

 icddr,b আন্তর্জাতিক উদরাময় গবেষণা কেন্দ্র  
চকরিয়া ক্যাম্পাস, চকরিয়া, কক্সবাজার

# CHAKARIA HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM REPORT - 2019

Focusing on Health and Climate Change

# **CHAKARIA HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM REPORT – 2019**

**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
UKAid	Foreign, Commonwealth and Development Office, UK
VHP	Village health post
WHO	World Health Organization

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### Introduction

Chakaria is one of the 492 *Upazilas* (sub-district) in Bangladesh, 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 5,64,539\* in 2019. 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 to improve of the 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 an 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 include assessment of health needs, defining actions for health, implementing them, and monitoring their implementation and outputs. Among the health-related activities, identifying volunteers for health education, mobilizing local resources to establish village health posts (VHP) and their management, introducing a pre-paid family health card, and establishing 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 the 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 the area since 1999. The primary purpose of this surveillance system is to monitor the impact of interventions with a focus on equity and to 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 2019.

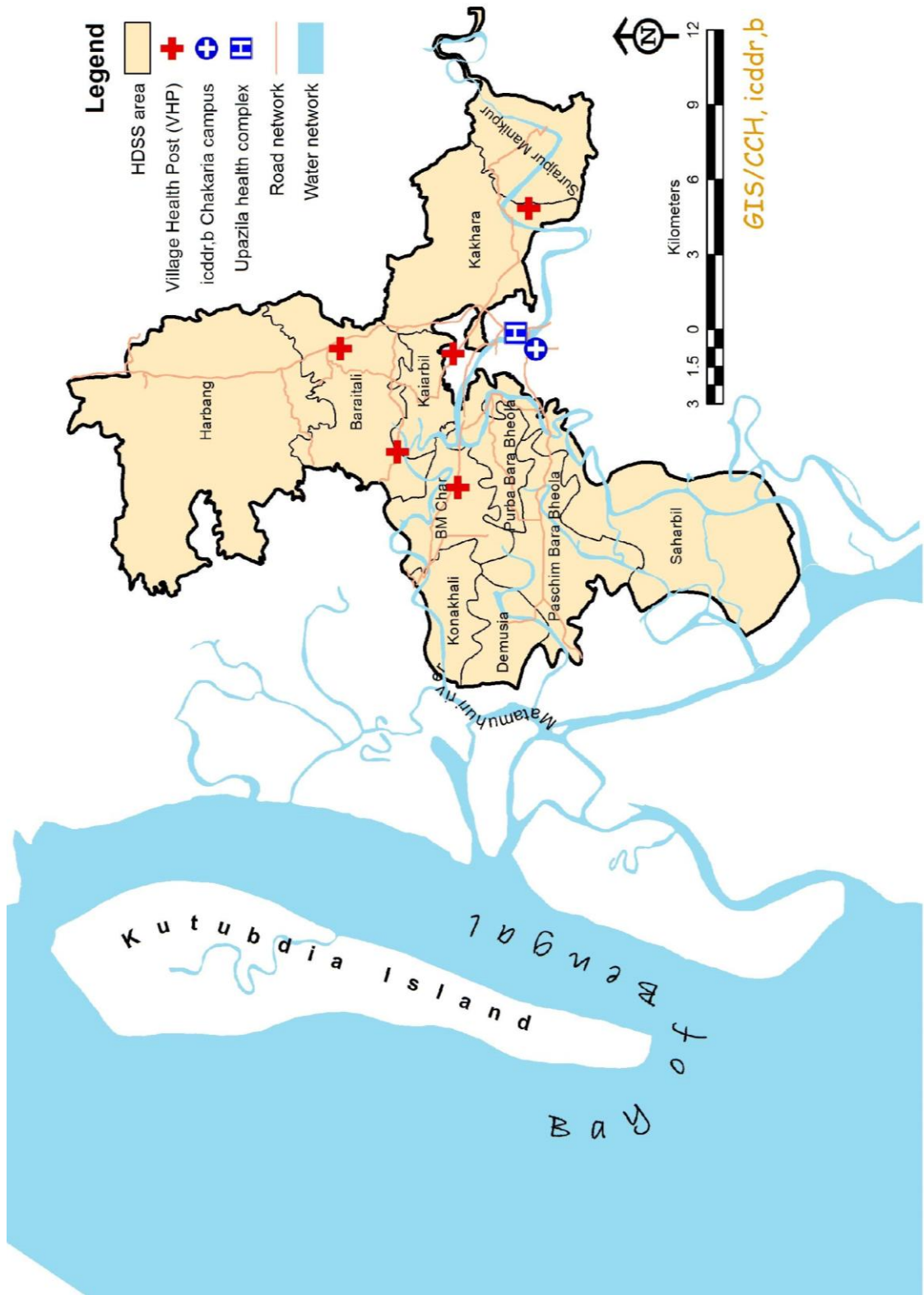
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\*Estimated population based on Census 2011, Bangladesh Bureau of Statistics (BBS), SID, Ministry of Planning, Government of The People's Republic of Bangladesh, December 2013.

**Existing health services in Chakaria HDSS area, 2019**

<b>Healthcare facility/provider</b>	<b>Number</b>
<b>icddr,b facilitated and Community initiated</b>	
Village health post	5
Trained midwife	12
Physician	1
Male paramedic	10
Medical assistant	2
<b>Government</b>	
Union Health and Family Welfare Centre (UHFWC)	11
EPI outreach centre	264
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
<b>Private</b>	
Village doctor (allopathic)	241
Village doctor (homeopathic)	102
Allopathic pharmacy	177
Homeopathic pharmacy	15
Diagnostic centre	4
<b>NGO</b>	
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, Kayerbil, 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 a 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 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 a 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, an 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 were divided into 13 work areas, and 13 SWs residing in each of the work areas were recruited for data collection. Most of the households included in the system prior to this modification were also included in the new system. The modification of the system 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 surveillance system includes complete villages (3). Currently, surveillance covers 86,667 individuals (16,772 households). From the beginning of 2015, the data collection process was shifted from paper-based to a web-based system. A web-based software application has been designed and developed. 14 tabs (smartphones) are connected with mobile internet through mobile operator network. The SWs collect data using these devices, and data are stored directly in a database in the central server.

One supervisor had been assigned to supervise the data-collection process. To detect any anomalies, a team of four independent interviewers re-visited 5% of the households, chosen randomly, within 2 days of the SW's visit. Afterward, 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

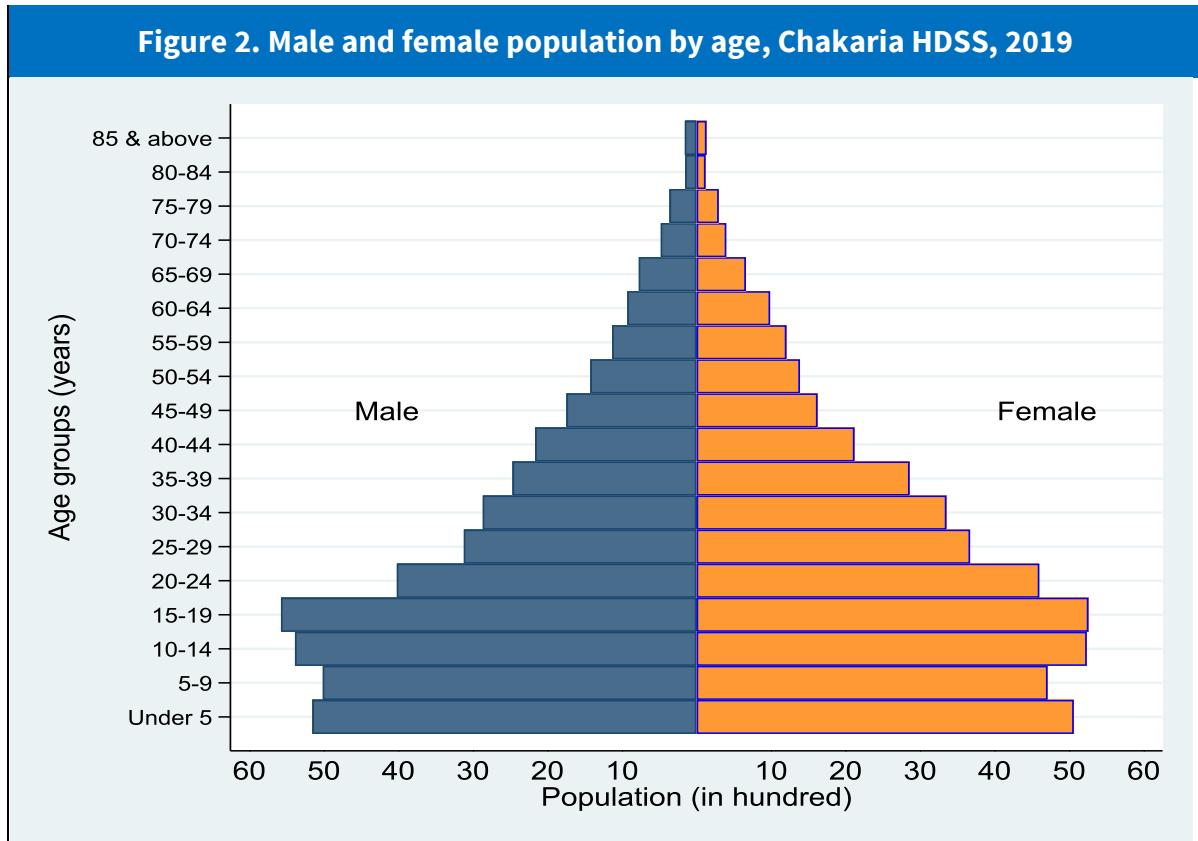
inconsistencies. Subsequently, computer-based data-editing procedures were applied to ensure the quality of data.

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 or any other adult member. 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 differs 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 2019 is presented in Figure 2. The shape of the pyramid is typical of a developing country with declining rates of mortality and fertility. The population sex ratio (male per 100 females) was 98.3 in 2019. The age dependency ratio<sup>1</sup> was 65.0% in 2019 (see Appendix A).



<sup>1</sup> 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 5.8 per 1,000 population in 2019. The infant mortality rate was 42.9 per 1,000 live births. The child mortality rate was 2.9 per 1,000 children aged 1-4 years (Table 1).

Abridged Life Tables for males and females are presented in Table 2. Life expectancy at birth was about 68 years for males and 71 years for females. Figure 3 shows the probability of survival by sex during various age groups. Up to 45 years, the probability of survival remained almost the same for both males and females. After that, the survival probability of females was higher than male survival. The rate of mortality of children aged less than 5 years (under-five mortality) was 50.5 per 1,000 live births in Chakaria HDSS in 2019 (Table 3).

**Table 1. Age-specific death rate per 1,000 population by sex, Chakaria HDSS, 2019**

Age (years)	No. of death			Death rate		
	Male	Female	Both	Male	Female	Both
<1*	44	46	90	42.5	43.5	43.0
<1 month	31	31	62	30.0	29.3	29.6
1-11 month	13	15	28	12.6	14.2	13.4
1-4	14	9	23	3.4	2.2	2.8
5-9	4	2	6	0.8	0.4	0.6
10-14	0	1	1	0.0	0.2	0.1
15-19	2	3	5	0.4	0.6	0.5
20-24	3	3	6	0.7	0.7	0.7
25-29	4	2	6	1.3	0.5	0.9
30-34	3	4	7	1.0	1.2	1.1
35-39	5	2	7	2.0	0.7	1.3
40-44	12	6	18	5.5	2.8	4.2
45-49	13	3	16	7.4	1.8	4.7
50-54	10	11	21	7.0	7.9	7.5
55-59	16	9	25	14.1	7.5	10.7
60-64	21	20	41	22.6	20.2	21.4
65-69	33	29	62	42.5	43.7	43.0
70-74	23	24	47	47.7	59.9	53.2
75-79	34	23	57	93.7	76.9	86.1
80-84	15	9	24	98.0	73.8	87.3
85+	28	16	44	176.1	118.5	149.7
All	284	222	506	6.6	5.1	5.8
*Per 1,000 live births						

**Table 2. Abridged Life Table, Chakaria HDSS, 2019**

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	0.0409	0.0394	100,000	96,454	67.8	0.0440	0.0423	100,000	96,189	70.6
1	0.0034	0.0136	96,059	381,618	69.6	0.0022	0.0089	95,766	381,356	72.8
5	0.0008	0.0040	94,749	472,804	66.6	0.0004	0.0021	94,912	474,057	69.4
10	0.0000	0.0000	94,372	471,862	61.8	0.0002	0.0010	94,711	473,328	64.5
15	0.0004	0.0018	94,372	471,439	56.8	0.0006	0.0028	94,620	472,428	59.6
20	0.0007	0.0037	94,203	470,140	51.9	0.0007	0.0033	94,351	470,987	54.8
25	0.0013	0.0064	93,853	467,766	47.1	0.0005	0.0027	94,044	469,579	49.9
30	0.0010	0.0052	93,254	465,054	42.4	0.0012	0.0059	93,788	467,546	45.1
35	0.0020	0.0101	92,768	461,503	37.6	0.0007	0.0035	93,230	465,338	40.3
40	0.0055	0.0273	91,833	452,896	32.9	0.0028	0.0141	92,905	461,261	35.5
45	0.0074	0.0365	89,325	438,465	28.8	0.0018	0.0092	91,600	455,893	30.9
50	0.0070	0.0345	86,061	422,889	24.8	0.0079	0.0388	90,758	444,979	26.2
55	0.0141	0.0682	83,095	401,307	20.6	0.0075	0.0366	87,234	428,188	22.1
60	0.0226	0.1070	77,428	366,432	16.9	0.0202	0.0962	84,041	399,984	17.9
65	0.0425	0.1920	69,145	312,539	13.6	0.0437	0.1969	75,952	342,379	14.5
70	0.0477	0.2132	55,871	249,581	11.3	0.0599	0.2603	60,999	265,300	12.5
75	0.0937	0.3795	43,961	178,103	8.7	0.0769	0.3226	45,121	189,216	11.0
80	0.0980	0.3937	27,280	109,548	7.5	0.0738	0.3114	30,566	129,032	10.0
85+	0.1761	1.0000	16,540	93,921	5.7	0.1185	1.0000	21,047	177,584	8.4

The Abridged life table is constructed by 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  $x+n$ ;

${}_n q_x = {}_n m_x / [(1/n) + {}_n m_x \{1/2 + n/12({}_n m_x - \log_e c)\}]$ ;  
 $\log_e c = .095$

$l_x$  = 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;

$L_0 = .20l_0 + .80l_1$ ,  $L_{85+} = l_{85+} / m_{85+}$

$e_x$  = 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, 2019**

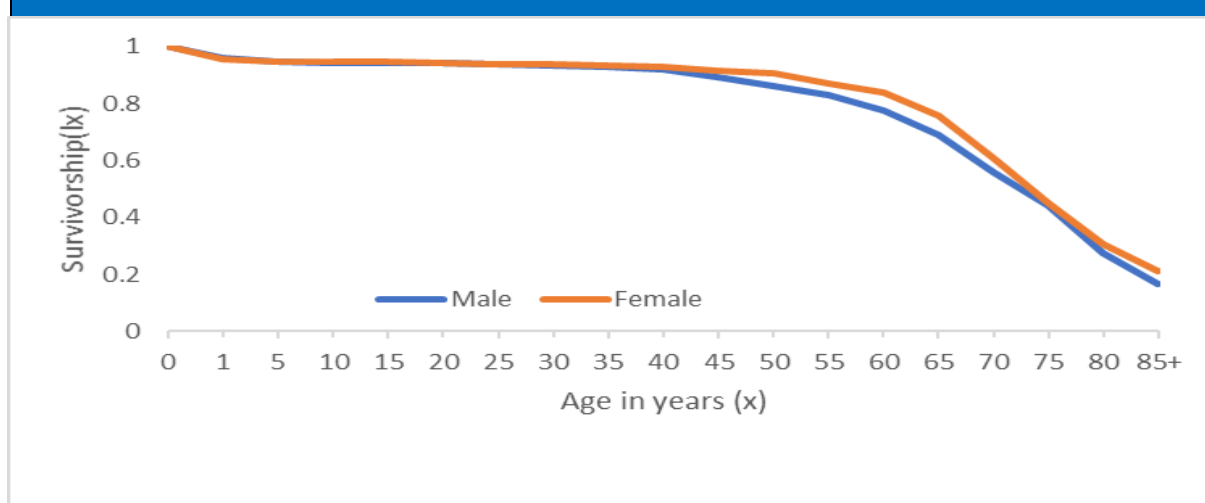
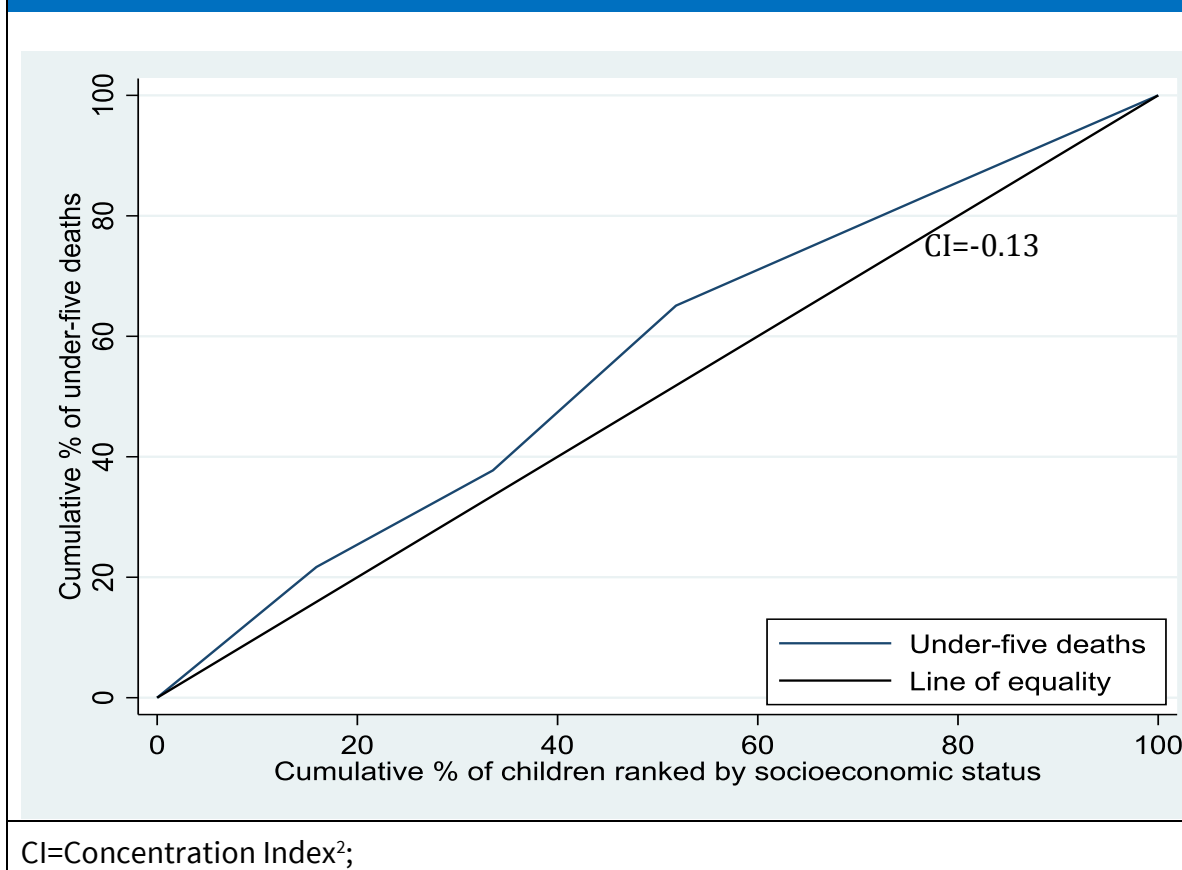


Table 3 presents the under-five mortality rate by household asset quintile. The under-five mortality rate was the lowest in the highest asset quintile. The under-five mortality rate from the lowest quintile was 1.7 times greater than that of the highest quintile. The under-five mortality rate was higher 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 are 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, 2019**

Asset quintile	No. of births			No. of under-five deaths			Under-five mortality rate		
	Boy	Girl	Both	Boy	Girl	Both	Boy	Girl	Both
Lowest	177	157	334	9	9	18	50.8	57.3	53.9
Second	175	195	370	14	10	24	80.0	51.3	64.9
Middle	181	203	384	9	19	28	49.7	93.6	72.9
Fourth	261	256	517	11	9	20	42.1	35.2	38.7
Highest	246	248	494	11	5	16	44.7	20.2	32.4
All	1,040	1,059	2,099	54	52	106	51.9	49.1	50.5

**Figure 4. Concentration curve for under-five mortality, Chakaria HDSS, 2019**



## Causes of death

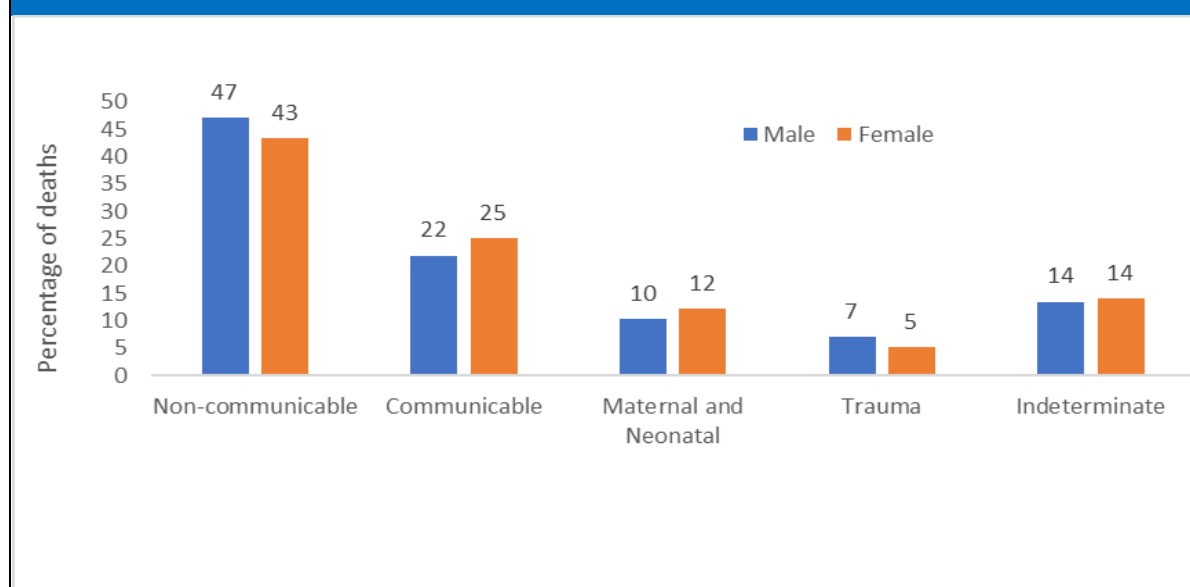
Verbal autopsy data on signs, symptoms and circumstances leading to death, and medical history of the deceased were collected during the quarterly household visits from an informed household member. A total of 506 deaths were registered in 2019. Data were analyzed using “InterVA-4.04” (5) to ascertain the causes of death.

## Broad pattern of the causes of death

Non-communicable conditions were the leading cause of death for both males (47%) and females (43%). This was followed by communicable diseases (male-22%, female-25%), maternal and neonatal condition (male-10%, female-12%), and trauma (male-7%, female-5%). For communicable diseases, the proportion of deaths was higher for females than males (Figure 5). Neonatal conditions were the leading causes of death in <15 years children and non-communicable diseases were the leading causes of death for adults and elderly people (Table 4).

<sup>2</sup> 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 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 leading causes for males and females, Chakaria HDSS, 2019**



**Table 4. Distribution of deaths by causes according to age groups, Chakaria HDSS, 2019**

Cause group	Children (<15 years) (%)	Adults (15-49 years) (%)	Elderly (50+ years) (%)
Communicable	30.6	15.9	22.0
Non-communicable	6.3	45.4	61.3
Maternal and neonatal	44.1	2.6	0.0
Trauma	8.6	22.9	1.7
Indeterminate	10.3	13.3	15.0
Total	100.0	100.0	100.0

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

**Table 5. Distribution of causes of death among males and females, Chakaria HDSS, 2019**

<b>Causes</b>	<b>Male (n=284)</b>	<b>Female (n=222)</b>	<b>Both (n=506)</b>
Sepsis (non-obstetric)	1.6	1.0	1.3
Acute respiratory infection, including pneumonia	10.4	14.9	12.4
HIV/AIDS related death	1.5	1.0	1.3
Diarrhoeal diseases	0.1	1.7	0.8
Malaria	0.0	0.0	0.0
Measles	0.0	0.0	0.0
Meningitis and encephalitis	2.0	2.0	2.0
Pulmonary tuberculosis	4.8	3.2	4.1
Pertussis	0.0	0.0	0.0
Haemorrhagic fever	0.3	0.0	0.2
Other and unspecified infectious diseases	1.2	1.3	1.2
Oral neoplasms	0.0	0.5	0.2
Digestive neoplasms	3.2	3.6	3.3
Respiratory neoplasms	3.4	1.7	2.7
Breast neoplasms	0.0	1.6	0.7
Reproductive neoplasms M, F	1.4	2.0	1.6
Other and unspecified neoplasms	4.8	2.4	3.8
Severe anaemia	0.2	0.2	0.2
Severe malnutrition	0.9	0.2	0.6
Diabetes mellitus	1.3	4.8	2.8
Acute cardiac disease	4.2	1.2	2.9
Stroke	11.0	10.2	10.6
Sickle cell with crisis	0.0	0.0	0.0
Other and unspecified cardiac diseases	5.7	4.2	5.0
Chronic obstructive pulmonary disease	3.8	5.4	4.5
Asthma	0.3	1.6	0.9
Acute abdomen	2.5	0.9	1.8
Liver cirrhosis	2.3	0.8	1.6
Renal failure	1.7	1.8	1.8
Epilepsy	0.4	0.0	0.2
Ectopic pregnancy	0.0	0.0	0.0
Abortion-related death	0.0	0.0	0.0
Pregnancy-induced hypertension	0.0	0.8	0.3
Obstetric haemorrhage	0.0	0.0	0.0
Obstructed labour	0.0	0.0	0.0
Pregnancy-related sepsis	0.0	0.0	0.0
Other and unspecified maternal causes of death	0.0	0.0	0.0

**Table 5. (contd...)**

<b>Causes</b>	<b>Male (n=284)</b>	<b>Female (n=222)</b>	<b>Both (n=506)</b>
Prematurity	3.0	3.9	3.4
Birth asphyxia	1.9	2.2	2.0
Neonatal pneumonia	1.9	2.7	2.2
Neonatal sepsis	0.8	0.1	0.5
Congenital malformation	1.2	0.0	0.7
Other and unspecified neonatal causes of death	1.7	2.5	2.0
Road traffic accident	1.3	1.3	1.3
Other transport accident	3.1	1.1	2.2
Accidental fall	0.3	0.4	0.3
Accidental drowning and submersion	1.4	1.3	1.4
Accidental exposure to smoke fire & flame	0.1	0.3	0.2
Contact with venomous plant/animal	0.0	0.0	0.0
Accidental poisoning & noxious substances	0.0	0.0	0.0
Intentional self-harm	0.0	0.3	0.1
Assault	0.3	0.5	0.4
Exposure to force of nature	0.3	0.0	0.2
Other and unspecified external causes of death	0.2	0.0	0.1
Other and unspecified non-communicable diseases	0.2	0.4	0.3
Indeterminate	13.5	14.1	13.8
<b>All</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

## CHAPTER 5

### Fertility

The crude birth rate in 2019 was 24.2 per 1,000 population, which was lower than in 2018 (24.9 per 1,000 population) (Table 20). The fertility rate was highest among women aged 20-24 years (Table 6). The total fertility rate (TFR) in 2019 was 2.7 per woman, which was slightly lower than in 2018 (2.8 per woman).

Table 6. Age-specific fertility rate per 1,000 women aged 15-49 years, Chakaria HDSS, 2019						
Age (years)	No. of females	No. of births			Birth rate	
		Male	Female	Both		
15-19	5,259	117	130	247	47.0	
20-24	4,600	384	368	752	163.5	
25-29	3,672	290	303	593	161.5	
30-34	3,354	178	167	345	102.9	
35-39	2,860	61	79	140	49.0	
40-44	2,120	7	8	15	7.1	
45-49	1,625	1	3	4	2.5	
All	23,490	1,038	1,058	2,096	-	
TFR (15-49)					2.7	
TFR=Total fertility rate expressed per woman						

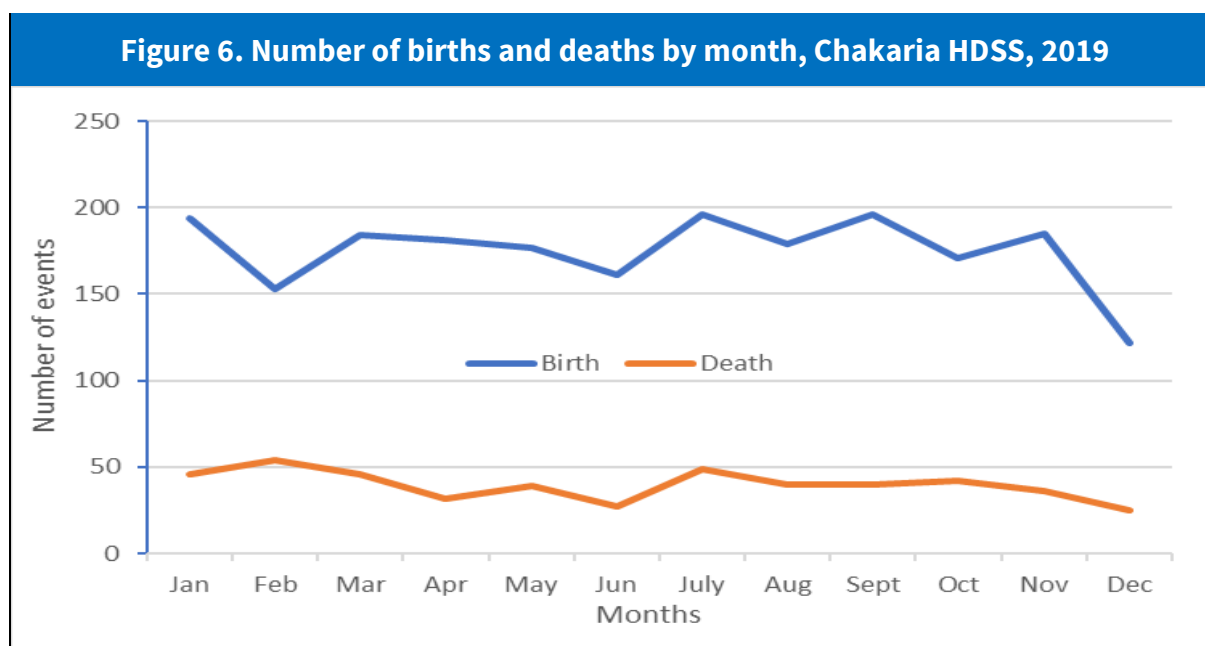
Table 7 presents the crude birth rate by household asset quintiles. The crude birth rate was the lowest among the second quintile.

Table 7. Crude birth rate per 1,000 population by asset quintile and sex of child, Chakaria HDSS, 2019									
Asset quintile	Midyear population			No. of births			Birth rate		
	Male	Female	Both	Boy	Girl	Both	Boy	Girl	Both
Lowest	7,493	7,754	15,247	177	157	334	23.6	20.2	21.9
Second	9,158	9,114	18,272	174	194	368	19.0	21.3	20.1
Middle	8,424	8,402	16,826	181	203	384	21.5	24.2	22.8
Fourth	9,670	9,709	19,379	261	256	517	27.0	26.4	26.7
Highest	8,214	8,729	16,943	245	248	493	29.8	28.4	29.1
All	42,959	43,708	86,667	1,038	1,058	2,096	24.2	24.2	24.2

Of the 2,461 pregnancies in 2019, 83.7% ended with live births. Among the remaining 16.3%, 10.2 percentage points were spontaneous abortions, 2.6 percentage points were induced abortions, and 3.5 percentage points resulted in stillbirths (Table 8).

Table 8. Pregnancy outcome, Chakaria HDSS, 2019		
Pregnancy outcome	No.	%
Spontaneous abortion	251	10.2
Induced abortion	64	2.6
Stillbirth	85	3.5
Live birth*	2,061	83.7
Total number of pregnancies	2,461	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 (two live births-19 and three live births-1) multiple live births were recorded.



The distribution of births and deaths by month is 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 for the month of January and the time period of July to September.

## CHAPTER 6

### Migration

In 2019, the out-migration rate was higher at 34.1 per 1,000 population than in-migration rate at 24.6 per 1,000 population (Table 9). The rates were lower for out-migration and the same for in-migration in 2018 (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 2019. The sex differential in both types of migrations was prominent. The number of in-migration and the number of out-migration was highest in January for both males and females.

**Table 9. Migration rate per 1,000 population by asset quintile and sex, Chakaria HDSS, 2019**

Asset quintile	Midyear population			In-migration rate			Out-migration rate		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
Lowest	7,493	7,754	15,247	21.1	31.0	26.1	35.8	44.9	40.4
Second	9,158	9,114	18,272	13.5	26.4	20.0	23.7	39.3	31.5
Middle	8,424	8,402	16,826	12.9	27.0	20.0	21.7	38.0	29.8
Fourth	9,670	9,709	19,379	13.8	31.6	22.7	26.2	40.0	33.1
Highest	8,214	8,729	16,943	19.4	49.8	35.1	32.6	40.7	36.8
All	42,959	43,708	86,667	15.9	33.2	24.6	27.7	40.5	34.1

**Table 10. Number of migrants by sex and month, Chakaria HDSS, 2019**

Month	In-migration			Out-migration		
	Male	Female	Both	Male	Female	Both
January	184	285	469	201	239	440
February	90	151	241	123	162	285
March	81	163	244	123	168	291
April	85	171	256	150	211	361
May	46	90	136	106	121	227
June	70	135	205	124	168	292
July	30	70	100	95	158	253
August	34	85	119	66	128	194
September	22	90	112	59	104	163
October	25	102	127	65	120	185
November	9	58	67	33	104	137
December	7	50	57	44	85	129
All	683	1,450	2,133	1,189	1,768	2,957



## Origin and destination of migrants

During 2019, 7.5% of 2,133 in-migrants moved into Chakaria HDSS households from outside Bangladesh, whereas 16.6% of 2,957 out-migrants moved out of Bangladesh from the Chakaria HDSS area. In both cases, male migrants were dominant compared to female migrants. The proportion of migrants that moved out of Bangladesh was higher than the proportion of migrants that moved into Bangladesh. The in-migration was higher than the out migration in Chakaria (Table 11).

<b>Table 11. Origin and destination of migrants by sex, Chakaria HDSS, 2019</b>						
<b>Origin or destination</b>	<b>In-migration</b>			<b>Out-migration</b>		
	Male (%)	Female (%)	Both (%)	Male (%)	Female (%)	Both (%)
Inside Bangladesh	78.3	99.2	92.5	64.2	96.3	83.4
Outside Bangladesh	21.7	0.8	7.5	35.8	3.7	16.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total number of migrants	683	1,450	2,133	1,189	1,768	2,957
<b>Cox's Bazar District</b>						
Inside Chakaria	80.0	80.9	80.7	80.2	79.6	79.8
Outside Chakaria	20.0	19.1	19.3	19.8	20.4	20.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total no. of migrants	340	1,121	1,461	660	1,538	2,198
<b>Chakaria Upazila</b>						
Inside HDSS area	65.1	64.8	64.9	47.1	56.1	53.8
Outside HDSS area	34.9	35.2	35.1	52.9	43.9	46.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total no. of migrants	272	907	1,179	329	921	1,250

## Reasons for migration

Table 12 presents the reasons for migration by sex. 45.2% of the migrants moved out due to family-related issues, followed by housing (30.6%), work (12.7%), and education (9.0%). Reasons for moving out for males were different from those of females. 52.2% of male in-migrants moved due to housing related issues whereas only 16.1% of the females moved due to that reason. On the other hand, 63.4% of female in-migrants moved due to family related issues - mostly marriage, while 18.1% of males moved due to family related reasons (Table 12). The reasons of movement for out-migration were similar to the reasons for in-migration.

Table 12. Reasons for migration, Chakaria HDSS, 2019						
Reasons for migration	In-migration			Out-migration		
	Male (%)	Female (%)	Both (%)	Male (%)	Female (%)	Both (%)
Family-related	30.5	72.4	59.0	18.1	63.4	45.2
Work-related	11.6	7.1	8.5	16.8	10.0	12.7
Housing-related	45.4	12.0	22.7	52.2	16.1	30.6
Education	10.8	7.4	8.5	10.7	7.8	9.0
Other	1.8	1.1	1.3	2.2	2.8	2.5
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total no. of migrants	683	1,450	2,133	1,189	1,768	2,957

## CHAPTER 7

### Marriage

In total 1,791 marriages took place in the surveillance villages in Chakaria during 2019 and the crude marriage rate was 20.7 per 1,000 population, with a greater rate among females than males. Among males, the highest marriage rate was found in the age group of 25-29 years and in the age group of 15-19 years for females. Throughout 2019, 98 divorces were registered in the 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 October and the lowest in December (Figure 7).

**Table 13. Crude rate of marriage and divorce by age and sex, Chakaria HDSS, 2019**

Age (years)	Marriage			Divorce		
	Male	Female	Both	Male	Female	Both
10-14	0.2	6.1	3.1	0.0	0.0	0.0
15-19	13.3	104.8	57.7	0.5	4.0	2.2
20-24	50.7	82.6	67.7	2.2	4.8	3.6
25-29	73.0	20.7	44.7	3.8	3.3	3.5
30-34	54.0	6.0	28.1	1.4	3.0	2.2
35-39	13.0	2.4	7.3	0.8	0.0	0.4
40-44	4.2	1.9	3.0	0.5	0.5	0.5
45-49	1.1	1.2	1.2	0.0	0.0	0.0
50-54	1.4	0.0	0.7	0.0	0.0	0.0
55-59	0.0	0.8	0.4	0.0	0.0	0.0
60-64	3.2	1.0	2.1	0.0	0.0	0.0
65+	9.0	0.0	4.9	0.5	0.0	0.3
All	16.7	24.6	20.7	0.7	1.5	1.1

**Figure 7. Number of marriages by month, Chakaria HDSS, 2019**

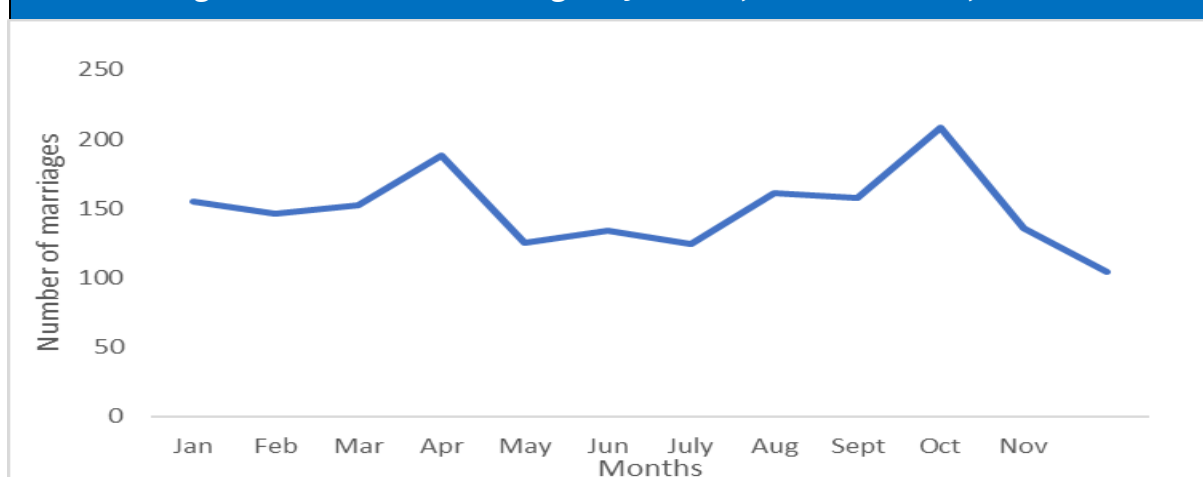


Table 14 presents singulate mean age at marriage (SMAM), and mean and median ages at first marriage. The SMAM, mean and median ages at first marriage for males were 28 years, 25 years, and 28 years respectively. For females, the mean and median ages at first marriage were 18 and 22 years, and the SMAM was 22 years. The SMAM, mean and median ages at first marriage remained nearly the same as in 2018 for both males and females. All indicators for males and females were almost positively associated with household socioeconomic status (Table 14).

<b>Table 14. Age at marriage by sex and asset quintile, Chakaria HDSS, 2019</b>						
<b>Asset quintile</b>	<b>Male</b>			<b>Female</b>		
	SMAM*	Mean age at first marriage	Median age at first marriage*	SMAM*	Mean age at first marriage	Median age at first marriage*
Lowest	25.3	23.8	25.0	21.3	18.1	21.0
Second	27.5	24.2	27.1	21.3	18.2	21.0
Middle	27.6	24.5	27.0	22.6	18.3	22.4
Fourth	28.8	25.4	28.6	22.3	18.3	21.6
Highest	30.4	27.0	30.6	22.2	18.9	21.2
All	28.2	25.1	27.8	22.2	18.4	21.6

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, 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 Community 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 6 private hospitals provide healthcare services at the headquarters of Chakaria. At the union level, 11 Union Health and Family Welfare Centres (UHFWCs) of the government, and 5 village health posts 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

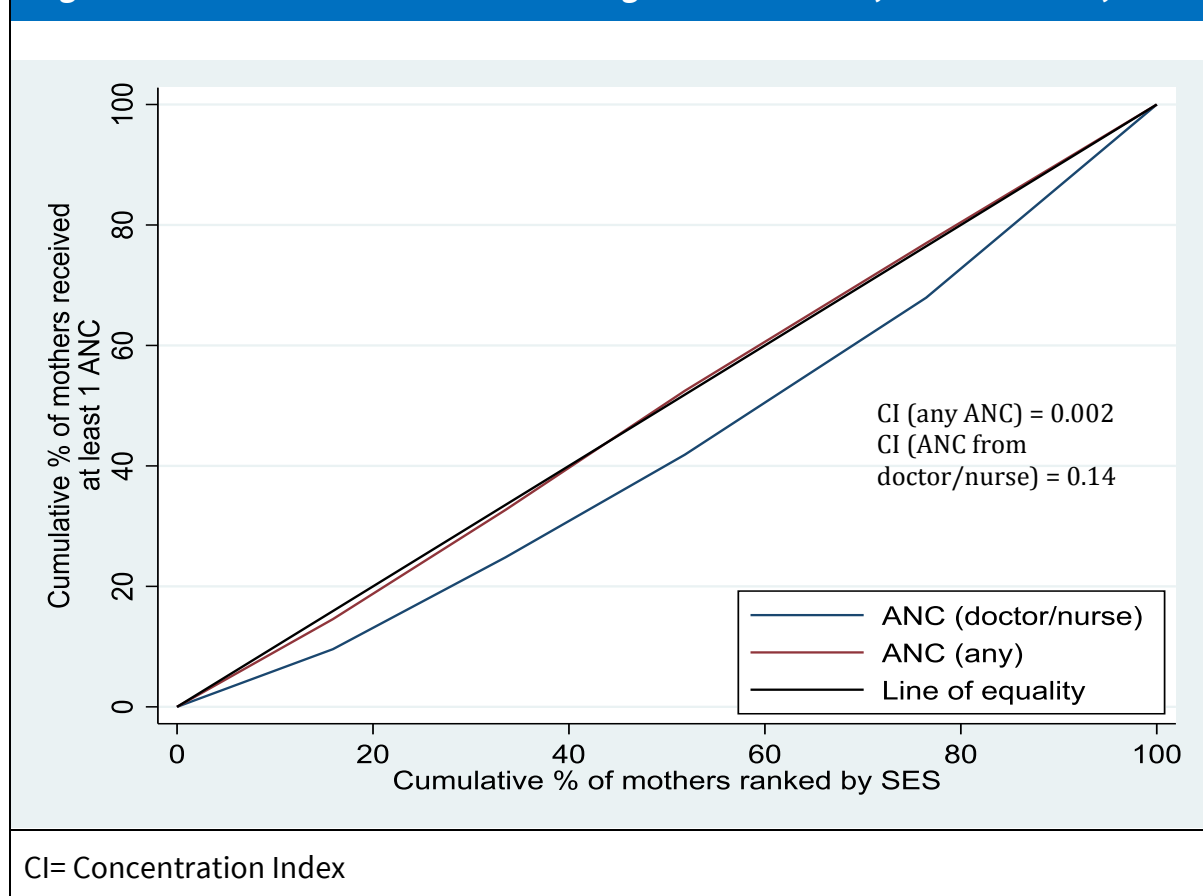
Among 2,099 women who gave live births, 76.2% received at least one antenatal care (ANC). These women received services from various sources. Among these sources, the nurses/doctors were dominant, followed by FWV and FDSR/CMH and midwives (Table 15). The use of at least one ANC during pregnancy was almost equitable during 2019 in the Chakaria HDSS area. Seventy percentages of the pregnant women from the lowest socioeconomic quintile used at least one ANC during pregnancy as opposed to 74.5% 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, the use of ANC service from doctors or nurses indicated a higher level of inequity where the rate was 58.3% for women in the highest socioeconomic quintile and only 25.7% 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 distribution of ANC service from doctor/nurse was more unequal than the distribution of ANC service from any other sources.

**Table 15. Antenatal care by sources and asset quintile, Chakaria HDSS, 2019**

Asset quintile	Received any ANC (%)	Midwife* (%)	FWV* (%)	Nurse/doctor* (%)	FDSR/CMH* (%)	None (%)	No. of women
Lowest	69.8	14.7	18.0	25.7	13.5	30.2	334
Second	78.4	16.5	15.4	37.0	11.4	21.6	370
Middle	82.3	15.4	13.8	39.8	13.0	17.7	384
Fourth	75.8	10.3	12.0	45.3	8.1	24.2	517
Highest	74.5	2.8	5.1	58.3	6.3	25.5	494
Total	76.2	11.2	12.2	42.8	10.0	23.8	2,099

\*Multiple responses recorded  
 ANC=Antenatal care  
 FWV=Family welfare visitor  
 FDSR=Family Development Services and Research  
 CMH= Christian Memorial Hospital

**Figure 8. Concentration curve for receiving at least one ANC, Chakaria HDSS, 2019**

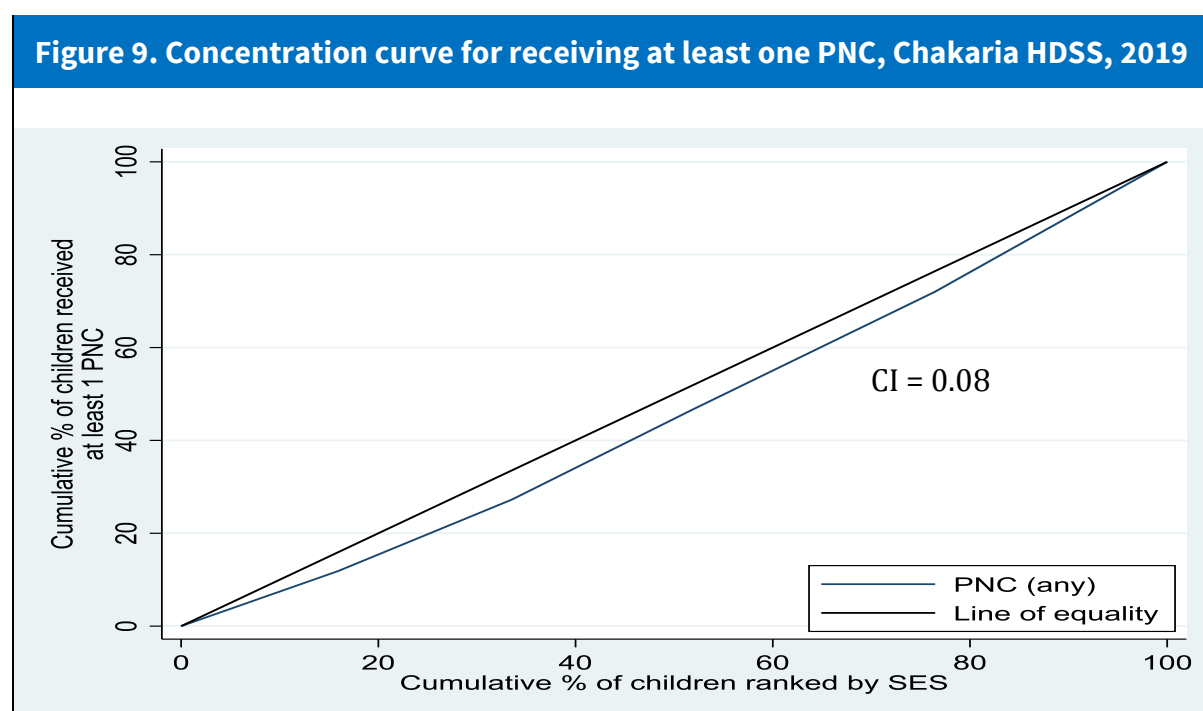


## Use of postnatal care services

Any postnatal check-up of both women and children up to 42 days of their delivery is of interest here. It was observed that only 47.0% of the delivering women received at least one postnatal care (PNC) in 2019. 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 services compared to the poor. In 2018 and 2019 the CI were 0.11 and 0.08, respectively which means the gap of receiving PNC services went down slightly.

Table 16. Postnatal care by sources and asset quintile, Chakaria HDSS, 2019							
Asset quintile	Received any PNC (%)	Midwife* (%)	FWV* (%)	Nurse/doctor* (%)	FDSR/CMH* (%)	None (%)	No. of women
Lowest	35.0	7.2	1.5	24.6	2.7	65.0	334
Second	41.1	7.8	2.2	29.2	3.8	58.9	370
Middle	49.7	9.1	3.6	36.2	3.9	50.3	384
Fourth	48.5	11.6	2.7	35.0	2.3	51.5	517
Highest	55.9	5.5	2.6	44.5	6.5	44.1	494
Total	47.0	8.3	2.6	34.8	3.9	53.0	2,099

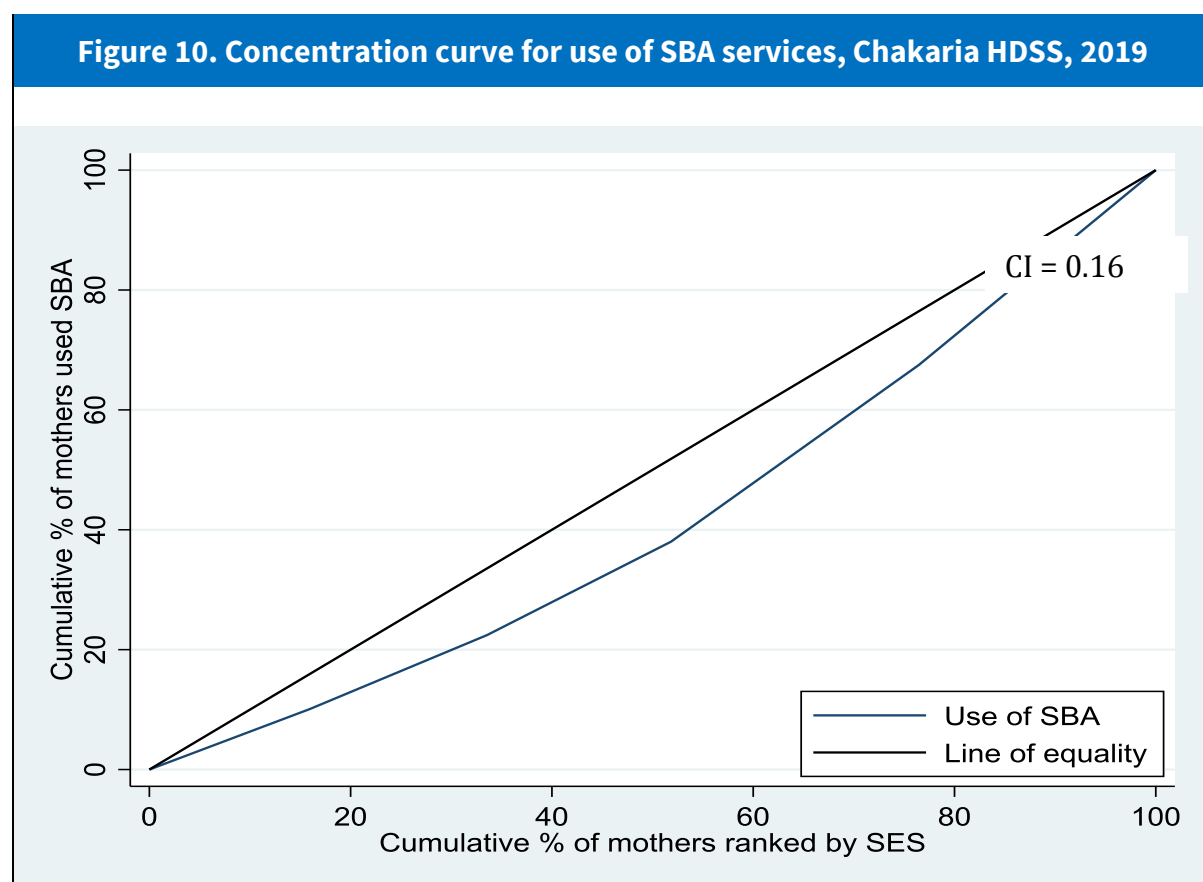
\*Multiple responses recorded  
PNC = Postnatal care



## Assistance during delivery

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. 60% of 2,099 deliveries in Chakaria were assisted by the TBAs as opposed to 40% 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.)

Table 17. Assistance during delivery by asset quintile, Chakaria HDSS, 2019					
Asset quintile	Midwife (%)	FWV (%)	Nurse/ doctor (%)	TBA (%)	No. of Women
Lowest	7.8	2.7	14.7	74.9	334
Second	8.9	3.2	15.7	72.2	370
Middle	12.2	3.1	18.5	66.1	384
Fourth	16.2	4.1	27.3	52.4	517
Highest	9.1	4.0	41.7	45.1	494
Total	11.2	3.5	25.0	60.3	2,099





## Place of delivery

Of the total number of deliveries, 71% took place at home. Only 28.6% of 2,099 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, 2019			
Asset quintile	Hospital/Clinic (%)	Home (%)	No. of women
Lowest	16.2	83.8	334
Second	17.8	82.2	370
Middle	21.6	78.4	384
Fourth	28.8	71.2	517
Highest	50.4	49.6	494
Total	28.6	71.4	2,099

Figure 11. Concentration curve for facility-based delivery, Chakaria HDSS, 2019

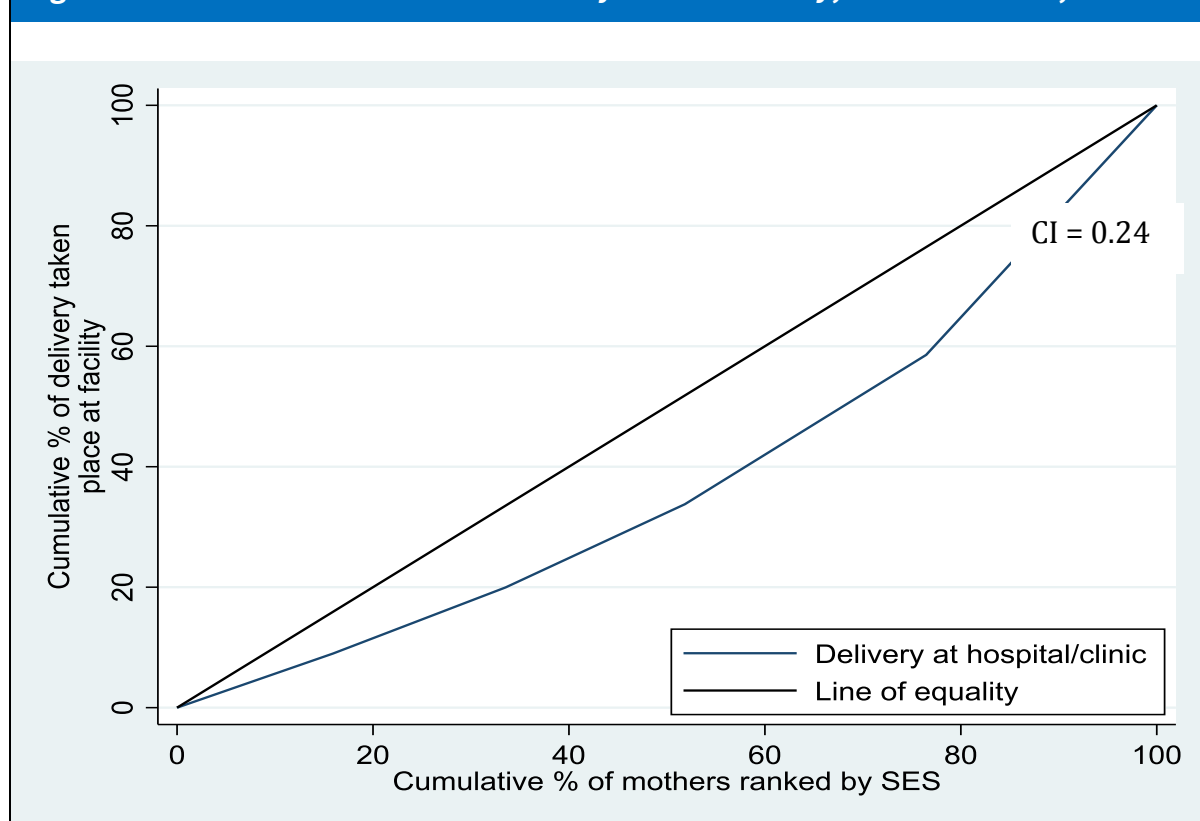
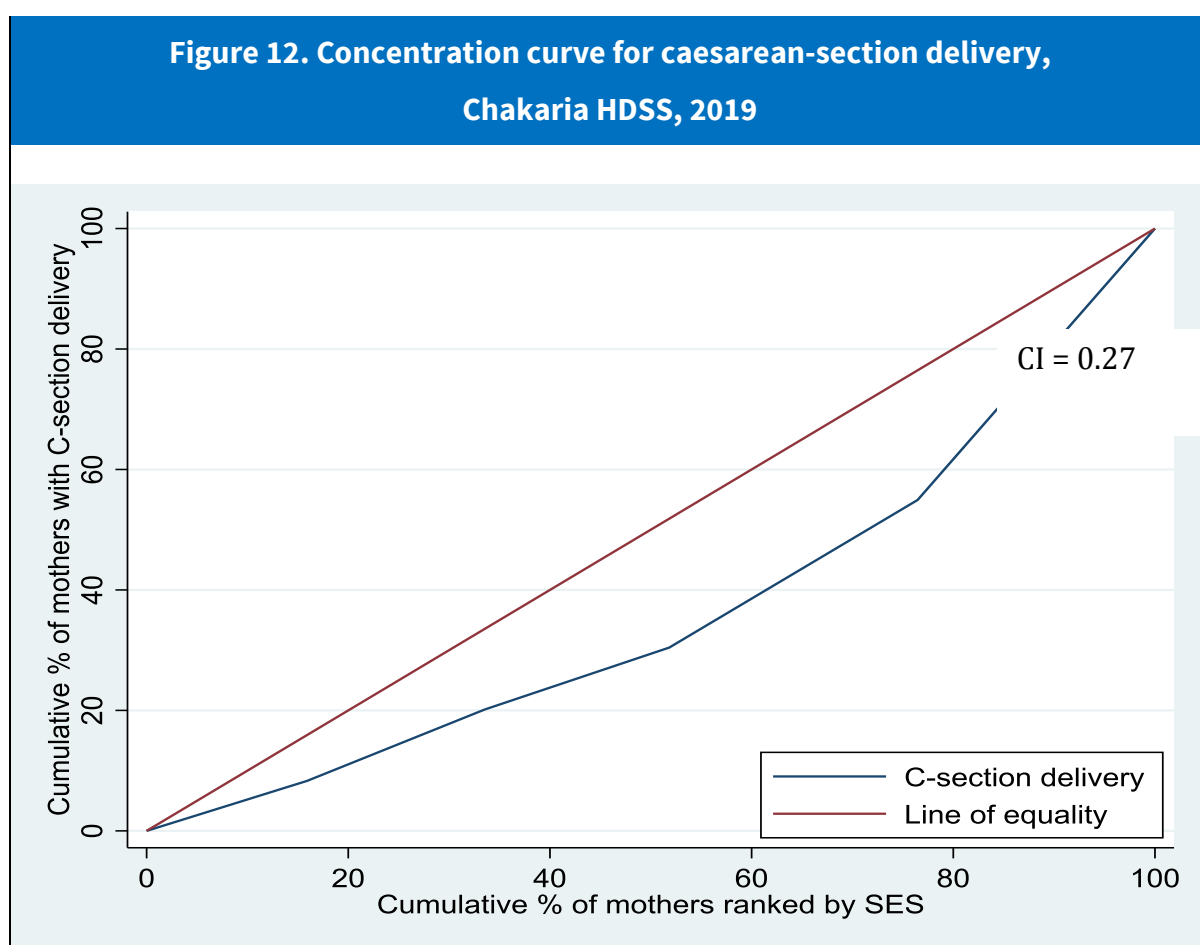


Table 19 shows caesarean-section delivery by household asset quintile in 2019. Caesarean-section delivery accounted for 10.7% of the total deliveries and 39.8% of the facility-based deliveries in the Chakaria HDSS area in 2019. Although the number of deliveries through caesarean sections was small, the number of women giving birth by caesarean sections exhibited discrepancies between the highest and lowest quintiles (Table 19 and Figure 12).

Table 19. Caesarean-section delivery by asset quintile, Chakaria HDSS, 2019			
Asset quintile	No. of caesarean-section delivery	Caesarean-section delivery (%)	Total no. of Deliveries
Lowest	21	6.3	334
Second	30	8.1	370
Middle	26	6.8	384
Fourth	62	12.0	517
Highest	114	23.1	494
Total	253	12.1	2,099



## 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, but 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. Sixteen indicators out of all basic and complementary SDG indicators can be calculated using the data of Chakaria HDSS (8).

The major demographic and health indicators (including the SDGs) during 2015-19 are presented in Table 20. The fertility indicators were almost similar and a declining trend in the natural rate of population increase was observed during 2015-19. Most of the indicator rates in the Chakaria HDSS area are much higher than those in the Matlab government service area, another rural field site of icddr,b (9). In 2019, the rate of natural increase and the annual population growth rate in the surveillance area of Chakaria was 1.9 % and 1.3%, respectively (Table 20).

Twenty nine percent of births in Chakaria HDSS were delivered at facilities (hospital or clinic) in 2019. The percentage of births at facilities in 2019 was slightly higher than that in 2017. About one-third of the births were attended by Skilled Birth Attendants (SBAs) in Chakaria during 2019 and the rate of deliveries assisted by SBAs was 39.7% (Table 20).

The legal age of marriage is 18 years for females and 21 years for males in Bangladesh. In 2019, 29.5% of the women were married before reaching their 18th birthday. The percentage of underage female marriage is following a declining trend. Among males, 18% were married before the age of 21 years in 2019. The proportion of male marriages before 21 years has decreased between 2018 and 2019. The percentage of underage marriage among females remained slightly higher than males from 2018 to 2019.

Total fertility rate and death rates in the Chakaria HDSS area during 2019 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. The full immunization coverage rate was almost the same as the national figure.

Among boys, 82% of those enrolled completed the last grade of primary level education, and 69% completed the last grade of secondary level education. The rate was higher for boys compared to the national level. The literacy rate of 15-24-year was higher than the national literacy rate in Bangladesh. Compared to the national level, a lower percentage

of active age group from both women and men were engaged in economic activities in the Chakaria HDSS area.

<b>Table 20. SDG and other health and socio-demographic indicators, Chakaria HDSS, 2015 – 2019, Matlab HDSS and National</b>								
<b>Rate</b>	<b>Chakaria HDSS area</b>					<b>Matlab HDSS Govt. service area</b>		<b>National</b>
	2015	2016	2017	2018	2019	2018		
Crude birth rate	25.6	25.7	25.6	24.9	24.2	21	-	18.5 <sup>e</sup>
Total fertility rate <sup>a</sup>	2.9	2.9	2.9	2.8	2.7	2.5	SDG	2.3 <sup>d</sup>
Neonatal mortality <sup>b</sup>	34.1	30.0	35.2	31.3	29.5	17.7	SDG	30.0 <sup>d</sup>
Post-neonatal mortality <sup>b</sup>	14.0	11.5	15.6	9.3	13.3	3.8	-	-
Infant mortality rate <sup>b</sup>	44.4	41.5	50.8	40.6	42.9	22.8	-	38.0 <sup>d</sup>
Child mortality rate (1-4 yrs)	2.9	2.7	2.9	3.1	2.9	1.7	-	-
Under-five mortality rate <sup>b</sup>	58.9	51.2	61.3	52.3	50.5	29.2	SGD	45.0 <sup>d</sup>
Crude death rate	5.9	5.7	5.8	5.9	5.8	7.3	-	5.5 <sup>e</sup>
Rate of natural increase	20.5	20	19.8	19.0	18.4	13.9	-	-
In-migration rate	33.2	36	33.6	34.4	24.6	50.2	-	-
Out-migration rate	37.3	41.8	46.9	42.7	34.1	59.1	-	-
Growth rate (%)	1.6	1.4	0.6	1.1	0.9	0.5	-	1.1 <sup>e</sup>
Adolescent birth rate	65.8	54.9	54.8	43.2	47.0	74.2	SDG	83.0 <sup>e</sup>
Stillbirth rate <sup>c</sup>	36.5	39.8	34.0	27.7	39.2	15.2	SDG	25.0 <sup>e</sup>
Facility-based delivery (%)	23.4	22.9	23.6	26.6	28.6	80	-	50.0 <sup>d</sup>
Received assistance from SBA during delivery (%)	35.3	35.3	38.7	37.4	39.7	76.5	SDG	53.0 <sup>d</sup>
Antenatal care coverage (at least 1 visit) (%)	76.6	77.9	77.3	74.9	74.9	96.7	SDG	92.0 <sup>d</sup>
Antenatal care coverage (at least 4 visits) (%)	29.3	29.7	29.1	25.2	25.2	53.6	SDG	47.0 <sup>d</sup>
Postnatal care coverage (1 visit) (%)	43.3	44.0	47.6	45.4	45.4	-	SDG	52.5 <sup>d</sup>
Male marriage at ages under 21 years (%)	23.5	22.8	19.0	20.4	18.1	6.1	-	-
Female marriage at ages under 18 years (%)	35.9	34.6	32.8	29.2	29.5	38.7	-	-
Female aged 20-24 who were married or in a union by age 18 (%)	39.2	39.0	40.0	37.1	35.6	-	SDG	59.0 <sup>d</sup>

<sup>a</sup>Per woman; <sup>b</sup>Per 1,000 live births; <sup>c</sup>Per 1,000 total births;

**Sources:**

<sup>d</sup>National Institute of Population Research and Training (NIPORT), Mitra and Associates, and ICF International. 2019. *Bangladesh Demographic and Health Survey 2017-2019: Key Indicators*. Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPORT, Mitra and Associates, and ICF International;

<sup>e</sup>The World Bank. Available at: <http://data.worldbank.org>;

<sup>f</sup>- Data not available

**Table 20. (contd...)**

Rate	Chakaria HDSS area					Matlab HDSS Govt. area 2019		National
	2015	2016	2017	2018	2019			
Children receiving full immunization (%)	81.8	82.4	84.0	85.8	85.4	87.1	SDG	85.6 <sup>d</sup>
1-year old children immunized against measles (%)	84.6	87.9	89.8	91.2	88.4	87.3	SDG	87.9 <sup>d</sup>
Primary education completion rate for girls (%)	74.3	74.8	79.8	81.9	83.5	-	SDG	87.1 <sup>e</sup>
Primary education completion rate for boys (%)	76.4	75.9	80.7	80.8	81.7	-	SDG	71.8 <sup>e</sup>
Secondary education completion rate for girls (%)	66.5	66.7	66.2	68.3	68.7	-	SDG	72.3 <sup>e</sup>
Secondary education completion rate for boys (%)	73.4	71.8	66.5	69.4	69.6	-	SDG	61.1 <sup>e</sup>
Tertiary enrollment rate for women (%)	4.1	4.0	4.6	5.4	5.1	-	SDG	16.0 <sup>e</sup>
Tertiary enrollment rate for men (%)	7.3	7.4	7.7	8.5	8.1	-	SDG	24.0 <sup>e</sup>
Literacy rate of 15-24-year-old women (%)	94.1	97.2	98.3	98.3	98.6	-	SDG	94.9 <sup>e</sup>
Literacy rate of 15-24-year-old men (%)	88.6	91.9	93	93.6	93.5	-	SDG	91.8 <sup>e</sup>
Employment to population ratio (EPR) for women (15+ years of age) (%)	20.8	16.8	16	17.5	16.8	-	SDG	33.9 <sup>e</sup>
Employment to population ratio (EPR) for men (15+ years of age) (%)	83.6	86.5	84	88.7	72.7	-	SDG	78.0 <sup>e</sup>
Women without incomes of their own (%)	7.0	6.2	5.9	5.7	5.7	-	SDG	6.7 <sup>e</sup>
<sup>a</sup> Per woman; <sup>b</sup> Per 1,000 live births; <sup>c</sup> Per 1,000 total births; <b>Sources:</b> <sup>d</sup> National Institute of Population Research and Training (NIPORT), Mitra and Associates, and ICF International. 2019. <i>Bangladesh Demographic and Health Survey 2017-2019: Key Indicators</i> . Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPORT, Mitra and Associates, and ICF International; <sup>e</sup> The World Bank. Available at: <a href="http://data.worldbank.org">http://data.worldbank.org</a> ; <sup>f</sup> -Data not available								

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## APPENDIX A

### Mid-year population by age and sex, Chakaria HDSS, 2019

Age (years)	Mid-year population			Percentage distribution of mid-year Population		
	Male	Female	Both	Male	Female	Both
<1	1,077	1,045	2,122	2.5	2.4	2.4
1-4	4,077	4,019	8,096	9.5	9.2	9.3
5-9	5,017	4,710	9,727	11.7	10.8	11.2
10-14	5,389	5,237	10,626	12.5	12.0	12.3
15-19	5,576	5,259	10,835	13.0	12.0	12.5
20-24	4,023	4,602	8,625	9.4	10.5	10.0
25-29	3,124	3,672	6,796	7.3	8.4	7.8
30-34	2,871	3,354	6,225	6.7	7.7	7.2
35-39	2,469	2,860	5,329	5.7	6.5	6.1
40-44	2,167	2,120	4,287	5.0	4.9	4.9
45-49	1,746	1,625	3,371	4.1	3.7	3.9
50-54	1,426	1,389	2,815	3.3	3.2	3.2
55-59	1,133	1,207	2,340	2.6	2.8	2.7
60-64	929	989	1,918	2.2	2.3	2.2
65-69	777	664	1,441	1.8	1.5	1.7
70-74	482	401	883	1.1	0.9	1.0
75-79	363	299	662	0.8	0.7	0.8
80-84	153	122	275	0.4	0.3	0.3
85+	159	135	294	0.4	0.3	0.3
All	42,958	43,709	86,667	100.0	100.0	100.0



## APPENDIX B

### Cause-specific mortality rate per 1,000 population by age and sex, Chakaria HDSS, 2019

Causes	Age groups (years)						
	Neonate	Infant	1-4	5-14	15-49	50-64	65+
<b>Male</b>							
Sepsis (non-obstetric)	0.00	2.5	0.00	0.00	0.0	0.00	0.7
Acute respiratory infection including pneumonia	0.00	5.3	0.3	0.1	0.1	1.5	8.0
HIV/AIDS related death	0.00	0.00	0.4	0.00	0.1	0.3	0.2
Diarrhoeal diseases	0.00	0.3	0.00	0.00	0.00	0.00	0.00
Malaria	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Measles	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meningitis and encephalitis	57.4	1.3	0.11	0.00	0.00	0.00	0.3
Pulmonary tuberculosis	0.00	0.00	0.00	0.00	0.1	1.4	3.7
Pertussis	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Haemorrhagic fever	0.00	0.00	0.00	0.1	0.00	0.00	0.00
Other and unspecified infectious diseases	0.00	0.00	0.00	0.0	0.1	0.00	1.0
Oral neoplasms	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Digestive neoplasms	0.00	0.00	0.00	0.00	0.1	0.6	2.4
Respiratory neoplasms	0.00	0.00	0.00	0.00	0.1	0.2	4.0
Breast neoplasms	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Reproductive neoplasms M, F	0.00	0.00	0.00	0.00	0.0	0.00	1.8
Other and unspecified neoplasms	0.00	0.00	0.00	0.1	0.2	0.3	4.4
Severe anaemia	0.00	0.00	0.00	0.0	0.00	0.00	0.00
Severe malnutrition	9.7	0.3	0.00	0.00	0.00	0.00	0.8
Diabetes mellitus	0.00	0.00	0.00	0.00	0.0	0.4	0.8
Acute cardiac disease	0.00	0.00	0.00	0.00	0.1	1.1	2.9
Stroke	0.00	0.00	0.00	0.00	0.2	2.4	10.7
Sickle cell with crisis	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other and unspecified cardiac diseases	0.00	0.00	0.00	0.00	0.1	0.7	6.8
Chronic obstructive pulmonary diseases	0.00	0.00	0.00	0.00	0.00	1.2	3.7
Asthma	0.00	0.00	0.00	0.00	0.00	0.00	0.5
Acute abdomen	0.00	0.9	0.3	0.00	0.1	0.5	1.4
Liver cirrhosis	0.00	0.00	0.2	0.00	0.00	0.9	1.4
Renal failure	0.00	0.00	0.00	0.00	0.0	0.2	2.1
Epilepsy	0.00	0.6	0.00	0.00	0.00	0.00	0.3

## Appendix B. (contd...)

Causes	Age groups (years)						
	Neonate	Infant	1-4	5-14	15-49	50-64	65+
Ectopic pregnancy	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Abortion-related death	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pregnancy-induced hypertension	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Obstetric haemorrhage	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Obstructed labour	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pregnancy-related sepsis	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other and unspecified maternal causes of death	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prematurity	140.8	0.00	0.00	0.00	0.00	0.00	0.00
Birth asphyxia	90.2	0.00	0.00	0.00	0.00	0.00	0.00
Neonatal pneumonia	89.2	0.00	0.00	0.00	0.00	0.00	0.00
Neonatal sepsis	38.5	0.00	0.00	0.00	0.00	0.00	0.00
Congenital malformation	23.9	1.0	0.3	0.00	0.00	0.00	0.00
Other and unspecified neonatal causes of death	80.5	0.00	0.00	0.00	0.00	0.00	0.00
Road traffic accident	0.00	0.00	0.00	0.00	0.1	0.6	0.00
Other transport accident	0.00	0.00	0.5	0.00	0.2	0.00	1.0
Accidental fall	0.00	0.00	0.00	0.00	0.0	0.00	0.00
Accidental drowning and submersion	0.00	0.00	1.0	0.00	0.00	0.00	0.00
Accidental exposure to smoke fire & flame	0.00	0.00	0.00	0.00	0.0	0.00	0.00
Contact with venomous plant/animal	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Accidental poisoning & noxious substances	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Intentional self-harm	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Assault	0.00	0.00	0.00	0.00	0.1	0.00	0.00
Exposure to force of nature	0.00	0.00	0.00	0.00	0.1	0.00	0.00
Other and unspecified external causes of death	0.00	0.00	0.00	0.00	0.0	0.00	0.00
Other and unspecified non-communicable diseases	0.00	0.00	0.00	0.00	0.00	0.00	0.3
Indeterminate	60.00	1.6	0.4	0.0	0.3	1.3	11.5
All causes	590.2	13.8	3.5	0.4	1.9	13.3	70.8

## Appendix B. (contd...)

Causes	Age groups (years)						
	Neonate	Infant	1-4	5-14	15-49	50-64	65+
<b>Female</b>							
Sepsis (non-obstetric)	0.0	1.0	0.2	0.0	0.0	0.0	0.3
Acute respiratory infection including pneumonia	0.0	10.4	0.4	0.0	0.0	2.0	9.4
HIV/AIDS related death	0.0	0.0	0.0	0.0	0.1	0.0	0.5
Diarrhoeal diseases	0.0	1.1	0.3	0.0	0.0	0.0	0.6
Malaria	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Measles	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meningitis and encephalitis	45.3	0.9	0.0	0.0	0.0	0.0	0.0
Pulmonary tuberculosis	0.0	0.0	0.0	0.0	0.0	0.7	2.9
Pertussis	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Haemorrhagic fever	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other and unspecified infectious diseases	0.0	0.0	0.2	0.0	0.0	0.1	1.0
Oral neoplasms	0.0	0.0	0.0	0.0	0.0	0.3	0.0
Digestive neoplasms	0.0	0.0	0.0	0.0	0.0	0.7	2.9
Respiratory neoplasms	0.0	0.0	0.0	0.0	0.0	0.3	1.8
Breast neoplasms	0.0	0.0	0.0	0.0	0.0	0.3	1.1
Reproductive neoplasms M, F	0.0	0.0	0.0	0.0	0.0	0.9	0.5
Other and unspecified neoplasms	0.0	0.0	0.0	0.0	0.1	0.2	1.5
Severe anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Severe malnutrition	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Diabetes mellitus	0.0	0.0	0.0	0.0	0.0	0.4	5.2
Acute cardiac disease	0.0	0.5	0.0	0.0	0.0	0.1	1.2
Stroke	0.0	0.0	0.0	0.0	0.2	1.1	9.2
Sickle cell with crisis	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other and unspecified cardiac diseases	0.0	0.0	0.0	0.0	0.1	0.4	3.2
Chronic obstructive pulmonary diseases	0.0	0.0	0.0	0.0	0.0	0.8	5.1
Asthma	0.0	0.0	0.2	0.0	0.0	0.3	1.2
Acute abdomen	0.0	0.0	0.0	0.1	0.0	0.0	0.6
Liver cirrhosis	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Renal failure	0.0	0.0	0.0	0.0	0.0	0.7	1.0
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+
Ectopic pregnancy	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Abortion-related death	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pregnancy-induced hypertension	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Obstetric haemorrhage	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Obstructed labour	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pregnancy-related sepsis	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other and unspecified maternal causes of death	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prematurity	111.7	0.0	0.0	0.0	0.0	0.0	0.0
Birth asphyxia	62.8	0.0	0.0	0.0	0.0	0.0	0.0
Neonatal pneumonia	75.8	0.0	0.0	0.0	0.0	0.0	0.0
Neonatal sepsis	4.1	0.0	0.0	0.0	0.0	0.0	0.0
Congenital malformation	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other and unspecified neonatal causes of death	70.9	0.0	0.0	0.0	0.0	0.0	0.0
Road traffic accident	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Other transport accident	0.0	0.0	0.3	0.0	0.0	0.0	0.4
Accidental fall	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Accidental drowning and submersion	0.0	0.0	0.8	0.0	0.0	0.0	0.0
Accidental exposure to smoke fire & flame	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Contact with venomous plant/animal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accidental poisoning & noxious substances	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Intentional self-harm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Assault	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exposure to force of nature	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other and unspecified external causes of death	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other and unspecified non-communicable diseases	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Indeterminate	47.2	1.9	0.1	0.0	0.2	0.8	11.9
All causes	417.7	15.8	2.3	0.2	1.1	10.7	62.9

## APPENDIX C

### Migration rate per 1,000 population by age and sex, Chakaria HDSS, 2019

Age (years)	No. of migrants			Migration rate per 1,000 population		
	Male	Female	Both	Male	Female	Both
<b>In-migration</b>						
<1	34	28	62	31.5	27.2	29.4
1-4	75	97	172	18.4	24.7	21.5
5-9	74	85	159	14.7	17.8	16.2
10-14	63	93	156	11.2	17.0	14.1
15-19	50	525	575	9.2	101.8	54.2
20-24	59	349	408	15.0	79.5	49.0
25-29	79	111	190	25.5	30.1	28.0
30-34	75	58	133	26.4	17.4	21.6
35-39	60	35	95	23.9	12.6	17.9
40-44	36	13	49	17.7	6.6	12.2
45-49	29	16	45	16.6	10.0	13.5
50-54	15	5	20	11.2	3.7	7.4
55-59	12	9	21	10.6	7.6	9.0
60-64	6	7	13	6.7	7.7	7.2
65-69	7	8	15	9.2	12.2	10.6
70-74	4	4	8	8.5	9.9	9.1
75-79	1	6	7	2.7	20.9	10.7
80-84	1	1	2	6.2	7.4	6.8
85+	3	0	3	19.2	0.0	10.2
<b>All</b>	<b>683</b>	<b>1,450</b>	<b>2,133</b>	<b>16.0</b>	<b>33.6</b>	<b>24.8</b>
<b>Out-migration</b>						
<1	33	37	70	30.6	36.0	33.2
1-4	114	98	212	28.0	25.0	26.5
5-9	102	92	194	20.3	19.3	19.8
10-14	92	98	190	16.3	17.9	17.1
15-19	132	590	722	24.2	114.4	68.1
20-24	223	447	670	56.8	101.8	80.5
25-29	153	176	329	49.3	47.7	48.5
30-34	115	90	205	40.4	27.1	33.2
35-39	91	48	139	36.2	17.2	26.3
40-44	57	23	80	28.1	11.6	20.0
45-49	25	12	37	14.3	7.5	11.1
50-54	9	13	22	6.7	9.6	8.2
55-59	13	9	22	11.5	7.6	9.5
60-64	9	10	19	10.0	11.0	10.5
65-69	10	7	17	13.1	10.7	12.0
70-74	3	6	9	6.4	14.9	10.3
75-79	4	8	12	10.8	27.9	18.3
80-84	2	1	3	12.4	7.4	10.1
85+	2	3	5	12.8	21.6	16.9
<b>All</b>	<b>1,189</b>	<b>1,768</b>	<b>2,957</b>	<b>27.8</b>	<b>40.9</b>	<b>34.4</b>

## APPENDIX D

### Number of migrants by origin and migration, Chakaria HDSS, 2019

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+
<b>In-migration</b>												
Male												
Inside Bangladesh	535	1	108	74	62	45	45	45	49	34	20	14
Outside Bangladesh	148	2	1	0	1	5	14	34	26	26	16	15
Inside Chakaria	272	1	53	42	39	26	18	17	20	18	14	3
Outside Chakaria	68	2	17	6	9	5	6	8	7	2	0	4
Inside HDSS area	177	1	36	31	25	13	13	10	16	10	6	2
Outside HDSS area	95	2	17	11	14	13	5	7	4	8	8	1
Female												
Inside Bangladesh	1,438	1	122	85	92	524	348	108	58	33	12	16
Outside Bangladesh	12	2	3	0	1	0	2	3	0	2	1	0
Inside Chakaria	907	1	55	43	57	370	223	59	34	22	4	11
Outside Chakaria	214	2	20	12	16	79	61	11	7	3	2	1
Inside HDSS area	588	1	32	27	40	253	136	32	19	15	3	7
Outside HDSS area	319	2	23	16	17	117	87	27	15	7	1	4
<b>Out-migration</b>												
Male												
Inside Bangladesh	763	1	142	100	86	72	74	76	62	59	30	15
Outside Bangladesh	426	2	5	2	6	60	149	77	53	32	27	10
Inside Chakaria	529	1	101	74	56	44	53	49	44	42	20	11
Outside Chakaria	131	2	26	14	18	18	8	17	13	9	5	0
Inside HDSS area	155	1	35	25	17	11	10	13	10	10	7	2
Outside HDSS area	174	2	35	24	25	14	17	13	14	14	5	4
Female												
Inside Bangladesh	1,702	1	129	89	94	570	433	170	83	45	23	12
Outside Bangladesh	66	2	6	3	4	19	15	6	7	3	0	0
Inside Chakaria	1,224	1	96	57	67	417	304	125	67	34	16	7
Outside Chakaria	314	2	24	16	16	103	99	30	10	4	1	2
Inside HDSS area	517	1	29	17	26	213	144	43	14	11	1	3
Outside HDSS area	404	2	37	27	23	130	85	48	28	10	9	1

## APPENDIX E

### Number of in-migrants by reasons for migration, Chakaria HDSS, 2019

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+
<b>Male</b>												
Family-related												
To join spouse	11	2	0	0	1	2	2	4	0	0	0	0
Family friction/ breakdown	147	25	18	8	8	14	20	16	12	7	2	17
Others	17	0	4	2	1	1	2	3	1	0	1	2
Work-related												
New job/job transfer	160	2	2	4	10	15	34	25	26	16	15	11
To look for work/lost job	118	57	22	13	5	4	3	3	1	2	2	6
Others	53	4	1	2	6	8	6	11	9	1	2	3
Housing-related												
Wanted to own home/ new house	86	10	4	10	12	12	9	8	6	5	5	5
Education												
To acquire education	56	4	21	22	6	0	0	1	0	1	0	1
Reasons not reported	35	5	2	2	1	3	3	4	5	4	2	4
<b>All</b>	<b>683</b>	<b>109</b>	<b>74</b>	<b>63</b>	<b>50</b>	<b>59</b>	<b>79</b>	<b>75</b>	<b>60</b>	<b>36</b>	<b>29</b>	<b>49</b>
<b>Female</b>												
Family related												
To join spouse	758	0	0	12	445	256	29	6	3	3	3	1
Family friction/breakdown	217	13	17	12	35	52	33	17	12	5	3	18
Others	37	9	2	6	3	3	3	2	1	0	2	6
Work-related												
New job/job transfer	24	3	0	7	3	3	3	1	2	1	0	1
To look for work/lost job	157	73	27	10	7	8	15	6	2	0	2	7
Others	39	4	2	2	2	8	9	9	0	0	2	1
Housing-related												
Wanted to own home/new house	39	4	2	2	2	8	9	9	0	0	2	1
Education												
To acquire education	80	5	27	27	7	1	5	5	3	0	0	0
Reasons not reported	28	6	3	2	2	4	3	4	3	0	1	0
<b>All</b>	<b>1,450</b>	<b>125</b>	<b>85</b>	<b>93</b>	<b>524</b>	<b>350</b>	<b>111</b>	<b>58</b>	<b>35</b>	<b>13</b>	<b>16</b>	<b>40</b>

## APPENDIX F

### Number of out-migrants by reasons for migration, Chakaria HDSS, 2019

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+
<b>Male</b>												
Family-related												
To Join spouse	21	0	0	0	1	13	5	1	1	0	0	0
Family friction/ breakdown	130	23	12	12	7	14	19	16	10	5	1	11
Others	35	3	4	6	4	4	2	2	3	2	1	4
Work-related												
New job/job transfer	400	4	2	1	59	141	76	49	30	28	6	4
To look for work/ lost job	130	66	37	14	4	4	1	1	0	0	0	3
Others	122	10	2	2	9	12	28	24	20	6	3	6
Housing-related												
Wanted to own home/ new house	113	15	17	19	14	11	10	6	5	3	1	12
Education												
To acquire education	78	7	10	18	21	3	2	2	3	1	3	8
Reasons not reported	160	19	18	20	13	21	10	14	19	12	10	4
<b>All</b>	<b>1,189</b>	<b>147</b>	<b>102</b>	<b>92</b>	<b>132</b>	<b>223</b>	<b>153</b>	<b>115</b>	<b>91</b>	<b>57</b>	<b>25</b>	<b>52</b>
<b>Female</b>												
Family-related												
To Join spouse	870	0	0	24	441	306	74	20	2	2	1	0
Family friction/ breakdown	184	11	8	7	48	48	30	11	9	1	0	11
Others	46	7	5	1	5	7	3	3	4	0	2	9
Work-related												
New job/job transfer	37	5	3	2	9	8	4	5	1	0	0	0
To look for work/lost job	156	72	32	13	11	7	5	3	1	2	0	10
Others	108	7	6	2	15	22	29	10	8	2	2	5
Housing-related												
Wanted to own home/ new house	110	8	12	17	11	18	6	14	5	5	5	9
Education												
To acquire education	91	3	14	20	22	6	4	4	6	5	2	5
Reasons not reported	166	22	12	12	27	26	21	20	12	6	0	8
<b>All</b>	<b>1,768</b>	<b>135</b>	<b>92</b>	<b>98</b>	<b>589</b>	<b>448</b>	<b>176</b>	<b>90</b>	<b>48</b>	<b>23</b>	<b>12</b>	<b>57</b>



## APPENDIX G

### Population, births, deaths, in and out-migration by village, Chakaria HDSS, 2019

Village	Population	Birth	Death	In-migration	Out-migration	Birth rate	Death rate	In-migration rate	Out-migration rate
Maizpara	1,726	42	10	43	75	24.3	5.8	24.9	43.5
Daingakata	1,813	39	17	51	51	21.5	9.4	28.1	28.1
Baniachara	3,422	76	11	106	139	22.2	3.2	31.0	40.6
Dakshin Baraitali	2,225	50	13	41	77	22.5	5.8	18.4	34.6
Gobindapur	5,023	134	43	105	113	26.7	8.6	20.9	22.5
Hapaliakata	3,820	106	18	72	118	27.7	4.7	18.8	30.9
<b>Baraitali</b>	<b>18,029</b>	<b>447</b>	<b>112</b>	<b>418</b>	<b>573</b>	<b>24.8</b>	<b>6.2</b>	<b>23.2</b>	<b>31.8</b>
Katakhal	395	8	2	11	11	20.3	5.1	27.8	27.8
Rakhainpara	642	11	7	17	22	17.1	10.9	26.5	34.3
Shantinagar	2,014	42	9	97	130	20.9	4.5	48.2	64.5
Kulalpara	190	4	3	1	5	21.1	15.8	5.3	26.3
Palpara	228	2	2	1	6	8.8	8.8	4.4	26.3
Stationpara	657	16	2	20	15	24.4	3.0	30.4	22.8
Kattoli	451	8	9	8	10	17.7	20.0	17.7	22.2
<b>Harbang</b>	<b>4577</b>	<b>91</b>	<b>34</b>	<b>155</b>	<b>199</b>	<b>19.9</b>	<b>7.4</b>	<b>33.9</b>	<b>43.5</b>
Purbo Kunakhali	1,755	42	31	26	83	23.9	17.7	14.8	47.3
Maddhya Kunakhali	4,961	142	18	129	122	28.6	3.6	26.0	24.6
Furotia Khali	3,242	81	12	102	123	25.0	3.7	31.5	37.9
<b>Konakhali</b>	<b>9,958</b>	<b>265</b>	<b>61</b>	<b>257</b>	<b>328</b>	<b>26.6</b>	<b>6.1</b>	<b>25.8</b>	<b>32.9</b>
Krisnapur	1,604	52	18	22	74	32.4	11.2	13.7	46.1
Chhainama Para	3,012	74	15	110	112	24.6	5.0	36.5	37.2
Dakshin									
Bahaddarkata	2,547	58	6	78	89	22.8	2.4	30.6	34.9
<b>BM Char</b>	<b>7,163</b>	<b>184</b>	<b>39</b>	<b>210</b>	<b>275</b>	<b>25.7</b>	<b>5.4</b>	<b>29.3</b>	<b>38.4</b>

## Appendix G. (contd...)

Village	Population	Birth	Death	In-migration	Out-migration	Birth rate	Death rate	In-migration rate	Out-migration rate
Chotta Bheola	917	10	7	25	35	10.9	7.6	27.3	38.2
Hasimar Kata	973	15	4	19	33	15.4	4.1	19.5	33.9
Hamidullah									
Sikderpara	817	16	4	29	50	19.6	4.9	35.5	61.2
Dwipkul	957	15	10	10	50	15.7	10.4	10.4	52.2
Baniarkum	1,183	38	9	20	50	32.1	7.6	16.9	42.3
Dakshin Khilsadok	1,758	42	8	32	64	23.9	4.6	18.2	36.4
<b>Kayerbil</b>	<b>6,605</b>	<b>136</b>	<b>42</b>	<b>135</b>	<b>282</b>	<b>20.6</b>	<b>6.4</b>	<b>20.4</b>	<b>42.7</b>
Kaddachura	1,734	50	18	45	54	28.8	10.4	26.0	31.1
Sikder Para	4,075	90	6	88	128	22.1	1.5	21.6	31.4
Baniarchar	979	27	5	11	14	27.6	5.1	11.2	14.3
Kalagazi Sikderpara	1,359	30	6	45	38	22.1	4.4	33.1	28.0
Mabiar Baper Para	748	18	1	13	32	24.1	1.3	17.4	42.8
Jele Para	636	16	7	11	27	25.2	11.0	17.3	42.5
<b>Purba B. Bheola</b>	<b>9,531</b>	<b>231</b>	<b>43</b>	<b>213</b>	<b>293</b>	<b>24.2</b>	<b>4.5</b>	<b>22.3</b>	<b>30.7</b>
Sharharbil Purba									
Para	1,220	29	6	35	31	23.8	4.9	28.7	25.4
Saharbil Paschim									
Para	1,095	29	1	40	45	26.5	0.9	36.5	41.1
Madrasha Para	498	13	7	20	14	26.1	14.1	40.2	28.1
Maizghona Purba									
Para	1,583	42	4	40	63	26.5	2.5	25.3	39.8
Shahapura	1,057	30	1	24	32	28.4	0.9	22.7	30.3
Failla Para	332	11	25	9	13	33.1	75.3	27.1	39.2
<b>Saharbil</b>	<b>5,785</b>	<b>154</b>	<b>44</b>	<b>168</b>	<b>198</b>	<b>26.6</b>	<b>7.6</b>	<b>29.0</b>	<b>34.2</b>

## Appendix G. (contd...)

Village	Population	Birth	Death	In-migration	Out-migration	Birth rate	Death rate	In-migration rate	Out-migration rate
Saker Mohammad Char	5,881	137	10	126	194	23.3	1.7	21.4	33.0
Uttar Lotony	1,892	31	23	52	48	16.4	12.2	27.5	25.4
Proper Kakhara	2,962	68	7	74	95	23.0	2.4	25.0	32.1
<b>Kakara</b>	<b>10,735</b>	<b>236</b>	<b>40</b>	<b>252</b>	<b>337</b>	<b>22.0</b>	<b>3.7</b>	<b>23.5</b>	<b>31.4</b>
Dakshin Surajpur	1,275	27	15	44	48	21.2	11.8	34.5	37.6
Dakshin Manikpur	2,814	61	22	78	92	21.7	7.8	27.7	32.7
Uttar Manikpur	4,358	120	3	90	192	27.5	0.7	20.7	44.1
<b>Surajpur Manikpur</b>	<b>8,447</b>	<b>208</b>	<b>40</b>	<b>212</b>	<b>332</b>	<b>24.6</b>	<b>4.7</b>	<b>25.1</b>	<b>39.3</b>
Muchar Para	538	19	2	7	7	35.3	3.7	13.0	13.0
Demoshia Bazar Para	1,042	15	6	14	27	14.4	5.8	13.4	25.9
Ammer Dera Para	1,383	36	6	41	47	26.0	4.3	29.6	34.0
Daskhali Para	1,124	29	4	18	21	25.8	3.6	16.0	18.7
<b>Dhemoshia</b>	<b>4,087</b>	<b>99</b>	<b>18</b>	<b>80</b>	<b>102</b>	<b>24.2</b>	<b>4.4</b>	<b>19.6</b>	<b>25.0</b>
Darbeshkata Manik Para	758	20	3	15	25	26.4	4.0	19.8	33.0
Tekhsira Para	992	28	28	18	13	28.2	28.2	18.1	13.1
<b>Paschim B. Bheola</b>	<b>1750</b>	<b>48</b>	<b>31</b>	<b>33</b>	<b>38</b>	<b>27.4</b>	<b>17.7</b>	<b>18.9</b>	<b>21.7</b>
All	86,667	2,099	504	2,133	2,957	24.2	5.8	24.6	34.1

## APPENDIX H

### Percentage of population by age and marital status, Chakaria HDSS, 2019

Age (years)	Married	Divorced	Widower/ Widow	Never married	Population
<b>Male</b>					
10-14	0.04	0	0	99.96	5,389
15-19	2.08	0.02	0	97.9	5,576
20-24	18.55	0.53	0.09	80.84	4,023
25-29	52.73	1.53	0.15	45.59	3,124
30-34	80.77	2.25	0.41	16.56	2,871
35-39	92.85	1.9	0.89	4.36	2,469
40-44	96.42	1.9	0.82	0.86	2,167
45-49	97.64	0.77	1.21	0.38	1,746
50-54	97.66	0.89	0.89	0.55	1,426
55-59	97.24	0.42	2.17	0.17	1,133
60-64	97.6	0.1	2.09	0.21	929
65-69	95.76	0.24	3.63	0.36	777
70-74	95.52	0	4.28	0.2	482
75-79	93.35	0	6.16	0.49	363
80-84	92.68	0.61	6.71	0	153
85+	84	0.57	15.43	0	159
All	49.54	0.79	0.76	48.91	32,787
<b>Female</b>					
10-14	0.51	0	0	99.49	5,237
15-19	24.1	0.12	0	75.78	5,259
20-24	68.55	0.81	0.06	30.59	4,602
25-29	89.12	1.43	0.41	9.04	3,672
30-34	95	1.9	0.57	2.53	3,354
35-39	95.98	1.02	1.98	1.02	2,860
40-44	93.87	1.67	3.71	0.74	2,120
45-49	92.88	1.01	5.58	0.53	1,625
50-54	87.24	1	11.12	0.64	1,389
55-59	82.98	0.95	15.45	0.63	1,207
60-64	74.41	1.08	24.41	0.1	989
65-69	65.92	1.26	32.82	0	664
70-74	51.05	0	48.95	0	401
75-79	38.75	0.31	60.94	0	299
80-84	25.38	1.54	73.08	0	122
85+	13.82	0	86.18	0	135
All	61.66	0.84	4.87	32.63	33,935

## APPENDIX I

### Chakaria HDSS project team, 2019

Name of Staff	Designation
<b>Dhaka</b>	
Manzoor Ahmed Hanifi	Scientist
Mohammad Iqbal	Project Coordinator
Sabrina Rasheed	Associate Scientist
Shehrin Shaila Mahmood	Assistant Scientist
Md Abdul Khalek	Research Officer
Mohammad Shohel Rana	Administrative Officer
<b>Chakaria</b>	
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)
Kajal Rekha	Surveillance Worker (Rural)
Tanjina Zannat Ara	Surveillance Worker (Rural)
Umme Habiba Mamata	Surveillance Worker (Rural)