

CHAKARIA HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM REPORT - 2018

Focusing on Health and Climate Change



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LIST OF ABBREVIATIONS

AIDS	Acquired immunodeficiency syndrome
ANC	Antenatal care
CI	Concentration Index
CMH	Christian Memorial Hospital
CSBA	Community Skilled Birth Attendant
EPR	Employment to population ratio
FDSR	Family Development Services and Research
FWV	Family Welfare Visitor
GAC	Global Affairs Canada
GIS	Geographic Information System
HIV	Human immunodeficiency virus
HDSS	Health and Demographic Surveillance System
INDEPTH	International Network of field sites with continuous Demographic Evaluation of Population and Their Health in developing countries
MDG	Millennium Development Goals
NGO	Non-government Organization
PNC	Postnatal care
SACMO	Sub-Assistant Community Medical Officer
SBA	Skilled Birth Attendant
SDG	Sustainable Development Goals
Sida	Swedish International Development Cooperation
SMAM	Singulate mean age at marriage
SW	Surveillance Worker
TBA	Traditional Birth Attendant
TFR	Total Fertility Rate
UHFWC	Union Health and Family Welfare Centre
UK Aid	Foreign, Commonwealth and Development Office, UK
VHP	Village health post
WHO	World Health Organization

Introduction

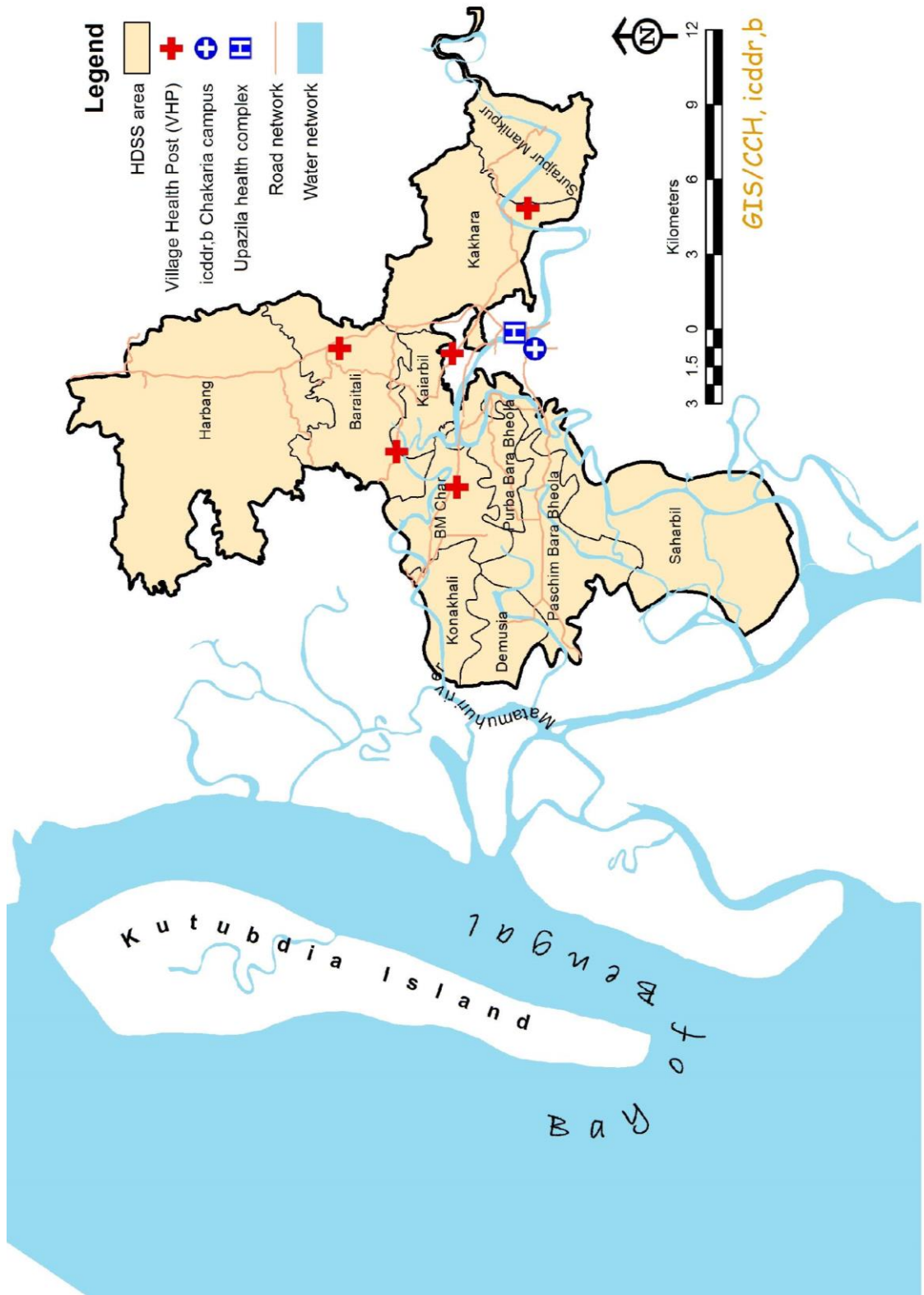
Chakaria is one of the 492 *Upazilas* (sub-district) in Bangladesh. It is located between latitudes 21°34' and 21°55' North and longitudes 91°54' and 92°13' East in the southeastern coast of the Bay of Bengal. Administratively, it is under Cox's Bazar district with an estimated population of 5,36,712 in 2018. The highway from Chattogram to Cox's Bazar passes through Chakaria. The east side of Chakaria is hilly, while on the west side towards the Bay of Bengal is lowland. A map showing the location of Chakaria HDSS area is presented in Figure 1.

icddr,b started its activities in Chakaria in 1994. The focus of the activities has been to facilitate local initiatives for the improvement of health of the villagers in general and of children, women, and the poor in particular. Thus, the activities of the project have been participatory with emphasis on empowering the people by raising awareness about health, inducing positive preventive behavior through health education, and providing technical assistance to any health initiatives taken by the village-based indigenous self-help organizations. Some major initiatives taken by the villagers included assessment of health needs, defining actions for health, implementing them, and monitoring their implementation and outputs. Among the health-related activities, identification of volunteers for health education, mobilizing local resources for the establishment of village health posts and their management, introduction of a pre-paid family health card, and establishment of health cooperatives have been the major ones. Details of the activities of the project and the outcomes have been reported elsewhere (1, 2). Health services that are currently available in surveillance area are presented in the box below. Collection of data from households on a quarterly basis, referred hitherto as Chakaria Health and Demographic Surveillance System (Chakaria HDSS), has been initiated in this area since 1999. The primary purpose of this surveillance system is to monitor the impact of interventions with equity focus and generate relevant health, demographic and socioeconomic information for policies and programmes, and further research. Also, Chakaria HDSS monitors 23 SDG indicators using its longitudinal data. This report presents data collected through the Chakaria HDSS during 2018.

Existing health services in Chakaria HDSS area, 2018

Healthcare facility/provider	Number
icddr,b facilitated and Community initiated	
Village health post	5
Trained midwife	12
Qualified physician	1
Male paramedic	10
Medical assistant	2
Government	
Union Health and Family Welfare Centre (UHFWC)	11
EPI outreach centre	264
Qualified physician	0
Family Welfare Visitor (FWV)	5
Sub-Assistant Community Medical Officer (SACMO)/Medical assistant	4
Family Welfare Assistant (Community skilled birth attendant)	18
Community Clinics	24
Community Healthcare Provider	24
Private	
Village doctor (allopathic)	241
Village doctor (homeopathic)	102
Allopathic pharmacy	177
Homeopathic pharmacy	15
Diagnostic centre	4
NGO	
Health and development activities	5
Paramedic	4
Health worker	30
Outdoor Hospital (Christian Memorial & Hope Foundation)	2

Figure 1. Map of Chakaria HDSS area



Methods and Materials

The Chakaria HDSS covers 11 unions, namely Baraitali, Kaiarbil, Bheola Manik Char, Paschim Bara Bheola, Saharbil, Kakara, Harbang, Purba Bara Bheola, Surajpur Manikpur, Konakhali, and Demoshia. In 1999, 1,66,405 people were living in 26,979 households. A household is defined as blood or otherwise related group of members and unrelated individuals living in the same compound at least once a month and sharing the food from the same kitchen. A household member is considered to have migrated out if they have left the household and do not intend to come back within six months since they left. A person is considered to have migrated in if they were not previously included in the list of household members and intend to live in the household for at least once a month for the next six months.

Although Chakaria HDSS started in 1999, covering 183 villages of 166,405 individuals living in 26,979 households, data collection was interrupted during 2001–03. Since 2004, quarterly data collection has resumed, and data have been systematically collected from 7,042 households, randomly chosen from the total of 26,979 households. Data have been collected through quarterly visits by a team of surveillance workers (SWs) with supervision from a team of two supervisors. On a typical day, prior to 2011 a SW would come to the office and take a list of households assigned by the supervisors, travel to respondents' households, update the events and return the collected data sheets to the office. Using this system, data collection and data management required a significant amount of time and money, involving daily travel to the households by SWs. The above system of data collection was modified in 2011. The modification involved choosing 49 villages randomly from a total of 183. The 49 villages have been divided into 14 work areas and 14 SWs were recruited from the 14 work areas where they reside. Most of the households included in the system prior to this modification were also included in the new system. The modification of the system has resulted in the SWs visiting almost double the number of households in comparison with the previous system, saving time spent on travel in the earlier system. In addition, the modification allowed the possibility of estimating migration as the system includes complete villages (3). Currently, surveillance covers 85,905 individuals (16,772 households). From the beginning of 2015, the data collection process was shifted from paper-based to web-based system. A web-based software application has been designed and developed. Fourteen tabs (Smartphones) have been connected with mobile internet through mobile operator network. The SWs collect data using these devices and data are stored directly in the central database server.

One supervisor had been assigned to supervise the data-collection process. To detect any anomalies, a team of four independent re-interviewers re-visited 5% of the households, chosen randomly, within 2 days of data collection by the SWs. Afterwards, the supervisor and the relevant field workers together sorted out any inconsistencies in the collected data. All the filled-up questionnaires were manually checked for completeness and any

inconsistencies. Subsequently, computer-based data-editing procedures were applied to ensure the quality of data.

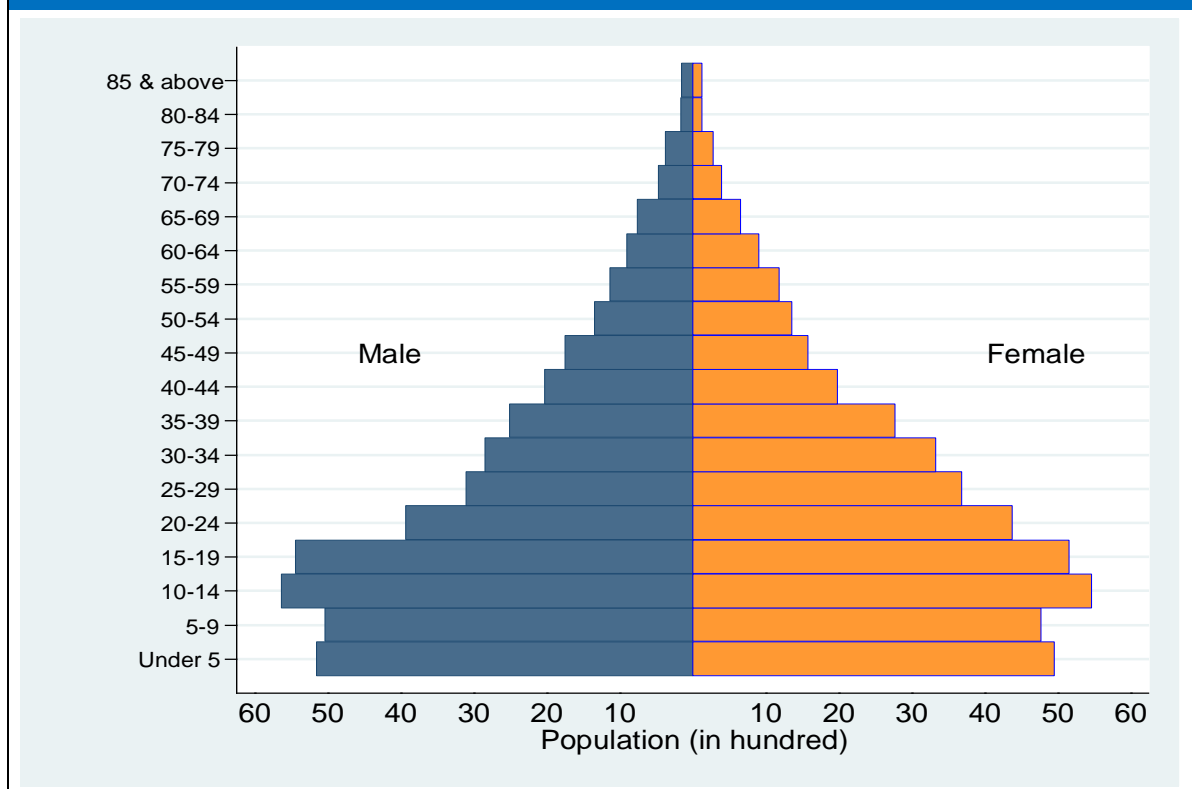
Asset quintiles based on ownership of various assets by any member of the households were used to examine differences in various demographic and health indicators. The asset list of the household is updated annually from the household head or their spouses. The list includes *almirah*, table/chair, *choki/khat*, television, cycle, motorcycle, fridge, sofa, electric fan, sewing machine, telephone, electricity, showcase, and watch/clock. The principal component analytical technique was used for calculating household asset index scores (4). The major demographic indicators and safe motherhood practices have been tabulated for the various asset quintiles.

It should be mentioned that the number of observations in the tables presented in this report differ in some instances due to missing information for some variables.

Population and Population Changes

The population pyramid based on the population of Chakaria HDSS area in 2018 is presented in Figure 2. The shape of the pyramid is typical of a developing country with declining rates of mortality and fertility. The sex ratio (male per 100 females) was 98.9 in 2018. The age dependency ratio¹ was 67.3 in 2018 (see Appendix A).

Figure 2. Male and female population by age, Chakaria HDSS, 2018



¹ The age dependency ratio represents the ratio of the combined child population (under 15) and aged population (65 and over) to the population of intermediate age (15 to 64).

CHAPTER 4

Mortality

Crude death rates and age-specific mortality rates by sex are presented in Table 1. The crude death rate was 5.9 per 1,000 population in 2018. Infant mortality rate was 40.6 per 1,000 live births. Child mortality rate was 3.1 per 1,000 children aged 1-4 years (Table 1).

Abridged Life Table for males and females are presented in Table 2. Life expectancy at birth was about 68 years for males and 70 years for females. Figure 3 shows the probability of survival by sex during various age groups. Up to the age of 55, the probability of survival remained almost the same for both males and females. After that till 85 years of age the survival probability of females increased. The rate of mortality of children aged less than 5 years (under-five mortality) was 52.3 per 1,000 live births in Chakaria HDSS in 2018 (Table 3).

Table 1. Age-specific death rate per 1,000 population by sex, Chakaria HDSS, 2018

Age (years)	No. of death			Death rate		
	Male	Female	Both	Male	Female	Both
<1*	47	40	87	43.8	37.4	40.6
<1 month	38	29	67	35.4	27.1	31.3
1-11 month	9	11	20	8.4	10.3	9.3
1-4	15	10	25	3.7	2.5	3.1
5-9	3	7	10	0.6	1.5	1.0
10-14	1	1	2	0.2	0.2	0.2
15-19	8	5	13	1.5	1.0	1.2
20-24	2	8	10	0.5	1.8	1.2
25-29	7	4	11	2.3	1.1	1.6
30-34	7	6	13	2.5	1.8	2.1
35-39	3	5	8	1.2	1.8	1.5
40-44	5	1	6	2.5	0.5	1.5
45-49	10	10	20	5.7	6.3	6.0
50-54	7	8	15	5.2	5.9	5.6
55-59	18	14	32	15.9	11.8	13.8
60-64	25	24	49	27.7	26.3	27.0
65-69	24	15	39	31.5	22.8	27.5
70-74	21	17	38	44.5	42.1	43.4
75-79	26	18	44	70.5	62.7	67.1
80-84	18	18	36	111.8	133.3	121.6
85+	26	22	48	166.7	158.3	162.7
All	273	233	506	6.4	5.4	5.9

*Per 1,000 live births

Table 2. Abridged Life Table, Chakaria HDSS, 2018

Age (years)	Male					Female				
	${}_n m_x$	${}_n q_x$	l_x	${}_n L_x$	e_x	${}_n m_x$	${}_n q_x$	l_x	${}_n L_x$	e_x
0	0.0436	0.0419	100,000	96,228	68.3	0.0389	0.0376	100,000	96,620	69.7
1	0.0037	0.0146	95,808	380,431	70.3	0.0025	0.0101	96,244	383,024	71.4
5	0.0006	0.0030	94,407	471,333	67.3	0.0015	0.0073	95,268	474,598	68.2
10	0.0002	0.0009	94,126	470,423	62.5	0.0002	0.0009	94,571	472,641	63.6
15	0.0015	0.0073	94,043	468,493	57.5	0.0010	0.0048	94,485	471,282	58.7
20	0.0005	0.0025	93,354	466,179	52.9	0.0018	0.0091	94,028	468,008	54.0
25	0.0023	0.0112	93,117	462,974	48.0	0.0011	0.0054	93,175	464,616	49.4
30	0.0025	0.0122	92,072	457,548	43.6	0.0018	0.0090	92,671	461,275	44.7
35	0.0012	0.0060	90,947	453,381	39.1	0.0018	0.0089	91,839	457,141	40.1
40	0.0025	0.0122	90,405	449,259	34.3	0.0005	0.0025	91,017	454,513	35.4
45	0.0057	0.0282	89,298	440,185	29.7	0.0063	0.0309	90,788	446,926	30.5
50	0.0052	0.0258	86,776	428,285	25.5	0.0059	0.0291	87,982	433,518	26.4
55	0.0159	0.0763	84,538	406,572	21.1	0.0118	0.0572	85,425	414,910	22.1
60	0.0277	0.1296	78,090	365,151	17.6	0.0263	0.1235	80,539	377,839	18.3
65	0.0315	0.1460	67,970	315,043	14.9	0.0228	0.1080	70,596	333,921	15.5
70	0.0445	0.2002	58,047	261,185	12.0	0.0421	0.1904	62,972	284,892	12.1
75	0.0705	0.2995	46,427	197,367	9.4	0.0627	0.2711	50,984	220,369	9.4
80	0.1118	0.4369	32,520	127,081	7.3	0.1333	0.5000	37,163	139,362	6.9
85+	0.1667	1.0000	18,312	109,874	6.0	0.1583	1.0000	18,582	117,402	6.3

The Abridged life table is constructed applying the Greville's method illustrated in "The Methods and Materials of Demography", edited by Jacob S. Siegel and David A. Swanson, Second edition; Elsevier Academic Press, 2004: 301-40.

${}_n m_x$ = Central mortality rate

${}_n q_x$ = Probability of dying between the ages x and x+n;

${}_n q_x = {}_n m_x / [(1/n) + {}_n m_x \{1/2 + n/12({}_n m_x - \log_e c)\}]$;
 $\log_e c = 0.095$

l_x = Survivors to exact age x = $(1 - {}_n q_{x-n}) l_{x-n}$

${}_n L_x$ = Numbers of years lived by the total of the cohort of 100,000 births in the interval;

$L_0 = 0.20l_0 + 0.80l_1$, $L_{85+} = l_{85+}/m_{85+}$

e_x = Life expectancy at age x = T_x / l_x where, $T_x = \sum L_y$

Figure 3. Probability of survival by age and sex, Chakaria HDSS, 2018

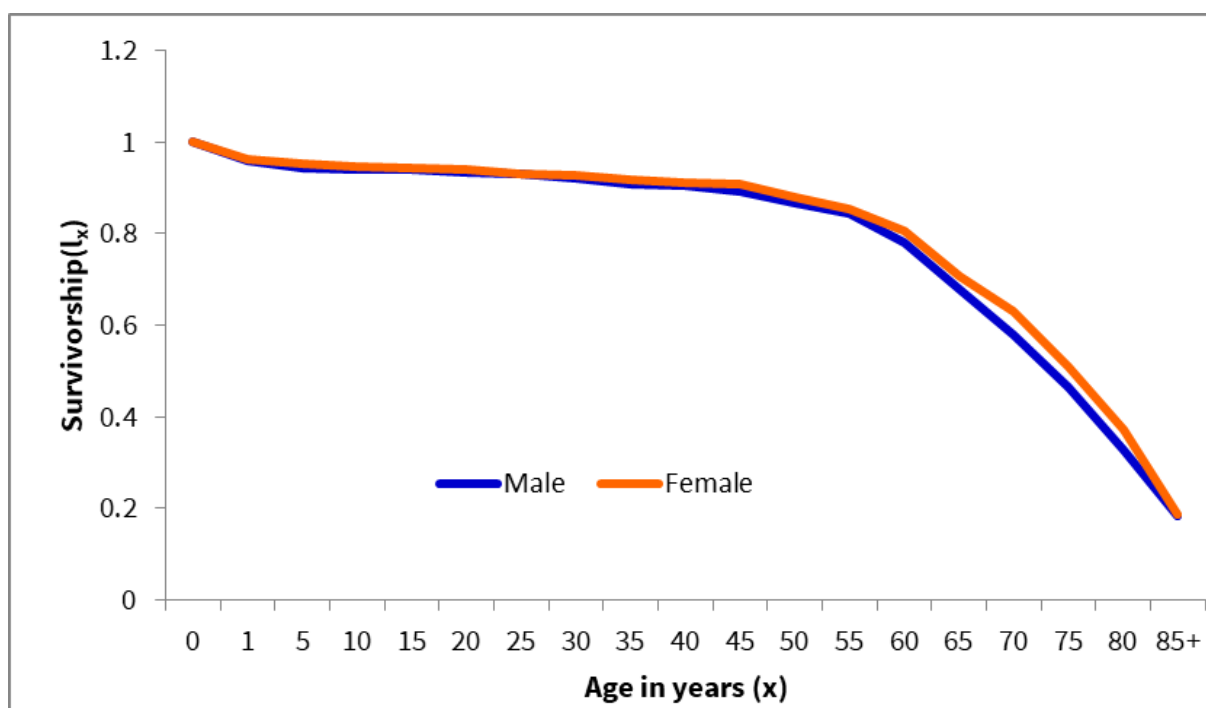
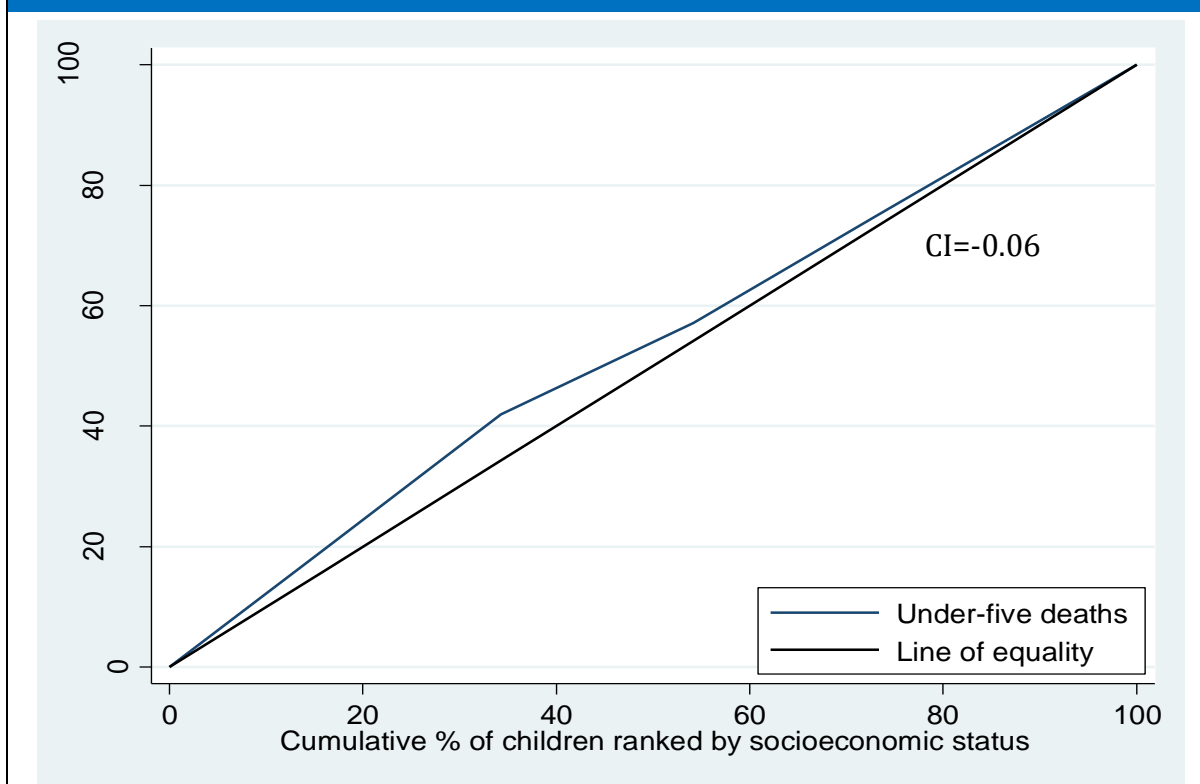


Table 3 presents under-five mortality rate by household asset quintile. Under-five mortality rate was the lowest in the middle asset quintile. The mortality rate of children from the lowest quintile was 1.3 times greater than that of the highest quintile. Under-five mortality rate was higher among the boys compared to the girls. The concentration curve for under-five mortality is presented in Figure 4. The curve lies above the line of equality and the concentration index for the area came out to be negative. These indicate that under-five deaths concentrated among the poorer segment of the population.

Table 3. Under-five mortality rate per 1,000 live births by asset quintile and sex, Chakaria HDSS, 2018

Asset quintile	No. of births			No. of under-five deaths			Under-five mortality rate		
	Boy	Girl	Both	Boy	Girl	Both	Boy	Girl	Both
Lowest	170	174	344	13	9	22	76.5	51.7	64.0
Second	191	199	390	9	16	25	47.1	80.4	64.1
Middle	216	210	426	8	9	17	37.0	42.9	39.9
Fourth	211	195	406	14	6	20	66.4	30.8	49.3
Highest	284	291	575	18	10	28	63.4	34.4	48.7
All	1,072	1,069	2,141	62	50	112	57.8	46.8	52.3

Figure 4. Concentration curve for under-five mortality, Chakaria HDSS, 2018



CI=Concentration Index²;

Causes of death

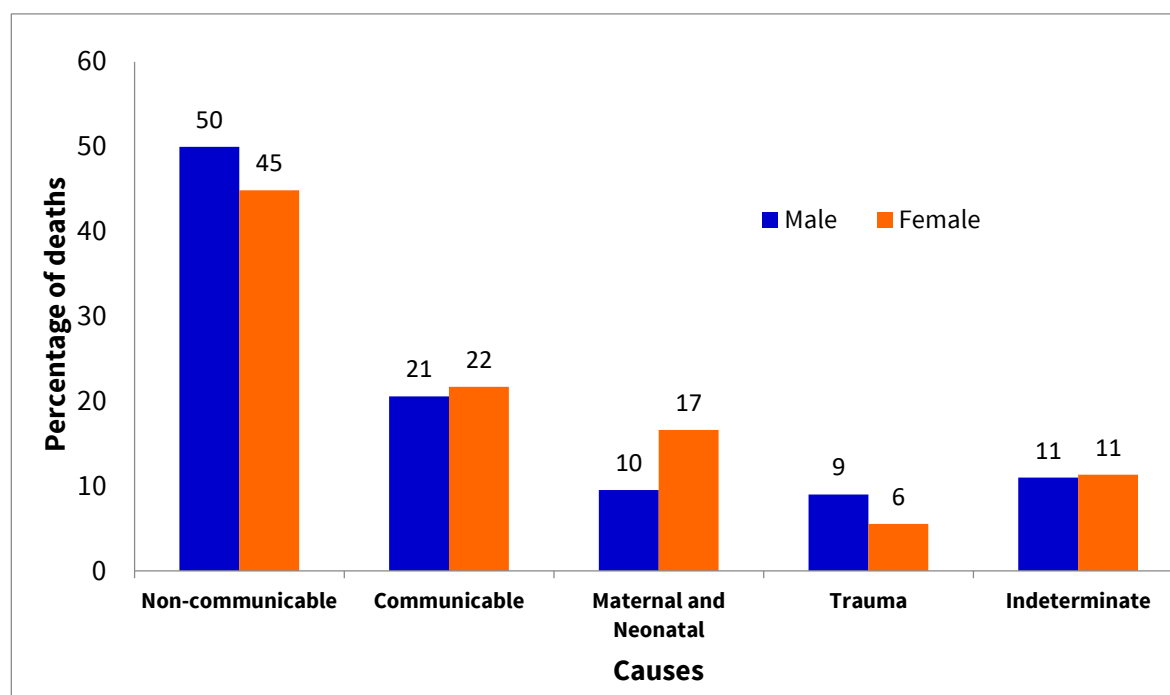
Verbal autopsy data on signs, symptoms and circumstances leading to death, and medical history of the deceased were collected during the quarterly household visits from an informed household member. A total of 506 deaths were registered in 2018. Data were analyzed using “InterVA-4.04” (5) to ascertain causes of death.

Broad pattern of cause of death

Non-communicable conditions (48%) were the leading cause of death for both men and women. This was followed by communicable diseases (21%), maternal and neonatal condition (13%), and trauma (7%). For communicable disease, the proportion of deaths was higher for males than for females (Figure 5). Neonatal conditions were the leading cause of death in children and non-communicable diseases were the leading cause of death for adults and elderly people (Table 4).

² Concentration Index (CI) is a measure of the socioeconomic inequality of health based upon information on the socioeconomic ranks and the health levels of all individuals in the population. A positive value of CI indicates that health is distributed in favour of the rich, and a negative one that it is distributed in favour of the poor (6). A value of zero indicates no relation between health and socioeconomic status (7).

**Figure 5. Distribution of deaths by causes for males and females,
Chakaria HDSS, 2018**



**Table 4. Distribution of deaths by causes according to age groups,
Chakaria HDSS, 2018**

Cause group	Children (<15 years) (%)	Adults (15-49 years) (%)	Elderly (50+ years) (%)
Communicable	7.4	46.1	64.6
Non-communicable	24.4	13.2	21.9
Maternal and neonatal	43.2	13.6	0.0
Trauma	15.0	14.7	2.3
Indeterminate	10.0	12.4	11.3
Total	100.0	100.0	100.0

Acute respiratory infection (including pneumonia), stroke, digestive neoplasms, chronic obstructive pulmonary disease, pulmonary tuberculosis and unspecified cardiac diseases were the leading six causes of death for all ages. Table 5 presents the distribution of cause of death for males and females.

Table 5. Distribution of causes of death among males and females, Chakaria HDSS, 2018

Causes	Male (n=273)	Female (n=233)	Both (n=506)
01.01 Sepsis (non-obstetric)	0.6	0.8	0.7
01.02 Acute respiratory infection, including pneumonia	8.8	12.2	10.4
01.03 HIV/AIDS related death	1.7	1.1	1.5
01.04 Diarrhoeal diseases	0.7	1.2	1.0
01.05 Malaria	0.0	0.0	0.0
01.06 Measles	0.0	0.2	0.1
01.07 Meningitis and encephalitis	2.3	1.1	1.8
01.09 Pulmonary tuberculosis	5.0	3.7	4.4
01.10 Pertussis	0.0	0.0	0.0
01.11 Haemorrhagic fever	0.0	0.0	0.0
01.99 Other and unspecified infectious diseases	1.2	1.5	1.3
02.01 Oral neoplasms	0.7	0.0	0.4
02.02 Digestive neoplasms	6.9	2.3	4.8
02.03 Respiratory neoplasms	3.6	0.6	2.2
02.04 Breast neoplasms	0.0	2.3	1.1
02.05 & 02.06 Reproductive neoplasms M, F	1.7	4.1	2.8
02.99 Other and unspecified neoplasms	4.7	3.5	4.1
03.01 Severe anaemia	0.0	0.2	0.1
03.02 Severe malnutrition	1.4	1.4	1.4
03.03 Diabetes mellitus	2.9	3.9	3.4
04.01 Acute cardiac disease	3.4	0.9	2.2
04.02 Stroke	9.6	8.4	9.1
04.03 Sickle cell with crisis	0.0	0.3	0.2
04.99 Other and unspecified cardiac diseases	4.3	4.5	4.4
05.01 Chronic obstructive pulmonary disease	6.3	2.3	4.5
05.02 Asthma	0.5	0.0	0.3
06.01 Acute abdomen	2.9	4.0	3.4
06.02 Liver cirrhosis	0.8	2.7	1.7
07.01 Renal failure	0.3	2.1	1.1
08.01 Epilepsy	0.0	1.4	0.7
09.01 Ectopic pregnancy	0.0	0.0	0.0
09.02 Abortion-related death	0.0	0.7	0.3
09.03 Pregnancy-induced hypertension	0.0	1.7	0.8
09.04 Obstetric haemorrhage	0.0	1.6	0.7
09.05 Obstructed labour	0.0	0.7	0.3
09.06 Pregnancy-related sepsis	0.0	0.0	0.0
09.99 Other and unspecified maternal causes of death	0.0	0.0	0.0

Table 5. (contd...)

Causes	Male (n=273)	Female (n=233)	Both (n=506)
10.01 Prematurity	2.3	2.5	2.4
10.02 Birth asphyxia	0.3	1.7	1.0
10.03 Neonatal pneumonia	3.6	2.5	3.1
10.04 Neonatal sepsis	0.6	1.2	0.9
10.06 Congenital malformation	0.4	0.9	0.6
10.99 Other and unspecified neonatal causes of death	2.4	3.1	2.7
12.01 Road traffic accident	2.7	0.6	1.7
12.02 Other transport accident	2.9	2.0	2.5
12.03 Accidental fall	0.0	0.4	0.2
12.04 Accidental drowning and submersion	2.2	1.7	2.0
12.05 Accidental exposure to smoke fire & flame	0.6	0.0	0.3
12.06 Contact with venomous plant/animal	0.0	0.0	0.0
12.07 Accidental poisoning & noxious substances	0.3	0.0	0.2
12.08 Intentional self-harm	0.0	0.9	0.4
12.09 Assault	0.4	0.0	0.2
12.10 Exposure to force of nature	0.0	0.0	0.0
12.99 Other and unspecified external causes of death	0.0	0.0	0.0
98 Other and unspecified non-communicable diseases	0.0	0.0	0.0
99 Indeterminate	11.0	11.3	11.1
All	100.0	100.0	100.0

CHAPTER 5

Fertility

The crude birth rate in 2018 was 24.9 per 1,000 population, which was lower than in 2017 (25.6 per 1,000 population) (Table 20). The fertility rate was highest among women of age-group of 20-24 years (Table 6). The total fertility rate (TFR) in 2018 was 2.8 per woman, which was slightly lower than in 2017 (2.9 per woman).

Table 6. Age-specific fertility rate per 1,000 women aged 15-49 years, Chakaria HDSS, 2018

Age (years)	No. of females	No. of births			Birth rate
		Male	Female	Both	
15-19	5,157	111	112	223	43.2
20-24	4,391	413	398	811	184.7
25-29	3,686	295	282	577	156.5
30-34	3,325	177	185	362	108.9
35-39	2,783	65	77	142	51.0
40-44	1,980	11	13	24	12.1
45-49	1,593	0	2	2	1.3
All	22,915	1,072	1,069	2,141	-
TFR (15-49)					2.8
TFR=Total fertility rate expressed per woman					

Table 7 presents the crude birth rate by household asset quintiles. The crude birth rate was the lowest among the lowest quintile.

Table 7. Crude birth rate per 1,000 population by asset quintile and sex of child, Chakaria HDSS, 2018

Asset quintile	Midyear population			No. of births			Birth rate		
	Male	Female	Both	Boy	Girl	Both	Boy	Girl	Both
Lowest	7,382	7,611	14,993	170	174	344	23.0	22.9	22.9
Second	8,178	8,199	16,377	191	199	390	23.4	24.3	23.8
Middle	9,259	9,114	18,373	216	210	426	23.3	23.0	23.2
Fourth	8,516	8,373	16,889	211	195	406	24.8	23.3	24.0
Highest	9,390	9,883	19,273	284	291	575	30.2	29.4	29.8
All	42,725	43,180	85,905	1,072	1,069	2,141	25.1	24.8	24.9

Of the 2,481 pregnancies in 2018, 85.3% ended with live birth. Among the remaining 14.7%, 9.6 percentage points were spontaneous abortion, 2.7 percentage points were induced abortion, and 2.5 percentage points resulted in stillbirths (Table 8).

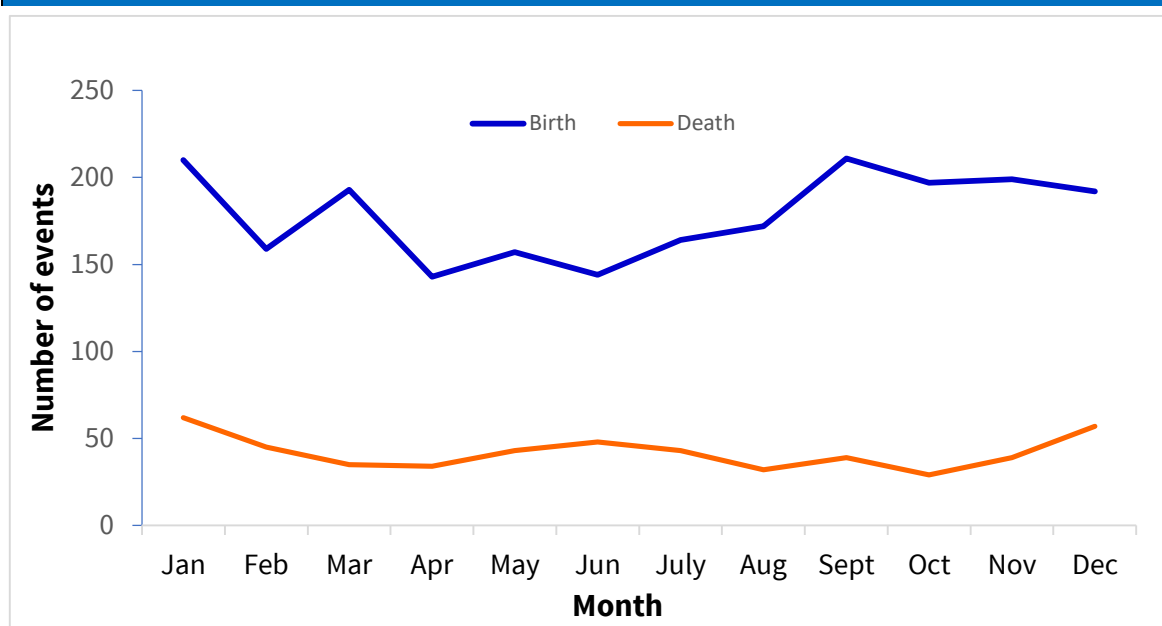
Table 8. Pregnancy outcome, Chakaria HDSS, 2018

Pregnancy outcome	Number	%
Spontaneous abortion	237	9.5
Induced abortion	67	2.7
Stillbirth	61	2.5
Live birth*	2,116	85.3
Total no. of pregnancies	2,481	100.0

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

Twenty-four (Two live births-23 and three live births-1) multiple live births were recorded.

Figure 6. Number of births and deaths by month, Chakaria HDSS, 2018



Distribution of births and deaths by month are shown in Figure 6. There is no apparent seasonality in the death pattern but in case of birth some seasonality was observed where a rise in birth rate was observed during the time period January and July to September.

CHAPTER 6

Migration

In 2018, the rate of out-migration was higher at 42.7 per 1,000 population than that of in-migration at 34.4 per 1,000 population (Table 9). The rates were higher for out-migration and same for in-migration in 2017 (Table 20). Monthly data on migration are presented in Table 10. Data showed that the number of in-migrants was lower than that of out-migrants during 2018. The sex differential in migration was prominent. The number of in-migration of males and females was highest in January. The out-migration number was highest among the males in January and among the females in December.

Table 9. Migration rate per 1,000 population by asset quintile and sex, Chakaria HDSS, 2018

Asset quintile	Midyear population			In-migration rate			Out-migration rate		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
Lowest	7,382	7,611	14,993	34.4	40.9	37.7	48.6	60.3	54.6
Second	8,178	8,199	16,377	27.5	36.6	32.1	31.3	47.9	39.6
Middle	9,259	9,114	18,373	20.4	39.3	29.8	31.1	43.2	37.1
Fourth	8,516	8,373	16,889	21.7	40.6	31.1	34.2	43.1	38.6
Highest	9,390	9,883	19,273	27.9	53.5	41.0	42.5	47.7	45.1
All	42,725	43,180	85,905	26.1	42.6	34.4	37.3	48.1	42.7

Table 10. Number of migrants by sex and month, Chakaria HDSS, 2018

Month	In-migration			Out-migration		
	Male	Female	Both	Male	Female	Both
January	204	247	451	193	182	375
February	86	129	215	137	186	323
March	87	147	234	124	173	297
April	83	162	245	129	155	284
May	65	134	199	144	188	332
June	85	127	212	80	131	211
July	81	149	230	119	151	270
August	101	163	264	127	184	311
September	69	144	213	117	179	296
October	84	140	224	122	163	285
November	73	122	195	143	186	329
December	97	174	271	158	200	358
All	1,115	1,838	2,953	1,593	2,078	3,671

Origin and destination of migrants

During 2018, 8.7% of 2,953 in-migrants moved into Chakaria HDSS households from outside of Bangladesh whereas 15.3% of 3,671 out-migrants moved out of Bangladesh from Chakaria HDSS area, and in both cases male migrants were dominant compared to the female migrants. The proportion of migrants that moved out of Bangladesh was higher than the proportion of migrants that moved into Bangladesh. Overall, the rates of movement of people to and from Chakaria were similar (Table 11).

Table 11. Origin and destination of migrants by sex, Chakaria HDSS, 2018

Origin or destination	In-migration			Out-migration		
	Male (%)	Female (%)	Both (%)	Male (%)	Female (%)	Both (%)
Inside Bangladesh	79.4	98.5	91.3	66.0	99.1	84.7
Outside Bangladesh	20.6	1.5	8.7	34.0	0.9	15.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total no. of migrants	1,115	1,838	2,953	1,593	2,078	3,671
Cox's Bazar District						
Inside Chakaria	76.4	79.3	78.5	80.0	81.7	81.2
Outside Chakaria	23.6	20.7	21.5	20.0	18.3	18.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total no. of migrants	593	1,402	1,995	921	1,852	2,773
Chakaria Upazila						
Inside HDSS area	60.9	65.5	64.2	54.5	61.2	59.2
Outside HDSS area	39.1	34.5	35.8	45.5	38.8	40.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total no. of migrants	453	1,112	1,565	466	1,117	1,583

Reasons for migration

Table 12 presents the reasons of migration by sex. 44.1% of the migrants moved out due to family-related issues - mostly marriage, followed by work (27.5%), housing (20.0%), and education (5.9%). Reasons for moving out for males were different from those of females. 41.4% of male in-migrants moved due to work related issues whereas only 12.9% of the females moved due to that reason. On the other hand, 65.2% of female in-migrants moved due to family related issues - mostly marriage, while 25.7% of males moved due to family related reasons (Table 12). The reasons of movement for out-migration were mostly similar to the reasons for in-migration.

Table 12. Reasons for migration, Chakaria HDSS, 2018						
Reasons for migration	In-migration			Out-migration		
	Male (%)	Female (%)	Both (%)	Male (%)	Female (%)	Both (%)
Family-related	25.7	65.2	50.3	20.5	62.2	44.1
Work-related	41.4	12.9	23.6	48.8	11.2	27.5
Housing-related	24.9	16.5	19.7	22.8	17.9	20.0
Education	5.9	3.3	4.3	5.8	6.0	5.9
Other	2.2	2.1	2.1	2.1	2.7	2.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total no. of migrants	1,115	1,838	2,953	1,593	2,078	3,671

CHAPTER 7

Marriage

In total 1,854 marriages took place in the surveillance villages in Chakaria during 2018 and the crude marriage rate was 21.6 per 1,000 population, with greater rate among the females than to the males. Among the males, highest marriage rate was found in the age group of 25-29 years and for females in the age group of 15-19 years. Throughout 2018, 98 divorces were registered in Chakaria HDSS area and the crude divorce rate was 1.1 per 1,000 population with similar rates among males and females (Table 13). The highest number of marriages took place in November and the lowest in June (Figure7).

Table 13. Crude rate of marriage and divorce by age and sex, Chakaria HDSS, 2018

Age (years)	Marriage			Divorce		
	Male	Female	Both	Male	Female	Both
10-14	0.4	5.5	2.9	0.0	0.0	0.0
15-19	16.5	104.9	59.5	0.6	4.1	2.3
20-24	58.0	86.5	73.1	2.3	5.0	3.7
25-29	73.8	27.7	48.8	3.9	3.3	3.5
30-34	47.8	10.8	27.9	1.4	3.0	2.3
35-39	17.1	2.9	9.6	0.8	0.0	0.4
40-44	5.4	0.0	2.7	0.5	0.5	0.5
45-49	4.0	0.0	2.1	0.0	0.0	0.0
50-54	2.2	0.0	1.1	0.0	0.0	0.0
55-59	1.8	0.0	0.9	0.0	0.0	0.0
60-64	1.1	0.0	0.6	0.0	0.0	0.0
65+	6.6	0.0	3.5	0.5	0.0	0.3
All	17.7	25.4	21.6	0.7	1.5	1.1

Figure 7. Number of marriages by month, Chakaria HDSS, 2018

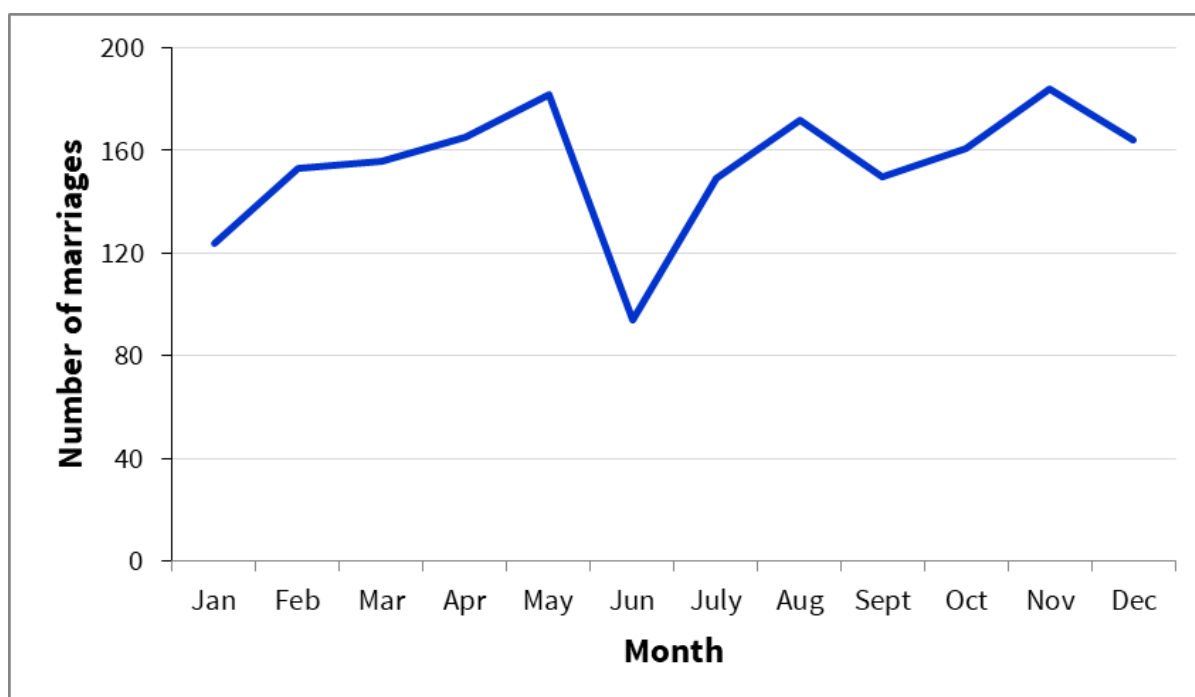


Table 14 presents singulate mean age at marriage (SMAM), and mean and median ages at first marriage. The SMAM and median ages at first marriage for males were 27 years and mean age was 25 years. For females, both SMAM and median ages at first marriage were 21 years and the mean was 18 years. All indicators for males and females were almost positively associated with household socioeconomic status (Table 14).

Table 14. Age at marriage by sex and asset quintile, Chakaria HDSS, 2018

Asset quintile	Male			Female		
	SMAM*	Mean age at first marriage	Median age at first marriage*	SMAM*	Mean age at first marriage	Median age at first marriage*
Lowest	24.8	23.8	24.5	20.7	18.1	20.6
Second	26.1	24.2	25.5	20.7	18.2	20.6
Middle	26.8	24.5	26.6	21.2	18.3	20.9
Fourth	28.1	25.4	28.4	21.8	18.3	21.4
Highest	29.5	27.0	29.6	21.7	18.9	20.6
All	27.4	25.1	27.1	21.4	18.4	20.9

SMAM = Singulate mean age at marriage

*The SMAM and median age at first marriage are calculated by applying indirect methods illustrated in “The Methods and Materials of Demography”, edited by Jacob S. Siegel and David A. Swanson, Second edition; Elsevier Academic Press, 2004: 196-202.

Safe Motherhood Practices

The health-related activities of icddr,b in Chakaria included facilitation of provision of safe motherhood services (e.g. antenatal care, delivery services, and postnatal care) by the trained midwives have been providing service from village health posts (VHP), established and managed by the villagers since the late nineties. Apart from this, the physicians and the paramedics employed by icddr,b also provide healthcare services to the villagers from these VHPs. Government trained Skilled Birth Attendants (CSBAs) are providing safe motherhood services at Union Health and Family Welfare Centres (UHFWCs), community clinics and at domiciliary level.

At present, the Upazila Health Complex of the government and six private hospitals provide healthcare services at the headquarters of Chakaria. At the union level, 11 UHFWCs of the government, and 5 VHPs which were initiated by the community members provide healthcare services. The Family Development Services and Research (FDSR), an NGO also provides healthcare services in Chakaria surveillance area.

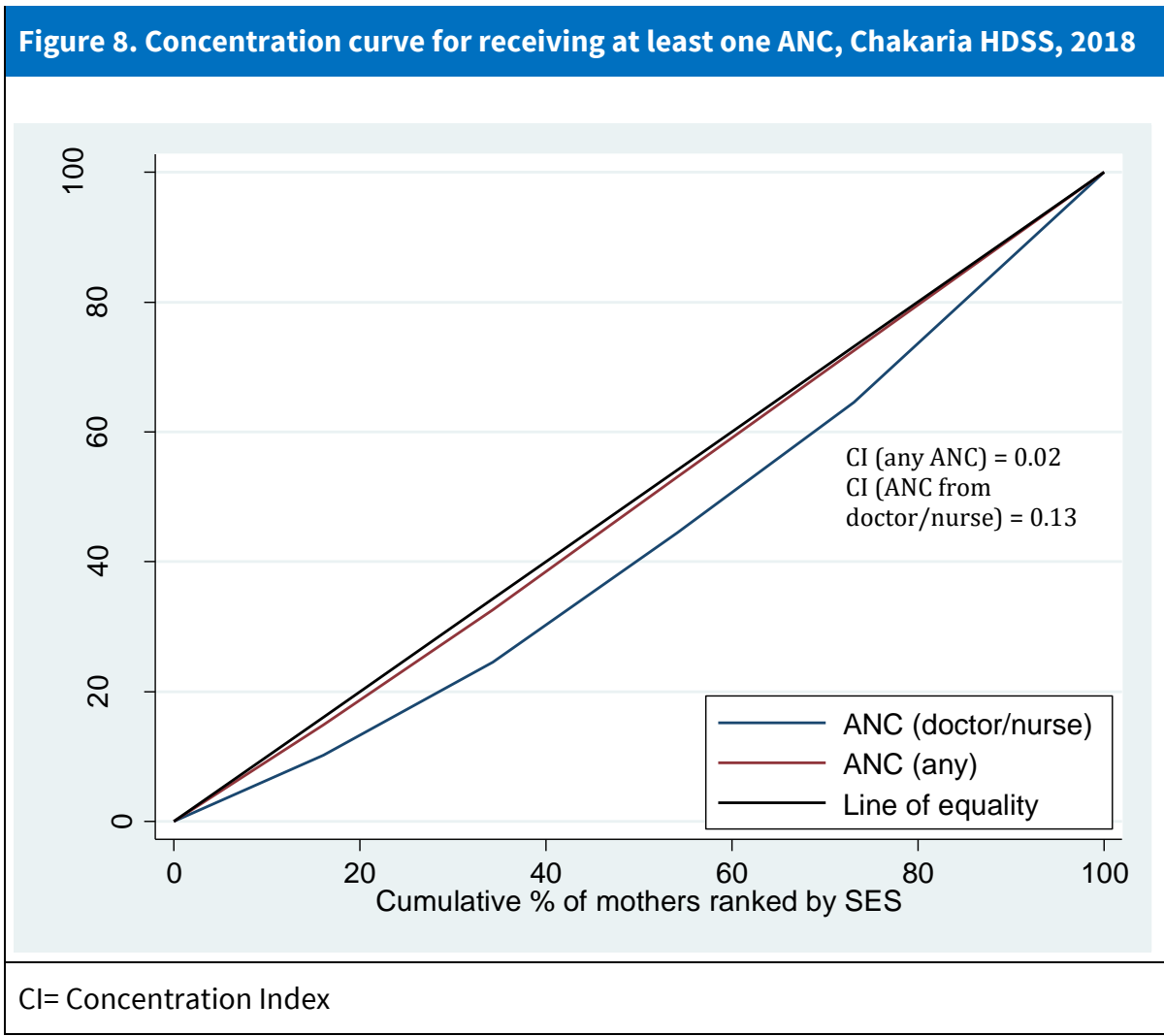
Use of antenatal care services

Table 15. Antenatal care by sources and asset quintile, Chakaria HDSS, 2018

Asset quintile	Received any ANC (%)	Midwife* (%)	FWV* (%)	Nurse/doctor* (%)	FDSR/CMH* (%)	None (%)	No. of women
Lowest	70.0	17.6	20.6	32.9	17.1	31.2	340
Second	74.0	16.1	16.4	41.0	21.6	27.3	385
Middle	77.6	15.8	20.5	51.9	15.6	22.9	424
Fourth	77.6	12.4	19.7	55.2	14.4	23.4	402
Highest	77.9	6.5	8.1	69.0	9.0	23.9	565
Total	75.8	13.0	16.3	52.1	14.9	25.4	2,116
*Multiple responses recorded ANC=Antenatal care FWV=Family welfare visitor FDSR=Family Development Services and Research CMH= Christian Memorial Hospital							

Among 2,116 pregnant women who gave live births, 75.8% received at least one antenatal care (ANC). These women received services from various sources. Among these sources,

the nurses/doctors were dominant, followed by FWV and FDSR/CMH and midwives (Table 15). Use of at least one ANC during pregnancy was almost equitable during 2018 in Chakaria HDSS area. Seventy percent of the pregnant women from the lowest socioeconomic quintile used at least one ANC during pregnancy as oppose to 77.9% of the women in the highest socioeconomic quintile (Table 15). The concentration curve and the concentration index of at least one ANC use also depicts similar picture where the curve lies below the line of equality indicating a comparatively higher rate among the highest socioeconomic quintile. However, the index of 0.02 indicates the level of disparity to be very low (Figure 8). On the contrary, use of ANC service from doctors or nurses indicated a higher level of inequity where the rate was 69% for women in highest socioeconomic quintile and only 32.9% for women in the lowest socioeconomic quintile (Table 15). This is visible in Figure 8 where the concentration curve for ANC use from doctors or nurses lies further away from the line of equality. Thus, the ANC service was more unequal for doctor/nurse.



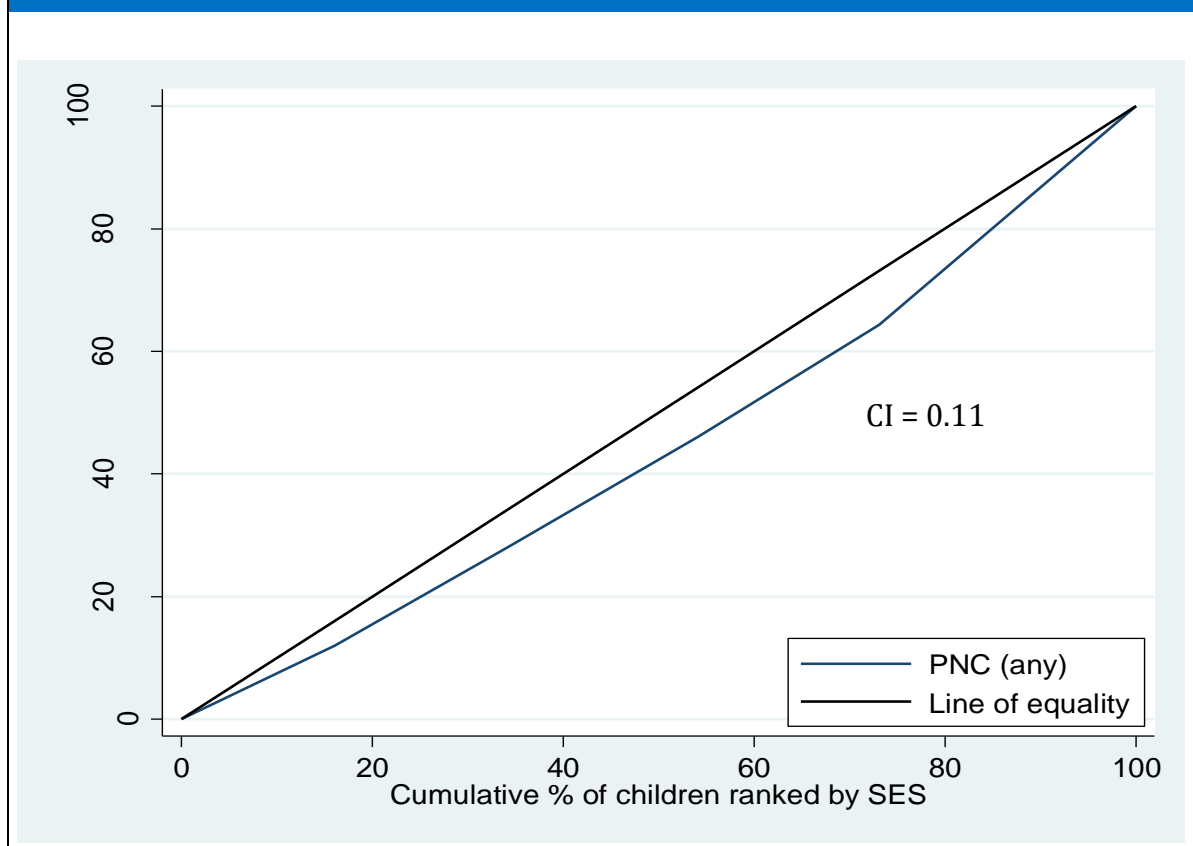
Use of postnatal care services

Any postnatal check-up of both women and children within 42 days of their delivery are of interest here. It was observed that only 45.9% of the pregnant women received at least one postnatal care (PNC) in 2018. The nurses, doctors and midwives were the dominant sources for PNC. The utilization of services was characterized by large inequities and the services concentrated among the richest segment of the society (Table 16). Figure 9 also shows the current inequality of the use of PNC services among different socioeconomic groups. The positive value of concentration index (CI) indicates that the rich people were more intended to receive the service compared to the poor. In 2017 and 2018 the CI were 0.12 and 0.11 respectively which means the gape of receiving PNC services shrink a bit.

Table 16. Postnatal care by sources and asset quintile, Chakaria HDSS, 2018

Asset quintile	Received any PNC (%)	Midwife* (%)	FWV* (%)	Nurse/ doctor* (%)	FDSR/ CMH* (%)	None (%)	No. of women
Lowest	34.4	6.5	3.5	24.1	2.1	66.8	340
Second	40.5	7.8	2.6	28.6	3.4	60.8	385
Middle	41.3	9.2	2.1	29.2	3.1	59.2	424
Fourth	44.0	8.7	5.0	31.1	2.7	57.0	402
Highest	61.2	6.2	3.2	51.9	4.2	40.5	565
Total	45.9	7.6	3.3	34.7	3.2	55.3	2,116
*Multiple responses recorded PNC = Postnatal care							

Figure 9. Concentration curve for receiving at least one PNC, Chakaria HDSS, 2018



Assistance during delivery

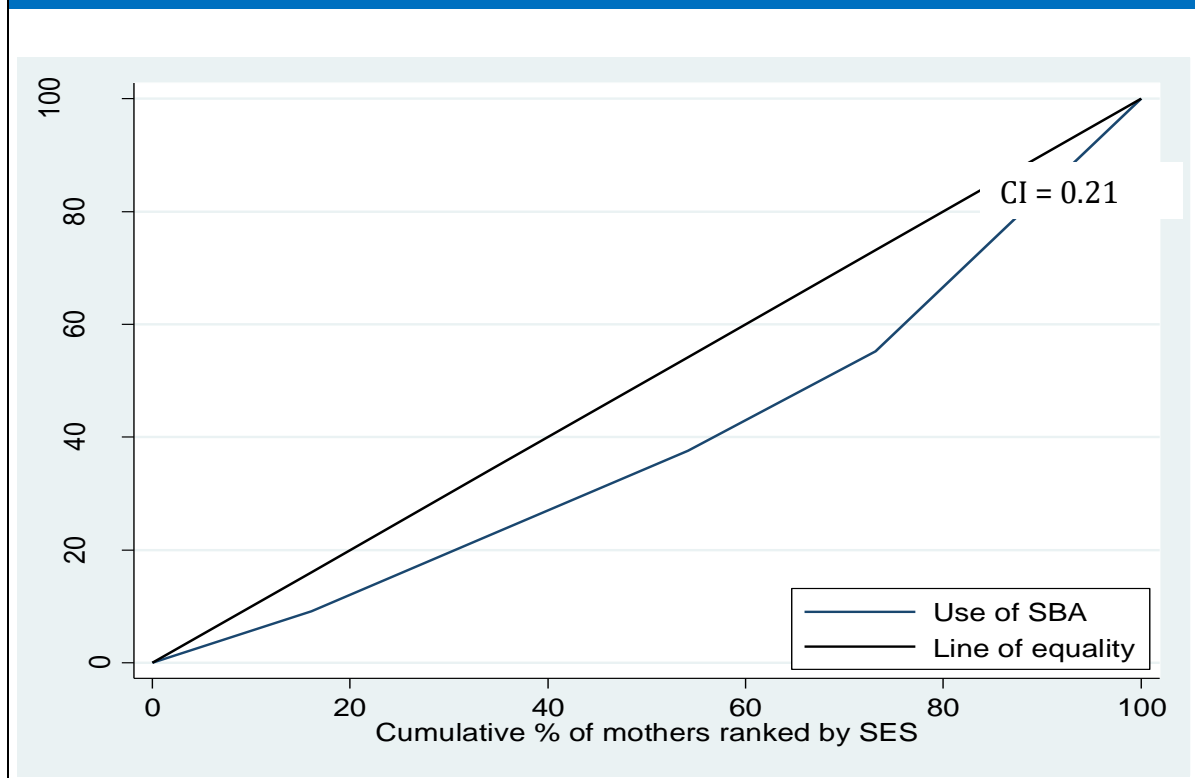
Table 17. Assistance during delivery by asset quintile, Chakaria HDSS, 2018

Asset quintile	Midwife (%)	FWV (%)	Nurse/ doctor (%)	TBA (%)	No. of Women
Lowest	6.8	3.8	10.9	79.7	340
Second	8.1	3.9	16.4	73.0	385
Middle	10.6	3.1	14.4	72.4	424
Fourth	11.2	5.0	18.9	65.9	402
Highest	8.5	6.5	48.3	38.4	565
Total	9.1	4.6	24.1	63.4	2,116

In Chakaria, the traditional birth attendants (TBAs) were used more than the skilled birth attendants (SBAs) (e.g. nurses/doctors, FWVs, midwives) for assisting deliveries. Sixty three percent of 2,116 deliveries in Chakaria were assisted by the TBAs as opposed to 37% of the deliveries assisted by the SBAs. The rate of seeking services from nurses/doctors by the women from the highest quintile was much higher than those by women from the

lowest quintiles (Table 17). Overall, the services of SBAs were more concentrated towards the richer segment of the population as the concentration curve lies below the line of equality (Figure 10.)

Figure 10. Concentration curve for use of SBA services, Chakaria HDSS, 2018



Place of delivery

Seventy four percent of the deliveries took place at home. Only 26.9% of 2,116 deliveries took place either at hospitals or at clinics (Table 18). The women from the households in the highest asset quintile had a much higher rate of facility based delivery than those from the lowest quintile (Table 18 and Figure 11).

Table 18. Place of delivery by asset quintile, Chakaria HDSS, 2018

Asset quintile	Hospital/Clinic (%)	Home (%)	No. of women
Lowest	14.4	86.8	340
Second	20.5	80.8	385
Middle	16.3	84.2	424
Fourth	22.1	78.9	402
Highest	50.3	51.5	565
Total	26.9	74.2	2,116

Figure 11. Concentration curve for facility-based delivery, Chakaria HDSS, 2018

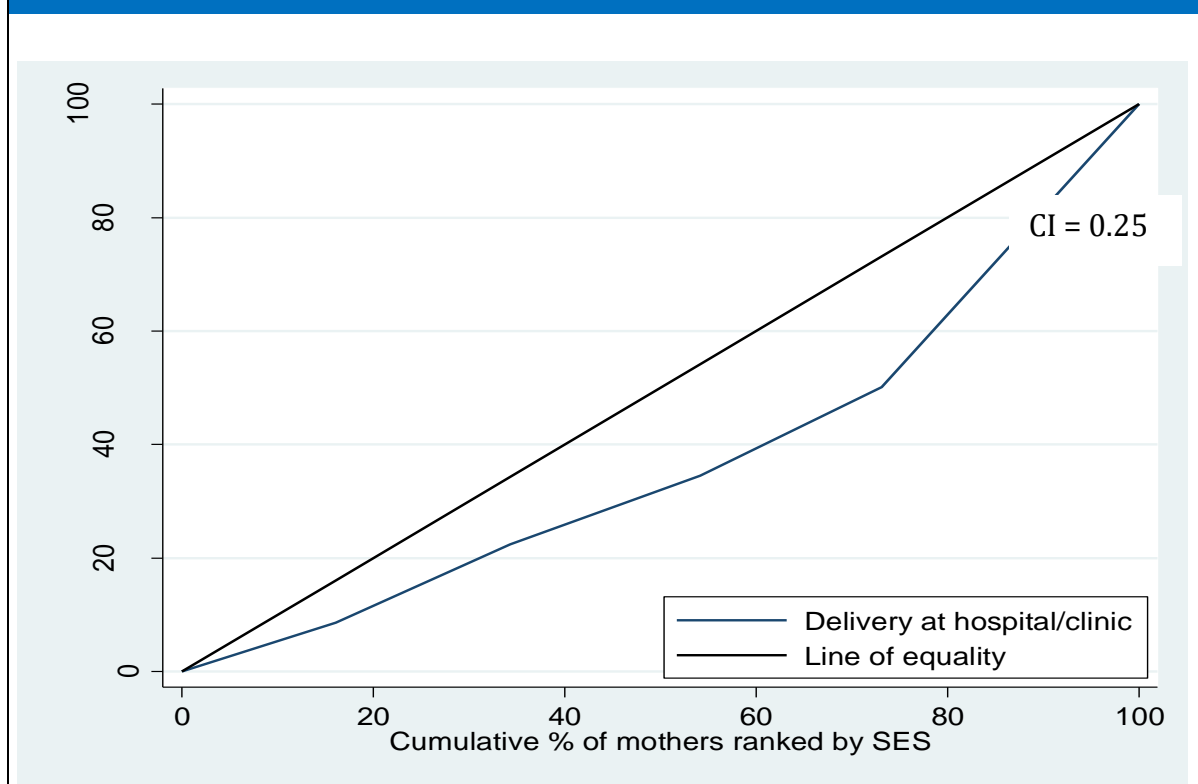
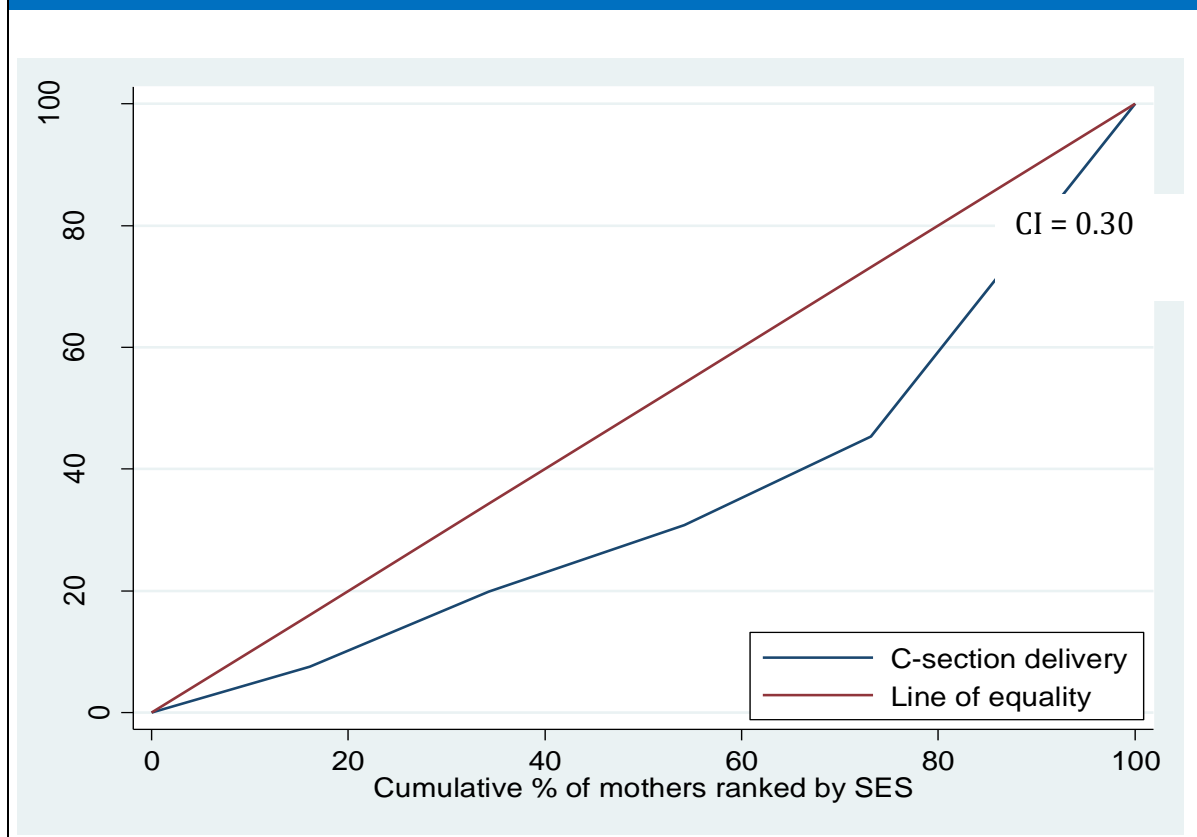


Table 19 shows caesarean-section delivery by household asset quintile in 2018. Caesarean-section delivery accounted for 10.7% of the total deliveries and 39.8% of the facility-based deliveries in the Chakaria HDSS area in 2018. Although the number of deliveries through caesarean sections was small, the number of women giving birth by caesarean sections exhibited discrepancies between highest and lowest quintiles (Table 19 and Figure 12).

Table 19. Proportion of caesarean-section delivery by asset quintile, Chakaria HDSS, 2018

Asset quintile	No. of caesarean-section delivery	Caesarean-section delivery (%)	Total no. of Deliveries
Lowest	17	5.0	340
Second	28	7.3	385
Middle	25	5.9	424
Fourth	33	8.2	402
Highest	124	21.9	565
Total	227	10.7	2,116

**Figure 12. Concentration curve for caesarean-section delivery,
Chakaria HDSS, 2018**



SDG and other Health and Socio-demographic Indicators

Sustainable development goals, popularly known as SDGs, include 17 goals with 169 associated targets, were announced for UN member States in order to eradicate poverty, inequality and injustice and climatic changes by 2030. Though Millennium Development Goals (MDGs) attainment in Bangladesh was relatively notable, the progress for most indicators could not meet the desired targets. The SDGs address the origins of poverty and universal development needs which will work for all people and thus expectantly go much further than the MDGs. Twenty three indicators out of all basic and complementary SDG indicators can be calculated using the data from Chakaria HDSS (8).

The major demographic and health indicators (including the SDGs) during 2014-18 are presented in Table 20. The fertility indicators were almost similar with a declining trend in natural rate of population increase was observed during 2014-18. Most of the indicator rates in Chakaria HDSS area are much higher than those in the Matlab government service area, another rural field site of icddr,b (9). In 2018, the rate of natural increase and the annual population growth rate in the surveillance area of Chakaria were 1.9% and 1.3%, respectively (Table 20).

Twenty seven percent of births in Chakaria HDSS were delivered at facilities (hospital or clinic) in 2018. The percentage of births at facilities in 2018 was slightly higher than in 2017. About one-third of the births were attended by Skilled Birth Attendants (SBAs) in Chakaria during 2018 and the rate of deliveries assisted by SBAs was 37.4% (Table 20).

The legal age of marriage is 18 years for female and 21 years for male in Bangladesh. In 2018, 29.2% of the women were married before reaching their 18th birthday. (Table 20) The percentage of underage female marriage is following a declining trend. Twenty percent of the males were married before the age of 21 years in 2018. The proportion of male marriages before 21 years increased between 2017 and 2018. The percentage of underage marriage for females remained higher than males from 2017 to 2018.

Total fertility rate and death rates in Chakaria HDSS area during 2018 were higher than their national counterparts. Facility-based deliveries, receiving service from SBAs, antenatal care coverage and postnatal care coverage were comparatively lower than the national rates. Full immunization coverage rate was slightly lower than the national figure.

Among boys, 81% of those enrolled completed the last grade of primary level education and 69% completed last grade of secondary level education. The rate was higher for boys than the national level. Literacy rate of 15-24 year olds was significantly higher than the national rate in Bangladesh. Compared to the national level, a lower percentage of active age group women and a higher percentage of active age group men were engaged in economic activities in Chakaria HDSS area.

Table 20. SDG and other health and socio-demographic indicators, Chakaria HDSS, 2014 – 2018, Matlab HDSS and National

Rate	Chakaria HDSS area					Matlab HDSS Govt. service area 2017		National
	2014	2015	2016	2017	2018			
Crude birth rate	25.5	25.6	25.7	25.6	24.9	21.8	-	18.5 ^e
Total fertility rate ^a	2.9	2.9	2.9	2.9	2.8	2.6	SDG	2.3 ^d
Neonatal mortality ^b	31.5	34.1	30.0	35.2	31.3	20.7	SDG	30.0 ^d
Post-neonatal mortality ^b	15.3	14.0	11.5	15.6	9.3	5.6	-	-
Infant mortality rate ^b	45.3	44.4	41.5	51.2	40.6	26.1	-	38.0 ^d
Child mortality rate (1-4 yrs)	2.8	2.9	2.7	2.9	3.1	3.0	-	-
Under-five mortality rate ^b	57.4	58.9	51.2	61.3	52.3	37.0	SGD	45.0 ^d
Crude death rate	5.3	5.9	5.7	5.8	5.9	7.2	-	5.5 ^e
Rate of natural increase	20.3	20.5	20	19.8	19.0	14.6	-	-
In-migration rate	32.7	33.2	36	33.6	34.4	51.6	-	-
Out-migration rate	35.9	37.3	41.8	46.9	42.7	67.2	-	-
Growth rate (%)	1.7	1.6	1.4	0.6	1.1	1.3	-	1.1 ^e
Adolescent birth rate	62	65.8	54.9	54.8	43.2	73.8	SDG	83.0 ^e
Stillbirth rate ^c	33.6	36.5	39.8	34.4	28.0	15.0	SDG	25.0 ^e
Facility-based delivery (%)	20.5	23.4	22.9	23.6	26.6	62.4	-	50.0 ^d
Received assistance from SBA during delivery (%)	31.4	35.3	35.3	38.7	37.4	67.8	SDG	53.0 ^d
Antenatal care coverage (at least 1 visit) (%)	74.1	76.6	77.9	77.3	74.9	93.7	SDG	92.0 ^d
Antenatal care coverage (at least 4 visits) (%)	27.8	29.3	29.7	29.1	25.2	27.5	SDG	47.0 ^d
Postnatal care coverage (1 visit) (%)	42.2	43.3	44.0	47.6	45.4	-	SDG	52.5 ^d
Male marriage at ages under 21 years (%)	23.9	23.5	22.8	19.0	20.4	5.9	-	-
Female marriage at ages under 18 years (%)	35.0	35.9	34.6	32.8	29.2	36.6	-	-
Female aged 20-24 who were married or in a union by age 18 (%)	40.8	39.2	39.0	40.0	37.1	-	SDG	59.0 ^d

^aPer woman; ^bPer 1,000 live births; ^cPer 1,000 total births;

Sources:

^dNational Institute of Population Research and Training (NIPORT), Mitra and Associates, and ICF International. 2019. *Bangladesh Demographic and Health Survey 2017-2018: Key Indicators*. Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPORT, Mitra and Associates, and ICF International;

^eThe World Bank. Available at: <http://data.worldbank.org>;

⁻Data not available

Table 20. (contd...)

Rate	Chakaria HDSS area					Matlab HDSS Govt. area 2017	National
	2014	2015	2016	2017	2018		
Children receiving full immunization (%)	79.0	81.8	82.4	84.0	90.8	78.7	SDG 85.6 ^d
1-year old children immunized against measles (%)	81.7	84.6	87.9	89.8	92.3	80.6	SDG 87.9 ^d
Primary education completion rate for girls (%)	75.3	74.3	74.8	79.8	81.9	-	SDG 87.1 ^e
Primary education completion rate for boys (%)	77.7	76.4	75.9	80.7	80.8	-	SDG 71.8 ^e
Secondary education completion rate for girls (%)	58.1	66.5	66.7	66.2	68.3	-	SDG 72.3 ^e
Secondary education completion rate for boys (%)	72.0	73.4	71.8	66.5	69.4	-	SDG 61.1 ^e
Tertiary enrollment rate for women (%)	3.8	4.1	4.0	4.6	5.4	-	SDG 16.0 ^e
Tertiary enrollment rate for men (%)	6.4	7.3	7.4	7.7	8.5	-	SDG 24.0 ^e
Literacy rate of 15-24 year-old women (%)	93.6	94.1	97.2	98.3	98.3	-	SDG 94.9 ^e
Literacy rate of 15-24 year-old men (%)	85.9	88.6	91.9	93.0	93.6	-	SDG 91.8 ^e
Employment to population ratio (EPR) for women (15+ years of age) (%)	20.7	20.8	16.8	16.0	17.5	-	SDG 33.9 ^e
Employment to population ratio (EPR) for men (15+ years of age) (%)	83.9	83.6	86.5	84.0	88.7	-	SDG 78.0 ^e
Women without incomes of their own (%)	6.7	7.0	6.2	5.9	5.7	-	SDG 6.7 ^e
^a Per woman; ^b Per 1,000 live births; ^c Per 1,000 total births; Sources: ^d National Institute of Population Research and Training (NIPORT), Mitra and Associates, and ICF International. 2019. <i>Bangladesh Demographic and Health Survey 2017-2018: Key Indicators</i> . Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPORT, Mitra and Associates, and ICF International; ^e The World Bank. Available at: http://data.worldbank.org ; ^f - Data not available							

Salinity

The coastal population of Bangladesh relies on tube wells (groundwater) for obtaining drinking and cooking water. Tube wells which are closer to coast have much higher concentration of sodium than the WHO recommended limit (10).

Coastal communities may be at higher risk of hypertension because of the high salinity of drinking water compared with non-coastal areas. Women living in coastal regions have higher prevalence of hypertension and preeclampsia (11), and miscarriage (12). Excessive dietary salt intake around the same time of conception or during pregnancy can increase risk of miscarriage, preeclampsia or adverse pregnancy outcome (13).

We measured the level of salinity in tube well water and urine of pregnant and non-pregnant women in Chakaria. We tested 120 tube wells in hilly and coastal areas. We examined a total of 32 women where 16 were from hilly areas and rest from coastal areas. We further classified them in terms of pregnancy where half of the women (n=8) from hilly areas and half from coastal areas (n=8) were pregnant.

Tube well water

A self-monitoring electronic salinometer, TANITA salinometer SO-313, was used to measure the actual salinity in tube well water (Table 21). The salinity in hilly areas ranged from 34.00 mg/L-104.90 mg/L with a mean of 54.42 mg/L and coastal areas ranged from 160.20 mg/L- 2020.00 mg/L. Coastal areas had higher mean salinity (292.66 mg/L) than hilly areas (54.42 mg/L) ($P<0.001$).

Table 21. Salinity in tube well water	
Area type	Mean salinity (mg/L) (Lowest Value-Highest Value)
Hilly (n=60)	54.42 (34.00-104.90)
Coastal (n=60)	292.66 (160.20-2020.00)

Urine salinity

Urine salinity (Table 22) was measured using a self-monitoring electronic salinometer, KME 03 salinometer, developed by KOUNO ME Institute, Kanagawa, Japan. The mean salinity in urine of non-pregnant women in coastal areas was 21.79 mg/L which was higher than that of women in hilly areas (14.48 mg/L).

Table 22. Salinity in urine in Chakaria HDSS area's women			
Area type	Pregnancy status		
	Pregnant (n=16)	Non-pregnant (n=16)	All (n=32)
Hilly (n=16)	20.23±10.36 mg/L	14.48±3.96 mg/L	17.35±8.14 mg/L
Coastal (n=16)	20.56±14.77 mg/L	21.79±9.70 mg/L	21.18±12.09 mg/L

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APPENDIX A

Midyear population by age and sex, Chakaria HDSS, 2018

Age (years)	Mid-year population			Percentage distribution of mid-year Population		
	Male	Female	Both	Male	Female	Both
<1	1,079	1,029	2,108	2.5	2.4	2.5
1-4	4,072	3,923	7,995	9.5	9.1	9.3
5-9	5,036	4,771	9,807	11.8	11.0	11.4
10-14	5,635	5,463	11,098	13.2	12.7	12.9
15-19	5,445	5,157	10,602	12.7	11.9	12.3
20-24	3,928	4,391	8,319	9.2	10.2	9.7
25-29	3,102	3,686	6,788	7.3	8.5	7.9
30-34	2,846	3,325	6,171	6.7	7.7	7.2
35-39	2,511	2,783	5,294	5.9	6.4	6.2
40-44	2,029	1,980	4,009	4.7	4.6	4.7
45-49	1,745	1,593	3,338	4.1	3.7	3.9
50-54	1,340	1,356	2,696	3.1	3.1	3.1
55-59	1,135	1,189	2,324	2.7	2.8	2.7
60-64	902	912	1,814	2.1	2.1	2.1
65-69	762	657	1,419	1.8	1.5	1.7
70-74	472	404	876	1.1	0.9	1.0
75-79	369	287	656	0.9	0.7	0.8
80-84	161	135	296	0.4	0.3	0.3
85+	156	139	295	0.4	0.3	0.3
All	42,725	43,180	85,905	100.0	100.0	100.0

APPENDIX B

Cause-specific mortality rate per 1,000 population by age and sex, Chakaria HDSS, 2018

Causes	Age groups (years)						
	Neonate	Infant	1-4	5-14	15-49	50-64	65+
Male							
01.01 Sepsis (non-obstetric)	0.0	1.2	0.0	0.0	0.0	0.0	0.3
01.02 Acute respiratory infection including pneumonia	0.0	5.4	0.0	0.0	0.1	1.3	6.7
01.03 HIV/AIDS related death	0.0	0.0	0.2	0.0	0.0	0.7	0.8
01.04 Diarrhoeal diseases	0.0	0.0	0.2	0.0	0.0	0.0	0.5
01.05 Malaria	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01.06 Measles	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01.07 Meningitis and encephalitis	97.9	0.0	0.0	0.0	0.0	0.0	0.0
01.09 Pulmonary tuberculosis	0.0	0.0	0.0	0.0	0.2	0.5	4.5
01.10 Pertussis	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01.11 Haemorrhagic fever	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01.99 Other and unspecified infectious diseases	0.0	0.0	0.1	0.0	0.0	0.3	1.0
02.01 Oral neoplasms	0.0	0.0	0.0	0.0	0.0	0.0	0.8
02.02 Digestive neoplasms	0.0	0.0	0.0	0.0	0.1	2.6	3.7
02.03 Respiratory neoplasms	0.0	0.0	0.0	0.0	0.0	0.9	3.6
02.04 Breast neoplasms	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02.05 & 02.06 Reproductive neoplasms M, F	0.0	0.0	0.0	0.0	0.0	0.7	0.6
02.99 Other and unspecified neoplasms	0.0	0.0	0.1	0.0	0.1	0.7	3.7
03.01 Severe anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0
03.02 Severe malnutrition	12.5	1.0	0.2	0.0	0.0	0.3	0.0
03.03 Diabetes mellitus	0.0	0.0	0.0	0.0	0.1	0.4	2.2
04.01 Acute cardiac disease	0.0	0.0	0.0	0.0	0.1	1.1	1.7
04.02 Stroke	0.0	0.0	0.0	0.0	0.3	1.4	8.1
04.03 Sickle cell with crisis	0.0	0.0	0.0	0.0	0.0	0.0	0.0
04.99 Other and unspecified cardiac diseases	0.0	0.0	0.0	0.0	0.1	0.8	3.5
05.01 Chronic obstructive pulmonary diseases	0.0	0.0	0.0	0.0	0.0	0.6	7.8
05.02 Asthma	0.0	0.0	0.2	0.0	0.0	0.0	0.2
06.01 Acute abdomen	16.2	0.0	0.0	0.0	0.0	0.7	2.1
06.02 Liver cirrhosis	0.0	0.0	0.2	0.0	0.0	0.0	0.3
07.01 Renal failure	0.0	0.0	0.0	0.0	0.0	0.0	0.2
08.01 Epilepsy	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Appendix B. (contd...)

Causes	Age groups (years)						
	Neonate	Infant	1-4	5-14	15-49	50-64	65+
09.01 Ectopic pregnancy	0.0	0.0	0.0	0.0	0.0	0.0	0.0
09.02 Abortion-related death	0.0	0.0	0.0	0.0	0.0	0.0	0.0
09.03 Pregnancy-induced hypertension	0.0	0.0	0.0	0.0	0.0	0.0	0.0
09.04 Obstetric haemorrhage	0.0	0.0	0.0	0.0	0.0	0.0	0.0
09.05 Obstructed labour	0.0	0.0	0.0	0.0	0.0	0.0	0.0
09.06 Pregnancy-related sepsis	0.0	0.0	0.0	0.0	0.0	0.0	0.0
09.99 Other and unspecified maternal causes of death	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10.01 Prematurity	102.3	0.0	0.0	0.0	0.0	0.0	0.0
10.02 Birth asphyxia	13.6	0.0	0.0	0.0	0.0	0.0	0.0
10.03 Neonatal pneumonia	161.0	0.0	0.0	0.0	0.0	0.0	0.0
10.04 Neonatal sepsis	27.9	0.0	0.0	0.0	0.0	0.0	0.0
10.06 Congenital malformation	0.0	0.0	0.2	0.0	0.0	0.0	0.0
10.99 Other and unspecified neonatal causes of death	105.6	0.0	0.0	0.0	0.0	0.0	0.0
12.01 Road traffic accident	0.0	0.0	0.0	0.2	0.2	0.0	0.5
12.02 Other transport accident	0.0	0.0	0.5	0.2	0.1	0.3	0.7
12.03 Accidental fall	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12.04 Accidental drowning and submersion	0.0	0.0	1.5	0.0	0.0	0.0	0.0
12.05 Accidental exposure to smoke fire & flame	0.0	0.0	0.0	0.0	0.0	0.0	0.4
12.06 Contact with venomous plant/animal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12.07 Accidental poisoning & noxious substances	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12.08 Intentional self-harm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12.09 Assault	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12.10 Exposure to force of nature	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12.99 Other and unspecified external causes of death	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98 Other and unspecified non-communicable diseases	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99 Indeterminate	86.1	1.3	0.2	0.0	0.3	1.7	5.6
All causes	622.9	8.8	3.7	0.4	2.0	14.8	59.4

Appendix B. (contd...)

Causes	Age groups (years)						
	Neonate	Infant	1-4	5-14	15-49	50-64	65+
Female							
01.01 Sepsis (non-obstetric)	0.0	0.0	0.1	0.0	0.0	0.0	0.9
01.02 Acute respiratory infection including pneumonia	0.0	8.0	0.9	0.1	0.1	1.7	4.9
01.03 HIV/AIDS related death	0.0	0.0	0.0	0.1	0.0	0.0	0.6
01.04 Diarrhoeal diseases	0.0	0.0	0.0	0.0	0.0	0.3	1.2
01.05 Malaria	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01.06 Measles	0.0	0.4	0.0	0.0	0.0	0.0	0.0
01.07 Meningitis and encephalitis	12.7	0.5	0.0	0.0	0.0	0.0	0.0
01.09 Pulmonary tuberculosis	0.0	0.0	0.0	0.0	0.0	0.6	3.4
01.10 Pertussis	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01.11 Haemorrhagic fever	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01.99 Other and unspecified infectious diseases	0.0	0.0	0.0	0.0	0.0	0.2	1.7
02.01 Oral neoplasms	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02.02 Digestive neoplasms	0.0	0.0	0.0	0.0	0.1	0.6	0.9
02.03 Respiratory neoplasms	0.0	0.0	0.0	0.0	0.0	0.4	0.0
02.04 Breast neoplasms	0.0	0.0	0.0	0.0	0.1	0.3	0.9
02.05 & 02.06 Reproductive neoplasms M, F	0.0	0.0	0.0	0.0	0.1	0.6	3.4
02.99 Other and unspecified neoplasms	0.0	0.0	0.0	0.0	0.0	0.6	3.7
03.01 Severe anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0
03.02 Severe malnutrition	0.0	0.0	0.0	0.0	0.1	0.2	0.6
03.03 Diabetes mellitus	0.0	0.0	0.0	0.0	0.0	0.5	4.0
04.01 Acute cardiac disease	0.0	0.0	0.0	0.0	0.0	0.4	0.6
04.02 Stroke	0.0	0.0	0.0	0.0	0.0	1.6	8.0
04.03 Sickle cell with crisis	0.0	0.0	0.2	0.0	0.0	0.0	0.0
04.99 Other and unspecified cardiac diseases	0.0	0.0	0.0	0.0	0.1	0.8	3.2
05.01 Chronic obstructive pulmonary diseases	0.0	0.0	0.0	0.0	0.0	1.2	0.9
05.02 Asthma	0.0	0.0	0.0	0.0	0.0	0.0	0.0
06.01 Acute abdomen	0.0	0.0	0.0	0.1	0.1	0.3	3.3
06.02 Liver cirrhosis	0.0	0.0	0.0	0.0	0.0	0.8	2.1
07.01 Renal failure	0.0	0.0	0.0	0.0	0.0	0.9	1.2
08.01 Epilepsy	0.0	0.0	0.0	0.2	0.0	0.2	0.6

Appendix B. (contd...)

Causes	Age groups (years)						
	Neonate	Infant	1-4	5-14	15-49	50-64	65+
09.01 Ectopic pregnancy	0.0	0.0	0.0	0.0	0.0	0.0	0.0
09.02 Abortion-related death	0.0	0.0	0.0	0.0	0.1	0.0	0.0
09.03 Pregnancy-induced hypertension	0.0	0.0	0.0	0.0	0.2	0.0	0.0
09.04 Obstetric haemorrhage	0.0	0.0	0.0	0.0	0.2	0.0	0.0
09.05 Obstructed labour	0.0	0.0	0.0	0.0	0.0	0.0	0.0
09.06 Pregnancy-related sepsis	0.0	0.0	0.0	0.0	0.1	0.0	0.0
09.99 Other and unspecified maternal causes of death	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10.01 Prematurity	73.7	0.0	0.0	0.0	0.0	0.0	0.0
10.02 Birth asphyxia	50.6	0.0	0.0	0.0	0.0	0.0	0.0
10.03 Neonatal pneumonia	72.2	0.0	0.0	0.0	0.0	0.0	0.0
10.04 Neonatal sepsis	36.0	0.0	0.0	0.0	0.0	0.0	0.0
10.06 Congenital malformation	12.7	0.0	0.3	0.0	0.0	0.0	0.0
10.99 Other and unspecified neonatal causes of death	90.5	0.0	0.0	0.0	0.0	0.0	0.0
12.01 Road traffic accident	0.0	0.0	0.0	0.0	0.1	0.0	0.0
12.02 Other transport accident	0.0	0.0	0.3	0.2	0.0	0.0	1.2
12.03 Accidental fall	0.0	0.0	0.0	0.0	0.0	0.0	0.5
12.04 Accidental drowning and submersion	0.0	0.0	0.8	0.1	0.0	0.0	0.0
12.05 Accidental exposure to smoke fire & flame	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12.06 Contact with venomous plant/animal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12.07 Accidental poisoning & noxious substances	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12.08 Intentional self-harm	0.0	0.0	0.0	0.0	0.1	0.0	0.0
12.09 Assault	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12.10 Exposure to force of nature	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12.99 Other and unspecified external causes of death	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98 Other and unspecified non-communicable diseases	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99 Indeterminate	18.9	2.7	0.1	0.1	0.2	1.1	8.3
All causes	367.1	11.6	2.5	0.8	1.7	13.0	56.1

APPENDIX C

Migration rate per 1,000 population by age and sex, Chakaria HDSS, 2018

Age (years)	No. of migrants			Migration rate per 1,000 population		
	Male	Female	Both	Male	Female	Both
In-migration						
<1	65	56	121	60.2	54.4	57.4
1-4	149	131	280	36.6	33.4	35.0
5-9	140	142	282	27.8	29.8	28.8
10-14	86	114	200	15.3	20.9	18.0
15-19	68	570	638	12.5	110.5	60.2
20-24	94	415	509	23.9	94.5	61.2
25-29	125	151	276	40.3	41.0	40.7
30-34	128	100	228	45.0	30.1	36.9
35-39	107	38	145	42.6	13.7	27.4
40-44	51	16	67	25.1	8.1	16.7
45-49	35	19	54	20.1	11.9	16.2
50-54	18	9	27	13.4	6.6	10.0
55-59	16	19	35	14.1	16.0	15.1
60-64	10	18	28	11.1	19.7	15.4
65-69	8	14	22	10.5	21.3	15.5
70-74	4	7	11	8.5	17.3	12.6
75-79	3	7	10	8.1	24.4	15.2
80-84	3	5	8	18.6	37.0	27.0
85+	5	7	12	32.1	50.4	40.7
All	1,115	1,838	2,953	26.1	42.6	34.4
Out-migration						
<1	54	48	102	50.0	46.6	48.4
1-4	147	125	272	36.1	31.9	34.0
5-9	127	136	263	25.2	28.5	26.8
10-14	109	154	263	19.3	28.2	23.7
15-19	197	598	795	36.2	116.0	75.0
20-24	295	493	788	75.1	112.3	94.7
25-29	189	222	411	60.9	60.2	60.5
30-34	158	118	276	55.5	35.5	44.7
35-39	141	51	192	56.2	18.3	36.3
40-44	73	27	100	36.0	13.6	24.9
45-49	37	19	56	21.2	11.9	16.8
50-54	19	13	32	14.2	9.6	11.9
55-59	13	16	29	11.5	13.5	12.5
60-64	8	18	26	8.9	19.7	14.3
65-69	8	14	22	10.5	21.3	15.5
70-74	8	7	15	16.9	17.3	17.1
75-79	5	7	12	13.6	24.4	18.3
80-84	2	4	6	12.4	29.6	20.3
85+	3	8	11	19.2	57.6	37.3
All	1,593	2,078	3,671	37.3	48.1	42.7

APPENDIX D

Number of migrants by origin and migration, Chakaria HDSS, 2018

Origin/ Destination	All ages	Age (years)										
		<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50+
In-migration												
Male												
Inside Bangladesh	885	211	139	86	63	74	80	79	65	29	16	43
Outside Bangladesh	230	3	1	0	3	22	45	49	41	23	19	24
Inside Chakaria	453	98	68	53	42	36	40	32	32	17	7	28
Outside Chakaria	140	41	22	9	4	11	7	19	13	4	7	3
Inside HDSS area	276	61	39	30	27	21	25	17	18	11	5	22
Outside HDSS area	177	37	29	23	15	15	15	15	14	6	2	6
Female												
Inside Bangladesh	1,811	184	141	112	563	412	149	97	36	16	18	83
Outside Bangladesh	27	3	1	2	4	6	2	3	2	0	1	3
Inside Chakaria	1,112	105	91	68	367	260	81	45	16	9	8	62
Outside Chakaria	290	25	19	11	106	62	24	21	8	2	3	9
Inside HDSS area	728	57	54	42	248	172	51	28	11	6	6	53
Outside HDSS area	384	48	37	26	119	88	30	17	5	3	2	9
Out-migration												
Male												
Inside Bangladesh	1,052	199	127	109	102	105	97	101	88	45	20	59
Outside Bangladesh	541	2	0	0	95	190	92	57	53	28	17	7
Inside Chakaria	737	146	88	74	68	76	64	71	64	31	12	43
Outside Chakaria	184	33	27	20	15	14	22	14	11	10	5	13
Inside HDSS area	254	55	36	27	19	23	22	18	18	9	3	24
Outside HDSS area	212	39	22	29	28	18	14	14	19	14	5	10
Female												
Inside Bangladesh	2,059	172	136	154	596	489	213	115	51	27	19	87
Outside Bangladesh	19	1	0	0	1	5	9	3	0	0	0	0
Inside Chakaria	1,514	126	100	108	445	364	155	90	32	17	11	66
Outside Chakaria	338	32	21	24	99	76	39	14	10	9	6	8
Inside HDSS area	684	48	40	45	221	170	62	38	9	6	5	40
Outside HDSS area	433	37	33	32	126	104	43	29	12	3	5	9

APPENDIX E

Number of in-migrants by reasons for migration, Chakaria HDSS, 2018

Reason for migration	All ages	Age (years)										
		<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50+
Male												
Family-related												
To join spouse	30	2	0	0	1	6	5	5	7	1	3	0
Family friction/ breakdown	138	20	21	13	12	17	11	10	13	4	4	13
Others	33	11	4	3	0	2	2	4	2	1	0	4
Work-related												
New job/job transfer	231	1	2	0	4	22	46	50	40	23	19	24
To look for work/lost job	194	114	41	16	6	4	1	6	1	0	1	4
Others	45	1	1	2	4	3	13	7	7	5	0	2
Housing-related												
Wanted to own home/ new house	333	51	35	32	27	38	42	40	27	16	5	20
Education												
To acquire education	66	9	28	16	9	1	0	1	1	0	1	0
Reasons not reported	45	5	8	4	3	3	5	5	8	2	2	0
All	1,115	214	140	86	66	96	125	128	106	52	35	67
Female												
Family related												
To join spouse	762	0	0	16	453	239	37	10	5	2	0	0
Family friction/breakdown	265	18	20	9	47	62	39	20	9	1	3	37
Others	59	11	7	3	4	7	5	4	1	0	2	15
Work-related												
New job/job transfer	30	3	1	3	4	7	3	4	1	0	2	2
To look for work/lost job	219	94	44	15	11	18	9	8	4	2	3	11
Others	40	4	3	0	6	8	5	6	3	1	1	3
Housing-related												
Wanted to own home/new house	367	48	39	42	32	73	48	41	11	8	8	17
Education												
To acquire education	60	3	23	22	7	2	0	1	1	1	0	0
Reasons not reported	36	6	5	4	3	2	5	6	3	1	0	1
All	1,838	187	142	114	567	418	151	100	38	16	19	86

APPENDIX F

Number of out-migrants by reasons for migration, Chakaria HDSS, 2018

Reason for migration	All ages	Age (years)										
		<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50+
Male												
Family-related												
To Join spouse	36	0	0	0	10	14	7	2	1	1	1	0
Family friction/ breakdown	174	26	19	10	17	19	17	23	15	8	7	13
Others	43	9	8	3	4	3	2	3	4	0	0	7
Work-related												
New job/job transfer	545	2	1	1	97	191	90	57	53	30	16	7
To look for work/ lost job	151	80	38	13	5	1	3	4	1	0	0	6
Others	124	10	4	2	6	15	24	34	18	6	2	3
Housing-related												
Wanted to own home/ new house	228	29	26	41	33	28	18	10	20	5	4	14
Education												
To acquire education	44	5	10	12	4	3	2	0	1	3	2	2
Reasons not reported	248	40	21	27	21	21	26	25	28	20	5	14
All	1593	201	127	109	197	295	189	158	141	73	37	66
Female												
Family-related												
To Join spouse	884	0	0	19	431	318	92	21	3	0	0	0
Family friction/ breakdown	259	14	17	18	56	50	27	22	13	11	3	28
Others	71	12	10	8	6	5	6	6	2	1	0	15
Work-related												
New job/job transfer	39	3	2	8	3	9	8	4	1	0	0	1
To look for work/lost job	185	80	37	15	9	12	4	9	1	2	0	16
Others	88	4	4	2	16	25	20	6	4	1	3	3
Housing-related												
Wanted to own home/ new house	258	27	24	42	42	34	21	25	11	6	10	16
Education												
To acquire education	77	5	20	20	12	3	5	7	4	1	0	0
Reasons not reported	217	28	22	22	22	38	39	18	12	5	3	8
All	2,078	173	136	154	597	494	222	118	51	27	19	87

APPENDIX G

Population, births, deaths, in and out-migration by village, Chakaria HDSS, 2018

Village	Population	Birth	Death	In-migration	Out-migration	Birth rate	Death rate	In-migration rate	Out-migration rate
Maizpara	1,706	37	11	76	63	21.7	6.4	44.5	36.9
Daingakata	1,807	40	6	47	81	22.1	3.3	26.0	44.8
Baniachara	3,368	86	29	120	166	25.5	8.6	35.6	49.3
Dakshin Baraitali	2,210	51	15	69	100	23.1	6.8	31.2	45.2
Gobindapur	4,918	121	29	166	172	24.6	5.9	33.8	35.0
Hapaliakata	3,810	95	18	93	166	24.9	4.7	24.4	43.6
Baraitali	17,819	430	108	571	748	24.1	6.1	32.0	42.0
Katakhal	382	14	2	9	16	36.6	5.2	23.6	41.9
Rakhainpara	644	8	8	28	42	12.4	12.4	43.5	65.2
Shantinagar	2,025	41	8	129	123	20.2	4.0	63.7	60.7
Kulalpara	188	5	1	5	2	26.6	5.3	26.6	10.6
Palpara	229	3	1	0	3	13.1	4.4	0.0	13.1
Stationpara	640	11	4	41	31	17.2	6.3	64.1	48.4
Kattoli	440	16	0	17	20	36.4	0.0	38.6	45.5
Harbang	4548	98	24	229	237	21.5	5.3	50.4	52.1
Purbo Kunakhali	1,757	34	10	66	79	19.4	5.7	37.6	45.0
Maddhya Kunakhali	4,856	140	30	141	174	28.8	6.2	29.0	35.8
Furotia Khali	3,165	75	14	89	98	23.7	4.4	28.1	31.0
Konakhali	9,778	249	54	296	351	25.5	5.5	30.3	35.9
Krisnapur	1,626	45	8	32	67	27.7	4.9	19.7	41.2
Chhainama Para	2,925	90	20	85	73	30.8	6.8	29.1	25.0
Dakshin									
Bahaddarkata	2,538	69	13	88	80	27.2	5.1	34.7	31.5
BM Char	7,089	204	41	205	220	28.8	5.8	28.9	31.0

Appendix G. (contd...)

Village	Population	Birth	Death	In-migration	Out-migration	Birth rate	Death rate	In-migration rate	Out-migration rate
Chotta Bheola	921	12	5	27	56	13.0	5.4	29.3	60.8
Hasimar Kata	977	31	10	23	59	31.7	10.2	23.5	60.4
Hamidullah Sikderpara	828	23	3	59	54	27.8	3.6	71.3	65.2
Dwipkul	970	30	7	33	42	30.9	7.2	34.0	43.3
Baniarkum	1,199	32	10	41	42	26.7	8.3	34.2	35.0
Dakshin Khilsadok	1,768	39	7	69	84	22.1	4.0	39.0	47.5
Kaiarbil	6,663	167	42	252	337	25.1	6.3	37.8	50.6
Kaddachura	1,715	39	13	67	66	22.7	7.6	39.1	38.5
Sikder Para	4,110	96	16	105	221	23.4	3.9	25.5	53.8
Baniarchar	955	25	2	25	25	26.2	2.1	26.2	26.2
Kalagazi Sikderpara	1,353	28	9	35	63	20.7	6.7	25.9	46.6
Mabiar Baper Para	758	24	7	31	38	31.7	9.2	40.9	50.1
Jele Para	634	14	3	13	25	22.1	4.7	20.5	39.4
Purba B. Bheola	9,525	226	50	276	438	23.7	5.2	29.0	46.0
Sharharbil Purba Para	1,211	34	7	47	54	28.1	5.8	38.8	44.6
Saharbil Paschim Para	1,077	25	5	44	48	23.2	4.6	40.9	44.6
Madrasha Para	476	13	4	16	32	27.3	8.4	33.6	67.2
Maizghona Purba Para	1,582	46	10	94	93	29.1	6.3	59.4	58.8
Shahapura	1,055	29	10	30	40	27.5	9.5	28.4	37.9
Failla Para	335	8	5	4	24	23.9	14.9	11.9	71.6
Saharbil	5,736	155	41	235	291	27.0	7.1	41.0	50.7

Appendix G. (contd...)

Village	Population	Birth	Death	In-migration	Out-migration	Birth rate	Death rate	In-migration rate	Out-migration rate
Saker Mohammad Char	5,736	171	28	301	270	29.8	4.9	52.5	47.1
Uttar Lotony	1,880	51	16	32	74	27.1	8.5	17.0	39.4
Proper Kakhara	2,953	54	18	99	123	18.3	6.1	33.5	41.7
Kakara	10,569	276	62	432	467	26.1	5.9	40.9	44.2
Dakshin Surajpur	1,264	34	11	42	62	26.9	8.7	33.2	49.1
Dakshin Manikpur	2,791	58	19	89	123	20.8	6.8	31.9	44.1
Uttar Manikpur	4,367	99	22	153	218	22.7	5.0	35.0	49.9
Surajpur Manikpur	8,422	191	52	284	403	22.7	6.2	33.7	47.9
Muchar Para	515	22	3	15	23	42.7	5.8	29.1	44.7
Demoshia Bazar Para	1,048	24	4	12	30	22.9	3.8	11.5	28.6
Ammer Dera Para	1,389	34	8	42	59	24.5	5.8	30.2	42.5
Daskhali Para	1,087	29	5	53	26	26.7	4.6	48.8	23.9
Dhemoshia	4,039	109	20	122	138	27.0	5.0	30.2	34.2
Darbeshkata Manik Para	759	13	8	12	27	17.1	10.5	15.8	35.6
Tekhsira Para	958	23	4	39	14	24.0	4.2	40.7	14.6
Paschim B. Bheola	1717	36	12	51	41	21.0	7.0	29.7	23.9
All	85,905	2,141	506	2,953	3,671	24.9	5.9	34.4	42.7

APPENDIX H

Percentage of population by age and marital status, Chakaria HDSS, 2018

Age (years)	Married	Divorced	Widower/ Widow	Never married	Population
Male					
10-14	0.05	0.0	0.0	99.95	5,811
15-19	2.66	0.11	0.0	97.23	5,168
20-24	19.24	0.23	0.0	80.53	3,660
25-29	51.98	0.45	0.0	47.56	3,018
30-34	80.85	0.69	0.07	18.39	2,797
35-39	94.53	0.54	0.12	4.81	2,371
40-44	98.21	0.36	0.18	1.25	1,989
45-49	98.21	0.39	0.39	1.01	1,627
50-54	98.54	0.35	0.35	0.77	1,288
55-59	96.99	0.52	1.8	0.69	1,082
60-64	96.59	0.1	2.37	0.93	878
65-69	95.0	0.13	3.46	1.41	735
70-74	89.24	0.59	8.81	1.37	460
75-79	83.25	0.25	13.96	2.54	347
80-84	79.21	1.12	18.54	1.12	146
85+	67.24	1.15	31.61	0.0	144
All	49.08	0.3	0.82	49.8	31,521
Female					
10-14	1.11	0.02	0.0	98.87	5,704
15-19	19.92	0.21	0.02	79.85	4,890
20-24	63.14	0.72	0.18	35.97	4,219
25-29	88.06	0.82	0.64	10.48	3,557
30-34	93.49	1.42	1.39	3.7	3,308
35-39	92.83	1.37	3.59	2.22	2,587
40-44	88.06	1.8	8.24	1.9	1,842
45-49	83.35	1.59	12.91	2.14	1,534
50-54	73.34	1.55	22.78	2.33	1,348
55-59	65.83	1.08	30.42	2.67	1,124
60-64	51.6	1.36	43.63	3.4	833
65-69	42.33	1.53	56.13	0.0	625
70-74	25.75	0.46	73.78	0.0	374
75-79	14.95	0.66	84.39	0.0	273
80-84	11.89	2.1	86.01	0.0	132
85+	5.52	0.0	94.48	0.0	129
All	55.46	0.84	8.24	35.46	32,479

APPENDIX I

Chakaria HDSS project team, 2018

Name of Staff	Designation
Dhaka	
Manzoor Ahmed Hanifi	Project Director
Mohammad Iqbal	Project Coordinator
Sabrina Rasheed	Associate Scientist
Shehrin Shaila Mahmood	Assistant Scientist
Md. Abdul Khalek	Research Officer
Mohammad Shohel Rana	Administrative Officer
Chakaria	
Shahidul Hoque	Field Research Manager
Mijanur Rahaman	Senior Field Research Officer
Ashish Paul	Data Management Officer
Md. Sharif Al Hasan	Field Research Officer
Md. Rehmat Ali	Field Research Supervisor
Fatema Zannat	Surveillance Worker (Rural)
Ismat Jahan Khuki	Surveillance Worker (Rural)
Jesmin Akter Rano	Surveillance Worker (Rural)
Kawsar Jannat	Surveillance Worker (Rural)
Kulsuma Akter	Surveillance Worker (Rural)
Monuara Begum	Surveillance Worker (Rural)
Mosharafa Sultana	Surveillance Worker (Rural)
Nasima Jannat	Surveillance Worker (Rural)
Nazma Akter	Surveillance Worker (Rural)
Raihan Zannat	Surveillance Worker (Rural)
Reshma Akter	Surveillance Worker (Rural)
Segupta Jahan	Surveillance Worker (Rural)
Tanjina Zannat Ara	Surveillance Worker (Rural)
Umme Habiba Mamata	Surveillance Worker (Rural)