2
Government area	30.3	21.2	25.1	27.9	27.5	20.7	20.3	22.3	21.8	23.1
Both areas	22.4	19.1	22.1	23.1	21.8	17.2	17.7	20.5	16.4	22.1
Post-neonatal mortality^B										
icddr,b area	4.9	5.9	5.7	3.7	5.3	4.0	3.7	6.2	4.8	3.3
Government area	7.1	5.4	4.7	5.7	4.0	5.6	4.0	6.4	4.3	4.0
Both areas	5.9	5.7	5.2	4.7	4.7	4.7	3.8	6.3	4.5	3.6
Infant mortality^B										
icddr,b area	20.5	23.1	25.2	22.5	22.1	18.2	19.0	25.0	16.4	24.5
Government area	37.4	26.6	29.8	33.6	31.5	26.1	26.8	28.7	26.1	27.1
Both areas	28.3	24.7	27.4	27.8	26.5	22.1	22.8	26.8	20.9	25.7
Child mortality (1-4yrs)^C										
icddr,b area	1.9	2.2	2.3	2.2	2.5	2.0	1.9	1.2	1.9	1.5
Government area	1.1	3.1	2.5	1.8	2.3	3.0	1.4	2.5	1.3	2.3
Both areas	1.5	2.6	2.4	2.0	2.4	2.5	1.7	1.8	1.6	1.9

Summary table (contd...)										
Indicators	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Under five mortality ^B										
icddr,b area	28.0	31.6	34.0	31.1	32.0	25.9	27.7	29.8	23.2	30.4
Government area	41.7	38.3	39.6	40.5	40.2	37.0	30.9	38.6	31.1	37.3
Both areas	34.2	34.7	36.6	35.6	35.8	31.1	29.2	34.0	26.9	33.6
Migration rate ^A										
In-migration	44.6	45.0	47.4	51.6	59.8	51.9	50.2	46.0	58.1	47.1
Out-migration	53.5	47.3	54.2	54.4	62.1	63.7	59.1	52.8	46.7	58.2
Natural increase rate ^A										
	14.9	14.2	14.8	15.3	15.5	14.9	13.9	14.3	14.1	13.4
Growth rate (r) (%) ^D										
	0.3	0.9	1.0	1.8	1.1	0.8	0.3	0.5	2.5	1.1

^A per 1000 population; ^B per 1000 live births; ^C per 1000 children aged 1-4 years; ^D Formula used: $r = \ln(p_t/p_0)/t$

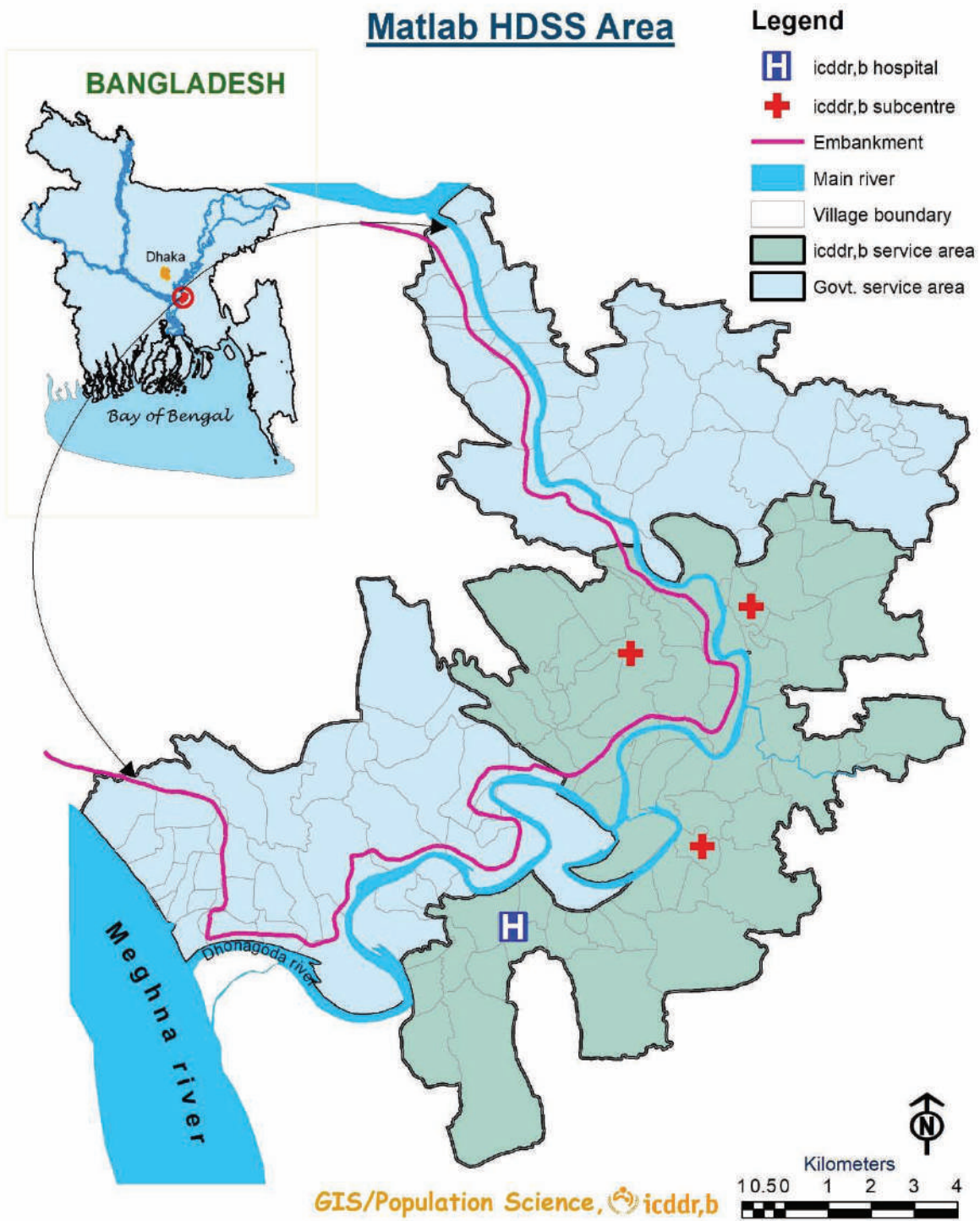
Since 1963, the International Centre for Diarrhoeal Disease Research (icddr,b), initiated as Cholera Research Laboratory, has been implementing a health research program in Matlab, Bangladesh. Matlab is located (Longitude = 90.720033 and Latitude = 23.388482) about 55 km southeast of Dhaka, the capital 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 maintains the registration of births, deaths, and migrations, in addition to carrying out periodic 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 the HDSS. Community Health Research Workers (CHRWs) collect vital demographic and health information by visiting each household in their assigned areas three-monthly since 2020 (two-monthly from 2007-2019, and monthly before that). HDSS data were collected using event registration forms from 2011 by using PDA (Personal Digital Assistant), and from 2014 using Tablets. The activities of CHRWs are supervised by Field Research Supervisors (FRSs), and the quality of collected information is monitored through independent data verification in the field. A detailed description of the Matlab HDSS and its operation appears elsewhere (Alam et al. 2017) Health & Demographic Surveillance System Profile: HDSS in Matlab, Bangladesh by Nurul Alam, International Journal of Epidemiology, 2017, 1–8, doi: 10.1093/ije/dyx076.)

In October 1977, the surveillance area was reduced from 233 to 149 villages, and a Maternal and Child Health and Family Planning (MCH-FP) Program was initiated in 70 villages (icddr,b service area or icddr,b area (ISA)). In these 70 villages, government provided MCH-FP services were also available. The remaining 79 villages were treated as a Government Service Area or Government area (GSA), where only government provided services were available (Figure 1.1). Since the introduction of the icddr,b's MCH-FP program, the CHRWs have collected data on child and reproductive health from female respondents, delivered maternal health care, provided FP information and products, 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 the Government area in 2000. River erosion devoured seven villages from the Government Area in 1987, leaving 142 villages in the HDSS. In 2000, icddr,b stopped providing MCH-FP services in three of the 70 villages of icddr,b area, but data collection continued.

Objective: This report aims to provide the 2021 demographic and health status of the people registered by the Matlab HDSS. Detailed analysis and discussion is beyond the scope of this report.

**Figure 1.1 Map of Matlab-HDSS area
(showing icddr,b and Government service area)**



Chapter 2. Demographic trends, 1966-2021

The systematic collection of vital events, which have been occurring for over 56 years, provides a unique opportunity to examine the demographic trends in Matlab HDSS. This chapter shows demographic changes in the HDSS area from 1966 to 2021. The HDSS area was divided into icddr, b service area (ISA), and government service area (GSA) in 1977. Therefore, indicators are reported by ISA and GSA separately from 1977 onwards, but combined results are reported for 1966-1976.

Figure 2.1 shows the crude birth rates (CBR), crude death rates (CDR), and natural increase (CBR-CDR) from 1966 to 2021.

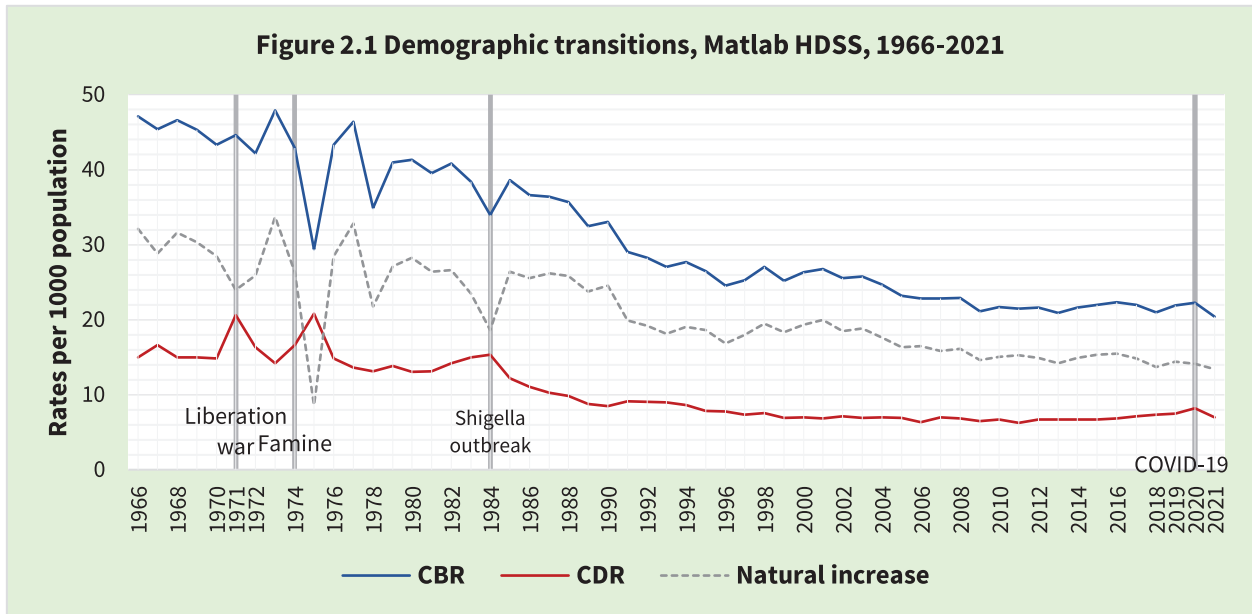


Figure 2.2 shows total fertility rates (TFR) by service area from 1966 to 2021

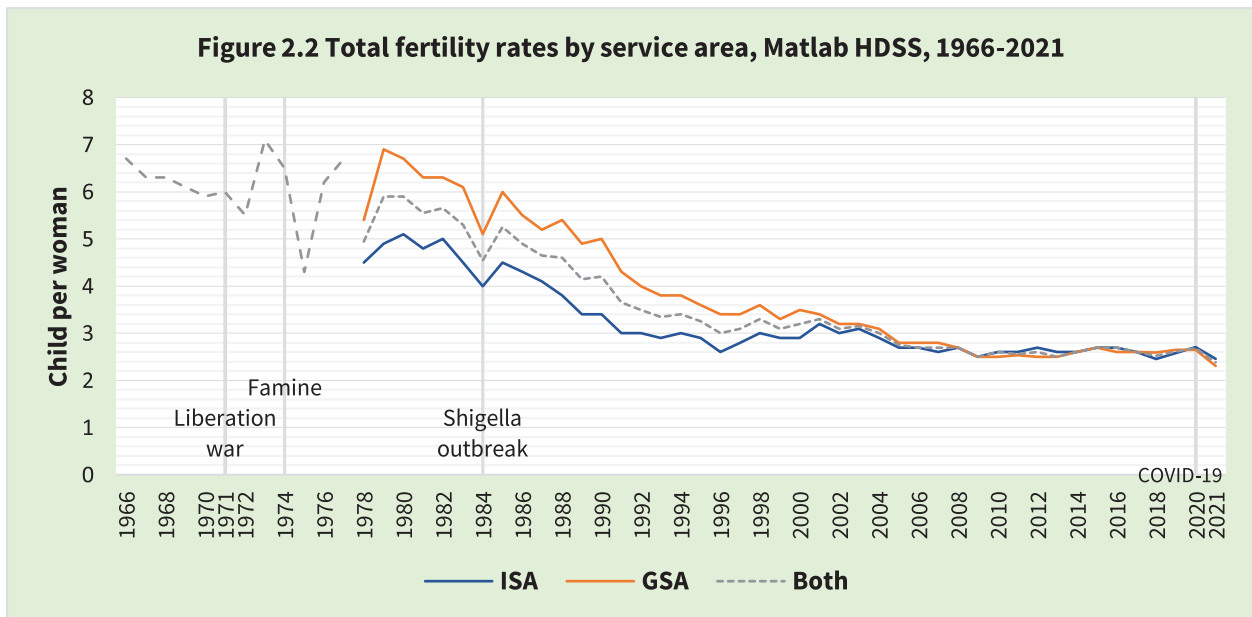


Figure 2.3 shows infant mortality rates (IMR) by service area from 1966 to 2021.

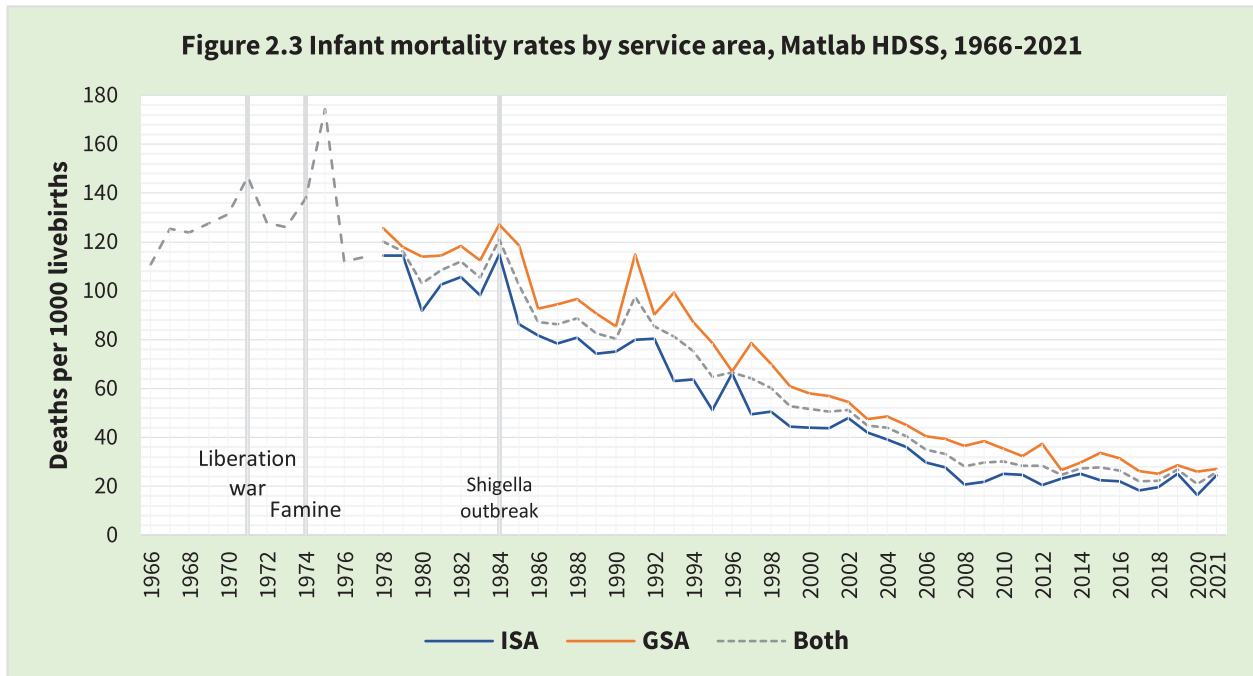


Figure 2.4 shows under-five mortality rates (U5MR) by service area from 1966 to 2021

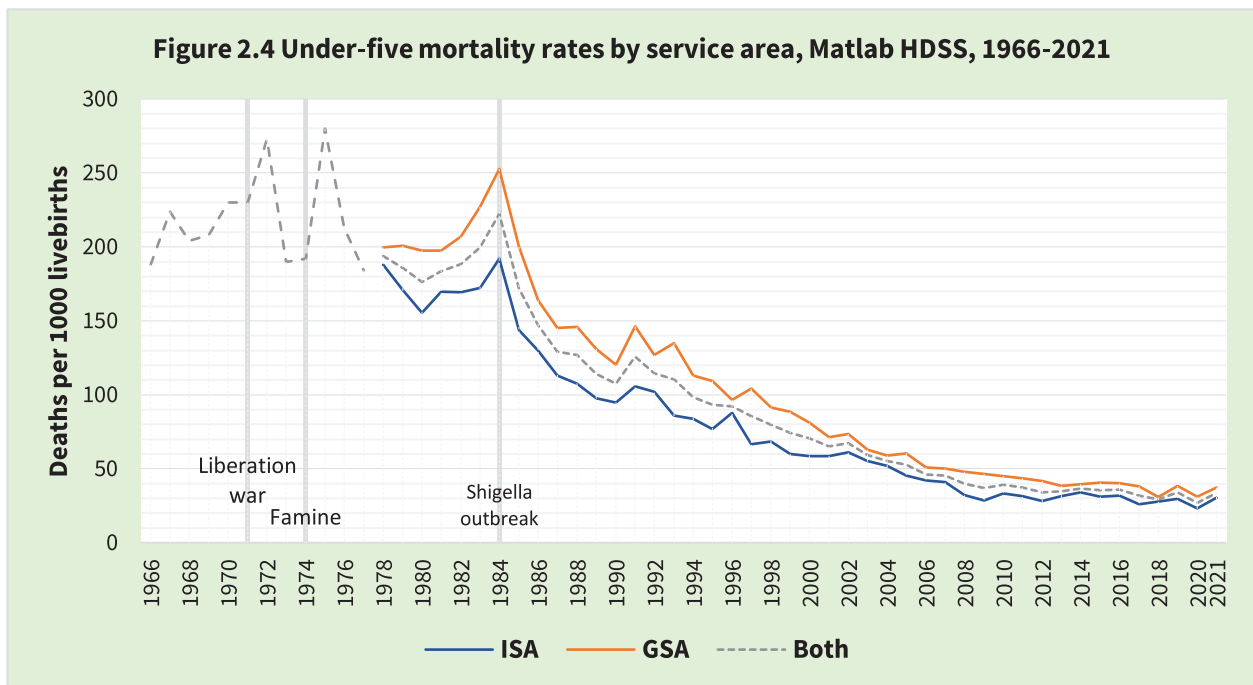


Figure 2.5 shows life expectancy at birth (e_0) by sex from 1966 to 2021 for both areas combined.

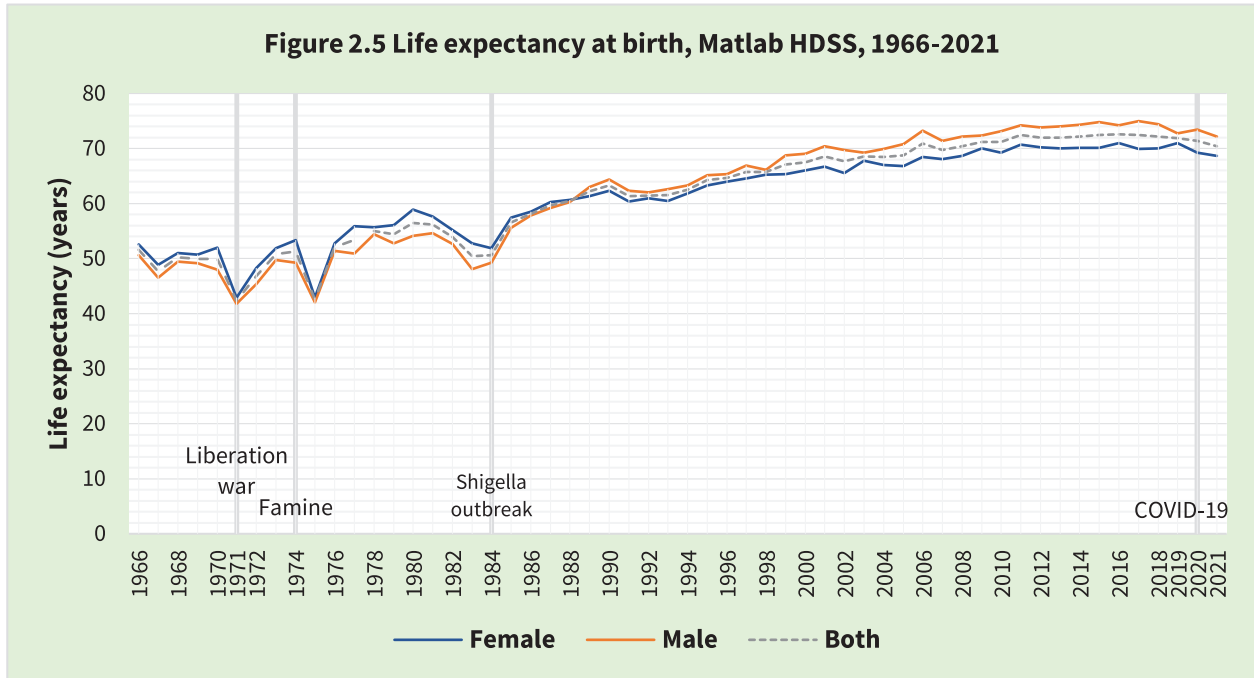
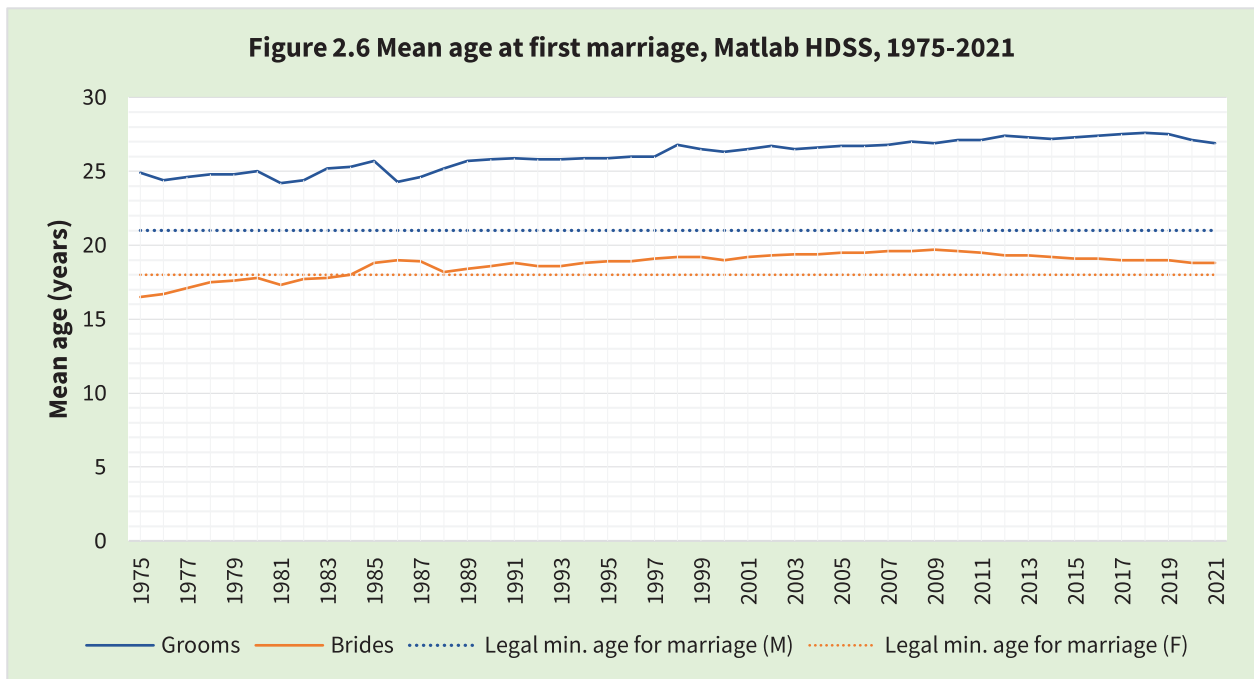


Figure 2.6 shows the mean age at first marriage by sex from 1975 to 2021 for both areas combined.



Chapter summary

- Mid-year population in the Matlab HDSS in 2021 was 249,554 (male: 114,050; female: 135,504)
- Children under 15 comprised 30.1% of the population, and people aged 65 and above included 7.7%.
- The total dependency ratio (DR) was 61% (child DR: 48.2%; aged DR: 12.4%).
- Population sex ratio (male/female x 100) is 84.

Chapter 3 provides age-sex characteristics of the HDSS population in 2021. It also includes the population sex ratio by age, overall dependency ratio, child dependency ratio, and aged dependency ratio.

Table 3.1 shows the mid-year population (in number and percentage) registered in the HDSS by age and sex. It also provides the sex ratio of the population.

Table 3.1 Mid-year population by age and sex, and sex ratio, 2021

Age (Years)	Number			Percentage			Sex ratio [M/F] ×100
	Both sexes	Male	Female	Both sexes	Male	Female	
All ages	249,554	114,050	135,504	100.0	100.0	100.0	84.2
<1 Year	5,112	2,639	2,473	2.0	2.3	1.8	106.7
1-4 Year	20,781	10,490	10,291	8.3	9.2	7.6	101.9
1	5,215	2,652	2,563	2.1	2.3	1.9	103.5
2	5,160	2,615	2,545	2.1	2.3	1.9	102.8
3	5,201	2,593	2,608	2.1	2.3	1.9	99.4
4	5,205	2,630	2,575	2.1	2.3	1.9	102.1
5-9	25,486	12,835	12,651	10.2	11.3	9.3	101.5
10-14	23,796	11,782	12,014	9.5	10.3	8.9	98.1
15-19	23,029	10,874	12,155	9.2	9.5	9.0	89.5
20-24	17,702	6,997	10,705	7.1	6.1	7.9	65.4
25-29	15,152	5,377	9,775	6.1	4.7	7.2	55.0
30-34	16,678	6,683	9,995	6.7	5.9	7.4	66.9
35-39	15,746	6,618	9,128	6.3	5.8	6.7	72.5
40-44	14,995	6,745	8,250	6.0	5.9	6.1	81.8
45-49	13,204	5,912	7,292	5.3	5.2	5.4	81.1
50-54	13,847	6,166	7,681	5.5	5.4	5.7	80.3
55-59	13,710	6,345	7,365	5.5	5.6	5.4	86.2
60-64	11,281	5,745	5,536	4.5	5.0	4.1	103.8
65-69	7,198	3,559	3,639	2.9	3.1	2.7	97.8
70-74	4,973	2,260	2,713	2.0	2.0	2.0	83.3
75-79	3,730	1,521	2,209	1.5	1.3	1.6	68.9
80-84	1,878	843	1,035	0.8	0.7	0.8	81.4
85+	1,256	659	597	0.5	0.6	0.4	110.4

Figure 3.1 shows the population pyramid of the Matlab HDSS for 2021

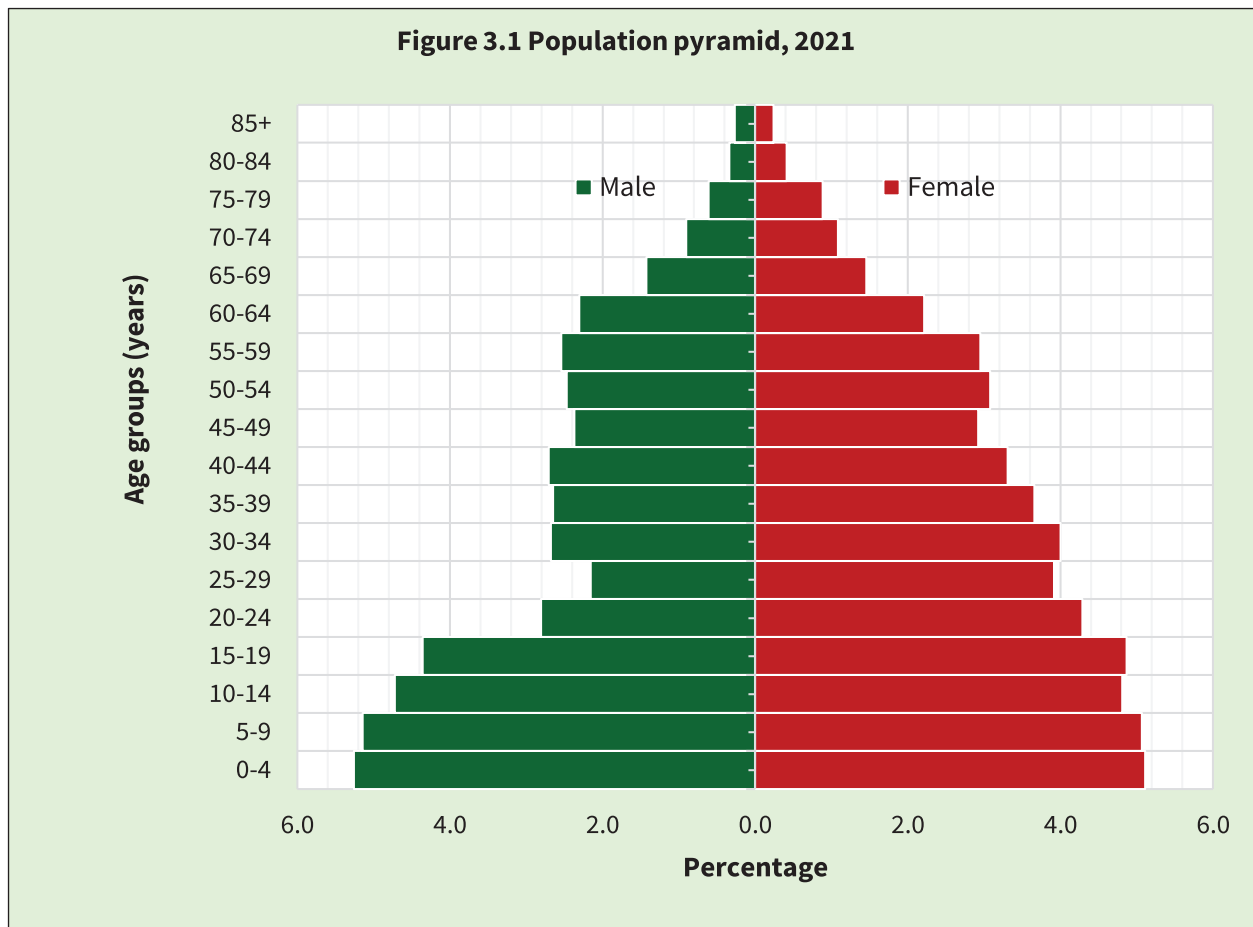
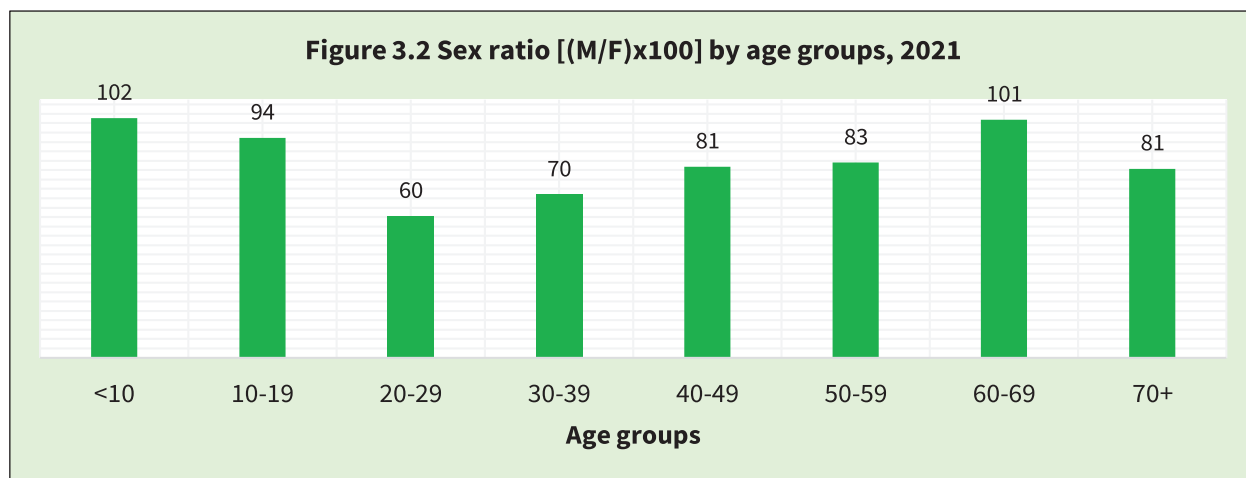


Table 3.2 shows the mid-year population of the HDSS by age and sex for ISA and GSA.

Table 3.2. Mid-year population by age, sex, and area, 2021

Age (years)	ISA			GSA		
	Both	Male	Female	Both	Male	Female
All ages	131054	59943	71111	118500	54107	64393
<1 Year	2778	1383	1395	2334	1256	1078
1-4 Years	10752	5398	5354	10029	5092	4937
1	2719	1375	1344	2496	1277	1219
2	2659	1329	1330	2501	1286	1215
3	2665	1331	1334	2536	1262	1274
4	2709	1363	1346	2496	1267	1229
5-9	13542	6824	6718	11944	6011	5933
10-14	12487	6245	6242	11309	5537	5772
15-19	12030	5673	6357	10999	5201	5798
20-24	9113	3521	5592	8589	3476	5113
25-29	8144	2899	5245	7008	2478	4530
30-34	8786	3474	5312	7892	3209	4683
35-39	8320	3457	4863	7426	3161	4265
40-44	7938	3622	4316	7057	3123	3934
45-49	7185	3284	3901	6019	2628	3391
50-54	7271	3256	4015	6576	2910	3666
55-59	7223	3354	3869	6487	2991	3496
60-64	5794	3002	2792	5487	2743	2744
65-69	3704	1857	1847	3494	1702	1792
70-74	2512	1145	1367	2461	1115	1346
75-79	1897	770	1127	1833	751	1082
80-84	933	424	509	945	419	526
85+	645	355	290	611	304	307

Figure 3.2 provides the population sex ratio [(male/female) x 100] by age groups in 2021 for both areas



Chapter Summary

- The Matlab HDSS recorded 2202 deaths (male: 1162; female: 1040) in 2021
- The crude death rate (CDR) was 8.8 per 1000 population. Males had a higher death rate of 10.2 per thousand than females (7.7 per 1000).
- The neonatal mortality rate (NNMR) was 22 per 1000 live births, the infant mortality rate (IMR) was 26 per 100 live births, and the under-five mortality rate (U5MR) was 33 per 1000 live births.
- The NNMR, IMR, and U5MR were similar in the ISA and the GSA, with a slightly higher level in the GSA.
- Life expectancy at birth was 68.7 years for males and 72.2 years for females.

Chapter 4 provides standard mortality and survival indicators, including crude death rate, neonatal mortality rate, infant mortality rate, under-five mortality rate, and life expectancy by age, sex, area, and causes.

Table 4.1 shows the number of deaths in 2021 by age, sex, and area.

Table 4.1. Number of deaths by age, sex, and area, 2021

Age (years)	Both areas			ISA			GSA		
	Both	Male	Female	Both	Male	Female	Both	Male	Female
All ages	2202	1162	1040	1,129	598	531	1,073	564	509
<1 year	127	83	44	66	42	24	61	41	20
<i><7 days</i>	88	63	25	49	33	16	39	30	9
<i>7-29 days</i>	21	10	11	8	4	4	13	6	7
<i>1-5 months</i>	10	4	6	6	3	3	4	1	3
<i>6-11 months</i>	8	6	2	3	2	1	5	4	1
1-4 years	39	21	18	16	10	6	23	11	12
1	18	11	7	9	6	3	9	5	4
2	11	5	6	3	2	1	8	3	5
3	5	2	3	3	1	2	2	1	1
4	5	3	2	1	1	0	4	2	2
5-9	9	5	4	3	2	1	6	3	3
10-14	10	7	3	5	4	1	5	3	2
15-19	19	6	13	9	3	6	10	3	7
20-24	10	2	8	6	0	6	4	2	2
25-29	12	8	4	7	4	3	5	4	1
30-34	20	5	15	7	2	5	13	3	10
35-39	28	12	16	17	5	12	11	7	4
40-44	48	27	21	22	12	10	26	15	11
45-49	46	22	24	18	8	10	28	14	14
50-54	83	41	42	55	25	30	28	16	12
55-59	155	81	74	84	45	39	71	36	35
60-64	255	151	104	134	75	59	121	76	45
65-69	238	141	97	126	76	50	112	65	47
70-74	240	133	107	119	60	59	121	73	48
75-79	329	142	187	171	76	95	158	66	92
80-84	276	144	132	133	76	57	143	68	75
85+	258	131	127	131	73	58	127	58	69

Table 4.2 shows the percent distribution of deaths in 2021 by age, sex, and area.

Table 4.2. Percent distribution of deaths by age, sex, and area, 2021

Age (years)	Both area			icddr,b area			Govt. area		
	Both	Male	Female	Both	Male	Female	Both	Male	Female
All ages	2202	1162	1040	1,129	598	531	1,073	564	509
<1 year	5.8	7.1	4.2	5.8	7.0	4.5	5.7	7.3	3.9
<7 days	4.0	5.4	2.4	4.3	5.5	3.0	3.6	5.3	1.8
7-29 days	1.0	0.9	1.1	0.7	0.7	0.8	1.2	1.1	1.4
1-5 months	0.5	0.3	0.6	0.5	0.5	0.6	0.4	0.2	0.6
6-11 months	0.4	0.5	0.2	0.3	0.3	0.2	0.5	0.7	0.2
1-4 years	1.8	1.8	1.7	1.4	1.7	1.1	2.1	2.0	2.4
1	0.8	1.0	0.7	0.8	1.0	0.6	0.8	0.9	0.8
2	0.5	0.4	0.6	0.3	0.3	0.2	0.7	0.5	1.0
3	0.2	0.2	0.3	0.3	0.2	0.4	0.2	0.2	0.2
4	0.2	0.3	0.2	0.1	0.2	0	0.4	0.4	0.4
5-9	0.4	0.4	0.4	0.3	0.3	0.2	0.6	0.5	0.6
10-14	0.5	0.6	0.3	0.4	0.7	0.2	0.5	0.5	0.4
15-19	0.9	0.5	1.3	0.8	0.5	1.1	0.9	0.5	1.4
20-24	0.5	0.2	0.8	0.5	0.0	1.1	0.4	0.4	0.4
25-29	0.5	0.7	0.4	0.6	0.7	0.6	0.5	0.7	0.2
30-34	0.9	0.4	1.4	0.6	0.3	0.9	1.2	0.5	2.0
35-39	1.3	1.0	1.5	1.5	0.8	2.3	1.0	1.2	0.8
40-44	2.2	2.3	2.0	1.9	2.0	1.9	2.4	2.7	2.2
45-49	2.1	1.9	2.3	1.6	1.3	1.9	2.6	2.5	2.8
50-54	3.8	3.5	4.0	4.9	4.2	5.6	2.6	2.8	2.4
55-59	7.0	7.0	7.1	7.4	7.5	7.3	6.6	6.4	6.9
60-64	11.6	13.0	10.0	11.9	12.5	11.1	11.3	13.5	8.8
65-69	10.8	12.1	9.3	11.2	12.7	9.4	10.4	11.5	9.2
70-74	10.9	11.5	10.3	10.5	10.0	11.1	11.3	12.9	9.4
75-79	14.9	12.2	18.0	15.1	12.7	17.9	14.7	11.7	18.1
80-84	12.5	12.4	12.7	11.8	12.7	10.7	13.3	12.1	14.7
85+	11.7	11.3	12.2	11.6	12.2	10.9	11.8	10.3	13.6

Table 4.3 shows the death rates in 2021 by age, sex, and area.

Table 4.3. Death rates by age, sex, and area, 2021 (per 1,000 population)

Age (years)	Both area			ISA			GSA		
	Both	Male	Female	Both	Male	Female	Both	Male	Female
All ages	8.8	10.2	7.7	8.6	10.0	7.5	9.1	10.4	7.9
<1 year*	25.7	32.6	18.3	24.5	31.0	17.9	27.1	34.5	18.8
<i><7 days*</i>	17.8	24.8	10.4	18.2	24.4	11.9	17.3	25.2	8.5
<i>7-29 days*</i>	4.2	3.9	4.6	3.0	3.0	3.0	5.8	5.0	6.6
<i>1-5 months*</i>	2.0	1.6	2.5	2.2	2.2	2.2	1.8	0.8	2.8
<i>6-11 months*</i>	1.6	2.4	0.8	1.1	1.5	0.7	2.2	3.4	0.9
1-4 years	1.9	2.0	1.7	1.5	1.9	1.1	2.3	2.2	2.4
1	3.5	4.1	2.7	3.3	4.4	2.2	3.6	3.9	3.3
2	2.1	1.9	2.4	1.1	1.5	0.8	3.2	2.3	4.1
3	1.0	0.8	1.2	1.1	0.8	1.5	0.8	0.8	0.8
4	1.0	1.1	0.8	0.4	0.7	0.0	1.6	1.6	1.6
5-9	0.4	0.4	0.3	0.2	0.3	0.1	0.5	0.5	0.5
10-14	0.4	0.6	0.2	0.4	0.6	0.2	0.4	0.5	0.3
15-19	0.8	0.6	1.1	0.7	0.5	0.9	0.9	0.6	1.2
20-24	0.6	0.3	0.7	0.7	0.0	1.1	0.5	0.6	0.4
25-29	0.8	1.5	0.4	0.9	1.4	0.6	0.7	1.6	0.2
30-34	1.2	0.7	1.5	0.8	0.6	0.9	1.6	0.9	2.1
35-39	1.8	1.8	1.8	2.0	1.4	2.5	1.5	2.2	0.9
40-44	3.2	4.0	2.5	2.8	3.3	2.3	3.7	4.8	2.8
45-49	3.5	3.7	3.3	2.5	2.4	2.6	4.7	5.3	4.1
50-54	6.0	6.6	5.5	7.6	7.7	7.5	4.3	5.5	3.3
55-59	11.3	12.8	10.0	11.6	13.4	10.1	10.9	12.0	10.0
60-64	22.6	26.3	18.8	23.1	25.0	21.1	22.1	27.7	16.4
65-69	33.1	39.6	26.7	34.0	40.9	27.1	32.1	38.2	26.2
70-74	48.3	58.8	39.4	47.4	52.4	43.2	49.2	65.5	35.7
75-79	88.2	93.4	84.7	90.1	98.7	84.3	86.2	87.9	85.0
80-84	147.0	170.8	127.5	142.6	179.2	112.0	151.3	162.3	142.6
85+	205.4	198.8	212.7	203.1	205.6	200.0	207.9	190.8	224.8
*Rate per 1,000 live births									

Table 4.4 shows the number of deaths in 2021 by age and calendar months

Table 4.4. Deaths by month and age, 2021

Month	Age at Death					
	All ages	<1 month	1-11 months	1-4 years	5-64 years	65+ years
January	203	11	1	3	54	134
February	164	5	4	4	55	96
March	167	6	1	3	65	92
April	169	14	2	1	54	98
May	144	10	1	2	39	92
June	132	6	2	5	48	71
July	219	4	1	3	70	141
August	332	8	0	4	94	226
September	156	16	1	3	59	77
October	178	12	3	7	55	101
November	166	10	1	3	47	105
December	172	7	1	1	55	108
Total	2202	109	18	39	695	1341

Table 4.5 shows the abridged life table in 2021 by sex.

Table 4.5. Abridged life table by sex, 2021

Age (years)	Male				Female			
	nq_x	l_x	L_x	e^0_x	nq_x	l_x	L_x	e^0_x
0	32.6	100000	97227	68.7	18.3	100000	98446	72.2
1	4.1	96737	96501	70.0	2.7	98171	98013	72.6
2	1.9	96337	96245	69.3	2.4	97903	97788	71.8
3	0.8	96153	96116	68.4	1.1	97673	97617	70.9
4	1.1	96079	96024	67.5	0.8	97561	97523	70.0
5	1.9	95969	479416	66.6	1.6	97485	487070	69.1
10	3.0	95783	478258	61.7	1.2	97331	486375	64.2
15	2.8	95498	476886	56.9	5.3	97209	484852	59.3
20	1.4	95235	475863	52.0	3.7	96691	482624	54.6
25	7.4	95099	473871	47.1	2.0	96330	481198	49.7
30	3.7	94394	471159	42.4	7.5	96133	479009	44.8
35	9.0	94042	468251	37.6	8.7	95414	475152	40.2
40	19.8	93193	461693	32.9	12.7	94582	470146	35.5
45	18.4	91345	452830	28.5	16.3	93385	463403	30.9
50	32.7	89659	441498	24.0	27.0	91860	453561	26.4
55	62.0	86724	421100	19.7	49.1	89380	436705	22.0
60	123.8	81348	383014	15.8	90.0	84992	407055	18.0
65	181.0	71281	325640	12.7	125.4	77345	363858	14.6
70	257.5	58380	255449	9.9	180.2	67646	309158	11.3
75	378.6	43347	175766	7.5	349.9	55453	229180	8.2
80	587.4	26937	92630	5.5	480.4	36052	135790	6.2
85+	1000.0	11114	55911	5.0	1000.0	18734	88063	4.7

Figure 4.1 shows the cumulative percent distribution of deaths by age in 2021 for both sexes combined and across both areas combined

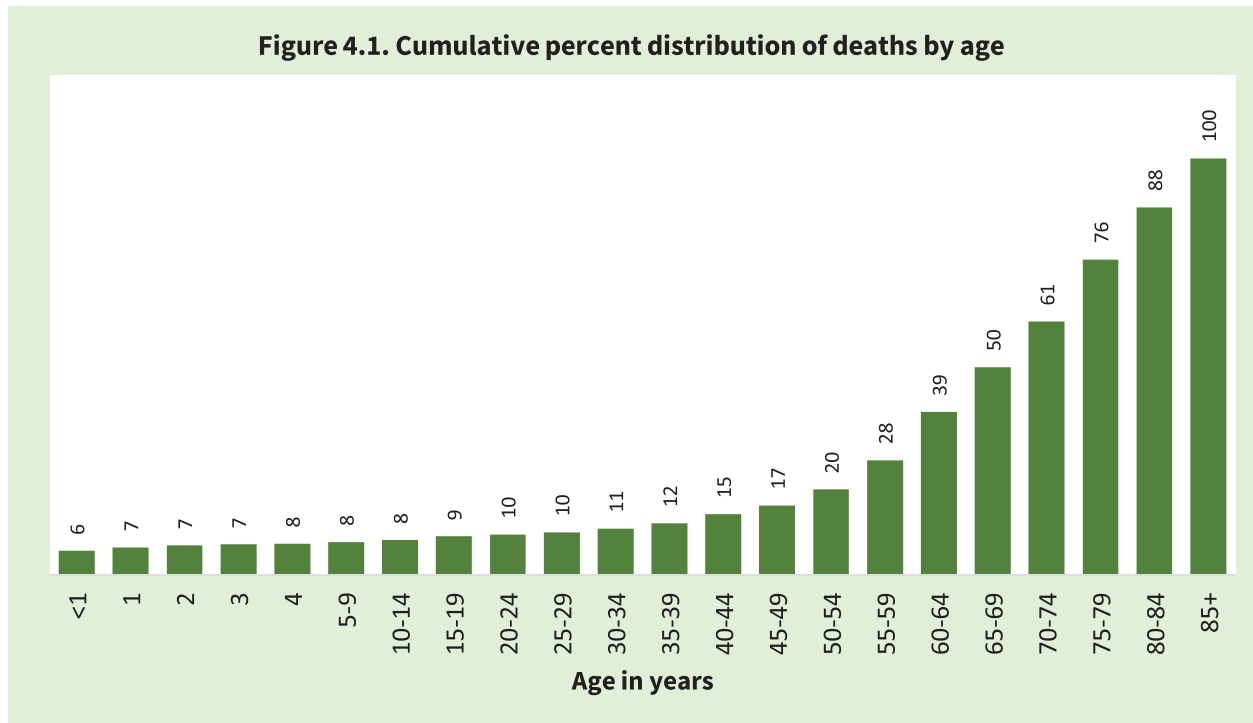


Figure 4.2 shows the probability of survival from birth to age(x) in 2021. m

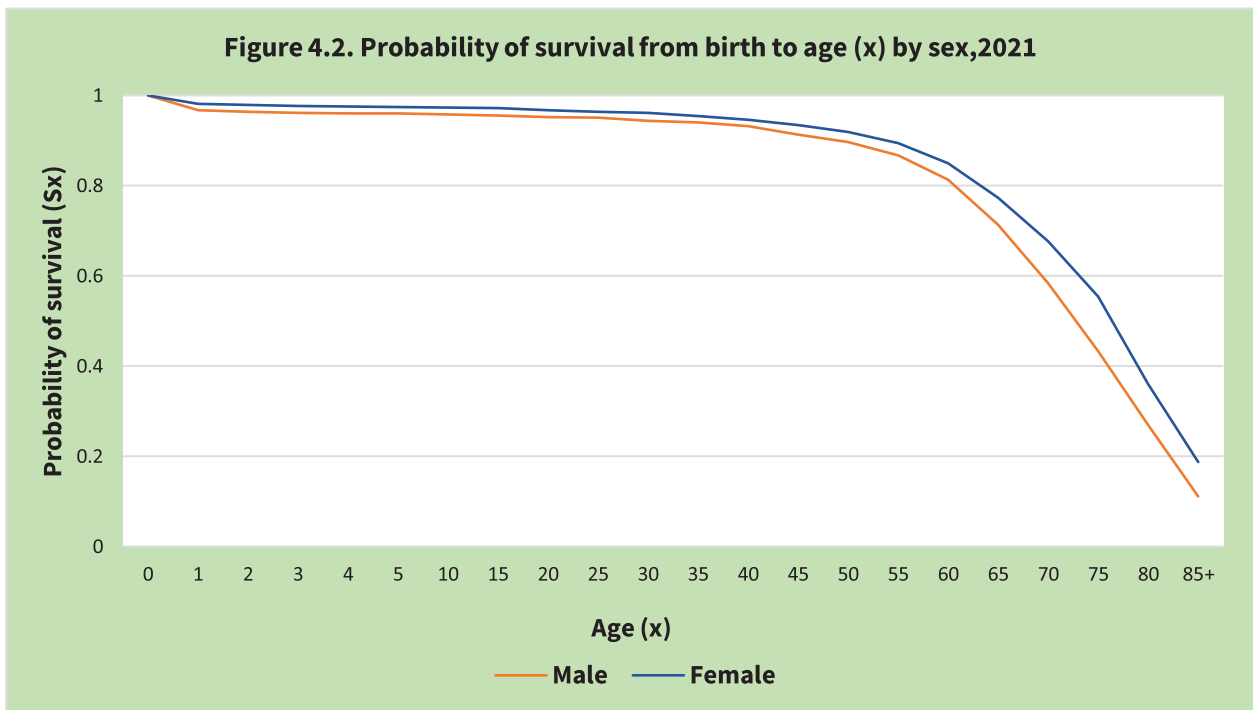
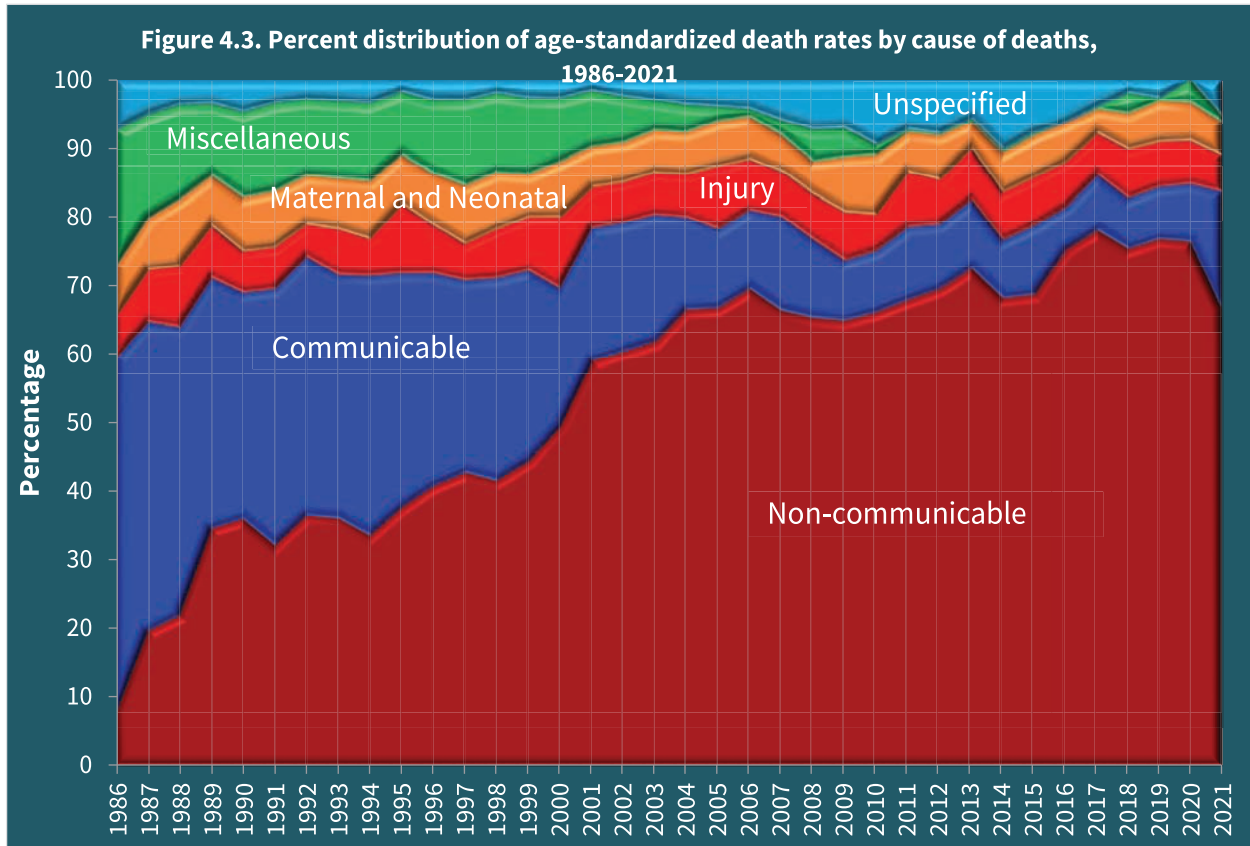


Figure 4.3 shows the percent-distribution of age-standardized death rates by broad categories of cause of death from 1986 to 2021. WHO standard verbal autopsy procedure was used to assess the cause of deaths from 2003 onward.



Chapter Summary

- A total of 5028 women had pregnancy outcomes in 2021. The pregnancy outcomes were 4943 live births, 82 stillbirths, 685 spontaneous abortions, and 119 induced abortions.
- Crude birth rate (CBR) was 19.8 per 1000 populations.
- The general fertility rate (GFR) and total fertility rate (TFR) were 73 and 2.4, respectively.
- Receiving at least one antenatal care (ANC) was almost universal (97%); however, only 54% received the recommended four or more ANC. Receiving at least four ANC was thrice in ISA than that of GSA.
- Near half (46%) received ANC in the first trimester, with a large difference between ISA and GSA. It was 63% in the ISA and 25% in the GSA.
- Facility birth was 84% - 93% in the ISA and 73% in the GSA.
- C-section birth was 59% and similar between the ISA and GSA.

This chapter provides a summary of pregnancy outcomes in 2021 and reports the key fertility indicators for 2021. The fertility indicators include crude birth rate (CBR), total fertility rate (TFR), age-specific fertility rate (ASFR), general fertility rate (GFR) and net reproduction rate (NRR). The chapter also includes pregnancy and delivery care (antenatal care (ANC), place of birth, and birth attendant) for live births in 2021.

Figure 5.1 shows the age-specific fertility rates in 2021 by area.

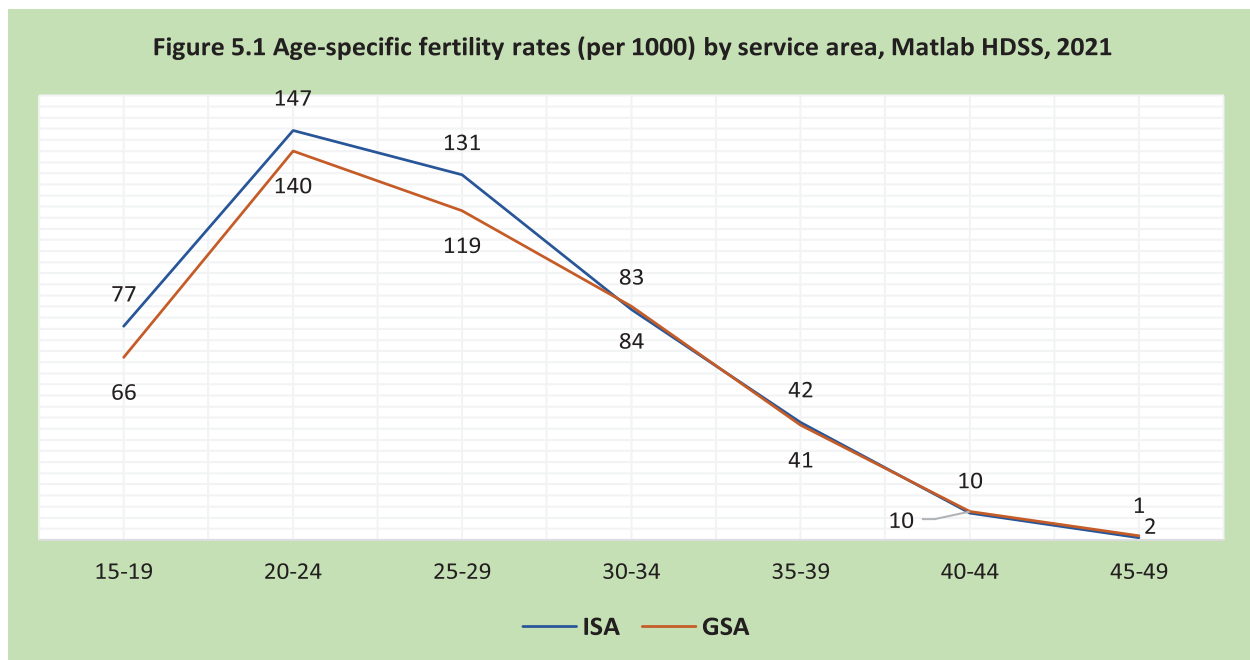


Table 5.1 shows the total number of pregnancies that ended in 2021 by type of pregnancy, pregnancy outcomes, and pregnancy rates by type of pregnancy.

Table 5.1 Results of pregnancy outcomes by area, 2021

Pregnancies and pregnancy outcomes	Both areas	ISA	GSA
Panel A: Number of pregnancies by type			
Total pregnancies that ended	5,781	3,126	2,655
Pregnancies that:			
Ended with at least one live birth	4,900	2,663	2,237
Ended with at least one stillbirth	81	43	38
Ended in spontaneous abortion	681	367	314
Ended in induced termination of pregnancy	119	53	66
Panel A1: Number of multiple outcome pregnancies by type			
Multiple outcome pregnancies	51	36	15
Twin pregnancies	51	36	15
Twin pregnancies that:			
Ended with 2 live births	43	31	12
Ended with 2 stillbirths	1	0	1
Ended with 1 live birth and 1 stillbirth	3	1	2
Ended with 1 miscarriage and 1 live birth	0	0	0
Ended with miscarriage	4	4	0
Ended with induced abortion	0	0	0
Triplet pregnancy	0	0	0
Quadruplets pregnancy	0	0	0
Panel B: Number of pregnancy outcomes by type			
Total outcomes	5,829	3,161	2,668
Live births	4,943	2,694	2,249
Stillbirths	82	43	39
Miscarriage	685	371	314
Induced abortions	119	53	66
Panel C: Pregnancy rates by type			
Pregnancies per 1,000 women age 15-49	85.9	87.8	83.7
Rates per 1,000 pregnancies:			
Live birth	847.6	851.9	842.6
Stillbirth	14.0	13.8	14.3
Miscarriage	117.8	117.4	118.3
Induced abortion	20.6	17.0	24.9
<i>Miscarriage:</i> Pregnancy that is spontaneously ended before 28 weeks of gestation;			
<i>Abortion:</i> Pregnancy that is ended using drugs or surgical intervention before 28 weeks of gestation;			
<i>Live birth pregnancy:</i> Pregnancy that ends with at least one live birth;			
<i>Stillbirth pregnancy:</i> Pregnancy that ends with at least one stillbirth;			
<i>Note:</i> 9 births to women aged below 15 years & 1 birth to a woman aged above 49 were excluded from the analysis.			

Table 5.2 shows the pregnancy outcomes in 2021 by calendar months.

Table 5.2 Pregnancy outcomes by month, 2021

Months	Pregnancy outcome					Number of live-born children			
	All	Miscarriage		Still birth	Live birth ^a	Both sexes	Male	Female	Sex ratio
		Induced	Spon.						
All months	5,829	119	685	82	4,943	4,943	2,540	2,403	1.1
Jan	477	9	36	4	428	428	230	198	1.2
Feb	452	12	46	5	389	389	208	181	1.1
Mar	443	15	70	10	348	348	189	159	1.2
Apr	437	10	70	6	351	351	179	172	1.0
May	367	5	58	3	301	301	140	161	0.9
Jun	372	13	57	3	299	299	152	147	1.0
Jul	474	20	62	9	383	383	178	205	0.9
Aug	498	6	56	17	419	419	211	208	1.0
Sep	544	4	47	4	489	489	254	235	1.1
Oct	636	9	65	8	554	554	301	253	1.2
Nov	580	12	63	5	500	500	263	237	1.1
Dec	549	4	55	8	482	482	235	247	1.0

^a For any multiple-birth pregnancy, the outcome is recorded as live birth if at least one of the issues is live-born;
^{*} Births to women under age 15 (9 counts) & ages above 49 (1 counts) were excluded from these statistics;
^{**} 7 and 0 live-born children had been found for births to women aged under 15 and over 49, respectively;

Figure 5.2 shows place of birth in 2021 by area

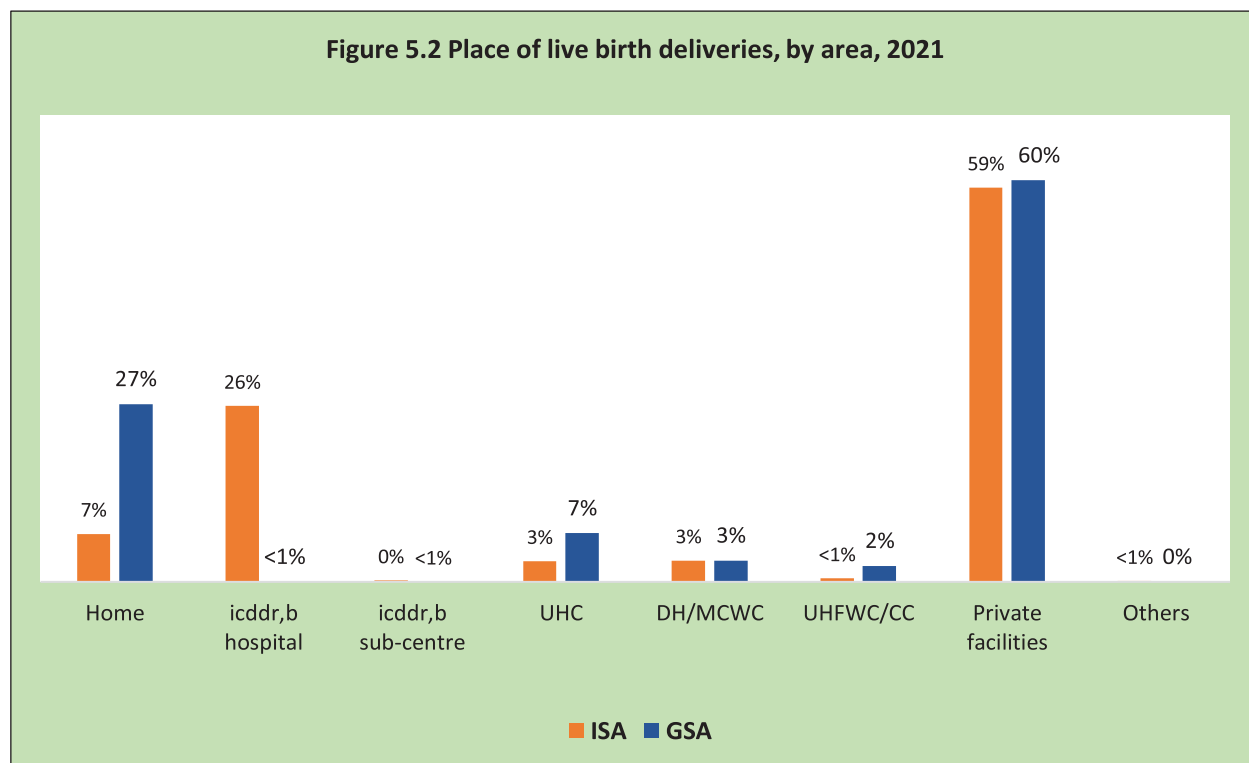


Table 5.3 shows the age-specific fertility rates, crude birth rate, total fertility rate, general fertility rate, gross reproduction rate, and net reproduction rate in 2021 by area.

Table 5.3 Age-specific fertility rates by area, 2021

Age (years)	Both areas		ISA		GSA	
	Live Births	Rate	Live Births	Rate	Live Births	Rate
All ages	4,943	73.4	2,694	75.7	2,249	70.9
15-19	870	71.6	489	76.9	381	65.7
20-24	1,540	143.9	824	147.4	716	140.0
25-29	1,226	125.4	689	131.4	537	118.5
30-34	835	83.5	441	83.0	394	84.1
35-39	382	41.8	206	42.4	176	41.3
40-44	82	9.9	42	9.7	40	10.2
45-49	8	1.1	3	0.8	5	1.5
Crude birth rate (per 1,000 population)	-	19.8	-	20.6	-	19.0
Total fertility rate (per woman)	-	2.4	-	2.5	-	2.3
General fertility rate (per 1,000 women)	-	73	-	76	-	71
Gross reproduction rate (per 1,000)	-	1160	-	1222	-	1091
Net reproduction rate (per 1,000)	-	1119	-	-	-	-

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

Table 5.4 shows the frequency and percent distribution of pregnancies that ended with a live birth in 2021 by place of delivery and area.

Table 5.4 Percent distribution of pregnancies that ended with live birth by place of delivery and area, 2021

Place of Delivery	Both areas		ISA		GSA	
	Number	Percent	Number	Percent	Number	Percent
Home	795	16.1	195	7.2	600	26.7
icddr,b Sub-Centre	5	0.1	5	0.2	0	0.0
icddr,b Matlab Hospital	712	14.4	711	26.4	1	0.0
Upazilla Health Complex	249	5.0	84	3.1	165	7.3
MCWC/District Hospital	159	3.2	87	3.2	72	3.2
Private hospitals	2953	59.7	1,596	59.2	1,357	60.3
UH&FWC	62	1.3	11	0.4	51	2.3
Community Clinic	6	0.1	3	0.1	3	0.1
Others	2	0.0	2	0.1	0	0.0
No. of live births	4943	100	2,694	100	2,249	100

Source: Birth registration form
Note: Births to mothers under age 15 & aged above 49 were excluded from these statistics

Table 5.5 shows the frequency and percent distribution of pregnancies that ended with a live birth in 2021 by birth attendants and area.

Table 5.5 Percent distribution of pregnancies that ended with live birth by attendant and area, 2021

Birth attendant	Both areas		ISA		GSA	
	Number	Percent	Number	Percent	Number	Percent
TBA	407	8.2	104	3.9	303	13.4
Trained TBA	175	3.5	39	1.4	136	6.0
FWV	266	5.4	138	5.1	128	5.7
Nurse	1,047	21.2	740	27.4	307	13.6
MBBS Doctor	2,996	60.5	1,652	61.3	1,344	59.7
Others	23	0.5	11	0.4	12	0.5
None	36	0.7	13	0.5	23	1.0
No. of live birth	4,950	100	2,697	100	2,253	100

TBA=Traditional birth attendant; FWV=Family welfare visitor

Table 5.6 shows the frequency and percent distribution of live birth deliveries in 2021 by mode of delivery and area.

Table 5.6 Number and percent distribution of mode of delivery of live births by area, 2021

Mode of Delivery	Both areas		ISA		GSA	
	Number	Percent	Number	Percent	Number	Percent
Normal vaginal	2,001	40.4	1,093	40.5	908	40.3
Operation(C/S)	2,936	59.3	1,604	59.5	1,332	59.1
Instrumental (forceps & ventouse)	13	0.3	0	0.0	13	0.6
Total	4,950	100	2,697	100	2,253	100

Table 5.7 presents key indicators relating to the receipt of antenatal care: number of visits and time of first visit.

Table 5.7 Percent distribution of different indicators for ANC visits, 2021

Number of ANC visits (%)	Both areas	ISA	GSA
None	3.0	0.7	5.8
1	8.7	1.9	16.9
2	16.0	5.9	28.2
3	18.0	14.4	22.5
4+	54.2	77.2	26.7
Total	100	100	100
Median	4	4	2
Number of months pregnant at the time of the first ANC visits (%)			
No ANC	3.0	0.7	5.8
<4 months	45.8	63.1	25.1
4-5 months	27.5	27.7	27.2
6-7 months	17.3	7.5	29.0
8+ months	6.4	1.0	12.9
Total	100	100	100
Median	4	3	5
Number of women having live births	4943	2694	2249
<i>Note: 9 births to women aged below 15 years & 1 birth to a woman aged above 49 were excluded from the analysis.</i>			

Chapter Summary

- A total of 3721 marriages and 408 divorces were recorded in 2021 in the Matlab HDSS.
- The mean age at first marriage was 26.9 years for males and 18.8 years for females.
- The mean duration of marriage at the time of divorce was 49.3 months.
- The bride's family provided a gift in 20% of the marriages (19% with prior negotiation and 1% without prior negotiation).
- Kazi registered eight in ten Muslim marriages, whereas only half (54%) of the divorces were registered by Kazai.
- Maladjustment and extramarital affairs were reported as the primary reasons for divorce.

Chapter 6 provides the statistics on marriage and divorce including marriage rates, divorce rates, age at marriage, marriage and divorce registration, causes of divorce and dowry for 2021.

Table 6.1 shows the percent distribution of marriages in 2021 by groom's and bride's age and previous marital status

Table 6.1 Percent distribution of groom's and bride's age at marriage by previous marital status, 2021

Age (years)	Groom					Bride			
	All	Single	Married	Divorced	Widowed	All	Single	Divorced	Widowed
All ages	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	4.5	5.1	0.2	0.0
15-17	1.2	1.3	2.3	0.3	0.0	6.3	7.2	0.0	0.0
18	1.7	2.0	0.0	0.3	0.0	10.4	11.5	2.6	0.0
19	1.9	2.2	0.0	0.3	0.0	14.3	15.8	3.6	2.7
20	2.6	2.9	0.0	0.0	0.0	15.2	16.3	7.1	5.4
21	2.6	3.0	0.0	0.3	0.0	11.6	12.5	5.7	2.7
22-24	15.1	16.8	9.3	4.7	0.0	25.8	25.5	30.0	8.1
25-29	40.3	44.1	14.0	19.9	1.8	6.7	4.7	22.1	8.1
30-34	24.0	23.4	23.3	32.9	16.1	2.9	1.2	13.3	32.4
35-39	5.6	3.6	16.3	20.5	13.4	1.2	0.2	7.9	10.8
40-44	1.9	0.6	7.0	8.3	17.9	0.6	0.1	4.5	5.4
45-49	1.0	0.1	14.0	4.5	11.6	0.3	0.0	1.7	8.1
50-54	0.9	0.0	11.6	2.7	17.9	0.2	0.0	0.7	8.1
55-59	0.5	0.0	2.3	2.7	8.0	0.1	0.0	0.2	5.4
60-64	0.3	0.0	0.0	1.5	7.1	0.0	0.0	0.2	0.0
65+	0.3	0.0	0.0	0.9	6.3	0.0	0.0	0.0	2.7
Unknown	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Median age*	28	27	35	33	46	18	18	25	34
Mean age*	28.3	26.9	36.5	34.8	46.2	19.8	18.8	26.4	35.6
Standard dev.*	6.7	4.5	10.3	8.9	11.2	5.1	3.4	7.7	11.9

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

Figure 6.1 shows the number of marriages and divorces in 2021 by calendar months.

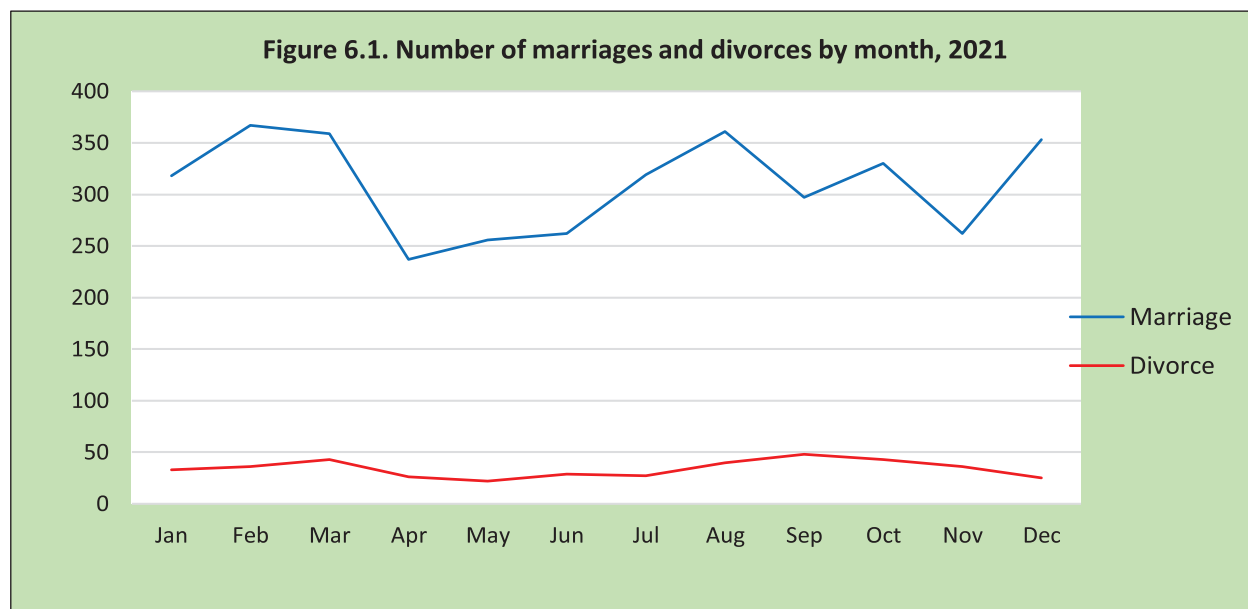


Table 6.2 shows the marriage rates in 2021 by age and sex.

Table 6.2 Marriage rates by age and sex, 2021, both areas combined

Age (years)	Male			Age (years)	Female		
	Marriages	Population	Rate*		Marriages	Population	Rate*
10 and above	3,721	88,086	42.2	10 and above	3,721	110,089	33.8
10-14	1	11,782	0.1	10-14	166	12,014	13.8
15-19	180	10,874	16.6	15-19	2,151	12,155	177.0
15	2	2,308	0.1	15	234	2,366	98.9
16	7	2,244	0.3	16	387	2,427	159.5
17	34	2,241	1.5	17	533	2,430	219.3
18	65	2,110	3.1	18	564	2,525	223.4
19	72	1,971	3.7	19	433	2,407	179.9
20-24	756	6,997	108.0	20-24	961	10,705	89.8
25-29	1499	5377	27.9	25-29	248	9,775	25.4
25	247	1,037	238.2	25	73	1,942	3.8
26	315	1,133	278.0	26	67	2,007	3.3
27	350	1,075	325.6	27	45	2,012	2.2
28	329	1,107	297.2	28	32	1,955	1.6
29	258	1,025	251.7	29	31	1,859	1.7
30-34	893	6,683	133.6	30-34	107	9,995	10.7
35-39	208	6,618	31.4	35-39	43	9,128	4.7
40-44	71	6,745	10.5	40-44	24	8,250	2.9
45+	112	33,010	3.4	45+	21	38,067	0.6
Unknown	1	-	-	Unknown	0	-	-

*Rates per 1000 population irrespective of previous marital status

Figure 6.2a and 6.2b show the trends in marriages with gift and payment of the gift at the time of marriage from 2009 to 2021.

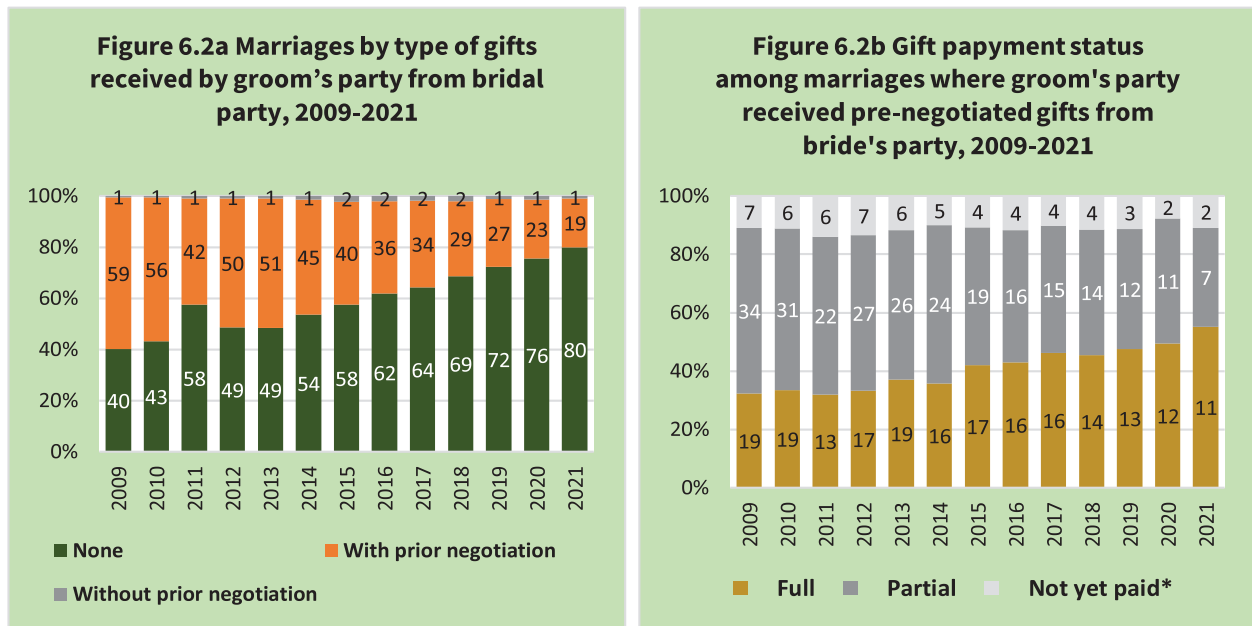


Table 6.3 shows the percent distribution of marital status at marriage in 2021 by age and sex.

Table 6.3 Percent distribution of current marital status (%) by age and sex, 2021

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	13129	100	0.0	0.0	0.0	100	12764
5-9	100	0.0	0.0	0.0	100	12835	100	0.0	0.0	0.0	100	12651
10-14	99.9	0.1	0.0	0.0	100	11782	96.8	3.1	0.0	0.1	100	12014
15-19	96.6	3.3	0.0	0.1	100	10874	54.4	44.4	0.0	1.2	100	12155
20-24	77.2	22.0	0.0	0.7	100	6997	14.1	83.8	0.2	2.0	100	10705
25-29	35.8	62.7	0.1	1.4	100	5377	3.1	94.8	0.4	1.7	100	9775
30-34	10.2	88.2	0.1	1.5	100	6683	1.5	95.9	1.1	1.5	100	9995
35-39	2.8	95.7	0.1	1.3	100	6618	0.8	95.4	2.4	1.3	100	9128
40-44	1.2	97.6	0.2	1.0	100	6745	0.4	93.7	4.7	1.1	100	8250
45-49	0.9	98.0	0.2	0.9	100	5912	0.3	89.9	8.5	1.3	100	7292
50-54	0.6	98.2	0.7	0.5	100	6166	0.2	83.4	15.1	1.3	100	7681
55-59	0.4	97.7	1.4	0.6	100	6345	0.4	71.8	26.1	1.7	100	7365
60-64	0.3	96.2	3.0	0.4	100	5745	0.2	57.4	40.5	1.9	100	5536
65-69	0.2	93.4	5.8	0.6	100	3559	0.1	40.2	58.5	1.3	100	3639
70-74	0.1	90.8	8.6	0.4	100	2260	0.1	24.3	74.4	1.3	100	2713
75-79	0.4	85.3	13.9	0.3	100	1521	0.0	11.8	87.5	0.7	100	2209
80-84	0.1	78.5	21.2	0.1	100	843	0.0	4.8	94.9	0.3	100	1035
85+	0.2	62.8	36.7	0.3	100	659	0.3	3.0	96.0	0.7	100	597
Total	49.7	48.6	1.2	0.5	100	114050	33.8	54.5	10.6	1.1	100	135504

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

Figure 6.3 shows the trends in marriage and divorce registered by Kazi from 2004 to 2021.

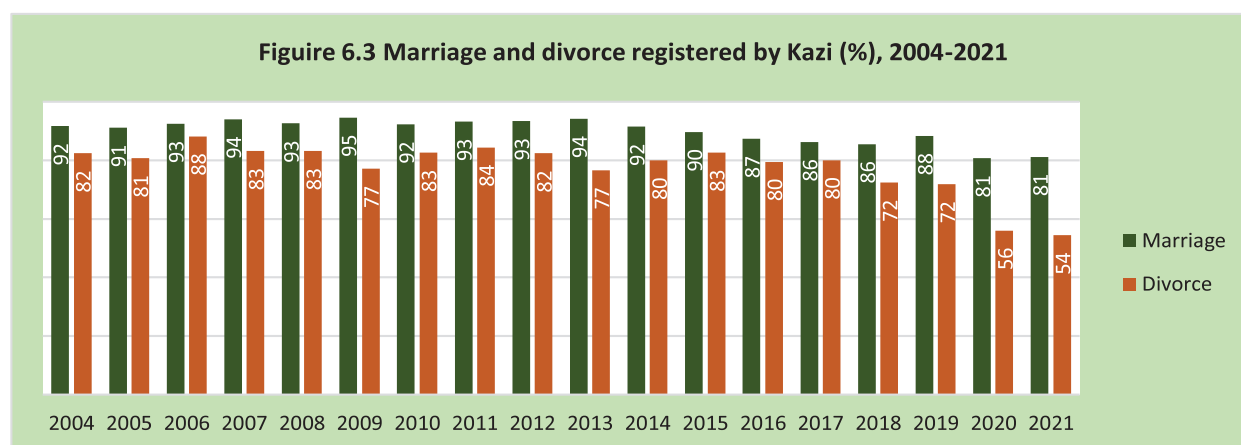


Table 6.4 shows duration of marriage at the time of divorce in 2021 by age at divorce and sex.

Table 6.4 Duration (months) of all marriages at divorce by age and sex, 2021

Age at divorce (years)	Male				Female			
	Count	Mean	Median	SD	Count	Mean	Median	SD
<20	13	5.5	5	4.4	122	15.9	10.5	17.9
20-24	57	16.6	9	18.2	114	33.1	24.5	29.0
25-29	82	29.3	17	51.5	67	66.9	66	42.1
30-34	120	40.0	32	33.2	46	95.9	85	79.1
35-39	61	65.7	65	49.7	21	104.3	84	81.6
40-49	52	112.8	104	85.5	22	132.5	108	110.1
50+	23	87.2	24	104.2	16	24.9	5	73.7
All ages	408	49.3	26	61.0	408	49.3	26	61.0

Table 6.5 shows the frequency and percent distribution of the reported causes of divorce by area.

Table 6.5 Reported causes of divorce by area, Matlab, 2021

Cause of Divorce	Both areas		ISA		GSA	
	Count	Percent	Count	Percent	Count	Percent
Dowry	7	1.7	5	2.4	2	1.0
Domestic violence	13	3.2	7	3.4	6	3.0
Husband's affair with another woman	58	14.2	30	14.5	28	13.9
Wife's affair with another man	89	21.8	52	25.1	37	18.4
Wife maladjustment with husband/family	132	32.4	49	23.7	83	41.3
Husband addicted to drug or gambling	13	3.2	7	3.4	6	3.0
No trace of husband	8	2.0	8	3.9	0	0.0
Husband/wife not good looking	16	3.9	9	4.4	7	3.5
Husband mentally/physically disabled	19	4.7	11	5.3	8	4.0
Wife mentally/physically disabled	8	2.0	4	1.9	4	2.0
Others/unspecified	45	11.0	25	12.1	20	10.0
Total	408	100	207	100	201	100

Chapter 7. Migration

Chapter Summary

- A total of 11759 in-migration and 14521 out-migration were recorded in 2021 in the Matlab HDSS. Out-migration was higher than in-migration.
- Both the in-migration and out-migration rates were higher for males than for females (in-migration rate per 1000 population: male – 50, female – 45; out-migration rate per 1000 population: male – 66, female 52).

This chapter provides 2021 updates on migration.

Figure 7.1 shows the in- and out-migration rate in 2021 by age and sex.

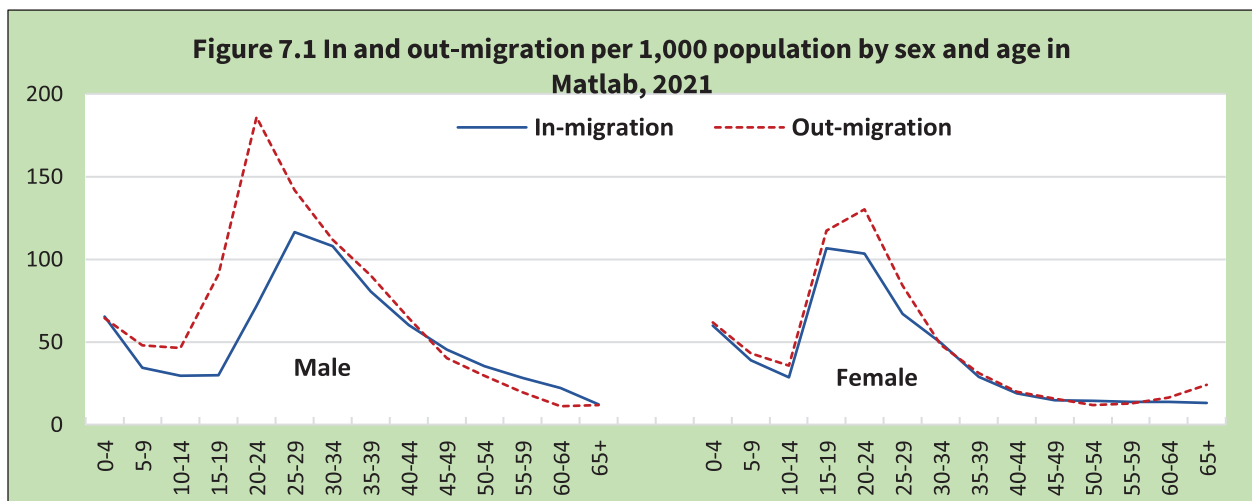


Figure 7.2 shows in- and out-migration rates in 2021 for males and females by calendar months.

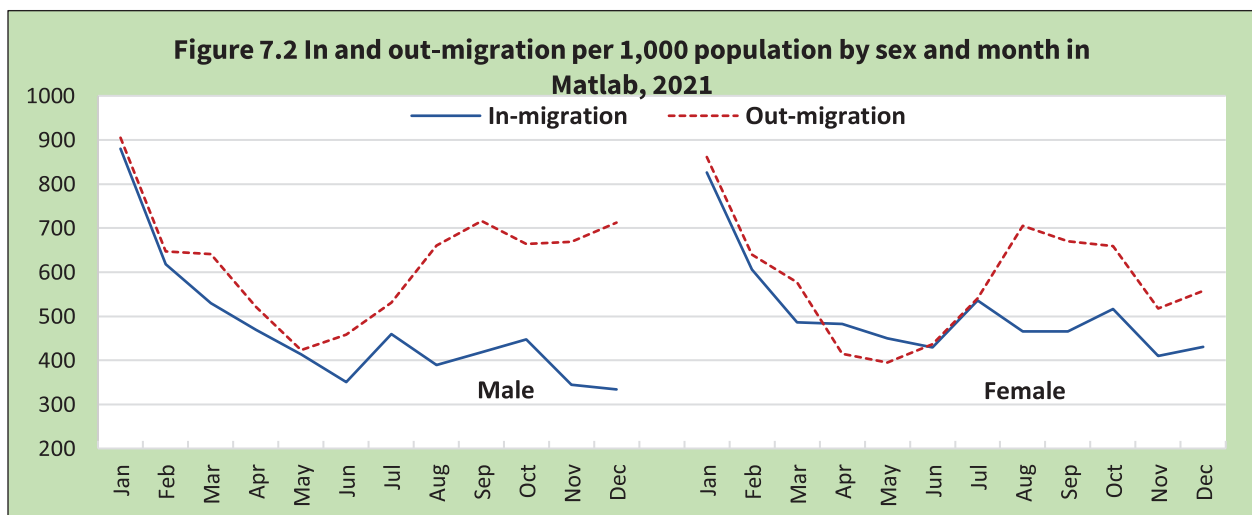


Table 7.1 shows the age and sex-specific in- and out-migration rates in 2021 by age.

Table 7.1 Age and sex-specific migration rates (per 1,000 population) by direction, 2021

Age (years)	Both sexes		Male		Female	
	In	Out	In	Out	In	Out
All ages	47.1	58.2	49.6	66.2	45.0	51.5
0-4	62.6	63.1	65.2	64.3	59.9	61.8
5-9	36.6	45.5	34.3	48.0	38.9	43.0
10-14	29.0	41.0	29.5	46.3	28.6	35.7
15-19	70.3	104.9	29.7	90.9	106.7	117.4
20-24	91.0	152.3	71.9	185.9	103.4	130.3
25-29	84.4	104.6	116.4	141.7	66.8	84.2
30-34	72.9	73.8	107.9	111.9	49.5	48.3
35-39	50.6	55.9	80.5	90.2	28.9	31.0
40-44	37.6	39.9	60.3	64.5	19.0	19.8
45-49	28.5	26.6	45.5	40.1	14.7	15.6
50-54	23.7	19.7	35.2	29.5	14.5	11.8
55-59	20.4	16.0	28.2	19.5	13.7	12.9
60-64	18.0	13.7	22.1	11.1	13.7	16.3
65+	12.8	18.4	12.2	11.8	13.2	24.2

Table 7.2 shows the number of in- and out-migration in 2021 by sex and calendar months.

Table 7.2 Number of in-and out-migrations by sex and month, 2021

Months	In-migration			Out-migration		
	Both sex	Male	Female	Both sex	Male	Female
All months	11,759	5,656	6,103	14,521	7,548	6,973
Jan	1,706	880	826	1,766	905	861
Feb	1,224	618	606	1,287	647	640
Mar	1,016	530	486	1,218	641	577
Apr	951	469	482	936	521	415
May	863	413	450	818	423	395
Jun	780	351	429	894	458	436
Jul	996	460	536	1071	531	540
Aug	855	389	466	1,365	660	705
Sep	884	419	465	1386	716	670
Oct	965	448	517	1,323	664	659
Nov	755	345	410	1187	669	518
Dec	764	334	430	1270	713	557

Chapter 8. Family planning, 2021

This chapter provides contraceptive method use among currently married women of reproductive age (CMWRA) (15-49 years). 55039 CMWRAs lived in the HDSS area on the 31st December, 2021. Among them, 5016 CMWRAs did not have any contraceptive use information in any rounds of routine visits and excluded from the analysis. Thus, the analysis includes 50023 CMWRAs.

Table 8.1. Contraceptive prevalence rate (%) among currently married women aged 15-49 years by area, 1987-2021

Year	Matlab			National**
	icDDR,b area	Government area*	Rural Chittagong (BDHS)	
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	49.0	38.6	-	-
2017	47.7	36.8	52.2	61.9
2018	43.9	35.1	-	-
2019	43.2	35.1	-	-
2020	-	-	-	-
2021	43.4	36.3	-	-

*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.

- Incomplete data due to COVID-19

Note: Definition of CPR was 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. Method specific contraceptive use rate among currently married women age 15-49 years by age in icddr,b service area, 2021

Age (year)	Not using	Any method used									No. of women
		Pill	Condom	Injec-tables	IUD	Tubec -tomy	NSV	Impl ants	Others*		
<20	81.4	18.6	8.1	3.6	5.7	0.1	0.0	0.0	0.9	0.2	1,802
20-24	69.9	30.1	12.7	4.7	9.4	0.3	0.1	0.0	2.3	0.5	4,269
25-29	61.9	38.1	16.0	5.9	11.8	0.4	1.0	0.0	2.4	0.6	4,732
30-34	53.2	46.8	17.8	6.2	13.3	0.7	4.7	0.2	2.8	1.2	4,859
35-39	47.2	52.8	18.5	5.7	14.5	0.6	8.5	0.6	3.1	1.1	4,496
40-44	44.8	55.2	17.5	5.8	13.6	0.5	11.8	1.3	2.4	2.2	3,737
45-49	48.7	51.3	13.2	4.9	12.1	0.4	13.9	1.9	2.2	2.6	3,158
Total	56.6	43.4	15.6	5.5	12.0	0.4	5.7	0.6	2.4	1.2	27,053

*Others include periodic abstinence, withdrawal and other traditional methods

Table 8.3. Method specific contraceptive use rate among currently married women age 15-49 years by age in Government service area, 2021

Age (year)	Not using	Any method used									No. of women
		Pill	Condom	Injec-tables	IUD	Tubec -tomy	NSV	Impl ants	Others*		
<20	85.8	14.2	7.4	4.5	1.5	0.0	0.0	0.0	0.3	0.5	1,495
20-24	76.2	23.8	12.3	4.4	4.7	0.4	0.0	0.1	0.7	1.1	3,604
25-29	68.8	31.2	15.6	4.4	7.5	0.5	1.3	0.0	0.8	1.2	4,016
30-34	61.1	38.9	18.5	3.8	8.9	0.5	4.0	0.2	1.6	1.3	4,103
35-39	52.2	47.8	19.1	4.5	10.6	0.9	8.5	0.4	2.0	1.9	3,871
40-44	52.0	48.0	17.4	3.6	9.8	0.5	11.1	0.7	3.5	1.5	3,319
45-49	61.9	38.1	11.6	2.1	6.9	0.4	12.1	0.6	3.1	1.1	2,562
Total	63.7	36.3	15.5	3.9	7.7	0.5	5.3	0.3	1.7	1.3	22,970

*Others include periodic abstinence, withdrawal and other traditional methods

Table 8.4. Percent distribution of contraception method mix (%) by area, 2021

	Pill	Condom	Injectables	IUD	Tubectomy	Vasectomy	Norplant	Others*	Total
icddr,b	35.9	12.6	27.7	1	13.1	1.3	5.6	2.8	100
Government	42.6	10.8	21.3	1.4	14.7	0.8	3.6	4.8	100

Chapter 9. Child immunization, 1987-2021

The CHRWs started measles vaccination to all children in a part of the ISA in 1982 and in the whole ISA in 1985. Vaccination for DPT and polio started in 1986 in all four blocks. From the beginning of these interventions, vaccination records have been maintained by CHRWs in the icddr,b area. The record-keeping system was started in ISA and GSA in 1977 and 2000, respectively.

The World Health Organization recommends that all children receive a BCG vaccination against tuberculosis; three doses of DPT for diphtheria, pertussis and tetanus prevention; hepatitis B; three doses of polio vaccine; and a vaccination against measles before their first birthday. In January 2009, the Bangladesh EPI program introduced haemophilus influenza type B (Hib) vaccine in the form of pentavalent vaccine that included the DPT and hepatitis B and the new Hib vaccine. By June 2009, the pentavalent vaccine had replaced the DPT and hepatitis B, and by 2012 measles-rubella replaced measles. So, vaccination of children aged 12-23 months allows comparison of results across 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 2021 and the Government Service Area from 2000 to 2021.

Table 9.1. Immunization coverage (%) among children aged 12-23 months in icddr,b service area, 1987-2021 and Government Service Area, 2000-2021

	Vaccination coverage rate of children aged 12 - 23 months							
	BCG (1 dose)		DPT/Pentavalent (3 doses)		Measles-Rubella (1 dose)		All*	
	icddr,b	Govt.	icddr,b	Government	icddr,b	Government	icddr,b	Government
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	-	97.3	-
1998	99.2	-	97.7	-	96.1	-	95.4	-
1999	99.0	-	97.7	-	94.8	-	94.1	-
2000a	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	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
2007b	99.8	99.8	98.8	99	96.3	95.1	96.1	94.7
2008b	97.8	96.3	97.3	95.9	95.1	93.6	94.8	93.6
2009b	97.4	97.8	96.7	97.5	95	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	-	-	-	-	-	-	-	-
2021	99.8	99.9	97.3	97.8	88.1	87.0	88.0	86.9

*Fully vaccinated if receives BCG, measles-rubella and three doses of pentavalent and polio.
^a Immunization coverage is ~20% under-reported in the Govt. area due to not checking of vaccination cards during the initial months of 2000.
^b Child immunization data were collected on sample basis in 2007-2009
- Incomplete data due to COVID-19

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Appendices 2021

Appendix A-1 Abridged life table for icddr,b service area by sex, 2021

Age (years)	Male				Female			
	nq_x	l_x	L_x	e^0_x	nq_x	l_x	L_x	e^0_x
0	31.0	100000	97365	69.2	17.9	100000	98480	72.2
1	7.4	96900	386259	70.5	4.5	98212	392023	72.5
5	1.5	96185	480600	67.0	0.7	97772	488694	68.9
10	5.9	96044	958069	62.1	5.5	97700	974714	63.9
20	6.2	95481	952312	52.4	8.3	97158	968191	54.2
30	10.1	94888	944855	42.7	16.6	96354	956790	44.6
40	16.4	93934	466103	33.1	11.5	94755	471258	35.3
45	12.1	92389	459365	28.6	12.7	93663	465564	30.7
50	37.7	91270	448371	23.9	36.7	92470	454480	26.0
55	65.1	87828	425826	19.7	49.2	89074	435180	21.9
60	118.0	82114	387766	15.9	100.7	84688	403436	17.9
65	186.4	72427	329901	12.7	127.2	76162	357957	14.6
70	232.6	58925	261575	10.0	195.6	66472	301258	11.4
75	395.6	45218	181233	7.2	348.7	53470	221158	8.5
80	605.7	27330	92359	5.3	436.1	34827	135628	6.7
85+	1000.0	10775	52401	4.9	1000.0	19639	98195	5.0

Appendix A-2 Abridged life table for Government service area by sex, 2021

Age (years)	Male				Female			
	nq_x	l_x	L_x	e^0_x	nq_x	l_x	L_x	e^0_x
0	34.5	100000	97069	68.2	18.8	100000	98402	72.3
1	8.6	96552	384648	69.6	9.7	98120	390699	72.6
5	2.5	95721	478054	66.2	2.5	97171	485288	69.3
10	5.6	95482	952580	61.3	7.8	96925	966085	64.5
20	10.0	94950	945482	51.7	3.1	96174	960480	55.0
30	15.6	93997	933783	42.1	15.5	95875	952459	45.1
40	23.8	92531	457575	32.7	13.9	94385	468898	35.7
45	26.3	90333	446169	28.4	20.4	93074	460971	31.2
50	27.1	87957	434259	24.1	16.2	91171	452433	26.8
55	58.5	85569	416187	19.7	48.9	89690	438256	22.2
60	130.0	80560	378078	15.8	79.0	85302	410772	18.2
65	175.0	70084	321206	12.8	123.5	78566	369960	14.5
70	282.3	57817	249288	9.9	164.4	68862	317413	11.2
75	360.6	41496	170289	7.8	351.1	57543	237623	7.9
80	568.1	26531	92864	5.8	520.2	37338	136212	5.8
85+	1000.0	11460	60065	5.2	1000.0	17917	79716	4.4

Appendix A-3 Male deaths by cause and age, 2021

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+
Diarrhoea	6	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Tuberculosis	15	0	0	0	0	0	0	0	0	1	1	0	0	2	3	3	2	2	1	0
Meningitis	1	0	1	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	0	1	1	0	1	1	1	0	0	1	0	1	0
Respiratory Infections	34	4	1	0	0	0	0	0	0	1	0	0	0	2	4	4	7	3	5	3
Septicaemia	10	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	2	4
Covid-19	119	0	0	0	0	0	0	3	0	1	3	3	4	8	16	16	18	17	18	12
Premature and Low Birth Weight	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Birth Asphyxia	17	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Neonatal Sepsis	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cerebral Ischemia (HIE)	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All Other Neonatal Conditions	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malignant neoplasm	120	0	0	1	1	1	0	1	0	3	5	4	10	12	28	16	13	10	8	7
Congenital Malformation	9	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diabetes	12	0	0	0	0	0	0	0	0	0	0	0	3	0	3	2	0	3	0	1
All Other Endocrine Disorders	2	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Neuro-psychiatric	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rheumatic Heart Diseases	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Hypertensive Diseases	7	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	3
Ischemic Heart Diseases	222	0	0	0	0	0	1	0	0	0	7	8	8	21	40	43	22	31	21	20
Pulmonary heart disease and diseases of pulmonary circulation	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Stroke	201	0	0	0	1	0	0	0	0	1	2	2	3	12	27	21	27	36	32	37
Other forms of heart disease	76	0	1	0	0	1	0	0	0	0	3	0	3	10	10	10	7	6	14	11
All Other Circulatory System Diseases	16	0	0	0	0	0	0	0	0	0	0	0	0	4	3	2	3	1	3	
COPD	67	0	0	0	0	0	0	0	0	1	0	0	0	5	5	6	16	13	13	8
Asthma	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
All Other Respiratory Diseases	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Digestive Diseases	26	1	0	0	0	0	0	0	0	2	2	0	1	2	3	4	5	2	3	1
Renal Failure	8	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	2	2	2
Other Urinary	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1
Transport Accidents	15	0	0	2	0	1	0	1	1	0	1	1	0	1	0	4	0	0	2	1
Falls	13	0	0	0	0	0	0	0	1	0	1	0	2	0	0	2	0	2	2	3
Drowning	17	0	11	1	2	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0
All Other External Causes of Accidental injury	13	0	2	0	2	1	0	1	1	1	1	0	0	2	1	0	0	1	0	0
Suicide	5	0	0	0	1	1	0	1	0	0	0	0	0	1	0	0	0	1	0	0
Homicide	4	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0
All Other External Causes of Mortality	2	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
Fever of unknown Origin	8	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2	0	0
All Other Unknown and Unspecific	49	2	2	0	0	0	0	1	0	0	0	1	3	1	3	2	7	4	14	9

Appendix A-4 Female deaths by cause and age, 2021

Cause	All ages	Age at death (years)																		
		<1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Diarrhoea	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1
Tuberculosis	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Hepatitis	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Respiratory Infections	39	8	4	0	0	0	0	0	0	1	1	1	2	2	2	5	5	4	4	
Septicaemia	11	1	1	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	6	
Covid-19	122	0	0	0	0	1	0	1	2	4	10	3	11	11	11	17	21	10	11	9
All Other Communicable Disease	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	
Maternal Deaths	12	0	0	0	0	1	2	1	5	1	2	0	0	0	0	0	0	0	0	
Premature and Low Birth Weight	6	6	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	
Neonatal Sepsis	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Cerebral Ischemia (HIE)	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
All Other Neonatal Conditions	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nutritional Deficiencies	3	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
Malignant neoplasm	58	0	1	1	1	0	0	0	2	0	2	4	6	13	15	3	6	3	1	0
Malignant neoplasms of female	5	0	0	0	0	0	0	0	0	1	1	0	0	1	1	1	0	0	0	
Congenital Malformation	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Diabetes	26	0	0	0	0	1	0	0	0	0	0	0	4	2	4	1	4	6	2	2
All Other Endocrine Disorders	2	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
Neuro-psychiatric	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
Rheumatic Heart Diseases	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
Hypertensive Diseases	15	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0	4	2	2	3
Ischemic Heart Diseases	144	0	0	0	0	0	0	0	1	2	0	5	7	12	16	17	15	31	21	17
Pulmonary heart disease and di	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	
Stroke	261	0	0	0	0	1	0	1	0	4	3	5	6	14	31	18	23	72	46	37
Other forms of heart disease	83	0	0	0	0	0	0	0	0	1	0	0	1	3	10	14	2	17	14	21
All Other Circulatory System D	21	0	0	0	0	0	0	0	0	0	0	0	1	1	1	5	5	5	3	
COPD	37	0	0	0	0	0	0	0	1	0	0	1	1	2	3	7	6	7	7	2
Asthma	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
All Other Respiratory Diseases	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	
Digestive Diseases	21	0	0	1	0	0	1	0	1	2	0	0	1	4	3	1	3	4	0	0
Renal Failure	4	0	0	0	0	1	0	0	0	0	0	2	0	1	0	0	0	0	0	
Nephritic Syndrome	2	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
All Other Non-Communicable Dis	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
Transport Accidents	8	0	0	0	1	0	0	0	0	0	1	0	1	1	0	1	1	1	0	1
Falls	9	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	3	3	
Drowning	15	0	8	1	0	0	2	0	0	0	0	1	1	0	1	1	0	0	0	
Fire	3	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	
All Other External Causes of A	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
Suicide	12	0	0	0	0	6	3	1	1	0	1	0	0	0	0	0	0	0	0	
Fever of unknown Origin	9	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	1	3	2	
Sudden Infant Death	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
All Other Unknown and Unspecific	66	0	1	0	0	2	0	0	0	1	0	0	1	2	4	8	7	14	10	16

Appendix A-5 Male deaths by cause, age and area, 2021

Cause	All ages		<1		1-4		5-14		15-44		45-64		65-84		85+	
	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.	icddr,b	Govt.
Communicable Diseases																
Diarrhoea	3	3	0	1	0	0	0	1	0	0	0	0	2	0	1	1
Tuberculosis	7	8	0	0	0	0	0	0	1	1	2	3	4	4	0	0
Meningitis	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Hepatitis	5	2	0	0	0	0	0	0	1	1	3	0	1	1	0	0
Respiratory Infections	17	17	1	3	0	1	0	0	0	1	4	2	11	8	1	2
Septicaemia	8	2	1	0	0	0	0	0	0	0	0	1	3	1	4	0
Covid-19	79	40	0	0	0	0	0	0	2	5	19	12	48	21	10	2
EPI Related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All Other Communicable Disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maternal and Neonatal Conditions																
Maternal Deaths	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Premature and Low Birth Weight	8	2	8	2	0	0	0	0	0	0	0	0	0	0	0	0
Birth Asphyxia	7	10	7	10	0	0	0	0	0	0	0	0	0	0	0	0
Neonatal Sepsis	11	9	11	9	0	0	0	0	0	0	0	0	0	0	0	0
Cerebral Ischaemia (HIE)	2	7	2	7	0	0	0	0	0	0	0	0	0	0	0	0
All Other Neonatal Conditions	5	4	5	4	0	0	0	0	0	0	0	0	0	0	0	0
Congenital Malformation	6	3	5	3	1	0	0	0	0	0	0	0	0	0	0	0
Nutritional Deficiencies																
Non-communicable Diseases																
Malignant neoplasm	67	53	0	0	0	0	1	1	7	3	33	21	23	24	3	4
Malignant neoplasms of female	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diabetes	7	5	0	0	0	0	0	0	0	0	3	3	3	2	1	0
All Other Endocrine Disorders	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Neuro-psychiatric	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Rheumatic Heart Diseases	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Hypertensive Diseases	1	6	0	0	0	0	0	0	0	0	0	2	1	1	0	3
Ischaemic Heart Diseases	116	106	0	0	0	0	0	0	4	4	45	32	55	62	12	8
Pulmonary heart disease and diseases of pulmonary circulation	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Stroke	99	102	0	0	0	0	1	0	1	2	20	24	52	64	25	12
Other forms of heart disease	28	48	0	0	1	0	0	0	2	2	7	16	15	22	3	8
All Other Circulatory System Diseases	8	8	0	0	0	0	0	0	0	0	3	1	5	4	0	3
COPD	28	39	0	0	0	0	0	0	1	0	1	9	23	25	3	5
Asthma	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	2
All Other Respiratory Diseases	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0
Digestive Diseases	15	11	1	0	0	0	0	0	1	3	5	1	7	7	1	0
Renal Failure	5	3	0	0	0	0	0	0	0	0	0	1	3	2	2	0
Other Urinary	2	2	0	0	0	0	0	0	0	0	0	0	2	1	0	1
Injuries and External Causes																
Transport Accidents	9	6	0	0	0	0	1	1	2	2	1	1	4	2	1	0
Falls	6	7	0	0	0	0	0	0	1	1	1	1	4	2	0	3
Drowning	6	11	0	0	4	7	1	2	0	0	0	1	1	1	0	0
Fire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All Other External Causes of Accidental Injury	4	9	0	0	1	1	1	1	1	4	1	2	0	1	0	0
Suicide	4	1	0	0	0	0	1	0	1	1	1	0	1	0	0	0
Homicide	1	3	0	0	0	0	0	0	0	1	1	1	0	1	0	0
All Other External Causes of Mortality	0	2	0	0	0	0	0	0	0	1	0	1	0	0	0	0
Miscellaneous																
Fever of unknown Origin	5	3	1	0	0	1	0	0	0	0	0	1	4	1	0	0
Sudden Infant Death	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All Other Unknown and Unspecified Causes	25	24	0	2	2	0	0	0	0	1	3	5	15	12	5	4

Appendix A-6 Female deaths by cause, age and area, 2021

Cause	All ages		<1		1-4		5-14		15-44		45-64		65-84		85+	
	icddr, b	Govt.	icddr, b	Govt.	icddr, b	Govt.	icddr, b	Govt.	icddr, b	Govt.	icddr, b	Govt.	icddr, b	Govt.	icddr, b	Govt.
Communicable Diseases																
Diarrhoea	4	1	0	0	0	0	0	0	0	0	0	0	3	1	1	0
Tuberculosis	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Meningitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Respiratory Infections	23	16	4	4	3	1	0	0	0	1	5	1	10	6	1	3
Septicaemia	7	4	0	1	0	1	0	0	0	0	1	0	2	0	4	2
Covid-19	73	49	0	0	0	0	0	0	11	7	25	11	34	25	3	6
EPI Related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All Other Communicable Disease	1	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0
Maternal and Neonatal Conditions																
Maternal Deaths	4	8	0	0	0	0	0	0	4	8	0	0	0	0	0	0
Premature and Low Birth Weight	5	1	5	1	0	0	0	0	0	0	0	0	0	0	0	0
Birth Asphyxia	3	2	3	2	0	0	0	0	0	0	0	0	0	0	0	0
Neonatal Sepsis	4	5	4	5	0	0	0	0	0	0	0	0	0	0	0	0
Cerebral Ischaemia (HIE)	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
All Other Neonatal Conditions	4	2	4	2	0	0	0	0	0	0	0	0	0	0	0	0
Congenital Malformation	3	2	3	2	0	0	0	0	0	0	0	0	0	0	0	0
Nutritional Deficiencies																
Non-communicable Diseases																
Malignant neoplasm	29	29	0	0	0	1	1	1	4	0	18	20	6	7	0	0
Malignant neoplasms of female	5	0	0	0	0	0	0	0	2	0	2	0	1	0	0	0
Diabetes	10	16	0	0	0	0	0	0	0	1	6	4	3	10	1	1
All Other Endocrine Disorders	2	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
Neuro-psychiatric	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Rheumatic Heart Diseases	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Hypertensive Diseases	9	6	0	0	0	0	0	0	0	0	3	1	4	4	2	1
Ischaemic Heart Diseases	64	80	0	0	0	0	0	0	2	1	19	21	37	47	6	11
Pulmonary heart disease and diseases of pulmonary circulation	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0
Stroke	139	122	0	0	0	0	0	0	3	6	28	28	88	71	20	17
Other forms of heart disease	34	49	0	0	0	0	0	0	0	1	9	5	17	30	8	13
All Other Circulatory System Diseases	6	15	0	0	0	0	0	0	0	0	1	1	4	12	1	2
COPD	20	17	0	0	0	0	0	0	1	0	5	2	13	14	1	1
Asthma	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
All Other Respiratory Diseases	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0
Digestive Diseases	13	8	0	0	0	0	1	0	4	0	4	4	4	4	0	0
Renal Failure	3	1	0	0	0	0	0	0	0	1	3	0	0	0	0	0
Nephritic Syndrome	0	2	0	0	0	1	0	0	0	0	0	1	0	0	0	0
All Other Non-Communicable Diseases	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Injuries and External Causes																
Transport Accidents	2	6	0	0	0	0	0	1	0	1	2	0	0	3	0	1
Falls	6	3	0	0	0	0	0	0	0	0	0	0	5	1	1	2
Drowning	5	10	0	0	2	6	0	1	2	0	0	2	1	1	0	0
Fire	2	1	0	0	0	0	0	1	0	0	0	0	2	0	0	0
All Other External Causes of Accidental Injury	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Suicide	7	5	0	0	0	0	0	0	7	5	0	0	0	0	0	0
Homicide	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All Other External Causes of Mortality	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous																
Fever of unknown Origin	4	5	0	0	0	0	0	1	0	1	0	0	2	3	2	0
Sudden Infant Death	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
All Other Unknown and Unspecified Causes	34	32	0	0	0	1	0	0	2	1	4	3	21	18	7	9

Appendix A-7 Marriages and divorces by month, 2021

Month	Marriage		Divorce	
	No.	Percentage	No.	Percentage
Jan	318	8.5	33	8.1
Feb	367	9.9	36	8.8
Mar	359	9.6	43	10.5
Apr	237	6.4	26	6.4
May	256	6.9	22	5.4
Jun	262	7.0	29	7.1
Jul	319	8.6	27	6.6
Aug	361	9.7	40	9.8
Sep	297	8.0	48	11.8
Oct	330	8.9	43	10.5
Nov	262	7.0	36	8.8
Dec	353	9.5	25	6.1
Total	3,721	100	408	100

Appendix A-8 In- and out-migrations by age and sex, 2021

Age (years)	In-migration			Out-migration		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	11,759	5,656	6,103	14,521	7,548	6,973
0-4	1,621	856	765	1,633	844	789
5-9	932	440	492	1,160	616	544
10-14	690	347	343	975	546	429
15-19	1,620	323	1,297	2,415	988	1,427
20-24	1,610	503	1,107	2,696	1,301	1,395
25-29	1,279	626	653	1,585	762	823
30-34	1,216	721	495	1,231	748	483
35-39	797	533	264	880	597	283
40-44	564	407	157	598	435	163
45-49	376	269	107	351	237	114
50-54	328	217	111	273	182	91
55-59	280	179	101	219	124	95
60-64	203	127	76	154	64	90
65+	243	108	135	351	104	247

Appendix A-9 In-migrations by age, sex and area, 2021

Age (years)	icddr,b service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	6,136	2,852	3,284	5,623	2,804	2,819
0-4	849	434	415	772	422	350
5-9	504	249	255	428	191	237
10-14	382	186	196	308	161	147
15-19	855	154	701	765	169	596
20-24	865	260	605	745	243	502
25-29	672	327	345	607	299	308
30-34	596	322	274	620	399	221
35-39	415	265	150	382	268	114
40-44	280	203	77	284	204	80
45-49	203	146	57	173	123	50
50-54	170	114	56	158	103	55
55-59	139	81	58	141	98	43
60-64	94	61	33	109	66	43
65+	112	50	62	131	58	73

Appendix A-10 Out-migrations by age, sex and area, 2021

Age (years)	icddr,b service area			Government service area		
	Both sexes	Male	Female	Both sexes	Male	Female
All ages	7,441	3,742	3,699	7,080	3,806	3,274
0-4	904	463	441	729	381	348
5-9	598	317	281	562	299	263
10-14	508	282	226	467	264	203
15-19	1,245	492	753	1,170	496	674
20-24	1389	634	755	1307	667	640
25-29	798	366	432	787	396	391
30-34	613	362	251	618	386	232
35-39	433	283	150	447	314	133
40-44	285	193	92	313	242	71
45-49	183	114	69	168	123	45
50-54	131	80	51	142	102	40
55-59	110	66	44	109	58	51
60-64	75	32	43	79	32	47
65+	169	58	111	182	46	136

Appendix A-11 Male out-migration by cause of movement and age, 2021

Cause of movement	Age (years)														
	Total	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
All migrants	7548	844	616	546	988	1301	762	748	597	435	237	182	124	64	104
Work/economic/educational															
Acquired/seeking job/set up new business	4213	0	2	78	617	1,020	631	622	479	340	179	128	81	23	13
Job completion/retirement	14	0	0	0	0	1	1	2	4	1	0	2	2	1	0
To acquire education/student lodging	777	12	163	199	193	177	25	5	3	0	0	0	0	0	0
Education completed/interrupted	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Housing/environmental															
Acquired/seeking new land/house	370	7	5	1	10	25	44	56	62	45	26	30	17	20	22
River erosion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marriage/familial															
Marriage	2	0	0	0	1	0	0	0	0	0	0	1	0	0	0
Separation/divorce/widow	6	0	0	0	0	0	0	0	2	2	0	0	0	0	2
Move or join with spouse/parents	1896	817	436	260	155	57	36	32	23	17	9	7	12	9	26
Move or join with other relatives	8	1	3	1	1	0	1	0	0	0	0	0	0	0	1
Adoption	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	87	1	0	2	3	10	15	15	6	12	9	5	2	5	2
Health or old age care	11	0	0	0	0	1	0	0	1	1	0	1	1	0	6
Legal problems	51	0	0	0	1	4	5	6	10	7	9	6	2	0	1
Corona Pandemic															
Due to COVID-19	6	0	0	0	0	4	0	0	0	1	1	0	0	0	0
Other and not stated															
Others n.e.c.*	100	2	7	5	6	2	4	10	7	8	4	2	7	6	30
Unknown or not stated	2	0	0	0	0	0	0	0	0	1	0	0	0	0	1

*n.e.c.=Not elsewhere classified

Appendix A-12 Female out-migration by cause of movement and age, 2021

Cause of movement	Age (years)														
	Total	< 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
All migrants	6973	789	544	429	1427	1395	823	483	283	163	114	91	95	90	247
Work/economic/educational															
Acquired/seeking job/set up new business	318	0	0	5	33	67	77	61	37	19	6	5	2	5	1
Job completion/retirement	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0
To acquire education/student lodging	389	7	89	82	101	81	13	9	4	1	2	0	0	0	0
Education completed/interrupted	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Housing/environmental															
Acquired/seeking new land/house	1040	1	3	10	140	256	220	146	80	47	33	27	24	16	37
River erosion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marriage/familial															
Marriage	1288	0	0	55	674	402	98	32	14	10	2	0	0	1	0
Separation/divorce/widow	45	0	0	0	10	9	8	4	3	1	1	0	3	2	4
Move or join with spouse/parents	3250	771	444	268	376	429	320	198	115	68	59	42	40	46	74
Move or join with other relatives	21	2	3	3	2	2	1	0	0	0	0	1	0	0	7
Adoption	8	5	1	0	0	0	1	0	1	0	0	0	0	0	0
Family friction/breakdown	250	1	0	3	50	84	51	25	13	7	2	1	4	5	4
Health or old age care	47	0	0	0	1	1	0	0	0	0	0	1	4	3	37
Legal problems	20	0	0	0	0	1	0	0	4	3	4	7	1	0	0
Corona Pandemic															
Due to COVID-19	10	0	2	1	1	3	0	1	1	1	0	0	0	0	0
Other and not stated															
Others n.e.c*	284	2	2	2	39	60	34	7	11	4	5	7	17	12	82
Unknown or not stated	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1

*n.e.c=Not elsewhere classified

Appendix A-13 Male in-migration by cause of movement and age, 2021

Cause of movement	Total	Age (years)													
		< 5	5- 9	10- 14	15- 19	20- 24	25- 29	30- 34	35- 39	40- 44	45- 49	50- 54	55- 59	60- 64	65 +
All migrants	5656	856	440	347	323	503	626	721	533	407	269	217	179	127	108
Work/economic/ educational															
Acquired/seeking job/set up new business	838	0	0	7	39	95	147	171	136	90	63	43	25	10	12
Job completion/retirement	612	0	0	0	7	29	73	111	89	90	60	47	53	38	15
To acquire education/student lodging	176	9	53	64	30	17	3	0	0	0	0	0	0	0	0
Education completed/interrupted	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Housing/environmental															
Acquired/seeking new land/house	1281	0	0	9	45	162	217	258	172	123	77	71	51	56	40
River erosion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marriage/familial															
Marriage	5	0	0	0	0	3	0	2	0	0	0	0	0	0	0
Separation/divorce/widow	2	0	0	0	0	0	0	1	0	0	0	1	0	0	0
Move or join with spouse/parents	1748	831	382	220	103	67	35	37	22	17	7	4	6	1	16
Move or join with other relatives	7	2	1	0	1	0	0	0	0	1	1	0	0	1	0
Adoption	12	9	2	1	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	45	1	0	1	4	4	9	7	9	3	1	0	3	0	3
Health or old age care	36	0	0	0	0	0	2	2	2	3	5	7	5	2	8
Legal problems	87	0	0	0	0	6	10	16	23	14	4	10	3	1	0
Corona Pandemic															
Due to COVID-19	472	0	0	18	40	74	87	84	62	39	31	15	14	5	3
Other and not stated															
Others n.e.c*	333	4	2	27	54	45	43	32	18	26	20	19	19	13	11
Unknown or not stated	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0

*n.e.c=Not elsewhere classified

Appendix A-14 Female in-migration by cause of movement and age, 2021

Cause of movement	Total	Age (years)													
		< 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
All migrants	6103	765	492	343	1297	1107	653	495	264	157	107	111	101	76	135
Work/economic/educational															
Acquired/seeking job/set up new business	119	0	0	1	6	18	23	21	18	11	8	6	6	0	1
Job completion/retirement	16	0	0	0	0	1	4	2	3	2	1	2	0	1	0
To acquire education/student lodging	186	9	58	62	42	9	4	2	0	0	0	0	0	0	0
Education completed/interrupted	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Housing/environmental															
Acquired/seeking new land/house	1050	0	0	4	174	222	182	166	78	50	33	34	38	32	37
River erosion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marriage/familial															
Marriage	939	0	0	25	589	230	41	26	10	11	1	1	3	1	1
Separation/divorce/widow	77	0	0	1	22	15	16	9	5	4	2	2	0	1	0
Move or join with spouse/parents	3095	729	423	232	360	430	306	212	117	68	51	53	45	28	41
Move or join with other relatives	7	2	1	0	0	0	1	0	2	0	0	0	0	0	1
Adoption	24	18	4	2	0	0	0	0	0	0	0	0	0	0	0
Family friction/breakdown	181	1	2	5	33	65	25	24	11	2	2	4	2	1	4
Health or old age care	33	0	0	0	1	2	4	3	2	1	2	1	0	1	16
Legal problems	5	0	0	0	0	1	2	0	0	0	0	1	0	1	0
Corona Pandemic															
Due to COVID-19	59	0	0	2	9	18	2	7	7	6	2	1	1	2	2
Other and not stated															
Others n.e.c.*	312	6	4	9	61	96	43	23	11	2	5	6	6	8	32
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 Male migration by destination or origin, 2021

Destination/ Origin	Rural/ Urban	Out-migration						In-migration					
		Age (years)						Age (years)					
		0- 14	15- 24	25- 34	35- 44	45 +	Tot al	0- 14	15- 24	25- 34	35- 44	45 +	Tot al
Barisal	Rural	12	7	6	4	3	32	17	1	10	4	1	33
	Urban	11	5	8	1	1	26	4	1	4	2	0	11
Chittagong	Rural	721	145	129	126	103	1224	681	124	146	130	88	1169
	Urban	282	215	129	76	80	782	183	101	130	93	86	593
Dhaka	Rural	17	5	5	1	3	31	22	4	7	6	3	42
	Urban	898	1,188	556	331	371	3344	684	506	566	308	381	2445
Khulna	Rural	2	0	1	0	0	3	3	2	4	1	2	12
	Urban	3	6	3	0	0	12	2	2	1	0	0	5
Mymensingh	Rural	3	0	2	1	0	6	3	1	2	0	0	6
	Urban	8	7	4	3	0	22	2	0	5	0	0	7
Rajshahi	Rural	11	2	1	1	1	16	5	1	6	3	2	17
	Urban	2	7	3	1	0	13	1	1	3	2	1	8
Rangpur	Rural	3	1	1	1	1	7	7	1	7	0	0	15
	Urban	2	3	1	1	1	8	3	2	1	1	2	9
Sylhet	Rural	3	3	2	0	1	9	8	4	5	1	3	21
	Urban	7	16	5	4	5	37	7	5	6	4	9	31
India		1	2	1	3	3	10	0	2	2	0	0	4
Asia		1	61	93	62	18	235	2	17	119	89	68	295
Middle-east		14	609	544	401	113	1681	4	47	302	288	246	887
Others		5	7	16	15	6	49	2	3	21	7	8	41
Unknown		0	0	0	0	1	1	3	1	0	1	0	5
Total		2006	2289	1510	1032	711	7548	1643	826	1347	940	900	5656

Appendix A-16 Female migration by destination or origin, 2021

Destination/ Origin	Rural/ Urban	Out-migration						In-migration					
		Age (years)						Age (years)					
		0- 14	15- 24	25- 34	35- 44	45 +	Tot al	0- 14	15- 24	25- 34	35- 44	45 +	Tot al
Barisal	Rural	8	8	9	1	3	29	17	13	7	3	2	42
	Urban	5	7	7	0	0	19	6	5	4	1	0	16
Chittagong	Rural	688	1,400	485	128	142	2843	648	1,431	460	118	110	2767
	Urban	197	250	162	61	85	755	180	207	126	59	75	647
Dhaka	Rural	23	59	15	3	9	109	24	53	14	6	3	100
	Urban	769	1,017	568	230	369	2953	659	613	478	203	310	2263
Khulna	Rural	1	2	1	0	2	6	2	3	3	0	2	10
	Urban	7	7	2	0	0	16	3	3	3	0	1	10
Mymensingh	Rural	4	2	2	1	0	9	5	5	3	0	0	13
	Urban	4	4	5	1	0	14	3	4	2	0	1	10
Rajshahi	Rural	14	3	5	3	1	26	10	8	6	0	1	25
	Urban	3	4	1	1	1	10	2	6	3	3	0	14
Rangpur	Rural	3	4	2	1	0	10	3	7	2	1	0	13
	Urban	1	4	1	0	0	6	8	2	5	0	1	16
Sylhet	Rural	6	11	6	0	2	25	10	13	8	1	4	36
	Urban	11	14	9	2	9	45	13	12	6	5	8	44
India		0	1	1	1	3	6	1	0	0	0	1	2
Asia		1	1	1	2	0	5	2	6	3	2	2	15
Middle-east		11	22	19	7	4	63	4	10	12	15	8	49
Others		5	2	5	4	5	21	0	1	2	3	0	6
Unknown		1	0	0	0	2	3	0	2	1	1	1	5
Total		1762	2822	1306	446	637	6973	1600	2404	1148	421	530	6103

Appendix B. Population, Births, and Deaths by village, 2021

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
Cluster-1						
A00	Uddamdi	3,498	84	30	24.0	8.6
D00	Charmukundi	3,402	66	28	19.4	8.2
V01	Kadamtali	387	8	4	20.7	10.3
V02	Nilokhi	449	4	1	8.9	2.2
V03	Char Nilokhi	592	13	9	22.0	15.2
V04	Char Pathalia	387	4	5	10.3	12.9
V10	Dhakirgaon	2,597	56	19	21.6	7.3
V11	Nabakalash	3,445	82	11	23.8	3.2
V13	Baburpara	817	19	5	23.3	6.1
V31	Dighaldi	11,158	230	104	20.6	9.3
V32	Mobarakdi	4,057	83	36	20.5	8.9
V60	Suvankordi	1,032	27	9	26.2	8.7
V61	Munsubdi	822	23	12	28.0	14.6
V62	Shilmondi	1,091	14	11	12.8	10.1
V72	Upadi	6,874	155	56	22.5	8.1
W00	Kaladi	10,111	170	56	16.8	5.5
Cluster-1 Total		50719	1038	396	20.5	7.8
Cluster-2						
F00	Sepoykandi	1,670	24	14	14.4	8.4
H00	Lamchari	1,220	23	9	18.9	7.4
V12	Bhangerpar	975	20	6	20.5	6.2
V14	Enayet Nagar	613	12	11	19.6	17.9
V15	Bhati Rasulpur	966	13	11	13.5	11.4
V16	Binandapur	937	15	11	16.0	11.7
V19	Lakshmipur	2,847	57	25	20.0	8.8
V20	Dagorpur	1,667	36	21	21.6	12.6
V21	Khadergaon	532	11	7	20.7	13.2
V22	Beloti	624	13	8	20.8	12.8
V23	Baluchar	675	14	7	20.7	10.4
V24	Machuakhal	3,234	79	35	24.4	10.8
V26	Narayanpur	4,428	88	34	19.9	7.7
V56	Pailpara	1,827	41	25	22.4	13.7
V59	Doshpara	2,802	73	17	26.1	6.1
V82	Dhanarpar	1,973	43	12	21.8	6.1
V83	Padmapal	655	15	5	22.9	7.6
V85	Bhanurpara	598	14	10	23.4	16.7
V87	Hurmaisha	749	20	5	26.7	6.7
U00	Baishpur	9,948	202	82	20.3	8.2
VBB	Nagda	5,319	142	57	26.7	10.7
VBC	Naogaon	5,345	134	53	25.1	9.9
Cluster-2 Total		49604	1089	465	22.0	9.4
Cluster-3						
DX0	Barogaon	3,702	71	29	19.2	7.8
DX1	Naoujan	1,504	18	15	12.0	10.0
K00	Shahpur	1,070	26	14	24.3	13.1
L00	Tatkhana	604	14	4	23.2	6.6
M00	Char Nayergaon	184	3	2	16.3	10.9
N00	Aswinpur	2,456	51	19	20.8	7.7
O00	Nayergaon	2,498	57	13	22.8	5.2
P00	Titerkandi	2,088	32	18	15.3	8.6
Q00	Char Shibpur	238	4	2	16.8	8.4
V27	Panchghoria	1,110	14	12	12.6	10.8
V28	Khidirpur	1,770	42	11	23.7	6.2
V30	Harion	688	18	4	26.2	5.8
V39	Gobindapur	271	1	4	3.7	14.8

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
V40	Masunda	878	17	9	19.4	10.3
V41	Paton	2,303	46	15	20.0	6.5
V42	Adhara (North)	747	18	8	24.1	10.7
V43	Kanachak	1,202	18	10	15.0	8.3
V44	Panchdona	649	13	2	20.0	3.1
V45	Bakchar	1,211	26	9	21.5	7.4
V46	Silinda	436	14	4	32.1	9.2
V47	Tulatali	1,856	32	12	17.2	6.5
V48	Gangkanda	500	9	4	18.0	8.0
V49	Harina					
V49	Bhabanipur	1,354	31	9	22.9	6.6
V57	Baluchar	989	25	8	25.3	8.1
V64	Kawadi	5,195	98	47	18.9	9.0
V68	Sobahan	1,077	20	6	18.6	5.6
V71	Khamarpara	541	13	7	24.0	12.9
V73	Sadhardia	833	12	9	14.4	10.8
V74	Ketundi	1,419	33	11	23.3	7.8
V75	Mukundi	327	4	3	12.2	9.2
V76	Chosoi	1,819	41	21	22.5	11.5
V78	Soladana	285	5	3	17.5	10.5
V79	Pitambordi	414	8	5	19.3	12.1
V80	Daribond	1,423	28	16	19.7	11.2
V86	Adhara (South)	1,182	28	10	23.7	8.5
V88	Datikara	629	10	1	15.9	1.6
V90	Narinda	1,280	26	10	20.3	7.8
VBA	Meharan	1,978	33	21	16.7	10.6
Cluster-3 Total		48710	959	407	19.7	8.4
Cluster-4						
D28	Bazarkhola	1,039	22	7	21.2	6.7
D29	Kirtonkhola	203	2	1	9.9	4.9
D30	Banuakandi	769	16	8	20.8	10.4
D31	Harina Bazarkhola	1,070	20	16	18.7	15.0
D32	Khalisha	838	14	12	16.7	14.3
D33	Nayanagar	1,026	16	6	15.6	5.8
D34	Saidkharkandi	1,440	23	12	16.0	8.3
D35	Mollakandi	502	6	7	12.0	13.9
G00	Thatalia	3,487	72	32	20.6	9.2
R00	Nandalalpur	1,612	39	11	24.2	6.8
S00	Tatua	1,037	24	10	23.1	9.6
T00	Amuakanda	1,826	46	14	25.2	7.7
V07	Nayakandi	320	4	4	12.5	12.5
V08	Goalbhar	1,324	24	6	18.1	4.5
V17	Hatighata	1,045	18	8	17.2	7.7
V18	Torkey	4,106	80	43	19.5	10.5
V25	Char pathalia	1,359	23	11	16.9	8.1
V29	Shibpur (South)	546	7	7	12.8	12.8
V33	Shibpur (North)	548	6	6	10.9	10.9
V34	Satparia	919	19	6	20.7	6.5
V35	Durgapur	3,616	56	30	15.5	8.3
V36	Ludhua	5,666	84	54	14.8	9.5
V38	Galimkha	1,555	30	12	19.3	7.7
V52	Nayakandi	234	8	2	34.2	8.5
V54	Balairkandi	618	10	6	16.2	9.7
V55	Induria	541	9	9	16.6	16.6
V63	Islamabad(east)	2,081	36	26	17.3	12.5
V65	Nayachar	819	18	5	22.0	6.1
V66	Thatalia	720	13	6	18.1	8.3
V67	Majlishpur	633	15	6	23.7	9.5
V81	Sonaterkandi	682	12	5	17.6	7.3

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
V84	Shahabajkandi	2,350	29	29	12.3	12.3
V89	Islamabad(Middle)	1,589	24	12	15.1	7.6
V97	Dhonagoda	327	6	2	18.3	6.1
V98	Santoshpur	99	1	2	10.1	20.2
V99	Baluakandi	546	7	5	12.8	9.2
VB1	Taltoli	974	24	9	24.6	9.2
VB2	Sree rayerchar	1,273	15	10	11.8	7.9
VB3	Rayerkandi	2,990	53	27	17.7	9.0
Cluster-4						
Total		52329	931	484	18.0	9.2
cluster-5						
Village code	village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
B00	Charmasua	2027	39	15	19.2	7.4
C00	Sarderkandi	4540	97	45	21.4	9.9
D88	Sankibanga	1514	31	10	20.5	6.6
D89	Namapara	995	17	6	17.1	6.0
D90	Zahirabad	858	13	7	15.2	8.2
D93	Maizkandi	1421	19	16	13.4	11.3
D94	Hazipur	1828	36	19	19.7	10.4
D95	Tapaderpara	635	8	6	12.6	9.4
D96	Sakharipara	1333	18	12	13.5	9.0
D97	Nayakandi	780	19	8	24.4	10.3
D98	Bara Haldia	3562	73	28	20.5	7.9
D99	Mandertali	2,287	46	23	20.1	10.1
J00	Char Harigope	971	18	11	18.5	11.3
V05	Gazipur	3,502	50	34	14.3	9.7
V06	Fatepur	2,720	53	22	19.5	8.1
V09	Naburkandi	1,314	24	13	18.3	9.9
V50	Bakharpur	56	3	0	53.6	0.0
V51	Induriakandi	863	10	11	11.6	12.7
V53	Choto Haldia	2983	63	35	21.1	11.7
V95	Baluchar	2653	65	23	24.5	8.7
V96	North Rampur	531	7	6	13.2	11.3
VB0	South Rampur	3855	102	30	26.5	7.8
VB4	Ramdaspur	3908	60	34	15.4	8.7
VB5	Thakurpara	881	19	12	21.6	13.6
VB6	Sarkerpara	557	7	4	12.6	7.2
VB7	Mirpur	334	11	1	32.9	3.0
VB8	Farazikandi	1284	25	19	19.5	14.8
Cluster-5						
Total		48192	933	450	19.4	9.3
Grand Total		249554	4950	2202	19.8	8.8

Village code	Village name	Population (mid-year)	Live births	Deaths	Birth rate	Death rate
D91**	North Joypur	-	-	-	-	-
D92**	West Joypur	-	-	-	-	-
V37**	Charputia	-	-	-	-	-
V58**	Mohishmari	-	-	-	-	-
V69**	Naobangha	-	-	-	-	-
V70**	South Joypur	-	-	-	-	-
VB9**	Ramanathgonj	-	-	-	-	-
*Division by cluster applies						
**Lost due to river erosion in 1987						

Appendix C. Life table equations

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

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

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

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

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

$$L_1 = 0.410 l_1 + 0.590 l_2$$

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

$${}_nL_x = \frac{{}_n d_x}{{}_n m_x}, \text{ for } 5 \leq x \leq 84$$

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

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

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. Geographic Information System (GIS)

GIS has been a very important and powerful tool in any field 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 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 close to each other, the *bari* locations can be used as a proxy for household locations in it. Table 10.1 shows the different object-oriented structural layers that Matlab HDSS created for spatial analysis.

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

	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 E. Health interventions in icddr,b service area
(both general provision and as part of research studies)**

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				X	
1998					X
2000			X		
2001		X			
2000	Fixed Site Clinics for delivering MCH-FP services			X	X
2001		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 to infant	X	X	X	X
2008	Rota Rix vaccine trial to infant	X	X	X	X
2009	Haemophilus 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		

Appendix E.
(Contd...)

Date	Activity	Blocks			
		A	B	C	D
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
Date	Activity	Blocks			
		A	B	C	D
October 2017	HEV	X	X	X	X
September 2018	WHO Polio	X	X	X	X
March 2018	KOICA vaccine study conducted in Block-F and G of Government service area				
September 2020	nOPV2 study: A phase II clinical trial of novel OPV in newborn (0- 3 days)	X	X	X	X
February 2021	TB vaccine study: A phase II / III randomized controlled trial of VPM 1002 in prevention of pulmonary TB recurrence	X	X	X	X
March 2021	HPV study: Bivalent HPV vaccine (Cecolin) trial (compared to Gardasil) in 9-14 years girls	X	X	X	X
April 2021	Globvac study: A phase IV effectiveness trial of influenza vaccine in protection of pregnant women and children in rural Bangladesh	X	X	X	X
September 2021	RSV009 vaccine study: A phase III trial of un adjuvant RSV vaccine in pregnant women and infant born to vaccinated mother	X	X	X	X

Appendix F. Staff of HDSS-Matlab, 2021

Dr. Syed Manzoor Ahmed Hanifi
Head, Population Science & Initiative for Climate Change and Health,
Health Systems and Population Studies Division (HSPSD)

Matlab staff

Field Supervisory Team

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

Data Management

Monowara Begum, DMO
Meherun Nessa, DMA

Administration

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

NOTE: 30 Community Health Research Workers (CHRWs) are collecting routine HDSS data.

Dhaka staff

Research

Md. Moinuddin Haider, Assistant Scientist
Md. Mehedi Hasan, Research Officer

Administration

Kiron Chandra Bala, Admin. Assistant
Md. Saidul Islam, Doc. Scan. Assistant

Programming & Data Management

Sayed Saidul Alam, Sr. Programmer
Samiran Barua, Data Manager

Geographic Information System

Muhammad Zahirul Haq, DMS-GIS



icddr,b