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COMMUNITY HEALTH SOLUTIONS IN BANGLADESH

Impact Evaluation Surveys in Dhaka Urban Slums 2007, 2009 and 2011

Scientific Report No: 118
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icddr,b
KNOWLEDGE FOR
GLOBAL LIFESAVING SOLUTIONS

brac

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Impact Evaluation Surveys in Dhaka Urban Slums 2007, 2009 and 2011

Nurul Alam
Dilruba Begum
Syed Masud Ahmed
Peter Kim Streatfield

International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) and BRAC
in cooperation with
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Abbreviations and Acronyms

ACPR	Associates for Community and Population Research
ANC	Antenatal care
ARI	Acute respiratory infection
ASA	Assistance for Social Advancement
BCC	Behaviour change communication
BDHS	Bangladesh Demographic and Health Survey
BRAC	Bangladesh Rural Advancement Committee
CSBA	Community-based skilled birth attendants
DCC	Dhaka City Corporation
DMA	Dhaka Metropolitan Area
EBF	Exclusive breast feeding
EOC	Emergency obstetric care
EPI	Expanded Programme on Immunization
FWV	Family Welfare Visitor
icddr,b	International Centre for Diarrheal Disease Research, Bangladesh
MA	Medical Assistant
MDG	Millennium development goal
MNCH	Maternal, newborn and child care
MOU	Memorandum of understanding
MR	Menstruation regulation
NGO	Non-governmental organization
NIPORT	National Institute of Population Research and Training
PHC	Primary healthcare
PNC	Post-natal care
PPH	Postpartum haemorrhage
PRSP	Poverty reduction strategy paper
PSU	Primary sampling unit
SACMO	Sub-Assistant Medical Officer
TBA	Trained birth attendant
TT	Tetanus toxoid
UPHC	Urban Primary Health Care
UPHCP-II	Urban Primary Health Care Project II
VAD	Vitamin A deficiency
WHO	World Health Organization

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SUMMARY OF FINDINGS

BRAC has launched the Manoshi project in 2007 for implementing a community-based programme on comprehensive package of essential services in urban slums for improvement of maternal, newborn and child health. The package included capacity development of the community health workers and birth attendants; development of health services provisions for pregnant and lactating women, neonates and under-five children; timely referral to quality health facilities; community empowerment through development of women's groups; and linkage with government (national and local), community people, and NGOs. The community health workers and birth attendants have received training to offer antenatal, safe delivery and postnatal care, neonatal care and childcare. The project has expanded its activities in two phases and covered all slums in Dhaka metropolitan area (DMA) by 2009.

As part of the impact evaluation activities of the Manoshi project, three community-based cross-sectional surveys (baseline, midline, and endline) are conducted in Dhaka urban slums in 2007, 2009, and 2011. A two-stage random cluster-sampling was used for selecting 100 slum-clusters (50 each from the project and the comparison areas in baseline survey and 67 from the project area and 33 from the comparison area in the midline and the endline surveys). The sample-size in the baseline survey was 2,874 [(1,284 women having infants and 1,590 having children aged 1-4 year(s)]; the sample-size in the midline was 3608 [(1,549 women having infants and 2,049 having children aged 1-4 year(s)]; and that the endline survey was 3,226 [(1,549 women having infants and 1,677 having children aged 1-4 year(s)]. Each survey obtained data from two groups of respondents in the project and the comparison areas.

The baseline survey randomly selected comparison clusters around the project slums while the midline and the endline surveys selected comparison clusters from a few non-project slums (in Nikunja housing area, Dhaka Uddyan, and Baraid) in Dhaka city and from slum-like clusters of impoverished households in the periphery of Dhaka city (namely Demra, Jingira, Keranigonj, and Tongi). As such, the comparison groups of the midline and endline surveys are not truly comparable with the project groups but provided contemporary estimates of knowledge and practices in maternity and newborn care for women in low-income urban households. The results of the three cross-sectional surveys conducted in 2007, 2009, and 2011 are presented below to assess changes in knowledge and practices within and between areas over the years. Consistent difference in maternal and newborn healthcare indicators between 2007 and 2011 in the project area compared to the comparison area could be attributed largely to the effects of the Manoshi's project activities.

Household Population and Housing Characteristics

The sampled household populations are predominantly young, with 41-46% aged below 15 years and 45-51% aged 15-44 years in three surveys.

Average household size has decreased in either area over the years. The average is 4.8 persons each in the project and the comparison areas in 2007 compared to 4.7 and 4.6 persons respectively in 2011.
The percentage of the female headed households has shown a declining trend: 7% each in the project and the comparison areas in 2007 decreased to 5% each in 2011.

Literacy rate (among persons aged 5+ years) was higher in 2011 compared to 2007 in the project area only. It was, however, similar in the comparison area.

Characteristics of the Sampled Households

Almost all (99%) of the households had electricity connections in 2011 compared to 89% in 2007 in the project area. In the comparison area, the figures were 95% in 2007 and 96% in 2011.

Access to sanitation (measured in terms of possession of modern toilet or water-sealed latrine) has increased to 73% in 2011 from 33% in 2007 in the project area. In the comparison area, it increased to 68% in 2011 from 59% in 2007.

More households had piped water inside dwelling houses in 2011 compared to 2007 in the project area (65% versus 56%) and the comparison area (75 versus 65%).

Proportionately, more households had roofs, walls, and floors made of cement/concrete in 2011 than in 2009 and 2007 in both areas.

More households had more durable assets, such as wardrobe, table, chair, television, and mobile phones (but not watch, radio, bicycle, and rickshaw/van) in 2011 than in 2009 and 2007 in either area, suggesting an improvement in quality of living over the years.

Characteristics of the Sampled Women

Women with complete primary education (class 5 or higher) were higher at 59% in 2011 compared to 34% in 2007 in the project area. In the comparison area, the figure was 48% in 2011 compared to 49% in 2007.

Access to mass media (measured in terms of reading newspapers, listening to radio or watching television at least once a week), with prominence of television over newspapers and radio being universal in either area.

Women's participation in labour force (indicated by employment at the survey time) decreased from 25% in 2007 to 17% in 2011 in the project area. In the comparison area, participation has decreased from 26% in 2007 to 21% in 2011.

Their involvement in NGO activities decreased in the project and the comparison areas over the years (from 23% each in 2007 to 9% and 13% respectively in 2011).

More than half of the women in either area came from rural areas, and the share shrank over the years.

Mean number of children ever born to the women was lower in the project and the comparison areas in 2011 (2.1 and 2.2, respectively) than in 2007 (2.6 and 2.4 respectively).

Women's Knowledge about Maternity Care

Knowledge about requirements for antenatal care and TT vaccination during pregnancy was universal (>97%) in each area and year. Importance of iron supplementation during pregnancy was known to more than 91% of the women in either area.

Knowledge about government recommendation of 4+ ANC visits increased from 45% in 2007 to 59% in 2011 in the project area. In the comparison area, it increased from 50% in 2007 to 52% in 2011.

Knowledge about requirements of postnatal care (PNC) was high (83% or more) in either area but awareness of the recommended 3+ PNC visits decreased over the years: from 40% each in 2007 to 28% each in 2011 in both areas.

Knowledge about requirements of vitamin A intake and iron supplementation after delivery was as high as 86%. It increased at a higher rate in the project area than in the comparison area over the years.

Knowledge about life-threatening pregnancy complications/illnesses (except lower abdominal pain and reduced foetal movement) improved in either area over the years. In 2011, the complications were known to 5-15% more women in the project area than in the comparison area.

For treating pregnancy complications/illnesses more women opt for government hospitals (59% and 69% respectively), followed by private clinics (30% and 33% respectively) and the NGO health centres (18% and 21% respectively) in either area in 2011. BRAC delivery hut is opted by 30% in 2011 compared to 2% in 2007 in the project area and 3% in the comparison area in 2011.

Knowledge about life-threatening post-delivery complications increased more in the project area than in the comparison area over the years.

For managing such complications, more women in either area in 2011 opted for government hospitals (77% and 80% respectively), followed by private clinics (32% and 34% respectively) and the NGO health centres (24% and 16% respectively).

Women's Knowledge about Newborn and Child Health Problems

When asked about newborn's life-threatening health problems in 2011, women in the project area mentioned more frequently: difficult or fast breathing, asphyxia, jaundice, and convulsions (70%, 49%, 39%, and 37% respectively) as health problems compared to women in the comparison area (65%, 48%, 27%, and 30% respectively).

For treating these problems, more women in either area in 2011 opted for government hospitals (78% each), followed by private clinics (42% each) and NGO health centres (16% and 11% respectively).

Knowledge relating to drying newborn thoroughly, wrapping with warm clothes, and feeding colostrums improved faster over the years in the project area than in the comparison area.

Mothers' knowledge about requirements of vaccination right after birth and vitamin A for under-five children was universal in either area.

Knowledge about newborn's first feeding substantially improved–more in the project area than in the comparison area over the years.

While knowledge about time of initiation of breastfeeding (within one hour) was almost universal (>90%) in either area, knowledge of duration of exclusive breastfeeding (up to 6 months) improved more in the project area–from 73% in 2007 to 96% in 2011 than the comparison area; this improved from 68% in 2007 to 91% in 2011.

Two in every five women knew symptoms of acute respiratory infection (ARI) and did not improve in either area over the years.

Knowledge of giving packet-saline to children suffering from diarrhoea was universal (95% or more) but giving 'more-than-usual food to children with diarrhoea' was known to three in five women in either area.

For treating diarrhoea and pneumonia in children, the most preferred healthcare provider in either area in 2011 was qualified doctor (87% in the project area and 83% in the comparison area).

More women in the project area than in the comparison area in 2011 made pregnancy planning (91% versus 80%), made plan for assistance during delivery (80% versus 77% respectively) and saved money to face extra expenses relating to childbirth (77% versus 72%).

Use of Maternal Health Services

The percentage of women having any ANC visit during the last pregnancy as well as average number of ANC visits increased more in the project area than in the comparison area over the years

Coverage of government-recommended '4 or more ANC visits' increased in the project area from 27% in 2007 to 42% in 2009 to 52% in 2011 but not in the comparison area (36% in 2007, 34% in 2009, and 36% in 2011).

Coverage of 4 or more ANC visits was higher for births of the first-order than four or higher order, for women with secondary education than no education; and the least poor than poorest households in either area. Differentials in ANC coverage by birth-order, education and economic groups decreased in the project area but not in the comparison area over the years.

Places to get ANC in the project area in 2011 were BRAC birthing (or delivery) hut (35%), followed by private clinics (17%), and NGO health centres (14%). In the comparison area,

places included government hospitals (25%), followed by NGO health centres (21%), and private clinics (16%) in 2011.

ANC services that the women received were of higher quality in the project area than in the comparison area. Measurements of weight and height and examination of abdomen (67% versus 59%, 11% versus 19% and 70% versus 52% respectively) were more frequent in the project area compared to the comparison area in 2011.

During ANC visits in 2011, more women in the project area compared to the comparison area received advice on 'proper diet', 'taking rest', 'not to lift heavy items', and 'intake of iron supplement' during pregnancy (72%, 64%, 49%, and 17% respectively).

The percentage of institutional delivery (including BRAC birthing hut) increased more in the project area than in the comparison area over the years; this increased to 59% in 2011 from 15% in 2007 in the project area than in the comparison area; this increased to 28% in 2011 from 25% in 2007.

In the project area, 23% of the deliveries took place in the BRAC delivery hut in 2011 compared to just 1% in 2007, or 3% in the comparison area in 2011.

Short duration of living in enumeration slum and history of migration from rural or urban areas were associated with lower percentage of institutional delivery in either area.

Likelihood of institutional delivery was higher for births of the first-order than four- or higher-order, for women with secondary education than no education, and the least poor than poorest households in either area.

Institutional delivery became more equitable (measured in terms of difference between sub-groups of birth-order, education, and asset score) in the project area than the comparison area over the years.

The caesarean section (C-section) rate increased to 24% in 2011 from 6% in 2007 in the project area, and in the comparison area; this increased to 14% in 2011 from 11% in 2007.

C-section varied widely by household asset quintile in both areas. The economic differential in C-section was lower in the project area than in the comparison area.

Type of institution was related to C-section; more than two-thirds (69-70%) of the deliveries in private clinics had C-sections compared to half (53-54%) of the deliveries in public hospitals in 2011.

Out-of-pocket expenditure was lower for normal vaginal delivery but not for C-section in the project area than in the comparison area. In 2011, normal delivery at home in the project area, on an average, cost Taka 1,452; normal delivery at institution cost Taka 2,181 and C-section cost Taka 12,714. The respective averages in the comparison area were Taka 1,821, Taka 3,823, and Taka 11,289.

Use of Misoprostol for prevention and treatment of postpartum bleeding was more frequent (53% versus 27%) in the project area than in the comparison area in 2011.

Deliveries assisted by medically-trained persons, such as doctors (28%), BRAC midwife (23%), and nurse/midwife/family welfare visitors (9%) were higher in 2011 than in 2007 (8%, 1%, and 5% respectively) in the project area. In the comparison area, the medically-trained persons were doctors (17%) and nurse/midwife/family welfare visitors (8%) in 2011 and comparable with 2007 (14% and 10% respectively).

More women received PNC after delivery in 2011 than in 2007 (66% versus 28%) in the project area and also in the comparison area (33% versus to 40%). Coverage of recommended three or more PNC visits was higher (20% versus 8%) in 2011 than in 2007 in the project area but not in the comparison area (9% versus 13%).

Short duration of living in enumeration slum or history and migration from rural or other urban areas was associated with lower coverage of PNC visits in either area.

Coverage of PNC has been higher for births of the first-order than four- or higher-order, women with secondary education than no education and the least poor than the poorest households in either area.

PNC services became more equitable (indicated by decline in gaps between sub-groups of birth-order, education, and asset quintiles) in the project area than the comparison area over the years.

Institutions that were used more often for PNC included BRAC delivery huts (24%), private clinics (15%), and government hospitals (15%) in the project area in 2011 compared to 2%, 4%, and 7% respectively in 2007. In the comparison area, institutions for PNC were government hospital (15%), private clinics (8%), and NGO clinics (5%) in 2011 compared to 10%, 11%, and 9% respectively in 2007.

More common self-reported pregnancy complications were oedema of hands/feet, abdominal pain, severe headache/blurry vision, and high fever in the project and the comparison areas in 2011.

For treatment of pregnancy complications, women more often used NGO health centres, private clinics, and government hospitals in either area.

Immediate Newborn Care Practices

Colostrum as pre-lacteal feed after birth was given more often in the project and the comparison areas in 2011 (77% and 61% respectively) than in 2007 (36% and 43% respectively). Over the years, use of honey and sugar/glucose water as pre-lacteal feed reduced at faster rates in the project area than in the comparison area.

The percentage of breastfeeding within an hour of birth increased in both areas; the rate of increase was higher in the project area (from 50% in 2007 to 71% in 2011) than in the comparison area (from 49% in 2007 to 62% in 2011) over the years.

Practice of giving bath just after birth reduced more in the project area (from 55% in 2007 to 16% in 2011) than in the comparison area (from 45% in 2007 to 29% in 2011) with simultaneous increase in giving bath within third day to one week after birth in the project area only.

The practice of shaving baby's hair within the third day to one week after birth was very high in either area with a faster declining trend in the project area (from 91% in 2007 to 72% in 2011) than in the comparison area (from 85% in 2007 to 77% in 2011).

Health check-up of neonates increased at a faster rate (from 40% in 2007 to 67% in 2011) in the project area but not in the comparison area (from 50% in 2007 to 39% in 2011) over the years.

Two-thirds of the neonates had no reported illness or complications in either area each year. Illnesses in order of prevalence were fever, followed by cough, difficult breathing, jaundice, and skin rash/pustule in either area.

Places for treating neonatal complications were private clinics, government hospitals and pharmacies in either area. Frequency of using pharmacy was lower in the project area than in the comparison area (4% versus 8%) in 2011.

Child (aged 1-4 years) Health Services

Complete vaccination (BCG, three doses of DPT and Polio, and Measles) coverage increased more in the project area (from 38% in 2007 to 79% in 2011) than in the comparison area (from 38% in 2007 to 69% in 2011) over the years.

Distribution of childhood illnesses was similar across areas. The most common childhood illnesses were fever, followed by cough, difficult breathing, and diarrhoea. Prevalence of acute respiratory infection (ARI) declined a little in the project area (from 11% in 2007 to 8% in 2011) but not in the comparison area (from 11% in 2007 to 10% in 2011).

Seeking treatment was less frequent for diarrhoea than for ARI. Common places for treatment of ARI and diarrhoea were pharmacies, private clinics, and government hospitals in either area.

Perception on Local Delivery Facilities and BRAC Birthing Hut in Project Area

Women's knowledge relating to healthcare and delivery facilities in their localities increased more in the project area (from 53% in 2007 to 94% in 2011) than in the comparison area (from 45% in 2007 to 63% in 2011).

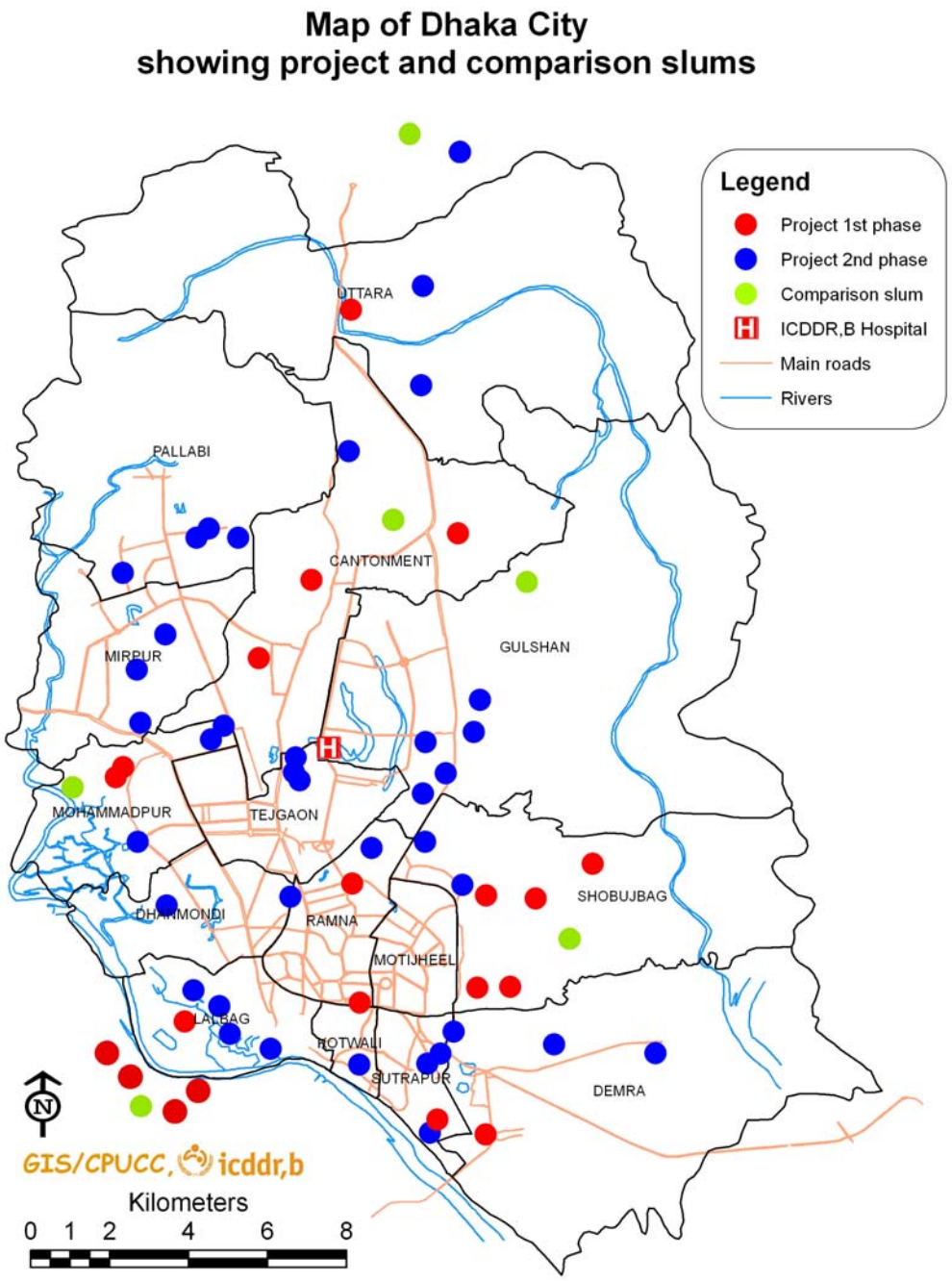
Health facilities mentioned more frequently in 2011 in the project area were BRAC delivery hut (86%), NGO-operated health centre (35%), and private clinic (19%) and that in the comparison area were private clinic (43%) and NGO health centre (35%).
Aspects of healthcare and facilities that satisfied women were good behaviour of the staff, availability of drugs and supplies, effective treatment, and less waiting-time in either area.
Women's knowledge about the existence of BRAC birthing huts in their localities increased from 25% in the 2007 to 90% in the project area. By 2011, 83% of the women became aware of availability of ANC, 59% were aware of skilled delivery assistance, 42% were aware of delivery care, and 27% were aware of newborn care in a birthing hut.

Most common sources of information on services a deliver hut offers were BRAC staff (66%), followed by own experience (24%), and neighbour/friend (17%).

Registration with BRAC birthing huts increased from 7% in 2007 to 62% in 2011 for accessing antenatal check-up (59%), skilled delivery assistance (42%), delivery care (32%), and newborn care (18%).

In conclusion, the project has been able to improve practices more than knowledge on maternal and newborn care and to reduce the inequalities in practices over the years. Lessons learnt from this intervention must be used effectively to further develop and improve the MNCH services in order to move towards a sustainable scale-up at the national level.

Figure 1: MAP OF DHAKA CITY CORPORATION



CHAPTER 1: INTRODUCTION

Urbanization is an inevitable and unavoidable feature in a society's development process. Bangladesh, along with other Asian countries, has been experiencing rapid urbanization in recent decades (1, 2, 3). The Bangladesh Bureau of Statistics–the national statistical organization of the government–projected that fifty percent of the Bangladesh population would be living in urban areas by 2035, and the majority would be living in Dhaka city (4). The increase in urbanization is due to (a) rural- urban migration, (b) geographical increase in urban territory, and (c) natural growth of population in urban area. The rural-urban migration contributes most to rapid urbanization.

Distant factors accelerating the rural-urban migration process are natural disasters, high population density, high population growth, small farm-size, landlessness, and poor communication infrastructure (5). Natural disasters, such as cyclone, flood, river erosion or drought affect thousands of rural households every year. Frequent flood and river erosion damage the rural infrastructure. Overall, population density is far higher than any other country that is not a city state (4). Agricultural land is virtually saturated. High population growth continuously shrinks availability of per-capita agricultural land, and makes 1 percent of it into non-agricultural land every year (6). All these together accelerate the ongoing process of increasing number of landless households and diminish job opportunities in rural areas.

In an era of globalization, economic and labour migration, both internal and international, is on the rise. Migration is an option to escape from deteriorating economic and social conditions at place of origin. Labour and economic migration from rural to urban areas in Bangladesh is predominantly due to shortage of agricultural land, small farm-size, surplus agricultural labour, the seasonal nature of agricultural work, and occasional natural disasters. The poor lack the financial and social resources required to live there. Many, already destitute, do not have a decent place to live. To cope with the situation they migrate to towns and cities in search of employment or scope of earning (7), indicating a clear link between rural poverty, migration and urbanization. The urban poor are largely rural migrants and find shelter in overcrowded slums with inadequate sanitation and other civic facilities. Migration and health connection is bidirectional and in the dynamic perspective it gives us the opportunity to look at it both ways. Altogether, rapid urbanization in Bangladesh raises new challenges for parties aiming to serve the poor and address poverty.

Most migrants from rural areas come to the already over-crowded Dhaka city, with around one-third living in informal settlements under unhealthy and unsafe conditions (8)**.** Implications of unbridled urban growth and proliferating slums are high unemployment and underemployment, overcrowded housing, deterioration of environmental conditions, inadequate supply of clean water, high incidence of diseases and poverty and overcrowding in schools and hospitals. The other implications are overloading in public transports and increase in traffic jams, road accidents, violence, crimes, and social tension. All these make the conditions more unhealthy and unsafe and challenge heavily the capacity of urban centres to cater for the basic civic needs of newcomers.

1.1 Health Services Delivery for Urban Poor

Compared to rural primary healthcare (PHC) infrastructure, the urban PHC infrastructure that could help improve the health of the urban poor is underdeveloped (9, 10). Although the urban population has been increasing rapidly for a longer period of time, the government and external donor agencies have started addressing urban PHC problems only in the last decade.

Under the present PHC system, slum-dwellers in metropolitan cities of this country need to seek treatment and care directly from tertiary-level hospitals and facilities, which involves time, money and, sometimes, negligent and incompliant behaviour on the part of the care-seekers. For improving the health of the urban poor, particularly women and children through improved access and provision of health services in urban areas, the Urban Primary Health Care (UPHC) Project was initiated in 1998 (9). The project established 142 PHC delivery centres in the four major cities of the country, including 60 solely in the Dhaka City Corporation (DCC) for delivering good quality preventive, promotional and curative services. DCC has signed the contract with selected competitive NGOs for delivering a package of essential health services and comprehensive *emergency obstetric care* (EOC) in 10 defined partnership areas, linking contract payments to improve health of the population in the project area. The interim poverty reduction strategy paper (PRSP) and the targets set on poverty reduction reflect the government's commitment to achieving the MDGs by strengthening urban PHC, especially for the poor.

The second project called 'Urban Primary Health Care Project II (UPHCP-II)' covers the six city corporations and five selected municipalities of Bangladesh for the period 2005-2011 with:

(a) focus on providing a package of essential primary health services with an emphasis on preventive intervention, giving priority to maternal and child health;

(b) expand the role of the private sector, including NGOs in the provision of health, nutrition and population services;

(c) take gender, equity, poverty and developmental issues into account in designing and provision of services;

(d) expand cost recovery and improve efficiency of resource utilization in the public sector;

(e) involve beneficiaries in the management of healthcare;

(f) emphasize on the sustainability and environmental issues; and

(g) endeavour to provide one-stop shopping for health and population services (11)

The Health, Nutrition and Population Sector Project (HNPSP), currently, a new HPNSDP (2011-2016) of the Ministry of Health and Family Welfare, Government of Bangladesh embodies all of these and adds a few new dimensions, e.g. risk-sharing and risk-spreading to address catastrophic illnesses and piloting of demand-side financing in different forms and decentralization of decision-making by the lower level managers (12). The project aims to contribute towards achievement of the Millennium Development Goals (MDGs) undertaken at the Millennium Summit 2000 of UN.

1.2 Launching of the Manoshi Project

The slums have a disproportionate share of the poor and have worst health status originating from lack of basic social and public-health services. BRAC has designed an intervention in 2007, called *Manoshi,* a five-year project to improve maternal, newborn, and child health in the urban slums of Bangladesh through the implementation of a community-based programme on comprehensive package of essential health services. The project focused primarily on enhancing the empowerment of communities, e.g. women to develop a system for the continuum of care for mothers and babies with an essential service package of

interventions. The components of the project include: capacity development of the community health workers and birth attendants to offer basic maternity services; health service provision for pregnant and lactating women, neonates and under-five children; timely referral to quality health facilities; community empowerment through development of women's groups; and linkage with government, local government, community people and NGOs. The community health workers are to visit households and identify pregnancies and follow them up no matter where women seek care from BRAC delivery hut. The project has gradually expanded its activities to all the slums under the Dhaka City Corporation and peripheral unions under the metropolitan area by 2009 and to all the slums in all other city corporation areas by 2011.

The impact evaluation surveys aim to examine how effective is the Manoshi project in improving knowledge and practices relating to maternal and newborn care in slums of Dhaka city. The results will help to have a distinct vision and clear strategies to address maternal, newborn and child healthcare in urban slums.

1.3 Slums under Dhaka Metropolitan Area

The Dhaka Metropolitan Area (DMA), with an estimated population of 9.1 million in 2005, comprises area under Dhaka City Corporation (DCC) and adjoining areas totalling 306 sq. kilometres. The 2005 Slum Census of Urban Bangladesh identified 4,966 slum clusters in DMA with a total slum population of 3.4 million (37.4% of the total population in DMA)–more than double the slum population counted in 1996 (3).

The 2005 slum survey also identified conspicuous growth of slums in peripheral and suburban areas of Dhaka city. In the central areas of the city, slum concentrations are relatively sparse compared to the periphery. The major slum concentrations in DMA are as follows:

- Eastern fringe of the city, along the border of the city corporation:
  Khilket, directly opposite to the Dhaka Airport
  Badda-Satarkul area, in the vicinity of the Gulshan and Baridhara residential areas
  Area between Meradia and the Kamalapur Railway Station
- Western fringe of the city:
  Kamrangir Char on the bank of the river Buriganga, just outside the DCC border
  Hazaribagh and West Mohammadpur, along the western embankment Mirpur

The single largest concentration of slums is in Kamrangir Char, having a slum population of 265,000. The largest single slum in Dhaka city is Korail in Mohakhali near Gulshan, with more than 100,000 people (3).

1.4. Methodology of Manoshi Project Impact Evaluation

Study Design: The target populations of the Manoshi project are: (a) pregnant women, and (b) mothers of newborn and child. The impact evaluation surveys targeted mothers with infant and mothers with 1-4 years old child, and followed the six-cell (baseline, midline and endline surveys in the project and comparison slums) study design to assess the effects of the project on knowledge and practices relating to maternal health services and newborn care in urban slums of Dhaka, Bangladesh.

Impact Surveys: The major challenge for the impact evaluation of the Manoshi project activities is the lack of non-project slums for follow-up to control for secular changes. BRAC has expanded the Manoshi project in two phases and covered all slums (except a few) in DMA by 2009. The first phase is implemented in Gulshan, Shyampur, Kamrangir Char, Shabujbag, Mohammadpur, and Uttara – these constituted the project area. The comparison slums are chosen around the project slums. These are Badda, Hazaribagh, Jatrabari, Khilkhet, Meradia, and Mirpur, constituting the comparison area. The sample-size of the project and the comparison groups in the baseline survey 2007 was equal.

The second phase of the Manoshi project covered all slums in DMA, except for slum households in Nikunja Housing area in Khilkhet Thana, Dhaka Uddyan in Adabar Thana and Baraid in Badda Thana. Lack of enough households to make the comparison groups forced us to make the project and the comparison groups unequal; 2:1.

Limitations of the Impact Study: In absence of enough slum households without Manoshi project activities in the DMA, the comparison group included a few slums in DCC and a number of slums selected from periphery of DCC. Arguably, the comparison and project slums were dissimilar in terms of access to health facilities, tenant status and economic condition. Nonetheless, such a comparison group is better than having none at all, to control for secular changes due to non-project and extraneous factors. Analysis, however, controls the effects of some of the factors that differentiate the project group from the comparison group.

1.5 Organization of the Manoshi Impact Evaluation Surveys

1.5.1 Survey Objectives and Implementing Organization

Impact evaluation surveys in 2007, 2009, and 2011 collected data on knowledge, perception, and practices relating to maternity care, newborn, and childcare of women having under-five child(ren) living in slums in the DMA. Sample-size, sampling design, and selection of primary sampling units were determined by icddr,b and shared with the Technical Management Committee of the project. All three surveys were implemented by a private survey organization entitled "Associates for Community and Population Research (ACPR, email: acpr@bangla.net)". The overall objective of the surveys was to estimate changes (improvements) over the years in knowledge and practices relating to maternal, newborn and childcare in the project slums compared to the comparison slums. The specific objectives were:

- Assess levels of women's knowledge and perceptions relating to antenatal care, delivery care and postnatal care, and care of neonates and sick children living in the project and comparison areas in 2007, 2009, and 2011.
- Assess levels of women's practices relating to maternity care, and care of neonates and sick children living in the project and comparison areas in 2007, 2009, and 2011.
- Assess the effects of the Manoshi's project on women's knowledge and practices relating to antenatal care, delivery care and postnatal care, and care of neonates and sick children, controlling for socioeconomic and demographic factors.
- Assess socioeconomic differentials (i.e. equity) in women's practices relating to maternity care, and care of neonates in the project area compared to the comparison area over the years.

1.5.2 Sampling Design of the Surveys

The two-stage random-cluster sampling was followed in all three surveys (the baseline survey 2007, the midline survey 2009, and the end line survey 2011) for selecting sampling units. The first stage was the random selection of clusters (of slums) by PPS (probability proportional to size measured in terms of number of households), and the second stage was selection of households with eligible women. As mentioned before, a few slums in the DMA outside the purview of the Manoshi's project are not enough to make a comparison group of equal size to the project group, the sample-size for the comparison group was made half the size of the project group (the project sample ratio was 1:2) in the midline survey 2009 and the endline survey 2011.

Sample-size: The sample-sizes of the project and comparison groups in three surveys are shown below (Table 1). Indicators that were used in estimating the sample-size are antenatal care visits (4 or more), facility delivery, any postnatal care visit, child immunization coverage, and sickness care. The sample-size of the baseline survey 2007 was 2,874, the midline Survey 2009 was 3,608, and the endline survey 2011 was 3,777 women.

Table 1. Sample-size of the baseline, midline and endline surveys for estimating maternal, newborn and childcare indicators

Group	Baseline survey 2007	Midline survey 2009	Endline survey 2011
Mothers with infant			
Project	672	1,013	1,136
Comparison	612	536	562
Mothers with 1-4 year old child			
Project	807	1,392	1,359
Comparison	783	667	720
Total number	**2,874**	**3,608**	**3,777**

Selection of the sampling units: Manoshi project prepared a list of slums and divided them onto blocks (or clusters), each of 175-200 households (a working unit of a BRAC community health worker called 'Shashthya Sebika'). This list served as sampling frame for the first stage of sampling 100 clusters (50 from the project area and 50 from the comparison area) for

the baseline survey 2007. The numbers of clusters in the project and the comparison areas were 67 and 33 respectively in the midline survey 2009 and the endline survey 2011. Samples of the intervention groups of the midline and the endline surveys were selected proportionately from slums covered in the 1st and 2nd phases of the Manoshi project. The project clusters consisted of 32 from the first phase and 35 from the second phase. The comparison sample included some clusters of impoverished households in Demra, Jingira, Keraniganj, and Tongi–the outreach of the Manoshi's project to serve as comparison group.
The second stage of the sample selection was the selection of households with mothers having infants or children of 1-4 year(s). A household listing operation was carried out to update the list and identify households with mothers of infant or child aged 1-4 years in each selected cluster. The resulting lists of the households served as sampling frame for selection of households with mothers for interview. The required number of mothers of infants and 1-4 year old children was selected in each cluster through random systematic sampling.

1.5.3 Survey Questionnaire

The baseline questionnaire with some modifications was used in the midline and the endline surveys. Modifications are inclusion of a few variables: 'date of start of the activity of the BRAC delivery centre in the catchment slums', 'use of Misoprostol tablets after delivery', and 'exposure to the Manoshi project'.

Data analysis: Both bivariate and multivariate analyses were carried out to assess changes or trends in measurable indicators of maternity and newborn care in the project and the comparison areas over the years. Bivariate analysis shows percentage, rate or mean of the indicators for different categories of socioeconomic and demographic factors within the area over the years. Multiple logistic regression models estimate time trends (in terms of odds ratio) in the indicators and their associations with different socioeconomic and demographic factors within the area. The dose-response relationship (i.e., the longer the exposure to the project the higher is the rate of change in measurable maternal and newborn care indicators) is also used in assessing the trends.

CHAPTER 2: HOUSEHOLD POPULATION AND HOUSING CHARACTERISTICS

This chapter presents information on demographic and socioeconomic characteristics of the household populations of the baseline survey 2007, the midline survey 2009, and the endline survey 2011, including age, sex, and marital status (for members aged 10 years or more), pregnancy status (for married female members of the household), and educational attainment (for members aged 5 years or older). The chapter also describes the conditions of the households in which the survey populations live, including source of drinking-water, sanitation facilities, availability of electricity, housing construction materials, possessions of household durable goods, and ownership of homestead land. Data on household durables and drinking-water source, sanitation facilities, quality of housing materials are used in creating a composite indicator of household economic status called the wealth index.

The definition of household has been the same in the three surveys. A household is defined as a person or a group of related and/or unrelated persons who usually live in the same dwelling unit(s), who have common cooking and eating arrangements, and who acknowledge one adult member as a head of the household. A member of the household is defined as any person who usually lives in the household. This definition is consistent with the Demographic and Health Survey (DHS) definition.

The characteristics of the household population are analyzed based on the *de jure* population while household characteristics are presented based on the *de facto* population, in order to maintain comparability of these results with other DHS reports. Tables present results of the surveys to highlight changes in each area over time.

2.1 Household Population by Age and Sex

The age-sex distribution of the population from sampled households of the three surveys in 2007, 2009, and 2011 is shown in Table 2.1.1 and further illustrated by sex ratios ($\frac{M}{F}\times 100$) in Table 2.1.1a. The age distribution shows a young population age-structure with more than 42% of the population under 15 years of age and more than 45% aged 15-44 years in the project and the comparison areas. As expected, one-fourth of the people are children less than five years of age.

Table 2.1.1a. Percent distribution of the *de jure* household population by age, sex, and area in Dhaka urban slums, 2007, 2009, and 2011

Age-group	Project area						Comparison area					
	Male			Female			Male			Female		
	2007	2009	2011	2007	2009	2011	2007	2009	2011	2007	2009	2011
<5	26.3	26.1	25.2	25.8	25.8	24.4	25.0	26.2	26.8	25.1	26.8	25.7
5-14	19.8	15.7	16.5	19.7	16.7	16.8	19.1	19.0	17.2	18.4	18.3	18.5
15-24	11.2	9.5	9.8	26.3	28.2	27.1	10.2	8.8	8.9	26.7	28.7	27.4
25-34	21.0	26.2	26.8	17.4	17.9	19.3	23.2	26.1	25.6	17.1	16.4	17.5
35-44	13.3	14.2	13.2	5.2	5.1	4.6	14.1	12.4	14.2	5.5	4.2	4.7
45-59	6.0	5.3	5.4	4.0	4.2	5.7	5.3	5.1	4.6	4.6	3.7	4.3
60+	2.3	2.9	3.0	1.6	2.0	2.1	3.1	2.4	2.6	2.6	1.8	2.0
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**3078**	**4861**	**5354**	**3183**	**5087**	**5484**	**3006**	**2410**	**2571**	**3095**	**2496**	**2697**

The overall sex ratio is below 100.3 – the national estimate, revealing that females outnumber males in each area and year. For age-group 15 to 24 years, the female population in urban slums of Dhaka is markedly larger than the male population and for age-groups 25 to 44 years, the male population is larger than the female. This is expected as slums are the major residing places of migratory young males looking for earning opportunities in the transport, construction, and manufacturing, and young females in manufacturing and ready-made garments sectors.

Table 2.1.1b. Distribution of the sex ratio ($\frac{M}{F}\times 100$) by age and area in Dhaka urban slums, 2007, 2009, and 2011

Age-group	Project area			Comparison area		
	Sex ratio			Sex ratio		
	2007	2009	2011	2007	2009	2011
<5	99	97	101	97	94	100
5-14	97	90	96	101	100	89
15-24	41	32	35	37	30	31
25-34	117	140	136	132	153	140
35-44	249	267	281	249	282	288
45-59	145	122	92	113	132	103
60+	141	135	142	115	134	126
Over all	**97**	**96**	**98**	**97**	**97**	**95**

In Bangladesh, most households are 'male-headed', and so are the households in slums (Table 2.1.2). Only 4-7% of the households are headed by females, and the percentage has declined over the years in either area. The three-fourths of the households consisted of 3 to 5 members in each area and year. The average household-size is slightly lower in 2011 (4.7

persons in the project area and 4.6 in the comparison area) than in 2007 (4.8 persons each in the project and the comparison areas).

Table 2.1.2. Percent distribution of household by sex of household head, household-size in urban slums of Dhaka, 2007, 2009, and 2011

Characteristics	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Sex of household head						
Male	93.4	95.0	94.9	92.5	95.9	95.3
Female	6.6	5.0	5.1	7.5	4.1	4.7
Number of household members						
2	0.4	0.5	0.1	0.7	0.2	0.1
3	22.9	30.2	27.8	21.8	27.7	26.8
4	25.3	29.6	27.3	28.2	30.4	29.6
5	22.9	18.2	20.8	21.2	18.9	21.8
6	14.2	10.9	10.8	12.2	11.7	11.5
7+	14.2	10.7	13.2	15.9	11.0	10.1
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Number of households	**1,295**	**2,209**	**2,322**	**1,251**	**1,074**	**1,154**
Mean household-size	**4.8**	**4.5**	**4.7**	**4.8**	**4.6**	**4.6**

2.2 Educational Attainment

Studies have shown that education is one of the major socioeconomic factors that influence a person's behaviour and attitudes and has a significant effect on access to health services. In general, the higher a person's education level, the more knowledgeable s/he is about the use of health services, family planning methods, and hygiene practices. For all household members aged 5 years or older, data were collected on the level of education last attained and the highest class completed. Table 2.2.1 shows the percent distribution of household population aged 5 years or older living in slums by educational attainment in 2007, 2009, and 2011. Educational attainment in terms of 'ever attending school/madrasah' and 'highest class passed' is higher in 2011 than in 2007 in the project and the comparison areas (68-72% versus 56-65%). Other than secular schools, percentage of household members attending madrasah (Islamic faith schools), non-formal (under Government's Mass Literacy Project) and non-institutional (vocational training) schools was very low each year. Educational level of class 10 or more in the project area in 2011 was more than double (9%) that in the project area in 2007 (3%). In the comparison area, this was lower in 2011 than in 2007 (4% versus 8%).

Table 2.2.1. Percent distribution of household population aged 5 years or older by education in Dhaka urban slums, 2007, 2009, and 2011

Ever attended educational institution and class passed	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Ever attended school/madrasah						
Yes	56.2	68.5	71.8	64.6	57.7	67.6
No	43.8	31.5	28.2	35.4	42.3	32.4
Type of school attended						
None	43.8	31.5	28.2	35.4	42.3	32.4
Non-formal	1.7	1.3	1.5	1.4	1.7	1.8
School	53.3	65.9	69.0	62.0	54.5	64.8
Non-institutional	0.5	0.8	0.2	0.2	0.9	0.3
Madrasah	0.6	0.6	1.0	0.9	0.5	0.7
Level of education (class passed)						
None	43.8	31.5	28.2	35.4	42.3	32.4
Primary incomplete	25.3	22.2	25.7	24.5	24.7	29.9
Primary complete	13.1	14.1	14.4	13.6	12.6	14.6
Secondary incomplete	14.4	22.1	22.9	18.8	16.7	19.1
Secondary complete or more	3.3	10.1	8.8	7.7	3.7	3.9
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**4,628**	**7,369**	**8,150**	**4,575**	**3,605**	**3,886**

2.3 Household Characteristics

The ever-increasing number of landless households and diminishing job opportunities in the rural areas are pushing people to migrate towards towns and cities in search of employment. They, already destitute, do not have a decent place to live in their places of origin. They find shelter in overcrowded slums with inadequate sanitation and other decrepit civic facilities. The three surveys in 2007, 2009, and 2011 collected data on certain characteristics of households, including the source of drinking-water, type of sanitation facility, main housing materials, and access to electricity. These physical characteristics of a household are important because they are used in assessing the general well-being and socioeconomic status of the household members.

Table 2.3.1 presents the percent distribution of households by their characteristics in urban slums of Dhaka in 2007, 2009, and 2011. The percentage of households with electricity connections was higher (99%) in 2011 than in 2007 (89%) in the project area. In the comparison area, this was 96% in 2011 compared to 95% in 2007. Availability of piped water inside dwelling was higher in 2011 than in 2007 in the project area (65% versus 56%) and in the comparison area (75% versus 65%). Possession of modern toilet or water-sealed slab latrine was higher in 2011 than in 2007 (73% versus 33% in the project area and 68% versus 59% in the comparison area). In the 2007, 2009, and 2011 surveys, *jhupri* type of dwellings (makeshift dwelling of low height and built with flimsy, temporary materials like polythene,

board, etc.) accounted for 1-2% of the sampled households. Most of the slum households had tin-roof, cement/concrete or tin walls, and cement floor in the project and the comparison areas. Compared to the 2007 baseline survey, more households had roofs, walls, and floors made of cement/concrete in the project and the comparison areas in 2011.

Table 2.3.1. Percent distribution of households by housing quality in Dhaka urban slums, 2007, 2009, and 2011

Housing quality	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Electricity connection						
Yes	88.9	97.9	99.4	95.4	92.0	95.8
No	11.1	2.1	0.6	4.6	8.0	4.2
Source of drinking-water						
Piped inside dwelling	55.7	54.1	64.6	64.6	64.2	74.7
Piped outside dwelling	20.0	23.4	10.5	13.0	20.8	15.9
Tubewell	23.6	22.2	24.5	20.5	15.0	9.4
Pond/tank/canal	0.7	0.4	0.3	1.8	0.0	0.0
Sanitation facility						
Modern toilet	20.2	72.0	44.7	41.1	64.0	44.5
Water-sealed/slab latrine	13.3	16.5	28.8	17.7	21.4	23.2
Pit-latrine	40.8	9.9	25.2	25.3	11.4	31.9
Open latrine/bush/field	23.8	1.4	1.1	15.6	2.0	0.3
Pond/tank/canal/river	1.9	0.3	0.3	0.4	1.3	0.0
Type of main dwelling						
Jhupri	1.9	1.0	1.9	1.8	2.0	1.6
Other	98.1	99.0	98.1	98.2	98.0	98.4
Main roof material						
Cement/concret	3.1	14.0	17.3	9.4	8.8	11.6
Tin	95.5	84.4	81.9	90.2	89.9	87.5
Bamboo/wood	0.6	0.9	0.5	0.3	0.8	0.5
Polythene	0.8	0.7	0.3	0.1	0.5	0.4
Main wall material						
Brick/cement	28.6	61.5	65.4	56.4	55.0	60.6
Tin	50.0	31.6	30.2	31.2	35.8	36.0
Bamboo/wood	20.6	6.5	3.9	11.9	8.0	3.1
Polythene	0.8	0.4	0.5	0.6	1.1	0.3
Floor material						
Pacca	58.0	82.3	83.0	75.5	76.9	85.1
Semi-pacca	3.2	2.4	1.5	2.3	4.9	2.3
Earth	26.3	11.0	10.8	19.1	14.9	8.8
Other	12.5	4.3	4.7	3.1	3.3	3.7
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**1,295**	**2,209**	**2,322**	**1,251**	**1,074**	**1,154**

2.4 Household Possessions of Durable Assets

Data on household's ownerships of selected durable assets were collected in 2007, 2009, and 2011. Some of these are used in generating a wealth index. The percent distribution of households that possess various durable goods in the project and the comparison areas in 2007, 2009, and 2011 is shown in Table 2.4.1. Overall, ownerships of durable assets, except for radio and bicycle, were more common in 2011 than in 2007 in either area. In 2011, ownerships were more common in the project area than in the comparison area. More households owned a mobile phone in 2011 than in 2009 and 2007, when more households owned a radio in either area.

Table 2.4.1. Percent distribution of households by durable assets in Dhaka urban slums, 2007, 2009, and 2011

Household assets	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Almirah/wardrobe	31.3	42.3	59.6	42.1	34.1	57.7
Table	24.7	37.7	41.9	33.6	23.1	25.4
Chair/bench	26.6	36.7	40.8	33.3	22.2	31.1
Radio	14.3	8.6	4.7	16.9	6.0	4.4
Television	42.9	62.2	65.6	55.2	46.6	55.7
Clock/watch	50.0	52.6	54.0	65.5	44.1	47.1
Bicycle	4.7	2.7	3.4	5.0	1.9	2.6
Motor-cycle	0.5	1.2	1.3	0.8	0.2	1.0
Rickshaw/van	6.1	3.1	3.7	5.5	5.5	8.6
CNG scooter	0.5	0.2	0.8	0.2	0.3	1.2
Sewing machine	3.5	6.3	7.3	6.9	7.9	12.3
Mobile phone	32.7	75.6	90.9	47.2	65.2	85.3
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**1,295**	**2,209**	**2,322**	**1,251**	**1,074**	**1,154**

2.5 Socioeconomic Status and Wealth Index

A composite wealth index is tested in a large number of countries in relation to inequities in household expenditure and income, use of health services, and health outcomes (14). The index is an indicator of the level of wealth that is assumed to be consistent with expenditure and income measures. The index is constructed from data on household ownerships of durable goods (almirah, table, chair, radio, television, watch, bicycle, motorcycle, rickshaw, CNG scooter, sewing machine, and mobile phone) and dwelling characteristics (such as source of drinking-water, sanitation facilities, and construction materials). The principal components analysis of the durables retained one factor and assigned a factor score to each household. The higher the score the higher was the number of household assets, indicating better long-term economic status of the household. The factor score was used in dividing the households into quintiles – from the lowest 20% to the highest 20%. Table 2.5.1 shows descriptive statistics and factor loadings of the household assets (including basic amenities and structural materials of the household) in 2007, 2009, and 2011. On the basis of factor loadings, only significant variables at 1% level of significance are retained in the final principal components analysis (15, 16).

Table 2.5.1. Mean and factor loadings of standardized variables used for constructing asset score in Dhaka urban slums, 2007, 2009, and 2011

Selected household possessions	Mean			Factor loading		
	2007	2009	2011	2007	2009	2011
Drinking-water						
Piped inside dwelling (Yes=1, No=0)	0.601	0.574	0.680	0.244	0.134	0.278
Sanitation facility						
Modern toilet (Yes=1, No=0)	0.332	0.104	0.274	0.179	0.220	0.201
Pit-latrine (Yes=1, No=0)	0.154	0.181	0.269	0.028	0.131	0.098
Open latrine/bush/field (Yes=1, No=0)	0.305	0.694	0.446	0.339	0.303	0.292
Electricity (Yes=1, No=0)	0.921	0.960	0.982	0.379	0.323	0.298
Household assets						
Almirah/wardrobe (Yes=1, No=0)	0.366	0.396	0.589	0.609	0.660	0.671
Table (Yes=1, No=0)	0.291	0.329	0.364	0.588	0.646	0.595
Chair/bench (Yes=1, No=0)	0.299	0.320	0.376	0.636	0.683	0.627
Radio (Yes=1, No=0)	0.156	0.774	0.046	0.285	0.305	0.145
Television (Yes=1, No=0)	0.489	0.571	0.623	0.661	0.704	0.658
Clock/watch (Yes=1, No=0)	0.576	0.498	0.517	0.646	0.654	0.631
Bicycle (Yes=1, No=0)	0.049	0.024	0.031	0.214	0.117	0.137
Motorcycle (Yes=1, No=0)	0.006	0.009	0.121	0.130	0.157	0.117
Rickshaw/Van (Yes=1, No=0)	0.058	0.039	0.535	0.039	0.022	0.059
CNG scooter (Yes=1, No=0)	0.004	0.002	0.009	0.064	0.765	0.075
Sewing machine (Yes=1, No=0)	0.051	0.068	0.089	0.307	0.226	0.197
Mobile phone (Yes=1, No=0)	0.399	0.722	0.890	0.632	0.541	0.410
Main roof material						
Cement/Tin (Yes=1, No=0)	0.062	0.123	0.154	0.323	0.367	0.383
Main wall material						
Brick/cement (Yes=1, No=0)	0.422	0.594	0.638	0.665	0.610	0.646
Floor material						
Pacca (Yes=1, No=0)	0.666	0.805	0.837	0.594	0.533	0.576

Household durables of the three surveys are merged together and the principal components analysis is conducted to retain one factor and assign a factor score to each household. Table 2.5.2 shows the percent distribution of households by asset quintiles in the project and the comparison slums over the years. Economic position of slum households improved over the years; it has been more frequent in the project area than in the comparison area. More

households of the 2007 baseline survey belonged to the poorest quintile than households of the 2009 midline survey or the 2011 endline survey in the project area. On the other hand, more households of the 2011 endline survey belonged to the least poor quintile than the households in the 2007 baseline survey or the 2009 midline survey.

Table 2.5.2. Percent distribution of women by household asset quintiles by area in Dhaka urban slums, 2007, 2009, and 2011

Asset quintile	Project area			Comparison area			All
	2007	2009	2011	2007	2009	2011	
Poorest	39.4	16.7	12.0	22.5	24.6	14.2	20.1
Poorer	23.4	18.2	16.8	19.7	24.8	20.6	19.9
Poor	19.0	20.1	20.0	19.9	20.7	22.4	20.2
Less poor	10.4	19.8	23.7	19.9	16.9	25.1	19.8
Least poor	7.8	25.1	27.5	18.0	13.1	17.7	20.1
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**1,256**	**2,172**	**2,269**	**1,227**	**1,054**	**1,129**	**9,107**

CHAPTER 3: CHARACTERISTICS OF SURVEY WOMEN

This chapter describes the demographic and socioeconomic profiles of women interviewed in 2007, 2009, and 2011. These surveys collected basic information on women's age, level of education, marital status, and religion. Information is also collected on women's exposure to mass media, employment status and occupation, type of employment, income and expenditure, NGO involvement, and migration history.

3.1 Background Characteristics of Women

Table 3.1.1 shows the percent distribution by selected background characteristics, of women interviewed in the 2007, 2009, and 2011 surveys. Age distribution of the sampled women of the three surveys in the project and the comparison areas were comparable. Majority of women were aged between 20 and 29 years. In both project and the comparison areas, women were predominantly Muslim (96-99%) in either survey. The rate of the 'currently married women' was similar in the project and the comparison areas in 2007, 2009, and 2011.

The educational attainment of its population is an important indicator of a society's stock of human capital and its level of socioeconomic development. Education also enhances the ability of individuals to achieve desired demographic and health goals. The percentage of women with no education was the lowest in 2011, followed by 2009 and 2007 in the project area (26, 32, and 51% respectively), and this was not the case in the comparison areas (30, 42, and 37% respectively). As expected, the percentage of women with secondary education (class VI+) was the highest in 2011, followed by 2009, and 2007 in the project area. In the comparison area, the percentage of women with secondary education was comparable in 2007, 2009, and 2011.

Access to mass media: Access to information through the media is essential for updating knowledge and raising awareness of what is happening around them. The surveys assessed women's exposure to media by asking if they listened to radio, watched television, or read newspapers or magazines at least once a week. Among the sampled women, the percentage of women who read newspapers was higher in 2011 than in 2007 (10% versus 7%) in the project area but opposite in the comparison area—lower in 2011 than 2007 (5% versus 13%). Regular exposure to electronic media, i.e. television, was widespread among the women – watching television project at least once a week was more than 81% in either area in 2007, 2009, and 2011. In comparison to television, women's exposure to radio gradually declined from 22-24% in 2007 to 4-5% in 2011 in both areas. On inquiry about their current employment status, fewer women were employed in 2011 compared to 2007 in either area (17-21% versus 25-26%).

Table 3.1.1. Percent distribution of women by socio-demographic characteristics in Dhaka urban slums, 2007, 2009, and 2011

Socio-demographic characteristic	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Women's age (year)						
<19	16.7	13.1	12.4	12.7	16.5	15.2
20-24	34.6	38.2	37.9	38.2	39.6	37.0
25-29	25.1	26.7	28.9	25.9	24.0	27.1
30-34	14.2	12.9	13.8	14.5	12.5	13.0
35-39	5.9	6.7	5.2	6.0	5.0	5.7
40+	3.5	2.4	1.9	2.6	2.4	1.9
Women's religion						
Islam	98.5	95.9	95.6	98.0	98.9	96.6
Hinduism	1.4	3.9	4.3	1.8	1.0	3.4
Buddhism	0.0	0.1	0.0	0.1	0.0	0.0
Christianity	0.1	0.1	0.0	0.2	0.1	0.0
Marital status						
Currently married	98.2	99.1	99.3	98.9	98.6	99.1
Divorced, separated, or widowed	1.8	0.8	0.5	1.0	1.2	0.8
Married once or more						
Married once	95.9	98.3	98.7	95.6	97.3	98.1
Married more than once	4.1	1.7	1.3	4.4	2.7	1.9
Education level (classed passed)						
None	50.8	32.1	26.0	37.2	41.6	29.8
Primary incomplete (class I-IV)	15.4	13.5	15.4	13.7	15.3	21.9
Primary complete (class V)	15.3	17.3	18.9	17.8	16.6	19.4
Secondary incomplete (class VI-IX)	16.2	28.0	31.4	23.6	22.5	25.5
Secondary complete or higher	2.2	9.2	8.3	7.7	4.1	3.5
Regular exposure to mass media						
Reads newspapers	7.2	8.7	9.7	13.0	5.0	4.8
Listens to radio	24.5	9.2	3.6	21.7	8.6	5.2
Watches television	84.2	87.7	88.2	88.1	80.9	85.2
Currently employed						
Yes	24.9	16.7	17.5	26.2	19.1	21.1
No	75.1	83.3	82.5	73.8	80.9	78.9
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**1,256**	**2,172**	**2,269**	**1,227**	**1,054**	**1,129**

3.2 NGO Involvement

Table 3.2.1 presents the percent distribution of women by membership of selected non-government organizations (NGOs) in Dhaka urban slums in 2007, 2009, and 2011. The percentage of women's involvement with NGOs was lower (9-13% in 2009 and 2011 compared to 23% in 2007) in the project and the comparison areas. A few women (<1%)

were involved in more than one NGO in 2009 and 2011 opposed to 2-3% in 2007. ASA (Assistance for Social Advancement) was the leading NGO in the project and comparison areas in 2009 and 2011 while BRAC was leading in the project area in 2007. Involvement with small localized NGOs was common in both the areas.

Table 3.2.1. Percent distribution of women by NGO involvement and membership in Dhaka urban slums, 2007, 2009, and 2011

NGO involvement	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Currently involved with NGO						
Yes	22.9	10.2	9.4	23.4	12.0	12.7
No	77.1	89.8	90.6	76.6	88.0	87.3
Number of NGOs involved with						
None	78.3	89.8	90.6	77.1	88.0	88.0
One	18.9	9.4	8.5	19.4	11.1	11.2
Two	2.5	0.8	0.9	3.0	0.8	0.8
Three or more	0.3	0.0	0.0	0.5	0.1	0.0
Has membership of[1]						
Grameen Bank	6.3	16.2	11.2	9.4	10.3	5.6
BRAC	31.3	23.4	20.1	23.3	13.5	11.2
ASA	27.8	48.2	40.2	36.2	29.4	38.5
Proshika	5.2	0.9	0.5	4.9	0.8	2.1
Other	38.5	19.4	37.9	41.1	54.0	44.1
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**1,256**	**2,172**	**2,269**	**1,227**	**1,054**	**1,129**

[1]Among the women who are involved with NGO activities

3.3 Income/Employment Activities

In the 2007, 2009 and 2011 surveys, women (who are employed on the survey date) are asked a number of questions regarding type and nature of their employment status, and the results are presented in Table 3.3.1. A major shift was marked in type of employment, with decrease in percentage of domestic work, daily labour and trading and an increase in the percentage of service in the project area over the years. Such a shift was not evident in the comparison area. The most common type of employment was the service in both areas in all years, followed by domestic work in the project area and skilled labour in the comparison area. The other common types of employment were daily labour, followed by trading, and making handicraft. Most of the employed women work round the year in either area. One-third of the women report sole control over the spending of their income and more than half report joint-control of husband and wife over the spending of wife's income. There was an increase in percentage of sole control and a decrease in joint control of wife's income over the years.

Table 3.3.1. Percent distribution of women by employment characteristics in Dhaka urban slums, 2007, 2009, and 2011

Employment	Project area			Comparison area		
Characteristics	2007	2009	2011	2007	2009	2011
Type of employment						
Service	37.7	46.7	61.1	35.5	26.4	25.6
Skilled labour	8.3	12.2	8.8	16.8	23.9	19.7
Construction work	0.3	0.3	0.0	0.6	1.5	0.4
Handicraft	5.4	6.9	4.5	9.3	9.5	16.4
Trade	9.3	6.9	4.3	8.1	7.5	7.6
Daily labour	15.3	9.1	6.3	15.6	15.4	9.7
Domestic work	22.4	14.6	14.6	12.1	14.9	19.3
Other	1.3	3.3	0.3	1.9	1.0	1.3
Nature of employment						
Round the year	80.5	84.8	87.9	79.6	74.6	74.4
Seasonal	3.0	3.9	3.0	5.7	9.0	7.6
Irregular	16.6	11.3	9.1	14.7	16.4	18.1
Control over spending income[1]						
Respondent	29.7	37.2	31.8	26.2	34.0	42.2
Husband	3.7	3.9	5.3	6.1	6.5	10.8
Someone else	1.0	0.0	0.5	1.0	0.5	0.0
Respondent and husband jointly	64.3	58.1	57.8	61.2	56.5	45.3
Respondent and someone else jointly	1.3	0.8	4.5	5.4	2.5	1.7
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**303**	**364**	**396**	**321**	**201**	**238**

[1]Applicable for cash incomes only

3.4 Migration History

Traditionally, in-migration, particularly from rural areas, has been the most important factor in the rapid growth of cities and the development of slums. Poor rural migrants concentrate mainly in the slum areas of cities. Sampled women were asked this question 'How long have you been living continuously in the current place of residence?' Information collected through this question was used in determining the status of a respondent as a migrant or a non-migrant as well as to determine his/her duration of residence at the place of enumeration. Persons who had always stayed at the place where they were enumerated were clearly non-migrants, and those who had not always lived in the place of enumeration were considered to be migrants in the enumeration place.

They are asked about previous place of living and reasons for migration and the results are presented in the Table 3.4.1. Women of the 2007 survey were more migratory than their peers in 2009 and 2011. Duration of living in the current slum for less than one year was higher in 2007 than 2009 and 2011 in either area, and so was the living always in the current dwelling less frequent. Majority of the women came from villages, and their percentage

showed a decreasing trend over the years in either area (decreased from 75% in 2007 to 53% in 2011 in the project area and from 68% in 2007 to 50% in 2011 in the comparison area). Women coming from district towns and other towns also increased in either area over the years. Distribution of reasons for migration shows a change in the pattern over the years; income/employment was the most common reason and the proportion increased in either area over the years. The second most common reason in either area was family-related, with a declining trend over the years.

Table 3.4.1. Percent distribution of women by residence status and migration history in Dhaka urban slums, 2007, 2009, and 2011

Residence status and migration	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Duration of living in current slum (in year)						
<1	31.1	11.9	11.6	26.3	19.1	17.0
1-2	21.4	19.8	17.0	19.5	20.5	19.0
3-5	16.5	16.9	20.7	17.0	15.7	18.1
6+	23.6	29.1	36.7	26.3	26.5	30.2
Always	7.3	22.3	14.1	10.9	18.2	15.7
Place of birth of women						
City corporation	14.9	25.3	19.7	23.2	21.3	9.3
District town	8.8	5.6	12.4	7.2	6.7	15.1
Other town	0.8	2.7	14.8	1.3	8.6	25.9
Village	75.3	66.4	52.9	68.1	63.0	49.6
Out of country	0.2	0.0	0.2	0.2	0.4	0.2
Reasons for migration into current location[a]						
Income/employment	26.6	45.3	44.0	24.9	53.6	43.8
Familial	30.4	37.2	24.6	28.0	29.1	21.8
Eviction from previous place	10.5	1.8	3.7	7.3	2.8	5.3
Security reasons	22.6	5.8	2.3	19.2	4.1	6.3
Others[1]	0.2	0.0	0.0	0.0	0.0	0.0
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**1,256**	**2,172**	**2,269**	**1,227**	**1,054**	**1,129**

[a]Multiple responses were allowed, [1] Includes the reasons of river erosion, education, etc.

3.5 Reproduction

Sampled women were asked about the number of children ever born, currently living, died, and pregnancy terminations, and the results are presented in Tables 3.5.1 and 3.5.2. The mean number of children ever born to the women was higher in 2007 than in 2009 and 2011 in either area (2.6, 2.1 and 2.1 respectively in the project area, and 2.4, 2.3, and 2.2 respectively in the comparison area). The mean number of children currently living with women was also higher in 2007 than 2009 and 2011 (2.4 compared to 2.0 each in the project area, and 2.2 compared to 2.1 each in the comparison area).

Table 3.5.1. Percent distribution of women by number of children ever born and number of children currently living in Dhaka urban slums, 2007, 2009, and 2011

Number of children ever born	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
1	30.4	39.5	40.9	31.9	36.3	36.3
2	25.8	30.9	28.9	30.6	29.4	29.6
3	18.2	15.7	17.7	17.8	16.4	18.7
4	12.3	7.2	7.2	9.0	9.0	8.0
5	6.4	3.6	2.8	5.5	4.5	4.5
6+	6.9	3.1	2.5	5.1	4.4	2.8
Mean number of children ever born	**2.6**	**2.1**	**2.1**	**2.4**	**2.3**	**2.2**
Number of children currently living						
1	34.2	42.6	43.5	36.0	39.3	39.4
2	28.2	31.5	31.0	32.6	30.8	30.7
3	18.4	14.5	16.6	17.0	16.7	17.4
4	10.7	6.8	5.2	8.1	7.1	7.0
5	4.7	3.0	2.2	3.8	3.6	3.6
6+	3.7	1.7	1.5	2.6	2.5	1.9
Mean number of children currently living	**2.4**	**2.0**	**2.0**	**2.2**	**2.1**	**2.1**
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**1,256**	**2,172**	**2,269**	**1,227**	**1,054**	**1,129**

Table 3.5.2 presents the percent distribution of women by pregnancy terminations in last five years in urban slums of Dhaka in 2007, 2009, and 2011. Here the phrase 'pregnancy termination' refers to abortion (spontaneous and induced), menstrual regulation (MR), and stillbirth. Overall, pregnancy termination was higher in 2007 compared to 2009 and 2011 (10% compared to 3-5%) in either area (results are not shown). The distribution of the pregnancy terminations by area and year shows some differences between areas and years. Pregnancy terminations took place more often in private clinics followed by government hospitals and NGO clinics.

Table 3.5.2. Percent distribution of women by pregnancy terminations and place of treatment for pregnancy terminations in Dhaka urban slums, 2007, 2009, and 2011

Pregnancy termination type and place	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Pregnancy termination type						
Stillbirth	12.9	10.3	12.7	11.9	9.6	22.5
Spontaneous abortion	32.3	30.9	44.9	25.4	34.6	55.0
Induced abortion	22.6	32.4	22.0	16.1	38.5	12.5
Menstrual regulation (MR)	32.3	26.5	20.3	46.6	17.3	10.0
Place of treatment for pregnancy termination[1]						
Home	20.2	27.9	12.7	22.8	23.1	25.0
BRAC delivery hut	0.8	0.0	4.2	0.8	0.0	0.0
Pharmacy	8.1	8.8	12.7	3.4	7.7	5.0
Government hospital	14.5	16.2	15.3	12.7	25.0	17.5
Private clinic/chamber	30.6	32.4	22.9	41.5	38.5	20.0
NGO health facility	21.8	17.6	11.0	14.4	13.5	5.0
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**124**	**68**	**118**	**118**	**52**	**40**

[1]Multiple responses allowed

CHAPTER 4: KNOWLEDGE ON MATERNAL COMPLICATIONS AND NEWBORN CARE

Before describing patterns of the use of reproductive health services in Dhaka urban slums, it is useful to review women's knowledge about these services as it is a major determinant of utilization. This chapter presents findings of the three surveys conducted in 2007, 2009, and 2011 relating to women's knowledge about services required during pregnancy, during delivery, and after delivery; life-threatening complications or illness during pregnancy, during delivery, and after delivery; place of treatment for the complications of the mothers; newborn and child-feeding practices; and life-threatening health problems and place of treatment for the newborns during the first week after birth and for children's morbidity.

4.1 Women's Knowledge about Maternal Health Services

Table 4.1.1 presents the percent distribution of women by knowledge about requirements of antenatal care (ANC) visits, tetanus toxoid (TT) vaccination, and iron supplementation during pregnancy in Dhaka urban slums in 2007-2011. Women's knowledge about requirements of ANC visits and TT vaccination is found universal (more than 97%) in either area over the years. However, knowledge about requirement of four or more ANC visits is 59% and 52% respectively in the project and the comparison area in 2011–higher than in 2007 and 2009. Knowledge about requirement of iron supplementation is very high (>90%) in either area and has increased from 91% in 2007 to 99% in the project area and from 93% in 2007 to 97% in the comparison area in 2011.

Table 4.1.1. Percent distribution of women by knowledge about services required during pregnancy in Dhaka urban slums, 2007, 2009, and 2011

Knowledge about services	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Requirement of ANC visit during pregnancy						
Required	97.2	98.8	99.3	97.9	97.2	99.0
Not required	2.1	1.0	0.5	2.1	1.8	0.8
Don't know	0.6	0.2	0.2	0.0	0.9	0.2
Number of ANC visits required						
None	2.8	1.0	0.5	2.1	1.8	0.8
1	1.4	1.2	1.0	1.2	1.1	1.7
2	8.4	12.6	7.4	8.8	10.3	11.7
3	36.2	33.1	32.2	32.0	32.3	32.7
4 or more	44.7	47.2	58.7	49.9	42.9	51.6
Don't know	6.4	4.8	0.2	5.9	11.5	1.4
Requirement of TT[1] vaccination						
Required	99.3	99.3	99.9	99.6	98.8	99.5
Not required	0.1	0.3	0.1	0.2	0.7	0.4
Don't know	0.6	0.4	0.0	0.2	0.6	0.1
Requirement of iron supplementation[2]						
Required	90.7	96.7	98.7	93.5	90.5	97.0
Not required	5.1	1.7	0.9	3.3	4.9	2.7
Don't know	4.2	1.6	0.4	3.2	4.6	0.3
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**1,256**	**2,172**	**2,269**	**1,227**	**1,054**	**1,129**

[1]Tetanus toxoid, [2]In tablet or syrup form

Table 4.1.2 presents the percent distribution of women by knowledge about requirements of PNC visits, vitamin A and iron supplementations after delivery in Dhaka urban slums in 2007, 2009, and 2011. Though women's knowledge about requirement of PNC has been very high (>83%); percentage of 'not required or don't know' has increased; it was 10-17% in 2009 and 2011 compared to 6-8% in 2007 in either area. They were also asked about requirements of vitamin A and iron supplementation after delivery. Their knowledge for iron supplementation has improved, but a little over the years at a differential rate. Knowledge has improved at a higher rate in the project area (from 72% in 2007 to 86% in 2011) than in the comparison area (from 76% in 2007 to 83% in 2011). The respective figures for vitamin A are 67% in 2007 and 84% in 2011 in the project area and 76% in 2007 and 86% in 2011 in the comparison area.

Table 4.1.2. Percent distribution of women by knowledge about services required after delivery in Dhaka urban slums, 2007, 2009, and 2011

Knowledge about	**Project area**			**Comparison area**		
services	2007	2009	2011	2007	2009	2011
Requirement of PNC visit						
Required	93.7	84.3	90.1	91.9	83.0	88.0
Not required	4.7	13.5	8.4	6.6	12.9	11.0
Don't know	1.6	2.2	1.5	1.5	4.1	1.0
Number of PNC visits required						
None	6.4	16.1	9.9	8.4	17.1	12.0
1	8.5	18.3	19.5	9.7	12.0	20.2
2	32.8	30.8	41.5	29.9	24.5	37.2
3 or more	40.0	23.6	27.6	39.8	25.0	28.1
Don't know	12.2	11.2	1.5	12.1	21.5	2.6
Requirement of iron supplementation						
Required	72.1	76.0	86.2	76.1	71.7	82.8
Not required	17.3	17.2	11.2	17.7	18.0	14.1
Don't know	10.6	6.8	2.5	6.2	10.2	3.1
Requirement of vitamin A supplementation						
Required	66.6	72.6	83.6	76.0	69.1	85.9
Not required	11.7	14.5	8.9	11.2	15.1	10.5
Don't know	21.7	12.9	7.5	12.8	15.8	3.6
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**1,256**	**2,172**	**2,269**	**1,227**	**1,054**	**1,129**

Table 4.1.3 presents the percent distribution of women by knowledge of pregnancy complications or illnesses that require immediate medical treatment and source of information on pregnancy care in Dhaka urban slums in 2007, 2009, and 2011. Knowledge of such complications was not widely prevalent in either area. Complications most frequently mentioned were severe headache, followed by convulsion, lower abdominal pain, blurry vision, and oaedema in hands/feet and, high fever and vaginal bleeding. Knowledge of complications has improved (except for reduced foetal movement and lower abdominal pain) over the years at a higher rate in the project area than the comparison area.

Although knowledge about life-threatening maternal complications during pregnancy is not very common, knowledge about place of treatment for such conditions is found very high and shows some changes over years within the areas. Very few women mentioned home or pharmacy as place of treatment. The most common place for treatment in the project and the comparison areas in 2011 was government hospitals (59% and 69% respectively), followed by private clinics (30% and 33% respectively) and NGO health centre (18% and 21% respectively). In the project area, BRAC delivery hut was opted by 30% of the women in 2011 compared to 13% in 2009 and 2% in 2007. Relative frequency of mentioning NGO health centres gradually declined in either area over the years.

The most common source of knowledge of information on pregnancy care in 2011 was 'own experience' (53% in the project area and 57% in the comparison area), followed by 'BRAC staff' (47% in the project area and 6% in the comparison area), 'friends' (6% in the project areas and 10% in the comparison areas), and 'family members' (9% in the project area and 15% in the comparison area). BRAC staff was mentioned more often in 2011 and 2009 compared to 2007 in the project area than in the comparison area.

Table 4.1.3. Percent distribution of women by knowledge about complications during pregnancy, place for treatment, and sources of information in Dhaka urban slums, 2007, 2009, and 2011

Area of knowledge	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Complications that require medical treatment[1]						
Severe headache	41.2	54.1	62.3	35.5	51.6	47.3
High fever	16.0	26.1	32.2	17.9	21.5	23.2
Blurry vision	20.9	24.5	34.9	11.2	25.8	26.0
Reduced/absent foetal movement	27.1	23.5	17.3	30.6	21.7	21.0
High blood pressure	0.9	5.9	7.0	2.0	5.4	5.1
Oedema in hands/feet	23.1	23.9	34.5	21.5	27.8	29.3
Oedema in face	1.4	7.6	7.9	1.3	9.8	9.7
Convulsion	21.2	30.3	42.4	21.8	25.3	29.3
Vaginal bleeding	17.5	18.5	29.9	24.0	11.4	24.2
Abortion/miscarriage	3.4	3.2	4.0	4.6	2.5	3.7
Lower abdominal pain	49.7	38.4	41.9	50.4	41.4	45.2
Others	0.3	0.1	0.1	0.2	0.0	0.0
Place of treatment for pregnancy complications						
Home	0.6	0.6	0.2	0.3	1.5	0.6
BRAC delivery hut	2.3	13.3	30.5	0.1	1.6	3.4
Pharmacy	2.5	4.9	4.5	2.0	3.3	5.4
Government hospital	58.8	62.3	58.9	51.4	71.9	68.6
Private clinic/chamber	30.7	60.1	29.9	36.7	48.9	32.8
NGO health centre	44.3	32.9	18.5	40.7	32.5	21.1
Sources of information on pregnancy care						
Own experience	31.9	52.1	53.5	27.5	57.0	57.4
Family members	15.8	18.6	9.0	15.5	23.2	15.4
Friends	21.2	24.1	6.4	18.7	24.4	9.6
BRAC Shasthya Sebika/Kormi	16.3	45.4	46.8	17.4	32.4	6.4
NGO clinic/worker	18.1	0.6	9.6	21.3	0.4	18.6
Mass media	10.0	0.6	4.2	11.2	0.9	6.4
Doctor	11.2	0.9	2.6	6.0	0.3	7.0
Health assistant (government)	2.1	0.0	6.6	2.1	0.1	13.5
Others	1.4	1.0	0.0	0.4	0.3	0.0
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**1,256**	**2,172**	**2,268**	**1,227**	**1,054**	**1,129**

[1]Multiple responses

Table 4.1.4 presents the percent distribution of women by knowledge of complications/illnesses during delivery as well as within 42 days of delivery that require medical treatment and area in 2007, 2009, and 2011. Women's overall knowledge about life-threatening post-delivery complications improved (except for prolonged labour, hand/feet prolapse, and severe abdominal pain) over the years, and the rate of improvement was higher

in the project area than in the comparison area. In 2011 more women in the project area than the comparison area reported complications, such as excessive vaginal bleeding (67% versus 60%), convulsions (48% versus 32%), hand/feet prolapse (29% versus 23%), and prolonged labour (26% versus 22%).

Women's knowledge about where to go for treatment of life-threatening maternal conditions during or after 42 days of delivery was very high in either area in 2007, 2009, and 2011. Very few women (1%) mentioned 'home' for managing such complications. Most frequently-mentioned places of treatment were government facilities (hospitals, maternity centre, and health and family welfare centres), followed by private clinics (including chamber) and NGO health centres in both areas each year.

Table 4.1.4. Percent distribution of women by knowledge about complications during and after delivery in Dhaka urban slums, 2007, 2009, and 2011

Knowledge on complications and treatment	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Complications that require medical treatment[1]						
Excessive vaginal bleeding	36.7	53.6	66.6	45.9	42.4	60.2
Prolonged labor	58.7	45.4	26.3	47.8	42.9	21.7
Hand/feet prolapsed	28.5	32.3	29.2	26.0	26.9	22.7
Foul-smelling discharge	1.6	2.0	3.0	1.9	3.2	3.7
High fever	5.7	10.6	12.3	9.1	12.1	11.2
Inverted nipples	0.2	0.7	0.4	0.3	0.5	0.6
Retained placenta	17.0	19.1	22.4	12.7	19.0	24.4
Severe abdominal pain	33.8	23.5	26.9	36.2	30.5	30.5
Convulsion	28.8	42.2	48.5	28.8	40.0	32.2
Engorged breasts	1.0	1.4	1.5	0.8	1.2	2.7
Tetanus	6.8	7.5	13.2	5.2	10.3	11.0
Others	0.1	0.1	0.0	0.2	0.3	0.1
Place of treatment for complications during and after elivery[1]						
Home	0.8	0.5	0.1	0.6	1.5	0.4
Government hospital/health and family welfare centre/maternity centre	74.5	72.8	76.7	64.5	79.6	79.6
Private clinic/chamber	29.8	60.1	32.4	40.0	47.1	33.8
NGO health centre	34.2	35.3	24.4	32.1	32.8	16.3
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**1,256**	**2,172**	**2,269**	**1,227**	**1,054**	**1,129**

[1]Multiple responses

4.2 Mother's Knowledge on Newborn and Childcare

The three surveys collected data on maternal knowledge about serious health problems during the first week after birth that could endanger the life of a newborn in Dhaka urban slums in 2007, 2009, and 2011. The results are presented in Table 4.2.1. Knowledge about newborn's life-threatening health problems in each area exhibits no consistent patterns of change over the years. The overall difference in prevalence of knowledge between the two areas was quite small, except for jaundice and convulsion. Health problems mentioned more by mothers in

2011 were: difficult and fast breathing (range 65-70%), followed by asphyxia (48-49%), jaundice (27-39%), and convulsion (30-37%) in the project and the comparison area.

Mothers were asked about place of treatment for newborn's health problems. Common places of treatment mothers reported were: government hospital (including maternal and child welfare centres and the health and family welfare centres), followed by private clinics (including doctor's chamber), and NGO health centres in each area and year. Frequency of reporting NGO health centres reduced over the years in either area.

Table 4.2.1. Percent distribution of mothers by knowledge about life-threatening health problems of newborns during the first week after birth and place for treatment in Dhaka urban slums, 2007, 2009, and 2011

Knowledge of health	**Project area**			**Comparison area**		
problems and treatment	2007	2009	2011	2007	2009	2011
Newborn's serious health problem[1]						
Difficult or fast breathing	69.8	56.4	69.9	66.5	60.2	65.5
Asphyxia	64.8	61.0	49.1	57.0	58.3	48.3
Reduction in food intake	14.7	9.6	8.2	9.3	8.1	6.0
Poor sucking of breast-milk	14.3	9.7	13.2	13.3	11.3	13.8
Jaundice	25.6	40.6	39.5	28.8	36.7	26.7
Skin rash/pustule	10.4	6.4	11.6	6.4	7.9	10.9
Infection in umbilical cord	4.9	8.6	7.7	8.3	7.7	6.7
Discharge from eyes	0.5	0.6	0.7	0.3	0.9	1.5
Low-birth weight	1.6	4.2	2.6	2.4	3.2	4.0
Swelling of head scalp	3.2	1.3	1.6	2.5	1.5	1.7
Convulsion	27.7	32.9	36.9	29.7	33.7	30.2
Lethargy	8.9	6.4	3.0	5.9	9.2	3.5
Excessive vomiting and swelling in belly	7.8	12.1	10.2	11.4	12.2	10.0
Others	0.6	0.4	0.1	0.5	0.4	0.1
Place of treatment for newborn's health problems[1]						
Home	0.6	0.8	0.3	0.7	2.3	0.8
Government hospital	77.5	80.8	78.3	80.5	81.7	78.3
Private clinic/chamber	31.0	58.6	42.2	37.0	45.8	41.7
NGO health centre	23.2	27.0	16.2	23.1	25.1	11.3
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**1,256**	**2,172**	**2,268**	**1,227**	**1,054**	**1,129**

[1]Multiple responses were allowed

Table 4.2.2 presents the percent distribution of mother's knowledge relating to newborn care immediately after birth in Dhaka urban slums in 2007, 2009, and 2011. Their knowledge relating to drying newborn thoroughly, wrapping with warm clothes and feeding colostrum immediately after birth was higher but not universal in the project area than in the comparison area in 2011. Two in five mothers in the project area and half of the mothers in the comparison area did not know that newborns need wrapping with warm clothes and feeding colostrum immediately after birth. Knowledge about cord-care reduced in both areas

over time. Mothers' knowledge about requirement of vaccination right after birth and requirement of vitamin A for under-five children, is universal in either area over the years.

Table 4.2.2. Percent distribution of mothers by essential newborn and childcare practices known to them in Dhaka urban slums, 2007, 2009 and 2011

Knowledge on newborn and childcare	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Essential newborn care immediately after birth[1]						
Drying thoroughly	64.4	91.5	81.9	67.6	88.6	77.3
Wrapping with warm clothes	59.4	75.7	61.1	59.6	70.7	53.5
Feeding colostrum	25.4	42.0	57.8	32.0	31.6	50.0
Cord-care	46.5	22.3	18.6	38.5	23.1	8.8
Eye-care	0.9	0.5	3.3	1.2	0.6	3.9
Others	0.4	0.0	0.0	0.7	0.0	0.0
Don't know	0.0	0.1	0.0	0.1	0.3	0.2
Requirement of vaccination right after birth						
Yes	99.8	99.8	100.0	100.0	99.7	99.9
No	0.1	0.1	0.0	0.0	0.2	0.1
Don't know	0.1	0.1	0.0	0.0	0.1	0.0
Requirement of vitamin A for under-five children						
Yes	95.9	95.6	98.6	96.4	91.7	97.3
No	1.7	2.0	0.5	1.1	3.5	1.6
Don't know	2.5	2.4	0.9	2.4	4.7	1.2
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**1,256**	**2,172**	**2,268**	**1,227**	**1,054**	**1,129**

[1]Multiple responses

Table 4.2.3 presents the percent distribution of mothers by knowledge about newborn and child-feeding practices and area in 2007, 2009, and 2011. A substantial improvement was found in mother's knowledge about newborn's first feeding. In the project area, 82% mentioned colostrums as the first feed in 2011 opposed to 39% in 2007 and it was 71% in the comparison area in 2011 compared to 48% in 2007. On the other hand, there was a substantial decrease in the use of honey as pre-lacteal feed from 49% in 2007 to 14% in 2011 in the project area. In the comparison area, it decreased from 39% in 2007 to 24% in 2011. Fewer mothers mentioned sugar-water (2-3%) in 2011 compared to 8-9% in 2007 in either area. Use of mustard oil was low, around 2%.

Mother's knowledge about time of initiation of breastfeeding was found to be very high in either area over the years. Knowledge of breastfeeding 'just after birth' increased from 52-54% in 2007 to 61% in 2011 in each area while knowledge 'within 24 hours of birth' did not change; 38% in 2007 and 37% in 2011 in either area.

Table 4.2.3. Percent distribution of mothers by knowledge about newborn and child-feeding practices in Dhaka urban slums, 2007, 2009, and 2011

Knowledge about newborn and child feeding	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Newborn's first feeding[1]						
Colostrums	38.9	72.8	82.3	48.0	50.9	70.6
Plain water	1.1	1.0	0.2	1.1	1.1	0.5
Misri/sugar-water	7.7	4.2	2.4	8.6	6.1	3.5
Honey	48.6	21.0	14.2	39.5	39.3	23.8
Mustard oil	2.5	0.6	0.5	1.6	2.5	1.2
Any milk except breast-milk	1.0	0.3	0.2	1.0	0.1	0.3
Other liquids	0.1	0.1	0.1	0.1	0.1	0.1
Initiation of breastfeeding						
Just after birth	53.7	44.2	61.4	52.2	44.3	61.0
<24 hours of birth	38.0	50.4	37.5	38.3	46.9	37.2
Second day	2.6	2.7	0.4	2.9	4.6	1.2
Third day	5.0	1.9	0.5	5.9	2.9	0.5
Later	0.2	0.1	0.1	0.1	0.5	0.1
Don't know	0.4	0.7	0.0	0.5	0.9	0.0
Duration of exclusive breastfeeding						
None[2]	0.6	0.2	0.0	0.9	0.5	0.0
<1 month	0.5	0.2	0.3	3.7	0.9	2.8
1-5 months	22.4	17.8	2.5	24.1	26.2	4.5
6 months	72.8	79.3	95.9	68.1	69.2	91.1
More than 6 months	3.7	2.5	1.2	3.2	3.3	1.6
Supplementary foods for child after exclusive breastfeeding[3]						
Any milk except breast-milk	69.8	51.4	52.7	66.5	43.0	44.9
Suji (wheat particles)	64.8	54.0	48.5	57.0	61.2	51.8
Soft rice	14.7	11.9	7.9	9.3	17.6	8.7
Egg	14.3	17.1	37.9	13.3	12.4	31.7
Pulses	25.6	7.2	12.7	28.8	8.4	12.4
Khichuri (rice, pulse, and vegetables cooked with oil)	10.4	92.1	89.7	6.4	88.0	88.1
Other liquid foods	4.9	0.8	6.4	8.3	2.2	4.5
Fruits	0.5	3.5	34.4	0.3	3.0	22.9
Rice/chapatti	1.6	1.0	23.3	2.4	1.5	18.2
Fish/meat	3.2	0.3	27.4	2.5	0.2	18.0
Biscuit	27.7	0.7	10.1	29.7	1.0	8.9
Leaves/vegetables	8.9	0.4	49.4	5.9	0.9	44.4
Others	0.6	0.7	0.0	0.5	0.7	0.0
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**1,256**	**2,172**	**2,268**	**1,227**	**1,054**	**1,129**

[1]Food/liquid that should put first in baby's mouth, [2]Includes 'don't know', [3]Multiple responses possible

Knowledge about correct duration of exclusive breastfeeding 6-months has improved from 73% in 2007 to 96% in 2011 in the project area; and from 68% in 2007 to 91% in 2011 in the comparison area. Mothers were asked about complementary foods that should be given along

with breast-milk to the baby after 6 months of age. Mother's knowledge underwent some changes in either area over the years. Relative frequency of reporting complementary foods, such as milk (other than breast-milk); *suji* (made of wheat particles), pulses and biscuit decreased with an increase in frequency of reporting egg, fish/meat, *khichuri* (made of rice, pulses, and vegetables cooked with edible oil), vegetables and fruits over the years. Complementary food items mothers more frequently mentioned in 2011 were *khichuri (*88-90%), any milk (45-53%), *suji* (48-52%), leaves and vegetables (44-49%), eggs (32-38%), fruits (23-34%) and fish and meat (18-27%).

Table 4.2.4. Percent distribution of mothers by knowledge about children's morbidity and management practices in Dhaka urban slums, 2007, 2009, and 2011

Knowledge about children's morbidity and place of treatment	**Project area**			**Comparison area**		
	2007	2009	2011	2007	2009	2011
Signs of pneumonia among under-five children[1]						
Fever	42.7	55.2	59.7	48.0	60.8	54.4
Cough	49.5	60.2	45.9	48.3	65.2	53.8
Fast breathing	39.9	26.7	42.3	47.2	35.3	44.5
Difficulty in breathing	68.2	51.0	65.4	63.3	43.5	53.1
Chest in-drawing	33.8	29.7	41.9	31.1	21.6	38.3
Others	0.3	0.0	0.0	0.2	0.0	0.0
Don't know	5.4	2.8	1.3	3.9	1.9	1.3
Acute respiratory infection (ARI)	41.4	43.2	36.9	40.3	44.3	42.2
Type of food should be given to under-five children with diarrhoea[1]						
Packet saline	95.3	97.4	98.6	97.2	95.0	97.2
Home-made saline	15.0	27.2	13.2	16.1	28.6	11.0
Plain water	5.7	3.6	3.4	5.8	2.8	5.4
Usual diet	13.4	8.6	12.4	8.1	6.4	8.0
Other liquid food/others	62.1	66.5	57.6	63.8	54.6	50.0
Amount of food should be given to under-five children with diarrhoea						
Usual diet	6.2	13.2	17.3	6.6	20.4	20.5
Less food than usual	17.1	26.9	18.8	21.7	36.1	22.1
More food than usual	76.7	59.9	63.9	71.7	43.5	57.4
Person to seek advice to manage pneumonia/diarrhoea[1]						
BRAC Shasthya Sebika	0.3	3.1	5.8	0.2	0.9	1.2
Medical assistant/sub-assistant community medical officer (MA/SACMO)	22.4	10.5	7.6	23.4	21.2	8.0
Nurse/midwife/family welfare visitor (Government)	29.9	10.8	4.9	27.8	13.4	5.1
Nurse/midwife/family welfare visitor (NGO)	8.4	13.4	3.3	10.0	14.3	3.1
Qualified doctor	60.7	78.9	86.6	57.8	69.9	82.9
Pharmacist	0.7	11.4	9.7	2.5	11.8	11.4
Spiritual healers	0.1	0.6	0.1	0.4	1.6	0.8
Homeopath	1.1	2.3	0.5	0.4	3.0	1.6
Kabiraj/Hekim	0.1	0.5	0.0	0.5	0.8	0.4
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**1,256**	**2,172**	**2,268**	**1,227**	**1,054**	**1,129**

[1]Multiple responses were possible

Mothers are asked about signs and symptoms of pneumonia in under-five children and place of treatment, and the results are presented in the Table 4.2.4. Knowledge of symptoms of acute respiratory infection (ARI refers to cough with rapid or difficult breathing which was chest-related is considered a proxy for pneumonia) did not improve in either area over the years. Two in every five mothers (41% in the project area and 40% in the comparison area in 2007, and 37% in the project area and 42% in the comparison area in 2011) had knowledge on the signs and symptoms of ARI.

Mother's knowledge about giving packet oral saline to children suffering from diarrhoea was universal in either area over the years. Their knowledge relating to amount of food that should be given to under-five children with diarrhoea was found to be high, but one in five mothers mentioned 'less food than usual' in either area. To manage diarrhoea and pneumonia among under-five children, qualified doctor was the most preferred healthcare provider (61% in 2007 and 87% in 2011 in the project area. In the comparison area, it was 58% in 2007 and 83% in 2011). Preference for paramedics (such as MA/SACMO or nurse/midwife/family welfare visitor) declined from 22-23% in 2007 to 5-8% in 2011 in the project area. In the comparison area, it declined from 23-28% in 2007 to 5-8% in 2011. Very few mothers (<6%) mentioned BRAC *Shashthya Sebika* for treatment of pneumonia or diarrhoea in the project area in 2011.

4.3 Pregnancy Planning

Table 4.3.1 presents percent distribution of women living in Dhaka urban slums by the knowledge on pregnancy planning prior to pregnancy or child birth in 2007, 2009 and 2011. Only 9% of the women in the project area and 20% in the comparison area have not had a plan regarding place of delivery beforehand in 2011. Preference for home as a place of delivery declined at a faster rate in the project area (from 85% in 2007 to 45% in 2011) than in the comparison area (from 76% in 2007 to 62% in 2011) over the years. In the project area, more women mentioned BRAC delivery hut for delivery in 2011 than in 2007. In the comparison area, institution in plan for delivery was the government hospital (7-8%), followed by private clinics and NGO health centre.

Table 4.3.1. Percent distribution of women by pregnancy planning prior to pregnancy/childbirth in Dhaka urban slums , 2007, 2009, and 2011

Pregnancy planning	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Made plans regarding place of delivery						
Yes	95.5	79.6	91.0	93.2	68.1	80.1
No	4.5	20.4	9.0	6.8	31.9	19.9
Type of place planned						
Did not have any plan	4.5	20.4	9.0	6.9	31.9	19.9
Home	84.8	50.4	45.3	75.6	52.1	61.7
BRAC delivery hut	1.1	11.6	29.9	0.2	2.2	2.9
Government hospital	4.5	6.1	6.8	7.4	8.3	8.3
Private clinic/chamber	1.6	8.6	5.8	5.4	2.1	3.4
NGO health centre	3.6	2.9	3.1	4.6	3.5	3.7
Made plan regarding assistance during delivery						
Yes	88.3	71.6	79.7	87.4	71.8	76.9
No	11.7	28.4	20.3	12.6	28.2	23.1
Assistance during delivery						
Did not have any plan	11.7	28.4	20.3	12.6	28.2	23.1
None	1.0	2.0	1.1	1.9	2.3	1.1
Relative/neighbour	54.8	24.0	19.3	42.2	34.3	32.2
Untrained TBA	24.0	23.4	17.8	27.9	22.2	28.9
Trained TBA	0.4	8.3	27.5	0.0	1.4	2.3
BRAC midwife	0.3	0.9	0.2	1.8	0.7	0.1
SACMO/MA[1]	0.8	1.3	2.8	3.9	3.3	3.5
Nurse/midwife/FWV (government)[2]	2.2	1.6	1.9	2.1	1.7	1.4
Nurse/midwife/FWV (NGO)	4.6	10.1	9.0	7.4	5.8	7.4
Qualified doctor	0.0	0.0	0.0	0.1	0.0	0.0
Pharmacist	0.1	0.0	0.0	0.0	0.1	0.0
Others	0.0	0.0	0.0	0.1	0.0	0.0
Saved money to bear expenses relating to childbirth						
Yes	72.1	69.2	76.6	74.5	61.5	71.9
No	27.9	30.8	23.4	25.5	38.5	28.1
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**1,256**	**2,172**	**2,268**	**1,227**	**1,054**	**1,129**

[1]Sub-assistant community medical officer/Medical assistant; [2]Family welfare visitor

One in five women did not have any plan regarding assistance during delivery in either area over the years. A shift in choice of assistance took place in the project area and also in the comparison area to a lesser extent. Choice for relative or neighbour and untrained TBA declined more in the project area than in the comparison area over the years. In the project area, trained TBAs were the choice of more women in 2011 compared to 2007. Three in every four women in either area practised saving money to bear extra expenses relating to childbirth in either area. The percentage of women who saved for delivery was higher and increased more in the project area than the comparison area.

CHAPTER 5: PRACTICES RELATING TO MATERNAL AND NEWBORN'S HEALTH

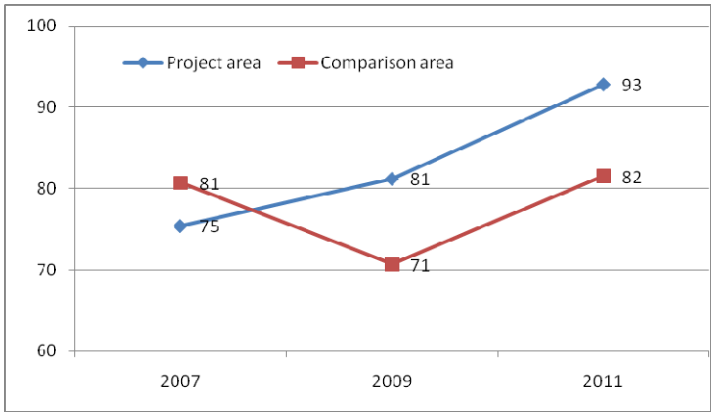
In response to Millennium Development Goal 4 and 5 and to meet the needs of women and infants, the Government of Bangladesh wants to increase skilled delivery attendance and post-delivery care up to 50% by 2015. The likelihood of receiving maternal health services decreases with increase in mother's age and birth-order, and increases with increase in the level of education and household asset quintile. This chapter presents findings from three surveys undertaken in 2007, 2009, and 2011 on the practices relating to antenatal care (ANC), place of delivery, delivery assistance, and postnatal care (PNC) for mothers and newborns living in Dhaka urban slums during 2007-2011.

5.1 Maternity care and services received

Antenatal care

Pregnancy is an important stage of a woman's life and has the potential to influence the growing foetus and the mother's health. Adequacy of prenatal care has been defined by the number of visits, the stage of pregnancy at which care is initiated, the source of care (private versus public), the spacing of visits, and medical care services, for example, blood and urine tests and blood pressure check-up, and health education. Antenatal care from a medically-trained provider reduces health risks for both mother and child during pregnancy and delivery. The Bangladesh maternal health strategy recommends at least four antenatal care visits during pregnancy: the first, when the woman realizes she is pregnant; the second, between the fourth and fifth month of pregnancy; the third, between the sixth and seventh month; and the fourth at the ninth month. Mothers who delayed initiation of care until the third trimester are likely to have a higher risk of low birth weight of their babies. The past decade has seen substantial progress, nationally, in increasing the proportion of pregnant women making at least one visit and in raising the total number of visits.

Figure 5.1.1. Percentage of women with ANC visit by area and year



ANC coverage increased in the project area by 18% points in 2011 from 75% in 2007 compared to increase by 1% point in 2011 from 81% in 2007 in the comparison area

Table 5.1.1 presents the distribution of women by ANC visit, timing of first visit, and place of last ANC visit for live births in the last one year in Dhaka urban slums in 2007, 2009, and 2011. The overall coverage of ANC visits for the most recent birth increased from 75% in 2007 to 93% in 2011 in the project area compared to no increase (81% in 2007 and 2011) in the comparison area (Figure 5.1.1).

Table 5.1.1. Percent distribution of women who gave live births in the last one year by any ANC visit for the most recent pregnancy and residence status in Dhaka urban slums, 2007, 2009, and 2011

Residence status	Project area			Comparison area			BUHS
	2007	2009	2011	2007	2009	2011	
Duration of residence in enumeration slum							
<1 year	71.2	74.4	86.4	75.5	67.6	74.5	
1-2 year(s)	75.0	80.4	90.7	83.2	68.7	86.0	
3+ years	78.3	82.9	94.4	82.4	72.4	81.8	
Place of previous residence							
Dhaka urban area	76.7	82.9	95.1	83.2	75.9	80.3	
Other urban area	69.4	82.4	92.6	66.7	73.7	83.0	
Rural area	74.8	79.1	90.5	79.0	64.0	81.6	
Over all	**75.4**	**81.2**	**92.8**	**80.7**	**70.7**	**81.5**	**66.6**
Total number	**672**	**1,013**	**1,136**	**612**	**536**	**562**	

Slum-dwellers in urban areas are usually poor, but all poor do not live in slums (2006 UHS). Jobs of slum-dwellers are temporary in nature. They change their jobs as well as residence more often compared to non-slum dwellers. Shift in residence to the non-project areas can affect exposure and access to maternal and child health services that are provided by the Manoshi's project. Women were asked about duration of residence in the enumeration slums till the survey date and location of previous residence. Duration of residence is categorized into three groups: <1 year, 1-2 year(s) and 3+ years; and location of previous residence into Dhaka urban area, other urban area, and rural area. As expected, duration of residence in enumeration slum is positively associated with any ANC visit in either area in each survey. In 2011, any ANC visit for the most recent birth in the project area was 86% among women who lived <1 year, 91% among women who lived 1-2 year(s), and 94% among women who lived 3 +years or always. Respective figures in the comparison area were 74%, 86% and 82%. Women's previous place of residence did not show any systematic difference in the coverage of any ANC visit in either area.

Table 5.1.2. Percent distribution of women with live births in the last one year by number, timing, and place for ANC visit for the most recent pregnancy in Dhaka urban slums, 2007, 2009, and 2011

Number and timing of ANC visits and mean number of visits	Project area			Comparison area			BUHS
	2007	2009	2011	2007	2009	2011	
Number of ANC visits							
None	24.6	18.8	7.2	19.3	29.3	18.5	33.4
1	12.4	7.1	6.4	13.1	9.0	10.0	19.7
2	18.0	13.1	14.5	12.9	12.1	17.4	24.4
3	18.3	19.0	20.3	18.5	14.6	18.2	23.6
4+	26.6	41.7	51.6	36.3	34.5	35.9	33.0
Unknown	0.2	0.4	0.0	0.0	0.6	0.0	-
Mean number of visits per woman	**2.24**	**2.95**	**3.03**	**2.39**	**2.69**	**2.43**	**-**
Number of months pregnant at the time of first ANC visit							
No ANC visit	24.6	18.8	7.2	19.3	29.3	18.5	33.4
<4	28.0	31.9	34.9	33.3	31.2	29.4	37.6
4-5	28.9	31.5	39.5	33.1	24.4	35.6	40.0
6-7	13.7	13.9	14.3	10.3	10.4	13.9	18.3
8+	4.3	3.8	4.0	3.9	4.5	2.7	4.8
Don't know	0.6	0.1	0.1	0.0	0.2	0.0	0.2
Mean months pregnant at first visit	**4.42**	**4.33**	**4.37**	**4.19**	**4.21**	**4.37**	
Place of last ANC visit							
No ANC visit	24.6	18.8	7.2	19.3	29.3	18.5	
Home	2.4	4.7	12.4	0.9	9.9	15.7	
Pharmacy	0.4	0.0	0.4	0.7	0.0	0.2	
BRAC delivery hut	5.5	21.6	35.4	0.5	2.8	3.6	
Government hospital	17.7	14.1	13.4	18.8	17	25.1	
Private clinic/chamber	8.9	20.6	17.5	18.1	14.7	16.4	
NGO health centre	40.4	20.1	13.7	41.8	26.3	20.6	
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	
Total number	**672**	**1,013**	**1,136**	**612**	**536**	**562**	

'-' is for not available

The government recommends four or more ANC visits during pregnancy. Coverage of 4+ ANC visits increased from 27% in 2007 to 52% in 2011 in the project area compared to no increase in the comparison area between 2007 and 2011 (Table 5.1.2). The average number of ANC visits also showed gradual increase between 2007 and 2011 in the project area, but it was not the case in the comparison area. Average months pregnant at the first ANC visit centred around 4.3 months in either area over the years. For the last ANC visit, the use of BRAC delivery hut and private clinic (including doctor's chamber) increased in the project area but not in the comparison area over the years. While utilization of NGO health centres decreased in both areas over the years, utilization of government hospitals increased, but little in the comparison area.

Equality in 4+ ANC visits

Slum-dwellers are of low income but differ in education, skills, and earnings. Women are of different ages, birth-orders, education levels (measured with class passed), and economic conditions (measured by asset quintile). These biosocial variables influence the use of

maternal health services in slum and non-slum populations (BDHS 2007). Associations of these biosocial variables with coverage of 4 or more ANC visits are examined across years within the area and are presented in Table 5.1.3. Coverage of 4+ANC visits was higher for mothers with first-order birth than for mothers with four or higher-order births; for women with secondary education than for women with no education; and for mothers of the least poor households than for mothers of the poorest households in either area. Interestingly, the gaps between sub-groups of birth-order, education, and asset quintiles tended to become narrower in the project area but not in the comparison area over the years.

Table 5.1.3. Percent distribution of women who gave live births in the last one year and had 4+ ANC visits for the most recent pregnancy by parity, education, and household asset quintile in Dhaka urban slums, 2007, 2009, and 2011

Parity, education, and asset quintile	**Project area**			**Comparison area**		
	2007	2009	2011	2007	2009	2011
Birth-order						
1	30.2	45.9	53.0	38.8	43.9	46.7
2-3	18.6	41.1	53.4	28.2	30.4	31.8
4+	8.9	22.9	30.4	20.0	17.2	14.5
Ratio (order 4+ to 1)	**0.3**	**0.5**	**0.6**	**0.5**	**0.4**	**0.3**
Level of education of mothers (class passed)						
None	20.1	30.7	38.2	17.5	23.3	21.7
Primary (class I-V)	24.3	36.6	49.4	34.0	32.6	36.3
Secondary (class VI+)	46.2	53.7	61.1	57.1	51.3	47.7
Ratio (secondary to none)	**2.3**	**1.8**	**1.6**	**3.3**	**2.2**	**2.2**
Household asset quintile						
Poorest	19.0	25.0	39.1	16.6	17.3	19.2
Poorer	23.2	28.8	36.7	25.8	32.1	23.8
Poor	32.5	44.5	47.7	37.8	33.6	34.6
Less poor	33.8	47.4	52.0	49.2	42.4	49.6
Least poor	58.1	57.1	70.2	60.6	58.8	47.3
Ratio (least poor to poorest)	**3.1**	**2.3**	**1.8**	**3.7**	**3.4**	**2.5**
Total number	**672**	**1,013**	**1,136**	**612**	**536**	**562**

Pace of increase in the coverage of 4+ ANC visits over the years and reduction in social and economic inequalities are estimated undertaking logistic regression analysis separately for the project and the comparison areas. Table 5.1.4 shows the adjusted and unadjusted coverage for different categories of the variables considered in each area. The odds ratio shows the relative difference between categories within the area. Pace of increase (indicated by the odds ratio) in coverage has been higher in the project area than in the comparison area, possibly due to the Manoshi's project. The effect of longer durations relative to short duration (<1 year) of living in the enumeration slum on coverage of 4+ ANC visits was lower in the project area than in the comparison area. Coverage of 4+ ANC visits was much lower in four- or higher-order births compared to births of first order in either area. The odds ratio of receiving 4+ ANC visits among women with secondary or higher education compared to women with no

education was 1.78 times higher in the project area, and it was 2.56 times higher in the comparison area. The gap between asset quintiles was much larger in the comparison area than in the project area; for example, the odds ratio of receiving 4+ ANC visits among women belonging to the least poor quintile compared to women belonging to the poorest quintile was 2.76 times higher in the project area and 4.56 times higher in the comparison area. Such a large reduction in inequalities in the project area compared to the comparison area could be due to the Manoshi's project activities.

Table 5.1.5 presents the percent distribution of women by services and messages received during ANC visits for the most recent births in Dhaka urban slums in 2007, 2009, and 2011. The percentages of women who received different ANC services (except for height measurement and urine test) are higher in the project area than in the comparison area in

Table 5.1.4. Demographic and socioeconomic variables associated with women's 4+ ANC visits for the most recent pregnancy in the last one year in Dhaka urban slums, 2007, 2009, and 2011

Demographic and socioeconomic variable	Project area		Comparison area	
	% of 4+ ANC visits	Odds ratio[a] (95% CI)	% of 4+ ANC visits	Odds ratio[a] (95% CI)
Survey year				
2007	26.4	1.00	36.3	1.00
2009	41.7	1.63** (1.26-2.09)	34.5	1.44* (1.09-1.90)
2011	51.6	2.47** (1.90-3.19)	35.9	1.43* (1.06-1.95)
Duration of residence (yr)				
<1	32.2	1.00	28.9	1.00
2-3	41.2	1.13 (0.89-1.44)	38.6	1.25 (0.88-1.76)
3+	45.0	1.26* (1.00-1.60)	37.0	1.32 (0.97-1.81)
Birth-order				
1	43.0	1.00	41.9	1.00
2-3	45.1	0.87 (0.72-1.05)	30.7	0.65** (0.81-0.84)
4+	21.7	0.42** (0.30-.58)	16.9	0.35** (0.20-0.61)
Highest educational level				
None	29.2	1.00	20.8	1.00
Primary	39.1	1.68** (0.96-1.42)	34.5	1.58** (1.17-2.15)
Secondary+	56.2	1.78** (1.42-2.23)	52.4	2.56** (2.03-3.23)
Asset quintile				
Poorest	28.6	1.00	16.8	1.00
Poorer	30.9	0.96 (0.77-1.20)	28.2	1.69** (1.14-2.50)
Poor	41.3	1.54** (1.22-1.94)	35.0	2.19** (1.45-3.31)
Less poor	49.3	1.82** (1.35-2.46)	45.6	3.13** (2.09-4.70)
Least poor	61.7	2.76** (2.09-3.66)	56.1	4.56** (2.86-7.25)
All	**42.1**		**35.6**	
Wald Chi-square (12 df)		226.1, p<0.001		s258.9, p<0.001

[a)] All odds ratios are adjusted for clustering of maternity care to women of the same clusters and for all other variables
The dependent variable was coded 1 if women made 4+ANC visits, otherwise coded 0.
*p<0.05, **p<0.01

2011. ANC services that are more frequently used in these two areas in 2011 were: examination of the abdomen (70% versus 52% respectively), measurement of weight (67% versus 59% respectively), and measurement of blood pressure (62% versus 38% respectively). Invasive diagnostic services they used more often were: blood and urine tests and ultrasonography (23%, 21%, and 34% respectively in the project area, and 17%, 21%, and 26% respectively in the comparison area) with higher frequency in the project area in 2011 than in 2007 (11%, 18%, and 15% respectively) and in the comparison area in 2011.

Table 5.1.5. Percent distribution of women who gave live births in the last one year by services and messages received during ANC visits for the most recent pregnancy in Dhaka urban slums, 2007, 2009, and 2011

Services and messages	**Project area**			**Comparison area**			**BUHS**
received during ANC visit	2007	2009	2011	2007	2009	2011	
Services received during ANC visits[a]							
No ANC visit	24.6	18.8	7.2	19.3	29.3	18.5	-
Height measured	1.3	17.2	10.7	1.0	15.7	19.0	35.6
Weight measured	42.4	54.6	67.2	41.0	46.8	59.3	61.1
Blood pressure measured	27.2	45.4	61.6	28.9	29.3	37.9	59.6
Blood tested	11.5	20.0	23.1	16.5	14.4	16.9	24.2
Urine tested	18.0	22.1	20.9	22.2	19.4	21.4	35.6
Abdomen examined	60.9	49.0	69.6	57.8	36.0	51.6	-
Internal examination	0.7	4.0	2.3	1.6	2.2	2.1	-
Ultrasonography	14.6	29.3	33.8	25.5	24.8	26.5	19.9
Iron supplementation	11.6	4.8	11.0	8.3	8.2	9.1	50.9
Messages received during ANC visits[a]							
No ANC visit	24.6	18.8	7.2	19.3	29.3	18.5	
Delivery plan	3.7	7.6	18.5	5.2	9.5	19.0	
Breast-care	0.1	1.0	0.9	0.2	0.6	0.9	
Danger signs of pregnancy	1.8	13.7	13.8	3.8	4.9	8.4	
Facility delivery	2.7	9.8	5.0	4.9	8.8	3.0	
Danger signs of newborns	0.7	2.7	4.8	1.8	1.7	2.7	
Essential newborn's care	1.2	2.1	3.7	2.0	2.8	3.0	
Use of clean delivery kit	0.3	0.3	1.1	0.2	0.2	0.4	
Iron supplementation	17.1	11.8	38.9	13.7	15.7	28.8	
Vitamin A intake	16.4	7.8	27.2	13.7	9.5	19.8	
Advice on proper diet	62.2	51.8	72.3	65.4	39.0	53.2	
Advice to take rest	43.3	50.0	64.1	47.5	45.5	46.4	
Advice on not to lift heavy items	43.0	44.2	49.0	46.1	40.9	31.3	
Advice on regular check-ups	13.2	17.6	17.4	16.0	11.4	14.1	
Referral	0.0	0.1	0.4	0.2	0.0	0.2	
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	
Total number	**672**	**1,013**	**1,136**	**612**	**536**	**562**	

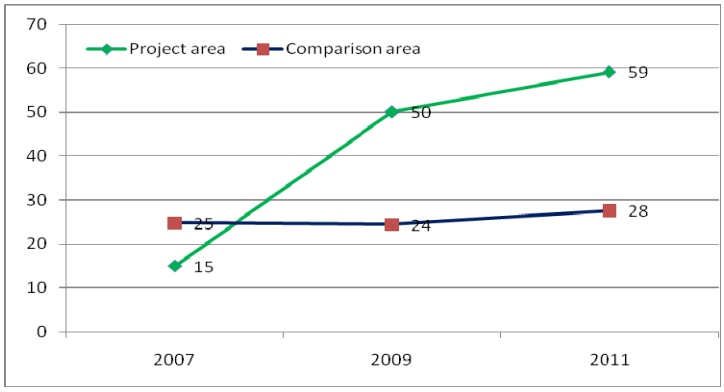
[a]Multiple responses were allowed

During ANC visits, more women received advices (except for proper diet) in 2011 than in 2007 in either area with a difference between areas. Advices were more frequent in the project area than in the comparison area. Advice most often received in both areas was on: proper diets (72% versus 53%), followed by taking more rest (64% versus 46%), intake of iron supplementation (39% versus 29%) and not to lift heavy items (49% versus 31%).

Delivery care

Proper medical care and hygienic conditions during delivery can reduce the risk of complications and infections that may cause death of the mother and the baby. Hence, it is important to increase the proportion of births delivered in a safe and clean environment and under supervision of health professionals. Table 5.1.6 presents the percent distribution of women by place of delivery by duration of living in the enumeration slum and previous place of living in Dhaka urban slums in 2007, 2009, and 2011. There has been a change in place of delivery; the percentage of institutional delivery increased at a faster rate (from 15% in 2007 to 59% in 2011) in the project area than the comparison area (from 25% in 2007 to 28% in 2011) over the same period (Figure 5.2). Major types of institutions in either area are: government hospitals, private clinics, and NGO health centres. In the project area, BRAC delivery hut emerged as a common place for delivery over the years. For delivering baby in 2011, 23% of women used BRAC delivery hut, followed by government hospital and private clinic/chamber (14% each) in the project area compared to 14% in government hospitals, followed by private clinic/chamber (7%) in the comparison area in 2011.

Figure 5.2: Percentage of institutional delivery by area and year



Institutional delivery increased by 44% points in 2011 from 15% points in 2007 in the project area opposed to increase by 3% points in 2011 from 25% points in 2007 in the comparison area

Table 5.1.6. Percent distribution of women by residence status and place of delivery with live births in the last one year in Dhaka urban slums, 2007, 2009, and 2011

	Project area			Comparison area			BUHS
Place of delivery of last live birth	2007	2009	2011	2007	2009	2011	
Home	**85.1**	**49.9**	**40.8**	**75.2**	**75.6**	**72.4**	**87.6**
Institutional delivery	**14.9**	**50.1**	**59.2**	**24.8**	**24.4**	**27.6**	**12.4**
Government hospital	5.8	11.7	14.3	7.4	11.2	13.9	6.8
BRAC delivery hut	1.2	19.2	23.1	0.0	3.0	3.0	
Private clinic/chamber	2.5	15.1	14.6	9.0	6.7	7.1	5.5
NGO health centre	4.6	3.7	7.1	8.3	3.5	3.6	
Other	0.7	0.4	0.1	0.2	0.0	0.0	0.1
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	
Duration of residence in enumeration slum ------- % of institutional delivery							
<1 year	15.1	38.3	49.6	22.7	22.5	25.5	
1-2 year(s)	11.8	46.0	53.7	27.7	18.8	29.5	
3+ years	16.1	54.0	62.2	24.7	27.0	27.7	
Place of previous residence							
Dhaka urban area	14.8	55.9	68.8	27.7	33.9	34.4	
Other urban area	14.3	54.4	55.6	26.7	17.5	22.7	
Rural area	15.2	42.8	51.7	20.6	15.3	23.8	
Total number	**672**	**1,013**	**1,136**	**612**	**536**	**562**	

Duration of residence in the enumeration slum is positively associated with institutional delivery in the project area, but not in the comparison area. In 2011, the percentage of institutional delivery in the project area was the highest, 62% among women who have been living in current slums for three or more years, followed by 54 percent among by women living for 1-2 year(s) and 50% among women living for less than one year. Previous place of living, a proxy for migration status, also influenced the percentage of institutional delivery. For example, the percentage of institutional deliveries was the lowest among women who migrated to Dhaka urban slums from rural areas (52 percent), followed by women who migrated from other urban areas (56%) and women who have always been living in Dhaka urban areas (69%) in the project area in 2011. The respective figures in the comparison area are 24%, 23%, and 34%.

Equity in Institutional Delivery

Differentials in institutional delivery by women's parity, education, and household asset quintiles are estimated across years within each area (Table 5.1.7). The percentage of institutional delivery has been higher for the first-order births than for four or higher-order births; for women with secondary or more education than for women with no education; and

for women from the least poor households than for women from the poorest households in either area. Interestingly, the differentials reduced more in the project area than in the comparison area over the years. For example, the ratios of the percentage of institutional delivery in women with secondary education (or women of least poor households) to the percentage of women with no education (or women of the poorest households) tend to be narrower in the project area than in the comparison area over the years.

Table 5.1.7. Percent distribution of women who had institutional delivery with live births in the last one year by parity, level of education, and asset score in Dhaka urban slums, 2007, 2009, and 2011

Demographic and socioeconomic variable	Project area and year			Comparison area and year		
	2007	2009	2011	2007	2009	2011
Parity of women						
1	15.0	51.0	61.0	26.6	31.7	33.0
2-3	10.8	49.9	58.8	17.6	22.2	25.9
4+	12.5	42.7	48.1	14.3	6.9	14.8
Ratio (4+ to 1)	**0.8**	**0.8**	**0.8**	**0.5**	**0.2**	**0.4**
Women's education (class passed)						
None	11.6	39.3	51.5	10.0	16.0	14.6
Primary (class I-V)	10.4	45.8	53.7	25.1	21.5	25.7
Secondary (class 6+)	26.5	60.6	67.9	39.0	38.6	41.4
Ratio (secondary to none)	**2.3**	**1.5**	**1.3**	**3.9**	**2.4**	**2.8**
Household asset quintile						
Poorest	9.7	37.2	42.1	11.9	12.6	13.7
Poorer	14.0	38.0	47.6	15.3	12.4	21.4
Poor	11.1	48.5	57.4	22.5	30.8	22.1
Less poor	20.0	53.6	61.3	30.3	36.5	35.8
Least poor	39.5	66.0	73.8	50.0	42.5	43.3
Ratio (Least poor to poorest)	**4.1**	**1.8**	**1.8**	**4.2**	**3.4**	**3.2**
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**672**	**1,013**	**1,136**	**612**	**536**	**562**

Rate of increase in institutional delivery over the years and reduction in inequalities between different categories of the biosocial variables are estimated using logistic regression analysis. Table 5.1.8 shows the unadjusted (in terms of percentage of institutional delivery) and adjusted rate (in terms of odds ratio) between different categories of the same variables in each area. The odds ratios of having an institutional delivery in 2009 and 2011 with reference to 2007 are respectively 5 times and 7.2 times higher in the project area and 1.5 times and 1.7 times higher in the comparison area. Such high odds ratios in the project area are possible due to the Manoshi's project activities. The effects of duration of living in the enumeration slum and birth-order on institutional delivery are not big compared to the effects of level of education and asset quintile in either area. The odds ratio of having an institutional delivery among women with secondary education compared to women with no education was 1.6 times higher in the project area and 2.7 times higher in the comparison area. Similarly, the odds ratio of having an institutional delivery among women belonging to the least poor quintile compared to women belonging to the poorest quintile was 2.8 times higher in the

project area and 4.3 times higher in the comparison area. Such large reductions in education and economic inequalities in the project area compared to the comparison area could be due to the interventions of the project.

Table 5.1.8. Demographic and socioeconomic variables associated with women's institutional delivery with live births in the last one year in Dhaka urban slums, 2007, 2009, and 2011

Demographic and socioeconomic variable	Project area		Comparison area	
	% of institutional delivery	Odds ratio[a] (& 95% CI)	% of institutional delivery	Odds ratio[a] (& 95% CI)
Survey year				
2007	14.9	1.00	24.8	1.00
2009	50.1	4.97** (3.56-6.96)	24.4	1.51 *(1.02-2.22)
2011	59.1	6.27** (4.42-8.90)	24.6	1.60* (1.07-2.38)
Number of ANC visits				
none	16.5	1.00	8.1	1.00
1-2	31.7	2.01** (1.33-3.02)	16.9	1.95** (1.32-2.89)
3-4	50.9	3.68** (2.51-5.41)	29.8	3.30** (2.13-5.11)
5-7	66.4	6.00** (4.02-8.93)	43.7	5.32** (3.82-7.41)
8+	65.6	7.31** (4.36-12.3)	50.5	6.74** (3.84-11.8)
Duration of residence (year)				
<1	31.1	1.00	23.4	1.00
2-3	40.7	0.92 (0.69-1.22)	25.7	0.80 (0.57-1.11)
3+	50.7	1.25 (0.94-1.66)	26.4	0.91 (0.70-1.19)
Birth-order				
1	42.6	1.00	29.5	1.00
2-3	51.0	0.95 (0.77-1.18)	23.2	0.89 (0.67-1.17)
4+	37.4	1.09 (0.79-1.51)	11.7	0.55* (0.31-0.98)
Highest educational level				
None	33.6	1.00	13.4	1.00
Primary	40.9	0.96 (0.78-1.18)	24.3	1.51* (1.03-2.23)
Secondary+	60.0	1.37** (1.08-1.73)	39.9	2.16** (1.49-3.11)
Asset quintile				
Poorest	31.6	1.00	12.1	1.00
Poorer	37.5	1.11 (0.86-1.44)	17.0	1.12 (0.73-1.73)
Poor	41.9	1.24 (0.90 -1.73)	25.4	1.69* (1.09-2.62)
Less poor	51.6	1.47** (1.11-1.95)	33.5	2.22** (1.49-3.30)
Least poor	65.6	2.20** (1.59-3.04)	43.2	2.97** (1.92-4.59)
All	**45.4**		**25.6**	
Wald Chi-square (12 df)		533.0, p<0.001		310.3, p<0.001

[a]All odds ratios are adjusted for clustering of maternity care to women of the same clusters and for all other variables.
The dependent variable was coded 1 if women who delivered made any PNC visit, otherwise coded 0.
*p<0.05, **p<0.01

Table 5.1.9 presents the percent distribution of women by assistance received during delivery and mode and procedure of delivery in Dhaka urban slums in 2007, 2009, and 2011. Distribution of delivery assistance women received during the most recent childbirth changed over the years, and the change was larger in the project area than in the comparison area. As expected, the use of BRAC midwife increased, and that of trained and untrained TBA

decreased over the years in the project area only. Use of qualified doctor for delivery increased in both areas over the years. In 2011, deliveries were assisted more frequently by qualified doctors (28%), followed by BRAC midwife (23%) and nurse/midwife/family welfare visitor (9%) in the project area than in the comparison area where deliveries were attended by qualified doctor (17%), followed by BRAC midwife (3%), and nurse/midwife/family welfare visitor (8%).

The mode of deliveries changed at a faster rate in the project area than in the comparison area over the years. In the project area, caesarean-section increased from 6% in 2007 to 18% in 2009 and to 24% in 2011 whereas, in the comparison area, it increased from 11% in 2007 to 12% in 2009 and to 14% in 2011. The procedure used in delivery has also undergone some changes over time; the use of drip has gone down in both areas over the years. Use of injection and saline increased in the project area but not in the comparison area over the years.

Table 5.1.9. Percent distribution of women by assistance, mode and procedure in delivery with live births in the last one year in Dhaka urban slums, 2007, 2009, and 2011

	Project area			Comparison area			BUHS
Assistance during delivery[1]	2007	2009	2011	2007	2009	2011	
None	0.9	0.1	0.3	0.5	0.2	0.5	0.8
BRAC midwife	0.9	14.3	23.2	0.0	2.2	3.0	
BRAC Shashthya Sebika	0.3	3.8	1.1	0.3	1.3	0.7	6.4
MA/SACMO[3]	1.0	0.2	0.2	1.3	0.6	0.2	
Nurse/midwife/family welfare visitor	4.8	9.8	9.2	9.8	7.6	8.0	
Qualified doctor	7.6	21.7	28.4	14.2	14.0	17.4	11.4
Pharmacist	0.1	0.0	0.1	0.0	0.0	0.0	
Relative/neighbour	6.3	2.4	1.1	8.3	2.4	2.8	11.2
Untrained TBA	58.0	29.6	22.9	44.0	43.1	42.2	53.7
Trained TBA	20.1	18.1	13.6	21.6	28.5	25.1	16.2
Mode of delivery							
Normal delivery	92.3	78.6	74.8	85.1	84.3	85.1	
Assisted delivery (vacuum, forceps, etc)	1.6	3.4	1.1	3.6	3.5	0.7	
Caesarean-section	6.1	18.1	24.0	11.3	12.1	14.2	
Procedures used in delivery[2]							
Injection	28.9	34.8	40.2	40.8	32.8	40.4	
Saline	27.2	39.0	41.3	37.4	33.0	35.2	
Drip	15.2	15.5	6.8	23.2	16.4	8.9	
Episiotomy	3.0	4.1	3.2	8.5	4.3	2.7	
Change foetal position	1.8	1.1	0.3	7.8	1.7	1.4	
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	
Total number	**672**	**1,013**	**1,136**	**612**	**536**	**562**	

[1]The person who actually caught the baby; [2]Multiple responses; [3]medical assistant/sub-assistant community medical officer

Caesarean-section delivery

The percentage of births by caesarean-section (C-section) is often considered a proxy for women's access to skilled care for complicated deliveries. Table 5.1.10 shows the percentage of live births in the last one year delivered by C-section for socioeconomic variables. Delivery by C-section increased in the project area over the years in than the comparison area. C-section was more frequent among women living in the enumeration slum for longer period than for shorter period; and among women with first-order births than for higher-order births. Education level and asset quintile were associated with C-section deliveries; in 2011, more than one-third of women in the project area, who had at least secondary education or who belonged to the least poor quintile delivered by C-section compared to 14% of women who had no education or 10% of women who belonged to the poorest quintile. In 2011, one-fourth of women in the comparison area, who had at least secondary education or who belonged to the least poor quintile delivered by C-section compared to 6% of women with no education or 4% of women who belonged to the poorest quintile. The gap in caesarean-section between the poorest and the least poor women decreased in the project area but not in the comparison area over the years.

Table 5.1.10. Percent distribution of women who had cesarean-section delivery with live births in the last one year by duration of residence, parity, level of education, and asset quintile in Dhaka urban slums, 2007, 2009, and 2011

Duration of residence, parity, level of education, and asset score	**Project area**			**Comparison area**		
	2007	2009	2011	2007	2009	2011
Overall	6.1	18.1	24.0	11.3	12.1	14.2
Duration of residence (yr)						
<1	5.8	14.3	18.4	9.8	11.8	11.2
1-2	4.2	13.8	25.1	10.2	8.0	15.5
3+	7.1	20.3	24.6	12.5	13.7	14.6
Parity						
1	6.6	19.3	29.8	12.4	16.3	17.2
2-3	4.9	18.1	19.9	8.2	10.5	13.1
4+	3.6	11.5	13.9	2.9	3.5	8.2
Ratio (4+ to 1)	0.6	0.6	0.5	0.2	0.2	0.5
Women's education (class passed)						
None	4.1	8.3	14.7	5.2	8.7	6.0
Primary (class I-V)	4.1	12.4	17.1	11.0	8.7	13.1
Secondary (class 6+)	14.4	30.0	35.2	17.6	20.3	23.0
Ratio (secondary to none)	3.5	3.6	2.4	3.4	2.3	3.8
Household asset quintile						
Poorest	2.8	6.7	10.3	2.3	5.2	4.1
Poorer	3.8	8.7	16.0	6.2	6.7	8.5
Poor	5.4	12.1	23.7	5.7	17.1	12.6
Less poor	5.9	21.0	30.0	15.0	15.6	25.5
Least poor	19.1	35.5	38.8	20.4	23.6	29.7
Ratio (Least poor to poorest)	**6.8**	**5.3**	**3.8**	**8.9**	**4.5**	**7.2**
Total number	**672**	**1,013**	**1,136**	**612**	**536**	**562**

As distributions of the women interviewed in three surveys by residence status, education, and household possessions of durable assets are similar, some of the increases in the usage of maternal health services may be due to differences in social and economic conditions, in addition to the project effects. Logistic regression model is fitted to estimate the effects of the variables, controlling simultaneously for other variables; the results are presented in Table 5.1.11. The odds ratios show an increase in C-section over the years in each area; and the likelihood was higher in the project area than in the comparison area. The education differential in C-section was comparable in both areas, but the economic (indicated by asset quintile) differential was lower in the project area than in the comparison area.

Table 5.1.11. Demographic and socioeconomic variables associated with women's C-section delivery with live births in the last one year in Dhaka urban slums, 2007, 2009, and 2011

Demographic and socioeconomic variable	**Project area**		**Comparison area**	
	% of C-sections	Odds ratio[a] (95% CI)	% of C-sections	Odds ratio[a] (95% CI)
Survey year				
2007	6.10	1.00	11.27	1.00
2009	18.07	2.74** (1.91-3.94)	12.13	1.68* (1.07-2.64)
2011	24.03	4.12** (2.72-6.23)	14.23	2.00 **(1.33-3.01)
Duration of residence (year)				
<1	11.66	1.00	10.74	1.00
2-3	15.80	0.88 (0.60-1.29)	11.38	0.77 (0.49-1.20)
3+	19.80	1.19 (0.85-1.65)	13.62	1.03 (0.68-1.57)
Birth-order				
1	18.64	1.00	14.47	1.00
2-3	17.71	0.68** (0.54-0.87)	11.36	0.75 (0.52-1.09)
4+	10.43	0.66 (0.41-1.08)	5.19	0.37* (0.17-0.83)
Highest educational level				
None	8.73	1.00	6.69	1.00
Primary	12.38	1.03 (0.78-1.35)	11.17	1.30 (0.89-1.91)
Secondary+	30.39	2.28** (1.76-2.96)	20.11	2.00* *(1.37-2.93)
Household asset quintile				
Poorest	6.86	1.00	4.05	1.00
Poorer	10.31	1.27 (0.83-1.94)	7.18	1.67 (0.87-3.21)
Poor	15.54	2.03** (1.43-2.88)	11.86	2.77** (1.45-5.29)
Less poor	21.82	2.58 ** (1.74-3.81)	18.13	4.59** (2.57-8.19)
Least poor	34.57	4.43** (3.20-6.12)	23.43	6.29** (3.10-12.75)
All	**45.4**		**25.6**	
Wald Chi-square (12 df)	**291.8, p<0.001**		**142.7, p<0.001**	

[a)] All odds ratios are adjusted for clustering of maternity care to women of the same clusters and for all other variables. The dependent variable was coded 1 if women who delivered in made any PNC visit, otherwise coded 0.
*p<0.05, **p<0.01

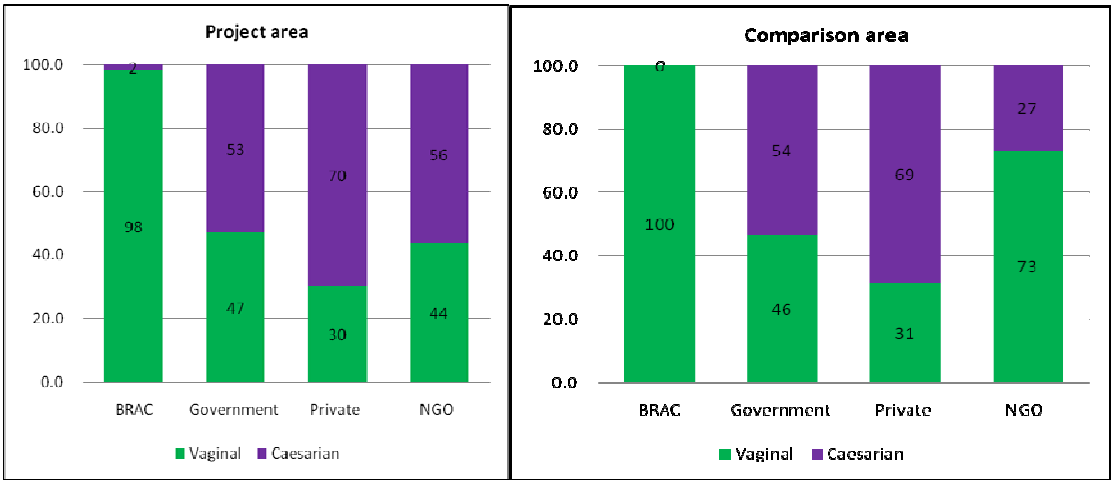
C-section delivery opens scopes for generating income, and the rate of C-section may be higher in private for-profit clinics than non-profit making clinics or hospitals. The Manoshi's project has signed an MOU (memorandum of understanding) with some public, private and NGO clinics or hospitals to refer pregnancy with complications for delivery services at negotiable rates. Table 5.1.12 shows the rate of C-sections deliveries by type of institution in each area in 2007, 2009, and 2011. Though the rate of C-section increased to a little extent among deliveries conducted in the government hospitals, the rate gradually increased at a higher rate in deliveries conducted in the private clinics in either area over the years. The rate of C-section in NGO health centres also increased at a rate lower than that in private clinic over the years in the project area but not in the comparison area.

Table 5.1.12. Percentage of normal and C-section deliveries by place of delivery with live births in the last one year in Dhaka urban slums, 2007, 2009, and 2011

Project area	2007			2009			2011		
	Normal	C-section	N	Normal	C-section	N	Normal	C-section	N
Place of delivery									
Home	100.0	-	572	100.0	-	505	100.0	-	462
BRAC delivery hut	100.0	-	8	100.0	-	189	100.0	-	261
Government hospital	48.7	51.3	39	49.6	50.4	119	44.8	55.2	163
Private clinic	58.8	41.2	17	36.6	63.4	153	21.8	78.2	165
NGO health centre	58.1	41.9	31	45.9	54.1	37	37.0	63.0	81
Other	80.0	20.0	5	40.0	60.0	10	25.0	75.0	4
Number			**672**			**1013**			**1136**
Comparison area	2007			2009			2011		
	Normal	C-section	N	Normal	C-section	N	Normal	C-section	N
Place of delivery									
Home	100.0		459	100.0		405	100.0		406
BRAC delivery hut	0.0		0	100.0		16	100.0		17
Government hospital	51.1	48.9	45	43.3	56.7	60	46.2	53.8	78
Private clinic	43.6	56.4	55	22.2	77.8	36	22.5	77.5	40
NGO health centre	70.6	29.4	51	84.2	15.8	19	70.0	30.0	20
Other	50.0	50.0	2	0.0	0.0	0	0.0	100.0	1
Number			**612**			**536**			**562**

Figure 5.1.2 shows percentage of caesarean-section and vaginal delivery among institutional deliveries by type of institution in Dhaka urban slums in 2007, 2009, and 2011. About two-thirds of deliveries in private clinics were done through C-section compared to about half of deliveries in government hospitals have under gone through C-section in either area.

Figure : 5.1.2 Percentage of caesarean-section and vaginal delivery among institutional deliveries



Out-of-Pocket Expenditure for Delivery

Pregnancy can become complicated anytime, and one needs to be prepared to face the emergency. Preparation includes planning for place of delivery, contact with skilled birth attendant to be present during delivery, and saving some money to pay extra expenses long before the delivery. Women were asked about out-of-pocket expenditure they made for delivery, assistance during delivery, delivery complications and medicine, transportation, and others if any for delivery of the baby born in the last one year in 2007, 2009, and 2011. Table 5.1.13 shows the percentage of women who did not make out-of-pocket expenditure for delivery by mode and place of delivery and by area and year. The overall percentage of deliveries, costing no money, increased in 2009 and declined substantially in 2011 compared to 2007 in either area. As expected, the percentage of deliveries with no out-of-pocket expenditure was higher for normal deliveries at home than for normal deliveries at institutions. A few cases of C-sections were performed in 2007 and also in 2009 with out-of-pocket expenditure.

Table 5.1.13. Percent distribution of deliveries with live births in the last one year without out-pocket expenditure by mode of delivery in Dhaka urban slums, 2007, 2009, and 2011

Mode and institute of delivery	**Project area**			**Comparison area**		
	2007	2009	2011	2007	2009	2011
Normal delivery at home	40.7	54.1	14.0	29.6	44.9	8.1
Normal delivery at institution	17.0	38.2	15.5	3.6	7.6	1.3
Caesarean-section	2.4	3.3	0.0	5.9	0.0	0.0
Overall	36.3	39.8	11.2	23.4	34.9	6.1
Total number	**672**	**1,013**	**1,136**	**612**	**536**	**562**

Table 5.1.14 shows out-of-pocket expenditure for the women who delivered in the last one year by mode and place of delivery and by area and year. Mean and median of out-of-pocket expenditure for a normal (including assisted) delivery in a health facility increased over the years, and the rate of increase was higher in the project area than in the comparison area. Expenditure for caesarean-section increased two-folds in either area over the years.

Table 5.1.14. Mean and median of out-of-pocket expenditure by mode of delivery with live births in the last one year in Dhaka urban slums, 2007, 2009, and 2011

Mode and place of delivery	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Normal delivery at home						
Mean	554	684	1452	903	771	1821
Median	180	200	1000	400	250	1000
Number[a]	**569**	**505**	**458**	**457**	**405**	**406**
Normal delivery at institution						
Mean	2379	2071	2181	3917	2268	3823
Median	805	500	1000	2025	1560	3000
Number[a]	**58**	**324**	**400**	**82**	**65**	**76**
Caesarean-section						
Mean	10396	12099	12714	12332	11366	11289
Median	10000	10000	11200	10700	10000	10000
Number[a]	**41**	**182**	**269**	**67**	**65**	**79**
TotalNumber[a]	**668**	**1011**	**1127**	**606**	**535**	**561**

[a]Excluded cases with no out-of-pocket expenditure and very few cases with unknown out-of-pocket expenditure

Out-of-pocket expenditure for delivery care is disaggregated by type of institutions, and the results are presented in Table 5.1.15. As expected, expenditures for normal and C-section deliveries were the highest in a private clinic, followed by an NGO health centre and government hospital. Surprisingly, delivery expenditure in an NGO health centre and in a government hospital were comparable, though services in government hospitals were free of charge. Expenditure for normal (and possibly less complicated) delivery was the lowest in BRAC birthing huts compared to other institutions.

Table 5.1.15. Average out-of-pocket expenditure by institution of delivery with live births in the last one year in Dhaka urban slums, 2007, 2009, and 2011

	2007		2009		2011	
			Project area			
Normal delivery at	N	Average	N	Average	N	Average
BRAC delivery hut[1]	8	591	188	745	261	895
Government hospital	18	1470	59	2759	73	4657
Private clinic	10	5992	56	6012	36	6407
NGO health centre	22	2131	21	1495	30	2272
C- section at						
Government hospital	20	11294	60	7422	90	10079
Private clinic	7	12130	97	15918	129	15518
NGO health centre	14	8248	25	8505	50	9649
			Comparison area			
Normal delivery at	N	Average	N	Average	N	Average
BRAC delivery hut	--	--	16	875	17	1386
Government hospital	22	3173	26	2414	36	4461
Private clinic	23	6110	8	5413	9	6676
NGO health centre	37	2995	15	1823	14	3310
C-section at						
Government hospital	22	9428	34	8413	42	8339
Private clinic	30	17275	28	15492	31	15573
NGO health centre	15	6705	3	6333	6	9800

[1]BRAC delivery huts conduct less-complicated normal delivery and refer the complicated cases

The women were asked about sources of out-of-pocket expenditure they incurred for delivery of the baby born in the last one year in either area; the results are disaggregated by place of delivery, and presented in Table 5.1.16. The most common sources of money were: family fund and savings for delivery purpose for each type of delivery. Though three in four women saved money in advance to pay for delivery expenditure (Table 4.3.1), own saving was not the most frequent source. Use of family fund was more frequent for C-sections than for normal delivery in either area. The less common sources were borrowing money from relatives and non-relatives in either area.

5.1.16. Percent distribution of women by source of out-of-pocket expenditure and mode and place of delivery with live birth in the last one year in Dhaka urban slums, 2007, 2009, and 2011

Source of money	Normal at home			Normal at institution			C-section		
	2007	2009	2011	2007	2009	2011	2007	2009	2011
	Project area								
Saving for delivery	18.9	13.1	32.8	32.2	19.4	37.4	34.2	43.2	41.0
Family fund	27.1	33.9	46.8	40.7	44.9	43.9	39.0	70.0	56.5
Borrowing	9.1	1.6	3.7	10.2	3.4	7.0	24.4	15.3	13.7
Relative	9.8	7.3	9.5	10.2	9.5	6.5	39.0	15.9	11.4
Asset sale/mortgage	0.5	0.2	0.2	0.0	0.3	0.0	7.3	1.1	0.4
[a]Number of deliveries with out-of-pocket expenditure	**572**	**505**	**464**	**59**	**325**	**401**	**41**	**183**	**271**
	Comparison area								
Saving for delivery	23.0	11.9	29.2	29.8	22.7	39.5	25.0	32.3	36.7
Family-fund	39.8	41.0	55.3	52.4	65.2	48.7	44.1	81.5	49.4
Borrowing	6.1	3.7	5.7	13.1	7.6	9.2	30.9	23.1	16.5
Relative	8.9	7.9	8.1	14.3	15.2	9.2	11.8	32.3	19.0
Asset sale/mortgage	0.2	0.3	0.0	0.0	1.5	0.0	5.9	7.7	1.3
[a]Number of deliveries with out-of-pocket expenditure	**460**	**405**	**407**	**84**	**66**	**76**	**68**	**65**	**79**

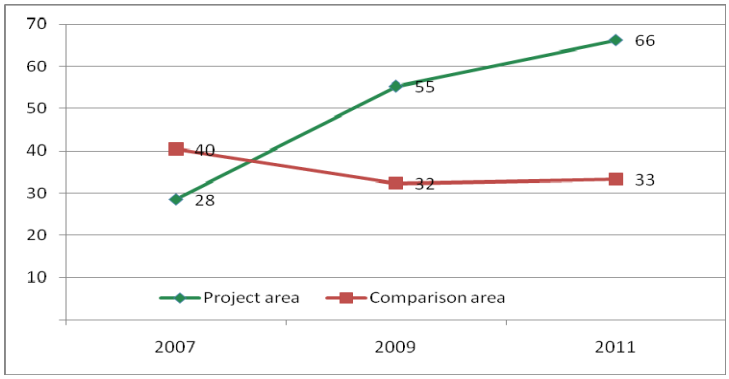
[a]Excluded cases with no out-of-pocket expenditure and very few cases with unknown out-of-pocket expenditure

Postnatal care

Postnatal care (PNC) is important for early detection and treatment of complications arising from delivery, especially for births that occur at home. Postnatal check-ups also offer an opportunity to counsel mothers on how to care for themselves and their newborns. In the past, use of PNC in Bangladesh has not been as emphasized as antenatal care. As a result, the use-rates of PNC have always been well below the use-rates of ANC. The PNC use-rates have been rising slowly since the introduction of the maternal health strategy which encourages use of PNC. It may be mentioned that there are cultural restrictions among the Hindus on mothers and their new babies to remain in the house for the first forty days after delivery. If enforced, this is obviously a barrier to early use of PNC as well as other services, such as expanded project on immunization–EPI (for BCG in particular). In order to assess the extent of PNC-use, every woman who has a birth in the last one year preceding the survey was asked whether she or her child received any check-up after delivery and about residence status; the results are presented in Table 5.1.17. The proportion receiving PNC among the sampled women increased from 28% in 2007 to 55% in 2009 and to 66% in 2011 in the project area. It was not the case in the comparison area where the proportion rather decreased

from 40% in 2007 to 32% in 2009 and to 33% in 2011. Residence status, particularly long duration of living in enumeration slums was associated with increased access to PNC in the project area but not in the comparison area. In 2011, PNC in the project area was the highest– 69% among women who was living in the enumeration slums for three or more years, followed by 61% among women living for 1-2 year(s), and 55% among women living for less than 1 year. It was not the case in the comparison area; the respective figures were 32%, 34%, and 37% in 2011. Women's previous place of living also influenced the coverage of PNC; it was the highest (75%) among women who had always been living in Dhaka urban slums, followed by 63% among women migrating from other urban areas and 59% among women migrating from rural areas.

Figure 5.1: Percentage of women who received any PNC by area and year



Between 2007 and 2011, coverage of PNC visits increased by 36% points in the project area opposed to 9% points in the comparison area

Table 5.1.17. Percent distribution of women who had PNC visits with live births in the last one year in Dhaka urban slums, 2007, 2009, and 2011

Residence status	Project area			Comparison area			BUHS
	2007	2009	2011	2007	2009	2011	
Duration of residence in enumeration slum (year)							
<1	27.8	40.6	55.2	36.2	36.3	36.7	
1-2	27.8	51.3	61.2	43.1	24.1	34.1	
3+	29.1	59.6	69.4	41.3	33.9	31.9	
Place of previous residence							
Dhaka urban area	28.4	61.0	74.8	43.1	42.0	40.4	
Other urban area	34.7	55.9	63.4	43.3	33.3	30.1	
Rural area	27.2	48.5	59.3	36.2	20.7	27.4	
Over all	28.4	55.3	66.2	40.4	32.3	33.3	17.9
Total number	**672**	**1,013**	**1,136**	**612**	**536**	**562**	

Women were asked about number and place of PNC visits, and within how many days of delivery the check-up took place; the results are presented in Table 5.1.18. The percentage of women who received one PNC visit after delivery increased because of increase in institutional delivery over the years in the project area but not in the comparison area. There was an increase in percentage of women with second or third PNC visit in project area over the years. It rather decreased in the comparison area. On enquiry about number of days after delivery for PNC visits, more women, 62% received PNC on the same day (the day of the birth is also the day of receiving PNC) in the project area compared to 28% in the comparisons area in 2011.

Percents distribution of the place of the first PNC visit shows some changes over the years within the areas. The use of BRAC delivery huts increased from 2% in 2007 to 19% in 2009 and to 24% in 2011 in the project area. While the use of government hospitals increased in both areas, the use of private clinics increased in the project area but decreased in the comparison area over the years. NGO health centre were used less frequently in either area over the years.

Table 5.1.18. Percent distribution of women by PNC visit with live births in the last one year in Dhaka urban slums, 2007, 2009, and 2011

Number and timing of	Project area			Comparison area			
PNC visits	2007	2009	2011	2007	2009	2011	BUHS
Number of PNC visits							
None	71.6	44.7	33.8	59.6	67.7	66.7	
1	14.6	40.0	29.3	18.1	20.9	14.9	
2	5.7	6.7	16.5	8.5	3.4	9.6	
3+	8.0	8.1	19.7	13.4	7.8	8.7	
Don't know	0.1	0.5	0.7	0.3	0.2	0.0	
Number of days after delivery for PNC visit							
No PNC visit	71.6	44.7	33.8	59.6	67.7	66.7	82.1
Same day	15.3	50.5	61.7	25.7	24.6	28.3	
1-2 days	2.1	1.3	1.6	1.5	1.3	0.9	13.7
3-7 days	3.9	1.6	1.7	3.6	2.2	1.8	1.1
8 days – 1 month	3.6	1.2	1.1	5.2	2.1	2	3.1
1 month+	2.8	0.7	0.2	4.1	2.1	0.4	17.9
Don't know	0.7	0	0	0.3	0	0	0.1
Place of first PNC visits							
No PNC visit	71.6	44.7	33.8	59.6	67.7	66.7	
Home	1.6	1.8	4.2	1.0	1.1	1.1	
BRAC delivery hut	1.8	19.4	23.6	0.0	3.2	3.0	
NGO health centre	6.0	3.8	7.7	9.2	3.5	5.3	
Private clinic	3.9	16.1	15.0	11.1	8.4	7.7	
Government hospital	6.8	12.6	15.3	10.3	12.3	15.5	
Pharmacy/chamber	8.3	1.6	0.4	8.8	3.7	0.7	
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	
Total number	**672**	**1,013**	**1,136**	**612**	**536**	**562**	

BUHS refers to 2006 Bangladesh Urban Health Survey

Equity in postnatal care

Differentials in PNC by parity, level of women's education, and household asset quintiles were estimated across years within each area (Table 5.1.19). Percentage of receiving PNC was higher for women with first parity than for women with four or higher parity, for women with secondary education than women with no education, and for women of the least poor households than women of the poorest households in either area. As expected the odds ratio between different categories of parity, education, and asset quintiles tended to be lower in the project area than in the comparison area over the years.

Chances of receiving PNC over the years and reduction in inequalities between different categories of the same variables were estimated using logistic regression analysis; the results are presented in Table 5.1.19. The odds ratios of receiving PNC in 2009 and 2011 with reference to 2007 were 2.54 times and 4.05 times higher in the project area, and these are comparable in the comparison area. Such a difference was due to the Manoshi's project activities. Duration of living for three or more years compared to less than 1 year in the enumeration slum was associated with higher odds ratio of receiving PNC visit in the project area only. The odds ratio of receiving PNC visit was lower for higher-order births compared to the first-order births in the comparison area, and it was not the case in the project area. The odds ratio of receiving PNC among women with secondary education compared to women with no education was 1.68 times higher in the project area and 2.36 times higher in the comparison area. Similarly, the odds ratio of receiving PNC among women belonging to the least poor quintile compared to women belonging to the poorest quintile was 2.61 times higher in the project area and 3.72 times higher in the comparison area. Lower education and economic inequalities in the project area compared to the comparison area could be due to the interventions of the Manoshi's project.

Table 5.1.19. Demographic and socioeconomic variables associated with women's PNC for the most recent birth in Dhaka urban slums, 2007, 2009, and 2011				
Demographic and socioeconomic variable	**Project area**		**Comparison area**	
	% of PNC	Odds Ratio[a] (95% CI)	% of PNC	Odds Ratio[a] (95% CI)
Survey year				
2007	28.4	1.00	40.4	1.00
2009	55.3	2.54** (1.99-3.39)	32.3	0.99 (.73-1.34)
2011	66.2	4.05**(2.99-5.49)	33.3	0.98 (.70-1.36)
Duration of residence (year)				
<1	38.9	1.00	36.4	1.00
2-3	49.4	1.11 (0.86-1.42)	34.4	0.72 (0.52-1.01)
3+	58.4	1.48** (1.14-1.91)	35.6	0.86 (0.66-1.12)
Birth order				
1	50.9	1.00	41.3	1.00
2-3	58.7	0.97 (0.80-1.18)	30.5	0.78* (0.61-0.99)
4_+	43.9	0.80 (0.59-1.09)	20.1	0.52** (0.33-0.83)
Highest education level				
None	41.8	1.00	22.4	1.00
Primary	50.0	1.05 (0.87-1.27)	34.0	1.49* (1.06-2.09)
$Secondary_+$	66.8	1.68** (1.35-2.09)	50.9	2.36* (1.81-3.07)
Asset quintile				
Poorest	39.1	1.00	19.4	1.00
Poorer	45.5	1.15 (0.93-1.43)	25.3	1.25 (0.91-1.73)
Poor	51.7	1.48** (1.13-1.95)	35.9	1.99** (1.43-2.76)
Less poor	60.0	1.74** (1.36-2.23)	45.9	2.76** (2.03-3.75)
Least poor	71.4	2.61** (2.00-3.42)	54.8	3.72** (2.55-5.43)
All	**53.3**		**35.5**	
Wald Chi-square (23 df)		428.9, p<0.001		218.7, p<0.001

[a]All odds ratios are adjusted for clustering of maternity care to women of the same clusters and for all other variables. The dependent variable was coded 1 if women made any PNC visit, otherwise coded 0.

*p<0.05, **p<0.01

Trends and differentials in 4+ ANC visits, place of delivery, area

Logistic regression analysis was conducted to estimate differentials in 4+ ANC visits, institutional delivery, and PNC visit by area, year, duration of residence in enumeration slum, birth-order (parity), level of women's education and household asset quintiles, controlling simultaneously for the effects of other variables (Table 5.1.20). The odds ratio of receiving 4+ ANC visits was 1.2 times higher, an institutional delivery was 2.2 times higher, and PNC was 2.0 times higher in the project area than in the comparison area. The use of maternity services has gradually increased over the years, with rate of increase being higher for institutional delivery, followed by PNC and 4+ ANC visits. Education and economic differentials (measured with odds ratio) in 4+ ANC visits, institutional delivery, and PNC are found to be high and similar for all indicators.

Table 5.1.20. Demographic and socioeconomic variables associated with women's 4+ ANC, visits, institutional delivery, and PNC visit for the most recent birth in Dhaka urban slums, 2007, 2009, and 2011

Demographic and socioeconomic variable	4+ ANC visits	Institutional delivery	1+ PNC visit
	Odds Ratio[a] (95% CI)	Odds Ratio[a] (95% CI)	Odds Ratio[a] (95% CI)
Type of area			
Comparison area	1.00	1.00	1.00
Project area	1.19* (1.03-1.39)	2.17** (1.76-2.68)	1.96** (1.60-2.40)
Survey year			
2007	1.00	1.00	1.00
2009	1.42** (1.19-1.70)	2.72** (2.09-3.52)	1.59** (1.24-2.04)
2011	1.90** (1.56-2.31)	3.68** (2.81-4.82)	2.19** (1.71-2.79)
Duration of residence (year)			
<1	1.00	1.00	1.00
2-3	1.19 (0.97-1.45)	0.96 (0.78-1.18)	0.95 (0.78-1.16)
3+	1.31* (1.10-1.56)	1.28* (1.06-1.54)	1.23* (1.02-1.48)
Birth-order			
1	1.00	1.00	1.00
2-3	0.78 (0.68-0.91)	0.84 (0.72-0.98)	0.88 (0.76-1.02)
4+	0.39 (0.29-0.52)	0.65 (0.51-0.84)	0.68 (0.53-0.87)
Highest educational level			
None	1.00	1.00	1.00
Primary	1.31* (1.12-1.54)	1.18* (1.00-1.39)	1.20* (1.02-1.42)
Secondary+	2.05** (1.76-2.40)	1.99** (1.66-2.38)	1.96** (1.67-2.32)
Asset quintile			
Poorest	1.00	1.00	1.00
Poorer	1.16 (0.95-1.40)	1.16 (0.95-1.42)	1.17 (0.99-1.40)
Poor	1.68** (1.36-2.08)	1.50** (1.17-1.92)	1.58** (1.29-1.95)
Less poor	2.22** (1.75-2.82)	2.08** (1.68-2.58)	2.14** (1.77-2.58)
Least poor	3.31** (2.60-4.21)	3.34** (2.66-4.20)	3.12** (2.52-3.85)
Wald Chi-square (13 df)	396.12, p<0.001	604.78, p<0.001	472.82, p<0.001

[a]All odds ratios are adjusted for clustering of maternity care to women of the same clusters and for all other variables.
The dependent variable was coded 1 if women had 4+ ANC visits, delivery at facility or PNC visit, otherwise coded 0.
*p<0.05,**p<0.01

5.2 Pregnancy Complications and Management

Pregnancy and childbirth-related complications are among the leading causes of maternal morbidity and mortality in Bangladesh. Though the knowledge and technology to cure/prevent most of these complications are available, proper knowledge and awareness of women and family members regarding the symptoms are crucial for health service use.

Table 5.2.1. Percent distribution of women by complication and its management during pregnancy with live births in the last one year in Dhaka urban slums, 2007, 2009, and 2011

Pregnancy complication during pregnancy and its management	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Complications during pregnancy[1]						
No complications	74.4	80.8	73.7	61.9	71.6	64.1
Severe headache/blurry vision	5.2	2.4	5.6	9.6	9.1	10.9
High fever	3.0	2.3	3.3	3.4	3.5	4.6
Smelly vaginal discharge	0.6	0.3	1.0	0.3	0.7	0.4
Convulsions	0.7	0.2	0.2	0.7	1.9	1.4
Excessive vaginal bleeding	1.3	0.9	1.1	1.6	1.9	1.4
Reduced/absent fetal movement	1.3	3.1	1.9	2.9	2.1	3.4
High blood pressure	0.6	0.6	1.3	1.1	0.6	2.0
Odema in face	4.0	3.2	1.9	6.4	6.3	3.4
Oedema in hands/feet	0.1	1.3	10.1	1.0	1.7	10.5
Lower abdominal pain	13.7	11.8	8.5	23.5	16.6	13.5
Untimely water break	0.9	1.1	0.8	2.1	2.8	0.4
Others	0.3	0.6	0.0	0.3	0.2	0.0
First place for treatment of pregnancy complications						
No complications	74.4	80.8	73.6	61.9	71.6	64.1
Did not seek any treatment	9.4	4.2	9.7	10.3	8.6	16.4
Home	0.6	0.0	1.1	0.7	0.4	3.2
BRAC delivery hut	0.6	2.4	3.5	0.0	0.4	0.4
Pharmacy	1.2	0.4	0.9	1.0	0.9	1.2
Government hospital	4.5	2.7	2.8	6.2	6.7	6.4
Private clinic/chamber	4.0	6.9	5.2	9.5	8.2	5.5
NGO health centre	5.4	2.6	3.2	10.5	3.2	2.8
Type of treatment received[1]						
No complications	74.4	80.8	73.6	61.9	71.6	64.1
No treatment sought	9.4	4.2	9.7	10.3	8.6	16.4
Medicine from pharmacy	7.7	9.4	7.3	13.9	11.2	9.6
Advice from FHW	2.1	2.2	3.1	4.2	1.5	2.5
Referral from FHW	1.2	0.8	0.0	0.3	0.4	0.4
Spiritual water/substance	0.4	0.0	0.0	0.3	0.6	0.2
Amulets	0.1	0.0	0.0	0.2	0.0	0.4
Homeopathic medicine	0.0	0.1	0.1	0.5	0.2	0.7
Injection/saline	0.3	1.3	1.1	3.1	2.1	1.6
Medicine from doctor/nurse	7.4	3.8	7.0	13.1	6.3	7.8
Medicine from *Kabiraj/Hekim*	0.6	0.0	1.1	0.2	0.2	1.6
Others	0.0	0.1	0.0	0.2	0.2	0.2
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**672**	**1,013**	**1,136**	**612**	**536**	**562**

[1]Multiple responses were possible; *Kabiraj/Hekim* refers to herbalists

Table 5.2.1 presents the percent distribution of women by complications during pregnancy and its management in Dhaka urban slums in 2007, 2009, and 2011. Pregnancy complications reported were lower−26% in the project area compared to 36% in the comparison area in 2011. The most prevalent complication women reported in 2007, 2009, and 2011 was: lower abdominal pain (8-14% in the project area, and 13-23% in the comparison area) and showed a declining trend in either area over the years. The other complications reported more often were: severe headache/blurry vision (2-6% in the project area and 9-11% in the comparison area), and oedema in hands, feet, or face (4-12% in the project area and 7-14% in the comparison area) in 2007, 2009, and 2011.

Seeking no treatment amongst women having complications was very high with an area difference−10% in the project area compared to 16% in the comparison area in 2011. For treatment of pregnancy complications, private clinics were visited most frequently by women (5% each) in 2011, followed by government hospitals (3% and 6% respectively), and NGO health centres (3% each) in the project and the comparison areas. BRAC delivery hut was used by 3% women in the project area in 2011.

Type of treatment received did not show much difference between areas and years. The predominant treatment type in 2011 was medicine from pharmacy (7% in the project areas and 10% in the comparison area), followed by medicine from doctor or nurse (7% in the project area and 8% in the comparison area). A few women (2-3%) got advice from the family health workers. Referral for treatment in case of complications was few, and it was mostly to government hospitals in the project area and private clinics in the comparison area, followed by NGO health facilities in the project area and government hospitals in the comparison area. The major reasons for referral were to get better treatment, followed by unavailability of equipment in the facility and lack of required skills to treat complications. One-third of the referrals did not adhere to the advice (data not shown).

Use of Misoprostol

Government of Bangladesh has approved the use of Misoprostol in the community for prevention and treatment of postpartum haemorrhage (PPH). Misoprostol is found to be safe for distribution by traditional providers. Women who had a live birth in the last one year were asked about the use of two tablets (Misoprostol) for prevention and treatment of PPH in 2011; the results are presented in Table 5.2.2. The use of Misoprostol was more frequent (53% versus 27%) in the project area than the comparison in 2011. The use-rate was higher in institutional delivery than in home-delivery in either area.

Table 5.2.2. Percent distribution of women who had a live birth in the last one year by use of the Misoprostol and place of delivery in Dhaka urban slums in 2011

Place of delivery	Project area			Comparison area		
	Yes	No	Number	Yes	No	Number
Home	18.5	81.5	464	12.8	87.2	407
BRAC delivery hut	92.0	8.0	262	100.0	0.0	17
Government hospital	69.3	30.7	163	61.5	38.5	78
Private clinic	66.7	33.3	165	57.5	42.5	40
NGO health centre	59.3	40.7	81	50.0	50.0	20
Other	0.0	100.0	1	0.0	0.0	0
Overall	52.6	47.4		26.7	73.3	
Total number		**1136**			**562**	

5.3 Immediate Newborn Care

Newborn babies are exposed to many infectious disease threats soon after birth. Persistently high rate of low birthweight remains a very important health problem in Bangladesh. They are particularly vulnerable to nutritional impairment as a consequence of complex interactions between feeding practices, infections, and care practices.

Three cross-sectional surveys in 2007, 2009, and 2011 collected information on immediate newborn care, morbidity experienced during neonatal period (within 1 month) and its management in Dhaka urban slums; the results are presented in Table 5.2.3. In accordance with women's knowledge on immediate newborn care (see Chapter 4), breast-milk as pre-lacteal feeding after birth was higher–77% in 2011 and 71% in 2009 compared to 36% in 2007 in the project area. In the comparison area, it was higher–61% in 2011 and 45% in 2009 compared to 43% in 2007. On the other hand, the use of honey and sugar/glucose water as initial feeding declined at a faster rate in the project and than in the comparison area over the years. Compared to the use-level in 2007, the use of honey and sugar/glucose-water reduced by 50% in 2009 and 60% in 2011 in the project area and by 43% in 2011 in the comparison area.

Amongst all feeding practices, breastfeeding is one of the most critical. Inappropriate, and inadequate breastfeeding have adverse consequences on the health and nutritional status as well as the mental and physical development of children. WHO recommends that infants should be exclusively breastfed for the first six months of life (with no other liquids or solid foods or even plain water) and that the infants be initiated on solid (semisolid) complementary foods, in addition to breast-milk after the sixth month of age. Exclusive breastfeeding in the early months of life has been associated with improved child growth and increased child survival and reduced risk of illness. Early breastfeeding improves the probability of successful exclusive breastfeeding and lengthens the duration of breastfeeding. The standard indicator of exclusive breastfeeding is the percentage of children aged less than six months, who are exclusively breastfed. The standard indicator of complementary feeding is the percentage of children aged 6-9 months, who are receiving both breast-milk and complementary foods. It is recommended that breastfeeding be continued through the second year of life.

Initiation of breastfeeding within one hour of birth increased in both areas over the years, and the rate of increase was higher in the project area (increased from 50% in 2007 to 71% in 2011) than in the comparison area (from 49% in 2007 to 62% in 2011). The WHO recommends that children be fed colostrum (the first flush of breast-milk) immediately after birth, and more than 91% of women in 2011 provided colostrum within one day to their newborn in both areas.

The practice of bathing just after birth is considered risky; this practice reduced markedly in both areas over the years with a faster rate of decline in the project area. Giving bath just after birth reduced from 55% in 2007 to 16% in 2011 in the project area and from 45% in 2007 to 29% in 2011 in the comparison area. Giving bath within the third day to one week after birth increased in the project area from 12% in 2007 to 47% in 2011 and in the comparison area from 20% in 2007 to 25% in 2011. A delay in timing of shaving baby's head has taken place in both areas over the years with a higher rate of delay in the project area. Only a few babies' heads were shaved within the second day of birth (2% in the project area and 2-4% in the comparison area) each year. The percentage of the babies whose heads were saved within 3-7

Table 5.2.3. Percent distribution of neonates born in the last one year by initial feeding and other care in Dhaka urban slums, 2007, 2009, and 2011

Initial feeding and immediate newborn care practices	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Pre-lacteal feed after birth[1]						
Colostrums	36.2	70.6	77.1	42.9	45.5	61.4
Plain water	0.9	1.5	1.2	2.6	0.7	2.0
Sugar/glucose water	15.6	7.8	6.2	13.6	13.4	7.8
Honey	39.6	16.2	11.7	35.8	36.2	23.8
Mustered oil	4.5	0.8	0.9	1.8	3.2	2.0
Any milk other than breast-milk	3.1	2.8	2.1	2.9	0.6	2.3
Other liquids	0.1	0.4	0.8	0.3	0.4	0.5
Don't know	0.0	0.0	0.0	0.0	0.0	0.2
Initiation of breastfeeding						
Breastfed within one hour of birth	50.1	52.0	70.8	49.0	47.4	62.5
Breastfed within one day of birth	35.1	39.8	25.4	36.3	42.0	29.7
Breastfed after first day of birth	14.4	7.8	3.6	14.5	10.4	6.9
Never breastfed	0.1	0.1	0.0	0.0	0.0	0.5
Don't know	0.1	0.3	0.2	0.2	0.2	0.4
Received colostrums within one day						
Yes	83.2	90.8	92.4	86.3	77.6	90.9
no	16.8	9.2	7.6	13.7	22.4	9.1
Timing of bathing the baby						
Just after birth	54.6	18	15.7	44.6	29.1	28.8
Within 24 hours of birth	17.4	17.8	11.7	20.4	23.1	22.8
On the second day after birth	14.1	17.7	18.6	12.3	21.1	18.5
Within third day to one week after birth	12.5	41.5	47.1	20.4	24.4	24.6
Later	0.7	4.8	7.0	2.1	2.1	5.3
Don't know	0.6	0.3	0.0	0.2	0.2	0.0
Timing of shaving the baby's head						
Just after birth	0.6	0.3	0.2	1.3	0.6	0.5
within 24 hours of birth	0.3	0.3	0.6	0.7	1.7	1.1
On the second day after birth	0.7	1.1	0.9	2	0.9	2.5
Within the third day to one week after birth	91.4	83.3	72.2	84.6	87.5	77.2
Later	6.3	11.7	24.4	10.6	8.2	16.7
Never shaved hair	0.7	3.3	1.8	0.8	1.1	2.0
Taken special cord-care of the baby						
Yes	98.5	95.4	92.9	98.5	92.9	91.1
No	1.5	4.6	7.1	1.5	7.1	8.9
Wrapping the baby with warm clothes						
Yes	97.2	95.2	95.4	95.9	94.8	96.6
No	2.8	4.8	4.6	4.1	5.2	3.4
Taken 'Kangaroo mother care' of the baby						
Yes	6.0	12.4	17.2	16.8	23.1	20.8
No	94.0	87.6	82.8	83.2	76.9	79.2
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**672**	**1,013**	**1,136**	**612**	**536**	**562**

[1]First thing put into mouth

days after birth declined from 91% in 2007 to 72% in 2011 in the project area and from 85% in 2007 to 77% in 2011 in the comparison area. Shaving heads after one week increased from 6% in 2007 to 24% in 2011 in the project area and from 11% in 2007 to 17% in 2011 in the comparison area.

Almost all women in either area took special cord-care of the baby, which is not recommended except for keeping it dry. However, there has been a gradual decline in the special cord-care over the years (from 98% in 2007 to 93% in 2011 in the project area and from 98% in 2007 to 91% in 2011 in the comparison area). The proportion of women taking 'Kangaroo-mother care' (skin-to-skin contact between mother and child) was low (6%) in 2007, but increased to 12% in 2009 and to 17% in 2011 in the project area. In the comparison area, 'Kangaroo-mother care' increased from 17% in 2007 to 23% in 2009 and to 21% in 2011

Table 5.2.4 presents the percent distribution of neonates born in the last one year by neonatal health check-up, complications, and management in Dhaka urban slums in 2007, 2009, and 2011. Health check-up of neonates within the first two days of life increased from 40% in 2007 to 67% in 2011 in the project area. It was not the case in the comparison area, it rather decreased from 50% in 2007 to 39% in 2011 in the same period.

Reported complications/illnesses among the neonates were lower and comparable—33% in the project area and 34% in the comparison area in 2011. Common illnesses in order of prevalence, were fever, followed by cough, difficult breathing, jaundice, and rapid breathing in either area, or the prevalence was little lower in the project area than in the comparison area in 2011. Skin rash/pustule and umbilical infection were reported more often in the project area than in the comparison area. The percentage of seeking no treatment for neonates in case of complications/illness decreased more in the project area than in the comparison area over the years. The most common place for treatment of newborns in both areas was: private clinics, followed by government hospitals and pharmacy. Although allopathic medicines from pharmacy and from qualified doctors/nurses were used in great majority of the cases, homeopathic and herbal medicines were also used, to an extent. The use of spiritual water, substance, or amulets was very low (1%).

Table 5.2.4. Percent distribution of neonates born in the last one year by complications and their management in Dhaka urban slums, 2007, 2009, and 2011

Neonatal healthcare and complications	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Health check-up within two days after birth						
Yes	39.6	57.4	67.3	49.8	37.3	38.6
No	60.4	42.6	32.7	50.2	62.7	61.4
Complications within one month after birth[1]						
No complications	64.3	79.9	66.9	64.2	67.9	66.0
Fever	20.4	8.1	10.9	18.0	17.9	13.2
Cough	14.0	7.4	9.5	12.9	15.7	12.6
Difficulty in breathing	7.0	2.4	8.6	6.5	5.2	9.1
Rapid breathing	2.8	0.7	3.8	2.8	1.7	3.0
Jaundice	3.7	3.4	5.0	5.9	5.6	6.2
Diarrhoea	1.9	1.1	1.8	2.3	0.9	0.7
Umbilical infection	1.3	1.8	1.4	1.0	0.9	0.7
skin rash/pustule	4.2	2.3	3.9	4.1	3.9	2.1
Convulsion	0.6	0.3	0.7	0.7	0.6	0.7
Inability to suck breast-milk	1.0	0.8	0.8	1.1	0.9	1.4
Lethargy/weakness	0.7	0.8	0.2	1.0	0.9	0.0
Baby became cold	3.0	1.1	0.3	3.9	0.9	0.2
Others	0.4	0.4	0.0	0.0	0.4	0.4
Place of first treatment for complications						
No complications	64.3	79.9	66.8	64.2	67.9	66.0
Did not seek any treatment	7.1	2.4	4.3	3.4	2.4	2.7
Home	4.3	0.9	4.2	3.1	0.9	6.1
BRAC delivery hut	0.4	0.7	0.4	0.0	0.2	0.2
Pharmacy	5.4	1.8	3.9	5.7	4.1	8.4
Government hospital	5.2	3.9	7.4	4.1	7.5	6.2
Private clinic/chamber	10.0	9.2	10.7	12.9	15.7	9.3
NGO health centre	3.3	1.3	2.4	6.5	1.3	1.2
Type of first treatment received[1]						
No complications	64.3	79.9	66.8	64.2	67.9	66.0
No treatment sought	7.1	2.4	4.3	3.4	2.4	2.7
Medicine from pharmacy	12.8	12.4	12.8	16.0	21.1	15.1
Referral from female health worker	0.7	0.0	0.2	0.2	0.0	0.2
Advice from female health worker	1.6	0.4	0.4	2.3	0.7	0.5
Spiritual water/substance	0.6	0.4	0.4	0.3	0.6	0.2
Amulets	0.6	0.4	0.2	0.2	0.4	0.2
Homeopathic medicine	3.9	2.0	3.0	4.4	4.3	4.1
Injection/saline	0.4	0.8	3.3	2.6	2.1	3.0
Medicine from doctor/nurse	9.7	3.5	11.3	9.0	6.2	9.6
Medicine from *Kabiraj*/*Hekim*	2.4	0.7	1.5	2.1	1.1	1.8
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**672**	**1,013**	**1,136**	**612**	**536**	**562**

[1]Multiple responses were possible; *Kabiraj*/*Hekim* refers to herbalists

CHAPTER 6: CHILD HEALTH IMMUNIZATION, MORBIDITY, AND MANAGEMENT

6.1 Immunization

This chapter presents findings on several areas of importance to child health, including the vaccination status of children and the prevalence and treatment of important childhood illnesses. Knowing how vaccination coverage varies among different subgroups of population can help planning public projects and interventions. Information on vaccination coverage is also important for the monitoring and evaluation of the government's Expanded Programme on Immunization (EPI).

Examining treatment practices and contact with health services for children with the three most important childhood illnesses: diarrhoea, acute respiratory infection (ARI), and fever can help assess national programme aimed at reducing mortality from these illnesses. Information is provided on the prevalence of fever, ARI, and diarrhoea and the extent to which treatment is sought from medically-trained care providers, pharmacies, and traditional (unqualified) doctors.

Universal immunization of children aged less than one year against the six major vaccine-preventable diseases (tuberculosis, diphtheria, pertussis, tetanus, poliomyelitis, and measles) is one of the most cost-effective programmes to reduce infant and child morbidity and mortality. The EPI is a priority programme of the Bangladesh Government which follows WHO-recommended international guidelines. According to the guidelines, children are considered fully immunized when they have received one dose of the vaccine against tuberculosis (BCG); three doses each of the vaccine against diphtheria; pertussis (whooping cough), and tetanus (DPT); three doses of polio vaccine (excluding polio vaccine given at birth); and one dose of measles vaccine before their first birthday. Therefore, vaccination of children aged 1-4 year(s) is presented to allow the comparison of results across the areas over the years.

The three surveys collected data on coverage of different vaccines among children aged 1-4 year(s) in Dhaka urban slums in 2007, 2009, and 2011; the results are presented in Table 6.1.1. Ever-receiving vaccine for children was found universal in either area. The percentage of receiving three or more polio vaccines was 87% in the project area compared to 83% in the comparison area in 2011. The percentage of receiving three or more DPT doses was higher in the project and comparison areas in 2011 (91% and 81% respectively) and in 2009 (82% and 77% respectively) than in 2007 (47% and 45% respectively).

Table 6.1.1. Percent distribution of children aged 1-4 year(s) by vaccines received at anytime before the survey in Dhaka urban slums, 2007, 2009, and 2011

Vaccinations received anytime before the survey	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Child ever received any vaccination						
Yes	97.1	97.6	98.3	98.0	96.1	96.7
No	2.9	2.4	1.7	2.0	3.9	3.3
Type of vaccinations received						
None	2.9	2.4	1.7	2.0	3.9	3.3
BCG	94.1	97.0	97.9	96.2	94.9	96.0
Polio	96.9	97.3	98.1	97.8	95.5	96.7
DPT	91.8	97.1	97.6	94.6	95.5	95.6
Measles	80.7	88.1	92.2	86.0	83.4	88.5
Vitamin A	91.1	89.1	96.0	92.5	84.9	91.1
Number of vaccinations received – Polio						
None	3.1	2.7	1.9	2.2	4.5	3.3
1	0.6	1.7	0.8	1.2	1.9	1.7
2	5.9	8.2	2.1	7.4	9.4	6.3
3 or more	84.2	84.6	86.8	83.7	78.7	83.3
Don't know	6.2	2.9	8.4	5.5	5.4	5.4
Number of vaccinations received – DPT						
None	8.3	2.9	2.4	5.9	4.8	4.4
1	5.1	1.7	1.8	6.0	2.7	2.2
2	39.5	13.7	4.4	42.9	15.4	12.2
3 or more	47.1	81.7	91.4	45.2	77.1	81.1
Don't know	0	0	0	0	0	0
Complete vaccination coverage	**38.2**	**69.1**	**79.2**	**37.7**	**62.0**	**69.5**
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**807**	**1,392**	**1,359**	**783**	**667**	**720**

Vaccinations are most effective when given at the proper age. Therefore, it is recommended that children complete the schedule of immunizations during their first year of life (by 12 months of age). Complete vaccination coverage (measured in terms of receiving all the recommended vaccinations, BCG, three doses of DPT, Polio, and measles) increased in the project area from 38% in 2007 to 69% in 2009 to 79% in 2011 and in the comparison area from 38% in 2007 to 62% in 2009 to 69% in 2011.

6.2 Children's Morbidity and Management

This section discusses three illnesses that are major contributors to childhood morbidity and mortality in Bangladesh: diarrhoea, fever, and acute respiratory infection (ARI). Estimates of the two-weekly prevalence of these illnesses as well as data concerning types of treatment and feeding practices during diarrhoea are presented in Table 6.2.1. The overall prevalence of morbidity among 1-4 year(s) old children was lower in 2009 than in 2007 and 2011 in either area. The lower prevalence in 2009, could be due to difference in the timing of the surveys; July-August (monsoon season) 2007, November-December (post-monsoon) 2009 and September-October (late monsoon) in 2011. Fever is a major manifestation of acute

infections in children and occurs round the year. It contributes to high levels of malnutrition and mortality. Major children's morbidity in order of two-weekly prevalence were: fever (ranging from 28-45%), cough (23-35%), and diarrhoea (5-19%) in the project and the comparison area during 2007-2011. There is no consistent difference in the prevalence of morbidity between the two areas over the years.

Table 6.2.1. Percent distribution of children aged 1-4 year(s) by prevalence of common childhood illnesses in the last two weeks in Dhaka urban slums, 2007, 2009, and 2011

Morbidity and healthcare-seeking behaviour	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Child had suffered from[1]						
Fever	44.7	27.9	38.4	43.2	33.1	36.8
Cough	33.1	22.6	29.1	35.1	30.9	27.1
Fast breathing	6.1	1.9	3.9	5.6	3.9	4.3
Difficulty in breathing	10.2	4.9	6.4	9.3	7.8	7.5
Chest in-drawing	3.8	1.0	2.1	5.1	1.8	3.5
Diarrhoea	19.1	4.8	5.5	12.1	4.9	4.2
Acute respiratory infection (ARI)[2]	11.4	5.6	7.9	11.2	9.6	9.8
Place of treatment for ARI[3]						
Did not seek any treatment	26.1	9.0	10.3	20.5	12.5	16.9
Home	0.0	1.3	0.0	1.1	4.7	1.4
BRAC delivery hut	0.0	0.0	0.9	0.0	0.0	0.0
Pharmacy	37.0	26.9	35.5	33.0	17.2	38.0
Government hospital	13.0	23.1	16.8	9.1	20.3	14.1
Private clinic	19.6	41.1	35.5	26.1	45.4	29.6
NGO health centre	5.4	7.7	2.8	14.8	10.9	2.8
Place of treatment for diarrhoea						
Did not seek any treatment	29.2	23.9	18.7	37.9	18.2	23.3
Home	2.6	3.0	1.3	3.2	3.0	0.0
BRAC delivery hut	0.0	0.0	0.0	0.0	0.0	0.0
Pharmacy	35.7	29.9	52.0	29.5	45.5	50.0
Government hospital	9.1	11.9	8.0	10.5	9.1	10.0
Private clinic/chamber	18.8	34.3	18.7	19.0	30.3	13.3
NGO health centre	7.8	1.5	1.3	3.2	3.0	3.3
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**807**	**1,392**	**1,359**	**783**	**667**	**720**

[1]Multiple responses; [2]Refers to cough with either rapid or difficult breathing, or chest in—drawing; [3]Multiple responses for the children who suffered from ARI in the last two weeks

ARI, primarily pneumonia, is a leading cause of childhood morbidity and mortality throughout the world, and early diagnosis and treatment with antibiotics can reduce mortality due to ARI. The two-weekly prevalence of ARI has shown a declining trend (from 11% in 2007 to 8% in 2011) over the years in the project area but not in the comparison area. A lower percentage of mothers in the project area than in the comparison area did not seek treatment for ARI in 1-4 year(s) old children. In 2011, common places of treatment for ARI in the project and the comparison areas were: pharmacies (35% and 38% respectively),

followed by private clinics/chambers (35% and 30% respectively) and government hospitals (17% and 14% respectively). For treatment of diarrhoea, common treatment places were: pharmacy, followed by private clinic and government hospitals in either area in 2007, 2009, and 2011.

Mothers were encouraged to continue normal feeding to children with diarrhoea and to increase the amount of fluids they offered. In three surveys, mothers [with a child aged 1-4 year(s) having a recent episode of diarrhoea] were asked about what they gave the child to drink during the diarrhoeal episode compared to usual practice. Table 6.2.2 shows that in 2011, 95% of children with diarrhoea in the project area and 93% in the comparison area were given packet saline while it was 88% in the project area and 80% in the comparison area in 2007. Other liquids (such as coconut-water) were given to 35% of children with diarrhoea in the project area and 23% in the comparison area in 2011. The use of home-made saline was more frequent in the project area than in the comparison area.

Table 6.2.2. Percent distribution of children aged 1-4 year(s) sick with diarrhoea in the last two weeks by management and features of diarrhoea in Dhaka urban slums, 2007, 2009, and 2011

Management and other	Project area			Comparison area		
feature	2007	2009	2011	2007	2009	2011
Food/fluid given during diarrhoea						
Packet saline	87.7	92.5	94.7	80.0	90.9	93.3
Home-made saline	7.8	16.4	8.0	9.5	6.1	0.0
Plain water	6.5	4.5	8.0	11.6	12.1	13.3
Other liquid	24.0	46.3	34.7	32.6	45.5	23.3
Features of diarrhoea						
Fever	22.7	17.9	25.3	26.3	27.3	20.0
Vomiting	20.1	22.4	14.7	17.9	33.3	30.0
Watery stool	51.9	58.2	61.3	40.0	45.5	60.0
Blood with stool	5.8	3.0	6.7	2.1	9.1	6.7
Eyes sunk	1.9	1.5	12.0	6.3	3.0	6.7
Dehydration	1.3	0.0	2.7	1.1	3.0	3.3
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**154**	**67**	**75**	**95**	**33**	**30**

Diarrhoea is often accompanied with fever (25% in the project area and 20% in the comparison area in 2011) and vomiting (15% in the project area and 30% in the comparison area in 2011). Amongst children with diarrhoea, 61% of the episodes in the project area and 60% in the comparison area were characterized by watery stool and 7% each by blood in stool. Diarrhoea causes dehydration if not managed with properly with fluids. Dehydration, mostly sunken eyes, was present in 2.7% of the episodes in the project area and 3.3% in the comparison area in 2011.

CHAPTER 7: PERCEPTION ON DELIVERY FACILITIES AND BRAC'S BIRTHING HUT

7.1 Opinion on Local Healthcare Facilities

In three cross-sectional surveys, questions were asked to the women on their perception of local healthcare and delivery facilities, and data are analyzed to understand their perception and presented in the Table 7.1.1. Availability of healthcare and delivery facilities increased in either area over the years, and the increase was faster in the project area than in the comparison area. For example, in the project area, 94% of women in 2011 compared to 53% in 2007 reported availability of healthcare and delivery facilities in the locality. In the comparison area, 63% of women in 2011 compared to 45% in 2007 reported the same. The increase was due mainly to the existence of BRAC delivery huts in the project area, and private clinics in either area.

Table 7.1.1. Percent distribution of women by their opinion on availability of health services in the locality in Dhaka urban slums, 2007, 2009, and 2011

Opinion on services in local healthcare and delivery facilities	Project area			Comparison area		
	2007	2009	2011	2007	2009	2011
Healthcare and delivery facilities available in the slum area						
Yes	52.6	85.1	93.6	44.8	49.2	62.7
No	47.4	14.9	6.4	55.2	50.8	37.3
Type of health facilities available[1]						
No	47.4	14.9	6.4	55.2	50.8	37.3
BRAC delivery hut	20.7	60.2	86.5	0.2	4.6	1.0
Private clinic	8.8	24.3	19.2	9.1	22.6	42.8
NGO health center	38.2	41.3	34.9	39.3	37.4	35.3
Other	0.0	0.1	0.1	0.2	0.2	0.2
Aspects of healthcare and facilities that satisfy women[1]						
Good behaviour of the staff	50.5	69.9	74.4	59.6	68.7	74.5
Availability of drugs/supplies	39.4	56.1	57.7	31.9	58.2	55.0
Do not have to wait	11.5	28.9	40.3	13.7	26.9	33.7
Treatment effective/cured	77.8	38.0	55.9	68.9	31.1	43.0
Willing to answer questions	17.0	14.7	20.3	20.1	12.8	21.5
Affordable	16.5	29.4	30.2	16.9	39.1	26.0
Clean	1.4	6.4	7.6	2.4	5.6	6.4
Amiable and easy to communicate	4.2	7.5	5.4	6.8	6.6	2.9
Aspects of healthcare and facilities that would dissatisfy women[1]						
Bad behaviour of the staff	53.8	71.1	71.5	65.6	70.3	68.5
Non-availability of drugs/supplies	32.2	49.9	49.6	22.2	48.9	47.7
Have to wait to get treatment	35.4	36.6	50.7	38.1	36.3	45.7
Costly/unaffordable	20.6	38.4	35.2	19.9	44.4	30.1
Not willing to answer questions	18.9	19.7	23.0	21.3	16.4	25.1
Dirty/lack of cleanliness	2.0	8.0	7.0	2.0	6.6	7.7
Not friendly and hard to communicate	7.0	7.8	7.1	8.7	9.1	3.5
Treatment not effective/not cured	56.8	13.6	39.5	40.3	12.4	24.7
Total %	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total number	**1,256**	**2,172**	**2,268**	**1,227**	**1,054**	**1,129**

[1]Multiple responses

Women were asked again about different "aspects of healthcare and facilities that satisfy women" in three surveys. Results show a change (in terms of percentage of the report) in aspects of satisfaction over the years within the areas. In 2007, the most frequently-mentioned was: effective treatment (78% and 69% respectively) in the project and the comparison area, followed by good behaviour of the staff (50% and 60% respectively), and availability of drugs and supplies (39% and 32% respectively). In 2011, women mentioned most frequently was: good behaviour of the staff (74% each) in the project and the comparison areas, followed by availability of drugs and supplies (58% and 55% respectively) and effective treatment (56% and 43% respectively). They are also asked about "aspects of healthcare and facilities that dissatisfy women." The most frequently-mentioned dissatisfying aspects in 2011 were: bad behaviour of the staff (71% and 68% respectively), non-availability of drugs (50% and 48% respectively), long waiting-time to get treatment (51% and 46% respectively), and not effective treatment (39% and 25% respectively) in the project and the comparison area.

7.2 Awareness about BRAC's Birthing Hut

In the 2007, 2009 and 2011 surveys, women who had children in the last five years were asked about the availability and usage of BRAC's birthing huts in their localities, and the results are presented in Table 7.2.1. In the project area, awareness about BRAC birthing hut increased over the years. Nine in every ten women in compared to 2011 one in every four women in 2007 were aware of availability of the BRAC birthing hut in their locality. More women were aware of the type of services BRAC birthing hut provided in 2011 than in 2007 and 2009. Common services it provides are: antenatal care (83%) followed by skilled delivery assistance (59%) and delivery care (42%), newborn care (27%), and postpartum care (16%), and the frequencies were higher in 2011 than in 2007 and 2009. Sources of knowledge of the BRAC birthing hut were: BRAC's Shashthya Sebika/midwife (66%), followed by own experience (24%), and friends/neighbours (17%), and the proportion was higher in 2011 than in 2007. Majority (62%) of women registered to the birthing huts in 2011 compared to 38% in 2009 and 7% in 2007. They registered for antenatal check-up, delivery care, and skilled delivery assistance.

Table 7.2.1. Percent distribution of women who had a child in the last five years by knowledge and usage of BRAC's birthing hut in Dhaka urban slums, 2007, 2009, and 2011

Knowledge and usage of services from BRAC's birthing hut	Project area		
	2007	2009	2011
BRAC's Birthing hut exists in the locality			
Yes	24.9	68.1	90.4
No	75.1	31.9	9.6
Services provided by BRAC's birthing hut[1]			
Antenatal check-up	14.7	61.3	83.4
Skilled delivery assistance	6.5	39.5	58.7
Delivery care	7.2	27.1	42.0
Newborn care	2.9	8.5	27.5
Postpartum care	2.9	8.5	16.5
Child healthcare	5.3	5.8	6.9
Don't know	6.9	1.9	2.7
Source of information on BRAC birthing hut[1]			
From own experience	1.8	12.9	23.7
From family members	1.3	8.2	8.2
From neighbours/friends	7.1	24.2	16.6
From BRAC Shashthya Sebika/staff/midwife	11	48.0	66.2
From posters/leaflet/advertisement	0.2	1.3	0.6
From BRAC's other projects	0.7	1.2	0.2
Other	0.0	0.0	0.0
Registered to BRAC's birthing hut			
Yes	7.3	37.8	62.4
No	17.6	30.3	20.0
Services for which registered to birthing hut			
Did not register	92.7	62.2	37.6
Antenatal check-up	5.7	34.3	59.1
Skilled delivery assistance	2.4	22.5	42.3
Delivery care	3.5	15.8	32.2
Newborn care	2.1	5.1	18.0
Postpartum care	1.5	5.7	11.9
Child healthcare	2.1	3.7	4.6
Total %	**100.0**	**100.0**	**100.0**
Total number	**1,256**	**2,172**	**2,269**

[1]Multiple responses were applicable only for women who were aware of birthing hut in the locality

CHAPTER 8: POLICY IMPLICATIONS OF THE MANOSHI'S PROJECT IMPACT EVALUATION SURVEYS AND CONCLUSIONS

8.1 Status of Maternal and Child Health in Dhaka Urban Slums

With increase in population density, landlessness, and decrease in farm-size, the concentration of population in urban slums has been increasing in Bangladesh in recent times (17). The Household Income and Expenditure Survey, in 2010 report, showed a slower rate of decline in urban poverty compared to rural poverty (18), perhaps due to disproportionate rural-to-urban migration of the poor households. Besides, the growing rural-urban migration brings with it higher likelihood of health hazards within the urban slums. The levels of maternal and newborn and childcare in slum population are comparable with rural population but are substantially lower when compared with non-slum urban population (19, 20). Poverty and ill-health constitute a vicious circle; due to ill-health, the poor are not able to raise their income to improve their health conditions, and without good health, their likelihood of escaping poverty is severely diminished (21,22).

Against these backdrops, Manoshi project undertook a community-based health solution programme of BRAC and, was implemented within the urban slums to bring about improvements in the level of maternal, newborn and childcare. The project involved different stakeholders and bridged connections between the community, BRAC health workers, and healthcare providers in public, private and NGO sectors. The project formed women's groups to build social network and increase trust, imparted knowledge to women and family members in maternal and newborn care, empowered community to address some of the barriers that hinder translation of knowledge into practice, and addressed some of the issues concerning ill-health and poverty.

8.2 Policy Implications of Manoshi Impact Evaluation Surveys in 2007, 2009, and 2011

Three cross-sectional surveys were conducted in Dhaka urban slums in 2007, 2009, and 2011 to generate statistics on knowledge and practices relating to maternal, newborn and childcare of women who gave birth in one year preceding the survey. The baseline and follow-up statistics on knowledge and practices portray noticeable changes in the project and the comparison areas over the years, which bring forward some key policy issues.

Knowledge of pregnancy and post-delivery care

Pregnancy is an important stage of a woman's life and has the potential to influence the growing foetus and the mother. Women's knowledge about requirements of ANC visits, TT vaccination, and iron supplementation during pregnancy had been universal. However, only half of them were aware of requirements of 4+ ANC visits (as per government recommendations) even if women did not have any complication in any visit. One in ten women did not know about the requirements of post-delivery care, including post-natal care, (PNC), and one in seven did not know about the requirements of iron and vitamin A supplementations after delivery. Three in four women did not have knowledge of the requirement of 3+ PNC visits in either area.

Lack of adequate knowledge reiterates the importance of BCC for women and family

members for raising awareness and translating knowledge into practice. Some women were found to possess superficial knowledge on relevant issues of pregnancy and related care, even after five years of intervention. Project needs to implement BCC campaigns more intensively so that a critical mass of knowledgeable women is available to work as change-makers in the future.

Knowledge of danger signs during pregnancy, delivery, and after delivery

More than half of the women could not name any life-threatening complication, such as excessive vaginal bleeding, convulsions, oedema in face or high fever during pregnancy, delivery or after delivery in either area. Knowledge has improved but, to a little extent, over the years in the project area compared to the comparison area. The low level of knowledge about the danger signs may stand as a barrier to greater use of maternal health services. Further investigations are required to understand factors behind the low level of improvement in knowledge in the project area compared to the comparison area over the years. This also suggests scrutiny of the acceptability of the lay health workers within the community, quality and content of training to impart health education, and level of understanding of the communication materials within the community. Both quality and contents of BCC were not easy to understand for a majority of women (23).

Knowledge about place for treatment/care provider

The most common place for treatment in pregnancy or delivery complications as perceived by women were government health facilities, followed by private clinics and NGO health centres in either area. BRAC delivery hut had emerged as a treatment place in the project area; in 2011, three in ten women named BRAC delivery hut for such treatment. Through the Manoshi's project, women became more aware of alternative places for treatment.

Sources of information

Although excess to mass media, mostly television, had been widespread, the main sources of information on place for maternal healthcare had been 'own experience', NGO workers, and family members in either area; the BRAC community-based health volunteers were additional sources in the project area only. Community-based counselling among small groups with culturally appropriate BCC may make knowledge more widespread.

Knowledge of immediate newborns care and life-threatening health problem

Knowledge of drying newborn thoroughly just after birth, wrapping with warm clothes, feeding colostrums as first feed, vaccination right after birth, and vitamin A for under-five children had been universal in either area. Major causes of neonatal deaths were acute respiratory infection (indicated by cough with fast or difficult breathing) and asphyxia (BDHS 2004). Resuscitation training in facilities reduced deaths of neonates by 30%. Yet, coverage of this intervention remained low and was a missed opportunity to save lives. Despite some improvements over the years, women's knowledge on the life-threatening conditions had been found to be low in both areas.

The implications of the findings are twofold. First, policy must address the low level of knowledge regarding life-threatening conditions of newborn and, second, focus must be placed on investigating the perception of people in the community regarding the project's ability to treat newborns for such conditions. Further investigations must also be made for understanding the reasons behind the low level of impact of the health volunteers of the project in imparting knowledge.

Knowledge of infant and young child-feeding practices

Mother's knowledge about timing of initiation of breastfeeding, duration of exclusive breastfeeding and supplementary foods for child after exclusive breastfeeding had increased over the years and became widespread in the project area than in the comparison area. Knowledge of giving *khichuri*, vegetables, eggs, fish, meat, and fruits as supplementary foods had improved more than any other foods in either area over the years. These positive changes in knowledge may improve child nutrition in future.

Knowledge about pneumonia and diarrhoea

ARI after neonatal period is the major cause of death in Bangladesh (24). Three in five women did not know symptoms of ARI, and knowledge had not improved in either area over the years. Knowledge of giving packet saline for managing diarrhoea had been universal, but one in five women had mentioned 'less than usual' food to be given to children with diarrhoea. BCC must be continued to ensure that mothers are aware of ARI symptoms; they also need to be informed of the implications of not only providing saline to manage diarrhoea but also of providing adequate amount of food to the child during diarrhoea.

Pregnancy planning for safe delivery

Saving money and planning for place of delivery and skilled delivery assistance ahead of delivery were high; however, at least one in five women had no plan for delivery assistance or had not saved money to meet extra expenses for childbirth. There remains a room for improvements in the level of knowledge of life-threatening conditions in childbirth and thereby generate the need for services among women and families within the community.

Use of maternal health services

Over the years, the use of maternal health services (4+ ANC visits, institutional delivery, skilled delivery assistance and PNC visit) had increased at a faster rate in the project area than in the comparison area. Pregnant women received services more frequently from the government hospitals, private clinics, and NGO health centres in both areas. The use of BRAC delivery hut for maternal health services had increased in the project area over the years, indicating its acceptability to slum-dwellers. BRAC delivery hut in the slum is the low-cost, welcoming, friendly and supportive maternity care centre and increases freedom of choice (25).

The use of Misoprostol for prevention and treatment of postpartum bleeding was greater (59% versus 27%) in the project area than in the comparison area in 2011. The use-rate was higher for institutional delivery than for home-delivery, suggesting the importance for promotion of institutional delivery and also community-based promotion of Misoprostol for prevention and treatment of PPH.

Despite improvements brought about by Manoshi's project in the overall practice of maternal health care in the project area, opportunities still exist and should be capitalized upon to promote at least 4 ANC visits, institutional delivery, skilled delivery assistance, and PNC care among all women. In addition to the BRAC midwife, similar to the government-appointed community-based skilled birth attendants (CSBA), community mobilization has been instrumental in increasing the skilled delivery assistance.

Practices of immediate newborn's care

Infections kill about half of the neonates in Bangladesh (24). Many deaths can be prevented through appropriate preventive and curative interventions for the newborns, including management of neonatal infections. Giving bath and shaving baby's head soon after birth were common in both areas, but delay had been more evident in the project area than in the comparison area. Mother's knowledge about danger signs of newborns and consulting qualified doctors in case of danger signs had not been high in either area. Change in management had been very small in the project area over the years. Management of newborn's complications can be done more effectively through community-based efforts; training and deployment of community-based female volunteers to make mothers aware of danger signs in neonates to seek care; and through recognizing and treating infections with referral to accessible good-quality and dependable facilities.

Equity in the use of maternal health services

Slum-dwellers are of low income but heterogeneous in terms of earnings, education, management skills, and access to health services. As such, economic and social inequalities in health persist. With the implementation of the Manoshi's project, BRAC delivery huts supported by community female volunteers had been instrumental, to a large extent, in increasing the 4+ ANC visits, facility deliveries, and PNC visits in the project area compared to the comparison area. Such approaches make access to health services easy to women of less motivated households. The interventions benefited them more, and thereby reduced economic and social inequalities. Increase in practices at higher rates in the disadvantaged groups over the years had gradually reduced the inequalities (measured in terms of odds ratio) between the poorest and the least poor or between women with lower and higher education in the project area than in the comparison area. This leads to infer that a more equitable use of maternal health services in the project area was due to the effects of Manoshi's project. This relative success implies that scale-up of community-based health solutions may reduce the inequalities further in the future.

Additionally, the study also indicates that the caesarean-section rate was as high as 34% in the least poor quintile compared to 6% in bottom asset quintile in the project area in 2011. Inequality was similar in the comparison area too. These figures suggest that many of the surgical interventions were not medically necessary. In the lowest quintiles, caesarean-section rate was low (6%), suggesting that poorer women did not receive adequate care.

8.3 Conclusion

The objective of the project undertaken by Manoshi Project was to improve the health of the mother, newborns, and children in urban slums through community-based solutions with aims to contribute to the achievement of MDG 4 and 5. The impact evaluation surveys in 2007, 2009, and 2011 provided evidences that positive changes took place at faster and higher rates in practices than in knowledge in the project slums than the comparison slums over the years. The impact surveys also evidenced reductions in socioeconomic inequalities in maternal and newborn-care and recorded high opinions of mothers in the provision of low-cost high-quality service and referral by the BRAC birthing hut. Lessons learnt from this intervention may be used effectively to further develop and improve the MNCH services in order to make it sustainable while scaling-up at the national level.

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