

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

**Demographic Events and Safe Motherhood  
Practices - 2008**

**Scientific Report No. 108**



**icddr,b**

KNOWLEDGE FOR  
GLOBAL LIFESAVING SOLUTIONS

# **Chakaria Health and Demographic Surveillance System**

## **Focusing on the Poor and Vulnerable**

Demographic Events and Safe Motherhood  
Practices – 2008

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All staff members of the Chakaria HDSS, Dhaka and Chakaria, have contributed to the preparation of this report.

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# CHAPTER I

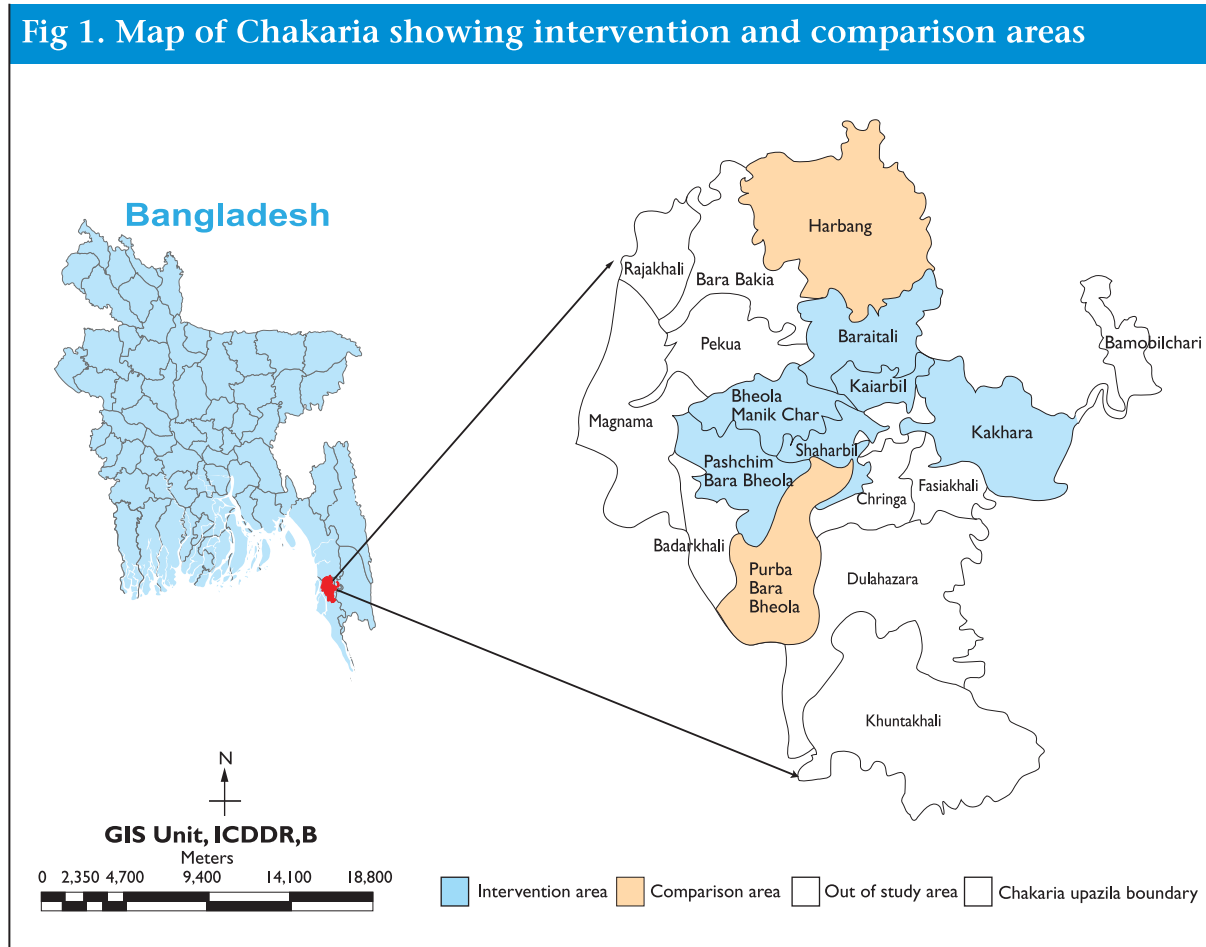
## Introduction

Chakaria is one of the 481 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 a population of around 416,110 in 2008. 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 2008.



Existing health services in the intervention and comparison areas, Chakaria Health and Demographic Surveillance System, 2008			
Intervention area (Six unions with 120,883 population)		Comparison area (Two unions with 39,172 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	11	Trained midwife	1
Qualified physician	0	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
Rural dispensary	0	Rural dispensary	1
EPI centre	216	EPI centre	38
Family Welfare Visitor (FWV)	5	Family Welfare Visitor (FWV)	2
Sub-Assistant Community Medical Officer (SACMO)/Medical assistant	3	Sub-Assistant Community Medical Officer (SACMO)/Medical assistant	1
Family Welfare Assistant (skilled birth attendant)	9	Family Welfare Assistant (skilled birth attendant)	4
Private		Private	
Village doctor (allopathic)	186	Village doctor (allopathic)	54
Village doctor (homeopathic)	82	Village doctor (homeopathic)	24
Allopathic pharmacy	168	Allopathic pharmacy	35
Homeopathic pharmacy	13	Homeopathic pharmacy	2
Diagnostic centre	3	Diagnostic centre	0
NGO		NGO	
Health and development activities	3	Health and development activities	3



## CHAPTER 2

### Methods and Materials

The Chakaria HDSS covered 8 unions, 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 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 the 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. 26 field-trained workers collected data during 2008. The data collectors were provided with written instructions for specific questions that required added explanations.

5 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.

The report derived the socioeconomic status of households following the asset quintile approach. A list of assets included almirah, table/chair, mosquito bed-net, watch/clock, van/rickshaw, choki/khat, radio, television, and telephone. The principal component analytical technique was used for calculating weights of the assets to derive household asset index scores. The major demographic indicators and safe motherhood related practices have been tabulated for the various asset quintiles.

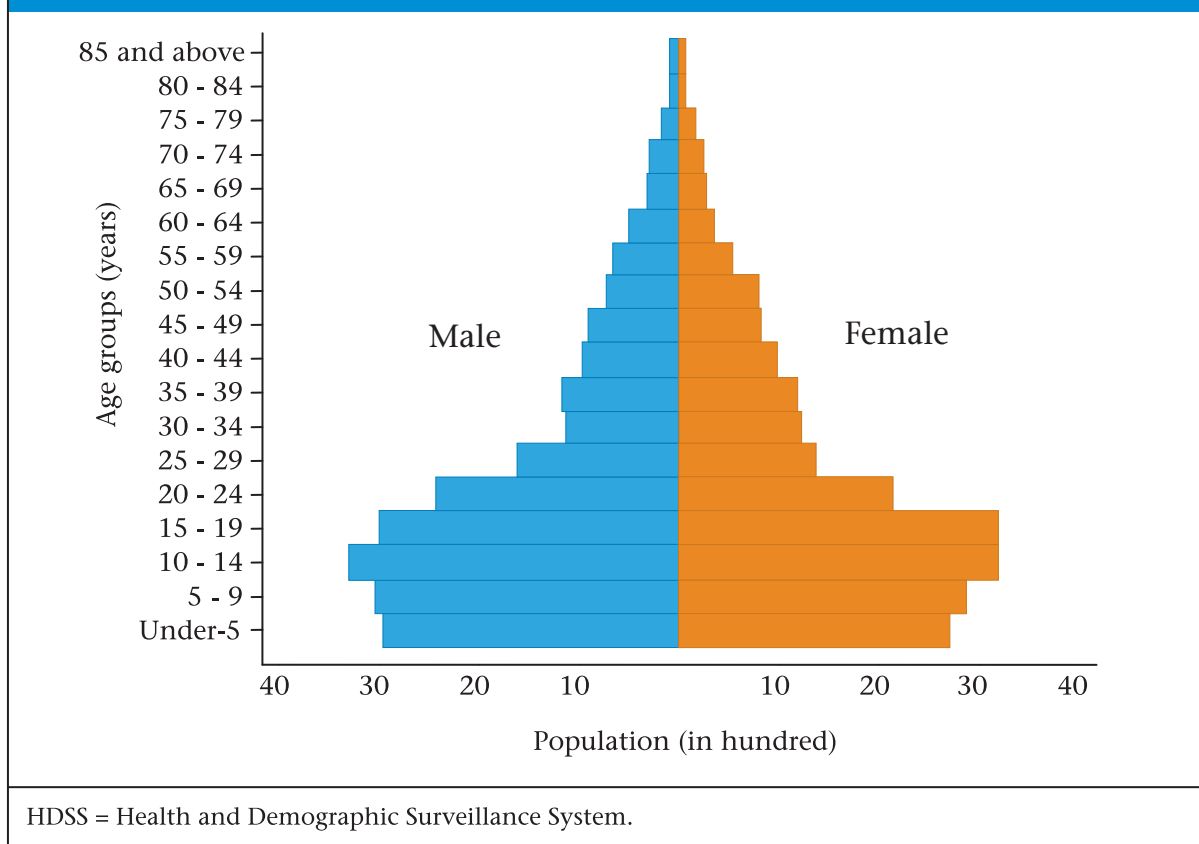
It should be mentioned that the number of observations in the tables presented in this report differ in some instances due to missing information for some variables.

## 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 105 in 2008. The age dependency ratio was 77 in 2008 (see Appendix A).

Fig. 2. Male and female population by age and sex, Chakaria HDSS, 2008



The major demographic and health indicators in the intervention and comparison areas during 1999, and 2004-2008 are presented in Table 1. A declining trend in the mortality and fertility indicators and natural rate of increase has been observed during 1999-2008. 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 (4). In 2008, the rate of natural increase and the annual growth rate in the surveillance area was 20.2 % and 1.1% respectively (Table 1).

14.4% of births in Chakaria were delivered at facilities (Hospital or Clinic) in 2008. The percentage of births at facilities increased from 5.1 in 2007 to 14.4 in 2008. 16.2% of the births were attended by Skilled Birth Attendant (SBA). There has been a decrease in deliveries by SBAs from 19.1% in 2007 to 16.2% in 2008 (Table 1).

The legal age of marriage is 18 years for female and 21 years for male in Bangladesh. In 2008, 47.5% of the women married before reaching their 18th birth day. The percentage of underage female marriage increased to 47.5% in 2008 from 43.2% in 2007. 24.7% of the males were married before the age of 21 years in 2008. The proportion of male marriages before 21 years has decreased from 25.6% in 2007 to 24.7% in 2008. The percentage of underage marriage for females remained higher than males during 2004 to 2008.

**Table 1. Demographic and health indicators, Chakaria HDSS, 1999-2008**

Rates per 1,000	Chakaria HDSS area						Matlab HDSS area 2007
	1999	2004	2005	2006	2007	2008	
Crude birth rate							
Intervention area	33.8	30.6	29.8	25.8	26.9	24.7	22.6
Comparison area	33.9	28.8	27.4	25.3	27.2	26.5	23.0
Both areas	33.9	29.7	28.7	25.6	26.6	25.5	22.8
Total fertility rate*							
Intervention area	5.1	4.6	4.4	3.5	3.6	3.3	2.6
Comparison area	4.9	4.4	4.0	3.3	3.4	3.4	2.8
Both areas	5.1	4.5	4.2	3.4	3.5	3.3	2.7
Neonatal mortality**							
Intervention area	40.0	24.8	25.2	33.7	27.0	25.0	20.3
Comparison area	47.3	40.8	35.9	42.3	44.3	33.5	29.9
Both areas	41.7	31.9	31.5	37.6	34.8	29.0	25.1
Post-neonatal mortality**							
Intervention area	21.2	15.5	14.1	17.7	18.0	23.3	7.4
Comparison area	22.4	19.7	25.1	15.4	7.4	5.6	9.4
Both areas	21.4	17.4	17.4	16.6	13.3	14.9	8.4
Infant mortality rate**							
Intervention area	61.2	40.3	39.3	51.4	45.0	48.3	27.7
Comparison area	69.7	60.5	61.0	57.7	51.7	39.0	39.3
Both areas	63.2	49.3	48.9	54.2	48.0	43.9	33.5
Child mortality rate (1-4 years)							
Intervention area	9.0	8.1	7.5	6.2	4.7	3.6	3.4
Comparison area	10.6	5.5	5.3	2.4	4.4	6.2	2.8
Both areas	9.4	6.9	6.5	4.5	4.6	4.7	3.1

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

Continued

Rates per 1,000	Chakaria HDSS area						Matlab HDSS area 2007
	1999	2004	2005	2006	2007	2008	
Crude death rate							
Intervention area	6.7	5.9	5.8	5.4	5.4	5.7	6.8
Comparison area	7.9	7.0	6.5	5.7	6.8	6.7	7.1
Both areas	7.0	6.3	6.1	5.6	6.1	6.1	7.0
Rate of natural increase							
Intervention area	27.1	24.7	24.0	20.4	21.7	19.4	15.8
Comparison area	26.0	21.8	20.8	19.6	19.2	21.0	15.9
Both areas	26.9	23.4	22.5	20.0	20.6	20.2	15.8
In-migration rate							
Intervention area	-	17.1	24.5	29.7	23.4	27.1	-
Comparison area	-	16.6	23.7	30.0	26.0	26.0	-
Both areas	-	16.9	24.1	29.9	24.6	26.6	40.0
Out-migration rate							
Intervention area	-	22.2	23.8	33.8	31.0	36.2	-
Comparison area	-	19.5	25.9	34.3	33.2	34.7	-
Both areas	-	21.0	24.8	34.0	32.0	35.5	63.5
Growth rate (%)							
Intervention area	-	2.0	2.5	1.6	1.4	1.0	-
Comparison area	-	1.9	2.0	1.5	1.3	1.2	-
Both areas	-	1.9	2.1	1.6	1.3	1.1	0.8
Facility-based delivery (%)							
Intervention area	-	6.8	6.4	6.2	3.8	18.3	-
Comparison area	-	4.4	3.8	4.5	6.8	9.5	-
Both areas	-	5.4	4.9	5.4	5.1	14.4	-
Received assistance from SBA during delivery (%)							
Intervention area	-	14.3	9.2	16.5	20.4	18.0	-
Comparison area	-	14.8	11.6	13.8	18.2	12.8	-
Both areas	-	14.5	10.3	15.3	19.1	16.2	-
Male marriage at ages under 21 years (%)							
Intervention area	-	23.4	25.6	26.3	25.2	25.6	-
Comparison area	-	23.3	23.8	29.7	26.0	23.8	-
Both areas	-	23.3	24.7	27.9	25.6	24.7	-
Female marriage at ages under 18 years (%)							
Intervention area	-	51.4	43.1	51.2	40.4	46.0	-
Comparison area	-	56.6	52.0	48.4	46.7	49.0	-
Both areas	-	53.6	47.3	49.8	43.2	47.5	-
'-' Data not available.							

## 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 6.1 per 1,000 population in 2008. 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 43.9 per 1,000 live births with a lower rate in the comparison area than in the intervention area. Child mortality rate was 4.7 per 1,000 children aged 1-4 years. The rate was higher in the comparison area than in the intervention area (Table 2).

Abridged Life Table for males and females are presented in Table 3. Life expectancy at birth was 67.7 years for males and 67.9 years for females. The rate of mortality of children aged less than 5 years (under-five mortality) was 60.6 per 1,000 live births in Chakaria in 2008 (Table 4). Figure 3 shows the probability of survival by sex during various age groups. Both males and females have similar life expectancies at birth in 2008.

**Table 2. Age-specific death rate (per 1,000 population) by sex, Chakaria HDSS, 2008**

Age (years)	Intervention area			Comparison area			Both areas		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
<1*	58.3	37.7	48.3	43.0	34.7	39.0	51.0	36.3	43.9
1-4	3.1	4.1	3.6	6.0	6.4	6.2	4.4	5.1	4.7
5-9	2.4	0.6	1.5	3.1	0.0	1.6	2.7	0.4	1.5
10-14	0.0	1.2	0.6	1.3	0.7	1.0	0.6	1.0	0.8
15-19	0.6	0.6	0.6	1.5	1.3	1.4	1.0	1.0	1.0
20-24	1.6	2.6	2.1	1.8	2.1	1.9	1.7	2.4	2.0
25-29	3.6	0.0	1.9	0.0	5.1	2.3	1.9	2.2	2.1
30-34	0.0	4.6	2.4	2.0	0.0	1.0	0.9	2.5	1.7
35-39	3.1	3.2	3.1	2.1	3.6	2.9	2.6	3.4	3.0
40-44	2.0	5.7	3.9	4.7	6.7	5.7	3.2	6.1	4.7
45-49	2.2	2.5	2.3	4.8	7.2	6.0	3.4	4.9	4.1
50-54	16.4	4.9	10.3	20.8	18.5	19.6	18.5	11.5	14.8
55-59	9.3	11.3	10.2	16.1	4.0	10.7	12.6	7.7	10.4
60-64	14.8	20.8	17.3	33.0	19.4	27.2	22.8	20.2	21.7
65-69	33.1	51.9	42.0	34.5	24.2	29.7	33.8	38.6	36.0
70-74	38.5	62.5	48.5	39.7	30.9	35.9	39.0	47.8	42.8
75-79	30.6	41.7	35.3	75.8	16.9	48.0	48.8	30.5	40.7
80-84	85.1	45.5	65.9	52.6	151.5	98.6	70.6	90.9	80.2
85+	102.0	157.9	126.4	129.0	222.2	179.1	112.5	189.2	149.4
All	5.8	5.6	5.7	7.1	6.2	6.7	6.4	5.9	6.1

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

Table 3. Abridged Life Table, Chakaria HDSS, 2008

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	0.0510	0.0510	100,000	95,918	67.7	0.0363	0.0363	100,000	97,096	67.9
1	0.0044	0.0174	94,898	376,487	70.3	0.0051	0.0203	96,370	381,808	69.5
5	0.0027	0.0133	93,246	463,359	67.5	0.0004	0.0018	94,417	471,702	66.9
10	0.0006	0.0031	92,002	459,357	63.4	0.0010	0.0048	94,251	470,220	62.0
15	0.0010	0.0051	91,718	457,521	58.6	0.0010	0.0048	93,802	467,970	57.3
20	0.0017	0.0083	91,254	454,514	53.9	0.0024	0.0118	93,350	464,203	52.5
25	0.0019	0.0095	90,493	450,482	49.3	0.0022	0.0111	92,246	458,867	48.1
30	0.0009	0.0045	89,634	447,233	44.7	0.0025	0.0124	91,222	453,501	43.6
35	0.0026	0.0131	89,228	443,445	39.9	0.0034	0.0169	90,091	446,935	39.2
40	0.0032	0.0160	88,060	437,052	35.4	0.0061	0.0303	88,567	436,625	34.8
45	0.0034	0.0171	86,653	429,847	31.0	0.0049	0.0242	85,885	424,612	30.8
50	0.0185	0.0887	85,173	408,171	26.4	0.0115	0.0558	83,804	408,148	26.5
55	0.0126	0.0613	77,614	376,994	23.8	0.0077	0.0379	79,130	388,693	22.9
60	0.0228	0.1083	72,857	345,745	20.1	0.0202	0.0963	76,129	363,457	18.7
65	0.0338	0.1564	64,967	300,729	17.3	0.0386	0.1768	68,797	315,006	15.4
70	0.0390	0.1784	54,807	250,725	15.0	0.0478	0.2146	56,634	253,984	13.1
75	0.0488	0.2183	45,027	201,506	12.7	0.0305	0.1424	44,482	207,426	11.0
80	0.0706	0.3009	35,197	150,046	10.5	0.0909	0.3706	38,148	155,517	7.4
85	0.1125	1.0000	24,606	218,717	8.9	0.1892	1.0000	24,010	126,912	5.3

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

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

$l_x$  = Survivors to exact age x

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

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

$e_x$  = Life expectancy at age x



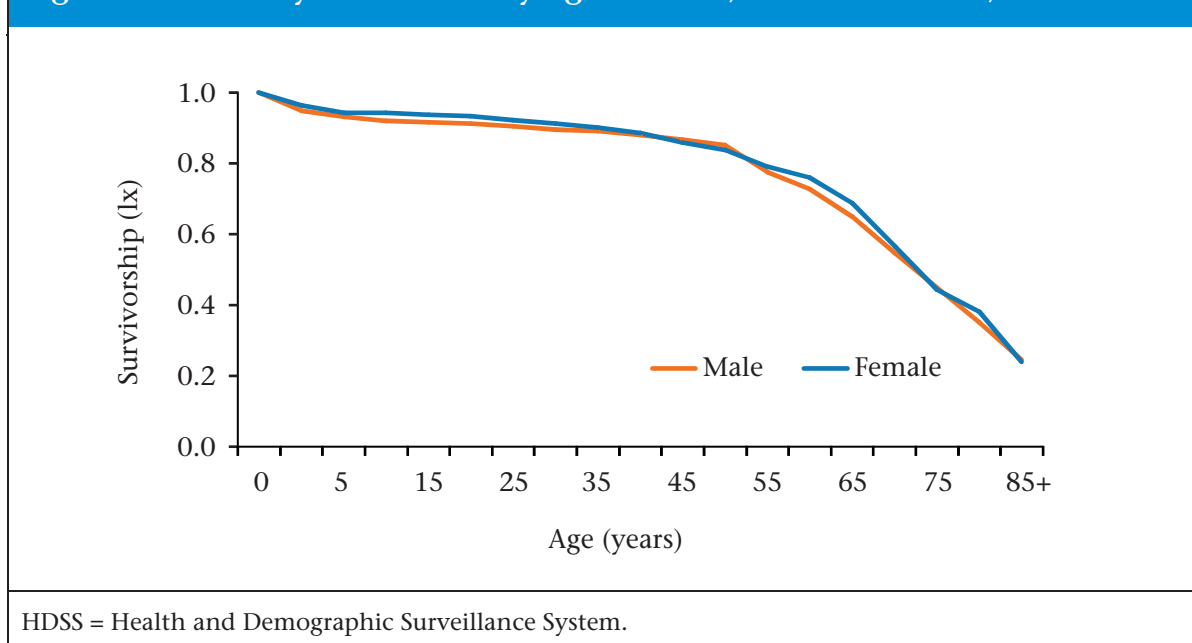
**Fig. 3. Probability of survival by age and sex, Chakaria HDSS, 2008**

Table 4 presents under-5 mortality rates by household asset quintile. Under-5 mortality rate was inversely correlated with household asset scores. The mortality rate of children from the lowest quintile was nearly 2.1 times higher than that of children from the highest quintile.

**Table 4. Under-5 mortality rate per 1,000 live births by asset quintile, Chakaria HDSS, 2008**

Asset quintile	Number of birth	Number of deaths	Under-5 mortality rate
Lowest	182	16	87.9
Second	190	17	89.5
Medium	225	12	53.3
Fourth	242	11	45.5
Highest	266	11	41.4
All	1,105	67	60.6

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 2004-2008. Stroke, neoplasm, asthma, respiratory infections, senility, hepatitis, neonatal, cardiovascular other than stroke, drowning, and accidents were the 10 leading causes of death in Chakaria in 2008.

Table 5. Causes of death, Chakaria HDSS, 2004 - 2008

Rank	2004		2005		2006		2007		2008	
	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths
1	Respiratory infections	39	Stroke	29	Stroke	31	Asthma/ Bronchitis	30	Stroke	33
2	Senility	30	Respiratory infections	28	Senility	28	Neoplasm (Benign and Malignant)	29	Neoplasm (Benign and Malignant)	33
3	Asthma/ Bronchitis	26	Senility	28	Asthma/ Bronchitis	26	Respiratory infections	26	Asthma/Bronchitis	26
4	Neonatal (Premature and LBW, Birth asphyxia, Birth trauma, Sepsis and infection)	17	Neoplasm (Benign and Malignant)	23	Respiratory infections	26	Senility	25	Respiratory infections	22
5	Diarrheal disease	15	Asthma/ Bronchitis	19	Neoplasm (Benign and Malignant)	21	Stroke	25	Senility	19
6	Hepatitis	14	Neonatal (Premature and LBW, Birth asphyxia, Bone trauma, Sepsis and infection)	14	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
7	Neoplasm (Benign and Malignant)	14	Drowning	12	Drowning	11	Accident	16	Neonatal (Premature and LBW, Birth asphyxia, Bone trauma, Sepsis and infection)	13

Continued

Rank	2004		2005		2006		2007		2008	
	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths
8	Cardiovascular other than stroke and hypertension	14	Accident	10	Hepatitis	7	Cardiovascular other than stroke and hypertension	11	Cardiovascular other than stroke and hypertension	10
9	Stroke	12	Cardiovascular other than stroke and hypertension	8	Accident	6	Diarrheal Diseases	9	Drowning	9
10	Accident	11	Nutritional	7	Diarrheal diseases	6	Hepatitis	9	Accident	9
11	Malaria	8	Diarrheal diseases	6	Diabetes	3	Drowning	8	Diarrheal diseases	7
12	Drowning	8	Hepatitis	6	Hypertension	3	Nutritional diseases	5	Hypertension	7
13	Nutritional	7	Tuberculosis	4	Malaria	3	Diabetes	3	Maternal death	5
14	Homicide	7	Typhoid	4	Cardiovascular other than stroke and hypertension	3	Hypertension	3	Diabetes	4
15	Hypertension	6	Urinary diseases	4	Urinary diseases	3	Urinary diseases	3	Tuberculosis	4
16	Diabetes	5	Rabies	3	Rabies	3	Epilepsy	2	Digestive disease	3
17	Urinary diseases	5	Maternal death	3	Tuberculosis	3	Malaria	2	Burn	2
18	Typhoid	2	Diabetes	3	Burn	2	Maternal death	2	Other urinary	2

Continued

Rank	2004		2005		2006		2007		2008	
	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths	Cause	No. of deaths
19	Digestive disease	2	Hypertension	3	Digestive diseases	2	Suicide	2	Homicide	1
20	Maternal death	1	Homicide	3	Nutritional diseases	2	Tuberculosis	2	Hutritional	1
21	Suicide	1	Burn	2	Congenital anomalies	1	Typhoid	2	Rabies	1
22	Unknown	36	Malaria	1	Leprosy	1	Dysentery	1	Snake bite	1
23			Congenital anomalies	1	Tetanus	1	Digestive disease	1	Suicide	1
24			Digestive disease	1	Unknown	42	Homicide	1	Typhoid	1
25			Suicide	1			Rabies	1	Malaria	1
26			Snake bite	1			Unknown	32	Unknown	46
27			Epilepsy	1						
			Unknown	46						
	Total	280		271		249		274		274
HDSS = Health and Demographic Surveillance System.										

## CHAPTER 5

### Fertility

The crude birth rate in 2008 was 25.5 per 1,000 population, which was lower than the rate in 2007 (26.6 per 1000 population) (Table 1). Total fertility rates per woman also showed a downward trend during 1999-2008 with a value of 3.3 in 2008 (Table 1). The fertility rate was highest among women of age-group of 25-29 years (Fig. 4 and Table 6).

**Table 6. Age-specific fertility rate per 1,000 women aged 15-49 years, Chakaria HDSS, 2008**

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	1,644	118	71.8	1,495	129	86.3	3,139	247	78.7
20-24	1,149	204	177.5	951	186	195.4	2,101	390	185.6
25-29	761	145	190.5	584	118	202.1	1,345	263	195.5
30-34	652	78	119.6	552	60	108.9	1,203	138	114.7
35-39	620	42	67.7	556	36	64.7	1,176	78	66.3
40-44	526	6	11.4	451	8	17.7	977	14	14.3
45-49	400	5	12.5	415	1	2.4	816	6	7.4
Total	5,752	598	651.1	5,005	538	677.5	10,757	1,136	662.6
TFR	3,256			3,386			3,313		

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

**Fig. 4. Age-specific fertility rate, Chakaria HDSS, 2008**

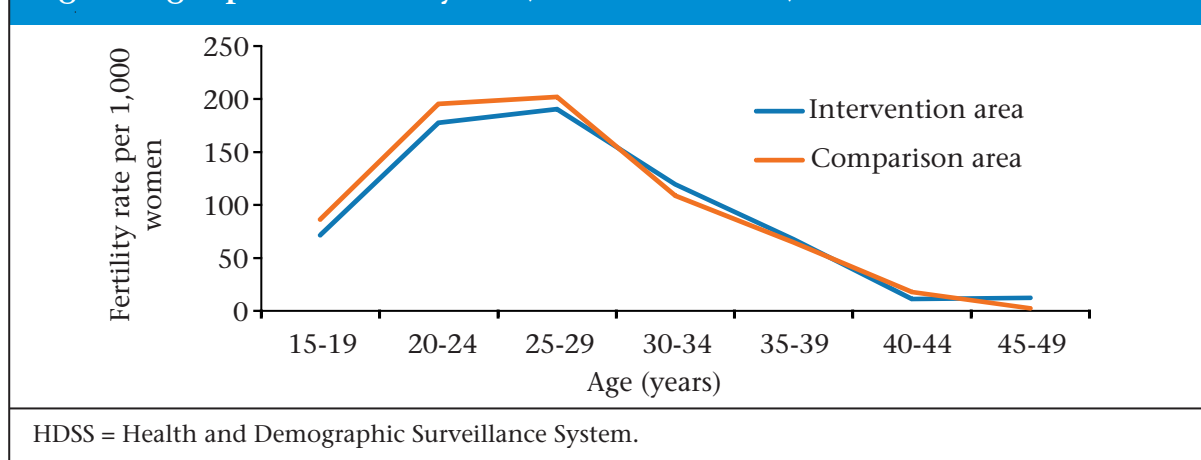


Table 7. Crude birth rate per 1,000 population by asset quintile, Chakaria HDSS, 2008			
Asset quintile	Midyear population	Number of births	Birthrate
Lowest	6,834	182	26.6
Second	8,325	190	22.8
Medium	9,054	225	24.9
Fourth	8,644	242	28.0
Highest	10,045	266	26.5
All	42,902	1,105	25.8
HDSS = Health and Demographic Surveillance System.			

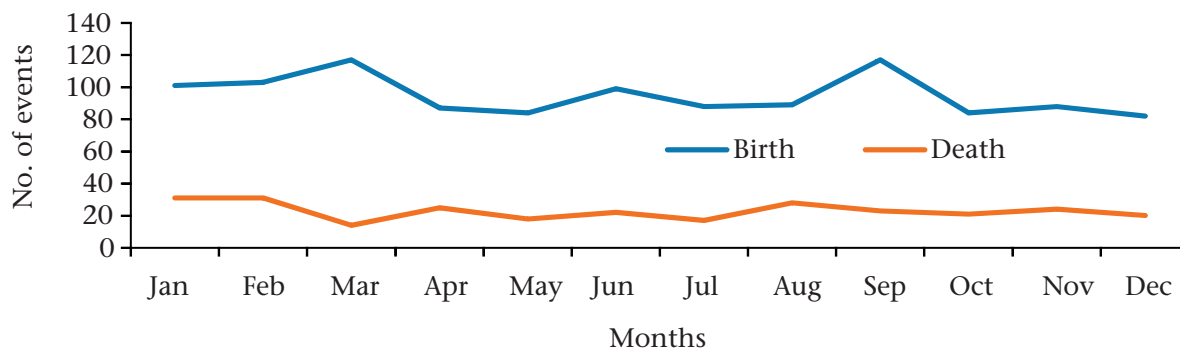
Table 7 presents the crude birth rates by household asset quintile. The crude birth rate showed a 'U' shaped relationship with household socioeconomic status measured by asset quintile.

Of the pregnancies in 2008, 8.8% of 1,327 were terminated prematurely and spontaneously, 3.4% were terminated through induction, and 2.6% resulted in stillbirths (Table 8).

Table 8. Pregnancy outcome, Chakaria HDSS, 2008						
Pregnancy outcome	Intervention area		Comparison area		Both areas	
	No.	%	No.	%	No.	%
Spontaneous abortion	60	8.6	57	9.1	117	8.8
Induced abortion	25	3.6	20	3.2	45	3.4
Stillbirth	13	1.9	21	3.3	34	2.6
Live birth*	600	86.0	531	84.4	1,131	85.2
Total number of pregnancies	698	100	629	100	1,327	100
*Multiple live births included HDSS = Health and Demographic Surveillance System.						

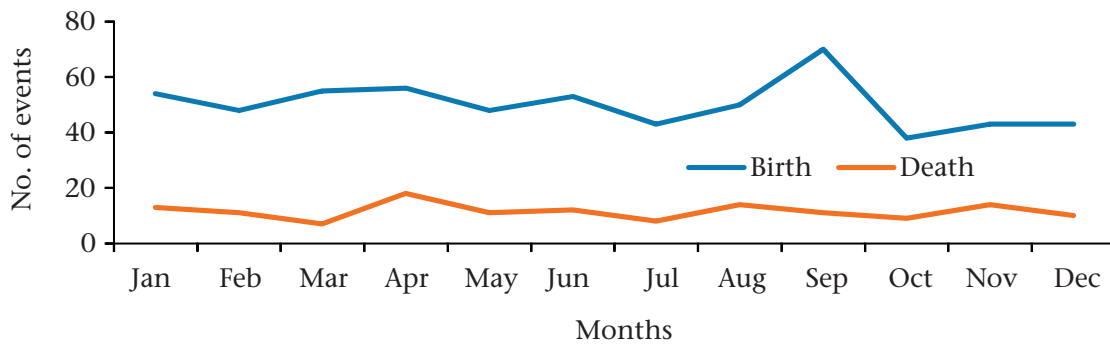
Distribution of births and deaths by month did not show any distinct seasonal pattern (Fig. 5). The seasonal patterns of birth and death were similar in the intervention and comparison areas (Fig. 6 and 7).

**Fig. 5. Number of births and deaths by month, Chakaria HDSS, 2008**



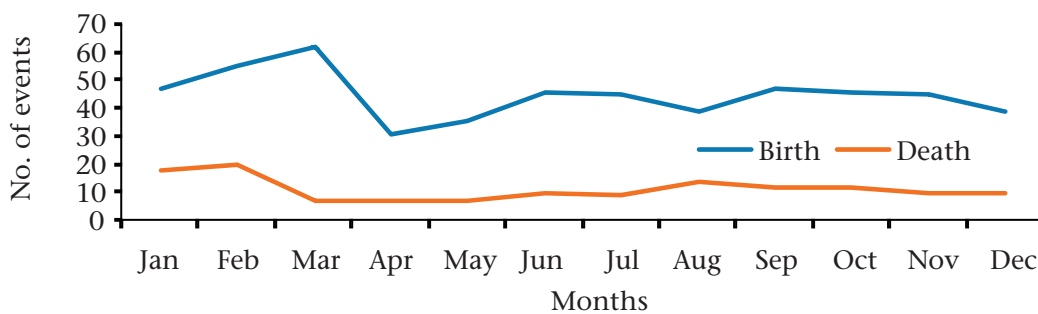
HDSS = Health and Demographic Surveillance System.

**Fig. 6. Number of births and deaths by month, intervention area Chakaria HDSS, 2008**



HDSS = Health and Demographic Surveillance System.

**Fig. 7. Number of births and deaths by month, comparison area Chakaria HDSS, 2008**



HDSS = Health and Demographic Surveillance System.



## CHAPTER 6

### Migration

In 2008, the rate of out-migration was higher at 35.5 per 1,000 population than that of in-migration at 26.6 per 1,000 population (Table 9). The rates were higher than in 2007. 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 2008 in both the areas. The sex differential in migration was also not prominent. The rate of in-migration among males was highest in June, and the rate was highest among females in January. The rate of out-migration was highest among the males in June and females was highest in May.

**Table 9. Migration rate per 1,000 population by asset quintile, Chakaria HDSS, 2008**

Asset quintile	Mid-year population	In-migration rate	Out-migration rate
Lowest	6,834	18.4	24.9
Second	8,325	20.8	31.8
Medium	9,054	26.5	31.1
Fourth	8,644	29.2	38.5
Highest	10,045	36.2	47.3
All	42,902	26.6	35.5

HDSS = Health and Demographic Surveillance System.

**Table 10. Number of migrants by sex and month, Chakaria HDSS, 2008**

Month	In-migration			Out-migration		
	Male	Female	Both	Male	Female	Both
January	47	80	127	66	75	141
February	40	72	112	68	94	162
March	33	60	93	56	73	129
April	37	58	95	54	54	108
May	38	78	116	73	103	176
June	51	63	114	76	72	148
July	33	50	83	51	72	123
August	32	58	90	49	76	125
September	28	51	79	49	35	84
October	37	54	91	59	82	141
November	23	40	63	35	49	84
December	48	75	123	69	94	163
All	447	739	1,186	705	879	1,584

HDSS = Health and Demographic Surveillance System.

**Table 11. Number of migrants by sex and month, intervention area Chakaria HDSS, 2008**

Month	In-migration			Out-migration		
	Male	Female	Both	Male	Female	Both
January	27	49	76	37	45	82
February	24	44	68	45	59	104
March	22	35	57	25	37	62
April	26	31	57	32	30	62
May	23	41	64	48	60	108
June	28	31	59	35	36	71
July	24	26	50	26	45	71
August	19	25	44	25	40	65
September	17	32	49	25	19	44
October	14	25	39	35	42	77
November	11	18	29	22	24	46
December	21	44	65	39	47	86
All	256	401	657	394	484	878

HDSS = Health and Demographic Surveillance System.

**Table 12. Number of migrants by sex and month, comparison area Chakaria HDSS, 2008**

Month	In-migration			Out-migration		
	Male	Female	Both	Male	Female	Both
January	20	31	51	29	30	59
February	16	28	44	23	35	58
March	11	25	36	31	36	67
April	11	27	38	22	24	46
May	15	37	52	25	43	68
June	23	32	55	41	36	77
July	9	24	33	25	27	52
August	13	33	46	24	36	60
September	11	19	30	24	16	40
October	23	29	52	24	40	64
November	12	22	34	13	25	38
December	27	31	58	30	47	77
All	191	338	529	311	395	706

HDSS = Health and Demographic Surveillance System.

## Origin and destination of migrants

During 2008, 3.7% of 1,183 in-migrants moved into Chakaria HDSS households from outside of Bangladesh whereas 13.9% of 1,581 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, 2008						
Origin or destination	In-migration			Out-migration		
	Male	Female	Both	Male	Female	Both
Inside Bangladesh	91.0	99.5	96.3	69.6	99.4	86.2
Outside Bangladesh	9.0	0.5	3.7	30.4	0.6	13.9
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total number of migrants	447	736	1,183	704	877	1,581
Inside Chakaria	78.1	75.3	76.3	76.9	74.5	75.3
Outside Chakaria	21.9	24.7	23.7	23.1	25.5	24.7
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total number of migrants	370	700	1,070	420	788	1,208
Inside HDSS area	54.3	52.1	53.0	44.7	55.9	51.2
Outside HDSS area	45.7	47.9	47.0	55.3	44.1	48.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total number of migrants	398	699	1,097	571	796	1,367

HDSS = Health and Demographic Surveillance System.

## Reasons for migration

Table 14 presents the reasons of migration by sex. 42.1% of the migrants moved due to family-related issues - mostly marriage, followed by housing (28.0%), work (25.3%) and education (7.6%). Reasons for moving for males were different from those of females. 38.6% of male in-migrants moved due to work related issues whereas only 2.1% of the females moved due to that reason. On the other hand, 64.4% of female in-migrants moved due to family related issues - mostly

marriage, while only 13.3% of males moved due to family related reasons (Table 14). The reasons of movement for out-migration were similar to the reasons for in-migration.

Table 14. Reasons for migration, Chakaria HDSS, 2008						
Reasons for migration	In-migration			Out-migration		
	Male	Female	Both	Male	Female	Both
Family-related	13.3	64.4	46.6	13.0	64.9	42.1
Work-related	38.6	2.1	14.8	54.4	2.6	25.3
Housing-related	34.3	25.9	28.8	27.4	28.6	28.0
Education	13.9	7.6	9.8	5.3	4.0	7.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
Total number of migrants	324	607	931	548	700	1,248
HDSS = Health and Demographic Surveillance System.						

## CHAPTER 7

### Marriage

In total, 798 marriages took place in the surveillance households in Chakaria during 2008. The highest number of marriages took place in May and the lowest in September. The number of marriages showed a downward trend from May to September (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 2008 remained same as of 2007 for males and females. The median ages at first marriage was 26 for males and 20 years for females. Both the indicators for males and females were almost positively associated with household socioeconomic status.

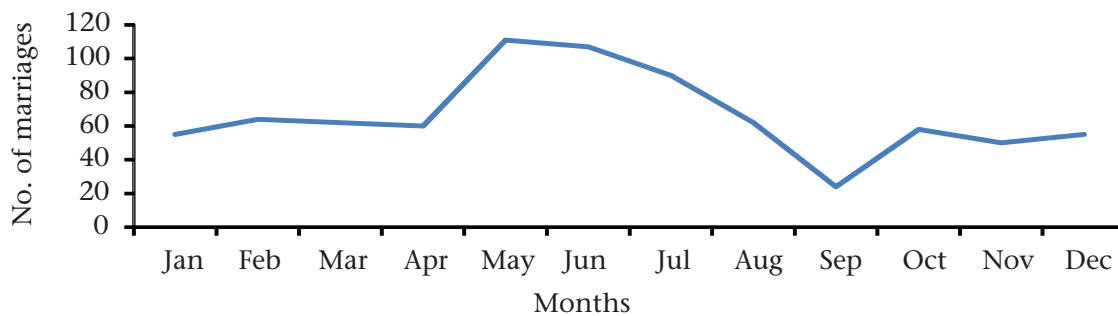
**Table 15. Age at marriage by sex, Chakaria HDSS, 2008**

Asset quintile	Male		Female	
	SMAM*	Median age at first marriage*	SMAM*	Median age at first marriage*
Lowest	24.0	23.6	19.5	19.4
Second	24.9	24.8	20.0	19.7
Medium	27.4	26.9	21.1	20.6
Fourth	27.6	28.4	20.7	20.3
Highest	28.4	28.1	20.7	20.1
All	27.0	26.4	20.4	20.0

HDSS = Health and Demographic Surveillance System.  
SMAM = Singulate mean age at marriage.

\* The SMAM and median age at 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, 2008**



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.

At present, the Upazila Health Complex of the government and two 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 2008, 56.9% of 1,028 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 intervention area (61.1%) than in the comparison area (51.9%). The women in the intervention area received services from various sources. Among these sources, the trained midwives and nurses/doctors have been consulted by most in the intervention area, followed by the Family Welfare Visitors (FWVs). On the other hand, the dominant source of services in the comparison area was the nurses/doctors, followed by the Family Welfare Visitors (FWVs) and the trained 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, 2008								
Area	Asset quintile	Received any ANC (%)	Midwife* (%)	FWV* (%)	Nurse/doctor* (%)	FDSR/CMH* (%)	None (%)	No. of women
Intervention area	Lowest	52.3	33.0	12.5	4.6	2.3	47.7	88
	Second	65.6	34.4	12.2	15.6	3.3	34.4	90
	Middle	59.1	20.0	13.9	20.9	4.4	40.9	115
	Fourth	63.4	20.3	8.9	30.1	4.1	36.6	123
	Highest	63.1	14.8	7.4	36.2	4.7	36.9	149
	Total	61.1	23.0	10.6	23.5	3.9	38.9	565
Comparison area	Lowest	36.1	9.6	7.2	6.0	13.3	63.9	83
	Second	37.8	11.1	8.9	8.9	8.9	62.2	90
	Middle	49.5	6.2	11.3	20.6	11.3	50.5	97
	Fourth	62.2	8.2	12.2	23.5	18.4	37.8	98
	Highest	70.5	9.5	9.5	40.0	11.6	29.5	95
	Total	51.9	8.9	9.9	20.3	12.7	48.1	463
Both areas	Lowest	44.4	21.6	9.9	5.3	7.6	55.6	171
	Second	51.7	22.8	10.6	12.2	6.1	48.3	180
	Middle	54.7	13.7	12.7	20.8	7.6	45.3	212
	Fourth	62.9	14.9	10.4	27.2	10.4	37.1	221
	Highest	66.0	12.7	8.2	37.7	7.4	34.0	244
	Total	56.9	16.6	10.3	22.1	7.9	43.1	1,028
*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 28.8% of the pregnant women received at least one postnatal care (PNC) during 2008. This percentage was higher in the intervention area (30.6%) than the comparison area (26.6%). 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, 2008								
Area	Asset quintile	Received any PNC (%)	Midwife* (%)	FWV* (%)	Nurse/doctor* (%)	FDSR/CMH* (%)	None (%)	No. of women
Intervention area	Lowest	13.6	10.2	0.0	3.4	0.0	86.4	88
	Second	28.9	8.9	2.2	17.8	0.0	71.1	90
	Middle	32.2	6.1	0.9	24.4	0.9	67.8	115
	Fourth	34.7	8.9	1.6	24.2	0.0	65.3	124
	Highest	36.9	4.7	2.0	29.5	0.7	63.1	149
	Total	30.6	7.4	1.4	21.4	0.4	69.4	566
Comparison area	Lowest	12.1	3.6	0.0	7.2	1.2	88.0	83
	Second	21.1	4.4	1.1	15.6	0.0	78.9	90
	Middle	29.9	6.2	1.0	21.7	1.0	70.1	97
	Fourth	28.6	4.1	2.0	19.4	3.1	71.4	98
	Highest	39.0	7.4	1.1	29.5	1.1	61.1	95
	Total	26.6	5.2	1.1	19.0	1.3	73.4	463
Both areas	Lowest	12.9	7.0	0.0	5.3	0.6	87.1	171
	Second	25.0	6.7	1.7	16.7	0.0	75.0	180
	Middle	31.1	6.1	0.9	23.1	0.9	68.9	212
	Fourth	32.0	6.8	1.8	22.1	1.4	68.0	222
	Highest	37.7	5.7	1.6	29.5	0.8	62.3	244
	Total	28.8	6.4	1.3	20.3	0.8	71.2	1,029
*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. Eighty four percent of 1,029 deliveries in Chakaria were assisted by the TBAs as opposed to 16% 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 comparison area (87.2%) than the intervention area (81.0%) (Table 18).

Despite the fact that the services provided by the midwives of the Chakaria project were also available to some parts of the comparison area, the use of these



trained midwives was similar in the intervention area compared to the comparison area (6.7% vs. 6.3%) (Table 18). At the same time, the overall use of SBAs that comprised nurses, doctors, FWVs, and midwives was higher in the intervention area (19.0%) than the comparison area (12.8%) (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 quintile.

Table 18. Assistance during delivery by asset quintile, Chakaria HDSS, 2008						
Area	Asset quintile	Midwife (%)	FWV (%)	Nurse/doctor (%)	TBA (%)	No. of women
Intervention area	Lowest	6.8	1.1	0.0	92.1	88
	Second	6.7	0.0	5.6	87.8	90
	Middle	6.0	4.3	12.9	76.7	116
	Fourth	8.9	0.0	11.3	79.8	124
	Highest	5.3	2.7	17.2	74.8	151
	Total	6.7	1.8	10.5	81.0	569
Comparison area	Lowest	3.6	0.0	1.2	95.2	83
	Second	6.7	0.0	6.7	86.7	90
	Middle	7.3	1.0	9.4	82.3	96
	Fourth	7.1	2.0	7.1	83.7	98
	Highest	6.5	1.1	3.2	89.3	93
	Total	6.3	0.9	5.7	87.2	460
Both areas	Lowest	5.3	0.6	0.6	93.6	171
	Second	6.7	0.0	6.1	87.2	180
	Middle	6.6	2.8	11.3	79.3	212
	Fourth	8.1	0.9	9.5	81.5	222
	Highest	5.7	2.1	11.9	80.3	244
	Total	6.5	1.4	8.4	83.8	1,029

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

### Place of delivery

85.6 percent of the deliveries took place at home. Only 14.4% of 1,016 deliveries took place either at hospitals or at clinics. The percentage of deliveries taking place at the hospitals was higher in the intervention area (18.3%) compared to the comparison area (9.5%) (Table 19). 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 19. Place of delivery by asset quintile, Chakaria HDSS, 2008				
Area	Asset quintile	Hospital/Clinic (%)	Home (%)	No. of women
Intervention area	Lowest	8.0	92.1	88
	Second	18.9	81.1	90
	Middle	22.3	77.7	112
	Fourth	17.7	82.3	124
	Highest	21.6	78.4	148
	Total	18.3	81.7	562
Comparison area	Lowest	6.0	94.0	83
	Second	4.7	95.4	86
	Middle	14.4	85.6	97
	Fourth	10.5	89.5	95
	Highest	10.8	89.3	93
	Total	9.5	90.5	454
Both areas	Lowest	7.0	93.0	171
	Second	11.9	88.1	176
	Middle	18.7	81.3	209
	Fourth	14.6	85.4	219
	Highest	17.4	82.6	241
	Total	14.4	85.6	1,016
HDSS = Health and Demographic Surveillance System.				

Table 20 shows caesarean-section delivery by household asset quintile in 2008. Caesarean-section delivery accounted for 5% of the deliveries in the Chakaria HDSS area in 2008. Although the number of caesarean sections was small, the number of women with caesarean sections from the highest quintile was 12 times the number of women from the lowest quintile.

Table 20. Proportion of caesarean-section delivery by asset quintile, Chakaria HDSS, 2008			
Asset quintile	No. of caesarean-section delivery	Caesarean-section delivery (%)	Total number of deliveries
Lowest	1	0.6	171
Second	8	4.4	181
Middle	11	5.2	213
Fourth	15	6.8	222
Highest	18	7.3	246
Total	53	5.1	1,033
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, 2008

Age (years)	Intervention area			Comparison area			Both areas		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
<1	328	297	625	293	228	521	621	525	1,146
1-4	1,284	1,213	2,497	995	937	1,932	2,279	2,150	4,429
5-9	1,700	1,597	3,297	1,280	1,244	2,524	2,980	2,841	5,821
10-14	1,729	1,713	3,442	1,509	1,432	2,941	3,238	3,145	6,383
15-19	1,585	1,644	3,229	1,369	1,495	2,864	2,954	3,139	6,093
20-24	1,289	1,149	2,438	1,100	952	2,052	2,389	2,101	4,490
25-29	841	761	1,602	732	584	1,316	1,573	1,345	2,918
30-34	615	652	1,267	488	551	1,039	1,103	1,203	2,306
35-39	655	620	1,275	484	556	1,040	1,139	1,176	2,315
40-44	509	526	1,035	423	451	874	932	977	1,909
45-49	453	400	853	418	416	834	871	816	1,687
50-54	366	408	774	336	378	714	702	786	1,488
55-59	323	266	589	311	252	563	634	518	1,152
60-64	270	192	462	212	155	367	482	347	829
65-69	151	135	286	145	124	269	296	259	555
70-74	156	112	268	126	97	223	282	209	491
75-79	98	72	170	66	59	125	164	131	295
80-84	47	44	91	38	33	71	85	77	162
85+	49	38	87	31	36	67	80	74	154
All	12,448	11,839	24,287	10,356	9,980	20,336	22,804	21,819	44,623

## APPENDIX B

### Percentage of midyear population by age and sex in the intervention and comparison areas, Chakaria HDSS, 2008

Age (years)	Intervention area			Comparison area			Both areas		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
<1	2.6	2.5	2.6	2.8	2.3	2.6	2.7	2.4	2.6
1-4	10.3	10.2	10.3	9.6	9.4	9.5	10.0	9.9	9.9
5-9	13.7	13.5	13.6	12.4	12.5	12.4	13.1	13.0	13.0
10-14	13.9	14.5	14.2	14.6	14.3	14.5	14.2	14.4	14.3
15-19	12.7	13.9	13.3	13.2	15.0	14.1	13.0	14.4	13.7
20-24	10.4	9.7	10.0	10.6	9.5	10.1	10.5	9.6	10.1
25-29	6.8	6.4	6.6	7.1	5.9	6.5	6.9	6.2	6.5
30-34	4.9	5.5	5.2	4.7	5.5	5.1	4.8	5.5	5.2
35-39	5.3	5.2	5.2	4.7	5.6	5.1	5.0	5.4	5.2
40-44	4.1	4.4	4.3	4.1	4.5	4.3	4.1	4.5	4.3
45-49	3.6	3.4	3.5	4.0	4.2	4.1	3.8	3.7	3.8
50-54	2.9	3.4	3.2	3.2	3.8	3.5	3.1	3.6	3.3
55-59	2.6	2.2	2.4	3.0	2.5	2.8	2.8	2.4	2.6
60-64	2.2	1.6	1.9	2.0	1.6	1.8	2.1	1.6	1.9
65-69	1.2	1.1	1.2	1.4	1.2	1.3	1.3	1.2	1.2
70-74	1.3	0.9	1.1	1.2	1.0	1.1	1.2	1.0	1.1
75-79	0.8	0.6	0.7	0.6	0.6	0.6	0.7	0.6	0.7
80-84	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4
85+	0.4	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.3
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, 2008

Age of mother (years)	Intervention area			Comparison area			Both areas		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
10-14	0	1	1	2	0	2	2	1	3
15-19	53	64	117	69	58	127	122	122	244
20-24	104	100	204	89	97	186	193	197	390
25-29	83	62	145	66	52	118	149	114	263
30-34	43	35	78	31	29	60	74	64	138
35-39	19	23	42	17	19	36	36	42	78
40-44	3	3	6	4	4	8	7	7	14
45-49	1	3	4	1	0	1	2	3	5
50-54	0	1	1	0	0	0	0	1	1
55-59	0	0	0	0	0	0	0	0	0
60-64	0	0	0	0	0	0	0	0	0
65-69	0	0	0	0	0	0	0	0	0
70-74	0	0	0	0	0	0	0	0	0
75-79	0	0	0	0	0	0	0	0	0
80-84	0	0	0	0	0	0	0	0	0
85+	0	0	0	0	0	0	0	0	0
All	306	292	598	279	259	538	585	551	1,136

## APPENDIX D

### Number of deaths by age and sex, Chakaria HDSS, 2008

Age (years)	Intervention area			Comparison area			Both areas		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
<1	18	11	29	12	9	21	30	20	50
1-4	4	5	9	6	6	12	10	11	21
5-9	4	1	5	4	0	4	8	1	9
10-14	0	2	2	2	1	3	2	3	5
15-19	1	1	2	2	2	4	3	3	6
20-24	2	3	5	2	2	4	4	5	9
25-29	3	0	3	0	3	3	3	3	6
30-34	0	3	3	1	0	1	1	3	4
35-39	2	2	4	1	2	3	3	4	7
40-44	1	3	4	2	3	5	3	6	9
45-49	1	1	2	2	3	5	3	4	7
50-54	6	2	8	7	7	14	13	9	22
55-59	3	3	6	5	1	6	8	4	12
60-64	4	4	8	7	3	10	11	7	18
65-69	5	7	12	5	3	8	10	10	20
70-74	6	7	13	5	3	8	11	10	21
75-79	3	3	6	5	1	6	8	4	12
80-84	4	2	6	2	5	7	6	7	13
85+	5	6	11	4	8	12	9	14	23
All	72	66	138	74	62	136	146	128	274

## APPENDIX E

### Causes of deaths by age and sex, Chakaria HDSS, 2008

Cause	All age	Age (years)					
		<1	1-4	5-14	15-49	50-59	60+
<b>Male</b>							
Communicable diseases							
Diarrheal	4	2	1	0	0	0	1
Tuberculosis	3	0	1	0	1	1	0
Hepatitis	8	2	0	2	3	0	1
Respiratory infections	14	13	1	0	0	0	0
Rabbis	1	0	0	1	0	0	0
Maternal and neonatal conditions							
Neonatal	3	3	0	0	0	0	0
Other neonatal	6	6	0	0	0	0	0
Non-communicable diseases							
Malignant neoplasm	10	0	0	0	1	1	8
Neoplasm	9	1	1	0	1	2	4
Diabetes	3	0	0	0	0	1	2
Hypertension disease	2	0	0	0	0	0	2
Stroke	21	0	0	0	1	7	13
Other cardiovascular	6	0	0	0	2	2	2
Asthma/Bronchitis	12	0	0	0	1	4	7
Digestive disease	2	0	0	0	0	0	2
Other urinary	1	0	0	0	1	0	0
Senility	7	0	0	0	0	0	7
Injuries							
Accident	7	0	0	2	3	0	2
Drowning	6	0	2	3	1	0	0
Homicide	1	0	0	0	0	1	0
Unknown	20	3	4	2	5	2	4
All	146	30	10	10	20	21	55

Continued

Cause	All age	Age (years)					
		<1	1-4	5-14	15-49	50-59	60+
<b>Female</b>							
Communicable diseases							
Diarrheal	3	1	1	0	0	0	1
Tuberculosis	1	0	0	0	1	0	0
Hepatitis	5	2	0	0	1	1	1
Respiratory infection	8	6	1	0	1	0	0
Typhoid	1	0	0	0	0	0	1
Malaria	1	0	0	1	0	0	0
Maternal and neonatal conditions							
Maternal death	5	0	0	0	5	0	0
Birth asphyxia	1	0	1	0	0	0	0
Other neonatal	3	3	0	0	0	0	0
Nutritional	1	1	0	0	0	0	0
Non-communicable diseases							
Malignant neoplasm	13	0	0	0	3	5	5
Neoplasm	1	0	0	0	0	0	1
Diabetes	1	0	0	0	0	0	1
Hypertension disease	5	0	0	0	1	2	2
Stroke	12	0	0	0	3	2	7
Other cardiovascular	4	1	0	0	2	1	0
Asthma/Bronchitis	14	0	0	0	1	0	13
Digestive disease	1	0	0	0	0	0	1
Other urinary	1	0	0	0	1	0	0
Senility	12	0	0	0	0	0	12
Injuries							
Accident	2	0	1	1	0	0	0
Drowning	3	0	3	0	0	0	0
Suicide	1	0	0	0	1	0	0
Burn	2	0	0	0	1	0	1
Snake bite	1	0	0	1	0	0	0
Unknown	26	6	4	1	7	2	6
All	128	20	11	4	28	13	52

## APPENDIX F

### Number of migrants by age and sex, Chakaria HDSS, 2008

Age (years)	Intervention area			Comparison area			Both areas		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
<b>In-migrants</b>									
<1	11	13	24	14	11	25	25	24	49
1-4	26	26	52	24	20	44	50	46	96
5-9	31	42	73	19	28	47	50	70	120
10-14	44	40	84	34	23	57	78	63	141
15-19	41	161	202	36	167	203	77	328	405
20-24	26	54	80	25	44	69	51	98	149
25-29	27	17	44	17	15	32	44	32	76
30-34	15	7	22	9	5	14	24	12	36
35-39	12	3	15	4	1	5	16	4	20
40-44	1	2	3	2	1	3	3	3	6
45-49	3	2	5	1	2	3	4	4	8
50-54	5	5	10	0	3	3	5	8	13
55-59	1	7	8	1	2	3	2	9	11
60-64	1	3	4	1	4	5	2	7	9
65-69	1	5	6	1	2	3	2	7	9
70-74	3	2	5	1	2	3	4	4	8
75-79	4	4	8	0	2	2	4	6	10
80-84	1	3	4	2	3	5	3	6	9
85+	3	4	7	0	1	1	3	5	8
All	256	400	656	191	336	527	447	736	1,183
<b>Out-migrants</b>									
<1	17	15	32	14	11	25	31	26	57
1-4	23	29	52	16	18	34	39	47	86
5-9	24	21	45	18	29	47	42	50	92
10-14	44	56	100	32	41	73	76	97	173
15-19	73	157	230	61	134	195	134	291	425
20-24	82	122	204	60	104	164	142	226	368
25-29	57	35	92	52	21	73	109	56	165
30-34	29	15	44	25	11	36	54	26	80
35-39	17	7	24	13	3	16	30	10	40
40-44	6	1	7	5	2	7	11	3	14
45-49	5	2	7	6	3	9	11	5	16
50-54	5	3	8	2	1	3	7	4	11
55-59	3	4	7	2	3	5	5	7	12
60-64	2	3	5	2	1	3	4	4	8
65-69	1	2	3	0	3	3	1	5	6
70-74	4	4	8	1	5	6	5	9	14
75-79	2	2	4	0	2	2	2	4	6
80-84	0	3	3	2	1	3	2	4	6
85+	0	3	3	0	2	2	0	5	5
All	394	484	878	311	395	706	705	879	1,584

## APPENDIX G

### Migration rate per 1,000 population by age and sex, Chakaria HDSS, 2008

Age (years)	Intervention area			Comparison area			Both areas		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
<b>In-migration</b>									
<1	33.5	43.8	38.4	47.8	48.2	48.0	40.3	45.7	42.8
1-4	20.2	21.4	20.8	24.1	21.3	22.8	21.9	21.4	21.7
5-9	18.2	26.3	22.1	14.8	22.5	18.6	16.8	24.6	20.6
10-14	25.4	23.4	24.4	22.5	16.1	19.4	24.1	20.0	22.1
15-19	25.9	97.9	62.6	26.3	111.7	70.9	26.1	104.5	66.5
20-24	20.2	47.0	32.8	22.7	46.2	33.6	21.3	46.6	33.2
25-29	32.1	22.3	27.5	23.2	25.7	24.3	28.0	23.8	26.0
30-34	24.4	10.7	17.4	18.4	9.1	13.5	21.8	10.0	15.6
35-39	18.3	4.8	11.8	8.3	1.8	4.8	14.0	3.4	8.6
40-44	2.0	3.8	2.9	4.7	2.2	3.4	3.2	3.1	3.1
45-49	6.6	5.0	5.9	2.4	4.8	3.6	4.6	4.9	4.7
50-54	13.7	12.3	12.9	0.0	7.9	4.2	7.1	10.2	8.7
55-59	3.1	26.3	13.6	3.2	7.9	5.3	3.2	17.4	9.5
60-64	3.7	15.6	8.7	4.7	25.8	13.6	4.1	20.2	10.9
65-69	6.6	37.0	21.0	6.9	16.1	11.2	6.8	27.0	16.2
70-74	19.2	17.9	18.7	7.9	20.6	13.5	14.2	19.1	16.3
75-79	40.8	55.6	47.1	0.0	33.9	16.0	24.4	45.8	33.9
80-84	21.3	68.2	44.0	52.6	90.9	70.4	35.3	77.9	55.6
85+	61.2	105.3	80.5	0.0	27.8	14.9	37.5	67.6	51.9
All	20.6	33.8	27.0	18.4	33.7	25.9	19.6	33.7	26.5
<b>Out-migration</b>									
<1	51.8	50.5	51.2	47.8	48.2	48.0	49.9	49.5	49.7
1-4	17.9	23.9	20.8	16.1	19.2	17.6	17.1	21.9	19.4
5-9	14.1	13.1	13.6	14.1	23.3	18.6	14.1	17.6	15.8
10-14	25.4	32.7	29.1	21.2	28.6	24.8	23.5	30.8	27.1
15-19	46.1	95.5	71.2	44.6	89.6	68.1	45.4	92.7	69.8
20-24	63.6	106.2	83.7	54.5	109.2	79.9	59.4	107.6	82.0
25-29	67.8	46.0	57.4	71.0	36.0	55.5	69.3	41.6	56.5
30-34	47.2	23.0	34.7	51.2	20.0	34.6	49.0	21.6	34.7
35-39	26.0	11.3	18.8	26.9	5.4	15.4	26.3	8.5	17.3
40-44	11.8	1.9	6.8	11.8	4.4	8.0	11.8	3.1	7.3
45-49	11.0	5.0	8.2	14.4	7.2	10.8	12.6	6.1	9.5
50-54	13.7	7.4	10.3	6.0	2.6	4.2	10.0	5.1	7.4
55-59	9.3	15.0	11.9	6.4	11.9	8.9	7.9	13.5	10.4
60-64	7.4	15.6	10.8	9.4	6.5	8.2	8.3	11.5	9.7
65-69	6.6	14.8	10.5	0.0	24.2	11.2	3.4	19.3	10.8
70-74	25.6	35.7	29.9	7.9	51.5	26.9	17.7	43.1	28.5
75-79	20.4	27.8	23.5	0.0	33.9	16.0	12.2	30.5	20.3
80-84	0.0	68.2	33.0	52.6	30.3	42.3	23.5	51.9	37.0
85+	0.0	78.9	34.5	0.0	55.6	29.9	0.0	67.6	32.5
All	31.7	40.9	36.2	30.0	39.6	34.7	30.9	40.3	35.5

## APPENDIX H

### Number of migrants by origin or destination, Chakaria HDSS, 2008

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+
<b>In-migration</b>												
<i>Male</i>												
Inside Bangladesh	407	75	50	78	75	48	31	17	7	2	1	23
Outside Bangladesh	40	0	0	0	2	3	13	7	9	1	3	2
Inside Chakaria	289	53	40	62	53	35	15	9	3	2	0	17
Outside Chakaria	81	17	9	15	13	7	10	4	2	0	0	4
Inside HDSS area	216	36	29	46	41	29	10	7	2	2	0	14
Outside HDSS area	182	36	19	31	27	16	20	10	9	1	3	10
<i>Female</i>												
Inside Bangladesh	732	70	69	63	326	97	32	12	4	3	4	52
Outside Bangladesh	4	0	1	0	2	1	0	0	0	0	0	0
Inside Chakaria	527	53	49	37	240	61	22	8	3	1	4	49
Outside Chakaria	173	16	17	22	73	31	8	2	1	1	0	2
Inside HDSS area	364	30	38	28	161	37	13	8	2	1	3	43
Outside HDSS area	335	34	29	30	157	52	17	4	2	1	1	8
<b>Out-migration</b>												
<i>Male</i>												
Inside Bangladesh	490	70	42	75	97	63	61	24	17	11	7	23
Outside Bangladesh	214	0	0	1	36	79	48	30	13	0	4	3
Inside Chakaria	323	53	30	53	69	27	38	14	10	4	5	20
Outside Chakaria	97	12	10	14	14	19	12	6	2	3	2	3
Inside HDSS area	255	37	27	44	55	20	29	11	9	3	3	17
Outside HDSS area	316	26	10	23	57	86	54	35	8	5	6	6
<i>Female</i>												
Inside Bangladesh	872	72	50	95	291	225	55	26	10	3	4	41
Outside Bangladesh	5	0	0	1	0	1	1	0	0	0	1	1
Inside Chakaria	587	55	28	58	200	142	36	17	8	2	3	38
Outside Chakaria	201	12	12	20	70	63	17	4	0	0	1	2
Inside HDSS area	351	42	24	41	156	94	29	13	7	1	3	35
Outside HDSS area	445	25	17	40	114	114	20	12	2	0	1	6

## APPENDIX I

### Number of in-migrants by reasons for migration, Chakaria HDSS, 2008

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+
<b>Male</b>												
<i>Family-related</i>												
To join spouse	23	0	0	1	4	8	7	2	0	0	0	1
Family friction/breakdown	13	1	0	0	2	3	3	1	0	0	0	3
Other family related	8	0	0	1	2	1	0	0	0	0	0	4
<i>Work-related</i>												
New job/job transfer	82	1	3	25	30	13	4	5	1	0	0	0
To look for work/lost job	43	0	0	2	4	3	12	7	9	1	3	2
Other job related reasons	3	0	0	0	0	2	0	1	0	0	0	0
<i>Housing-related</i>												
Wanted to own home/new house	114	56	14	6	9	9	9	3	0	1	0	7
<i>Education</i>												
To acquire education	45	2	17	19	5	2	0	0	0	0	0	0
Reasons not reported	116	15	16	24	21	10	9	5	6	1	1	8
All	447	75	50	78	77	51	44	24	16	3	4	25
<b>Female</b>												
<i>Family related</i>												
Change in marital status	329	0	0	18	261	40	7	2	1	0	0	0
Family friction/breakdown	37	2	1	0	7	10	3	0	3	0	2	9
Other family related	32	1	0	0	1	4	2	0	0	0	0	24
<i>Work-related</i>												
New job/job transfer	8	0	0	0	2	2	1	3	0	0	0	0
To look for work/lost job	4	0	0	0	1	3	0	0	0	0	0	0
Other job related reasons	1	0	0	0	0	1	0	0	0	0	0	0
<i>Housing-related</i>												
Wanted to own home/new house	164	54	21	8	25	24	14	2	0	3	2	11
<i>Education</i>												
To acquire education	42	2	20	15	4	1	0	0	0	0	0	0
Reasons not reported	119	11	26	24	27	13	5	5	0	0	0	8
All	736	70	70	63	328	98	32	12	4	3	4	52



## APPENDIX J

### Number of out-migrants by reasons for migration, Chakaria HDSS, 2008

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+
<b>Male</b>												
<i>Family-related</i>												
To Join spouse	32	0	0	0	7	8	9	3	1	1	1	2
Family friction/ breakdown	33	4	1	2	5	6	8	2	1	1	0	3
Other family related	8	0	0	0	4	2	0	1	0	0	0	1
<i>Work-related</i>												
New job/job transfer	85	0	1	17	30	18	10	4	3	1	0	1
To look for work/ lost job	213	0	0	1	35	79	49	29	13	0	5	2
Other work-related	7	1	0	0	0	2	1	1	1	0	0	1
<i>Housing-related</i>												
Wanted to own home/ new house	159	47	26	14	14	12	20	9	5	6	1	5
<i>Education</i>												
To acquire education	29	0	5	13	8	2	1	0	0	0	0	0
Reasons not reported	139	18	9	29	31	13	11	5	6	2	4	11
All	705	70	42	76	134	142	109	54	30	11	11	26
<b>Female</b>												
<i>Family-related</i>												
To Join spouse	394	0	0	17	208	139	19	9	1	0	0	1
Family friction/breakdown	49	0	0	1	8	17	4	5	2	0	0	12
Other family related	22	0	0	0	2	1	0	0	1	0	0	18
<i>Work-related</i>												
New job/job transfer	13	0	0	1	5	3	2	2	0	0	0	0
To look for work/ lost job	6	0	0	1	0	2	1	0	0	0	1	1
Other job-related reason	3	1	0	0	0	0	1	1	0	0	0	0
<i>Housing-related</i>												
Wanted to own home/ new house	209	60	23	21	32	38	18	6	2	2	4	3
<i>Education</i>												
To acquire education	29	0	11	10	7	0	1	0	0	0	0	0
Reasons not reported	154	12	16	46	29	26	10	3	4	1	0	7
All	879	73	50	97	291	226	56	26	10	3	5	42

## APPENDIX K

### Percentage of population by age and marital status, Chakaria HDSS, 2008

Age (years)	Married	Divorced	Abandoned	Widower/ Widow	Separated	Never married	Population
<b>Male</b>							
10-14	0.1	0.0	0.0	0.0	0.0	99.9	3,237
15-19	3.1	0.1	0.0	0.0	0.0	96.8	2,951
20-24	22.8	0.4	0.0	0.1	0.0	76.7	2,385
25-29	56.7	0.6	0.0	0.3	0.0	42.4	1,570
30-34	82.6	0.6	0.0	0.2	0.1	16.5	1,102
35-39	96.2	0.1	0.0	0.4	0.0	3.3	1,137
40-44	98.4	0.2	0.3	0.1	0.1	0.9	932
45-49	98.9	0.2	0.1	0.6	0.1	0.1	871
50-54	98.6	0.1	0.0	0.9	0.0	0.4	702
55-59	97.9	0.0	0.0	1.9	0.0	0.2	634
60-64	97.7	0.0	0.2	2.1	0.0	0.0	482
65-69	95.9	0.3	0.0	3.7	0.0	0.0	296
70-74	91.8	0.0	0.4	7.1	0.0	0.7	281
75-79	89.6	0.0	0.0	10.4	0.0	0.0	164
80-84	75.3	1.2	0.0	23.5	0.0	0.0	85
85+	70.9	0.0	0.0	29.1	0.0	0.0	79
All	34.7	0.2	0.0	0.6	0.0	64.5	16,908
<b>Female</b>							
10-14	1.0	0.0	0.0	0.0	0.0	99.0	3,145
15-19	30.2	0.3	0.1	0.2	0.0	69.2	3,131
20-24	67.6	1.2	0.4	0.4	0.0	30.3	2,098
25-29	88.5	1.1	1.6	1.4	0.0	7.4	1,344
30-34	93.3	1.2	1.6	2.4	0.1	1.4	1,201
35-39	89.8	1.7	1.6	6.2	0.3	0.4	1,176
40-44	86.4	1.2	1.6	10.3	0.1	0.4	975
45-49	80.7	0.5	2.3	16.2	0.1	0.1	813
50-54	68.7	0.9	2.3	27.8	0.0	0.3	783
55-59	61.0	0.4	0.6	37.4	0.2	0.4	516
60-64	49.0	0.3	1.4	48.7	0.3	0.3	347
65-69	42.9	0.0	1.2	56.0	0.0	0.0	259
70-74	23.0	1.4	0.5	75.1	0.0	0.0	209
75-79	14.5	0.0	0.8	84.0	0.0	0.8	131
80-84	13.0	0.0	0.0	85.7	0.0	1.3	77
85+	4.1	0.0	1.4	94.6	0.0	0.0	74
All	38.9	0.5	0.6	6.9	0.0	53.0	16,279

## APPENDIX L

### Percentage of population by age and marital status, intervention area, Chakaria HDSS, 2008

Age (years)	Married	Divorced	Abandoned	Widower/ Widow	Separated	Never married	Population
<b>Male</b>							
10-14	0.1	0.0	0.0	0.0	0.0	99.9	1,728
15-19	2.7	0.1	0.0	0.0	0.0	97.3	1,584
20-24	21.5	0.3	0.0	0.1	0.0	78.1	1,288
25-29	54.7	0.6	0.0	0.2	0.0	44.5	841
30-34	82.9	0.8	0.0	0.2	0.2	16.0	614
35-39	96.2	0.2	0.0	0.2	0.0	3.5	655
40-44	98.4	0.2	0.4	0.2	0.0	0.8	509
45-49	99.1	0.4	0.0	0.4	0.0	0.0	453
50-54	98.4	0.3	0.0	0.8	0.0	0.5	366
55-59	98.5	0.0	0.0	1.2	0.0	0.3	323
60-64	97.4	0.0	0.4	2.2	0.0	0.0	270
65-69	96.7	0.0	0.0	3.3	0.0	0.0	151
70-74	94.2	0.0	0.6	3.8	0.0	1.3	156
75-79	91.8	0.0	0.0	8.2	0.0	0.0	98
80-84	66.0	2.1	0.0	31.9	0.0	0.0	47
85+	63.3	0.0	0.0	36.7	0.0	0.0	49
All	34.2	0.2	0.0	0.6	0.0	65.0	9,132
<b>Female</b>							
10-14	1.0	0.0	0.0	0.0	0.0	99.0	1,715
15-19	28.8	0.3	0.1	0.4	0.0	70.4	1,637
20-24	67.9	1.4	0.3	0.2	0.0	30.1	1,148
25-29	89.1	0.9	2.0	1.4	0.0	6.6	760
30-34	94.5	1.1	1.1	2.3	0.0	1.1	651
35-39	90.0	2.3	1.6	5.5	0.3	0.3	620
40-44	88.2	1.0	2.1	8.2	0.2	0.4	526
45-49	83.2	0.8	2.0	13.8	0.3	0.0	399
50-54	67.4	0.5	2.7	29.2	0.0	0.2	408
55-59	62.9	0.8	1.1	34.8	0.0	0.4	264
60-64	51.6	0.5	2.1	45.8	0.0	0.0	192
65-69	42.2	0.0	1.5	56.3	0.0	0.0	135
70-74	24.1	2.7	0.9	72.3	0.0	0.0	112
75-79	12.5	0.0	0.0	87.5	0.0	0.0	72
80-84	13.6	0.0	0.0	84.1	0.0	2.3	44
85+	5.3	0.0	0.0	94.7	0.0	0.0	38
All	38.5	0.5	0.7	6.4	0.0	53.8	8,721

## APPENDIX M

### Percentage of population by age and marital status, comparison area, Chakaria HDSS, 2008

Age (years)	Married	Divorced	Abandoned	Widower / Widow	Separated	Never married	Population
<b>Male</b>							
10-14	0.1	0.0	0.0	0.0	0.0	99.9	1,509
15-19	3.6	0.1	0.0	0.0	0.0	96.3	1,367
20-24	24.2	0.5	0.0	0.2	0.0	75.0	1,097
25-29	59.0	0.7	0.0	0.4	0.0	39.9	729
30-34	82.2	0.4	0.0	0.2	0.0	17.2	488
35-39	96.3	0.0	0.0	0.8	0.0	2.9	482
40-44	98.3	0.2	0.2	0.0	0.2	0.9	423
45-49	98.6	0.0	0.2	0.7	0.2	0.2	418
50-54	98.8	0.0	0.0	0.9	0.0	0.3	336
55-59	97.4	0.0	0.0	2.6	0.0	0.0	311
60-64	98.1	0.0	0.0	1.9	0.0	0.0	212
65-69	95.2	0.7	0.0	4.1	0.0	0.0	145
70-74	88.8	0.0	0.0	11.2	0.0	0.0	125
75-79	86.4	0.0	0.0	13.6	0.0	0.0	66
80-84	86.8	0.0	0.0	13.2	0.0	0.0	38
85+	83.3	0.0	0.0	16.7	0.0	0.0	30
All	35.3	0.2	0.0	0.6	0.0	63.9	7,776
<b>Female</b>							
10-14	1.0	0.0	0.0	0.0	0.0	99.0	1,430
15-19	31.7	0.3	0.1	0.1	0.0	67.9	1,494
20-24	67.2	1.1	0.5	0.7	0.1	30.4	950
25-29	87.7	1.4	1.0	1.4	0.0	8.6	584
30-34	92.0	1.3	2.2	2.5	0.2	1.8	550
35-39	89.6	1.1	1.6	7.0	0.2	0.5	556
40-44	84.2	1.6	1.1	12.7	0.0	0.4	449
45-49	78.3	0.2	2.7	18.6	0.0	0.2	414
50-54	70.1	1.3	1.9	26.4	0.0	0.3	375
55-59	59.1	0.0	0.0	40.1	0.4	0.4	252
60-64	45.8	0.0	0.6	52.3	0.6	0.6	155
65-69	43.5	0.0	0.8	55.6	0.0	0.0	124
70-74	21.6	0.0	0.0	78.4	0.0	0.0	97
75-79	16.9	0.0	1.7	79.7	0.0	1.7	59
80-84	12.1	0.0	0.0	87.9	0.0	0.0	33
85+	2.8	0.0	2.8	94.4	0.0	0.0	36
All	39.3	0.5	0.6	7.4	0.1	52.1	7,558

## APPENDIX N

### Chakaria HDSS project team, 2008

Name of Staff	Designation
<b>Dhaka</b>	
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
Shehrin Shaila Mahmood	Assistant Scientist
Farhana Urni	Senior Statistical Officer
Md. Kashem Iqbal	Senior Administrative Officer
Ayesha Begum	Senior Data Management Assistant
<b>Chakaria</b>	
Ariful Moula	Field Research Officer
Shahidul Hoque	Senior Field Research Officer
Sharif Al Hasan	Field Research Supervisor
Ashish Paul	Senior Data Management Assistant
Snahashis Dutta	Field Research Assistant
Rehmat Ali	Senior Field Assistant
Tahmina Akter	Data Management Assistant
Minu Paul	Data Management Assistant
Rauson Ara	Data Management Assistant
Monjilara	Data Management Assistant
Aysha Siddiqa	Data Management Assistant
Bappi Rani	Data Collector
Hosaina Begum	Data Collector
Kawsar Jannat	Data Collector
Mina Dhar	Data Collector
Nazma Akter	Data Collector
Noor Aysha	Data Collector
Rawnak Zahan	Data Collector
Shilpi Dey	Data Collector
Taslina Zannat	Data Collector
U Shang Prue	Data Collector
Zosna Akter	Data Collector
Monuara Begum	Data Collector
Afroza Yesmin	Data Collector
Fatema Jannat	Data Collector
Sabina Yesmin	Data Collector
Armanul Maowa Moni	Data Collector
Jesmin Akter Ranu	Data Collector
Tanzina Jannat Ara	Data Collector
Romena Begum	Data Collector
Farhana Jannat	Data Collector
Atia Nasrin Rosy	Data Collector
Setara Begum	Data Collector
Noore Jannat	Data Collector
Zannatul Ferdousi	Data Collector
Thofiqun Nahar	Data Collector
Uhlayai	Data Collector



**icddr,b**

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