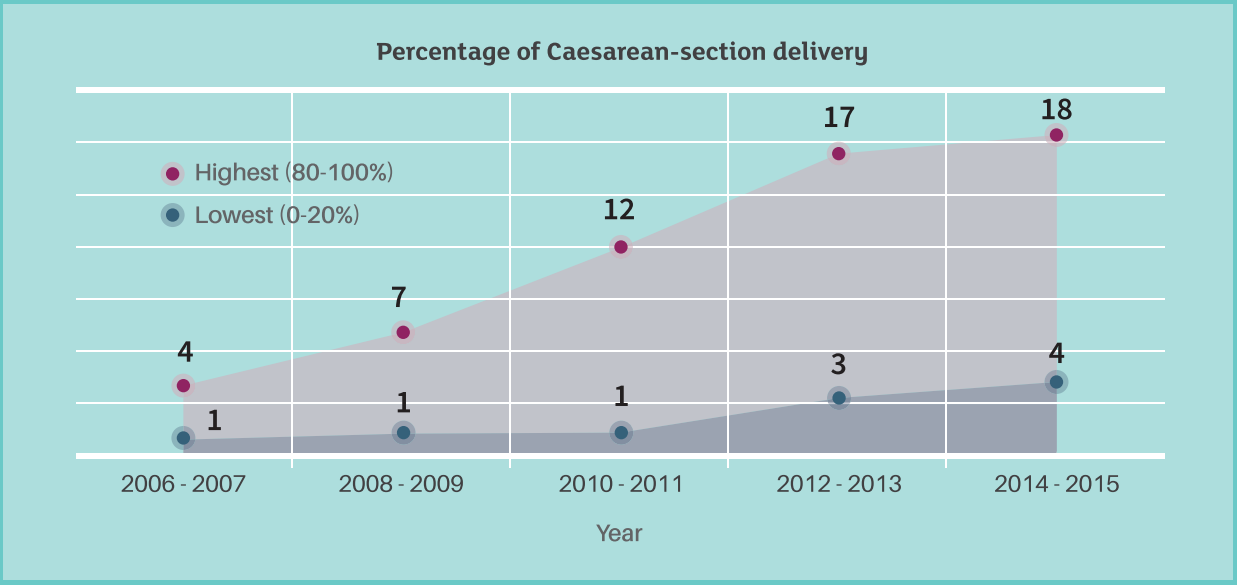
Chakaria Health and Demographic Surveillance System Report-2016

Focusing on the Sustainable Development Goals



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Chakaria Health and Demographic Surveillance System Report – 2016

Focusing on the Sustainable Development Goals

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CHAPTER 1

Introduction

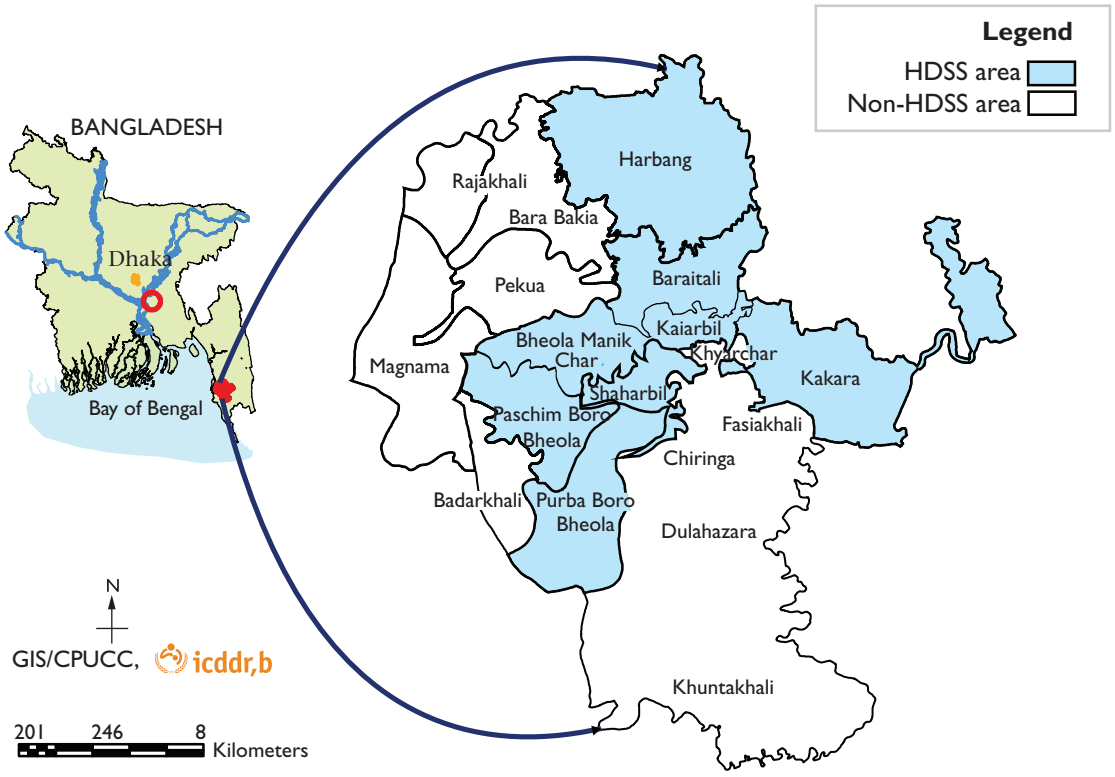
Chakaria is one of the 500 *upazilas* (sub-districts) in Bangladesh. It is located between latitudes 21°34′ and 21°55′ North and longitudes 91°54′ and 92°13′ East in the southeastern coast of the Bay of Bengal. Administratively, it is under Cox's Bazar district with an estimated population of 523,317 in 2016. The highway from Chittagong 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 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 behaviour 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 is the only surveillance in Bangladesh that monitors SDG indicators using its longitudinal data. This report presents data collected through the Chakaria HDSS during 2016.

Existing health services in Chakaria HDSS area, 2016	
Healthcare facility/provider	No.
ICDDR,B facilitated and Community initiated	
Village health post	5
Trained midwife	12
Qualified physician	1
Male paramedic	10
Medical assistant	4
Government	
Union Health and Family Welfare Centre (UHFWC)	11
EPI outreach centre	264
Qualified physician	3
Family Welfare Visitor (FWV)	11
Sub-Assistant Community Medical Officer (SACMO)/Medical assistant	4
Family Welfare Assistant (skilled birth attendant)	18
Community Clinics	23
Community Healthcare Provider	23
Private	
Village doctor (allopathic)	240
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

HDSS = Health and Demographic Surveillance System.

Fig. 1. Map of Chakaria showing Chakaria HDSS area



HDSS = Health and Demographic Surveillance System.

CHAPTER 2

Methods and Materials

The Chakaria HDSS covered 11 unions, namely Baraitali, Kaiarbil, Bheola Manik Char, Paschim Boro Bheola, Shaharbil, Kakara, Harbang, Purba Boro Bheola, Surajpur Manikpur, Konakhali, and Dhemoshia. In 1999, 166,405 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 s/he has left the household and does not intend to come back within six months of the time s/he left. A person is considered to have migrated in if s/he was not previously included in the list of household members and intends to live in the household for at least once in 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 took 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 14 work areas and 14 SWs were recruited from the 14 work areas where they resided. 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. Currently, surveillance covers 84,406 individuals (16,094 households). From beginning of 2015, the data collection process sifted from paper-based to web-based system. A web-based software application has been designed and developed. Fourteen tabs (Smartphone) are 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.

Two supervisors supervised 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. Later on, the supervisors 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 for 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 his/her spouse. The list included *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 (3). The major demographic indicators and safe motherhood practices have been tabulated for the various asset quintiles.

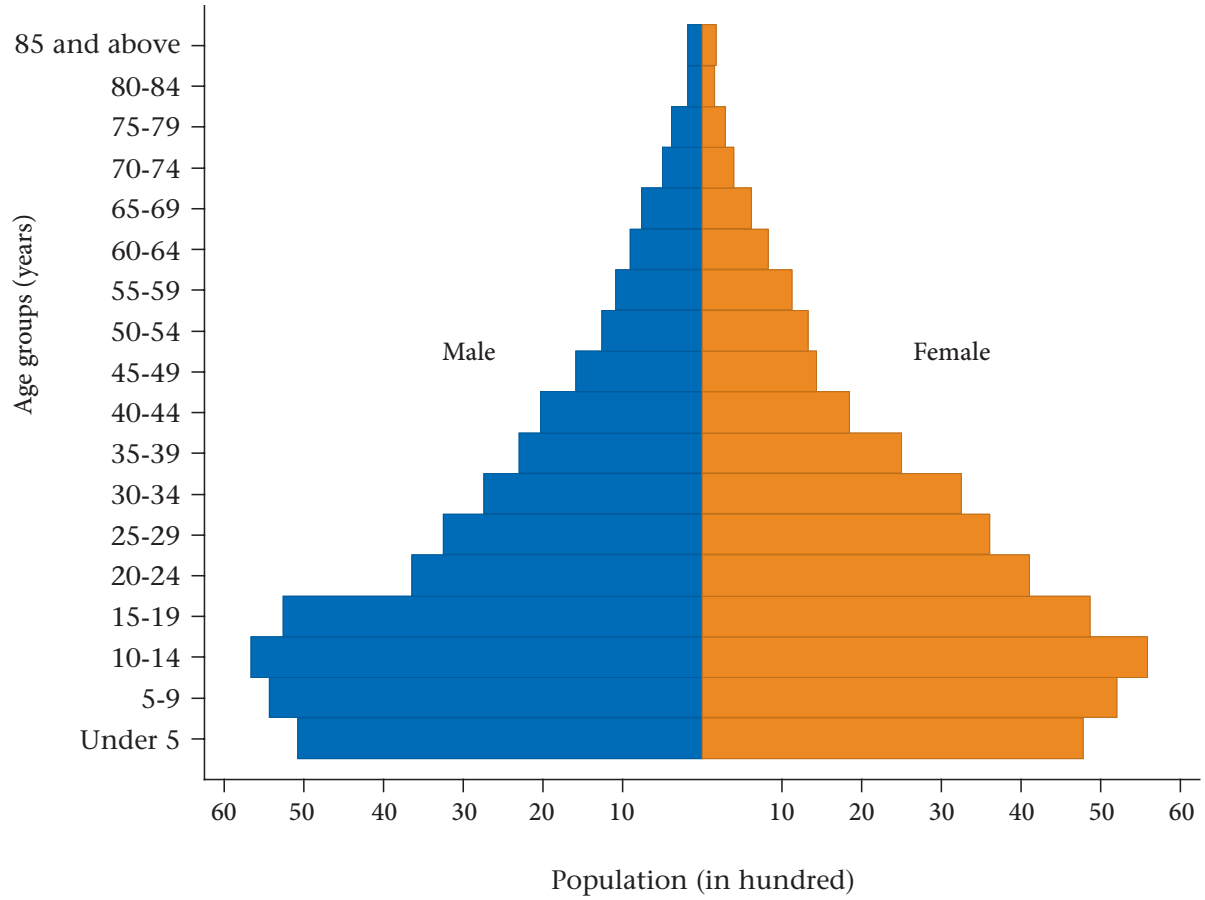
It should be mentioned that the number of observations in the tables presented in this report differ in some instances due to missing information for some variables.

CHAPTER 3

Population and Population Changes

The population pyramid based on the population of Chakaria in 2016 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 100 in 2016. The age dependency ratio[1] was 72 in 2016 (see Appendix A).

Fig. 2. Male and female population by age, Chakaria HDSS, 2016



HDSS = Health and Demographic Surveillance System.

[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

Age-specific mortality rate by sex are presented in Table 1. The crude death rate was 5.7 per 1,000 population in 2016. Infant mortality rate was 41.5 per 1,000 live births. Child mortality rate was 2.7 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 71 years for males and 70 years for females. The rate of mortality of children aged less than 5 years (under-five mortality) was 51.2 per 1,000 live births in Chakaria in 2016 (Table 3). Figure 3 shows the probability of survival by sex during various age groups. Up to the age of 50, the probability of survival remained almost the same for both males and females. After that till 70 years of age the survival probability of females increased.

Table 1. Age-specific death rate per 1,000 population by sex, Chakaria HDSS, 2016

Age (years)	No. of death			Death rate		
	Male	Female	Both	Male	Female	Both
<1*	59	31	90	53.4	29.1	41.5
<1 month	47	18	65	42.6	16.9	30.0
1-11 month	12	13	25	10.9	12.2	11.5
1-4	12	9	21	3.0	2.4	2.7
5-9	4	3	7	0.7	0.6	0.7
10-14	6	4	10	1.1	0.7	0.9
15-19	4	4	8	0.8	0.8	0.8
20-24	3	3	6	0.8	0.7	0.8
25-29	4	2	6	1.2	0.6	0.9
30-34	1	5	6	0.4	1.5	1.0
35-39	1	3	4	0.4	1.2	0.8
40-44	5	8	13	2.5	4.3	3.4
45-49	10	5	15	6.3	3.5	5.0
50-54	12	6	18	9.5	4.5	6.9
55-59	19	16	35	17.4	14.2	15.8
60-64	17	23	40	18.9	27.4	23.0
65-69	28	17	45	36.7	27.4	32.6
70-74	15	13	28	30.3	33.1	31.5
75-79	22	28	50	58.0	93.0	73.5
80-84	15	21	36	82.4	127.3	103.7
85+	14	26	40	76.1	144.4	109.9
All	251	227	478	5.9	5.4	5.7

*Per 1,000 live births; HDSS = Health and Demographic Surveillance System.

Table 2. Abridged Life Table, Chakaria HDSS, 2016

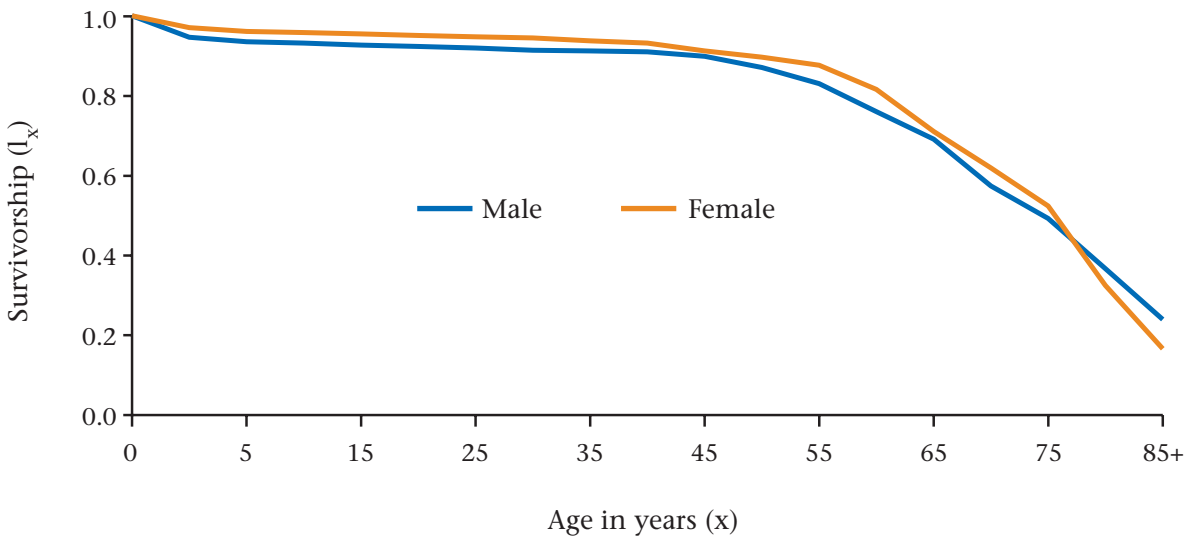
Age (years)	Male					Female				
	$_nm_x$	$_nq_x$	l_x	$_nL_x$	e_x	$_nm_x$	$_nq_x$	l_x	$_nL_x$	e_x
0	0.0564	0.0537	100,000	95,169	70.5	0.0306	0.0298	100,000	97,317	70.4
1	0.0030	0.0118	94,632	376,286	73.5	0.0024	0.0095	97,019	386,238	71.5
5	0.0007	0.0037	93,511	466,696	70.4	0.0006	0.0029	96,100	479,810	68.2
10	0.0011	0.0053	93,168	464,608	65.6	0.0007	0.0036	95,824	478,264	63.4
15	0.0008	0.0038	92,676	462,499	60.9	0.0008	0.0041	95,482	476,429	58.6
20	0.0008	0.0041	92,324	460,671	56.2	0.0007	0.0036	95,090	474,585	53.9
25	0.0012	0.0061	91,944	458,310	51.4	0.0006	0.0028	94,744	473,063	49.0
30	0.0004	0.0018	91,380	456,483	46.7	0.0015	0.0077	94,481	470,600	44.2
35	0.0004	0.0022	91,213	455,571	41.8	0.0012	0.0060	93,758	467,392	39.5
40	0.0025	0.0122	91,015	452,288	36.9	0.0043	0.0215	93,198	460,991	34.7
45	0.0063	0.0311	89,900	442,505	32.3	0.0035	0.0172	91,198	452,081	30.4
50	0.0095	0.0466	87,101	425,364	28.2	0.0045	0.0221	89,634	443,209	25.9
55	0.0174	0.0836	83,044	397,866	24.5	0.0142	0.0688	87,649	423,174	21.4
60	0.0189	0.0903	76,102	363,335	21.5	0.0274	0.1283	81,620	381,927	17.8
65	0.0367	0.1683	69,232	317,035	18.4	0.0274	0.1283	71,150	332,930	15.1
70	0.0303	0.1408	57,582	267,635	16.6	0.0331	0.1528	62,022	286,422	11.9
75	0.0580	0.2535	49,472	216,012	13.9	0.0930	0.3774	52,547	213,163	8.6
80	0.0824	0.3417	36,933	153,116	12.8	0.1273	0.4828	32,718	124,103	7.4
85+	0.0761	1.0000	24,314	319,549	13.1	0.1444	1.0000	16,923	117,160	6.9

HDSS = Health and Demographic Surveillance System.

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.

$_nm_x$ = Central mortality rate
$_nq_x$ = Probability of dying between the ages x and x+n;
$_nq_x$ = $_nm_x/[(1/n) + {}_nm_x\{1/2+n/12(_nm_x-\log_e c)\}]$;
$\log_e c=.095$
l_x = Survivors to exact age x
$_nL_x$ = 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

Fig. 3. Probability of survival by age and sex, Chakaria HDSS, 2016



HDSS = Health and Demographic Surveillance System.

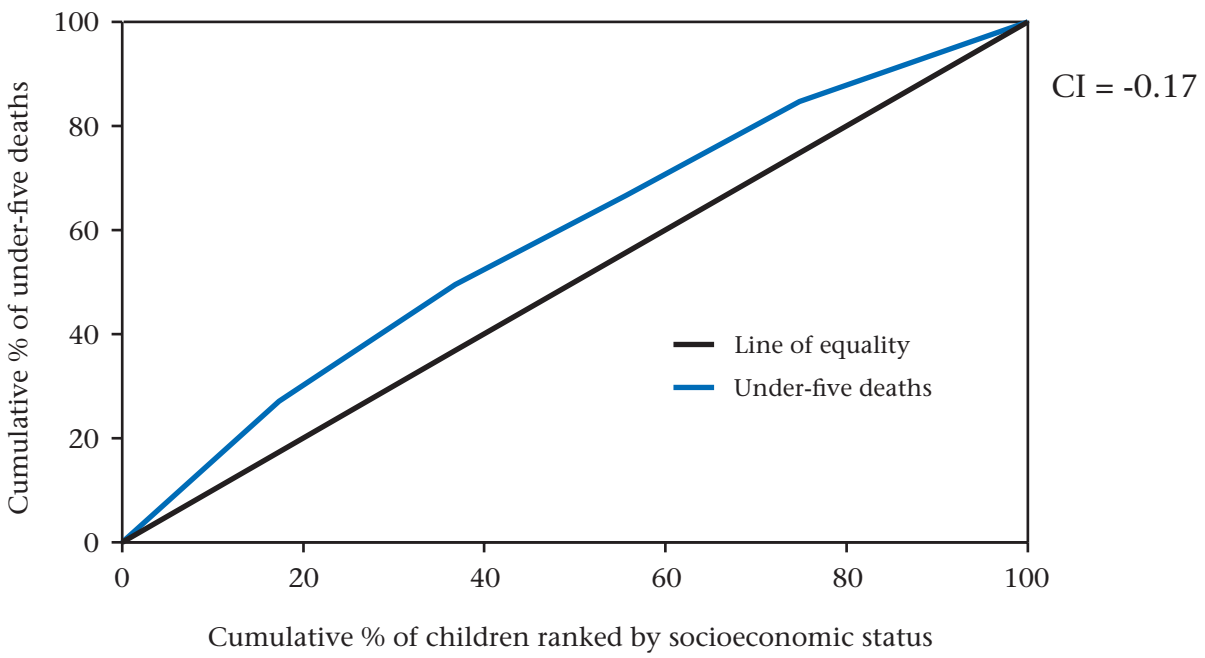
Table 3 presents under-five mortality rate by household asset quintile. Under-five mortality rate was inversely correlated with household asset scores. The mortality rate of children from the lowest quintile was more than 2 times greater than that of the highest quintile. Under-five mortality rate was 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, 2016

Asset quintile	No. of births			No. of under-five deaths			Under-five mortality rate		
	Boy	Girl	Both	Boy	Girl	Both	Boy	Girl	Both
Lowest	192	184	376	17	13	30	88.5	70.7	79.8
Second	205	217	422	15	10	25	73.2	46.1	59.2
Middle	212	197	409	12	7	19	56.6	35.5	46.5
Fourth	214	202	416	15	5	20	70.1	24.8	48.1
Highest	281	265	546	12	5	17	42.7	18.9	31.1
All	1,104	1,065	2,169	71	40	111	64.3	37.6	51.2

HDSS = Health and Demographic Surveillance System.

Fig. 4. Concentration curve for under-five mortality, Chakaria HDSS, 2016



CI = Concentration Index[2]; HDSS = Health and Demographic Surveillance System.

Causes of death

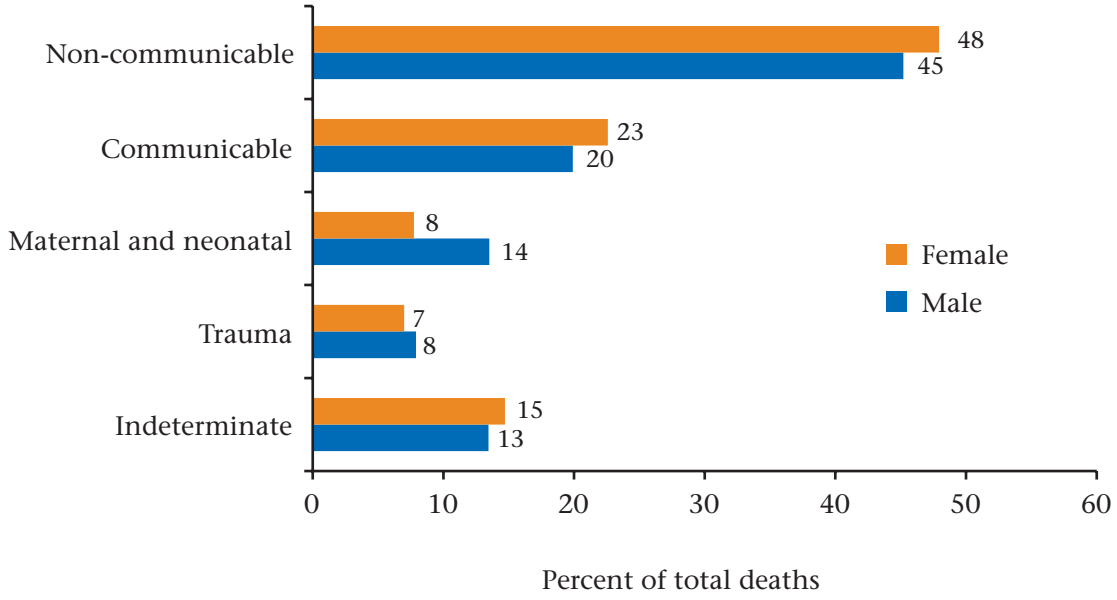
Verbal autopsy data on signs, symptoms and circumstances leading to death, and medical history of the deceased were collected during the quarterly household visits from an informed household member. A total of 478 deaths were registered in 2016. Data were analyzed using "InterVA-4.04" (4) to ascertain causes of death.

Broad pattern of cause of death

Non-communicable conditions (47%) were the leading cause of death for both men and women. This was followed by communicable diseases (22%), maternal and neonatal condition (11%), and trauma (8%). For both communicable and non-communicable diseases, the proportion of deaths was higher for females than for males (Fig. 5). Neonatal conditions were the leading cause of death in children and accounted for one-third of child deaths. 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 (5). A value of zero indicates no relation between health and socioeconomic status (6).

Fig. 5. Distribution of deaths by leading causes for males and females, Chakaria HDSS, 2016



HDSS = Health and Demographic Surveillance System.

Table 4. Distribution of causes of death according to age groups, Chakaria HDSS, 2016

Cause group	Children (<15 years) (%)	Adults (15-49 years) (%)	Elderly (50+ years) (%)
Communicable	25.1	15.1	20.9
Non-communicable	10.6	48.6	61.6
Maternal and neonatal	38.2	7.2	0.0
Trauma	12.6	16.2	3.7
Indeterminate	13.6	12.9	13.9
Total	100.0	100.0	100.0

HDSS = Health and Demographic Surveillance System.

Acute respiratory infection (including pneumonia), stroke, pulmonary tuberculosis, digestive neoplasms, and unspecified cardiac diseases are the leading five 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, 2016

Causes	Male (n=251)	Female (n=227)	Both (n=478)
01.01 Sepsis (non-obstetric)	0.0	0.4	0.2
01.02 Acute respiratory infection, including pneumonia	8.3	11.9	10.0
01.03 HIV/AIDS related death	1.0	0.6	0.8
01.04 Diarrhoeal diseases	1.0	1.9	1.4
01.05 Malaria	0.0	0.0	0.0
01.06 Measles	0.0	0.4	0.2
01.07 Meningitis and encephalitis	2.6	1.2	1.9
01.09 Pulmonary tuberculosis	6.3	4.2	5.3
01.10 Pertussis	0.0	0.0	0.0
01.11 Haemorrhagic fever	0.8	0.4	0.6
01.99 Other and unspecified infectious diseases	0.0	1.7	0.8
02.01 Oral neoplasms	1.4	0.7	1.0
02.02 Digestive neoplasms	6.3	3.1	4.8
02.03 Respiratory neoplasms	2.6	1.8	2.2
02.04 Breast neoplasms	0.0	1.0	0.5
02.05 & 02.06 Reproductive neoplasms M, F	1.3	5.9	3.5
02.99 Other and unspecified neoplasms	3.7	2.7	3.2
03.01 Severe anaemia	0.0	0.0	0.0
03.02 Severe malnutrition	1.1	2.6	1.8
03.03 Diabetes mellitus	2.8	4.1	3.4
04.01 Acute cardiac disease	2.6	1.1	1.9
04.02 Stroke	9.0	8.8	8.9
04.03 Sickle cell with crisis	0.2	0.0	0.1
04.99 Other and unspecified cardiac diseases	2.5	5.8	4.0
05.01 Chronic obstructive pulmonary disease	3.3	4.6	3.9
05.02 Asthma	0.0	0.9	0.4
06.01 Acute abdomen	2.7	1.4	2.1
06.02 Liver cirrhosis	1.8	0.6	1.2
07.01 Renal failure	2.0	2.1	2.1
08.01 Epilepsy	1.7	0.4	1.1
09.01 Ectopic pregnancy	0.0	0.1	0.1
09.02 Abortion-related death	0.0	0.7	0.3
09.03 Pregnancy-induced hypertension	0.0	1.0	0.5
09.04 Obstetric haemorrhage	0.0	0.0	0.0
09.05 Obstructed labour	0.0	0.0	0.0
09.06 Pregnancy-related sepsis	0.0	0.0	0.0

Table 5. (contd...)

Causes	Male (n=251)	Female (n=227)	Both (n=478)
09.99 Other and unspecified maternal causes of death	0.0	0.0	0.0
10.01 Prematurity	4.1	1.8	3.0
10.02 Birth asphyxia	2.9	1.3	2.1
10.03 Neonatal pneumonia	1.8	0.9	1.4
10.04 Neonatal sepsis	1.3	0.5	1.0
10.06 Congenital malformation	0.0	0.0	0.0
10.99 Other and unspecified neonatal causes of death	3.2	1.4	2.3
12.01 Road traffic accident	2.4	0.9	1.7
12.02 Other transport accident	0.7	0.0	0.4
12.03 Accidental fall	0.3	0.4	0.4
12.04 Accidental drowning and submersion	2.3	3.9	3.1
12.05 Accidental exposure to smoke fire & flame	0.0	0.0	0.0
12.06 Contact with venomous plant/animal	0.3	0.0	0.2
12.07 Accidental poisoning & noxious substances	0.0	0.0	0.0
12.08 Intentional self-harm	0.3	1.6	0.9
12.09 Assault	1.2	0.2	0.7
12.10 Exposure to force of nature	0.4	0.0	0.2
12.99 Other and unspecified external causes of death	0.0	0.0	0.0
98 Other and unspecified non-communicable diseases	0.4	0.4	0.4
99 Indeterminate	13.5	14.7	14.1
All	100.0	100.0	100.0

HDSS = Health and Demographic Surveillance System.

CHAPTER 5

Fertility

The crude birth rate in 2016 was 25.7 per 1,000 population, which was similar in 2015 (25.6 per 1,000 population) (Table 20). The fertility rate was highest among women of age-group of 20-24 years (Table 6).

Table 6. Age-specific fertility rate per 1,000 women aged 15-49 years, Chakaria HDSS, 2016

Age (years)	No. of females	No. of births			Birth rate
		Male	Female	Both	
15-19	4,865	154	113	267	54.9
20-24	4,113	384	384	768	186.7
25-29	3,604	314	313	627	174.0
30-34	3,255	179	181	360	110.6
35-39	2,503	61	58	119	47.5
40-44	1,844	10	13	23	12.5
45-49	1,445	2	3	5	3.5
All	21,629	1,104	1,065	2,169	589.7
TFR					2,948

TFR = Total fertility rate per 1,000 women; HDSS = Health and Demographic Surveillance System.

Table 7 presents the crude birth rate by household asset quintiles. The crude birth rate showed a 'U' shaped relationship with household socioeconomic status measured by asset quintiles.

Table 7. Crude birth rate per 1,000 population by asset quintile and sex, Chakaria HDSS, 2016

Asset quintile	Midyear population			No. of births			Birth rate		
	Male	Female	Both	Boy	Girl	Both	Boy	Girl	Both
Lowest	6,914	7,294	14,208	192	184	376	27.8	25.2	26.5
Second	8,185	8,089	16,274	205	217	422	25.0	26.8	25.9
Middle	9,031	8,858	17,889	212	197	409	23.5	22.2	22.9
Fourth	8,708	8,399	17,107	214	202	416	24.6	24.1	24.3
Highest	9,383	9,545	18,928	281	265	546	29.9	27.8	28.8
All	42,221	42,185	84,406	1,104	1,065	2,169	26.1	25.2	25.7

HDSS = Health and Demographic Surveillance System.

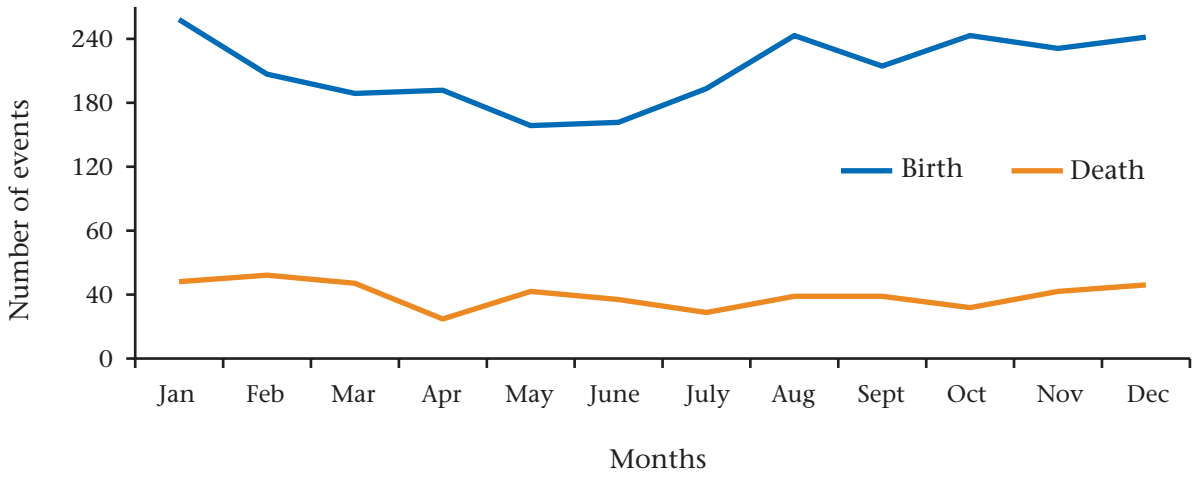
Of the pregnancies in 2016, 10.3% of 2,637 were terminated prematurely and spontaneously, 4.1% were terminated through induction, and 3.4% resulted in stillbirths (Table 8).

Table 8. Pregnancy outcome, Chakaria HDSS, 2016

Pregnancy outcome	No.	%
Spontaneous abortion	271	10.3
Induced abortion	107	4.1
Stillbirth	90	3.4
Live birth*	2,169	82.2
Total number of pregnancies	2,637	100.0

*Multiple live births included; HDSS = Health and Demographic Surveillance System.

Fig. 6. Number of births and deaths by month, Chakaria HDSS, 2016

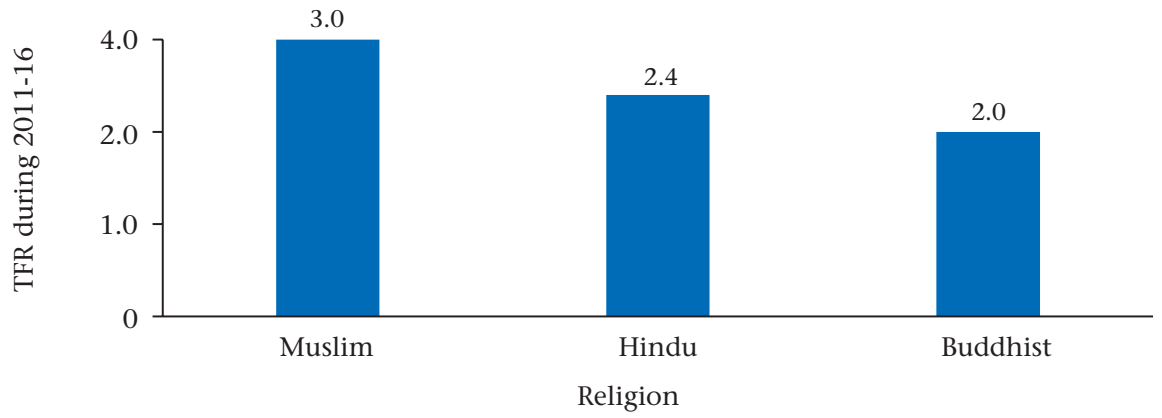


HDSS = Health and Demographic Surveillance System.

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 birthrate was observed during the time period January and June to August.

Fertility behaviour varies widely by three religious groups in Chakaria HDSS and total fertility rates are lower amongst the religious minorities. The aim of Bangladesh was to reduce fertility to 2 births per woman by 2016 and only the smallest religious minority groups (Buddhist) has reached that level (Fig. 7).

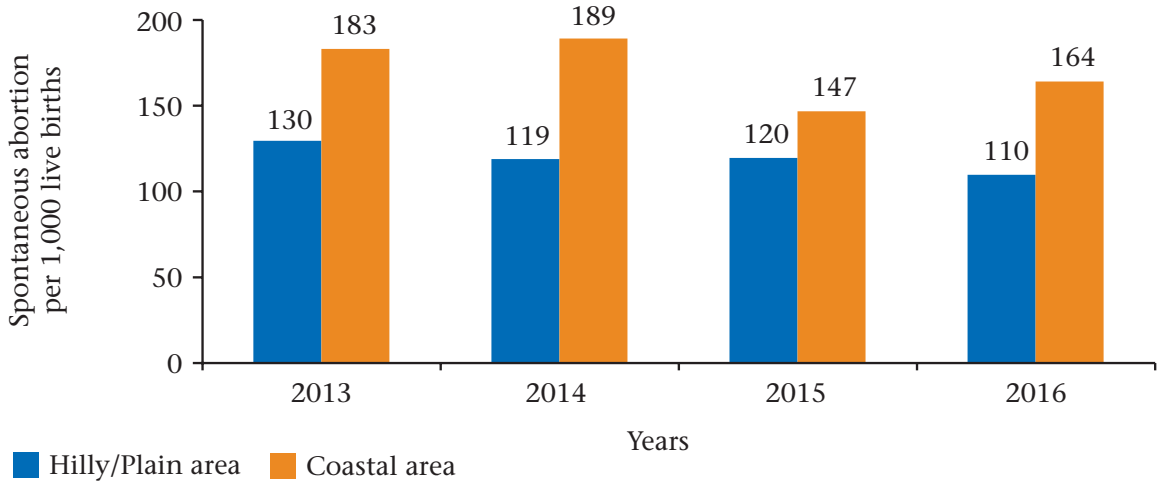
Fig. 7. Total fertility rate for three religious groups, Chakaria HDSS, 2011-16



HDSS = Health and Demographic Surveillance System.

Among 49 villages of Chakaria HDSS, 36 are hilly/plain villages and the remaining 13 are coastal villages. Figure 8 illustrates the higher rate of spontaneous abortions among the population of coastal villages compared to the people living in hilly and plain area over a long time period (2013 to 2016).

Fig. 8. Ratio of spontaneous abortions to live births (per 1,000), Chakaria HDSS, 2013-16



HDSS = Health and Demographic Surveillance System.

CHAPTER 6

Migration

In 2016, the rate of out-migration was higher at 41.8 per 1,000 population than that of in-migration at 35.9 per 1,000 population (Table 9). The rates were lower in 2015 (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 2016. 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 April.

Table 9. Migration rate per 1,000 population by asset quintile and sex, Chakaria HDSS, 2016

Asset quintile	Midyear population			In-migration rate			Out-migration rate		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
Lowest	6,914	7,294	14,208	40.6	49.6	45.3	50.9	67.2	59.3
Second	8,185	8,089	16,274	28.2	40.7	34.4	30.5	47.3	38.9
Middle	9,031	8,858	17,889	23.1	40.6	31.8	28.0	41.4	34.7
Fourth	8,708	8,400	17,108	21.9	44.5	33.0	34.0	45.7	39.7
Highest	9,383	9,544	18,927	22.3	51.1	36.8	30.8	48.3	39.6
All	42,221	42,185	84,406	26.6	45.3	35.9	34.1	49.4	41.8

HDSS = Health and Demographic Surveillance System.

Table 10. Number of migrants by sex and month, Chakaria HDSS, 2016

Month	In-migration			Out-migration		
	Male	Female	Both	Male	Female	Both
January	203	248	451	158	229	387
February	101	154	255	116	162	278
March	121	183	304	156	187	343
April	147	198	345	148	230	378
May	103	190	293	106	192	298
June	92	167	259	114	137	251
July	59	120	179	135	170	305
August	83	130	213	113	129	242
September	85	169	254	117	203	320
October	53	148	201	109	171	280
November	33	105	138	98	153	251
December	42	102	144	70	122	192
All	1,122	1,914	3,036	1,440	2,085	3,525

HDSS = Health and Demographic Surveillance System.

Origin and destination of migrants

During 2016, 4.9% of 3,036 in-migrants moved into Chakaria HDSS households from outside of Bangladesh whereas 10.6% of 3,525 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, 2016

Origin or destination	In-migration			Out-migration		
	Male (%)	Female (%)	Both (%)	Male (%)	Female (%)	Both (%)
Inside Bangladesh	87.5	99.6	95.1	75.6	99.0	89.5
Outside Bangladesh	12.5	0.4	4.9	24.4	1.0	10.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total number of migrants	1,122	1,914	3,036	1,440	2,085	3,525
Cox's Bazar District						
Inside Chakaria	74.8	76.4	75.9	83.2	81.5	82.1
Outside Chakaria	25.2	23.6	24.1	16.8	18.5	17.9
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total no. of migrants	687	1,467	2,154	951	1,864	2,815
Chakaria *Upazila*						
Inside HDSS area	67.1	69.1	68.5	61.3	60.0	60.4
Outside HDSS area	32.9	30.9	31.5	38.7	40.0	39.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total no. of migrants	514	1,121	1,635	522	1,154	1,676

HDSS = Health and Demographic Surveillance System.

Reasons for migration

Table 12 presents the reasons of migration by sex. 46.1% of the migrants moved out due to family-related issues - mostly marriage, followed by work (24.5%), housing (24.5%), and education (2.6%). Reasons for moving out for males were different from those of females. 33.4% of male in-migrants moved due to work related issues whereas only 12.8% of the females moved due to that reason. On the other hand, 66.4% of female in-migrants moved due to family related issues - mostly marriage,

while 32.7% 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, 2016

Reasons for migration	In-migration			Out-migration		
	Male (%)	Female (%)	Both (%)	Male (%)	Female (%)	Both (%)
Family-related	32.7	66.4	54.3	25.1	60.6	46.1
Work-related	33.4	12.8	20.0	41.2	13.0	24.5
Housing-related	27.6	16.3	20.5	29.1	21.3	24.5
Education	5.3	3.6	4.2	3.3	2.2	2.6
Other	1.1	1.0	1.1	1.3	2.9	2.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total no. of migrants	1,122	1,914	3,036	1,440	2,085	3,525

HDSS = Health and Demographic Surveillance System.

CHAPTER 7

Marriage

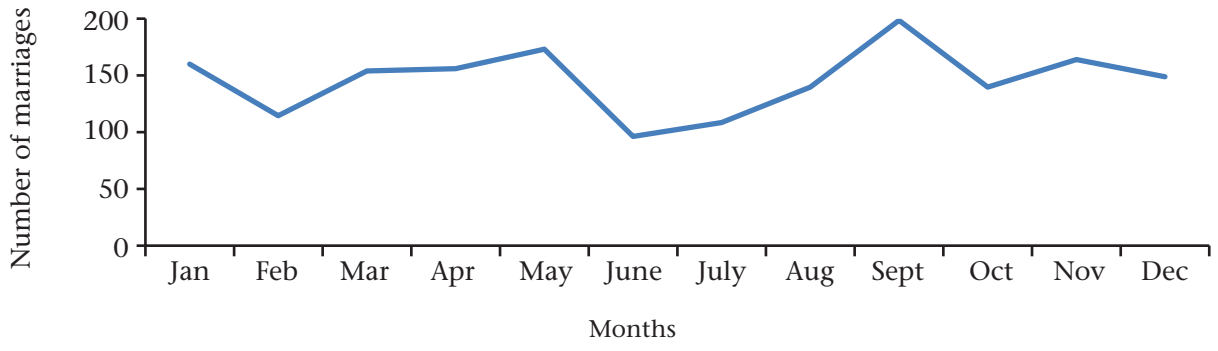
In total 1,755 marriages took place in the surveillance villages in Chakaria during 2016 and the crude marriage rate was 20.8 per 1,000 population, with greater rate among the females than to the males. Among the males, highest marriage rate was found in the age group of 25-29 years and for females in the age group of 15-19 years. Throughout 2016, 101 divorces happened in Chakaria and the crude divorce rate was 1.2 per 1,000 population with nearly similar rates among males and females (Table 13). The highest number of marriages took place in September and the lowest in June (Fig.9).

Table 13. Crude rate of marriage and divorce by age and sex, Chakaria HDSS, 2016

Age (years)	Marriage			Divorce		
	Male	Female	Both	Male	Female	Both
10-14	0.0	7.9	3.9	0.0	0.4	0.2
15-19	13.3	111.2	60.4	0.2	2.9	1.5
20-24	50.0	90.9	71.7	2.5	5.3	4.0
25-29	65.0	29.7	46.4	3.1	4.2	3.6
30-34	44.1	8.3	24.7	2.9	2.2	2.5
35-39	15.3	4.0	9.4	2.2	0.8	1.5
40-44	3.0	2.7	2.8	0.5	0.0	0.3
45-49	3.2	0.7	2.0	0.6	0.0	0.3
50-54	2.4	0.7	1.5	2.4	0.0	1.2
55-59	3.7	0.0	1.8	0.9	0.0	0.5
60-64	2.2	1.2	1.7	0.0	0.0	0.0
65+	0.0	1.6	3.6	0.0	0.0	0.0
All	15.2	26.4	20.8	0.9	1.5	1.2

HDSS = Health and Demographic Surveillance System.

Fig. 9. Number of marriages by month, Chakaria HDSS, 2016



HDSS = Health and Demographic Surveillance System

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 27 years. For females, both mean and median ages at first marriage were 20 years and the SMAM was 21 years. The SMAM, mean and median ages at first marriage remained nearly same as of 2015 for both males and females. 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, 2016

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	24.3	24.2	24.1	19.9	19.8	19.9
Second	25.6	25.4	25.4	19.9	19.8	19.9
Middle	26.9	26.6	26.5	20.5	20.0	19.9
Fourth	27.7	27.5	28.0	20.6	20.1	20.2
Highest	29.2	29.1	29.5	20.8	20.7	20.3
All	27.1	27.0	27.1	20.5	20.2	20.2

HDSS = Health and Demographic Surveillance System.
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.

CHAPTER 8

Safe Motherhood Practices

The health-related activities of ICDDR,B in Chakaria included facilitation of provision of safe motherhood services (e.g. antenatal care, postnatal care, and delivery services) by the trained midwives who has 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 (SBAs) 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 five 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

Table 15. Antenatal care by sources and asset quintile, Chakaria HDSS, 2016

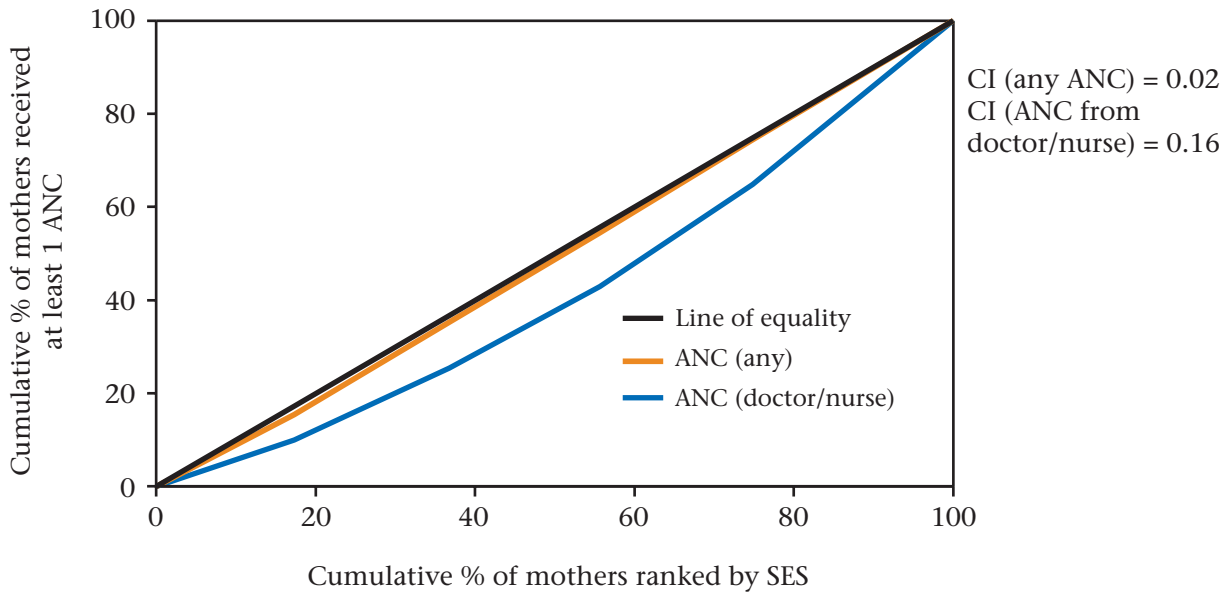
Asset quintile	Received any ANC (%)	Midwife* (%)	FWV* (%)	Nurse/ doctor* (%)	FDSR/ CMH* (%)	None (%)	No. of women
Lowest	69.4	19.1	23.1	28.7	15.7	30.6	376
Second	79.6	17.1	26.3	39.1	20.6	20.4	422
Middle	79.0	15.6	23.2	46.0	20.3	21.0	409
Fourth	81.3	12.5	20.9	56.5	14.4	18.8	416
Highest	79.1	8.4	7.9	68.9	8.1	20.9	546
Total	77.9	14.1	19.5	49.4	15.4	22.1	2,169

*Multiple responses recorded
ANC = Antenatal care
FWV = Family welfare visitor
FDSR = Family Development Services and Research
CMH = Christian Memorial Hospital
HDSS = Health and Demographic Surveillance System.

Among 2,169 pregnant women who gave live births, 77.9% 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 then midwives (Table 15). Use of at least one ANC during pregnancy was almost equitable during 2016 in Chakaria. Sixty nine percent of the pregnant women from the lowest socioeconomic quintile used at least one ANC during pregnancy as oppose to seventy nine percent 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 (Fig. 10). On the contrary, use of ANC service from doctors or nurses indicated a higher level of inequity where the rate was sixty nine percent for women in highest socioeconomic quintile and only twenty nine percent for women in the lowest socioeconomic quintile (Table 15). This is visible in Figure 10 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.

Fig. 10. Concentration curve for receiving at least one ANC, Chakaria HDSS, 2016



CI = Concentration Index; HDSS = Health and Demographic Surveillance System.

Use of postnatal care services

Any postnatal check-up of both women and children within 42 days of their delivery are of interest here. And it was observed that only 44% of the pregnant women received at least one postnatal care (PNC) in 2016. 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

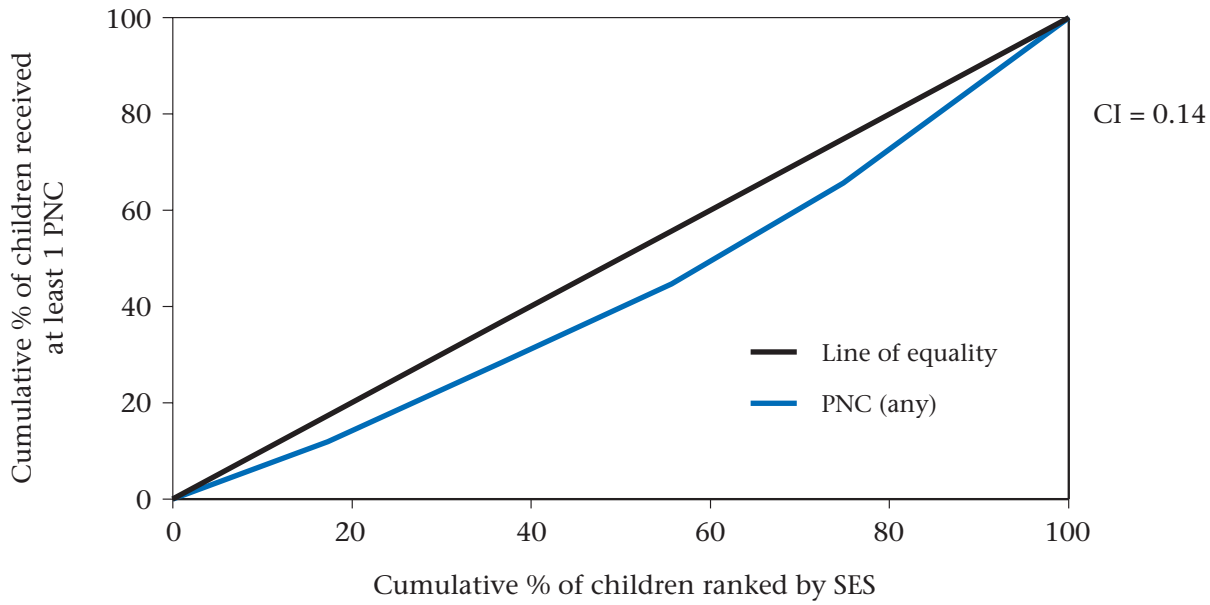
society (Table 16). Figure 11 also shows the current inequality of the use of PNC services among different socioeconomic groups. The concentration index (0.14) supported that the rich people were more intended to receive the service compared to the poor.

Table 16. Postnatal care by sources and asset quintile, Chakaria HDSS, 2016

Asset quintile	Received any PNC (%)	Midwife* (%)	FWV* (%)	Nurse/ doctor* (%)	FDSR/ CMH* (%)	None (%)	No. of women
Lowest	30.1	5.9	4.0	19.4	1.6	69.9	376
Second	37.4	10.0	1.4	27.5	2.6	62.6	422
Middle	37.9	9.3	2.2	28.1	1.7	62.1	409
Fourth	48.1	9.1	3.4	38.0	2.2	51.9	416
Highest	60.1	7.0	2.9	52.2	1.5	39.9	546
Total	44.0	8.2	2.8	34.4	1.9	56.0	2,169

*Multiple responses recorded
PNC = Postnatal care
FWV = Family welfare visitor
FDSR = Family Development Services and Research
CMH = Christian Memorial Hospital
HDSS = Health and Demographic Surveillance System.

Fig. 11. Concentration curve for receiving at least one PNC, Chakaria HDSS, 2016



CI = Concentration Index; HDSS = Health and Demographic Surveillance System.

Assistance during delivery

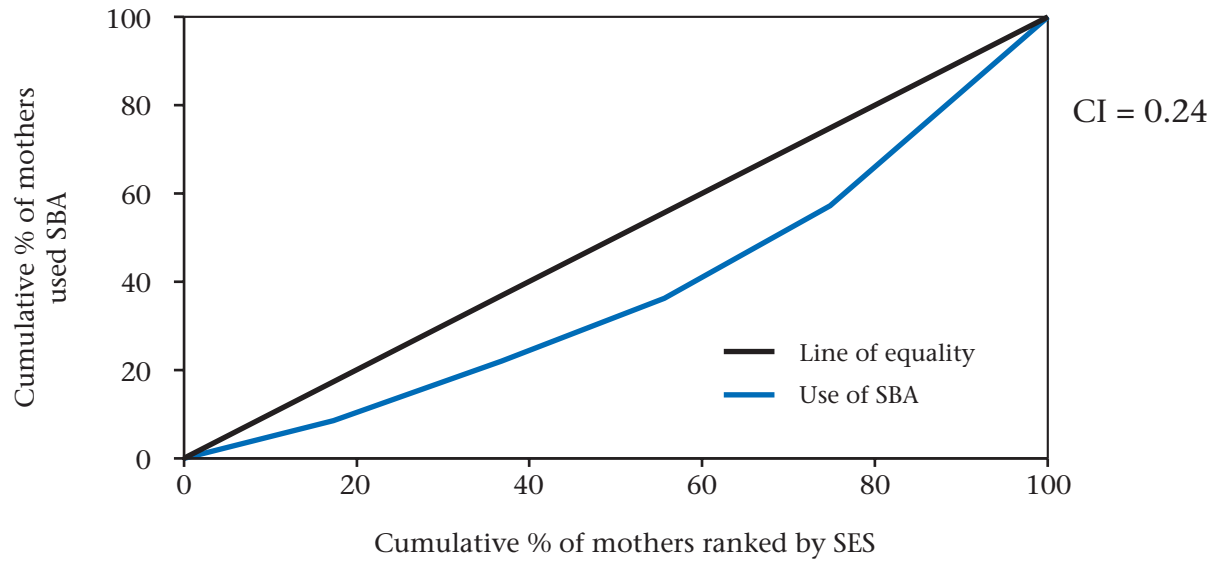
Table 17. Assistance during delivery by asset quintile, Chakaria HDSS, 2016

Asset quintile	Midwife (%)	FWV (%)	Nurse/ doctor (%)	TBA (%)	No. of women
Lowest	5.9	2.7	8.8	82.7	376
Second	11.4	1.4	11.8	75.4	422
Middle	11.0	3.2	12.5	73.3	409
Fourth	12.7	4.1	21.6	61.5	416
Highest	9.2	3.3	47.6	39.9	546
Total	10.1	3.0	22.3	64.7	2,169

FWV = Family Welfare Visitor
HDSS = Health and Demographic Surveillance System.

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 five percent of 2,169 deliveries in Chakaria were assisted by the TBAs as opposed to thirty five percent of the deliveries assisted by the SBAs. The use rate of 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 (Fig. 12).

Fig. 12. Concentration curve for use of SBA services, Chakaria HDSS, 2016



CI = Concentration Index; HDSS = Health and Demographic Surveillance System.

Place of delivery

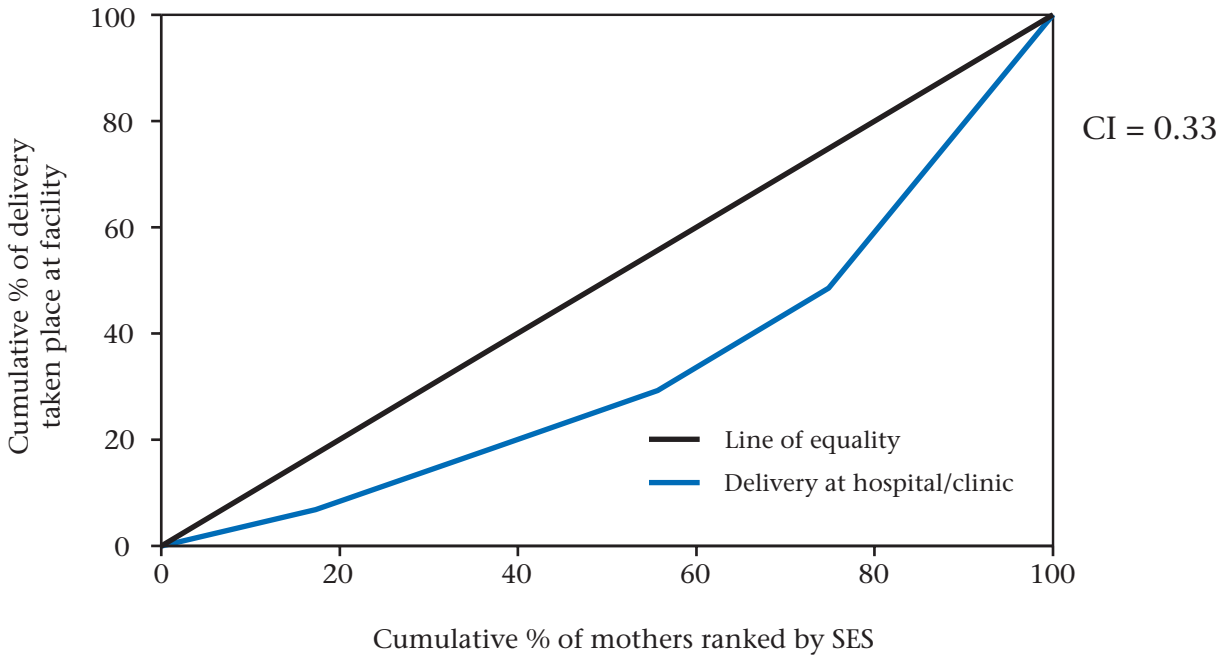
Seventy seven percent of the deliveries took place at home. Only 22.9% of 2,169 deliveries took place either at hospitals or at clinics (Table 18). The women from the households in the highest asset quintile had a much higher rate of facility based delivery than those from the lowest quintile (Table 18 and Fig. 13).

Table 18. Place of delivery by asset quintile, Chakaria HDSS, 2016

Asset quintile	Hospital/Clinic (%)	Home (%)	No. of women
Lowest	9.0	91.0	376
Second	13.3	86.7	422
Middle	13.4	86.6	409
Fourth	23.1	76.9	416
Highest	46.7	53.3	546
Total	22.9	77.1	2,169

HDSS = Health and Demographic Surveillance System.

Fig. 13. Concentration curve for facility-based delivery, Chakaria HDSS, 2016



CI = Concentration index; HDSS = Health and Demographic Surveillance System.

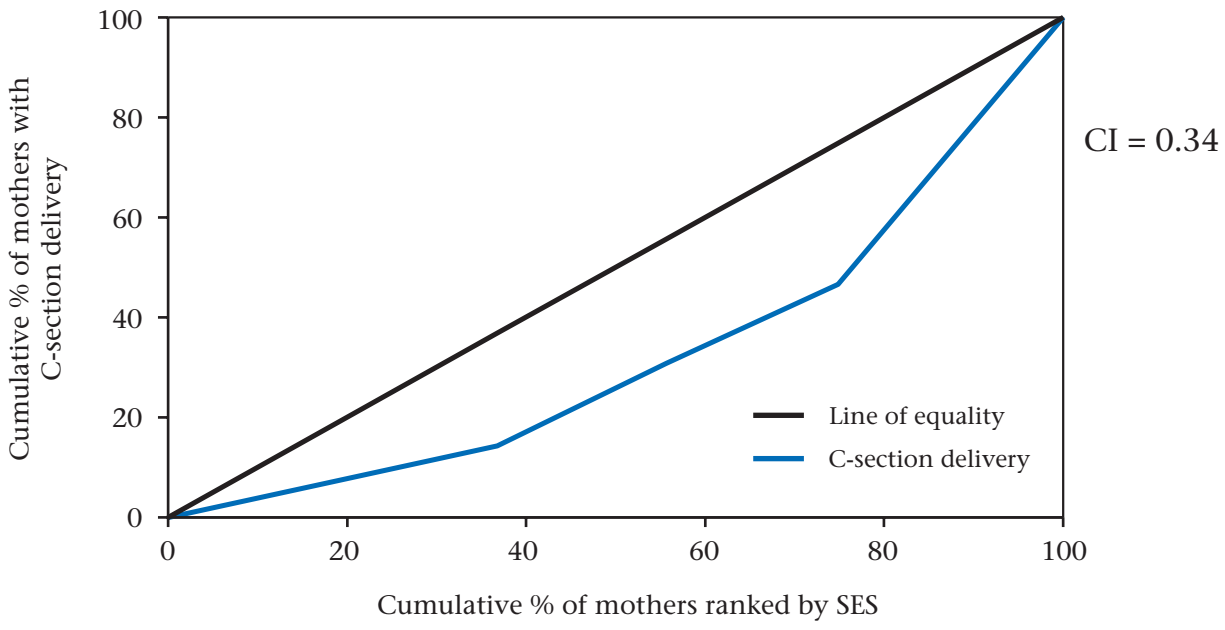
Table 19 shows caesarean-section delivery by household asset quintile in 2016. Caesarean-section delivery accounted for 9.0% of the total deliveries and 39.3% of the facility-based deliveries in the Chakaria HDSS area in 2016. Although the number of deliveries through caesarean sections was small, the number of women giving birth by caesarean sections exhibited discrepancies between highest and lowest quintiles (Table 19 and Fig. 14).

Table 19. Proportion of caesarean-section delivery by asset quintile, Chakaria HDSS, 2016

Asset quintile	No. of caesarean-section delivery	Caesarean-section delivery (%)	Total no. of deliveries
Lowest	13	3.5	376
Second	15	3.6	422
Middle	32	7.8	409
Fourth	31	7.5	416
Highest	104	19.0	546
Total	195	9.0	2,169

HDSS = Health and Demographic Surveillance System.

Fig. 14. Concentration curve for caesarean-section delivery, Chakaria HDSS, 2016



CI = Concentration Index; HDSS = Health and Demographic Surveillance System.

CHAPTER 9

SDG and Other Health and Socio-demographic Indicators

Sustainable development goals, popularly known as SDGs, including 17 goals with169 associated targets were announced for UN member States in order to eradicate poverty, inequality and injustice and to deal with climatic changes by 2030. Though Millennium Development Goals (MDGs) attainment in Bangladesh was relatively notable, but the progress for most indicators could not meet with desired target. The SDGs address the origins of poverty and the universal development needs which will work for all people and thus expectantly go much further than the MDGs. 16 indicators among all basic and complementary SDG indicators can be calculated using the data of Chakaria HDSS (7).

The major demographic and health indicators (including the SDGs) during 2012-16 are presented in Table 20. A declining trend in the fertility indicators and natural rate of population increase was observed during 2012-16. Most of the rates in Chakaria HDSS area are much higher than those in the Matlab government service area, another rural field site of ICDDR,B (8). In 2016, the rate of natural increase and the annual population growth rate in the surveillance area of Chakaria was 2.0 % and 1.4% respectively (Table 20).

Twenty three percent of births in Chakaria were delivered at facilities (hospital or clinic) in 2016. The percentage of births at facilities in 2016 remained nearly same as of 2015. About one-third of the births were attended by Skilled Birth Attendants (SBAs) in Chakaria during 2016 and the rate of deliveries assisted by SBAs remained same as was in 2015 (Table 20).

The legal age of marriage is 18 years for female and 21 years for male in Bangladesh. In 2016, 34.6% of the women married before reaching their 18th birthday. The percentage of underage female marriage remained nearly equal during 2015 to 2016. Twenty three percent of the males were married before the age of 21 years in 2016. The proportion of male marriages before 21 years has stayed nearly same between 2015 and 2016. The percentage of underage marriage for females remained higher than males during 2012 to 2016.

Total fertility rate and death rates in Chakaria during 2016 were higher than their national counterparts. Facility-based deliveries, receiving service from Skilled Birth Attendants (SBAs) and antenatal care coverage were lower, and postnatal care coverage was comparatively higher than the national rates. Immunization rate was slightly lower than the national figure.

Among the boys, 76% of those enrolled completed the last grade of primary level education and 72% completed last grade of secondary level education. The rates were, however, lower for girls and were 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 higher percentage of active age group population was engaged in economic activities in Chakaria.

Table 20. SDG and other health and socio-demographic indicators, Chakaria HDSS, 2012 – 2016

Rate	Chakaria HDSS area					Matlab HDSS Govt. area 2015	National	
	2012	2013	2014	2015	2016			
Crude birth rate	25.4	24.9	25.5	25.6	25.7	21.6	-	-
Total fertility rate[a]	2.9	2.8	2.9	2.9	2.9	2.7	SDG	2.3[d]
Neonatal mortality[b]	28.0	40.6	31.5	34.1	30.0	27.9	SDG	28.0[d]
Post-neonatal mortality[b]	13.7	5.9	15.3	14.0	11.5	5.7	-	-
Infant mortality rate[b]	41.7	46.5	45.3	44.4	41.5	33.6	SDG	38.0[d]
Child mortality rate (1-4 yrs)	3.7	5.0	2.8	2.9	2.7	1.8	-	-
Under-five mortality rate[b]	56.8	65.6	57.4	58.9	51.2	40.5	SDG	46.0[d]
Crude death rate	5.6	5.4	5.3	5.9	5.7	6.9	-	-
Rate of natural increase	19.8	19.4	20.3	20.5	20.0	14.7	-	-
In-migration rate	33.9	37.4	32.7	33.2	36.0	51.6	-	-
Out-migration rate	35.2	44.0	35.9	37.3	41.8	54.4	-	-
Growth rate (%)	1.9	1.3	1.7	1.6	1.4	1.2	-	-
Adolescent birth rate	61.8	56.2	62.0	65.8	54.9	64.8	SDG	79.4[e]
Stillbirth rate[c]	24.9	24.4	33.6	36.5	39.8	25.5	SDG	36.0[f]
Facility-based delivery (%)	16.1	16.7	20.5	23.4	22.9	56.5	-	37.4[d]
Received assistance from SBA during delivery (%)	29.2	29.7	31.4	35.3	35.3	58.9	SDG	42.1[d]
Antenatal care coverage (at least 1 visit) (%)	68.1	66.6	74.1	76.6	77.9	-	SDG	78.6[d]
Antenatal care coverage (at least 4 visits) (%)	-	-	27.8	29.3	29.7	-	SDG	31.2[d]
Postnatal care coverage (1 visit) (%)	35.9	36.2	42.2	43.3	44.0	-	SDG	38.0[d]
Male marriage at ages under 21 years (%)	23.4	23.3	23.9	23.5	22.8	7.5	-	-
Female marriage at ages under 18 years (%)	37.1	37.2	35.0	35.9	34.6	36.9	-	-
Female aged 20-24 who were married or in a union by age 18 (%)	-	-	40.8	39.2	39.0	-	SDG	65.0[g]

Table 20. (contd...)

Rate	Chakaria HDSS area					Matlab HDSS Govt. area 2015		National
	2012	2013	2014	2015	2016			
Children receiving full immunization (%)	-	-	79.0	81.8	82.4	87.7	SDG	83.8[d]
1-year old children immunized against measles (%)	-	-	81.7	84.6	87.9	87.9	SDG	86.1[d]
Primary education completion rate for girls (%)	-	-	75.3	74.3	74.8	-	SDG	79.8[h]
Primary education completion rate for boys (%)	-	-	77.7	76.4	75.9	-	SDG	69.5[h]
Secondary education completion rate for girls (%)	-	-	58.1	66.5	66.7	-	SDG	64.9[h]
Secondary education completion rate for boys (%)	-	-	72.0	73.4	71.8	-	SDG	52.2[h]
Tertiary enrollment rate for women (%)	-	-	3.8	4.1	4.0	-	SDG	11.0[h]
Tertiary enrollment rate for men (%)	-	-	6.4	7.3	7.4	-	SDG	15.4[h]
Literacy rate of 15-24 year-old women (%)	-	-	93.6	94.1	97.2	-	SDG	83.3[h]
Literacy rate of 15-24 year-old men (%)	-	-	85.9	88.6	91.9	-	SDG	78.9[h]
Employment to population ratio (EPR) for women (15+ years of age) (%)	-	-	20.7	20.8	16.8	-	SDG	33.9[h]
Employment to population ratio (EPR) for men (15+ years of age) (%)	-	-	83.9	83.6	86.5	-	SDG	79.2[h]
Women without incomes of their own (%)	-	-	6.7	7.0	6.2	-	SDG	7.4[h]

[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. 2015. *Bangladesh Demographic and Health Survey 2014: Key Indicators*. Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPORT, Mitra and Associates, and ICF International;

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'-'Data not available; SDG = Sustainable development goals; HDSS = Health and Demographic Surveillance System.

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APPENDIX A

Midyear population by age and sex, Chakaria HDSS, 2016

Age (years)	Midyear population			Percentage distribution of midyear population		
	Male	Female	Both	Male	Female	Both
<1	1,046	1,012	2,058	2.5	2.4	2.4
1-4	4,028	3,784	7,812	9.6	9.0	9.3
5-9	5,436	5,207	10,643	12.9	12.4	12.6
10-14	5,668	5,592	11,260	13.4	13.3	13.3
15-19	5,259	4,865	10,124	12.5	11.5	12.0
20-24	3,640	4,113	7,753	8.6	9.7	9.2
25-29	3,248	3,604	6,852	7.7	8.5	8.1
30-34	2,743	3,255	5,998	6.5	7.7	7.1
35-39	2,295	2,503	4,798	5.4	5.9	5.7
40-44	2,029	1,844	3,873	4.8	4.4	4.6
45-49	1,581	1,445	3,026	3.7	3.4	3.6
50-54	1,258	1,340	2,598	3.0	3.2	3.1
55-59	1,089	1,123	2,212	2.6	2.7	2.6
60-64	899	839	1,738	2.1	2.0	2.1
65-69	762	620	1,382	1.8	1.5	1.6
70-74	495	393	888	1.2	0.9	1.1
75-79	379	301	680	0.9	0.7	0.8
80-84	182	165	347	0.4	0.4	0.4
85+	184	180	364	0.4	0.4	0.4
All	42,221	42,185	84,406	100.0	100.0	100.0

APPENDIX B

Cause-specific mortality rate per 1,000 population by age and sex, Chakaria HDSS, 2016

Causes	Age groups (years)						
	Neonate	Infant	1-4	5-14	15-49	50-64	65+
Male							
01.01 Sepsis (non-obstetric)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01.02 Acute respiratory infection including pneumonia	0.0	6.1	0.7	0.0	0.0	0.9	4.5
01.03 HIV/AIDS related death	0.0	0.5	0.0	0.0	0.0	0.0	0.3
01.04 Diarrhoeal diseases	0.0	1.0	0.0	0.0	0.0	0.4	0.0
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	41.1	1.0	0.0	0.1	0.0	0.0	0.5
01.09 Pulmonary tuberculosis	0.0	0.0	0.0	0.0	0.0	0.5	7.0
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	0.2	0.0	0.0	0.0
01.99 Other and unspecified infectious diseases	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02.01 Oral neoplasms	0.0	0.0	0.0	0.0	0.0	0.0	1.7
02.02 Digestive neoplasms	0.0	0.0	0.0	0.0	0.2	2.9	1.4
02.03 Respiratory neoplasms	0.0	0.0	0.0	0.0	0.0	0.6	2.2
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	0.5	0.8
02.99 Other and unspecified neoplasms	0.0	0.0	0.0	0.0	0.2	0.5	1.5
03.01 Severe anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0
03.02 Severe malnutrition	0.0	0.4	0.5	0.0	0.0	0.0	0.0
03.03 Diabetes mellitus	0.0	0.0	0.0	0.2	0.0	0.0	2.1
04.01 Acute cardiac disease	0.0	0.0	0.0	0.0	0.0	0.4	2.6
04.02 Stroke	0.0	0.0	0.0	0.0	0.1	2.2	7.0
04.03 Sickle cell with crisis	0.0	0.0	0.1	0.0	0.0	0.0	0.0
04.99 Other and unspecified cardiac diseases	0.0	0.0	0.0	0.0	0.0	0.9	1.5
05.01 Chronic obstructive pulmonary diseases	0.0	0.0	0.0	0.0	0.0	0.6	3.1
05.02 Asthma	0.0	0.0	0.0	0.0	0.0	0.0	0.0
06.01 Acute abdomen	9.2	1.0	0.5	0.0	0.0	0.0	1.2
06.02 Liver cirrhosis	0.0	0.0	0.0	0.0	0.0	0.3	1.2

Appendix B. (contd...)

Causes	Age groups (years)						
	Neonate	Infant	1-4	5-14	15-49	50-64	65+
07.01 Renal failure	0.0	0.0	0.0	0.0	0.0	0.6	1.1
08.01 Epilepsy	19.2	1.0	0.2	0.0	0.0	0.0	0.5
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	156.4	0.0	0.0	0.0	0.0	0.0	0.0
10.02 Birth asphyxia	111.8	0.0	0.0	0.0	0.0	0.0	0.0
10.03 Neonatal pneumonia	69.1	0.0	0.0	0.0	0.0	0.0	0.0
10.04 Neonatal sepsis	50.8	0.0	0.0	0.0	0.0	0.0	0.0
10.06 Congenital malformation	5.8	0.0	0.0	0.0	0.0	0.0	0.0
10.99 Other and unspecified neonatal causes of death	120.3	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	0.1	0.3	0.5
12.02 Other transport accident	0.0	0.0	0.0	0.0	0.0	0.0	0.5
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	0.5	0.1	0.0	0.3	0.5
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	0.1	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	0.6	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	113.3	0.2	0.4	0.1	0.1	1.6	6.8
All causes	697.0	11.2	3.0	0.9	1.3	14.2	48.5

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	0.6	0.0	0.0	0.0	0.0	0.3
01.02 Acute respiratory infection including pneumonia	0.0	6.1	0.8	0.0	0.0	1.5	8.0
01.03 HIV/AIDS related death	0.0	0.0	0.0	0.0	0.0	0.3	0.2
01.04 Diarrhoeal diseases	0.0	1.0	0.0	0.0	0.1	0.0	1.0
01.05 Malaria	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01.06 Measles	0.0	1.0	0.0	0.0	0.0	0.0	0.0
01.07 Meningitis and encephalitis	9.8	1.0	0.0	0.0	0.0	0.0	0.0
01.09 Pulmonary tuberculosis	0.0	0.0	0.0	0.0	0.2	1.0	1.7
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	0.3	0.0
01.99 Other and unspecified infectious diseases	0.0	0.0	0.0	0.1	0.0	0.0	1.4
02.01 Oral neoplasms	0.0	0.0	0.0	0.0	0.0	0.0	0.9
02.02 Digestive neoplasms	0.0	0.0	0.0	0.0	0.1	0.6	2.3
02.03 Respiratory neoplasms	0.0	0.0	0.0	0.0	0.0	0.0	2.0
02.04 Breast neoplasms	0.0	0.0	0.0	0.0	0.0	0.2	0.6
02.05 & 02.06 Reproductive neoplasms M, F	0.0	0.0	0.0	0.0	0.1	1.5	3.2
02.99 Other and unspecified neoplasms	0.0	0.0	0.0	0.0	0.1	0.7	1.1
03.01 Severe anaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0
03.02 Severe malnutrition	0.0	1.4	0.0	0.0	0.0	0.0	2.8
03.03 Diabetes mellitus	0.0	0.0	0.0	0.0	0.1	0.0	4.6
04.01 Acute cardiac disease	0.0	0.0	0.0	0.0	0.0	0.3	1.0
04.02 Stroke	0.0	0.0	0.0	0.0	0.0	1.9	8.2
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	1.5	3.6
05.01 Chronic obstructive pulmonary diseases	0.0	0.0	0.0	0.0	0.0	0.6	4.4
05.02 Asthma	0.0	0.0	0.0	0.0	0.0	0.3	0.6
06.01 Acute abdomen	0.0	0.0	0.0	0.0	0.0	0.3	1.4
06.02 Liver cirrhosis	0.0	0.0	0.0	0.0	0.0	0.2	0.4
07.01 Renal failure	0.0	0.0	0.0	0.0	0.0	0.6	1.5
08.01 Epilepsy	0.0	0.0	0.0	0.0	0.0	0.3	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	0.1	0.0	0.0
09.03 Pregnancy-induced hypertension	0.0	0.0	0.0	0.0	0.1	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	51.5	0.0	0.0	0.0	0.0	0.0	0.0
10.02 Birth asphyxia	35.3	0.0	0.0	0.0	0.0	0.0	0.0
10.03 Neonatal pneumonia	25.3	0.0	0.0	0.0	0.0	0.0	0.0
10.04 Neonatal sepsis	14.8	0.0	0.0	0.0	0.0	0.0	0.0
10.06 Congenital malformation	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10.99 Other and unspecified neonatal causes of death	38.6	0.0	0.0	0.0	0.0	0.0	0.0
12.01 Road traffic accident	0.0	0.0	0.0	0.1	0.0	0.3	0.0
12.02 Other transport accident	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12.03 Accidental fall	0.0	0.0	0.0	0.0	0.0	0.0	0.6
12.04 Accidental drowning and submersion	0.0	0.0	1.5	0.2	0.0	0.0	0.6
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	0.1	0.1	0.0	0.6
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	0.6
99 Indeterminate	46.9	2.9	0.1	0.0	0.2	0.8	11.5
All causes	222.2	14.0	2.4	0.5	1.4	13.0	65.1

APPENDIX C

Migration rate per 1,000 population by age and sex, Chakaria HDSS, 2016

Age (years)	No. of migrants			Migration rate per 1,000 population		
	Male	Female	Both	Male	Female	Both
In-migration						
<1	52	72	124	49.7	71.1	60.3
1-4	149	161	310	37.0	42.5	39.7
5-9	149	142	291	27.4	27.3	27.3
10-14	104	154	258	18.3	27.5	22.9
15-19	86	570	656	16.4	117.2	64.8
20-24	88	375	463	24.2	91.2	59.7
25-29	157	184	341	48.3	51.1	49.8
30-34	120	74	194	43.7	22.7	32.3
35-39	79	59	138	34.4	23.6	28.8
40-44	44	20	64	21.7	10.8	16.5
45-49	26	14	40	16.4	9.7	13.2
50-54	15	16	31	11.9	11.9	11.9
55-59	10	12	22	9.2	10.7	9.9
60-64	8	10	18	8.9	11.9	10.4
65-69	15	15	30	19.7	24.2	21.7
70-74	6	12	18	12.1	30.5	20.3
75-79	7	9	16	18.5	29.9	23.5
80-84	3	5	8	16.5	30.3	23.1
85+	4	10	14	21.7	55.6	38.5
All	1,122	1,914	3,036	26.6	45.4	36.0
Out-migration						
<1	39	65	104	37.3	64.2	50.5
1-4	134	141	275	33.3	37.3	35.2
5-9	143	148	291	26.3	28.4	27.3
10-14	122	178	300	21.5	31.8	26.6
15-19	169	559	728	32.1	114.9	71.9
20-24	239	460	699	65.7	111.8	90.2
25-29	191	215	406	58.8	59.7	59.3
30-34	142	108	250	51.8	33.2	41.7
35-39	89	59	148	38.8	23.6	30.8
40-44	69	35	104	34.0	19.0	26.9
45-49	30	20	50	19.0	13.8	16.5
50-54	25	16	41	19.9	11.9	15.8
55-59	9	14	23	8.3	12.5	10.4
60-64	12	15	27	13.3	17.9	15.5
65-69	6	16	22	7.9	25.8	15.9
70-74	7	14	21	14.1	35.6	23.6
75-79	6	6	12	15.8	19.9	17.6
80-84	2	7	9	11.0	42.4	25.9
85+	6	9	15	32.6	50.0	41.2
All	1,440	2,085	3,525	34.1	49.4	41.8

APPENDIX D

Number of migrants by origin and destination, Chakaria HDSS, 2016

Origin/ Destination	All age	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	982	201	148	104	78	75	124	90	58	31	17	56
Outside Bangladesh	140	0	1	0	6	15	33	30	21	13	9	12
Inside Chakaria	514	103	74	67	47	37	62	40	30	13	6	35
Outside Chakaria	173	38	28	17	11	12	20	23	8	4	2	10
Inside HDSS area	345	68	49	44	31	28	41	30	18	7	4	25
Outside HDSS area	169	35	25	23	16	9	21	10	12	6	2	10
Female												
Inside Bangladesh	1,906	232	141	153	562	380	184	73	58	20	14	89
Outside Bangladesh	8	1	1	1	1	2	0	1	0	1	0	0
Inside Chakaria	1,121	126	82	76	377	222	92	38	32	9	5	62
Outside Chakaria	346	42	20	26	101	73	42	10	13	4	4	11
Inside HDSS area	775	81	53	52	260	155	61	24	20	5	5	59
Outside HDSS area	346	45	29	24	117	67	31	14	12	4	0	3
Out-migration												
Male												
Inside Bangladesh	1,089	171	143	122	108	124	116	99	59	52	26	69
Outside Bangladesh	351	2	0	0	61	115	75	43	30	17	4	4
Inside Chakaria	791	114	104	81	85	97	88	69	42	37	17	57
Outside Chakaria	160	35	22	21	14	13	17	13	7	10	6	2
Inside HDSS area	320	51	49	37	40	33	27	20	15	18	6	24
Outside HDSS area	202	22	28	31	23	23	15	14	10	10	6	20
Female												
Inside Bangladesh	2,064	204	148	177	558	452	211	107	58	35	19	95
Outside Bangladesh	21	2	0	1	1	8	4	1	1	0	1	2
Inside Chakaria	1,519	155	109	129	394	334	149	76	48	30	13	82
Outside Chakaria	345	27	23	27	113	81	40	17	6	4	1	6
Inside HDSS area	692	55	49	62	194	154	54	30	25	9	2	58
Outside HDSS area	462	55	29	37	129	102	44	22	13	11	6	14

APPENDIX E

Number of in-migrants by reasons for migration, Chakaria HDSS, 2016

Reason for migration	All age	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	95	0	0	5	13	21	13	11	22	8	1	1
Family friction/ breakdown	262	0	3	32	48	40	44	36	26	14	5	14
Others	19	3	3	2	1	0	1	3	3	0	0	3
Work-related												
New job/job transfer	166	0	0	4	8	21	39	37	23	13	9	12
To look for work/ lost job	183	0	5	20	103	44	2	1	3	1	0	4
Others	13	0	0	1	0	2	3	1	6	0	0	0
Housing-related												
Wanted to own home/new house	259	16	33	34	24	25	45	30	17	12	11	12
Education												
To acquire education	59	3	23	21	6	6	0	0	0	0	0	0
Reasons not reported	66	18	10	3	5	2	10	11	3	3	0	1
All	1,122	40	77	117	195	140	144	119	81	43	25	46
Female												
Family related												
To join spouse	998	0	35	44	502	257	79	23	27	12	10	9
Family friction/ breakdown	237	5	6	26	42	52	42	12	40	8	4	0
Others	36	3	5	5	1	2	2	3	2	11	2	0
Work-related												
New job/job transfer	5	0	0	0	3	1	0	1	0	0	0	0
To look for work/ lost job	225	0	30	51	116	8	2	3	14	1	0	0
Others	11	0	0	1	2	2	2	2	2	0	0	0
Housing-related												
Wanted to own home/new house	252	23	18	28	30	55	40	25	14	6	2	11
Education												
To acquire education	68	1	26	30	8	1	2	0	0	0	0	0
Reasons not reported	82	24	2	5	8	14	17	5	4	2	0	1
All	1,914	56	122	190	712	392	186	74	103	40	18	21

APPENDIX F

Number of out-migrants by reasons for migration, Chakaria HDSS, 2016

Reason for migration	All age	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	89	0	0	3	16	21	16	8	5	4	2	14
Family friction/ breakdown	193	20	20	30	24	13	20	14	8	21	10	13
Others	80	6	14	8	12	9	2	8	5	3	0	13
Work-related												
New job/job transfer	368	0	6	2	64	114	79	46	31	17	5	4
To look for work/ lost job	185	0	0	19	31	89	38	1	1	3	0	3
Others	39	0	3	1	4	8	6	7	3	2	4	1
Housing-related												
Wanted to own home/new house	170	10	19	37	26	16	13	19	14	4	2	10
Education												
To acquire education	20	3	7	5	1	4	0	0	0	0	0	0
Reasons not reported	296	34	21	17	19	49	58	39	22	15	7	15
All	1,440	73	90	122	197	323	232	142	89	69	30	73
Female												
Family-related												
To Join spouse	997	0	1	60	387	298	128	61	30	15	13	4
Family friction/ breakdown	182	8	8	12	36	38	16	16	6	5	2	35
Others	84	4	9	14	7	4	8	8	6	4	4	16
Work-related												
New job/job transfer	25	0	0	3	3	9	4	1	1	1	1	2
To look for work/ lost job	211	0	49	29	82	29	6	12	2	0	1	1
Others	29	0	2	4	5	5	5	4	1	0	2	1
Housing-related												
Wanted to own home/new house	190	10	26	40	33	32	18	13	8	3	2	5
Education												
To acquire education	13	0	3	4	2	3	1	0	0	0	0	0
Reasons not reported	354	61	23	21	66	67	53	23	16	7	4	13
All	2,085	83	121	187	621	485	239	138	70	35	29	77

APPENDIX G

Population, births, deaths, in and out-migration by village, Chakaria HDSS, 2016

Village	Population	Birth	Death	In-migration	Out-migration	Birth rate	Death rate	In-migration rate	Out-migration rate
Maizpara	1,658	44	13	50	73	26.5	7.8	30.2	44.0
Daingakata	1,871	45	14	28	100	24.1	7.5	15.0	53.4
Baniachara	3,291	81	15	171	162	24.6	4.6	52.0	49.2
Dakshin Baraitali	2,262	53	17	59	110	23.4	7.5	26.1	48.6
Gobindapur	4,824	130	23	192	205	26.9	4.8	39.8	42.5
Hapaliakata	3,751	87	15	142	166	23.2	4.0	37.9	44.3
Baraitali	**17,657**	**440**	**97**	**642**	**816**	**24.9**	**5.5**	**36.4**	**46.2**
Katakhali	403	8	4	11	9	19.9	9.9	27.3	22.3
Rakhainpara	654	18	12	19	22	27.5	18.3	29.1	33.6
Shantinagar	1,999	46	6	131	83	23.0	3.0	65.5	41.5
Kulalpara	187	4	3	7	13	21.4	16.0	37.4	69.5
Palpara	234	3	1	5	6	12.8	4.3	21.4	25.6
Stationpara	622	16	3	23	39	25.7	4.8	37.0	62.7
Kattoli	435	11	3	16	18	25.3	6.9	36.8	41.4
Harbang	**4,534**	**106**	**32**	**212**	**190**	**23.4**	**7.1**	**46.8**	**41.9**
Purbo Kunakhali	1,738	40	5	65	96	23.0	2.9	37.4	55.2
Maddhya Kunakhali	4,676	132	30	190	151	28.2	6.4	40.6	32.3
Furotia Khali	3,122	79	10	113	109	25.3	3.2	36.2	34.9
Konakhali	**9,536**	**251**	**45**	**368**	**356**	**26.3**	**4.7**	**38.6**	**37.3**

Appendix G. (contd...)

Village	Population	Birth	Death	In-migration	Out-migration	Birth rate	Death rate	In-migration rate	Out-migration rate
Krisnapur	1,571	45	4	55	49	28.6	2.5	35.0	31.2
Chhainama Para	2,810	83	19	53	88	29.5	6.8	18.9	31.3
Dakshin Bahaddarkata	2,441	60	15	82	72	24.6	6.1	33.6	29.5
BM Char	**6,822**	**188**	**38**	**190**	**209**	**27.6**	**5.6**	**27.9**	**30.6**
Chotta Bheola	925	23	6	30	50	24.9	6.5	32.4	54.1
Hasimar Kata	993	14	4	35	46	14.1	4.0	35.2	46.3
Hamidullah Sikderpara	795	26	6	31	40	32.7	7.5	39.0	50.3
Dwipkul	989	32	11	28	19	32.4	11.1	28.3	19.2
Baniarkum	1,160	26	6	27	51	22.4	5.2	23.3	44.0
Dakshin Khilsadok	1,749	59	9	46	93	33.7	5.1	26.3	53.2
Kaiarbil	**6,611**	**180**	**42**	**197**	**299**	**27.2**	**6.4**	**29.8**	**45.2**
Kaddachura	1,626	36	9	55	61	22.1	5.5	33.8	37.5
Sikder Para	4,028	118	20	117	120	29.3	5.0	29.0	29.8
Baniarchar	939	18	3	24	24	19.2	3.2	25.6	25.6
Kalagazi Sikderpara	1,348	34	10	34	60	25.2	7.4	25.2	44.5
Mabiar Baper Para	740	20	5	22	32	27.0	6.8	29.7	43.2
Jele Para	603	10	2	10	33	16.6	3.3	16.6	54.7
Purba B. Bheola	**9,284**	**236**	**49**	**262**	**330**	**25.4**	**5.3**	**28.2**	**35.5**
Sharharbil Purba Para	1,183	27	7	46	64	22.8	5.9	38.9	54.1
Shaharbil Paschim Para	1,050	23	6	34	28	21.9	5.7	32.4	26.7
Madrasha Para	500	19	5	35	22	38.0	10.0	70.0	44.0
Maizghona Purba Para	1,499	48	5	75	65	32.0	3.3	50.0	43.4
Shahapura	1,036	34	4	18	32	32.8	3.9	17.4	30.9
Failla Para	346	14	2	12	16	40.5	5.8	34.7	46.2
Shaharbil	**5,614**	**165**	**29**	**220**	**227**	**29.4**	**5.2**	**39.2**	**40.4**

Appendix G. (contd...)

Village	Population	Birth	Death	In-migration	Out-migration	Birth rate	Death rate	In-migration rate	Out-migration rate
Saker Mohammad Char	5,516	140	38	293	261	25.4	6.9	53.1	47.3
Uttar Lotony	1,840	51	13	31	80	27.7	7.1	16.8	43.5
Proper Kakara	2,942	61	13	59	107	20.7	4.4	20.1	36.4
Kakara	**10,298**	**252**	**64**	**383**	**448**	**24.5**	**6.2**	**37.2**	**43.5**
Dakshin Surajpur	1,268	28	3	22	55	22.1	2.4	17.4	43.4
Dakshin Manikpur	2,833	64	15	98	138	22.6	5.3	34.6	48.7
Uttar Manikpur	4,343	111	29	150	187	25.6	6.7	34.5	43.1
Surajpur Manikpur	**8,444**	**203**	**47**	**270**	**380**	**24.0**	**5.6**	**32.0**	**45.0**
Muchar Para	504	14	3	19	23	27.8	6.0	37.7	45.6
Demoshia Bazar Para	1,046	32	5	37	53	30.6	4.8	35.4	50.7
Ammer Dera Para	1,379	35	15	70	71	25.4	10.9	50.8	51.5
Daskhali Para	1,012	25	4	117	38	24.7	4.0	115.6	37.5
Dhemoshia	**3,941**	**106**	**27**	**243**	**185**	**26.9**	**6.9**	**61.7**	**46.9**
Darbeshkata Manik Para	765	16	4	33	51	20.9	5.2	43.1	66.7
Tekhsira Para	900	26	4	16	34	28.9	4.4	17.8	37.8
Paschim B. Bheola	**1,665**	**42**	**8**	**49**	**85**	**25.2**	**4.8**	**29.4**	**51.1**
All	84,406	2,169	478	3,036	3,525	25.7	5.7	36.0	41.8

APPENDIX H

Percentage of population by age and marital status, Chakaria HDSS, 2016

Age (years)	Married	Divorced	Widower/ Widow	Never married	Population
Male					
10-14	0.0	0.0	0.0	100.0	5,668
15-19	2.4	0.0	0.0	97.6	5,259
20-24	20.6	0.2	0.0	79.3	3,640
25-29	52.3	0.5	0.0	47.2	3,248
30-34	83.8	0.6	0.1	15.5	2,743
35-39	95.9	0.6	0.0	3.5	2,295
40-44	98.6	0.4	0.1	1.0	2,029
45-49	98.9	0.2	0.3	0.6	1,581
50-54	98.7	0.3	0.5	0.5	1,258
55-59	97.8	0.4	1.7	0.2	1,089
60-64	96.6	0.2	2.8	0.3	899
65-69	96.3	0.0	3.0	0.6	762
70-74	91.0	0.2	8.1	0.8	495
75-79	87.3	0.8	11.2	0.8	379
80-84	81.9	1.1	17.0	0.0	182
85+	69.4	1.0	29.7	0.0	184
All	49.0	0.3	0.8	49.9	31,711
Female					
10-14	1.0	0.0	0.0	99.0	5,592
15-19	25.9	0.3	0.1	73.7	4,865
20-24	69.7	1.0	0.3	28.9	4,113
25-29	90.4	1.4	0.8	7.4	3,604
30-34	94.8	1.6	1.6	2.0	3,255
35-39	93.2	1.2	4.4	1.2	2,503
40-44	88.6	2.0	8.2	1.2	1,844
45-49	84.3	1.4	13.4	0.9	1,445
50-54	75.8	1.3	22.0	0.9	1,340
55-59	66.7	1.4	31.2	0.7	1,123
60-64	57.8	1.3	40.2	0.7	839
65-69	44.3	1.1	54.7	0.0	620
70-74	30.0	0.7	69.3	0.0	393
75-79	18.8	0.3	80.9	0.0	301
80-84	12.9	1.1	86.0	0.0	165
85+	4.0	0.0	96.0	0.0	180
All	56.9	0.9	8.2	33.9	32,182

APPENDIX I

Chakaria HDSS project team, 2016

Name of Staff	Designation
Dhaka	
Abbas Bhuiya	Project director
Mohammad Iqbal	Project Coordinator
SM Manzoor Ahmed Hanifi	Associate Scientist
Sabrina Rasheed	Associate Scientist
Shehrin Shaila Mahmood	Assistant Scientist
Amena Sultana	Research Officer
Mohammad Nahid Mia	Research Officer
Md. Kashem Iqbal	Office Manager
Chakaria	
Shahidul Hoque	Field Research Manager
Mijanur Rahaman	Senior Field Research Officer
Ashish Paul	Data Management Officer
Md. Sharif -Al Hasan	Field Research Officer
Mohammad Raeedur Rahaman	Field Research Assistant
Md. Rehmat Ali	Senior Field Assistant
Asia Zannat	Surveillance Worker (Rural)
Dezi Akter	Surveillance Worker (Rural)
Farjana Nasrin	Surveillance Worker (Rural)
Fatema Johura Surma	Surveillance Worker (Rural)
Fatema Zannat	Surveillance Worker (Rural)
Ismat Jahan Khuki	Surveillance Worker (Rural)
Jesmin Akter Rano	Surveillance Worker (Rural)
Jesmin Jannat	Surveillance Worker (Rural)
Kawkaba Zannat	Surveillance Worker (Rural)
Kawsar Jannat	Surveillance Worker (Rural)
Kulsuma Akter	Surveillance Worker (Rural)
Merina Jannat Resmi	Surveillance Worker (Rural)
Miftahul Zannat Tamanna	Surveillance Worker (Rural)
Monuara Begum	Surveillance Worker (Rural)
Mosharafa Sultana	Surveillance Worker (Rural)
Nasima Jannat	Surveillance Worker (Rural)
Nazma Akter	Surveillance Worker (Rural)
Nusrat Jannat Sadia	Surveillance Worker (Rural)
Papi Prova Das	Surveillance Worker (Rural)
Raihan Zannat	Surveillance Worker (Rural)
Reshma Akter	Surveillance Worker (Rural)
Riasmin Zannat	Surveillance Worker (Rural)
Segupta Jahan	Surveillance Worker (Rural)
Shabekun Nahar Jesmin	Surveillance Worker (Rural)
Tanjina Zannat Ara	Surveillance Worker (Rural)
Tasmin Akter	Surveillance Worker (Rural)
Umme Habiba Mamata	Surveillance Worker (Rural)
Zannatul Maowa	Surveillance Worker (Rural)
Zosna Begum	Surveillance Worker (Rural)

HDSS = Health and Demographic Surveillance System.

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