

Chakaria Health and Demographic Surveillance System Focusing on the Poor and Vulnerable

**Demographic Events, Safe Motherhood and Infant
Feeding Practices, and Care-seeking Behaviour
for Malaria and Tuberculosis – 2010**

Scientific Report No. 116



icddr,b

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GLOBAL LIFESAVING SOLUTIONS

Chakaria Health and Demographic Surveillance System

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CHAPTER I

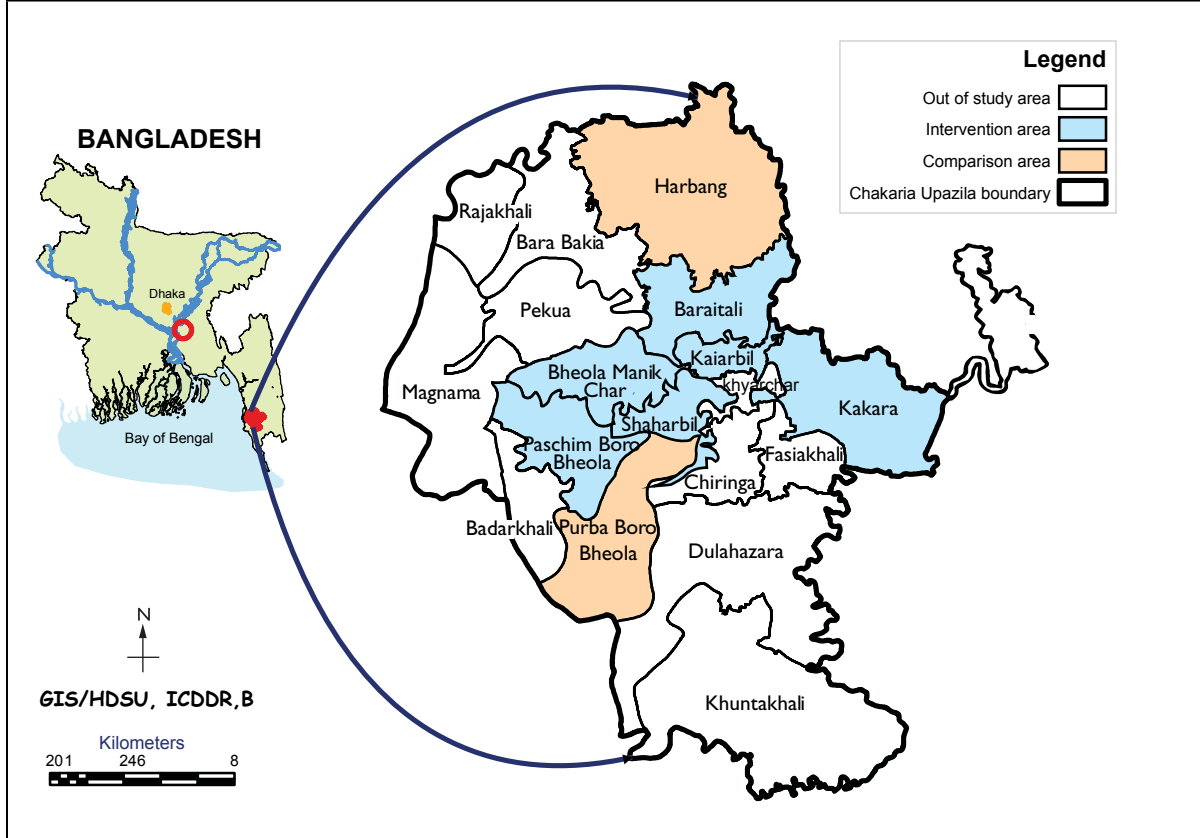
Introduction

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 419,865 in 2010. 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 the intervention and comparison areas are presented in the box below. Collection of data from sample households on a quarterly basis, referred hitherto as Chakaria Health and Demographic Surveillance System (Chakaria HDSS), has been initiated in both the areas 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. This report presents data collected through the Chakaria HDSS during 2010.

Existing health services in the intervention and comparison areas, Chakaria Health and Demographic Surveillance System, 2010			
Intervention area (Six unions with 122,459 population)		Comparison area (Two unions with 39,447 population)	
Healthcare facility/provider	No.	Healthcare facility/provider	No.
ICDDR,B facilitated and Community initiated		ICDDR,B facilitated and Community initiated	
Village health post	7	Village health post	0
Trained midwife	12	Trained midwife	0
Qualified physician	1	Qualified physician	0
Male paramedic	10	Male paramedic	0
Government		Government	
Union Health and Family Welfare Centre (UHFWC)	6	Union Health and Family Welfare Centre (UHFWC)	1
EPI centre	216	EPI centre	38
Rural dispensary	0	Rural dispensary	1
Family Welfare Visitor (FWV)	6	Family Welfare Visitor (FWV)	2
Sub-Assistant Community Medical Officer (SACMO)/Medical assistant	3	Sub-Assistant Community Medical Officer (SACMO)/Medical assistant	2
Family Welfare Assistant (skilled birth attendant)	23	Family Welfare Assistant (skilled birth attendant)	1
Private		Private	
Village doctor (allopathic)	186	Village doctor (allopathic)	54
Village doctor (homeopathic)	78	Village doctor (homeopathic)	24
Allopathic pharmacy	142	Allopathic pharmacy	35
Homeopathic pharmacy	13	Homeopathic pharmacy	2
Diagnostic centre	3	Diagnostic centre	0
NGO		NGO	
Health and development activities	4	Health and development activities	4

Fig. 1. Map of Chakaria showing intervention and comparison areas



CHAPTER 2

Methods and Materials

The Chakaria HDSS covered 8 unions¹, namely Baraitali, Kayerbil, Bheola Manik Char, Paschim Boro Bheola, Shaharbil, Kakara, Harbang, and Purba Boro Bheola. Of these, the last two unions formed the comparison area, and the first 6 formed the intervention area. In 1999, 106,320 people were living in 20,252 households in the intervention area and 34,418 people were living in 6,727 households in the comparison area (3). A household is defined as a unit comprising of a single individual or a group of blood or otherwise related or unrelated individuals who live in the same compound and share food from the same kitchen. Individuals who live outside the household but spend at least one night every month at the household are also considered members of the household. A household member is considered migrated-out if s/he leaves the household and does not return or intend to return within six months from the day s/he leaves the household. An individual, previously not included as a household member, is considered migrated-in to household if s/he starts living in the household for at least one night every month for a minimum of six months from the day s/he joins the household.

Although Chakaria HDSS started in 1999 covering all the households in 8 unions, data collection was interrupted during 2001-2003. Since 2004, quarterly data collection has resumed, and data are being collected from 3,727 and 3,315 systematically randomly-chosen households in the intervention and comparison areas respectively. Twenty seven field-trained workers collected data during 2010. The data collectors were also provided with written instructions for specific questions that required added explanations.

Five supervisors supervised the data-collection process. To detect any anomalies, the supervisors re-visited 5% of the households, chosen randomly, within 2 days of data collection by the field workers. 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 health and demographic indicators. The list of assets included almirah, table/chair, van/rickshaw, *choki/khat*, radio, television, cycle, motorcycle, fridge, sofa, electric fan, sewing machine, telephone and electricity. The principal component analytical technique was used

¹ Government has restructured the existing 8 unions into 11 in 2005.

for calculating weights of the assets to derive household asset index scores (4). The major demographic indicators and safe motherhood practices have been tabulated for the various asset quintiles.

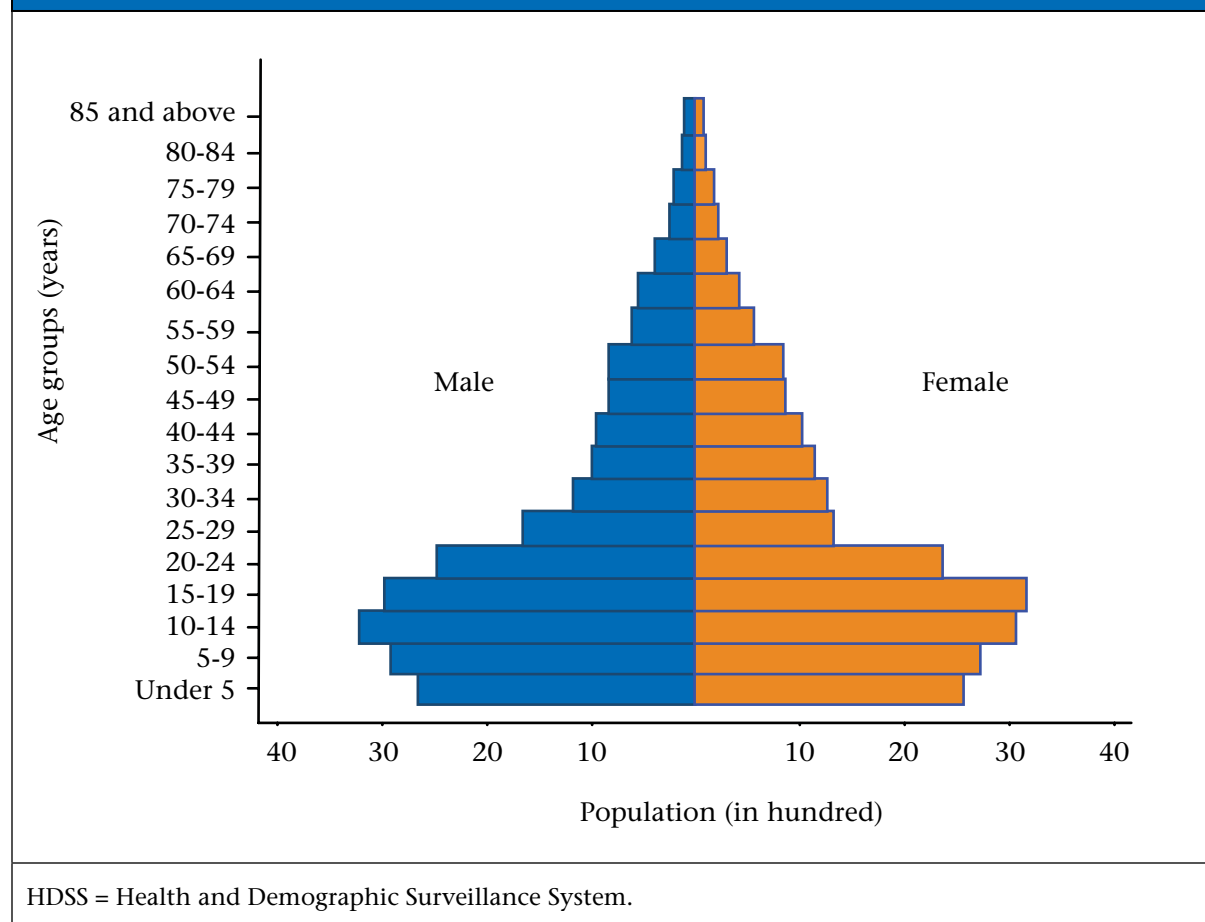
It should be mentioned that the number of observations in the tables presented in this report differ in some instances due to missing information for some variables.

CHAPTER 3

Population and Population Changes

The population pyramid based on the sample households is presented in Figure 2. The shape of the pyramid is typical of a developing country with declining mortality and fertility. The sex ratio (male per 100 females) was 103 in 2010. The age dependency ratio² was 74 in 2010 (see Appendix A).

Fig. 2. Male and female population by age and sex, Chakaria HDSS, 2010



The major demographic and health indicators in the intervention and comparison areas during 1999, and 2004-2010 are presented in Table 1. A declining trend in the fertility indicators and natural rate of population increase has been observed during 1999-2010. Most of the rates in Chakaria HDSS area are much higher than those in the Matlab HDSS area, another rural field site of ICDDR,B (5). In 2010, the rate of natural increase and the annual population growth rate in the surveillance area was 1.7 % and 0.3% respectively (Table 1).

² 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).

Fourteen percent of births in Chakaria were delivered at facilities (Hospital or Clinic) in 2010. The percentage of births at facilities increased from 12.0% in 2009 to 14.1% in 2010. Twenty eight percent of the births were attended by Skilled Birth Attendant (SBA). There has been an increase in deliveries by SBAs from 25.3% in 2009 to 28.1% in 2010 (Table 1).

The legal age of marriage is 18 years for female and 21 years for male in Bangladesh. In 2010, 36.4% of the women married before reaching their 18th birth day. The percentage of underage female marriage decreased to 36.4% in 2010 from 39.3% in 2009. Twenty five percent of the males were married before the age of 21 years in 2010. The proportion of male marriages before 21 years has remained similar between 2009 and 2010. The percentage of underage marriage for females remained higher than males during 2004 to 2010.

Table 1. Demographic and health indicators, Chakaria HDSS, 1999-2010

Rates per 1,000	Chakaria HDSS area								Matlab HDSS area 2009
	1999	2004	2005	2006	2007	2008	2009	2010	
Crude birth rate									
Intervention area	33.8	30.6	29.8	25.8	26.9	24.7	23.7	22.6	21.6
Comparison area	33.9	28.8	27.4	25.3	27.2	26.5	21.9	22.8	20.5
Both areas	33.9	29.7	28.7	25.6	26.6	25.5	22.9	22.7	21.1
Total fertility rate*									
Intervention area	5.1	4.6	4.4	3.5	3.6	3.3	2.9	2.8	2.5
Comparison area	4.9	4.4	4.0	3.3	3.4	3.4	2.6	2.7	2.5
Both areas	5.1	4.5	4.2	3.4	3.5	3.3	2.8	2.7	2.5
Neonatal mortality**									
Intervention area	40.0	24.8	25.2	33.7	27.0	25.0	29.1	33.9	16.2
Comparison area	47.3	40.8	35.9	42.3	44.3	33.5	46.8	29.9	33.5
Both areas	41.7	31.9	31.5	37.6	34.8	29.0	36.8	32.1	24.4
Post-neonatal mortality**									
Intervention area	21.2	15.5	14.1	17.7	18.0	23.3	25.7	16.0	5.7
Comparison area	22.4	19.7	25.1	15.4	7.4	5.6	15.6	19.2	4.9
Both areas	21.4	17.4	17.4	16.6	13.3	14.9	21.3	17.5	5.3
Infant mortality rate**									
Intervention area	61.2	40.3	39.3	51.4	45.0	48.3	54.8	49.9	21.9
Comparison area	69.7	60.5	61.0	57.7	51.7	39.0	62.5	49.1	38.4
Both areas	63.2	49.3	48.9	54.2	48.0	43.9	58.1	49.6	29.8
Child mortality rate (1-4 yrs)									
Intervention area	9.0	8.1	7.5	6.2	4.7	3.6	5.2	5.0	1.7
Comparison area	10.6	5.5	5.3	2.4	4.4	6.2	4.1	3.8	2.1
Both areas	9.4	6.9	6.5	4.5	4.6	4.7	4.7	4.5	1.9

*Per woman; **Per 1,000 live births.

Table 1. (Contd...)

Rates per 1,000	Chakaria HDSS area								Matlab HDSS area 2009
	1999	2004	2005	2006	2007	2008	2009	2010	
Crude death rate									
Intervention area	6.7	5.9	5.8	5.4	5.4	5.7	6.8	5.6	6.2
Comparison area	7.9	7.0	6.5	5.7	6.8	6.7	6.1	6.5	6.9
Both areas	7.0	6.3	6.1	5.6	6.1	6.5	6.5	6.0	6.5
Rate of natural increase									
Intervention area	27.1	24.7	24.0	20.4	21.7	19.4	16.9	17.2	15.4
Comparison area	26.0	21.8	20.8	19.6	19.2	21.0	15.8	16.4	13.7
Both areas	26.9	23.4	22.5	20.0	20.6	20.2	16.4	16.8	14.5
In-migration rate									
Intervention area	-	17.1	24.5	29.7	23.4	27.1	32.0	30.2	-
Comparison area	-	16.6	23.7	30.0	26.0	26.0	27.1	26.8	-
Both areas	-	16.9	24.1	29.9	24.6	26.6	29.8	28.7	54.1
Out-migration rate									
Intervention area	-	22.2	23.8	33.8	31.0	36.2	38.8	43.7	-
Comparison area	-	19.5	25.9	34.3	33.2	34.7	42.9	40.4	-
Both areas	-	21.0	24.8	34.0	32.0	35.5	40.6	42.2	58.0
Growth rate (%)									
Intervention area	-	2.0	2.5	1.6	1.4	1.0	1.0	0.4	-
Comparison area	-	1.9	2.0	1.5	1.3	1.2	0.4	0.3	-
Both areas	-	1.9	2.1	1.6	1.3	1.1	0.6	0.3	1.1
Facility-based delivery (%)									
Intervention area	-	6.8	6.4	6.2	3.8	18.3	14.3	12.3	-
Comparison area	-	4.4	3.8	4.5	6.8	9.5	9.2	16.2	-
Both areas	-	5.4	4.9	5.4	5.1	14.4	12.0	14.1	-
Received assistance from SBA during delivery (%)									
Intervention area	-	14.3	9.2	16.5	20.4	18.0	25.6	23.9	-
Comparison area	-	14.8	11.6	13.8	18.2	12.8	24.8	33.1	-
Both areas	-	14.5	10.3	15.3	19.1	16.2	25.3	28.1	-
Male marriage at ages under 21 years (%)									
Intervention area	-	23.4	25.6	26.3	25.2	25.6	21.8	24.2	-
Comparison area	-	23.3	23.8	29.7	26.0	23.8	28.1	26.2	-
Both areas	-	23.3	24.7	27.9	25.6	24.7	24.8	25.0	-
Female marriage at ages under 18 years (%)									
Intervention area	-	51.4	43.1	51.2	40.4	46.0	40.2	35.6	-
Comparison area	-	56.6	52.0	48.4	46.7	49.0	38.5	37.4	-
Both areas	-	53.6	47.3	49.8	43.2	47.7	39.3	36.4	-
'-' Data not available.									
HDSS = Health and Demographic Surveillance System.									

CHAPTER 4

Mortality

Age-specific mortality rates by area and sex are presented in Table 2. The crude death rate for the intervention and comparison areas in Chakaria, when considered together, was 6.0 per 1,000 population in 2010. The rate was slightly higher in the comparison area than in the intervention area. Infant mortality rate for all the villages in the intervention and comparison areas was 49.6 per 1,000 live births with a slightly lower rate in the comparison area than in the intervention area. Child mortality rate was 4.5 per 1,000 children aged 1-4 years in the intervention and comparison areas combined. The rate was higher in the intervention area than in the comparison area (Table 2).

Abridged Life Table for males and females are presented in Table 3. Life expectancy at birth was 68.9 years for males and 69.6 years for females. The rate of mortality of children aged less than 5 years (under-five mortality) was 67.1 per 1,000 live births in Chakaria in 2010 (Table 4). Figure 3 shows the probability of survival by sex during various age groups. The probability of survival of females remained same as males up to age 45 years, but after age 45 probability of survival oscillated.

Table 2. Age-specific death rate (per 1,000 population) by sex, Chakaria HDSS, 2010

Age (years)	Intervention area			Comparison area			Both areas		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
<1*	69.2	29.4	49.9	42.2	56.3	49.1	57.0	41.7	49.6
1-4	5.7	4.3	5.0	0.0	7.6	3.8	3.2	5.8	4.5
5-9	0.0	1.9	0.9	0.8	0.0	0.4	0.3	1.1	0.7
10-14	1.1	0.6	0.9	0.0	0.7	0.4	0.6	0.7	0.6
15-19	0.6	1.2	0.9	1.5	0.7	1.1	1.0	0.9	1.0
20-24	1.5	0.8	1.2	0.9	0.9	0.9	1.2	0.8	1.0
25-29	0.0	0.0	0.0	2.6	1.7	2.2	1.2	0.8	1.0
30-34	1.5	1.4	1.5	0.0	0.0	0.0	0.8	0.8	0.8
35-39	0.0	1.7	0.9	0.0	1.9	1.0	0.0	1.8	0.9
40-44	1.8	3.6	2.7	4.9	6.4	5.7	3.1	3.9	4.0
45-49	4.6	6.6	5.6	5.2	2.5	3.8	4.8	4.7	4.8
50-54	4.7	9.7	7.1	5.1	7.2	6.2	4.9	8.4	6.7
55-59	13.0	6.9	10.1	13.2	11.1	12.2	13.1	8.9	11.1
60-64	24.1	17.5	21.2	38.9	26.3	33.6	31.0	21.5	26.9
65-69	28.7	19.6	24.9	49.5	28.2	40.1	38.4	23.7	32.1
70-74	7.5	23.8	15.4	34.5	74.5	52.4	20.1	45.5	32.0
75-79	59.8	43.5	52.6	72.9	47.1	66.3	65.7	50.8	59.0
80-84	25.3	80.0	46.5	88.9	87.0	87.9	48.4	83.3	63.6
85+	250.0	177.8	217.8	155.6	153.8	154.8	207.9	166.7	189.2
All	6.3	4.9	5.6	6.5	6.5	6.5	6.4	5.6	6.0

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

Table 3. Abridged Life Table, Chakaria HDSS, 2010

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	0.0570	0.0570	100,000	95,437	68.9	0.0417	0.0417	100,000	96,660	69.6
1	0.0032	0.0128	94,297	374,912	72.1	0.0058	0.0229	95,825	379,171	71.6
5	0.0003	0.0017	93,086	465,060	69.0	0.0011	0.0055	93,630	466,963	69.3
10	0.0006	0.0031	92,926	463,965	64.1	0.0007	0.0033	93,115	464,875	64.6
15	0.0010	0.0050	92,637	462,111	59.3	0.0010	0.0048	92,811	463,037	59.8
20	0.0012	0.0061	92,170	459,566	54.6	0.0008	0.0042	92,369	460,945	55.1
25	0.0012	0.0060	91,612	456,785	49.9	0.0008	0.0038	91,979	459,093	50.3
30	0.0008	0.0042	91,059	454,404	45.2	0.0008	0.0040	91,631	457,319	45.5
35	0.0000	0.0000	90,673	453,438	40.3	0.0018	0.0088	91,268	454,485	40.7
40	0.0031	0.0156	90,673	450,100	35.3	0.0039	0.0194	90,463	448,270	36.0
45	0.0048	0.0239	89,259	441,353	30.9	0.0047	0.0231	88,712	438,825	31.7
50	0.0049	0.0241	87,122	430,750	26.5	0.0084	0.0414	86,664	425,004	27.4
55	0.0131	0.0636	85,020	412,500	22.1	0.0089	0.0438	83,079	406,950	23.4
60	0.0310	0.1445	79,611	370,827	18.5	0.0215	0.1022	79,439	378,136	19.4
65	0.0384	0.1758	68,107	312,021	16.1	0.0237	0.1124	71,317	337,740	16.3
70	0.0201	0.0959	56,137	268,066	14.0	0.0455	0.2049	63,303	285,420	13.0
75	0.0657	0.2832	50,754	218,708	10.2	0.0508	0.2265	50,329	224,196	10.7
80	0.0484	0.2167	36,379	162,948	8.2	0.0833	0.3454	38,930	161,358	8.1
85+	0.2079	1.0000	28,494	137,043	4.8	0.1667	1.0000	25,483	152,898	6.0

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.

${}_n m_x$ = 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

${}_n L_x$ = Number 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

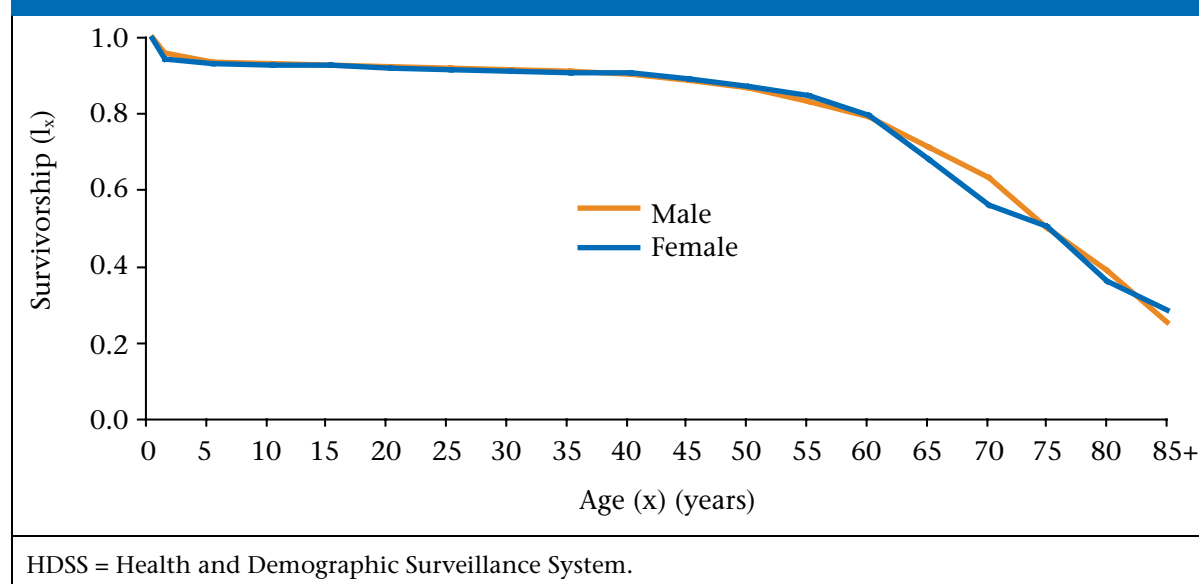
Fig. 3. Probability of survival by age and sex, Chakaria HDSS, 2010

Table 4 presents under-5 mortality rates by household asset quintiles. Under-5 mortality rate was inversely correlated with household asset scores. The mortality rate of children from the lowest quintile was nearly 2 times of children from the highest quintile.

Table 4. Under-5 mortality rate per 1,000 live births by asset quintile, Chakaria HDSS, 2010

Asset quintile	Number of birth	Number of under-5 deaths	Under-5 mortality rate
Lowest	227	14	61.7
Second	182	15	82.4
Middle	255	24	94.1
Fourth	166	9	54.2
Highest	183	6	32.8
All	1,013	68	67.1

HDSS = Health and Demographic Surveillance System.

Causes of death

Causes of death were recorded as reported by the informed household members. A physician classified the reported causes of death with medical synonyms. Table 5 presents the number of deaths from various causes in the year 2006-2010. Old age related complications, stroke, asthma, neoplasm, respiratory infections, neonatal, accident, diarrhoea, drowning, and cardiovascular were the 10 leading causes of death in Chakaria in 2010.

Table 5. Causes of Death, Chakaria HDSS, 2006-2010

Rank	2006		2007		2008		2009		2010	
	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths
1	Stroke	31	Asthma/ Bronchitis	30	Stroke	33	Stroke	42	Old age related complications	44
2	Old age related complications	28	Neoplasm (Benign and Malignant)	29	Neoplasm (Benign and Malignant)	33	Old age related complications	37	Stroke	41
3	Asthma/ Bronchitis	26	Respiratory infections	26	Asthma/ Bronchitis	26	Asthma/ Bronchitis	31	Asthma/ Bronchitis	27
4	Respiratory infections	26	Old age related complications	25	Respiratory infections	22	Neoplasm (Benign and Malignant)	29	Neoplasm (Benign and Malignant)	19
5	Neoplasm (Benign and Malignant)	21	Stroke	25	Old age related complications	19	Neonatal (Premature and LBW, Birth asphyxia, Bone trauma, Sepsis and infection)	26	Respiratory infections	18
6	Neonatal (Premature and LBW, Birth asphyxia, Birth trauma, Sepsis and infection)	15	Neonatal (Premature and LBW, Birth asphyxia, Birth trauma, Sepsis and infection)	24	Hepatitis	13	Respiratory infections	22	Neonatal (Premature and LBW, Birth asphyxia, Bone trauma, Sepsis and infection)	16
7	Drowning	11	Accident	16	Accident	9	Drowning	14	Accident	16
8	Hepatitis	7	Cardiovascular other than stroke and hypertension	11	Drowning	9	Hepatitis	9	Diarrhoea	8

Table 5. (Contd...)

Rank	2006		2007		2008		2009		2010	
	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths
9	Accident	6	Diarrheal Diseases	9	Cardiovascular other than stroke and hypertension	10	Accident	8	Drowning	8
10	Diarrheal diseases	6	Hepatitis	9	Diarrheal diseases	7	Diabetes	7	Cardiovascular other than stroke and hypertension	7
11	Diabetes	3	Drowning	8	Hypertension	7	Diarrheal	7	Hepatic failure	5
12	Hypertension	3	Nutritional diseases	5	Maternal death	5	Cardiovascular other than stroke and hypertension	5	Suicide	5
13	Malaria	3	Diabetes	3	Diabetes	4	Suicide	3	Hepatitis	4
14	Cardiovascular other than stroke and hypertension	3	Hyper-tension	3	Digestive disease	3	Epilepsy	2	Tuberculosis	4
15	Urinary diseases	3	Urinary diseases	3	Neonatal (Premature and LBW, Birth asphyxia, Bone trauma, Sepsis and infection)	13	Hyper-tension	2	Congenital anomalies	3

Table 5. (Contd...)

Rank	2006		2007		2008		2009		2010	
	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths
16	Rabies	3	Epilepsy	2	Tuberculosis	4	Nutritional	2	Digestive disease	3
17	Tuberculosis	3	Malaria	2	Burn	2	Other urinary	2	Malaria	2
18	Burn	2	Maternal death	2	Other urinary	2	Burn	1	Maternal death	1
19	Digestive diseases	2	Suicide	2	Homicide	1	Digestive disease	1	Nutritional	2
20	Nutritional diseases	2	Tuberculosis	2	Nutritional	1	Disease of uterus	1	Other urinary	2
21	Congenital anomalies	1	Typhoid	2	Rabies	1	Dysentery	1	Measles	1
22	Leprosy	1	Dysentery	1	Snake bite	1	Epestaxis	1	Diabetes	1
23	Tetanus	1	Digestive disease	1	Suicide	1	Homicide	1	Dysentery	1
24	Unknown	42	Homicide	1	Typhoid	1	Malaria	1	Epestaxis	1
25			Rabies	1	Malaria	1	Maternal death	1	Homicide	1
26			Unknown	32	Unknown	46	Tuberculosis	1	Hypertension	1
27							Unknown	35	intestinal obstruction	1
28									Unknown	29
Total		249		274		274		292		271

HDSS = Health and Demographic Surveillance System.

CHAPTER 5

Fertility

The crude birth rate in 2010 was 22.7 per 1,000 population, which was similar in 2009 (22.9 per 1,000 population) (Table 1). Total fertility rates per woman showed a downward trend during 1999-2010 with a value of 2.7 in 2010 (Table 1). The fertility rate was highest among women of age-group of 20-24 years (Fig. 4 and Table 6).

Table 6. Age-specific fertility rate per 1,000 women aged 15-49 years, Chakaria HDSS, 2010

Age (years)	Intervention area			Comparison area			Both areas		
	No. of females	No. of births	Birth rate	No. of females	No. of births	Birth rate	No. of females	No. of births	Birth rate
15-19	1,715	148	86.3	1,454	127	87.3	3,169	275	86.8
20-24	1,257	194	154.3	1,109	185	166.8	2,366	379	160.2
25-29	739	105	142.1	580	85	146.6	1,319	190	144.0
30-34	710	76	107.0	552	47	85.1	1,262	123	97.5
35-39	602	25	41.5	533	17	31.9	1,135	42	37.0
40-44	555	10	18.0	469	6	12.8	1,024	16	15.6
45-49	454	3	6.6	403	1	2.5	857	4	4.7
Total	6,032	561		5,100	468		11,132	1,029	
TFR	2,780			2,665			2,729		

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

Fig. 4. Age-specific fertility rate, Chakaria HDSS, 2010

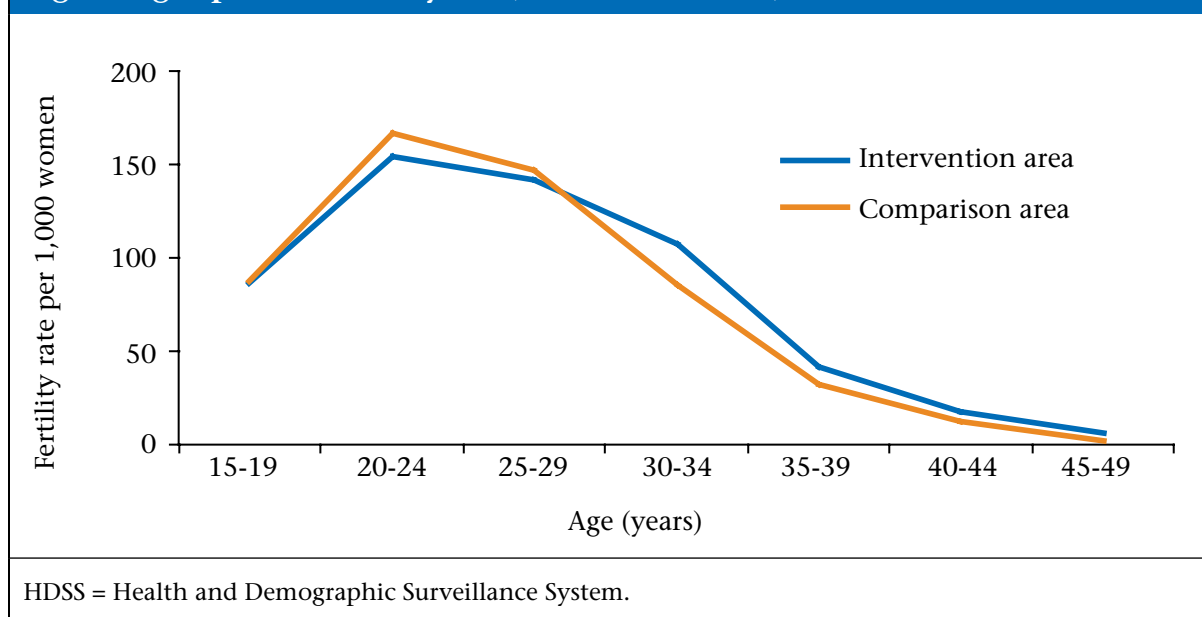


Table 7. Crude birth rate per 1,000 population by asset quintile, Chakaria HDSS, 2010

Asset quintile	Midyear population	Number of births	Birth rate
Lowest	8,162	223	27.3
Second	8,252	186	22.5
Middle	11,603	255	22.0
Fourth	7,763	166	21.4
Highest	8,862	183	20.6
All	44,642	1,013	22.7

HDSS = Health and Demographic Surveillance System.

Table 7 presents the crude birth rates by household asset quintiles. The crude birth rate of the lowest quintile was 1.3 times higher than that of the highest quintile.

Of the pregnancies in 2010, 9.4% of 1,239 were terminated prematurely and spontaneously, 4.4% were terminated through induction, and 3.1% resulted in stillbirths (Table 8).

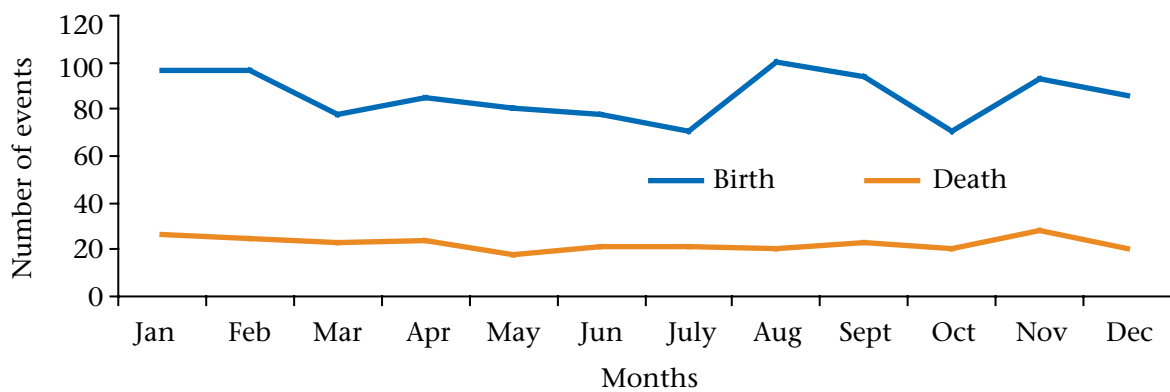
Table 8. Pregnancy outcome, Chakaria HDSS, 2010

Pregnancy outcome	Intervention area		Comparison area		Both areas	
	No.	%	No.	%	No.	%
Spontaneous abortion	59	8.8	58	10.2	117	9.4
Induced abortion	28	4.2	27	4.8	55	4.4
Stillbirth	24	3.6	14	2.5	38	3.1
Live birth*	561	83.5	468	82.5	1,029	83.1
Total number of pregnancies	672	100.0	567	100.0	1,239	100.0

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

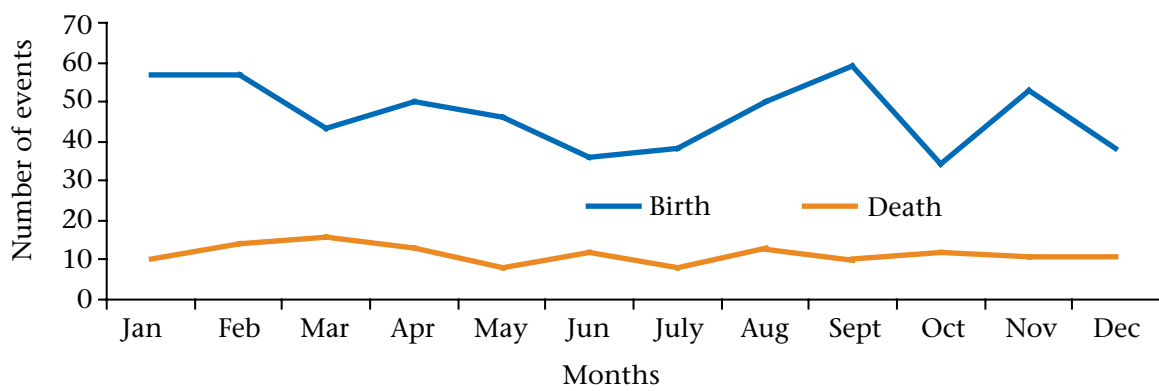
Distribution of births and deaths by month did not show any distinct seasonal pattern (Fig. 5). The seasonal patterns of birth and death were similar in the intervention and comparison areas (Fig. 6 and 7).

Fig. 5. Number of births and deaths by month, Chakaria HDSS, 2010



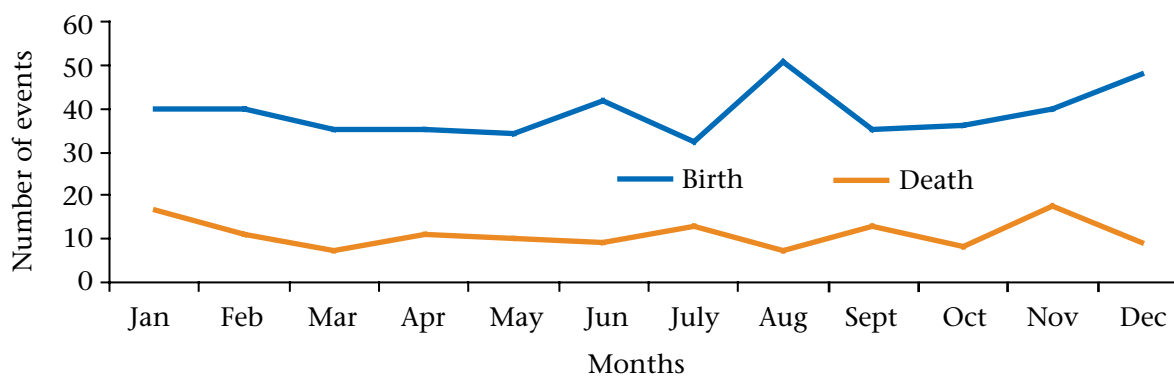
HDSS = Health and Demographic Surveillance System.

Fig. 6. Number of births and deaths by month, Intervention area, Chakaria, HDSS, 2010



HDSS = Health and Demographic Surveillance System.

Fig. 7. Number of births and deaths by month, Comparison area, Chakaria, HDSS, 2010



HDSS = Health and Demographic Surveillance System.

CHAPTER 6

Migration

In 2010, the rate of out-migration was higher at 42.0 per 1,000 population than that of in-migration at 28.5 per 1,000 population (Table 9). Monthly data on migration are presented in Tables 10, 11 and 12. Data showed that the number of in-migrants was lower than that of out-migrants during 2010 in both the areas. The sex differential in migration was also not prominent. The rates of in-migration among both males and females were highest in January. The rate of out-migration was highest among the males in January and females in July.

Table 9. Migration rate per 1,000 population by asset quintile, Chakaria HDSS, 2010

Asset quintile	Mid-year population	In-migration rate	Out-migration rate
Lowest	8,162	21.2	27.7
Second	8,252	23.0	33.6
Middle	11,603	27.4	40.5
Fourth	7,763	32.2	50.9
Highest	8,862	38.7	57.4
All	44,642	28.5	42.0

HDSS = Health and Demographic Surveillance System.

Table 10. Number of migrants by sex and month, Chakaria HDSS, 2010

Month	In-migration			Out-migration		
	Male	Female	Both	Male	Female	Both
January	61	92	153	99	112	211
February	37	61	98	91	87	178
March	32	87	119	55	86	141
April	38	75	113	65	101	166
May	22	64	86	63	110	173
June	47	61	108	57	102	159
July	42	91	133	78	130	208
August	31	69	100	50	70	120
September	43	49	92	68	72	140
October	32	72	104	30	66	96
November	34	64	98	64	85	149
December	26	61	87	54	107	161
All	445	846	1,291	774	1,128	1,902

HDSS = Health and Demographic Surveillance System.

Table 11. Number of migrants by sex and month, intervention area, Chakaria HDSS, 2010

Month	In-migration			Out-migration		
	Male	Female	Both	Male	Female	Both
January	31	50	81	49	54	103
February	22	39	61	53	47	100
March	16	43	59	30	43	73
April	22	45	67	44	56	100
May	13	38	51	36	60	96
June	26	38	64	37	54	91
July	23	57	80	48	85	133
August	19	43	62	30	39	69
September	24	26	50	48	45	93
October	17	45	62	13	34	47
November	20	33	53	29	51	80
December	19	35	54	32	60	92
All	252	492	744	449	628	1,077

HDSS = Health and Demographic Surveillance System.

Table 12. Number of migrants by sex and month, comparison area, Chakaria HDSS, 2010

Month	In-migration			Out-migration		
	Male	Female	Both	Male	Female	Both
January	30	42	72	50	58	108
February	15	22	37	38	40	78
March	16	44	60	25	43	68
April	16	30	46	21	45	66
May	9	26	35	27	50	77
June	21	23	44	20	48	68
July	19	34	53	30	45	75
August	12	26	38	20	31	51
September	19	23	42	20	27	47
October	15	27	42	17	32	49
November	14	31	45	35	34	69
December	7	26	33	22	47	69
All	193	354	547	325	500	825

HDSS = Health and Demographic Surveillance System.

Origin and destination of migrants

During 2010, 5.2% of 1,291 in-migrants moved into Chakaria HDSS households from outside of Bangladesh whereas 9.8% of 1,902 out-migrants moved out of Bangladesh from Chakaria HDSS area. 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 13).

Table 13. Origin and destination of migrants by sex, Chakaria HDSS, 2010

Origin or destination	In-migration			Out-migration		
	Male (%)	Female (%)	Both (%)	Male (%)	Female (%)	Both (%)
Inside Bangladesh	85.2	99.9	94.8	77.8	98.8	90.2
Outside Bangladesh	14.8	0.1	5.2	22.2	1.2	9.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total number of migrants	445	846	1,291	774	1,128	1,902
Inside Chakaria	63.1	67.3	66.0	65.8	66.2	66.0
Outside Chakaria	36.9	32.7	34.0	34.2	33.8	34.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total number of migrants	379	845	1,224	602	1,115	1,717
Inside HDSS area	69.0	64.1	65.6	70.1	62.8	65.3
Outside HDSS area	31.0	35.9	34.4	29.9	37.2	34.7
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total number of migrants	239	569	808	398	739	1,137

HDSS = Health and Demographic Surveillance System.

Reasons for migration

Table 14 presents the reasons of migration by sex. Forty four percentage of the migrants moved out due to family-related issues - mostly marriage, followed by housing (28.6%), work (21.6%), and education (5.2%). Reasons for moving out for males were different from those of females. Forty percentage of male in-migrants moved due to work related issues whereas only 7.6% of the females moved due to that reason. On the other hand, 72.6% of female in-migrants moved due to family related issues - mostly marriage, while only 21.1% of males moved due to family related reasons (Table 14). The reasons of movement for out-migration were mostly similar to the reasons for in-migration.

Table 14. Reasons for migration, Chakaria HDSS, 2010

Reasons for migration	In-migration			Out-migration		
	Male (%)	Female (%)	Both (%)	Male (%)	Female (%)	Both (%)
Family-related	21.1	72.6	54.8	14.6	64.5	44.2
Work-related	40.3	7.6	18.8	42.3	7.4	21.6
Housing-related	27.4	16.2	20.1	34.2	24.7	28.6
Education	11.2	3.5	6.2	8.4	3.0	5.2
Other	0.0	0.1	0.1	0.5	0.4	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total number of migrants	445	846	1,291	774	1,228	1,902

HDSS = Health and Demographic Surveillance System.

CHAPTER 7

Marriage

In total 936 marriages took place in the surveillance households in Chakaria during 2010. The highest number of marriages took place in July and the lowest in February. There has been no strong seasonal pattern for marriages (Fig. 8).

Table 15 presents singulate mean age at marriage (SMAM) and median age at first marriage. The SMAM was 27 years for males and 20 years for females. The SMAM in 2010 remained same as of 2009 for males and females. The median age at first marriage for males and females were 27 and 19 years. Both the indicators for males and females were almost positively associated with household socioeconomic status.

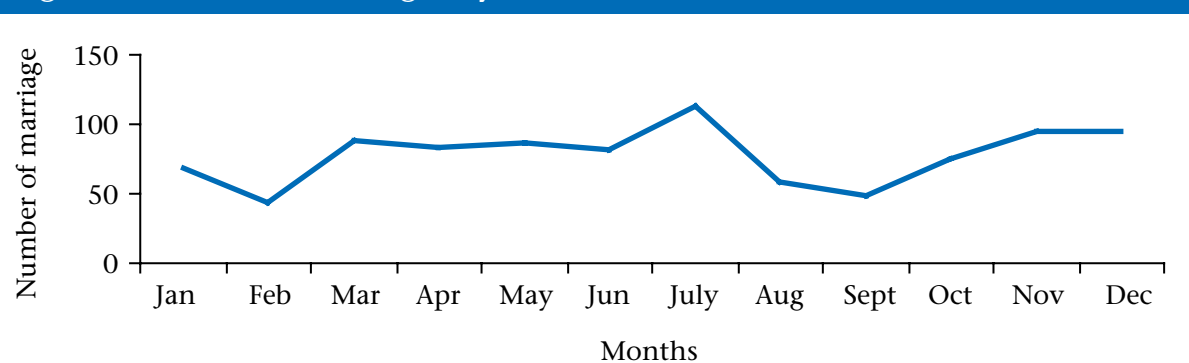
Table 15. Age at marriage by sex, Chakaria HDSS, 2010

Asset quintile	Male		Female	
	SMAM*	Median age at first marriage*	SMAM*	Median age at first marriage
Lowest	23.4	23.0	18.7	18.0
Second	25.1	24.8	18.7	18.0
Middle	27.0	26.5	19.3	18.4
Fourth	28.0	28.2	19.8	18.6
Highest	29.5	29.7	20.4	19.6
All	27.1	27.1	19.6	18.7

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.

Fig. 8. Number of marriages by month, Chakaria HDSS, 2010



HDSS = Health and Demographic Surveillance System.

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 were based in the seven village health posts that had been established and managed by the villagers since the late nineties. The services provided by these midwives were not strictly restricted to the intervention area. The women from the comparison area also availed their services to some extent. Apart from this, the physicians employed by ICDDR,B with financial support from the community, also provided healthcare services once a week to the villagers from these village health posts during 1998 and 2005.

At present, the Upazila Health Complex of the government and four private hospitals provide healthcare services at the headquarters of Chakaria. At the union level, 6 Union Health and Family Welfare Centres (UHFWCs) of the government and 7 village health posts which were initiated by the community members provide healthcare services in the intervention area. At the same level, one UHFWC and one Rural Dispensary (RD) of the government provide health services in the comparison area. The Family Development Services and Research (FDSR), an NGO, also provides healthcare services both in intervention and comparison areas.

Use of antenatal care services

During 2010, 62.2% of 1,013 pregnant women in Chakaria received at least one antenatal check-up (ANC). The percentage of women receiving at least one ANC was higher in the comparison area (65.6%) than in the intervention area (59.3%). The women in the intervention area received services from various sources. Among these sources, the nurses/doctors were dominant, followed by midwives and FDSR/CMH and then FWV. In the comparison area, the dominant source was FDSR/CMH followed by nurses/doctors and then midwives (Table 16).

The use of ANC was very inequitable in both the intervention and the comparison areas. Of the various sources, services from nurse and doctor has been the most inequitable (Table 16).

Table 16. Antenatal care by type of sources and asset quintile, Chakaria HDSS, 2010

Area	Asset quintile	Received any ANC (%)	Midwife* (%)	FWV* (%)	Nurse/doctor* (%)	FDSR/CMH* (%)	None (%)	No. of women
Intervention area	Lowest	51.9	23.3	15.5	9.3	19.4	48.1	129
	Second	61.2	17.3	16.3	16.3	27.6	38.8	98
	Middle	62.2	18.9	16.1	25.9	18.2	37.8	143
	Fourth	60.9	14.9	13.8	34.5	14.9	39.1	87
	Highest	61.7	8.5	11.7	52.1	3.2	38.3	94
	Total	59.3	17.2	14.9	26.1	17.1	40.7	551
Comparison area	Lowest	59.2	12.2	9.2	11.2	37.8	40.8	98
	Second	66.7	20.2	10.7	20.2	38.1	33.3	84
	Middle	63.4	17.0	12.5	30.4	25.9	36.6	112
	Fourth	68.4	8.9	7.6	38.0	31.6	31.6	79
	Highest	73.0	6.7	11.2	50.6	20.2	27.0	89
	Total	65.6	13.2	10.4	29.7	30.5	34.4	462
Both areas	Lowest	55.1	18.5	12.8	10.1	27.3	44.9	227
	Second	63.7	18.7	13.7	18.1	32.4	36.3	182
	Middle	62.7	18.0	14.5	27.8	21.6	37.3	255
	Fourth	64.5	12.0	10.8	36.1	22.9	35.5	166
	Highest	66.7	7.7	11.5	51.4	11.5	33.3	183
	Total	62.2	15.4	12.8	27.7	23.2	37.8	1,013
*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.								

Use of postnatal care services

It was observed that only 31.5% of the pregnant women received at least one postnatal care (PNC) during 2010. This percentage was higher in the comparison area (33.8%) than the intervention area (29.6%). The nurses, doctors and midwives were the dominant sources for PNC in both the areas, and the utilization of services was characterized by large inequities (Table 17).

Table 17. Postnatal care by type of sources and asset quintile, Chakaria HDSS, 2010

Area	Asset quintile	Received any PNC (%)	Midwife* (%)	FWV* (%)	Nurse/doctor* (%)	FDSR/CMH* (%)	None (%)	No. of women
Intervention area	Lowest	23.3	6.2	0.8	17.1	3.9	76.7	129
	Second	21.4	5.1	0.0	16.3	2.0	78.6	98
	Middle	28.0	7.0	2.1	18.2	3.5	72.0	143
	Fourth	31.0	8.0	2.3	23.0	1.1	69.0	87
	Highest	47.9	5.3	2.1	44.7	1.1	52.1	94
	Total	29.6	6.4	1.5	22.9	2.5	70.4	551
Comparison area	Lowest	23.5	10.2	1.0	10.2	3.1	76.5	98
	Second	25.0	4.8	0.0	17.9	3.6	75.0	84
	Middle	32.1	8.9	0.0	26.8	0.9	67.9	112
	Fourth	36.7	10.1	0.0	30.4	0.0	63.3	79
	Highest	52.8	5.6	2.2	47.2	2.2	47.2	89
	Total	33.8	8.0	0.6	26.2	1.9	66.2	462
Both areas	Lowest	23.3	7.9	0.9	14.1	3.5	76.7	227
	Second	23.1	4.9	0.0	17.0	2.7	76.9	182
	Middle	29.8	7.8	1.2	22.0	2.4	70.2	255
	Fourth	33.7	9.0	1.2	26.5	0.6	66.3	166
	Highest	50.3	5.5	2.2	45.9	1.6	49.7	183
	Total	31.5	7.1	1.1	24.4	2.3	68.5	1,013
*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.								

Assistance during delivery

In Chakaria, the traditional birth attendants (TBAs) were more popular than the skilled birth attendants (SBAs) for assisting deliveries. Seventy two percent of 1,013 deliveries in Chakaria were assisted by the TBAs as opposed to 28% of the deliveries assisted by the SBAs (e.g. nurses/doctors, FWVs, midwives). The percentage of deliveries assisted by the TBAs was slightly higher in the intervention area (76.2%) than the comparison area (66.9%) (Table 18).

Despite the fact that the services provided by the midwives of the Chakaria project were also available to comparison area, the use of these trained midwives became more popular in comparison area compared to intervention area (10.0%

vs 7.6%) (Table 18). At the same time, the overall use of SBAs that comprised nurses, doctors, FWVs, and midwives was higher in the comparison area (33.1%) than the intervention area (23.8%) (Table 18). The use rate of nurse/doctors by the women from the highest quintile was much higher than those by women from the lowest quintiles.

Table 18. Assistance during delivery by asset quintile, Chakaria HDSS, 2010						
Area	Asset quintile	Midwife (%)	FWV (%)	Nurse/doctor (%)	TBA (%)	No. of women
Intervention area	Lowest	7.7	1.6	3.9	86.8	129
	Second	4.1	1.0	7.1	87.8	98
	Middle	7.0	4.2	9.7	79.1	143
	Fourth	6.9	6.9	13.1	73.1	87
	Highest	12.8	3.2	36.2	47.8	94
	Total	7.6	3.3	12.9	76.2	551
Comparison area	Lowest	7.1	8.2	3.1	81.6	98
	Second	5.9	2.4	9.5	82.2	84
	Middle	13.4	5.4	13.4	67.8	112
	Fourth	16.5	2.5	19.0	62.0	79
	Highest	6.7	9.0	44.9	39.4	89
	Total	10.0	5.6	17.5	66.9	462
Both areas	Lowest	7.5	4.4	3.5	84.6	227
	Second	4.9	1.6	8.2	85.3	182
	Middle	9.8	4.7	11.4	74.1	255
	Fourth	11.5	4.8	15.7	68.0	166
	Highest	9.8	6.0	40.4	43.8	183
	Total	8.7	4.3	15.0	72.0	1,013
FWV = Family Welfare Visitor HDSS = Health and Demographic Surveillance System.						

Place of delivery

Eighty six percent of the deliveries took place at home. Only 14.2% of 1,013 deliveries took place either at hospitals or at clinics. The percentage of deliveries taking place at the hospitals was higher in the comparison area (16.5%) compared to the intervention area (12.3%) (Table 19). The women from the households in the highest asset quintile had a much higher rate of facility based delivery (38.2%) than those from the lowest quintile (4.0%).

Table 19. Place of delivery by asset quintile, Chakaria HDSS, 2010

Area	Asset quintile	Hospital/Clinic (%)	Home (%)	No. of women
Intervention area	Lowest	3.9	96.1	129
	Second	6.1	93.9	98
	Middle	11.2	88.8	143
	Fourth	10.3	89.7	87
	Highest	34.0	66.0	94
	Total	12.3	87.7	551
Comparison area	Lowest	4.1	95.9	98
	Second	7.1	92.9	84
	Middle	13.4	86.6	112
	Fourth	16.5	83.5	79
	Highest	42.7	57.3	89
	Total	16.5	83.5	462
Both areas	Lowest	4.0	96.0	227
	Second	6.6	93.4	182
	Middle	12.2	87.8	255
	Fourth	13.3	86.7	166
	Highest	38.2	61.8	183
	Total	14.2	85.8	1,013

HDSS = Health and Demographic Surveillance System.

Table 20 shows caesarean-section delivery by household asset quintile in 2010. Caesarean-section delivery accounted for 4.9% of the deliveries in the Chakaria HDSS area in 2010. Although the number of caesarean section was small, the number of women with caesarean section exhibited huge discrepancies between highest and lowest quintile.

Table 20. Proportion of caesarean-section delivery by asset quintile, Chakaria HDSS, 2010

Asset quintile	No. of caesarean-section delivery	Caesarean-section delivery (%)	Total number of deliveries
Lowest	1	0.4	227
Second	5	2.7	182
Middle	13	5.1	255
Fourth	7	4.2	166
Highest	24	13.1	183
Total	50	4.9	1,013

HDSS = Health and Demographic Surveillance System.

CHAPTER 9

Infant Feeding Practices

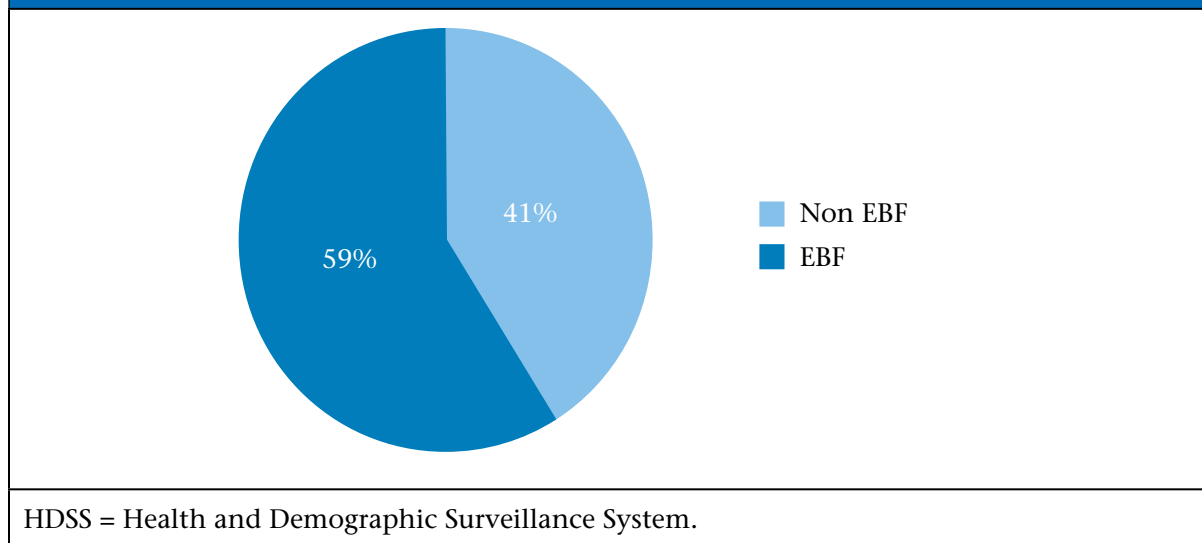
Bangladesh has one of the highest rate of malnourished under-5 children in the world (39.2%). That such a large portion of children does not have access to an essential amount of food, it is crucial to look at infants' feeding practice in Bangladesh. This current report presents the infant feeding practices in Chakaria.

Data on exclusive breastfeeding (EBF: not giving anything other than breast milk) and complementary feeding (CF: giving other foods in addition to breast milk) were collected from 776 children during February-April 2010.

Infants under 6 months

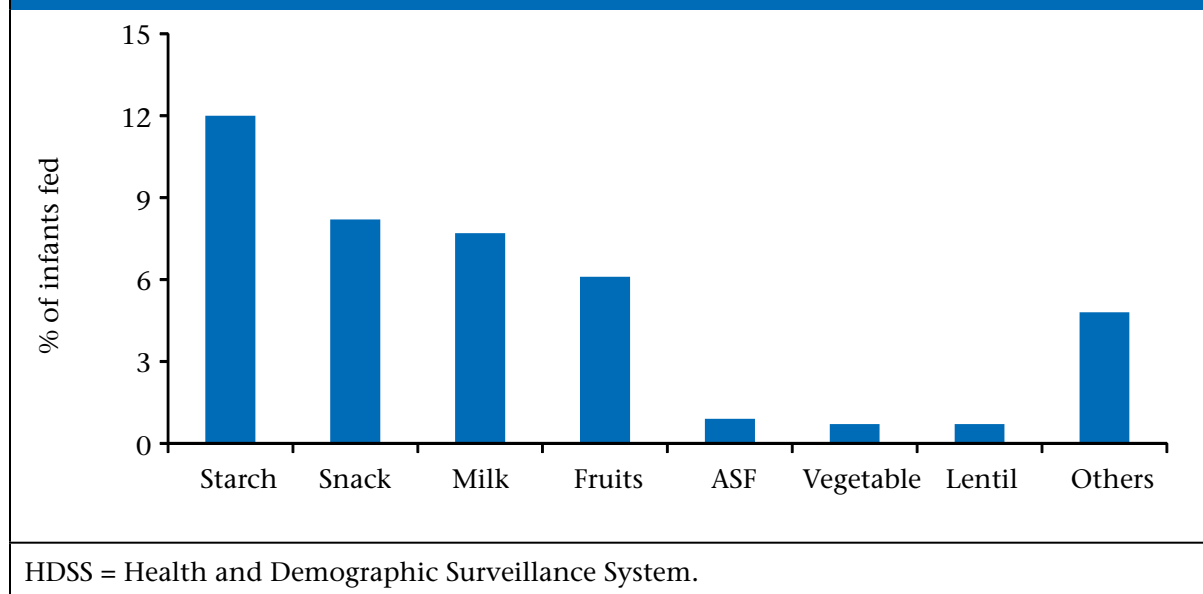
Data showed that 59% of the infants were exclusively breastfed in the last 24 hours preceding the day of the interview (Fig. 9). This figure is higher compared to Bangladesh Demographic and Health Survey (BDHS) data of 2007 (42.9%).

Fig. 9. Proportion of infants (0-5 months) exclusively breastfed, Chakaria HDSS, 2010



Although only EBF is recommended for this age group, often additional foods are given to the infants. In Chakaria starch, milk and fruits were offered frequently (12%, 7.7% and 6.1%). Food such as animal-source food (ASF), vegetables and lentils were offered rarely (0.9%, 0.7% and 0.7%) to infants of this age group (Fig. 10).

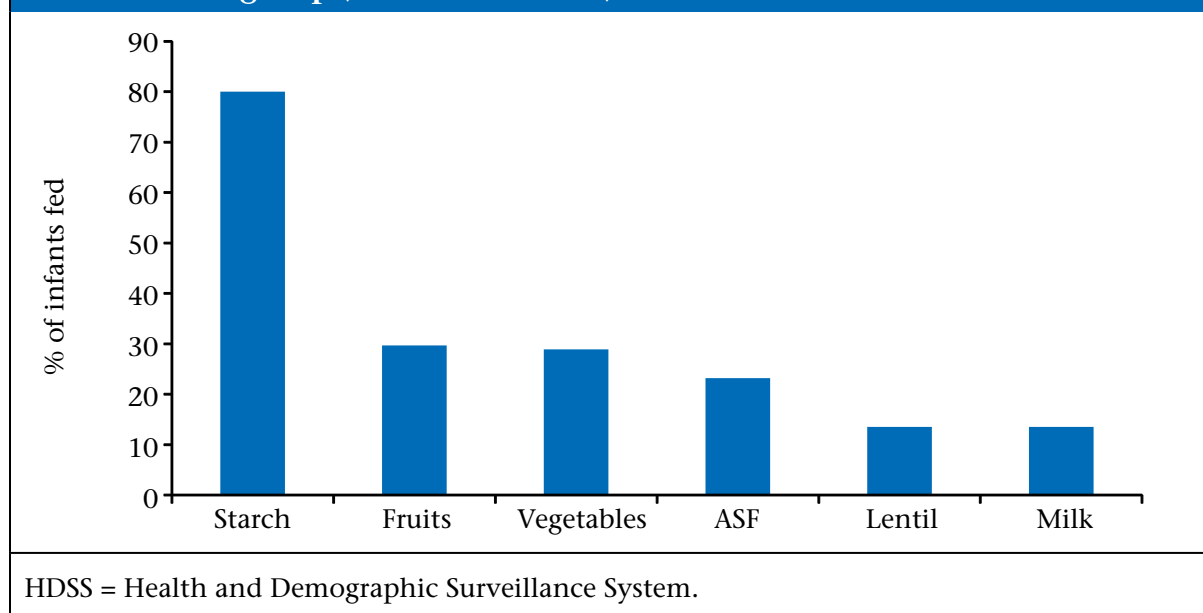
Fig. 10. Proportion of infants (0-5 months) fed other than breast milk, Chakaria HDSS, 2010



Infants aged 6-11 months

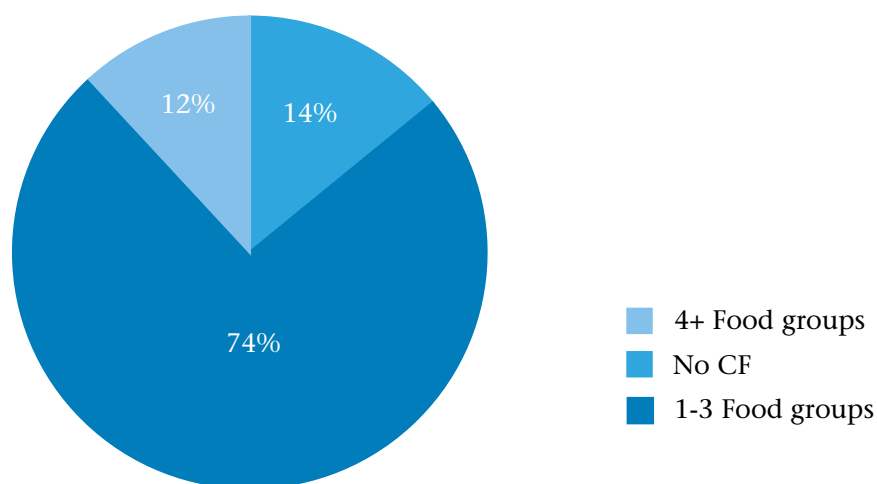
Breastfeeding was universal for the infants aged 6-11 months. Among the food groups, starch (80%) was dominant, followed by fruits (30%), vegetable (29%), ASF (23%), lentil (13%) and milk (13%) (Fig. 11).

Fig. 11. Proportion of infants (6-11 months) received complimentary food groups, Chakaria HDSS, 2010



According to the WHO feeding recommendation, infants at age 6-11 months advised to offer at least 4 different groups of food in a day (6). In Chakaria 14% of the 6-12 month old infants were not given any CF, 74% were offered food of 1-3 groups and only 12% were fed as recommended (Fig. 12).

Fig. 12. Dietary diversity among 6-11 months old infants, Chakaria HDSS, 2010



HDSS = Health and Demographic Surveillance System.

CHAPTER 10

Malaria and Care-Seeking Behaviour

Chakaria is a malaria endemic area. The HDSS collected data on prevalence of malaria during April-June, 2010. Each head of HDSS household were asked whether any of their household members were currently suffering from fever accompanied by shivering. Health seeking behaviour of those reporting fever with shivering was recorded. They were further enquired to find out whether any had gone through blood screening for malaria. The prevalence of fever with shivering (suspected cases of malaria) was 4.2% 1,000 population on the day of interview (Table 21) in the Chakaria HDSS area. The prevalence was highest among people belonging to the age-group of 20-49 years (Table 21). In 2007, a study conducted by ICDDR,B and BRAC revealed that 18% of people had fever with shivering in last 15 days in south-eastern region of Bangladesh (7).

Table 21. Age and sex specific prevalence of fever with shivering, Chakaria HDSS, 2010

Age (years)	Number of individuals			Rate per 1,000		
	Male	Female	Both	Male	Female	Both
Under-5	2,757	2,638	5,395	2.2	1.1	1.7
5-19	9,471	9,230	18,701	1.9	2.1	2.0
20-49	8,095	7,924	16,019	6.8	7.2	7.0
50 and above	2,846	2,529	5,375	6.0	5.5	5.8
Total	23,169	22,321	45,490	4.1	4.2	4.2

HDSS = Health and Demographic Surveillance System.

Table 22 presents the prevalence of fever with shivering by household asset quintiles. The prevalence showed a declining trend with household socioeconomic status measured by asset quintile.

Table 22. Prevalence of fever with shivering by asset quintile, Chakaria HDSS, 2010

Asset quintile	Number of individuals	Rate per 1,000
Lowest	8,144	6.5
Second	8,118	5.7
Middle	11,514	4.5
Fourth	7,702	3.0
Highest	9,007	1.4
Total	44,533	4.2

HDSS = Health and Demographic Surveillance System.

About one-fifth of the people who had fever with shivering took the microscopic blood-test for malaria at Upazila Health Complex (UHC) or at private clinic. The number of people who examined their blood was higher for males than for females (Table 23).

Table 23. Proportion of suspected cases who investigated for malaria, Chakaria HDSS, 2010

Tested for malaria?	Male (%)	Female (%)	Both (%)
Yes	25.5	10.9	18.3
No	74.5	89.1	81.7
Total number of individuals	94	92	186

HDSS = Health and Demographic Surveillance System.

Table 24 presents the results of microscopic blood-tests. About two-thirds of the cases tested positive for malaria.

Table 24. Results of microscopic blood-test for malaria, Chakaria HDSS, 2010

Results	Male (%)	Female (%)	Both (%)
Positive	78.3	44.4	68.7
Negative	21.7	55.6	31.3
Total number of individuals	23	9	32

HDSS = Health and Demographic Surveillance System.

Table 25 shows the care seeking behaviour of people who had fever with shivering. About half of the people did not seek care for their health problems and of those who sought care, most contacted village doctors. Moreover, only a few people contacted the UHC for care. A sex-differential in care-seeking behavior exists for treatment of malaria.

Table 25. Care-seeking behaviour for malaria, Chakaria HDSS, 2010

Sources of care	Number of individuals who had fever with shivering			Percentage of individuals sought care		
	Male	Female	Both	Male	Female	Both
Upazila Health Complex	1	1	2	1.1	1.1	1.1
Private Practitioners (MBBS)	10	15	25	11.4	16.9	14.1
SACMO	5	2	7	5.7	2.2	4.0
Homeopathy	0	2	2	0.0	2.2	1.1
Village Doctors	43	22	65	48.8	24.7	36.7
None	29	47	76	33.0	52.9	43.0
Total	88	89	177	100.0	100.0	100.0

HDSS = Health and Demographic Surveillance System.

CHAPTER II

Tuberculosis and Care-Seeking Behaviour

During April-June 2011, HDSS collected data on prevalence of tuberculosis (TB). The household heads were asked whether any of the household member currently had chronic cough for more than three weeks. Those reporting chronic cough was then asked whether they had taken any sputum specimen test for tuberculosis. The health seeking behaviour of members with chronic cough was also recorded. 2.5% of the household members reported having chronic cough on the day of the interview. Data shows prevalence of chronic cough increased with age in Chakaria (Table 26). Among the adults (15 years and above), the prevalence of chronic cough was 3.7% which was lower compared to the national figure (6.1%) (8).

Table 26. Age and sex specific prevalence of chronic cough for more than three weeks, Chakaria HDSS, 2010

Age (Year)	Number of individuals			Rate per 100		
	Male	Female	Both	Male	Female	Both
Under-5	2,757	2,640	5,397	0.9	0.6	0.7
5-14	6,416	6,057	12,473	0.7	0.7	0.7
15-24	5,456	5,436	10,892	0.7	0.8	0.8
25-34	2,749	2,623	5,372	1.4	1.6	1.5
35-44	2,010	2,152	4,162	3.5	3.5	3.5
45-54	1,634	1,665	3,299	7.2	7.2	7.2
55+	2,142	1,753	3,895	13.6	11.0	12.4
Total	23,164	22,326	45,490	2.7	2.4	2.5

HDSS = Health and Demographic Surveillance System.

Proportion of people with chronic cough by asset quintiles is presented in Table 27. The prevalence for the people from the lowest quintile was nearly double than the people from the highest quintile.

Table 27. Prevalence of chronic cough for more than three weeks by asset quintile, Chakaria HDSS, 2010

Asset quintile	Number of individuals	Rate per 100
Lowest	8,143	2.9
Second	8,044	2.8
Middle	11,391	2.9
Fourth	7,702	2.5
Highest	9,007	1.5
Total	44,532	2.5

HDSS = Health and Demographic Surveillance System.

Table 28 presents data on sputum specimen test for TB. Only 10% of the people who had cough for more than three weeks took the sputum test for TB and males took the test more than females.

Table 28. Proportion of people who took sputum specimen test for TB, Chakaria HDSS, 2010

Tested for TB?	Male (%)	Female (%)	Both (%)
Yes	10.7	8.1	9.5
No	89.3	91.9	90.5
Total number of individuals	608	530	1,138

HDSS = Health and Demographic Surveillance System.

One-fourth of the sputum tests showed positive results for TB. The test results showed that TB cases were detected more in females than males (Table 29).

Table 29. Results of sputum test for tuberculosis, Chakaria HDSS, 2010

Results	Male (%)	Female (%)	Both (%)
Positive	22.4	27.5	24.5
Negative	77.6	72.5	75.5
Total	58	40	98

HDSS = Health and Demographic Surveillance System.

Data on health seeking behaviour revealed that about 70% of the people who had cough for more than 3 weeks sought healthcare. Among those who contacted a healthcare provider, majority went to a village doctor (Table 30). Only a few people visited the Upazila Health Complex (UHC) or BRAC for care seeking.

Table 30. Care-seeking behaviour for tuberculosis, Chakaria HDSS, 2010

Sources of care	Number of individuals who had chronic cough for more than three weeks			Percentage of individuals sought care		
	Male	Female	Both	Male	Female	Both
BRAC	8	9	17	1.3	1.7	1.5
Upazila Health Complex	8	9	17	1.3	1.7	1.5
Private practitioners (MBBS)	110	90	200	18.1	17.1	17.6
SACMO/Health assistant/Health inspector	26	18	44	4.3	3.4	3.9
Homeopathy	15	13	28	2.5	2.5	2.5
Village doctors	272	216	488	44.6	41.2	43.0
None	170	170	340	27.9	32.4	30.0
Total	609	525	1,134	100.0	100.0	100.0

HDSS = Health and Demographic Surveillance System.

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APPENDIX A

Midyear population by age and sex in the intervention and comparison areas, Chakaria HDSS, 2010

Age (yrs)	Intervention area			Comparison area			Both areas		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
<1	276	273	549	211	209	420	487	482	969
1-4	1,225	1,154	2,379	942	919	1,861	2,167	2,073	4,240
5-9	1,618	1,568	3,186	1,296	1,149	2,445	2,914	2,717	5,631
10-14	1,786	1,663	3,449	1,430	1,405	2,835	3,216	3,068	6,284
15-19	1,602	1,715	3,317	1,367	1,454	2,821	2,969	3,169	6,138
20-24	1,332	1,257	2,589	1,138	1,109	2,247	2,470	2,366	4,836
25-29	882	739	1,621	768	580	1,348	1,650	1,319	2,969
30-34	647	710	1,357	531	552	1,083	1,178	1,262	2,440
35-39	564	602	1,166	421	533	954	985	1,135	2,120
40-44	545	555	1,100	410	469	879	955	1,024	1,979
45-49	439	454	893	387	403	790	826	857	1,683
50-54	430	411	841	390	419	809	820	830	1,650
55-59	307	288	595	303	271	574	610	559	1,169
60-64	291	229	520	257	190	447	548	419	967
65-69	209	153	362	182	142	324	391	295	686
70-74	133	126	259	116	94	210	249	220	469
75-79	117	92	209	96	85	181	213	177	390
80-84	79	50	129	45	46	91	124	96	220
85+	56	45	101	45	39	84	101	84	185
All	12,538	12,084	24,622	10,335	10,068	20,403	22,873	22,152	45,025

APPENDIX B

Percentage distribution of midyear population by age and sex in the intervention and comparison areas, Chakaria HDSS, 2010

Age (years)	Intervention area			Comparison area			Both areas		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
<1	2.2	2.3	2.2	2.0	2.1	2.1	2.1	2.2	2.2
1-4	9.8	9.5	9.7	9.1	9.1	9.1	9.5	9.4	9.4
5-9	12.9	13.0	12.9	12.5	11.4	12.0	12.7	12.3	12.5
10-14	14.2	13.8	14.0	13.8	14.0	13.9	14.1	13.8	14.0
15-19	12.8	14.2	13.5	13.2	14.4	13.8	13.0	14.3	13.6
20-24	10.6	10.4	10.5	11.0	11.0	11.0	10.8	10.7	10.7
25-29	7.0	6.1	6.6	7.4	5.8	6.6	7.2	6.0	6.6
30-34	5.2	5.9	5.5	5.1	5.5	5.3	5.2	5.7	5.4
35-39	4.5	5.0	4.7	4.1	5.3	4.7	4.3	5.1	4.7
40-44	4.3	4.6	4.5	4.0	4.7	4.3	4.2	4.6	4.4
45-49	3.5	3.8	3.6	3.7	4.0	3.9	3.6	3.9	3.7
50-54	3.4	3.4	3.4	3.8	4.2	4.0	3.6	3.7	3.7
55-59	2.4	2.4	2.4	2.9	2.7	2.8	2.7	2.5	2.6
60-64	2.3	1.9	2.1	2.5	1.9	2.2	2.4	1.9	2.1
65-69	1.7	1.3	1.5	1.8	1.4	1.6	1.7	1.3	1.5
70-74	1.1	1.0	1.1	1.1	0.9	1.0	1.1	1.0	1.0
75-79	0.9	0.8	0.8	0.9	0.8	0.9	0.9	0.8	0.9
80-84	0.6	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.5
85+	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

APPENDIX C

Number of births by age of mother, Chakaria HDSS, 2010

Age (years)	Intervention area			Comparison area			Both areas		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
10-14	2	0	2	0	0	0	2	0	2
15-19	77	69	146	69	57	126	146	126	272
20-24	96	98	194	88	98	186	184	196	380
25-29	61	44	105	38	47	85	99	91	190
30-34	40	36	76	28	19	47	68	55	123
35-39	9	16	25	9	8	17	18	24	42
40-44	3	7	10	4	2	6	7	9	16
45-49	0	2	2	0	0	0	0	2	2
50-54	1	0	1	1	0	1	2	0	2
All	289	272	561	237	231	468	526	503	1,029

APPENDIX D

Number of deaths by age and sex of decease, Chakaria HDSS, 2010

Age (years)	Intervention area			Comparison area			Both areas		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
<1	20	8	28	10	13	23	30	21	51
<1 month	16	3	19	5	9	14	21	12	33
1-11 month	4	5	9	5	4	9	9	9	18
1-4	7	5	12	0	7	7	7	12	19
5-9	0	3	3	1	0	1	1	3	4
10-14	2	1	3	0	1	1	2	2	4
15-19	1	2	3	2	1	3	3	3	6
20-24	2	1	3	1	1	2	3	2	5
25-29	0	0	0	2	1	3	2	1	3
30-34	1	1	2	0	0	0	1	1	2
35-39	0	1	1	0	1	1	0	2	2
40-44	1	2	3	2	3	5	3	5	8
45-49	2	3	5	2	1	3	4	4	8
50-54	2	4	6	2	3	5	4	7	11
55-59	4	2	6	4	3	7	8	5	13
60-64	7	4	11	10	5	15	17	9	26
65-69	6	3	9	9	4	13	15	7	22
70-74	1	3	4	4	7	11	5	10	15
75-79	7	4	11	7	5	12	14	9	23
80-84	2	4	6	4	4	8	6	8	14
85+	14	8	22	7	6	13	21	14	35
All	79	59	138	67	66	133	146	125	271

APPENDIX E

Causes of deaths by age and sex of decease, Chakaria HDSS, 2010

Cause	All age	Age (years)					
		<1	1-4	5-14	15-49	50-59	60+
Male							
Communicable diseases							
Diarrheal	2	1	1	0	0	0	0
Tuberculosis	3	0	0	0	0	0	3
Hepatitis	3	3	0	0	0	0	0
Hepatic failure	3	0	1	0	0	0	2
Respiratory infections	13	10	2	0	0	0	1
Measles	1	0	1	0	0	0	0
Malaria	1	0	0	0	0	1	0
Maternal and neonatal conditions							
Neonatal	5	5	0	0	0	0	0
Other neonatal	4	4	0	0	0	0	0
Non-communicable diseases							
Malignant neoplasm	7	0	0	0	3	2	2
Neoplasm	5	0	0	0	1	1	3
Diabetes	1	0	0	0	0	0	1
Stroke	22	0	0	0	3	3	16
Other cardiovascular	2	0	0	0	0	0	2
Asthma/Bronchitis	14	0	0	0	0	2	12
Digestive disease	1	0	0	0	0	0	1
Old age related complications	20	0	0	0	0	0	20
Epistaxis	1	0	0	0	0	0	1
Intestinal obstruction	1	0	0	0	0	0	1
Nutritional	1	1	0	0	0	0	0
Urinary	1	0	0	0	1	0	0
Hypertension	1	0	0	0	0	0	1
Congenital anomalies	1	1	0	0	0	0	0
Injuries							
Accident	14	0	0	3	7	1	3
Drowning	3	1	2	0	0	0	0
Homicide	1	0	0	0	0	1	0
Suicide	2	0	0	0	1	1	0
Unknown	13	4	0	0	0	0	9
All	146	30	7	3	16	12	78

Appendix E. (contd...)

Cause	All age	Age (years)					
		<1	1-4	5-14	15-49	50-59	60+
Female							
Communicable diseases							
Diarrheal	6	2	4	0	0	0	0
Dysentery	1	0	0	0	0	0	1
Tuberculosis	1	0	0	0	0	1	0
Hepatitis	1	1	0	0	0	0	0
Hepatic failure	2	0	0	1	1	0	0
Respiratory infections	5	5	0	0	0	0	0
Malaria	1	0	0	0	1	0	0
Maternal and neonatal conditions							
Neonatal	6	6	0	0	0	0	0
Other neonatal	1	1	0	0	0	0	0
Maternal death	1	0	0	0	1	0	0
Non-communicable diseases							
Malignant neoplasm	3	0	0	0	1	1	1
Neoplasm	4	0	0	0	1	2	1
Stroke	19	0	0	0	5	2	12
Other cardiovascular	5	0	0	0	2	0	3
Asthma/Bronchitis	13	0	0	0	0	5	8
Digestive disease	2	0	0	0	0	1	1
Old age related complications	24	0	0	0	0	0	24
Nutritional	1	1	0	0	0	0	0
Urinary	1	0	0	0	0	0	1
Congenital anomalies	2	1	1	0	0	0	0
Injuries							
Accident	2	1	0	1	0	0	0
Drowning	5	1	3	1	0	0	0
Suicide	3	0	0	1	2	0	0
Unknown	16	2	4	1	3	0	6
All	125	21	13	5	17	12	57

APPENDIX F

Number of migrants by age and sex, Chakaria HDSS, 2010

Age (years)	Intervention area			Comparison area			Both areas		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
In-migrants									
<1	12	7	19	8	10	18	20	17	37
1-4	29	23	52	20	20	40	49	43	92
5-9	26	32	58	18	19	37	44	51	95
10-14	52	35	87	29	24	53	81	59	140
15-19	31	236	267	17	160	177	48	396	444
20-24	35	83	118	26	78	104	61	161	222
25-29	28	37	65	29	16	45	57	53	110
30-34	12	6	18	14	2	16	26	8	34
35-39	5	3	8	7	0	7	12	3	15
40-44	5	1	6	6	1	7	11	2	13
45-49	2	1	3	4	4	8	6	5	11
50-54	3	4	7	0	2	2	3	6	9
55-59	2	1	3	1	2	3	3	3	6
60-64	1	2	3	5	4	9	6	6	12
65-69	2	7	9	2	3	5	4	10	14
70-74	2	4	6	0	4	4	2	8	10
75-79	2	3	5	3	2	5	5	5	10
80-84	0	3	3	1	2	3	1	5	6
85+	3	4	7	3	1	4	6	5	11
All	252	492	744	193	354	547	445	846	1,291
Out-migrants									
<1	18	18	36	15	10	25	33	28	61
1-4	33	36	69	25	31	56	58	67	125
5-9	36	37	73	32	30	62	68	67	135
10-14	54	45	99	44	35	79	98	80	178
15-19	74	201	275	51	163	214	125	364	489
20-24	84	169	253	56	127	183	140	296	436
25-29	43	51	94	44	49	93	87	100	187
30-34	40	19	59	18	9	27	58	28	86
35-39	23	10	33	17	4	21	40	14	54
40-44	12	0	12	6	3	9	18	3	21
45-49	10	5	15	3	6	9	13	11	24
50-54	2	4	6	0	3	3	2	7	9
55-59	3	5	8	3	4	7	6	9	15
60-64	3	5	8	5	8	13	8	13	21
65-69	2	6	8	0	4	4	2	10	12
70-74	3	7	10	1	4	5	4	11	15
75-79	4	4	8	3	7	10	7	11	18
80-84	2	5	7	0	1	1	2	6	8
85+	3	1	4	2	2	4	5	3	8
All	449	628	1,077	325	500	825	774	1,128	1,902

APPENDIX G

Migration rate per 1,000 population by age and sex, Chakaria HDSS, 2010

Age (years)	Intervention area			Comparison area			Both areas		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
In-migration									
<1	43.5	25.6	34.6	37.9	47.8	42.9	41.1	35.3	38.2
1-4	23.7	19.9	21.9	21.2	21.8	21.5	22.6	20.7	21.7
5-9	16.1	20.4	18.2	13.9	16.5	15.1	15.1	18.8	16.9
10-14	29.1	21.0	25.2	20.3	17.1	18.7	25.2	19.2	22.3
15-19	19.4	137.6	80.5	12.4	110.0	62.7	16.2	125.0	72.3
20-24	26.3	66.0	45.6	22.8	70.3	46.3	24.7	68.0	45.9
25-29	31.7	50.1	40.1	37.8	27.6	33.4	34.5	40.2	37.0
30-34	18.5	8.5	13.3	26.4	3.6	14.8	22.1	6.3	13.9
35-39	8.9	5.0	6.9	16.6	0.0	7.3	12.2	2.6	7.1
40-44	9.2	1.8	5.5	14.6	2.1	8.0	11.5	2.0	6.6
45-49	4.6	2.2	3.4	10.3	9.9	10.1	7.3	5.8	6.5
50-54	7.0	9.7	8.3	0.0	4.8	2.5	3.7	7.2	5.5
55-59	6.5	3.5	5.0	3.3	7.4	5.2	4.9	5.4	5.1
60-64	3.4	8.7	5.8	19.5	21.1	20.1	10.9	14.3	12.4
65-69	9.6	45.8	24.9	11.0	21.1	15.4	10.2	33.9	20.4
70-74	15.0	31.7	23.2	0.0	42.6	19.0	8.0	36.4	21.3
75-79	17.1	32.6	23.9	31.3	23.5	27.6	23.5	28.2	25.6
80-84	0.0	60.0	23.3	22.2	43.5	33.0	8.1	52.1	27.3
85+	53.6	88.9	69.3	66.7	25.6	47.6	59.4	59.5	59.5
All	20.1	40.7	30.2	18.7	35.2	26.8	19.5	38.2	28.7
Out-migration									
<1	65.2	65.9	65.6	71.1	47.8	59.5	67.8	58.1	63.0
1-4	26.9	31.2	29.0	26.5	33.7	30.1	26.8	32.3	29.5
5-9	22.2	23.6	22.9	24.7	26.1	25.4	23.3	24.7	24.0
10-14	30.2	27.1	28.7	30.8	24.9	27.9	30.5	26.1	28.3
15-19	46.2	117.2	82.9	37.3	112.1	75.9	42.1	114.9	79.7
20-24	63.1	134.4	97.7	49.2	114.5	81.4	56.7	125.1	90.2
25-29	48.8	69.0	58.0	57.3	84.5	69.0	52.7	75.8	63.0
30-34	61.8	26.8	43.5	33.9	16.3	24.9	49.2	22.2	35.2
35-39	40.8	16.6	28.3	40.4	7.5	22.0	40.6	12.3	25.5
40-44	22.0	0.0	10.9	14.6	6.4	10.2	18.8	2.9	10.6
45-49	22.8	11.0	16.8	7.8	14.9	11.4	15.7	12.8	14.3
50-54	4.7	9.7	7.1	0.0	7.2	3.7	2.4	8.4	5.5
55-59	9.8	17.4	13.4	9.9	14.8	12.2	9.8	16.1	12.8
60-64	10.3	21.8	15.4	19.5	42.1	29.1	14.6	31.0	21.7
65-69	9.6	39.2	22.1	0.0	28.2	12.3	5.1	33.9	17.5
70-74	22.6	55.6	38.6	8.6	42.6	23.8	16.1	50.0	32.0
75-79	34.2	43.5	38.3	31.3	82.4	55.2	32.9	62.1	46.2
80-84	25.3	100.0	54.3	0.0	21.7	11.0	16.1	62.5	36.4
85+	53.6	22.2	39.6	44.4	51.3	47.6	49.5	35.7	43.2
All	35.8	52.0	43.7	31.4	49.7	40.4	33.8	50.9	42.2

APPENDIX H

Number of migrants by origin or destination, Chakaria HDSS, 2010

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	379	69	44	80	47	46	38	14	3	8	3	27
Outside Bangladesh	66	0	0	1	1	15	19	12	9	3	3	3
Inside Chakaria	239	37	29	64	31	21	16	8	3	4	2	24
Outside Chakaria	140	32	15	16	16	25	22	6	0	4	1	3
Inside HDSS area	165	25	19	42	23	17	11	4	1	3	2	18
Outside HDSS area	74	12	10	22	8	4	5	4	2	1	0	6
Female												
Inside Bangladesh	845	60	51	59	396	160	53	8	3	2	5	48
Outside Bangladesh	1	0	0	0	0	1	0	0	0	0	0	0
Inside Chakaria	569	38	37	39	287	84	30	2	1	2	4	45
Outside Chakaria	276	22	14	20	109	76	23	6	2	0	1	3
Inside HDSS area	365	20	24	32	180	52	12	0	1	1	3	40
Outside HDSS area	204	18	13	7	107	32	18	2	0	1	1	5
Out-migration												
Male												
Inside Bangladesh	602	89	68	96	88	82	54	43	23	13	10	36
Outside Bangladesh	172	2	0	2	37	58	33	15	17	5	3	0
Inside Chakaria	396	60	42	80	65	46	30	25	9	7	4	28
Outside Chakaria	206	29	26	16	23	36	24	18	14	6	6	8
Inside HDSS area	278	44	25	55	48	32	26	16	6	3	1	22
Outside HDSS area	119	17	17	25	17	14	4	9	3	4	3	8
Female												
Inside Bangladesh	1,114	95	67	78	358	293	99	28	14	3	10	69
Outside Bangladesh	14	0	0	2	6	3	1	0	0	0	1	1
Inside Chakaria	738	54	47	56	243	184	64	13	8	3	8	58
Outside Chakaria	377	41	20	22	116	109	35	15	6	0	2	11
Inside HDSS area	464	29	26	40	145	116	40	7	5	2	6	48
Outside HDSS area	275	25	21	16	98	69	24	6	3	1	2	10

APPENDIX I

Number of in-migrants by reasons for migration, Chakaria HDSS, 2010

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	16	0	0	0	2	5	6	1	0	1	0	1
Family friction/ breakdown	21	5	1	0	2	4	1	3	1	0	0	4
Others	58	11	3	3	2	8	10	3	0	2	1	15
Work-related												
New job/job transfer	67	1	0	1	0	15	18	13	9	4	3	3
To look for work/lost job others	95	0	3	48	23	12	5	0	0	2	0	2
16	3	2	3	2	0	1	1	1	1	1	0	2
Housing-related												
Wanted to own home/ new house	122	47	10	11	12	15	15	5	1	1	2	3
Education												
To acquire education	50	2	25	15	5	2	1	0	0	0	0	0
All	445	69	44	81	48	61	57	26	12	11	6	30
Female												
Family related												
To join spouse	461	0	1	17	325	96	19	1	0	0	1	1
Family friction/ breakdown	52	2	1	0	12	14	5	4	1	0	1	12
Others	101	9	9	5	18	12	14	2	0	2	0	30
Work-related												
New job/job transfer	4	0	1	1	1	1	0	0	0	0	0	0
To look for work/lost job Others	42	0	9	12	11	6	4	0	0	0	0	0
19	2	3	4	1	3	1	0	1	0	0	0	4
Housing-related												
Wanted to own home/ new house	137	46	10	15	22	28	10	1	1	0	3	1
Education												
To acquire education	30	1	17	5	6	1	0	0	0	0	0	0
All	846	60	51	59	396	161	53	8	3	2	5	48

APPENDIX J

Number of out-migrants by reasons for migration, Chakaria HDSS, 2010

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	15	0	0	0	2	6	5	1	1	0	0	0
Family friction/ breakdown	38	4	2	2	3	9	5	5	1	1	0	6
Others	51	6	3	5	6	7	8	2	1	1	0	12
Work-related												
New job/job transfer	185	1	0	0	38	62	39	17	17	6	4	1
To look for work/ lost job	120	1	3	20	27	20	11	18	7	2	6	5
Others	31	3	6	5	3	2	5	0	2	1	0	4
Housing-related												
Wanted to own home/new house	265	75	43	44	30	23	13	13	10	5	2	7
Education												
To acquire education	65	0	11	22	15	10	1	2	1	2	0	1
Reasons not reported	4	1	0	0	1	1	0	0	0	0	1	0
All	774	91	68	98	125	140	87	58	40	18	13	36
Female												
Family-related												
To Join spouse	508	0	0	15	252	187	47	4	3	0	0	0
Family friction/ breakdown	83	2	2	3	16	28	12	2	2	1	3	12
Others	128	13	8	6	26	23	10	3	2	1	3	33
Work-related												
New job/job transfer	9	0	0	0	4	2	1	0	0	0	1	1
To look for work/lost job	47	1	3	10	11	11	5	5	1	0	0	0
Others	36	3	3	3	8	3	0	4	0	0	1	11
Housing-related												
Wanted to own home/ new house	279	75	41	30	39	41	22	10	6	1	2	12
Education												
To acquire education	34	1	10	11	7	0	3	0	0	0	1	1
Reasons not reported	4	0	0	2	1	1	0	0	0	0	0	0
All	1,128	95	67	80	364	296	100	28	14	3	11	70

APPENDIX K

Percentage of population by age and marital status, Chakaria HDSS, 2010

Age (years)	Married	Divorced	Widower/ Widow	Never married	Population
Male					
10-14	0.1	0.0	0.0	99.9	3,216
15-19	4.3	0.1	0.0	95.6	2,971
20-24	24.9	0.3	0.0	74.7	2,478
25-29	55.0	1.1	0.1	43.8	1,660
30-34	83.1	0.7	0.0	16.2	1,183
35-39	95.8	0.9	0.2	3.1	993
40-44	97.7	0.7	0.1	1.5	960
45-49	99.0	0.1	0.6	0.2	829
50-54	99.2	0.0	0.7	0.1	822
55-59	98.5	0.2	1.0	0.3	612
60-64	98.0	0.4	1.6	0.0	552
65-69	94.1	0.0	5.9	0.0	390
70-74	94.8	0.0	5.2	0.0	252
75-79	87.3	0.5	11.8	0.5	212
80-84	85.6	0.0	14.4	0.0	125
85+	68.6	2.9	28.4	0.0	102
All	47.7	0.4	0.8	51.1	17,357
Female					
10-14	1.3	0.0	0.0	98.6	3,064
15-19	31.4	0.5	0.0	68.1	3,176
20-24	70.2	1.6	0.4	27.8	2,376
25-29	88.0	1.0	1.9	9.1	1,319
30-34	93.6	1.9	2.3	2.2	1,267
35-39	93.2	1.5	5.3	0.0	1,136
40-44	90.2	1.4	8.0	0.4	1,022
45-49	82.9	1.1	15.6	0.4	859
50-54	76.0	1.0	23.0	0.1	828
55-59	62.0	1.6	36.2	0.2	561
60-64	54.7	0.0	44.9	0.5	419
65-69	43.2	0.3	56.5	0.0	294
70-74	33.3	0.5	66.2	0.0	219
75-79	15.6	0.6	83.8	0.0	179
80-84	8.3	0.0	90.6	1.0	96
85+	3.6	0.0	96.4	0.0	84
All	54.4	0.9	9.2	35.5	16,899

APPENDIX L

Percentage of population by age and marital status, intervention area, Chakaria HDSS, 2010

Age (years)	Married	Divorced	Widower/ Widow	Never married	Population
Male					
10-14	0.1	0.0	0.0	99.9	1,786
15-19	4.4	0.1	0.0	95.6	1,602
20-24	24.8	0.4	0.0	74.9	1,336
25-29	54.2	1.6	0.1	44.1	891
30-34	83.4	0.9	0.0	15.7	649
35-39	96.0	1.1	0.4	2.6	569
40-44	97.6	0.9	0.0	1.5	547
45-49	99.1	0.0	0.5	0.5	442
50-54	99.3	0.0	0.7	0.0	432
55-59	98.7	0.3	0.7	0.3	307
60-64	98.3	0.3	1.4	0.0	293
65-69	92.8	0.0	7.3	0.0	207
70-74	93.4	0.0	6.6	0.0	137
75-79	90.5	0.9	7.8	0.9	116
80-84	84.8	0.0	15.2	0.0	79
85+	70.2	1.8	28.1	0.0	57
All	47.6	0.4	0.8	51.2	9,450
Female					
10-14	1.2	0.0	0.0	98.9	1,659
15-19	31.5	0.6	0.1	67.9	1,723
20-24	71.1	1.9	0.5	26.6	1,261
25-29	87.7	0.4	2.0	9.9	738
30-34	94.1	1.8	2.1	2.0	714
35-39	93.7	1.7	4.6	0.0	603
40-44	91.7	1.3	6.7	0.4	554
45-49	85.1	1.1	13.9	0.0	455
50-54	76.8	1.0	22.3	0.0	409
55-59	58.3	2.4	39.0	0.3	290
60-64	59.4	0.0	40.2	0.4	229
65-69	47.7	0.7	51.6	0.0	153
70-74	33.1	0.8	66.1	0.0	124
75-79	12.8	1.1	86.2	0.0	94
80-84	10.0	0.0	90.0	0.0	50
85+	4.4	0.0	95.6	0.0	45
All	54.8	0.9	8.7	35.6	9,101

APPENDIX M

Percentage of population by age and marital status, comparison area, Chakaria HDSS, 2010

Age (years)	Married	Divorced	Widower/ Widow	Never married	Population
Male					
10-14	0.0	0.0	0.0	99.9	1,430
15-19	4.2	0.2	0.0	95.6	1,369
20-24	25.1	0.3	0.1	74.5	1,142
25-29	55.9	0.7	0.0	43.4	769
30-34	82.8	0.4	0.0	16.9	534
35-39	95.5	0.7	0.0	3.8	424
40-44	97.8	0.5	0.2	1.5	413
45-49	99.0	0.3	0.8	0.0	387
50-54	99.0	0.0	0.8	0.3	390
55-59	98.4	0.0	1.3	0.3	305
60-64	97.7	0.4	1.9	0.0	259
65-69	95.6	0.0	4.4	0.0	183
70-74	96.5	0.0	3.5	0.0	115
75-79	83.3	0.0	16.7	0.0	96
80-84	87.0	0.0	13.0	0.0	46
85+	66.7	4.4	28.9	0.0	45
All	47.8	0.3	0.8	51.1	7,907
Female					
10-14	1.5	0.1	0.1	98.4	1,405
15-19	31.3	0.3	0.0	68.4	1,453
20-24	69.3	1.3	0.3	29.2	1,115
25-29	88.5	1.7	1.7	8.1	581
30-34	93.0	2.0	2.5	2.5	553
35-39	92.7	1.3	6.0	0.0	533
40-44	88.5	1.5	9.6	0.4	468
45-49	80.5	1.0	17.6	0.7	404
50-54	75.2	1.0	23.6	0.2	419
55-59	66.1	0.7	33.2	0.0	271
60-64	49.0	0.0	50.5	0.5	190
65-69	38.3	0.0	61.7	0.0	141
70-74	33.7	0.0	66.3	0.0	95
75-79	18.8	0.0	81.2	0.0	85
80-84	6.5	0.0	91.3	2.2	46
85+	2.6	0.0	97.4	0.0	39
All	53.9	0.8	9.8	35.5	7,798

APPENDIX N

Chakaria HDSS project team, Chakaria HDSS, 2010

Name of Staff	Designation
Dhaka	
Abbas Bhuiya	Project Director
Mohammad Iqbal	Senior Operations Researcher
SM Manzoor Ahmed Hanifi	Assistant Scientist
Rumesa R Aziz	Research Investigator
Tania Wahed	Senior Operations Researcher
Farhana Urni	Senior Statistical Officer
Md. Kashem Iqbal	Senior Administrative Officer
Ayesha Begum	Senior Data Management Assistant
Chakaria	
Shahidul Hoque	Senior Field Research Officer
Ariful Moula	Field Research Officer
Mijanur Rahaman	Field Research Officer
Ashish Paul	Senior Data Management Assistant
Md. Sharif Al-Hasan	Field Research Supervisor
Snehasish Dutta	Field Research Assistant
Md. Rehmat Ali	Senior Field Assistant
Afroza Yeasmin	Data Collector
Armanul Maowa	Data Collector
Aymun Nahar	Data Collector
Fatema Johura Surma	Data Collector
Fatema Zannat	Data Collector
Helena Khanom Happy	Data Collector
Hosaina Begum	Data Collector
Ismat Jahan Khuki	Data Collector
Kawsar Jannat	Data Collector
Kawsar Jannat Mukta	Data Collector
Kulsuma Aktar	Data Collector
Mina Dhar	Data Collector
Mobasseratul Zannat	Data Collector
Monuara Begum	Data Collector
Nazma Akter	Data Collector
Nigar Sultana	Data Collector
Noor Ayesha Begum	Data Collector
Rawnak Zahan	Data Collector
Riasmin Zannat	Data Collector
Rosan Ara	Data Collector
Sabina Yesmin	Data Collector
Setara Begum	Data Collector
Shamima Khanam	Data Collector
Tanjina Zannat Ara	Data Collector
Tanjimul Zannat	Data Collector
Zannatul Ferdous	Data Collector
Zosna Begum	Data Collector
HDSS = Health and Demographic Surveillance System.	



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