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HEALTH

BRAC Research Report

February 2013

Current Status of Maternal and Child Health Indicators in BRAC EHC Programme Areas of Bangladesh

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS

The authors acknowledge the cooperation of EHC programme of BRAC for smoothly conducting the study. Also, the time and cooperation of the participants is greatly acknowledged. The authors would like to thank Iftekhar A Chaudhury, Coordinator, Editing and Publications, BRAC Research and Evaluation Division who carefully edited the report. Altamas Pasha and Md. Akram Hossain deserve thanks for copy editing, corrections and formatting.

RED is supported by BRAC's core fund and funds from donor agencies, organizations and governments worldwide. Current donors of BRAC and RED include Aga Khan Foundation Canada, AIDA-Spain, Asian Disaster Preparedness Center, AusAid, Australian High Commission, AVRDC (The World Vegetable Centre), Bencom S.r.L, BRAC-UK, BRAC-USA, British Council, Campaign for Popular Education, Canadian International Development Agency, CARE-Bangladesh, Center for Development Research, Commonwealth Foundation, Department For International Development (DFID), Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), EACI-Qatar, Embassy of the Kingdom of the Netherlands, Euro consult Mott Mac Donald, European Commission, Family Health International, FHI Solutions, LLC, Foundation Open Society Institute, The Global Alliance for Improved Nutrition, Global Development Network, The Global Fund, Govt. of Bangladesh (GoB), The Hospital for Sick Children, Canada, ICDDR,B, International Food Policy Research Institute, International Labour Organization, International Potato centre, International Rice Research Institute, International Union for Conservation of Nature and Natural Resources, Liverpool School of Tropical Medicine, Manusher Jonno Foundation, Oxfam Novib (NOVIB), Oxford University, Rockefeller Foundation, Safer World, Sight Saver-UK, Social Marketing Company, UN Women, UNICEF, Unilever-UK, United Nations Development Program, University of Bonn, University of Leeds, University Research Company LLC, Vision Spring, Women WIN, World Bank, World Fish and World Food Program.

ABSTRACT

Essential Health Programme (EHC) is one of many development efforts of BRAC providing an integrated package of preventive, promotive and basic curative services at a minimum cost to improve health and nutrition of the poor especially reproductive age women and children under-five. The BRAC community-based health workers: *Shasthya Shebika*s (SSs) and *Shasthya Kormis* (SKs) provide these services through fortnightly household visits. EHC started its new phase III in January 2011. Therefore, a survey was done to record benchmark data on some selected indicators among EHC *upazilas* in align with MDG four and MDG five. The study randomly selected 1200 mothers of under-two children from 30 EHC *Upazilas*. Data were collected in March 2013.The mothers in this study represented a young age group (25 years) with higher literacy rate. Seventy one per cent were currently using modern family planning (FP) method. The majority (52%) bought pill/condom from drug shop while very few (5%) reported SSs as their source of supplies. One third of the sample households reported that they were visited once in a month by the BRAC SS, while less than a quarter (22.5%) of the households had received no visits. Forty seven per cent of the mothers received ANCs four or more times, while 42 per cent received one PNC during their last pregnancy. Less than two-third of the mothers had heard about micronutrients and had insufficient knowledge of its effect on children's health and use pattern such as appropriate age to initiate and duration of use. Ninety two per cent of the children were found to have received complete immunization. The findings revealed a better status of indicators (e.g. immunization coverage, family planning, antenatal and delivery care, and infant and young child feeding practices) in EHC *upazilas* than that of national average. The challenge for the programme will be to sustain the current good practices and invest further effort to achieve the desired levels to reach the MDG health goals.

EXECUTIVE SUMMARY

Introduction

Essential Health Programme (EHC) is one of many development efforts of BRAC which provides an integrated package of preventive, promotive and basic curative services, including referral services at a minimum cost, towards the improvement of health and nutrition of the poor. The EHC has 11 basic components: health and nutrition education, water and sanitation, family planning, pregnancy-related care, immunization and vitamin A supplementation, basic curative services for ten common diseases, TB and malaria control and community based management of ARI and diarrhoea. The community-based health workers such as the *Shasthya Shebika*s (SSs) and *Shasthya Kormis* (SKs) aided by BRAC health staff provide these services through fortnightly household visits, interpersonal communication, community and *Bari* health forums, and satellite clinics.

EHC has evolved during the last two decades and emerged in its present form (phase III) with substantial knowledge and experience gained, not only from its own activities but from other successful parallel programme of BHP such as MNCH, WASH and Alive and Thrive. Currently, EHC is focusing on three major challenges: to improve the reproductive and maternal health status among women of reproductive age; to improve the health status of newborns and children under five years of age; and to reduce the risk and vulnerability towards selective communicable and other diseases in the country.

EHC started its new phase III in January, 2011. According to its programme proposal, continuous monitoring of different components using specific indicators is warranted annually. To begin with, a survey was done to record benchmark information with respect to some selected indicators of reproductive health and child health in selected *upazilas*, where the EHC intervention was in place. This data will help to evaluate the effectiveness of the EHC package over time and be used to modify and fine-tune the EHC package as necessary.

Methods

The study selected 30 *Upazilas* (30-clusters) from 363 *upazilas* of 47 districts (BRAC EHC areas) using PPS (probability proportional to size), i.e. more *upazilas* will come from bigger districts. A total of 1200 mothers of under-two years-old children were interviewed to capture the information on ANC, PNC, child health, etc., adopting cross-sectional design. The survey was conducted in March 2013.

Key Findings

Demographic and socioeconomic status

The respondents i.e. the mother of under-two children in the study represent a young age group (25 years) with higher literacy, where about 69% of them could read and write. Also around half attended secondary schooling (49%).The median monthly income of the households was BDT. 8000, with little less than 1/3rd of the households (30%) perceived their HH income as deficit in the year preceding the survey. Knowledge

on 'critical times' of hand washing, especially after defecation was mentioned most frequently (96%) compared to before having a meal (87%) or preparing meals (58%) or feeding children (48%).

Family planning

Current modern family planning (FP) method use was found to be 71 per cent. Among the modern FP method users, the pill was found to be the most popular method (50%) followed by injection (23%). Only seven per cent were using condom whereas, around ten per cent used natural methods like 'safe period', 'withdrawal' etc. Moreover, permanent methods were not popular among the participants (≤ 3%). It was found that the majority of the couples initiated FP method (48%) on their own motivation.

The Majority (52%) bought pill/condom from drug shop attendants. Only five per cent mentioned SS as their source of supplies. A high percentage among the users (91%) also mentioned that they did not face any problem acquiring pill/condom.

Among the modern method users, around 1/4th reported experiencing side effects (24%). Sixty nine per cent of those experienced side effects reported 'doing nothing' to mitigate it. 'Amenorrhea due to breastfeeding' (35%) or 'Currently not living with husband' (32%) were the most common reasons mentioned for not using any FP method.

Maternal Health Care: ANC, delivery and PNC

Participants who took at least one ANC during last pregnancy were 75 per cent from a trained provider compared to 36 per cent participants who availed four or more ANCs from the same. Among them, 44 per cent respondents took at least one ANC from BRAC SK, compared to 16 per cent respondents who availed at least four ANCs from the same service provider.

It was observed that a higher proportion of mothers (42.2%) among the literate group took 4^{+} ANCs compared to the illiterate mothers (22.6%; p=.000). Same was true for mothers having primary or higher education (41.5%) compared to mothers having no schooling (17.5%; p=.000) and mothers from surplus households (46.1%) compared to deficit households (28.2%; p=.000). Moreover, regular visits (one visit/month) from SS also ensured higher percentage of mothers (47%) receiving 4^{+} ANCs compared to no HH visits by SS (22.5%; p=.000).

Three fourths (75%) of the deliveries were found to be normal in the study areas with 66 per cent mentioning home as the place of delivery. The rest of the deliveries mainly took place at government hospitals (14%) and private clinics (18%). Delivery kits were mentioned in 29 per cent of the cases, among the deliveries which took place at home. All the deliveries were done mostly by TBAs (35%) followed by medical doctors, nurses (20%, 14%) and trained TBAs (18%).

Forty two per cent received one PNC during their last pregnancy within 42 days. Most frequently mentioned place of the PNC was private clinics (40%) followed by home (34%) and government hospitals (24%). The providers were nurses (61%), private doctors (36%), government doctors (24%), and BRAC SKs (23%). Also, most commonly mentioned providers of PNC were nurses (61%) and doctors (private 36% and government 24%), followed by BRAC SK (23%) and SS (8%).

It was also observed that the mother's socio-demographic profile and regular HH visits by a SS were associated with receiving one PNC. Factors like literacy (47.4% vs. 30.5 for illiterate, p=.000), primary or higher education (47.0% vs. 25.6%, p=.000 for no schooling), surplus economy (54% vs. 33.5% for deficit household, p=.000), and regular health workers visit (49% vs.34.3% for no visit, p=.000) were significantly associated with receiving one PNC. Vitamin A was received by 40 per cent of the participants in their last pregnancy during post natal period.

Child health and nutrition

Initiation of breast milk within one hour was 76 per cent. Sixty two per cent of the mothers reported to practice exclusive breastfeeding. About three-fourth (76%) reported that they initiated family food from seven months onward.

Only 19.3 per cent of mothers could mention all three danger signs of ARI, rapid breathing, wheezing, and chest in-drawing. The prevalence of specific types of ARI, such as common cough and cold was 49.2 per cent, pneumonia 14 per cent, and severe pneumonia was found to be 3.4 per cent.

Ninety two per cent of children were found to have received complete immunization i.e. BCG, measles, pentavalent and polio vaccine (excluding polio vaccine given at birth).

Less than two-thirds of the mothers had heard about micronutrients. They had insufficient knowledge concerning its effect on children's health and its use pattern such as appropriate age to initiate (39%) and duration of use (15%). Around one fourth (24%) of the mothers had introduced micronutrient powder (MNP) to their children. Among them 57% initiated it during the first seven months of age. The proportion of mothers who did not complete the micronutrient cycle was quite high (71%). Sources of information regarding micronutrient were mentioned to be SS (56%), SK (38%), CNO/CNP (18%) etc. Majority of mothers obtained MNP from SS (60%) among other sources such as BRAC SK (22%), *'pushtiapa'* and drug store (9% each) etc.

Recommendation

- The programme could work towards sensitizing the health workers regarding education on the side effects and its management, equip them with necessary training, and make the services available to the users.
- The programme could also promote permanent methods by identifying the potential clients and encourage use, utilizing IEC as the permanent method use was found to be low.
- To sustain the current FP use rate, the programme should ensure FP supplies by making it accessible and available in the community.

Maternity care

- 4+ ANCs by medically trained providers, skilled birth attendants and PNC within 48 hours reduces substantial maternal death risks. Effective counseling is necessary for the mother and the family to utilize these services.

Child Health

- The programme could initiate campaigns to remind mothers or communities about the importance of ensuring measles vaccination of children soon after they have turned nine months. This is due to the fact that it was found to be lower compared to other categories of immunization.
- In EHC *upazila*, initiatives need to be taken in order to make mothers more aware of the danger signs of ARI and its management. This is due to the low level of knowledge found despite the prevalence of ARI risk factors.
- Through group meetings and *'bari'* visits, SS and SKs can improve the knowledge level of mothers in addition to exploring the IEC strategies, for example through organizing campaigns and developing behaviour change materials and approaches for community awareness.

Health Volunteers of EHC

- The programme should ensure increased regular household visits of SS. If required, this could be done through strengthening the supervision chain.
- SSs were the life line of the EHC programme despite the fact that they were volunteers. The programme needs to innovate new ways to provide incentives to these workers. Hence, could create more opportunities for cash earnings, provide technical support in selling health commodities if necessary, provision for support during their medical emergencies might be ways to start with.

INTRODUCTION

BACKGROUND

Bangladesh has already achieved the Millennium Development Goal (MDG) of reducing under-five mortality. But there are still challenges ahead in reducing infant mortality. Pneumonia, diarrhoea and malnutrition are major causes of childhood mortality and morbidity in addition to neonate causes and drowning (BDHS 2011).On the other hand, to achieve the target of three quarter reduction of MMR by 2015, Bangladesh needs to step up efforts to have more control over different indicators such as contraceptive prevalence rate, antenatal care (ANC) coverage, postnatal care (PNC),and unmet need for family planning among others(UNDP 2013).

In reducing maternal mortality two indicators could be very effective in improved maternal and child health, they are 4^+ ANCs and (PNC) (Koblinsky 2005, PMNCH 2006, Dhakal *et al.* 2006,).Higher utilization of these indicators by medically trained providers is an effective way of reducing risks of child birth and post-partum maternal and infant deaths ((Koblinsky 2005, PMNCH 2006, Dhakal *et al.* 2006). Nationally about 55 per cent of pregnant women received one ANC by a medically trained provider in Bangladesh, but data is not available for 4^+ ANCs by the same (BDHS 2011). Furthermore, only 27 per cent of mothers and 30 per cent of children received one PNC by a medically trained provider (BDHS 2011. The timing of PNC is also very crucial as 45 per cent of maternal deaths occur within day one and in Bangladesh 70 per cent of all infant deaths are occurring within the first 28 days of life (BDHS 2011, BMMS 2010). In a Matlab study it was found that, 37 per cent of the neonatal deaths occurred within 24 hours, 76 per cent within 0-3 days, 84 per cent within 0-7 days, and the remaining 16 per cent within 8-28 days (Chowdhury *et al.* 2010).

Another challenge, in reducing maternal mortality in Bangladesh, is dealing with the fact that a high proportion of births are occurring at home. This situation intensifies by poor utilization of the indicator 'skilled birth attendant'. More than half of births are assisted by '*dais*' or unskilled birth attendants in Bangladesh (BMMS 2010).

Despite the challenges, Bangladesh has progressed well in the health sector and achieved substantially to be marked as 'on track' in reaching the Millennium Development Goal four and five. Government support through policies (HNPSDP,) and strategies (Bangladesh maternal and neonatal strategy) and involvement of different stakeholders like national and international NGOS, UN bodies, donor agencies and active participation of the professional alliances (PMNCH, OGSB, white ribbon etc.) in initiating and implementing various interventions (ensuring skilled birth attendants) have made this possible. BRAC has also played its role responsibly through inclusion of essential health care components necessary to ensure basic health care services for common people with a pro poor approach, giving special emphasis to reproductive age group women and children under-five in align with MDG four and five.

Essential Health Programme (EHC) is one such effort of BRAC which provides an integrated package of preventive, promotive and basic curative services (including referral services) at a minimum cost towards the improvement of health and nutrition of the poor. The EHC has 11 basic components: health and nutrition education, water and

sanitation, family planning, pregnancy-related care, immunization and vitamin A supplementation, basic curative services for ten common diseases, TB and malaria control, and community based management of ARI and diarrhoea.

The community-based health workers such as the *Shasthya Shebikas* (SSs) and *Shasthya Kormis* (SKs) aided by BRAC health staff provide these services through fortnightly household visits, interpersonal communication, community and *Bari* health forums, and satellite clinics (Ahmed 2007). They provide a cost-effective bridge between the community they serve and the PHC level facilities of formal health systems, though they are not part of it.

EHC has evolved during the last two decades and emerged in its present form (phase III) with substantial knowledge and experience gained not only from its own activities but from other successful parallel programme of BHP such as MNCH, WASH and Alive and Thrive. Currently, EHC is focusing on improving reproductive, maternal, children (under five) health as well as reducing the risk and vulnerability towards selective communicable and other diseases in the country. This will complement government efforts in attaining MDGs as well as emerging public health needs of the rural population.

Rationale

EHC started its phase III in January, 2011. According to the programme proposal, continuous monitoring of different components using specific indicators is warranted annually. To begin with, a survey was done, to record benchmark information with respect to some selected EHC indicators of maternal and child health, in the EHC intervention areas. This baseline data were meant to help evaluate the effectiveness of the EHC package over time and also, modify and fine-tune the EHC package as necessary.

GENERAL OBJECTIVE

Investigate the current status of selected indicators in EHC *upazilas*. This will be used later to evaluate the effectiveness of the EHC package to fine tune the programme.

Specific Objectives

The specific objectives of the study were to assess

- The current use FP methods and management
- The practice regarding ANC, delivery care and post natal care(PNC)
- Infant and child feeding knowledge and practices
- Micronutrient knowledge and practices
- Knowledge and management of ARI
- Knowledge and management of diarrhoea
- Immunization coverage
- Knowledge of hygiene and sanitation

METHODS

STUDY DESIGN

This was a cross sectional study to document benchmark conditions at *upazila* level, where BRAC EHC programme is being implemented.

STUDY AREA AND POPULATION

Study areas selected were EHC *upazilas.* The study population was defined as mothers of one to two years old children.

SAMPLING

The study selected 30 *Upazilas* (30-clusters) from 363 *upazilas* of 47 districts (BRAC EHC areas) using PPS (probability proportional to size), i.e. more *upazilas* will come from bigger districts. Five villages were randomly selected from each *upazila*. A list of household shaving one to two-years old children were collected from each village. Later, eight households from these were randomly taken. The sample size was determined on the basis of maximum proportion (5) with a 5% significance level, and with a 5% precision. The minimum calculated sample was 400 mothers of under-two children. To reduce the design effect for taking *upazila* and villages it was (400*3) 1,200 mothers of under-two children. Thus, 40 mothers of under-two children were taken from each *upazila* to capture the data on ANC, PNC, child health, etc.

TOOL DEVELOPMENT

A Pre-tested questionnaire was developed including structured and semi-structured questions to collect information on socioeconomic and demographic characteristics, family planning issues, ANC, delivery and PNC, infant and child nutrition, child health, hygiene and sanitation. Data collection techniques including the questionnaire were pre-tested before embarking of the actual survey.

DATA COLLECTION

Skilled interviewers (comprising science graduates having survey experience) were recruited for data collection. A five-day intensive training was organized which included lectures, mock interviews, role play and field practice at the community level. A training manual was developed to guide the interviewers in the field. Five teams were formed for data collection each consisting of one supervisor and four interviewers. These respondents were also informed prior about the purpose and activities of the survey and seeking their cooperation and the status of their anonymity. Data were collected during March 2013.

DATA ANALYSIS

Data entry and cleaning were done at the head office level under the supervision of the principal investigator and analyzed by SPSS version 16.0.Univariate analysis was done

and the Chi-square test was also performed to identify factors associated in practicing desired behaviours.

ETHICAL ISSUES

The study was approved by Research and Evaluation Division (RED) of BRAC. The institutional ethics committee does not have to be consulted as no intervention is involved. All respondents were informed that their responses would remain anonymous, and verbal consent was obtained.

RESULTS

SOCIOECONOMIC AND DEMOGRAPHIC PROFILE

The socioeconomic and demographic profile of the study sample is presented in Table 1. The respondents i.e. the mothers of under-two children in the study found to represent a young age group (25 years) with higher literacy; where about 69 per cent of them could read and write. The study also found that around half of the respondents attended secondary schooling (49%).

Table 1. Socio-demographic profile of the respondents in EHC *upazilas*

Study variables	(%)
Age (in years) %	
<20	10.6
20-35	85.8
35+	3.6
Mean age (±SD)	25(±5)
Median age(range)	25 (16-47)
Can read and write %	69.0
Years of schooling %	
None	13.0
≤5 yrs	32.0
6-10 yrs	49.0
10+	5.7
Occupation %	
Housewife	97.0
Others	3.0
Marital Status %	
Married	99.0
Others	1.0
Religion	
Muslim	89.5
Hindu	10.5
Monthly median income of HH (BDT)	8000
Perceived HH income status in the previous year	
Surplus	32.0
Equal	38.0
Deficit	29.6
Total (n)	1200

Almost all reported as married as well as mentioned household chores as a main occupation. Muslims were dominant (89.5%) where Hindu represented only 10.5 per cent of the respondents. The median monthly income of the households was BDT. 8000. This study has used a proxy indicator for house hold income which is known as 'self-rated food security status'; respondents were asked to rate their perceived status as one of three (or four) pre-coded groups: Surplus, Equal, or Deficit. This method has been

validated as a good proxy approximation for household income as reported in earlier studies (8). Using this indicator it was found that, about one third of the households (30%) perceived their HH income as deficit in the year preceding the survey. The respondents stated that around one third of the households (34%) were regularly visited by the BRAC SS (Table 2). Approximately one fourth of the HHs (26%) reported that they never encountered a SS's visit. More than half of the households (52%) mentioned that the SS spends about ≤15 minutes during each visit.

Table 2. HH visit by SS as reported by respondents in EHC *upazilas*

Study variables	(%)
HH visit by SS	
One visit in each month	34.0
2/3 visits in 6 months	40.0
Never	26.0
Time spent in HH by SS as mentioned by respondents(minutes)(n=884)	
≤15	51.6
15+-30	45.4
30+	3.1
Total (n)	1200

FAMILY PLANNING

Current family planning (FP) modern method use was found to be 71 per cent (Table 3). Among the modern FP method users, the pill was found to be the most popular method (50%) followed by injection (23%). Only seven per cent were using condom, whereas, around ten per cent used natural methods like 'safe period', 'withdrawal' etc. (Table 3). A majority of the couples reported that they themselves made the decision to initiate FP method (48%) when inquired,' who' motivated them to initiate FP. The Majority (52%) bought pill/condom from drug shop attendants. Only five per cent mentioned SS as their source of supplies.

Table 3. Family planning practices in EHC *upazilas*

Study variables	(%)
Currently using any FP method	78.0
Currently using modern FP method[1]	71.0
Temporary methods(n=931)	
Pill	39.0
Condom	5.5
Injectables	18 .0
IUD/ Norplant	5.4
Permanent methods(n=931)	3.0
Experienced side effects as reported by respondents(n=851)	24.0
Measures taken for side effects(n=204)	
Did nothing	69.0
Asked neighbours	8.0
Drug shop attendants	7.0
Govt. MBBS doctor	6.0
FWA	4.0
BRAC SS	3.0
Others	7.0

(Table 3 continued....)

(.....continued Table 3)

Face no Problem obtaining FP supplies (pill/condom) (n=535)	91.0
*Reasons for not using FP methods	
Not living with husband for various reasons	32.0
Amenorrhea due to breastfeeding	35.0
Pregnant	11.0
Baby will not have breast milk	8.0
Menstrual problem	7.0
Physical problem	7.0
Others	3.0
Source of supplies (pill/condom) (n=535)	
Drug store seller	52.0
FWA	28.0
FWV	13.0
BRAC SS	4.7
SK	0.6
Others	1.7
Total (n)	1200

[1] pill, condom, injection, intra uterine device, Norplant, Ligation, Vasectomy
* Multiple response questions

A high percentage (91%) also mentioned that they did not face any problem acquiring pill/condom. Among the modern method users around one forth reported experiencing side effects (24%). Sixty nine per cent of those experienced side effects reported 'doing nothing' to mitigate it. Very few consulted with formal sector (10%). 'Amenorrhea due to breastfeeding' (35%) or 'Currently not living with husband' (32%) were the most common reasons mentioned for not using any FP method.

ANTENATAL CARE (ANC)

Participants who took at least one ANC during last pregnancy were 75 per cent from a trained provider compared to 36 per cent participants who availed four or more ANCs from the same (Table 4). Among them, 44 per cent respondents took at least one ANC from BRAC SK, compared to 16 per cent respondents who availed at least four ANCs from the same service provider.

Table 4. Antenatal care practices in EHC *upazilas*

Study variables	(%)
Received at least one ANC from medically trained provider[1]	44.0
Received at least one ANC from trained provider[2]	75.0
Received at least one ANC from BRAC SK	44.0
Received at least four ANCs from medically trained provider[1]	12.0
Received at least four ANCs from trained provider[2]	36.0
Received at least four ANCs from BRAC SK	16.0
Two dose of TT received	98.0
Total (n)	1200

[1]Qualified doctor FWV nurse/paramedic, trained midwives
[2] Includes BRAC SK in addition to the medically trained providers

Half of the respondents (50%) mentioned that they took TT during their last pregnancy and another almost half (48%) mentioned that they had completed the dose previously (Table 4).

It was observed that a higher proportion of mothers (42.2%) among the literate group took 4^+ ANCs compared to illiterate mothers (22.6%; p=.000) (Table 13 of Annex). The same was true for mothers having primary or higher education (41.5%) compared to mothers having no schooling (17.5%; p=.000) and mothers from surplus households (46.1%) compared to deficit households (28.2%; p=.000) (table 13). Moreover, regular visits (one visit/month) from SS also ensured higher percentage of mothers (47%) receiving 4^+ ANCs compared to no HH visit by SS (22.5%; p=.000) (Table 13 of Annex).

DELIVERY CARE

Three fourths (75%) of the deliveries were found to be normal (Table 5) in the study areas with 66 per cent mentioned home as the place of delivery. The rest of the deliveries mainly took place at government hospitals (14%) and private clinics (18%). Delivery kit use was mentioned in 29 per cent of the cases, 58 per cent used a sterile blade while 50 per cent of umbilical cord cut were done by untrained traditional birth attendants (TBAs) among the deliveries which took place at home. All the deliveries were done mostly by TBAs (35%) followed by medical doctors, nurses (20%, 14%), trained TBAs (18%, TTBAs) and friends and relatives (13%).

Table 5. Delivery care practices in EHC *upazilas*

Study variables	(%)
Mode of delivery	
Normal	74.8
C-section	17.5
Episiotomy	7.7
Place of delivery	
Home	65.6
Government hospital	14.0
Private clinic	18.4
Others	2.0
Delivery assisted by	
Qualified Doctors (government & private)	20.0
Untrained TBA	35.0
Trained TBA	17.7
Nurse/midwife/ paramedics	14.2
Friends/relatives	13.1
Practices at home delivery	
Delivery kit used	28.9
Instruments used while cutting the cord (n=792)	
New and boiled blade	58.2
Blade from delivery kit	27.4
New blade but not boiled	6.4
Surgical blade	5.2
Others	2.8
Total (n)	1200

POST NATAL CARE (PNC)

Table 6 shows the PNC services received by the respondents in BRAC EHC *upazilas*. Vitamin A was received by 40 per cent of the participants in their last pregnancy during

post natal period. Forty two per cent received one PNC during their last pregnancy within 42 days. Most frequently mentioned place of the PNC was private clinics (40%) followed by home (34%) and government hospitals (24%) and the provider was a nurse (61%), private doctor (36%), government doctor (24%), and BRAC SK (23%).

Table 6. Postnatal care practices in EHC *upazilas*

Study variables	(%)
Received any PNC during last pregnancy within 42 days	42.0
*Place of PNC received (n=506)	
Government hospital	24.0
Private clinic	40.0
Home	34.0
Others	10.0
*Provider of PNC (n=506)	
BRAC SS	8.0
BRAC SK	23.0
Government Doctor	24.0
Nurse	61.0
Village doctor	8.0
Private doctor	36.0
Services received in the postnatal period(n=506)	
BP test	95.0
Anemia test	92.0
Newborn's weight	83.0
Mother's weight	24.0
Aid in breast feeding	65.0
Vitamin A/Iron	67.0
Nutritional advice for newborn	87.0
Hygiene	84.0
Neonatal complicacy	73.0
Newborn danger sign	70.0
Family planning	73.0
Breast-feeding	89.0
Vitamin A received during last pregnancy	40.0
Total (n)	1200

*Multiple responses

Also most commonly mentioned providers of PNC were nurses (61%) and doctors (private 36% and government 24%), followed by BRAC SK (23%) and SS (8%) (Table 6).

It was also observed that mother's socio-demographic profile and HH visit by SS was associated with receiving one PNC (Table 14). Factors like literacy (47.4% vs. 30.5 for illiterate, p=.000), primary or higher education (47.0% vs. 25.6%, p=.000 for no schooling), surplus economy (54% vs. 33.5% for deficit household, p=.000) and regular health workers visit (49% vs.34.3% for no visit, p=.000) were significantly associated with receiving one PNC.

FEEDING PRACTICES OF NEWBORN AND INFANTS < 1YR AND KNOWLEDGE AND PRACTICE OF MICRONUTRIENTS

Initiation of breast milk within one hour was 76 per cent (Table 7). Sixty two per cent mothers reported to practice exclusive breast-feeding.

Table 7. Practices regarding breast-feeding, complementary feeding by mothers of under-two children in EHC *upazilas*

Study variables	(%)
Breast-feeding immediately after birth	85.0
*Reason for not feeding colostrum (n=183)	
Mother sick	21.0
Social norms	20.0
Delay of breast milk	40.0
Sweet tongue	12.0
Others	12.0
Initiation of breast milk ≤1(hr.)	76.0
Practiced exclusive breast-feeding	62.0
Reason for not practicing exclusive breast-feeding(n=420)	
Insufficient milk	81.0
Satisfy baby's thirst	10.0
Others	9.0
Did not introduce complementary food after six months	24.0
Reasons for not introducing family food after six months (n=281)	
Baby got sufficient milk	20.0
Baby does not eat	29.0
Hindu culture	29.0
Continue breast-feeding to maintain good health	11.0
Others	11.0
*Source of information regarding feeding practices	
BRAC SS	35.0
BRAC SK	32.0
Doctors	17.0
Nurse	7.0
CNO/CNP	7.0
Radio/TV/newspaper	31.0
Neighbour	52.0
Total (n)	1200

*Multiple responses

About three fourth (76%) initiated family food from seven months onward. Neighbours (52%), BRAC SS, SK (35%, 32%) and media (31%) were frequently mentioned sources of information on infant feeding practices of mothers.

Less than two-thirds of the mothers had heard about micronutrients with insufficient knowledge concerning its effect on children's health and use pattern such as appropriate age to initiate (39%) and duration of use (15%) (Table 8). Around one fourth (24%) of the mothers had introduced micronutrient powder (MNP) to their children. Among them 57 per cent initiated it during the first seven months of age. The proportion of mothers who did not complete the micronutrient cycle was quite high (71%). Sources of information regarding micronutrient were mentioned to be SS (56%), SK (38%), CNO/CNP (18%) etc. Majority of mothers obtained MNP from SS (60%), among other sources were BRAC SK (22%), '*pushtiapa*' and drug store (9% each) etc. (Table 8).

Table 8. Mother's knowledge and practice regarding 'Micronutrient' in EHC *upazilas*

Study variables	(%)
Knowledge on Micronutrient powder (MNP)	
Heard about micronutrient powder	61.0
*Necessity of micronutrient for children (n=730)	
Baby's health	51.0
Baby's growth	18.0
Baby's nutrition	65.0
Knows appropriate age (>180 days) to initiate MNP	39.0
Knows appropriate duration cycle (60 days) of MNP	15.0
Gap (120 days) between cycle of MNP(n=172)	23.0
Source of information regarding micronutrient	
BRAC SS	56.0
BRAC SK	38.0
CNO/CNP (*Pustiapa*)	18.0
Newspaper/television/ radio	10.0
Family	4.0
Acceptance and compliance of micronutrient as reported by mothers	
Proportion gave micronutrient to children	24.0
Proportion initiated at age 7 (n=283)	57.0
Proportion completed the 60 days cycle (n=283)	29.3
Reason for not completing the cycle	
Baby does not want to eat	67.0
Financial problem	7.0
Did not feel like giving	6.0
Baby sick	4.0
SS did not bring	3.0
Others	13.0
*Source of MNP supplies	.
BRAC SS	60.0
BRAC SK	22.0
Drug store	9.0
Pushtiapa	9.0
Others	2.2
Total (n)	1200

*Multiple responses

Hygiene and Sanitation

Knowledge on 'critical times' of hand washing, especially after defecation was mentioned most frequently (96%) compared to before having a meal (87%) or preparing meals (58%) or feeding children (48%), (Table 9). Ninety four per cent mentioned about receiving hygiene and sanitation information from sources like radio/TV (62%), BRAC SS (38%) and SK (28%), etc.

Table 9. Knowledge and practice of Hygiene and sanitation of mother of under two children in EHC *upazilas*

Study variables	(%)
*Knowledge on critical time for hand washing	
After deification	96.4
Before preparing meal	57.9
Before feeding children	48.4
Before meal	87.0
After cleaning the baby	41.2
Received information on safe water and sanitation	94
*Source of information regarding safe water and sanitation	
BRAC SS	38.0
BRAC SK	28.0
Doctor	8.0
Radio/TV/newspaper	62.0
Family	8.0
Neighbour	7.0
BRAC WASH	7.0
Total (n)	1200

*Multiple responses

Knowledge and management of acute respiratory infection (ARI)

Only 19.3 per cent of mothers could mention all the three danger signs of ARI, rapid breathing, wheezing, and chest in-drawing.

Table 10. Knowledge and management of ARI by the mother of under-two children in EHC *upazilas*

Study variables	(%)
Knowledge of ARI	
Proportion knows danger signs of ARI[a]	19.3
*Source of information of ARI danger sign (n=1187)	
BRAC SS	26.0
BRAC SK	18.0
Doctor	23.0
Village doctor	12.0
Radio/television/Newspaper	30.0
Neighbour	18.0
Family	19.0
Prevalence of ARI	
Specific types of ARI	
Common cough and cold (c & c)	49.2
Pneumonia (c & c accompanied with fast breathing)	13.8
Severe Pneumonia (c & c accompanied with fast breathing and chest in drawing)	3.4
Severe disease[b]	0.5
Total (n)	1200

*Multiple responses

[a] knows all three danger signs-rapid breathing, wheezing, chest in-drawing

[b] Symptoms such as being unable to eat experiencing convulsions, dizziness, breathing problems, exhibiting wheezing sounds when breathing and having fever hypothermia are examples of very severe diseases

Frequently mentioned source of information of ARI danger signs were different media such as radio, TV, newspaper (30%), BRAC SS (26%), doctor (23%). Among other sources were SK (18%), village doctor (12%) etc. (Table 10). Prevalence of specific types of ARI such as common cough and cold was 49.2 per cent; pneumonia which was defined as having symptoms of common cough and cold accompanied with fast breathing was found to be 14 per cent; and severe pneumonia, which include chest in-drawing in addition to all other pneumonia symptoms, was found to be 3.4 per cent. Whereas, prevalence of severe disease, such as being unable to eat, experiencing convulsions, dizziness, breathing problems, exhibiting wheezing sounds when breathing, and having fever/hypothermia are examples of very severe diseases, was 0.5 per cent. ARI was identified by mother/family in most of the cases (97%). Eighty two per cent of mothers reported to have taken treatment for their children for symptoms of ARI. Most sought treatments were taken from doctors (private 34% and government 22%) among other providers mentioned in Table 10.

KNOWLEDGE AND MANAGEMENT OF DIARRHOEA

Any incident of diarrhoea during previous month of survey was at nine per cent (Table 11).

Table 11. Management of diarrhoea by the mother of <2 children in EHC *upazilas*

Study variables	(%)
Management of diarrhoea	
Any incident of diarrhoea during previous month of survey	9.0
Liquid and medicine given during diarrhoea (n=106)	
ORS	94.3
Homemade ORS	22.6
Zinc Syrup	45.0
Zinc tablet	9.0
Zinc+ORS	48.0
Breast milk during diarrhoea	87.0
Total (n)	1200

*Multiple responses

Among the children suffering from diarrhoea, a high percentage were given ORS (94%) and 48 per cent were given oral saline with zinc. Eighty seven per cent of mothers also continued giving breast milk to their children during diarrhoea.

Vaccination coverage of under-two children

In this report, immunization information was reported from cards only. Ninety two per cent of children were found to have received complete immunization i.e. BCG, measles, pentavalent and polio vaccine (excluding polio vaccine given at birth) (Table 12).

Table 12. Vaccination coverage of <2 children in EHC *upazilas*

Study variables	(%)
Card available (n=986)	82
Children with complete vaccination, (n=986)	92
Children with a complete vaccination (n=986)	
BCG	100
Polio 3	98
Measles	92
Pentavalent 3	98
Children with no vaccination,	0.7
Received vitamin A capsule on last immunization day (n=986)	92
*Place of immunization (n=1192)	
Government hospital	19
Satellite clinic	67
EPI centre	12
Others	2
Presence of BRAC SS on vaccination day	
Yes	25
No	69
Don't know	6
Total (n)	1200

*Multiple responses
[a]BCG, measles, pentavalent and polio vaccine (excluding polio vaccine given at birth)

Individual vaccine coverage was; all received BCG, 98 per cent received polio 3, 92 per cent measles and 98 per cent pentavalent 3. Moreover, 92 per cent children received vitamin A capsule. The majority of the children were immunized at satellite clinics (67%), followed by government hospitals (19%), EPI centres (12%), and others (2%).

DISCUSSION

In absence of equity in the health system, BRAC EHC of HNPP continued to provide basic healthcare services and tried to maintain a linkage to formal healthcare services, to ensure better health for the rural community, especially for the most vulnerable i.e. women of reproductive age and children under-five. This study aimed to look into the current status of some selected EHC indicators, reflecting family planning, maternal and child health, infant feeding and knowledge on hygiene and sanitation at *upazila* level in EHC programme areas.

Although, Bangladesh has achieved substantial gains in maternal health and is 'on track' with MDG five, there are still many challenges including the fact that 71 per cent (BMMS 2010) of births are occurring at home. It was encouraging to observe, that in EHC *upazilas* 66 per cent of deliveries were occurring at home which is lower than national average. More over 'skilled attendant' at delivery is one of two indicators which measured progress towards MDG five (BMMS 2010). In this context, where home delivery was predominant, the utilization of untrained TBA (35%) was found to be smaller than the national average (53%). The respondents of this study represented a young population where a higher proportion could read and write and almost half attended secondary schooling. This could have influenced in giving birth at a facility or using skilled birth attendant (Joharifard *et al.* 2012, Margaret *et al.* 2008). Moreover, this might as well be a reflection of increased stakeholders' involvement including government, media partners, international and national bodies, non-governmental organizations (Mengesha 2013) in the effort of promoting safe delivery.

Ensuring at least four ANCs by medically trained providers is highly desirable to warrant a safe delivery for both mother and child. This is done through monitoring pregnancy, identifying risk factors and preventing adverse pregnancy outcome (Koblinski 2005). The percentage of women who had received no ANC by medically trained providers were found to be higher in EHC *upazilas* (56%) while comparing it to the national equivalent (45%),but interestingly when SKs were considered, it plummeted to 25 per cent. Utilization of at least four ANCs by medically trained provider was 12 per cent in EHC *upazilas* which experienced a high of 36 per cent when SKs were included and was higher than national average of at least four ANC visits (26%, regardless of provider status).This study lacked data on the service quality by SKs and medically trained providers other than medical doctors in achieving the purpose of ANC. However, it was reassuring that a higher proportion of mothers in EHC *upazilas* received at least four ANCs by a trained provider. Nevertheless, it is important to note here, that more pregnant women should be utilizing the required four ANCs from medically trained providers. Thus, the fact still remains that, a higher proportion of pregnant women remained untouched by this crucial service which might have influenced better health seeking behaviour among the pregnant mothers and higher chances of identifying complications.

Another important indicator of lowering post-partum death was PNC (Vieira *et al.* 2012). Although maternal deaths during delivery and pregnancy declined, post-partum maternal deaths comprised a higher proportion and had in fact increased from 63 per cent (in 2001) to 71 per cent in 2010 (BDHS 2011). An earlier study found that the utilization of PNC in Bangladesh was very much neglected (Elaine *et al.* 2009) which was reflected in the 2011 DHS survey (30%) (BDHS 2011). Current research lacked

the data of receiving PNC within 48 hours but found that 42 per cent sought PNC from any provider (within 42 days) in EHC *upazilas*. Nationally, among those received PNC (40.5%), most of them received it within 48 hours from any provider (BDHS 2011). According to present research finding, SKs provided 23 per cent of PNCs in EHC *upazilas*. This could be considered, as a 'good' contribution comparing with the national context, but surely, there is room for improvement in EHC service delivery. Increasing service utilization of PNC could ensure timely intervention to prevent both maternal and neonatal morbidity and mortality. It is also worth mentioning here that our national target is to ensure 50 per cent PNC from medically trained provider by 2016 (Fort 2012).

In the IYCF guideline by WHO, emphasis have been given to initiate breast milk within one hour in the community, for a number of reasons, for example, health benefit of mothers and children; reduce postpartum blood loss and ensure antigen for the prevention of diseases in newborn, were among the few. Breast milk initiation ≤1 hour was found to be higher (76%) than national average (47%). This could probably be a reflection of the programme intervention as well as recent media campaign concerning optimum infant feeding behaviours. A fair number of respondents also mentioned their sources of information regarding infant feeding, were SS and SK. In addition, 'mass media' and 'neighbour' were mentioned as sources of information. Practice of exclusive breast feeding in EHC *upazilas* was comparable with national data (64%). But the programme needs to continue its efforts to sustain these results and go beyond.

The idea of fortifying homemade food, by adding micronutrient powder for young children was a rather new concept for mothers in the community. In large scale programmes like EHC, acceptance compliance among the mothers of MNP as well as follow up desired behaviour might be an issue to mull over seriously (Adgianou and Le Grand 2013). In this regard, mothers' knowledge of MNP was also a precondition of MNP acceptance and compliance. Although a majority of mothers had heard about MNP, they did not have any comprehensive knowledge about appropriate initiation age, duration of each MNP cycle, required gap between each cycle and necessity of MNP for children. It was laudable that about more than half of the mothers mentioned SS as their source of information and supply of MNP but compliance of MNP was very low. Majority of the mothers reported, that babies did not want to have MNP, as reason behind non completion of the MNP Cycle. Clearly, ample effort is required from the programme side to overcome these barriers and popularize MNP.

ARI is one of the major causes of childhood mortality and morbidity in developing countries like Bangladesh (Rah *et al.* 2011). Most ARIs result in mild illnesses like common cold, which might turn into serious infections, such as pneumonia for vulnerable children if care is not taken (Stephen *et al.* 2008). Recognizing danger signs, seeking appropriate care , and treating appropriately with antibiotics are three essential steps in reducing the risk of death from pneumonia among under-five children. Hence the role of caregiver in identifying danger signs is very crucial (Stephen *et al.* 2008). This study found that a majority of mothers were not aware of the danger signs of ARIs, although the prevalence of common cough, cold and pneumonia existed in the study area. A large proportion was found to seek care from drug shop attendants, village doctors and homeopaths which might be interpreted as delayed or inappropriate behaviour in care seeking.

EHC structure is being utilized by HNPP in different areas for various health interventions like malaria TB, ARI, MNCH etc., it would be more challenging for EHC to assimilate the different interventions and deliver these with equal focus in the community. This study finding revealed, while comparing with national average, a better

status of indicators in EHC *upazilas*, for example in immunization coverage, family planning, antenatal and delivery care and infant and young child feeding practices. The challenge for the programme will be to sustain the current good practices and invest in further effort to achieve the desired levels to reach the MDG health goals.

LIMITATIONS

Data were collected verbally from mothers except the information on immunization. Hence, the data are not free from information bias for example data of ANC, PNC and infant feeding practices. Rigorous training and guidelines regarding interview techniques for the enumerators were incorporated to reduce these biases. Moreover, the results were only representing mothers in EHC *upazilas* having an outcome of a live birth and not the whole country.

RECOMMENDATIONS

FAMILY PLANNING

To sustain the FP use rate the programme should ensure FP supplies so that the service is accessible and available for the community. It is a well-known fact, that education on side effects and its management is an imperative precondition of choosing a particular method and continuation of its use by the probable clients. This programme might think of sensitizing the health workers regarding these issues, equip them with necessary training, and accordingly make the service available for the clients. The study found that very few were using permanent methods. Therefore, the programme could promote these methods by identifying the potential clients and encourage uses, utilizing IEC.

MATERNITY CARE

4+ ANCs by medically trained providers, skilled birth attendants and PNC within 48 hours reduces substantial maternal death risks. Therefore, effective counseling is necessary for the mother and the family to utilize these services. The programme might also initiate strengthening PNC services within 48 hours.

CHILD HEALTH

Bangladesh has received an award for outstanding performance in child immunization by GAVI Alliance and this status was also reflected in the findings. It would be good to continue the work towards meeting the challenges for this service. For instance the programme needs to focus on ways to fulfill the aim towards universal coverage. In light of this, the programme could initiate campaigns to remind mothers or community to receive measles vaccination of children after they have turned nine months due to the fact that it was found to be lower among other categories of vaccination.

ARI management protocol emphasizes care givers' skills in identification of danger signs as a crucial condition for appropriate case management. In EHC *upazilas*, initiatives could be taken to make mothers aware of the danger signs of ARI and its management as, the knowledge level found to be low despite the prevalence of ARI risk factors. Similarly mothers also lacked knowledge of micronutrients and its compliance. SS and SKs could through group meetings and *bari* visit improve the knowledge level of mothers in addition to exploring the IEC strategies for example through organizing campaigns and developing behaviour change materials and approaches for community awareness.

HEALTH VOLUNTEERS OF EHC

SS visits were found to be irregular and a quarter of the HH reported 'no visit.' Thus the programme should ensure an increase in regular household visits of SSs and this could be done through strengthening supervision chain if required. Recent research and programme experience have found that despite the prestige attached to SS's work, incentives both monetary and non-monetary could motivate SS more.

SSs are the life line of the EHC programme despite the fact that they are volunteers. The Programme needs to innovate new ways to provide incentives to these

workers. Hence, could create more opportunities for cash earnings, provide technical support in selling health commodities if necessary or provision for support during their medical emergencies might be ways to start with.

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ANNEX

Table 13. Factors associated in receiving 4+ ANCs

	4+ ANCs from trained provider	
	Percentage	p-value
Mother's literacy		
Can read and write	42.2	.000
Can't read and write	22.6	
Mother's education		
No schooling	17.5	
Primary incomplete	28.4	.000
Primary or higher	41.5	
Mother's age		
<20	38.6	
20-35	36.3	.299
36+	25.6	
*Perceived economy		
Surplus	46.1	
Equal	33.9	.000
Deficit	28.2	
HH visit by SS		
One visit in each month	47.0	
2/3 visits in 6 months	36.0	
Never	22.5	.000

* reported household economic condition of the year preceding the survey

Table 14. Factors associated in receiving one PNC

	Receiving one PNC	
	Percentage	p-value
Mother's literacy		
Can read and write	47.4	
Can't read and write	30.5	.000
Mother's education		
No schooling	25.6	
Primary incomplete	34.5	
Primary or higher	47.0	.000
Mother's age		
<20	44.9	
20-35	41.5	
36+	51.2	.363
Perceived economy		
Surplus	53.9	
Equal	38.9	
Deficit	33.5	.000
HH visit by SS		
One visit in each month	47.8	
2/3 visits in 6 months	42.6	
Never	34.3	.001

Table 15. Factors associated in using modern family planning method

	Use of modern FP method	
	Percentage	p-value
Mother's literacy		
Can read and write	71.3	
Can't read and write	69.8	.602
Mother's education		
No schooling	66.3	
Primary incomplete	71.6	
Primary or higher	71.5	.391
Mother's age		
<20	77.2	
20-35	70.4	
36+	62.8	.142
Perceived economy		
Surplus	68.0	
Equal	75.3	
Deficit	68.2	.030
HH visit by SS		
One visit in each month	72.5	
2/3 visits in 6 months	69.4	
Never	70.8	.603

Table 16. Factors associated in practicing exclusive breast-feeding

	Practice of exclusive breast feeding	
	Percentage	p-value
Mother's literacy		
Can read and write	63.0	
Can't read and write	60.1	.345
Mother's education		
No schooling	55.0	
Primary incomplete	63.4	
Primary or higher	63.1	.139
Mother's age		
<20	56.7	
20-35	63.4	
36+	46.5	.034
Perceived economy		
Surplus	64.2	
Equal	61.3	
Deficit	60.8	.582
HH visit by SS		
One visit in each month	68.1	
2/3 visits in 6 months	59.5	
Never	58.4	.009

Table 17. Factors associated in introducing family food to children at the age of 7 months

	Introducing family food to children (7 months onward)	
	Percentage	p-value
Mother's literacy		
Can read and write	78.4	
Can't read and write	72.5	.026
Mother's education		
No schooling	70.0	
Primary incomplete	71.6	
Primary or higher	79.0	.010
Mother's age		
<20	69.3	
20-35	77.9	
36+	67.4	.035
Perceived economy		
Surplus	80.9	
Equal	75.7	
Deficit	73.0	.032
HH visit by SS		
One visit in each month	79.0	
2/3 visits in 6 months	73.8	
Never	77.8	.166

Table 18. Factors associated in receiving complete vaccination

	*Complete vaccination	
	Percentage	p-value
Mother's literacy		
Can read and write	93.3	
Can't read and write	88.9	.020
Mother's education		
No schooling	85.8	
Primary incomplete	92.1	
Primary or higher	93.1	.017
Mother's age		
<20	90.7	
20-35	92.4	
36+	84.8	.255
Perceived economy		
Surplus	93.7	
Equal	91.7	
Deficit	90.5	.346
HH visit by SS		
One visit in each month	91.1	
2/3 visits in 6 months	92.0	
Never	93.2	.642

*[a]BCG, measles, pentavalent and polio vaccine (excluding polio vaccine given at birth)